

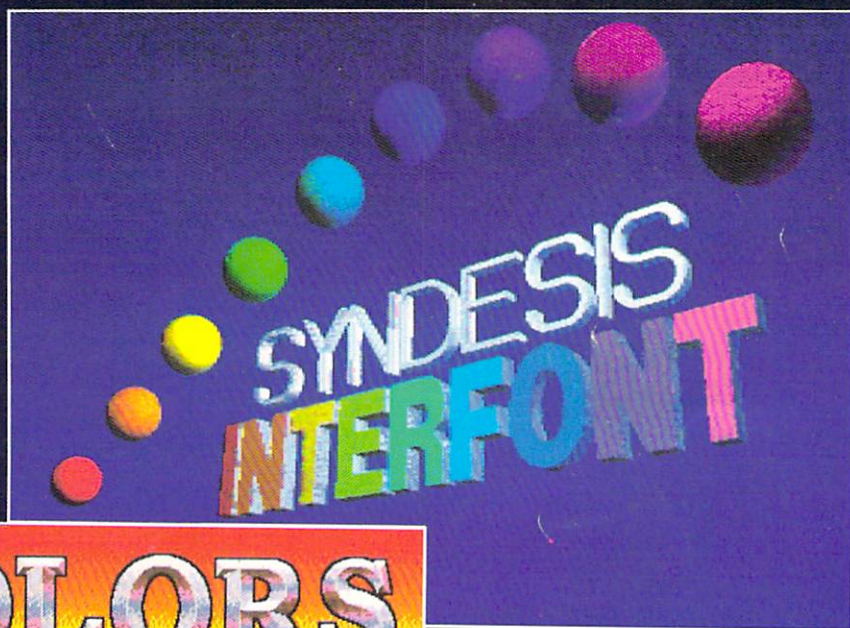
THE AMIGAtm SENTRY[®]

THE AMIGA[®] NEWS MAGAZINE

FEB. 89
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Getting Graphic!

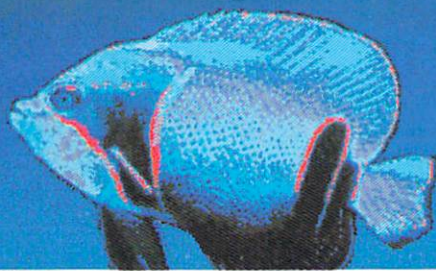
- ▶ Interfont
- ▶ Photon Paint II
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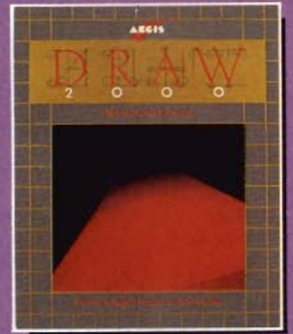
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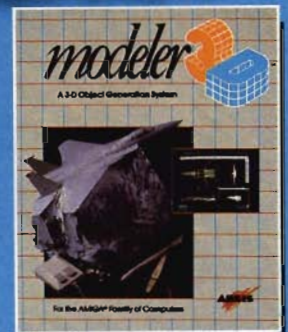
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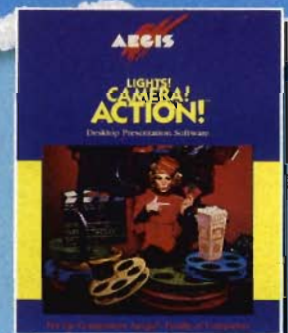
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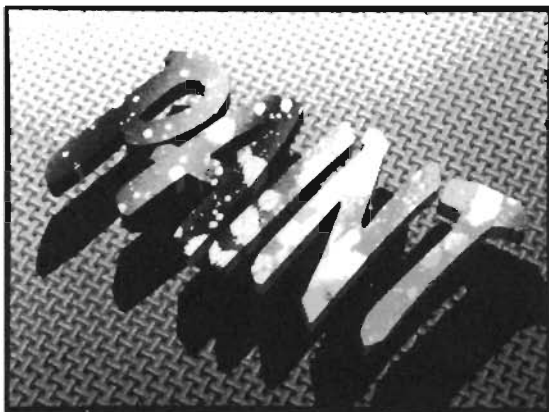
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On Point

Notes from Editor, Tom Bucklin

Read all about it: ...local boys make good...

Okay, all you frustrated folks who call with that sound of desperation in your voice saying, "The nearest store I know of that sells Amiga Sentry is 50 miles away in Kansas City. Isn't there someone closer to *my* area that sells your magazine?" Well, wait no more! We've increased our distribution and moved into a number of additional book chains, including the nationwide B. Dalton chain. Now we'll be as close as your local mall or shopping center.

Consequently, I imagine there may be a number of you holding your first issue of Amiga Sentry this month. Welcome to what we feel is the most informative "what's new" Amiga magazine on the market, bar none. With this, our nineteenth issue, I'm proud to say that we have consistently brought Amiga users (and developers for that matter) the latest detailed news about products and happenings related to Amiga computing. It is a matter of record that The Amiga Sentry provides more *late breaking, detailed*, information in a single issue than any other Amiga magazine. So, you see, you've answered your first question: yes, you did buy the right magazine.

You may also find it comforting to know that The Amiga Sentry is published by Amiga enthusiasts, like yourself. No large publishing conglomerate here. We don't look at the Amiga as just another computer that might produce some profits for us if we support it with a magazine (as is becoming the trend of late). The Amiga Sentry was started by and for the Amiga out of an appreciation for the astonishing capabilities of this machine. I believe this philosophy is reflected within these pages. But don't take my word for it, read on....

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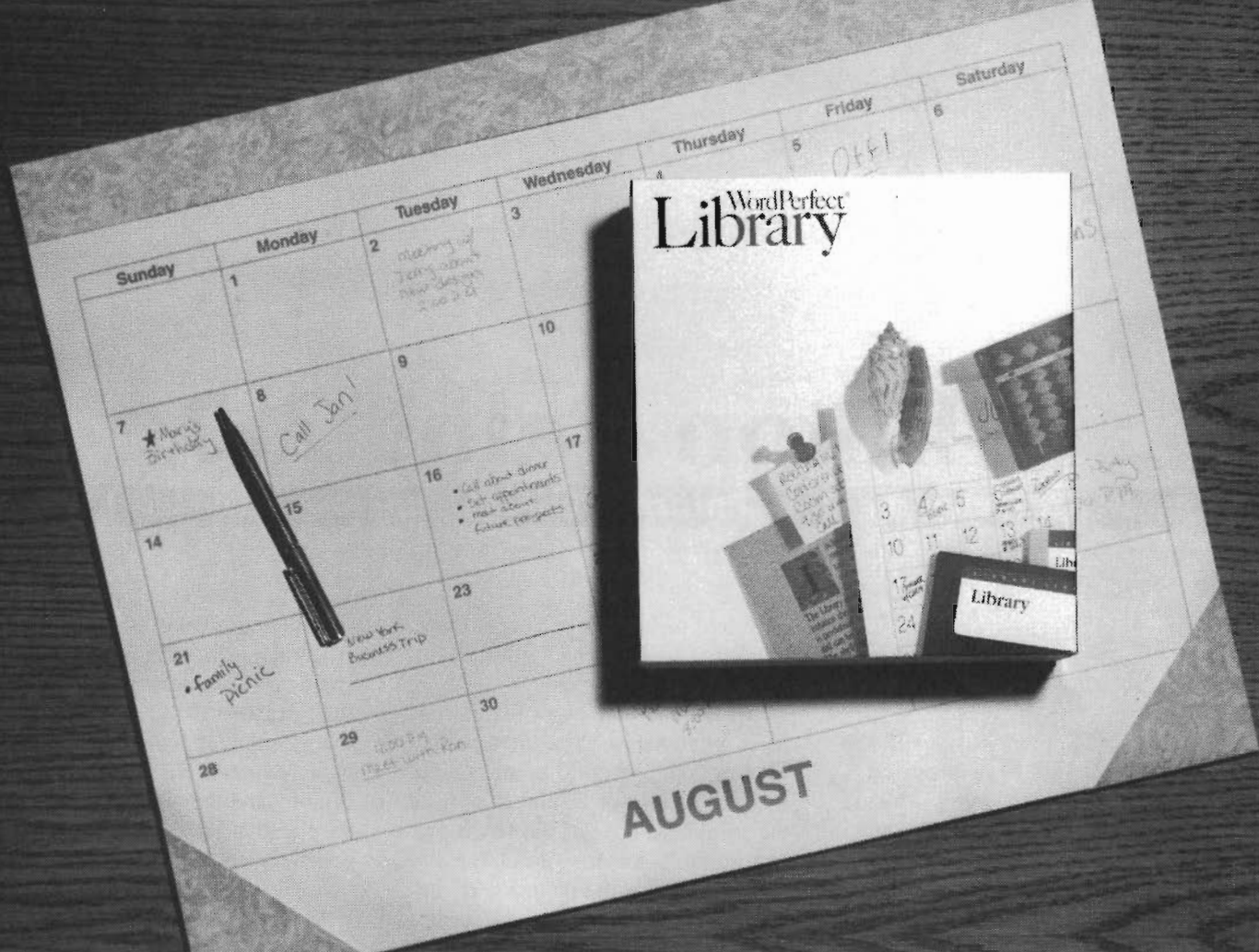
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Photon Paint 2.0

A Preview of Ham Painting brought up to a new level

by Paul R. Miller

Microillusions and Bazbo Soft have prepared a lovely New Years present for all Amiga painters in the form of Photon Paint 2.0. It appears that the Bazbo elves have labored long (and brilliantly) to satisfy our every wish. The so called "HAM wars" combatants may have to sue for peace. Photon 2.0 combines such power and painterly grace that I, for one, will retire the others to my

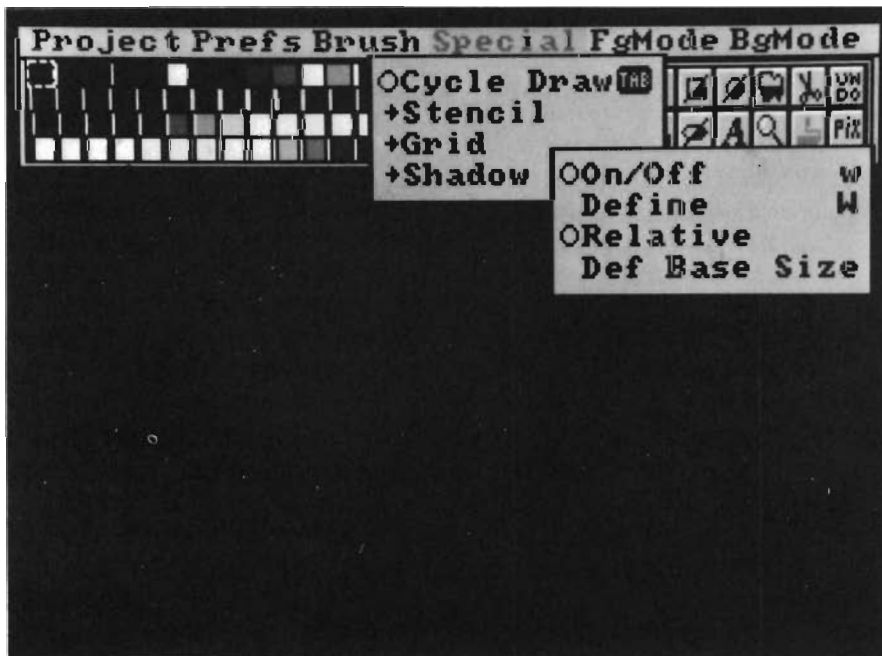
shelf and make a New Year's resolution to master its myriad of features.

Just about every paint feature has been improved or augmented so that PP now combines most of the compositional features of DPaint II with all the painting modes of the HAM programs, plus some new ones. The top-per, however, is the inclusion of animation within the program itself. Limited only by memory, you can now create a sequence of pages, edit your sequences in the paint modes, play them back as you create, and save them in anim files. I always

found Photon Paint 1.0 to be the most "natural" paint program because its speed and features most nearly emulate real "brush strokes." Now 2.0 brings that natural approach to animation. You have the combination of page flipping and drawing together. This is the electronic equivalent of painting on a registration tablet.

Most of the new features are quite transparent to the user, but I cannot guarantee that I caught them all. With that caveat, the following is a tour of the enhancements, menu by menu, left to right.

New powerful tools such as "Stencil" have been included in this version of Photon Paint



PROJECT:

Project is the new home for Fonts, which now gets a gadgeted requester to load fonts from other than your normal sys: directory. There is also a gadget to free fonts from memory for reassignment on the fly. As you now can have many pages, Base Colors includes a "Next Page" option and global Restore Palette and Default Palette. The big change is in Alternate, which now offers: Next, Previous, Go To, Insert, Append, Exchange, Delete Page, Delete All Pages, Copy to Next, Merge to Next, and Animate. As you add pages your menu bar updates with a readout of page#/total#. Having created a series of pages, the animate command will yield a requester for range (page# to page#, delay (a numerical value for playback speed), and

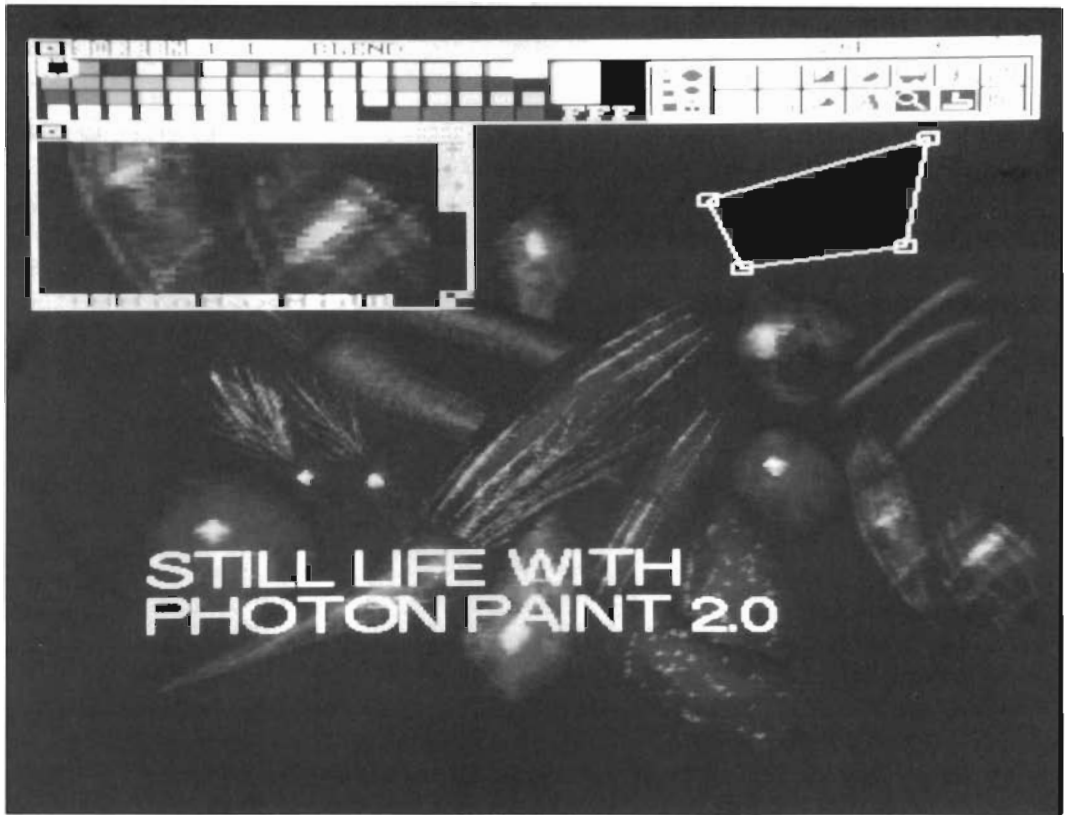
a reverse toggle. Normal animate will sequence, 1,2,3...1,2,3; reverse will give 1,2,3,2,1,2,3.... Activating animate will clear menus and cursor for a video display. Press escape to get back. Rounding out the commands are Save Anim, and Video, which gives you a still shot without title bar and cursor. Photon Paint will recognize compressed HAM anim's automatically when you use the standard Load command. At present, Microillusions is working to assure compatibility with anim's created by other programs.

PREFS:

Two new ones here. Clear to First, which retains color zero as the background when you clear the screen, no matter what your current background color selection. Then there's "Fast Brush." Fast Brush allows use of custom brushes in free hand draw mode. (This was formerly restricted to dotted free hand). "Clear to first" is real handy. No matter how many times I've done it, I always forget to select the background I want before clearing and end up repeating the process. It's touches like this, along with the matchless speed of the follow mouse feature that make this program so like real painting.

BRUSH:

Twist and Bend are now located in a sub-menu called "Special", along with a new feature called Stretch. Activating stretch will outline your brush with a four-sided polygon with gadgets at the corners to drag to new locations.



Photon Paint 2.0 strutting its stuff and displaying the magnify and polygon tools

(It's a lot like the polyfont resizing feature in Video Titler). While you wait for it to display, Photon augments the scanline count-down with a "wait pointer" that gives percentage completion. (This is common to most functions in this new version). Brush now offers "Solid" in addition to transparent background. This is a bit of a misnomer because it actually allows your brush to use the currently selected foreground color (like dPaint's color mode). Whatever the nomenclature, it was a feature I missed in 1.0, and is now available with a keystroke (as are most PP 2.0 items). For brush wrapping we get an additional contour mapping option, with a sub-menu for setting an "averaging size value." Here, numeric keys select and lock pitch, roll, yaw, distance, and x and y positions. This one's a little tough without final in-

structions, so I couldn't determine all its features. Lastly, the LUM requester that is used in conjunction with brush wrapping has been augmented with new sliders for contrast and dither, and a button to activate fine shading. Wrapped brushes look much better than in 1.0, and seem to be remapped in a smoother, less grainy display.

SPECIAL:

A whole new menu with four new items: Cycle Draw, Stencil, Grid, and Shadow. Cycle draw is defined by selections for background and foreground colors, and steps through the range color by color, so you have the potential for a 64 color range. Resetting is a simple matter of clicking on a new color. Stencil provides On and Off toggles and

(continued on next page)

Photon Paint 2.0 (continued from previous page)

an Invert button. Stencils are defined by dragging your mouse around the desired area. While it's not as flexible as dPaint's separately lockable color registers (dPaint only has to deal with 32 colors at most), a purely area mapped stencil has its advantages and it sure beats cutting a frisket! Grid is also similar to dPaint in function. The only difference is in setup. Instead of entering x,y numbers you drag a rectangle while watching the coordinate readout to get your size. Shadow is a new and unique feature. You set up by dragging your mouse to determine distance and orientation from the parent brush stroke, then all painting operations get a background shadow. A variation allows definition and implementation of relative shadows. In this mode, the offset of the shadow from the parent object is a function of the parent's size. The effect is a kind of perspective where bigger objects are closer to the viewer by virtue of the appearance of their shadows against an imaginary background plane. This effect, in combination with PP's new separately selectable modes for foreground and background brush modes, will be a treat for graphics designers.

MODE:

Photon Paint was previously limited to four paint modes -- Color, Blend, Add, and Subtract. This set was lacking compared to Digi-Paint and PhotoLab's Paint. Not to remain outdone, Microillusions give us separate menus for foreground (left button) and background (right button), plus lots of new features within. Additional modes are provided for: Max, Min, And, Or, Xor, UseH and UseH&S. The first five will be familiar to HAM painters, the last two are new. The "Set Blend" requester has been refined with additional effects, including an option that blends against the current background color. (This is especially useful with the filled free

draw tool). Photon Paint's set blend requester was the best before because you got a graphic idea of your effect and it's even better now. Now you can also specify Sources for your tool operations: Color, Pattern (your last custom brush), Pantograph, or Under (rubbing through from an alternate page). Pantograph grants you a second cursor crosshair and you set its position by dragging the mouse for offset and orientation. When you drag this cursor over the canvas, whatever is underneath is copied and translated to the new position, tempered of course by your use of left or right button and the mode selections for each.

TOOLS:

2.0 gets an airbrush with an adjustable nozzle as the second click selection on dotted freehand. Computer paint airbrushes are no match for the real thing (use a blend fill to get that effect), but try reducing the nozzle to the smallest size, then paint in blend mode for the effect of a soft pencil or chalk. Filled freehand draw in blend was my favorite 1.0 tool. This new release gives us a filled polygon mode too, and it's useful for creating meticulous shapes (your hand can get shaky in free form) and for blended effects in its own right. Finally, the brush tool now lets you drag a rectangle, lasso freeform, or lasso with a polygon shape. Yet another thoughtful convenience that convinces me that Photon Paint was designed by people who really understand how graphic artists work.

Photon Paint 2.0 implements all the features we like in a HAM paint program with the tools and conveniences of dPaint that most Amiga users have come to use and require. Cheers to Bazbo for using the same keystroke equivalents as dPaint when possible! No "not-invented-here" syndrome from Bazbo! I won't throw dPaint away be-

cause I still need to work in Hi-res for many applications, but for sheer out and out painting that approaches the look and feel of brush on canvas, there's nothing to match this package. The inclusion of animation within the program is the clincher. The computer is, after all, supposed to be a tool for creation, and the less intrusive its workings are into the process, the better.

Animation in PP 2.0 interposes no barriers between you and your product. If you have been put off by the color fringing artifacts that are inherent in HAM mode, you may be encouraged to know that these effects are largely eliminated when RGB is encoded to composite video. Take the time to set your palette to legal NTSC color values (below 12), and you'll be even more encouraged. The first time I looked at Photon Paint displayed in composite through my SuperGen, I realized that the Amiga comes very close indeed to a professional paint box. Now with painting and animation built in, we have a video instrument with remarkable capabilities.

This is one program that I can recommend without qualification to all Amiga owners. If I were stranded on the proverbial desert island with my Amiga and just one program, Photon Paint 2.0 would be the choice.

Photon Paint 2.0
Program and Tutorial Art Disk
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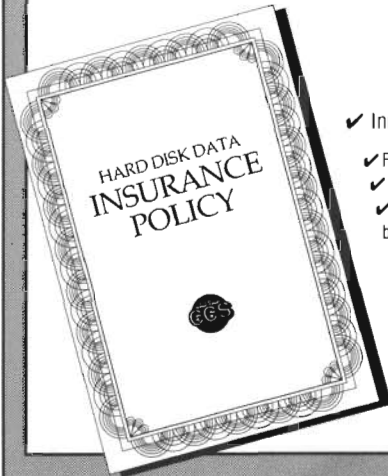
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InterFont

A 3D Object Font Designer from Synthesis

by Paul R. Miller

Synthesis has been helping out Amiga 3-D modelers for some time now with "Interchange," which lets you translate objects between the various rendering programs' formats. They began with VideoScape and Sculpt converters, then added Forms in Flight and Turbo Silver. Interchange lets you swap object files so that you can take advantage of these programs' particular strengths. Whether its quality of rendering, speed, object editing, or animation, you can avoid duplicat-

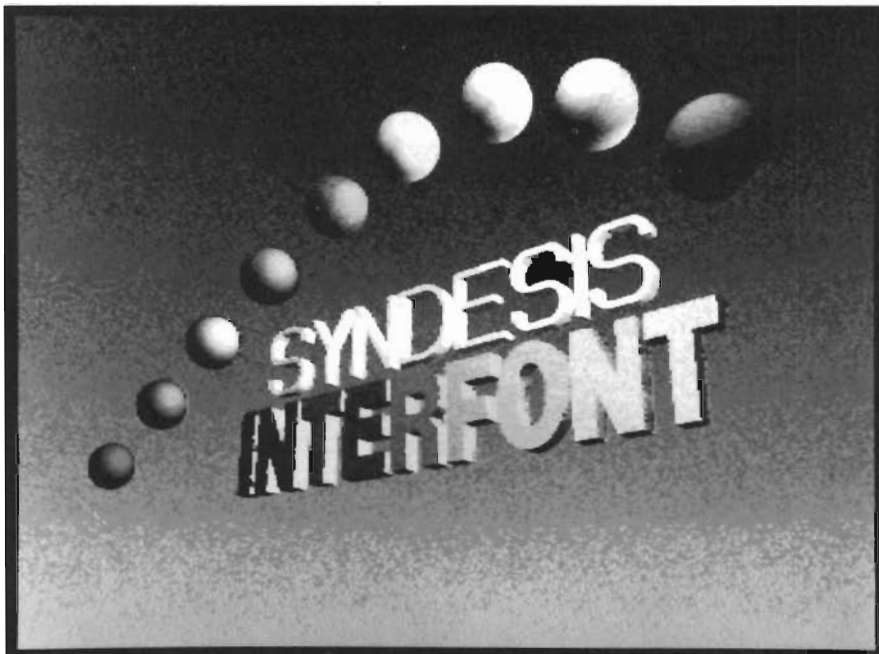
ing effort in the most tedious task -- object creation. Most video applications of 3-D modeling involve some text, and in this area we have all experienced a lot of tedium. VideoScape gave us one built in set of letters and others have begun to release sets of ready-made letters, but they are individual object files which have to be loaded one at-a-time and translated in space to compose your particular text string.

Take my word for it, this is not fun. In VideoScape you have to use OCT to translate each letter by the right amount to maintain proper spacing and kerning. (Modeler 3D makes this a whole lot better because you use a visual process with fine control). In

Sculpt 3D, Silver, and FIF you'll have to do a lot of fiddling to get each letter just right, and you'll probably give up the whole process. Byte-By-Byte's new heavy duty Sculpt Animate 4D has a feature that lets you type in their ready made fonts, which are automatically scaled and spaced according to your tri-view window size, but the font files are quite large in size. What we need is a method that is as easy as normal two-dimensional Amiga fonts: just typing - with options for styling and justifying. Interfont to the rescue!

Although the package is titled "InterFont," this is really a collection of several programs that function together with Interchange, and can serve a multitude of ends. The basic package includes: Interchange (the master environment), conversion modules for VideoScape 3D, Sculpt 3D, and Aegis DrawPlus (therefore Professional Page), the InterFont Conversion module, a collection of ready-made Interfonts, and InterFont Designer. All this fits on one disk.

Modules for Turbo Silver and Forms in Flight are sold separately, and Synthesis offers an upgrade path for present Interchange owners, with pricing tiered to their modular needs. Taken together the whole package allows you to: convert 3-d objects (including fonts) to and from the major modeling programs; convert 3-d objects and fonts to 2-dimensional vector files for use in

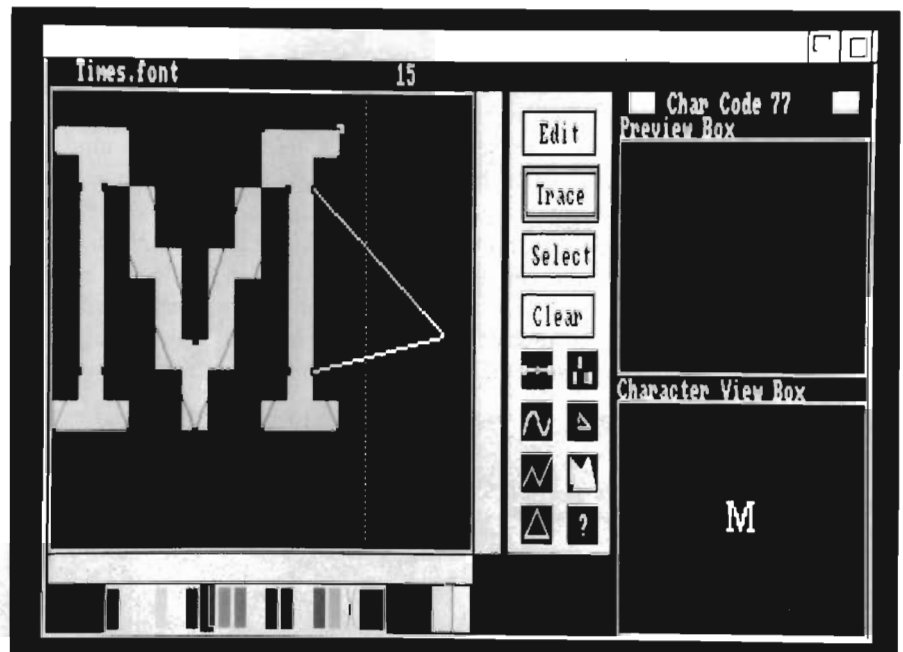


CAD (DrawPlus), and from there into Professional Page for desktop publishing; compose complex objects that are text strings of ready-made 3-D fonts (with control of size, depth of letters, surface texture, and automatic spacing, kerning, and justification); make your own 3-D vector mapped fonts with InterFont Designer -- a simple object editing program that overlays standard Amiga bit-mapped fonts, genlocked images, or allows free form design.

InterFont conversion follows the same procedure as the standard modeling conversions. First you must open the master Interchange program, then you must start the appropriate conversion modules. For example: InterFont Conversion and VideoScape. Each opens a window, so you will have a least three sets of requesters to deal with. Not to worry, Interchange will prompt you if you do something wrong, or haven't started the necessary modules, and it's really quite easy.

First comes Interchange. A comprehensive requester window will let you select available files (the "From" part), with gadgets to sort through disks and directories. In the case of a font conversion, you'll need to select from the Interfonts directory, where you'll find a choice of six ready-made font sets. A double click on the selected font file will transfer it to the "Selected Files" box. You can load a bunch of standard 3-d objects into this box and convert the whole lot, but only one set of fonts at a time. (Interchange will provide the proper .geo or .scene suffixes to your designated path).

Another set of gadgets under "Convert To:" sets your destination disk and directory. Now select the output format from another box (eg. VideoScape, Sculpt, etc., depending on which modules you have activated), and click on the "Convert" button. The system



With Interfont you can trace over bit-mapped fonts and create fonts that can be scaled to the desired size

message window will display the conversion process as it reads through the characters. Here you may also see a prompt if you've forgotten to do something. When completed, a message will tell you to "Enter text on InterFont Module window..." Now move your pointer to the InterFont window where you will see boxes for up to 5 lines of text. Each line has a button to the left which activates that particular line. Immediately below these lines is a box to enter your text string, and the remainder of the window offers gadgets for:

Justification -- Left, Right, Center.

Style -- Plain, Bold, and/or Italic.

Texture -- Dull, Shiny, Mirror, Luminous, Glass, and Wireframe.

Height -- expressed in relative values .001 to 2000. Height settings also determine the leading between lines of text, based on a value of 1/5th the size of the size of the line below.

Extrude -- On or Off (plus a gadget for depth value).

Backsides -- for use with extrude or to give rear faces to Videoscape letters.

Smoothness -- a value ranging from 1 to 10, and which determines the number of points InterFont uses to approximate curves.

Settings -- Load, Save, and Reset, to store combinations of text strings and styles for later use with other fonts.

Clip -- "On" removes the "holes" in font polygons so the background shows thru; "Off" maintains the hole as an opaque polygon. "Off" comes into play with 2-dimensional conversions to eliminate extraneous lines in DrawPlus, or to cover up backgrounds in Professional Page.

Object Name -- is your entry for the file name for your block of styled text.

(continued on next page)

Interfont (continued from previous page)

Last but not least, choosing *Cancel* aborts the lot.

Simply select one of the 5 lines, click on the string box, enter your phrase, hit return, and your text will appear in the check-marked box. At any time you can alter the settings until you are satisfied. A final click on the Create button will compute the complex file and store it according to your destination settings in Interchange. Not much can go wrong, and if it does you'll get a message informing you that:

-Your InterFont character has crossed polygons (meaning you made a mistake when you created it in InterFont Designer).

-You typed in a character that doesn't exist in your font set.

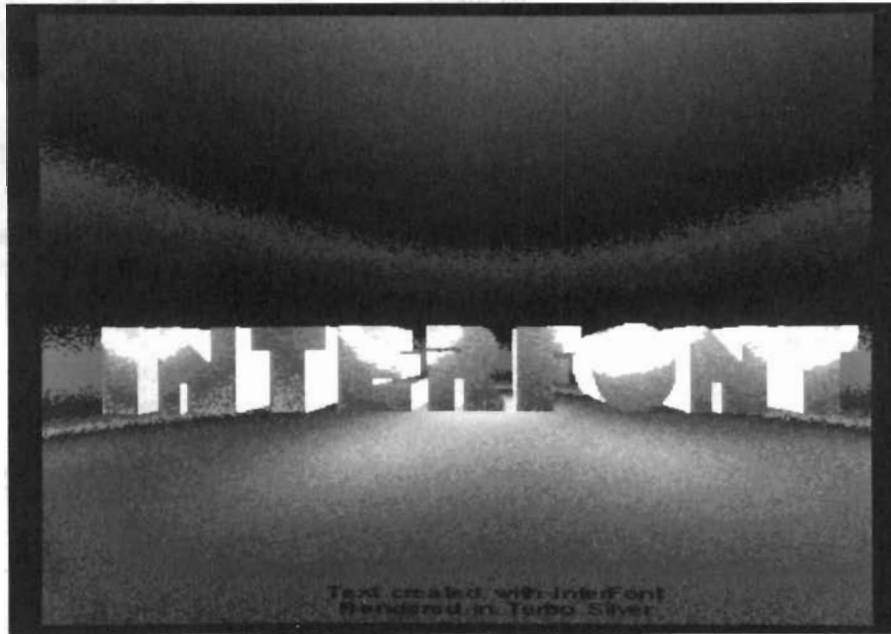
-You forgot to press return when you entered text in the string gadget.

You're finished with Interfont and its time to load your rendering program. Once this is running, load your text object, and sit back and relax while your block of text is displayed. Suffice to say that it's a neat trick and a great labor saving device. The combination of Interchange, InterFont, and the 3 base conversion modules alone would justify the price of this package, but you get the added bonus of InterFont Designer as well.

Before moving on to that program, I'll offer a few cautionary words concerning the conversions modules:

VideoScape 3D: (Version 1.4)

Owners of VideoScape 2.0 (or better yet, 2.01) will be disappointed to learn that Syndesis' conversion module is not up to date with the new color and surface features, nor does it create objects in the much faster loading binary format. A call to Syndesis yielded the explanation that they need further support from Aegis to make the upgrade. Let's hope they receive the help they



When used in conjunction with Syndesis' Interchange program, you can import your new creations into a variety of different programs

need for this useful product. In the meantime you can utilize Modeler 3D to convert to binary and re-edit for more colors and smooth textures. It sure would be nice to do it all in one fell swoop, however.

Sculpt 3D: (Version 1.4)

Although Interchange provides a wire-frame texture option, it will be treated as solid Dull by Sculpt. Large smoothing values applied to Sculpt's tri-angle based objects can result in enormous file sizes, such that one line

of text can exceed the program's memory limits.

Draw Plus: (Version 1.0)

This module only converts into 2-dimensions; it does not read from Draw Plus. Once you have converted to Draw Plus, however, you can go on to Professional Page and Professional Draw for desktop publishing. This module has two gadgets: Polygon

(Fill or Outline) and Color (Black or Grey). "Fill" sets the "hole polygon" color to 8, which is solid white in Professional Page, while "Outline" will set the "hole" according to your Color choice, either black or grey (which results in a match to color of the character outlines). "Grey" utilizes the Professional Page color system from 0 to 8 which correspond to black, and various percentages of grey and white. The various colors of your

own font creations are interpreted as brightness values and translated to the closest gray value. You must further remember not to extrude your letters (this is default anyway), and to select Clip toggle for the proper effect. With filled polygons this means "On" to let underlying background show through the holes, "Off" to preserve opaque white holes. With outline letters you turn clip off to avoid extraneous lines. Syndesis gives you a simple instruction for adding a line to Professional Page's "psprlg" file in the data drawer that will cure a bug in Postscript out-

put. Also included are two utilities that fix a bug in PP's use of the Mathtrans.library and correct PP font files so they conform to the Amiga standard.

InterFont:

Make sure the version of the conversion module with your package is 1.1, so splines will be created. If not, contact Syndesis for a replacement. You must remember to hit the return key when you enter a size value in the string gadget, or your fonts will not be resized.

Finally, if the ready-made InterFonts don't provide enough scope for your graphic needs, InterFont Designer will let you create your own. Unlike vector mapped 3-d fonts previously available, the fonts you create with Designer will be one file with all the characters. This file is then accessed by simply typing

while in the InterFont conversion module. Basically, Designer provides a method for tracing vector mapped polygons around Amiga bit map font models. You simply load in a font and use the editing tools to create straight and curved (spline) line outlines and "holes." One screen provides all the tools, requesters, and windows:

-A *Character Edit Box* -- wherein you form outlines of polygons over top of an enlarged bit-map of the font character.

-A *Preview Box* -- that shows the colored vector image of the character and updates as you work.

-A *Character View Box* -- that displays the Amiga font (or ColorFont) as it is normally displayed by the system.

-*Mode Gadgets* -- for Edit, Trace, Select and Clear.

-*Polygon Gadgets* -- to create new polygons, add points, spline or de-spline curves, alter existing polygon colors, delete points, change the order in which the polygons are displayed, and get statistics on your fonts.

Pull down menus supplement with options for:

-*Project* -- Loading Amiga or Inter-Fonts, Saving, Altering the color palette, or Quitting.

-*Edit* -- Snap: (to increments of the fat-bit display in the edit box), Pixel: (square, tall or wide, to correspond with the screen resolution mode your rendering will be in), Character: (Cut, Copy, Paste, and Move options, so you can easily utilize similar polygons in similar characters), and Points: to select all or clear (de-select) all.

(continued on next page)

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Interfont (continued from previous page)

-Preferences -- Pointer type, Coordinates, and file Icons.

Even if you loathe and despise structured drawing editing, you'll find this editor a snap. First select a bit-map font to load. Next pick your preferences for display, etc.. Then select edit mode; activate the polygon gadget and a triangle will appear over your bit-map background. The triangle will have three points represented by small squares. Now it's just a matter of dragging these points to the locations you desire. Another tool will add points to your original triangle so you can follow any complex shape. Easier still is to activate the Trace Mode, which will keep adding points automatically after each preceding one is positioned. Fifteen colors are available for the polygon outlines, with the sixteenth being reserved for your holes. Making a hole is the same process. Just add a polygon on top of your first (in "hole" color) and edit it to the proper shape. For curves, Designer gives you a Spline

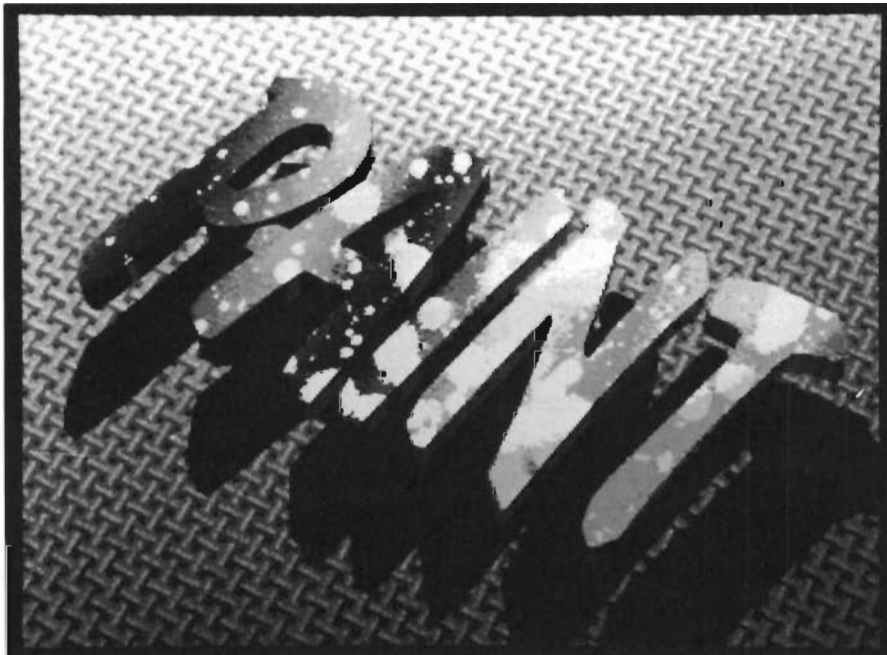
tool that will create a smooth curve between selected points on a line (and a tool to un-spline as well). In less than half an hour you can go through the manual and the tutorials, and be creating curved characters with multi-colored components.

Designer has all sorts of conveniences: zoom for the edit box display, scrolling through the character codes, typing in a character number, typing the character directly, a complete palette tool with RGB, HSV and spread. There's even an information gadget that tells you the lowest and highest character codes for the system font, the character pixel widths and kerning values, and the numbers of points that you create as you make your vector font. The low and high character numbers (0 to 255) correspond to the Amiga codes, not ASCII. Different system fonts will fill more or less of these slots. Width and Kern values are taken from the font as it was created. None of this matters, except that in order to create your own

custom vector font you need first to load a system font of your choice to get a set of values for these items. Once you've done this, you save it under a different name and reload without displaying the bit-map. Now you're ready to create a completely custom font. For that matter, since the character codes are merely an indexing system for particular keystrokes or combinations thereof, your "font" could be anything from a series of logos that you have traced over a genlocked image to frames in an animation sequence.

Except for the font sizing feature in the InterFont conversion module, everything in this package worked flawlessly. (Even here it just took a telephone call to determine that the return key **MUST** be pressed.) Syndesis is performing an extremely valuable service in providing Amiga 3-D modelers with bridges between the various programs, and deserves our thanks and patronage. Let's hope that the software manufacturers do their share and provide them with the technical assistance they need to maintain their modules through upgrades, and that with the introduction of new programs like Caligari we will see even more modules. Interfont and InterFont Designer are a wonderful convenience that should find a wide and grateful audience.

More dazzling displays of Interfont's portability prowess



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BROADCAST TITLER

A Look into the Future of Amiga Graphics

By Art Warsell

Like the first HAM painting and ray tracing programs, Broadcast Titler ushers in a new medium for the Amiga: Super Hi-Res. Super Hi-Res gives your present Amiga monitor an effective resolution of 2160 x 1440, with up to 320 colors on screen at once. Although the display is interlaced, it is virtually flicker free. This software miracle is accomplished by assigning each line of text or graphics on a hi res

screen its own 16 color palette. At the same time, radically new anti-aliasing algorithms are introduced to eliminate jaggies in curves and smooth staircases out of diagonal lines. There are actually 736 x 480 pixels on the overscan screen, but the resolution is multiplied approximately three times by the line dithering routines made possible with the additional colors. The end result is a quantum leap into the future of Amiga graphics. Super Hi Res does not ignore, but utterly surpasses, IFF standards. Broadcast Titler loads files from and can save pictures to IFF. But a Super Hi Res image saved

to IFF will keep only what IFF can read: the first 16 colors used.

Broadcast Quality Character Generation

Apart from introducing Super Hi-Res, how does Broadcast Titler perform as a titling and character generation program? We will examine this question in great depth in the following pages. But it cannot be disputed that this is the fastest, most powerful, versatile, and easy to use character generation software for the Amiga. Here are a few of its main features:

- * Accepts all standard Amiga Fonts and Color Fonts
- * Has over 100 line and page transitions including rolls, tumbles, flips, splits, slides, fades and dissolves
- * Stores sequences of up to 1,000 pages of text and graphics
- * Controls Supergen for automatic genlocked fades and dissolves
- * Provides automatic or custom backgrounds and patterns.

User Interface

To use Broadcast Titler, you will need a minimum of 1.5 Megabytes of RAM. Loading the program brings
(*continued on next page*)

*Broadcast Titler uses its own menu system
operated through the cursor keys and keyboard commands*



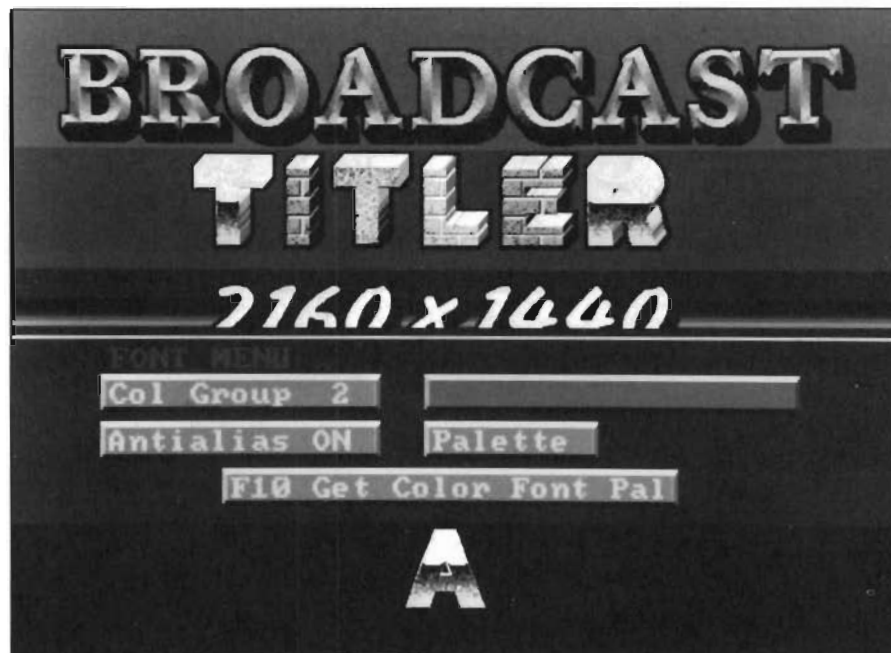
Broadcast Titler (continued from previous page)

you to a blank screen with a long blinking cursor tucked away in the top right overscan. This is the text entry screen. Touching the right ALT key will make the EDIT MENU appear across the bottom of the screen. This menu contains six buttons: FONT, EDGE, LINE, PAGE, FILE and PLAY. Right and left arrow keys move a highlight from button to button. Pressing the right ALT key brings up the next menu or requestor for the highlighted button. Striking the ESCAPE key takes you to the previous menu, and the right AMIGA key returns you to the text entry screen.

One of the joys of Broadcast Titler is that there is no waiting. Nearly all selections throughout the program occur instantaneously. Would you like to change Color Font palettes? While you are pressing the F10 key, it has already happened. How about extruding any font into 3D? The transformation is just as quick. Even loading an IFF picture is unthinkable fast, since the file is read as a block rather than byte by byte. Given this orientation, let's take a quick look at the program's features menu by menu.

THE FONT MENU The FONT SELECT button on this menu will bring up a parade of all the fonts you have loaded. These can be any Amiga Fonts in your collection. You can change the palette for any font with a single keystroke. Or, if you want to experiment with new color combinations, select the PALETTE button and you'll find the face, outline, and shadow colors for the font you're using conveniently tagged. ANTIALIAS ON/OFF toggles to let you see the difference between hires and Super Hi-Res.

THE EDGE MENU This menu provides outlines of any size or color, shadows that hug the letters or can be



The program allows you scroll through your collection of fonts and adjust the color so that you can try various fonts on "for size" to see if they fit in a scene

cast in eight directions with varying distances from the font, as well as instant 3D extrusions.

THE LINE MENU Line transitions available from this menu include Teletype, Slide (in any direction), Ease (any direction), and six different types of Fade and Color Cycle. Each of these effects is an animation of a line of type, pattern, graphics, or any combination of the three. Setting the speed and sequence of transitions is fast, easy and direct. To see what an effect looks like, just escape to the EDIT MENU and select PLAY (or press the F1 key).

The backgrounds available for text lines are color ramps in the form of straight vertical spreads or various types of cylinders. The shading and blending can be more gradual and subtle than HAM because you are working in an effectively higher resolution. You control the precise size and position of any pattern. For example,

the illustration on the cover of this issue shows the vertical spread as a background pattern, extended continuously behind several text lines.

You may also select and position any previously loaded IFF picture or brush on the screen. A brush that is loaded on a text line will be able to perform all the line effects. The tropical fish on the cover illustration, for example, can glide across the screen horizontally, vertically or diagonally.

THE PAGE MENU From this menu, you set up page sequences through routines that are similar to the cut, paste, copy and insert functions of a word processor. Doing so is fast and uncomplicated.

The full page transitions available include: Roll, Push, Slide, Ease, Corner, Mirror, Split, Tumble, Flash, Blink, Spread, Ripple, Weave, Slant, Wave, Build and Teletype. All effects can be

(continued on page 16)

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Broadcast Titler (continued from page 14)

executed either at pre-selected intervals, or activated by touching the spacebar while in PLAY mode.

You may also make selections here which will control Supergen for timed dissolves and fades. Other Supergen controls include line by line and real time live control through the function keys.

THE FILE MENU Here is where you load IFF pictures, fonts, and previously saved sequences. You can save any screen as an IFF file, but IFF can retain only 16 of the colors you have used.

Conclusions:

Broadcast Titler extracts an unprecedented level of performance from the Amiga. It does so through a new window management system that will rewrite the books on Amiga programming.

With this software, the Amiga is actually faster and more versatile than many dedicated character generators costing tens of thousands of dollars. The Super Hi-Res display and smoothness of transitions provide a truly professional video tool, suitable for broadcast television.

Fortune 500 companies with in-house production facilities will no longer be able to ignore the Amiga. I expect that Broadcast Titler will open the door for Amiga into video production studios at every level of the industry. And for those of us with Amigas at home, with the release of this program our desktop videos will enter another dimension.

SUPER HI-RES PAINTING?

Imagine a paint program with an effective resolution of 2160 x 1440 with up to 320 colors on screen at once in this Super Hi-Res mode! In a recent

VIDEO TITLING & CHARACTER GENERATION PROGRAMS A Brief Summary and Comparison

PROGRAM NAME	COMMENTS
TV*TEXT	This was one of the first generation of Titling/CG programs for the Amiga. Vastly underrated, TV*Text is fast, easy to use and produces clean looking results. Its main limitation is that it lacks line and page transitions altogether. Accepts standard Amiga fonts.
VideoTitler	VideoTitler provides the ability to customize fonts in unique and delightful ways. Some of its functions are very fast. Others are clumsy and slow. Transition effects are limited and of moderate quality. Accepts standard Amiga fonts and Color Fonts.
Pro Video Plus	The first Amiga program to emulate dedicated character generators. PVP is powerful but cumbersome to learn and use. Fonts and transitions are excellent. Although the program has an extensive library of effects, it does not include ROLL, probably the transition used most often for credits and titles. Comes with four fonts in four sizes each, with other styles available for purchase separately. Does not accept standard Amiga fonts or Color Fonts.
Video Effects 3D	Extrudes and animates titles, logos and graphics with 3D tumbles, zooms, rolls, turns and other very high quality effects. Easy to learn and use. Accepts IFF files, but does not generate characters from fonts.
Broadcast Titler	Broadcast quality Titling/CG program. Super Hi Res takes the jaggies out of and puts magic into standard Amiga fonts. Permits multiple color fonts on screen at once. Dazzling speed on all functions. Quickly learned and easy to use. Very high quality transitions.

conversation with Jim Schneider, the programming wizard who created Broadcast Titler and Video Effects 3D, I asked if it would be possible to create drawing and painting tools for Super Hi-Res. He did not see any great difficulty in accomplishing this. I believe reader response to this proposition, however, will be the key to making this concept a speedy reality. So, now I'll throw the ball in your court and ask you to write Jim Schneider and tell him we want Super HI-RES Paint.

Keep those cards and letters coming, folks.

BroadCast Titler \$299.00

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*Super HI-RES means that anti-aliasing has never been more effective.
The lower word is in Amiga Hi-Res - compare to the same word above in Super HI-RES*



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Animation: MultiPlane

Foreground/Background Layering Capabilities for your Animations

by Tom Reed

Animation:Multiplane, is a "digital composer" from Hash Enterprises. In plain English, Multiplane lets you combine foreground and background pictures, along with animations and then save the combined images as a new animation. A composite image is a single image file resulting from the combination of an IFF file, IFF brush, or a sequence of images ie.

PACKed animations, a sequence of IFF's, etc.. Multiplane also has the ability to combine foreground and background elements in many interesting ways. Finally, the program includes digital processing functions which work on a single foreground image to create a shadow, perform a pixelation, or create foreground animations which will eventually "play" against a genlocked background with Multiplane.

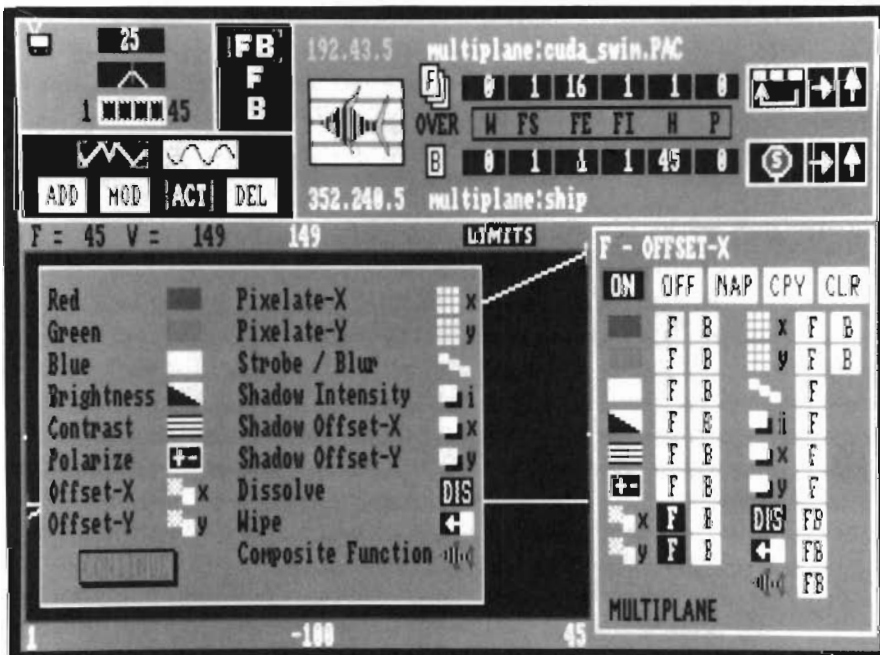
Multiplane allows you to use all Amiga resolutions and screen sizes, in-

cluding HAM. The resolution of the foreground layer can be different from that of the background. However, the resolution of the background layer will determine the resolution of the composited animation. Animation Multiplane is copy protected and utilizes a key disk arrangement to operate the program. Multiplane also requires at least 1 megabyte of memory and one or more disk drives.

The manual is a 47 page stapled booklet with limited screen shot illustrations. There is an initial tutorial in the manual to demonstrate the procedures for using Multiplane. In short order you will have completed your first animation with elements supplied on the disk. The next chapter of the manual describes in some detail the user interface for Multiplane. Each of the many functions of Multiplane is explained.

Another chapter of seven tutorials is provided to give you an idea of what the various effects look like. The sample choreographs are provided on the disk. (Hash uses the term choreograph, where others use script or sequence.) You must load the choreography and then render the frames. When that is completed, you can play the example back. I found it very useful to load the choreography and study the channels that were used and try to envision what the rendered animation would look like when played back. Other sections of

A variety of effects are possible with Multiplane



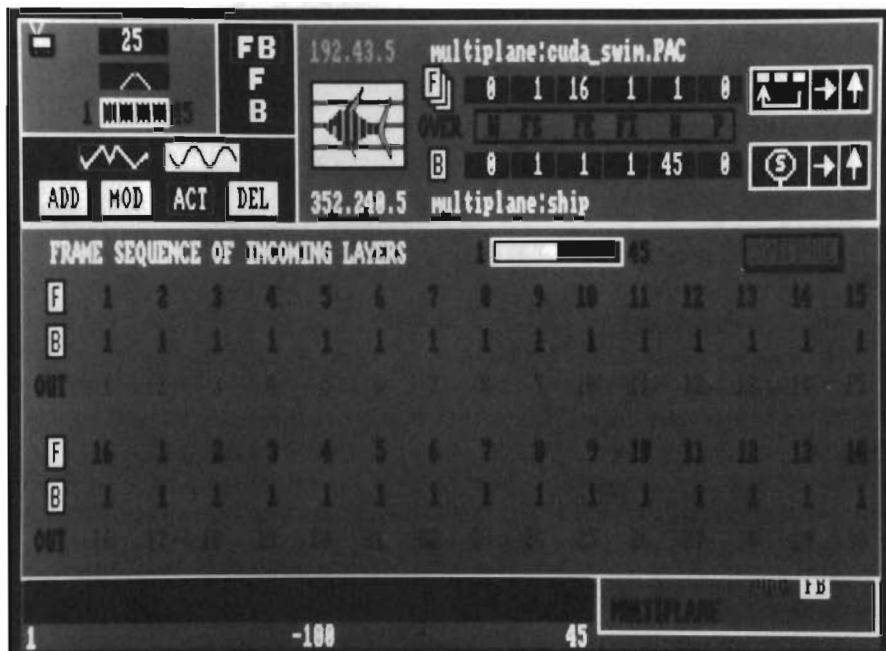
the manual include a reference section, a glossary, rules, trouble shooting, and display module information.

In the Disney studios animations are commonly made by creating different layers or planes, and then combining these planes photographically. Usually, there is a background layer with a foreground object or character moving against the background. Special effects in films are created in much the same way. Any one scene of a feature length film may contain many elements filmed, or created separately, and then combined into one cohesive, and convincing shot.

Multiplane has a unique and easy to learn user interface which is predominantly icon driven. To create an animation in Multiplane you first load a foreground and background layer into the program. Once these are loaded you define "channels," which then control the different effects you wish to use in your animation. A channel controls a specific effect over the duration of the animation. Channels control either foreground or background elements. Some effects can be applied to the foreground and background, and some effects only apply to the foreground. A specific effect is created by placing control points by a left mouse click within the channel graphing window. There are 27 different channel types or digital effects to choose from.

These effects include the following Channel Types or Digital Effects:

Brightness: If a control point is placed at the very bottom of the Graphing window the image will be completely black. A control point at the very top creates a foreground or background that is completely white. A control point that is half-way between the top and bottom of the graphing window will not affect the picture.



This Multiplane frame window allows you to determine the frame sequence for incoming layers of your production

Color Control (Red, Green, Blue): The color components can be altered by activating these channels. A control point at the bottom of the graphing window sets the color value to zero, and a control point placed at the top of the graphing window sets the color value to 15. The original color value will be unchanged if the control point is set mid-way in the graphing window.

Contrast: This channel has a threshold value for each red, green, blue, color component. If a control point in this channel is set at the top, all pixels which are below the red, green, or blue threshold values will be black and those above the threshold will be white.

Polarization: This channel is used to remap pixel color values during the animation.

Picture Offsets: To produce motion in the animation the picture offset channels are used. Each layer can be moved

relative to each other during the animation.

Motion Blur/Strobing: To simulate motion blur and strobing, these channels are used. This effect can only be viewed during playback.

Drop Shadows: This is a very nice feature of the program. A shadow of the foreground layer is cast over the background. You have control of the shadow's intensity, from a completely black shadow, to shadows that are completely transparent. Being able to "see through" the shadow to the background is an effective feature. A shadow can be placed and moved throughout the animation independent of the foreground layer's movement or lack of movement. So, if you have a stationary object and want to simulate the movement of a shadow that the sun will cast at various times during the day, you can easily accomplish this with Multiplane.

(continued on next page)

Multiplane (continued from previous page)



F OUT B- foreground out of background

F ATOP B- foreground atop background

F XOR B- foreground xor background

These functions can also be accessed by using the "Layer" function gadget. This unique gadget uses a fish to represent the foreground, and

Wipes: This channel is used to perform a wipe transition between the foreground and the background layers.

Dissolve: Another transition effect for going from a foreground layer to a background layer, or for combining foreground and background layers.

Pixelation: The user can define the pixel height and width of the pixelation rectangles of the image. Then, by placing control points in the graphing window, you can control the pixelation effect throughout your animation.

Compositing Functions: Interesting (bizarre) effects can be gained by changing the way the foreground and background layers are composited throughout the animation. This can be changed from one frame to the next throughout the animation. There are a total of five functions that can be performed while combining the foreground and background layers in the compositing mode. The five functions are:

F OVER B- foreground over background

F IN B- foreground in background

blue horizontal bars represent the background.



Once the frames have been defined using the various channels, it is time to record your animation. Your first step in this process is to record the choreograph for your animation on a disk labeled "data." The program will look for this data disk and will not save it to another disk unless you have used the assign command to redirect the saving of your choreographs. Once the choreographs have been saved you will record the individual frames of the animation. This takes a little time, so you might want to

take a break while the program and computer does it's thing.

Display Module:

After the frames have been rendered and saved you must exit the program and enter the display module. While viewing an animation you can toggle frame numbers on and off by pressing the return key. Single frames of an animation may be viewed sequentially by pressing the left or right mouse button.

Subsequent clicks of the left button will advance the animation forward one frame at a time. The right mouse button will move the animation backward one frame at a time. Function keys F1 through F10 control playback speeds.

These are the major functions of the program, but certainly not all.

Multiplane allows you to control the sequencing of the foreground and background layers, animations can be paused, stopped, repeated, cycled. You can horizontally and/or vertically FLIP a layer prior to compositing. There are two types of channels that can be used: linear or curve. The curve type of channel will create smooth transitions between control points. This is a "feature-rich" piece of software. I found the program a delight to use. Multi-



plane behaved well, and the functions worked as described with ease. It is nice not to fight with a program to accomplish the end you want. It is also nice to end up with the effect you want and not the effect the program frustrates you into accepting. Adding dissolves, drop shadows, strobos, adjusting brightness and contrast, filtering colors or performing pixelations is almost effortless and actually fun to do. The graphic representation of the effects in the channel graphing window allow you to "see" what is happening to the various elements of the animation. This is an unusual user interface which is well adapted to its tasks.

At any point in the development of your animation it is possible to preview just the foreground "plane," look at the background "plane" by itself, or view the composited image of both the

foreground and background. Hash Enterprises has invested most of their time in the development of the program, and not in the production of the manual. In short, the manual should be more complete. More illustrations with clear detail as to the location of the gadgets and their functions is needed. This manual is the weak point of an otherwise strong package. Access to information about your animation is almost always on the screen for you to check (or at most a key stroke away). It is very good to have this information so accessible instead of having to embark on a fact-finding expedition.

There is, however, one feature that I would like to see incorporated in the program. You can view individual frames of an animation, but you cannot preview the animation itself without exiting the program and entering a

player program. And furthermore, to get back to the Multiplane program you must reinsert the key disk. This is a disruption which interferes with my work, to say the least.

All in all, Multiplane works well, is easy to learn and use, with results that are sure to please. Hash Enterprises continues to produce products which advance the art of animation on the Amiga.

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3D Object Disks

High Quality 3D Objects for use in Sculpt 3D or Videoscape

by Paul R. Miller

Anyone who utilizes three-dimensional objects in graphic productions and lacks sufficient free time to build those objects (which includes just about everyone) may want to consider 4 new disks of ready-made objects and parts just released by Antic Software. For this first offering, four realms are provided: The Human Body, Future objects, Architectural elements, and Sci-Fi humanoid Micro-

bots. The disks are available in either VideoScape 3D object (.geo files) or Sculpt 3D/4D format. If you're a dedicated user of one or the other, you'll want to buy your proper format, but you can translate any of the files using InterChange and the appropriate conversion module (Forms in Flight, Silver, AegisDraw, Professional Page, etc.). You can also do some conversions with 3-Demon, and Modeler 3D users can load either .geo or .scene formats.

Each package includes a pretty box, a disk, and 3 loose 8-1/2 by 14

"blueprints" to illustrate the objects. The quality of these illustrations vary. Future and Architectural give you a breakdown and direct correspondence with the composite objects and the subdirectory file parts, while the others are more sketchy and incomplete.

Some of the illustrations list numbers of objects, vertices, and faces, but there is no indication of color or surface texture. You'll have to render the object to see. There are no written instructions, but each disk includes a Readme file that you can print out, as well as a readme which describes Interchange.

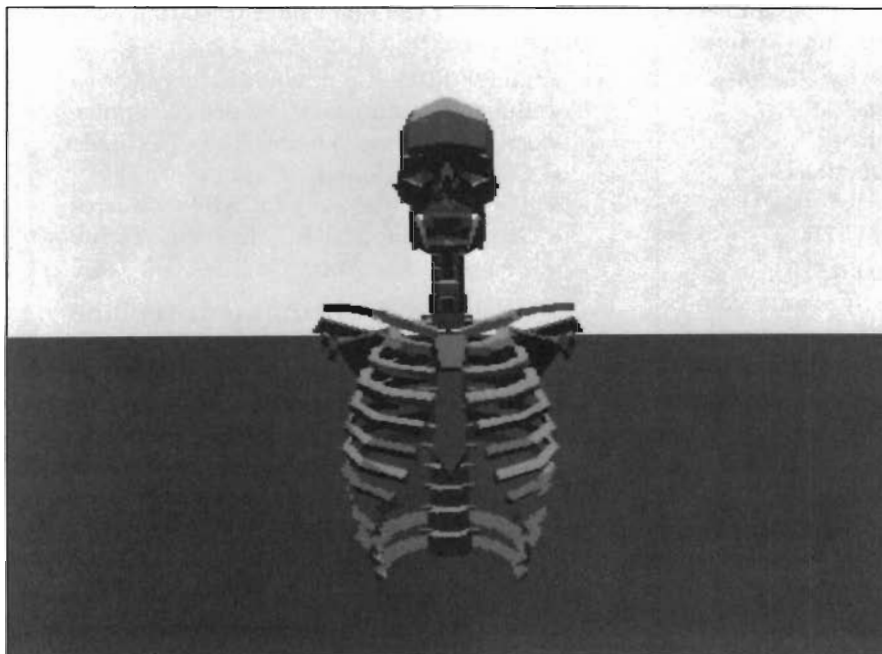
Since I'm partial to Architecture, I'll start with that disk first. Typical of these disks, the Architectural Design package provides a finished complex example constructed from the individual parts (in this case a version of an M.C. Escher imaginary building). The remainder of the files are organized in directories as follows:

ARCHES -- 3 circular, 4 Gothic, 3 parabolic, and 1 half shell.

ROOFS -- 2 domed, 2 extruded (barrel and canti-lever), 4 square, and 1 round tower with conical roof and port window.

COLUMNS -- 7 in all, from 4-sided to 18 sided, including a fairly detailed classical order.

Skeletal forms are featured in the "Human" Disk



WALL FRAMES -- 7 segments of stud wall construction with various window and door framing.

STAIRS -- straight stringers and a spiral number complete with ballustrade.

SKYLIGHTS -- square, hex, and barrel vault, complete with roof curbs.

SQUARE WINDOWS -- 4 with varying jamb sections plus a triangular sash.

ROUND WINDOWS -- 2 segmented stone jambs, one with muntins, and 2 semi-circular.

DOORWAYS -- 6 arched frames plus doors to fit with and without windows, and 2 additional segmented rectangular jambs.



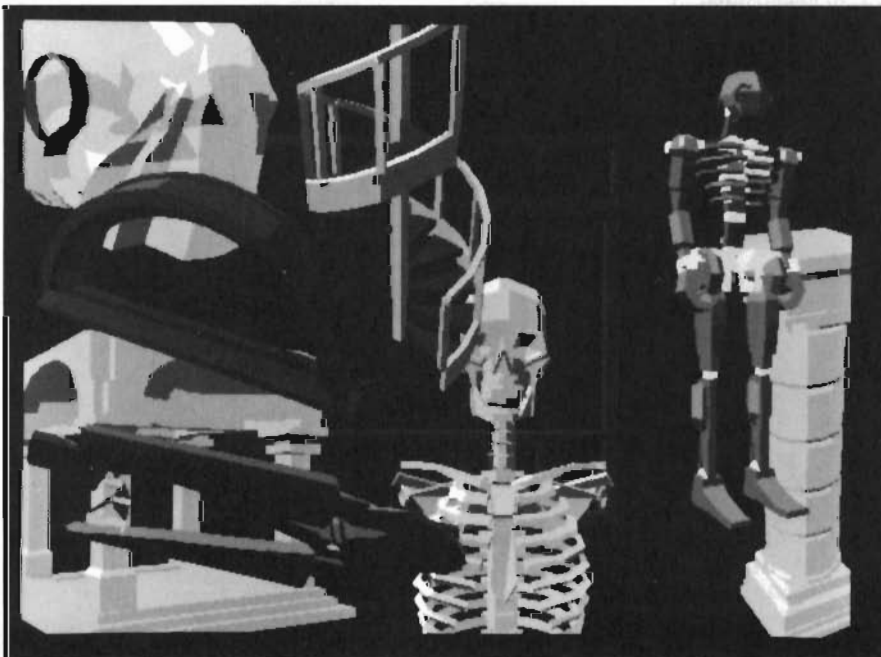
The Human Design disk contains only a few complex objects, namely the major skeletal segments of both the male and female, divided into segments of Head and Torso, Arm and Hand, and

Hips and Legs. These are very complex and detailed objects, running into several thousand vertices and polygons.

You also get a very detailed skeletal hand. To assist in the construction of the total skeleton in various poses, "Human" gives you additional files for

male and female "joints." These are spatial representations of the major joints formed by cubes whose center is the pivot point. To aid in the creation of animation files, WatchMan and Women figures are included for testing your motion. These are greatly simplified human figures with corresponding pivot points, so your test animations will run quickly.

Objects from the various categories of disks can be mixed and matched within your favorite application



Microbot Design also contains just 16 files in 7 categories, but they tend to be complex. The object here is to mix and match the parts to create your fantasy figures. The illustrations provide models to create characters like "Hammerhead/2C," who is composed of 3 different "Tracbot" models (a,b, and c). It's kind of like the LEGO catalogs that show you finished examples, but the point is to create your own. When you've exhausted the simple mix and match permutations, you can always edit the parts in your modeling program to make new variations.

Future Design is more like the Architectural disk in organization, with a few
(continued on next page)

3D Design Disks (continued from previous page)

complex objects and directories with lots of parts. The ready-mades include four spaceships, one treaded vehicle and a complex android. Parts are legion, organized as follows:

CREWMODS -- 8 spaceship hulls (bilaterally symmetrical complex objects).

ENGINES -- 9 radially symmetrical forms, 4-sided to 12 sided.

RINGDISCS -- 7 radially symmetrical objects

TANKS -- 5 types, radially symmetry

WINGS -- 7 extruded objects, two of which have true airfoil sections.

WHEELS -- 2 wheels and 2 treadsets

FRAMES -- 18 extruded objects to form the skeletal structure of your outer space creations.

When I first saw the advertisements for these disks I was most anxious to get the Architectural and the Human Design forms, as I thought they would be very useful in my work. I imagined that the others would be for sci-fi fans only. Now that I've sampled them all, I feel just the opposite. The Architectural forms are, for the most part, more suited to illustration and graphics applications. The most technically useful would be the wood frame parts, as you could rather easily construct complex representations of complete struc-

tures in skeletal form. The Human disk is perplexing. I guess I was expecting classical proportioned human figures like the Da Vinci drawing in the ad (with skin). Had I read more closely I would have seen that it says "skeletal." While they are striking and detailed skeletons, they seem more suited to technical illustration rather than figurative work. The Microbots and especially the Future Design objects will probably find the widest audience. I foresee their appearance in all sorts of graphics and video productions, and they are just plain fun to play with.

Each disk sells for \$34.95, which seems a quite reasonable price when you consider the time you would spend creating objects of this complexity. All the objects have been carefully constructed and appear glitch free. Colors have been kept to a minimum, which is fine because that makes creating your own palettes and texture variations that much simpler. Which should you choose, the Sculpt or the VideoScape formats? If you use both programs, you'll want to purchase the Sculpt format so that you have the advantage of the textures and smooth color rendering available in ray tracing, or the new scanline rendering options available in Sculpt 4D. Serious VideoScape users will be using Modeler 3D as well, which easily loads Sculpt files and saves them in binary form.

Future, Human, Architectural, and Microbot Designs

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MovieSetter

Gold Disk's Latest Effort Combines Animation and Sound

by Ed L. Fadigan

Just as the Macintosh spawned a generation of DeskTop Publishing programs, the Amiga leads the way in DeskTop Video. MovieSetter is a new entry from GoldDisk which clearly fits this category. DeskTop Video is a broad term used to describe those programs which display images in a fashion suitable for recording onto video cassette (although lots of folks simply skip the Video part, and display their animations only on the computer). In fact, DeskTop Video may be too broad a category for many of image presentation programs. There's the Mouse & Icon based interface of programs like "Lights! Camera! Action!" and "TV*SHOW," which are for the most part Slideshow programs with little built in animation. Then there's "The Director," with it's BASIC-like script language which has the ability to create complex interactive slideshows and animations in multiple resolutions. Because DeskTop Video is so wide a category, many of the these programs are positioning themselves into separate niches within the "DeskTop Video" category. So, when purchasing a DeskTop Video Program, you must decide whether or not the features of the program suit your needs. Although it can be used for many animation purposes, MovieSet-



A "Fast Menu" system provides for speedy access to your creation tools

ter is targeted at those who wish to create animations that are reminiscent of "Loony Toons" type cartoons.

Traditional cel animation has come a long way since Winsor McCay's "Gertie the Dinosaur" in 1914 and Walt Disney's introduction of Micky Mouse in 1928 with "Steamboat Willie." Animation in films and shorts blossomed in the 40's with Walt Disney's "Fantasia" and had continued success up until the 60's when rising labor costs made it much less profitable.

But lately, animation has gained some new appeal as a way to make a movie.

Right now, two animated films are enjoying popularity, "Oliver & Company" and "The Land Before Time." Both films are created by the painstaking process of hand painting individual "cels" of acetate with the different positions of a character and filming them in order to create the illusion of motion. This kind of filmmaking is very expensive, and rarely do you see two full-length animated features being released at the same time. In order to create this type of movie, teams of people are employed to work assembly-line style, drawing and painting

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MovieSetter (continued from previous page)

thousands of acetate cels. Jiminy Cricket was painted using 27 different colors in the film "Pinocchio" (He was later cut to 9 colors for the Micky Mouse Club films). At 24 hand painted frames for every second of film, you can see why you don't run into many people who do cel-animation as a hobby. But now, with home computers

have him looking up. Maybe in the third frame we'll have him squash down in order to build up to the jump. Finally we'll make our frog in a springing up position as he leaps into the air.

Having this series saved as an object such as MovieSetter's "set" gives us the freedom of easily positioning that

protected and can be installed on a hard disk without a problem. You also get a ClipArt Disk that contains dozens of already made backgrounds, sets, and sounds.

MovieSetter works ONLY in lo-res overscan mode with a 32 color palette. All other art that you want to incorporate into your productions will have to be re-mapped to this resolution. Since MovieSetter comes with ready to use sets, backgrounds, and sounds, it's easiest to start the program from the Scene Editor. You begin your movie in frame one. From there you should load an IFF picture that will serve as your palette and background picture. This background cannot interact with the sets in any way, and sets will always be displayed on top of the background. If you want your frog to be able to jump BEHIND the rock, the rock should be loaded as a set, not as part of the background. This is similar to the reason why you could always tell which bowling ball Fred Flintstone was going to pick up. Didn't it always seem to be lighter in color than the other bowling balls? That's because the other balls were part of a motionless background painting, and the bowling ball he picked up was painted on acetate for animating. No part of the background can move separately in MovieSetter. The background can be set to scroll in a horizontal or vertical direction, but that's pretty much the limit of background motion. All other movement is done with sets.

Loading a set will bring the first frame of the set to the tip of your mouse, and allow you to stamp its position in the first frame. After you've stamped out a frame, the image held by your mouse automatically changes to the next frame in the set! Therefore, once you have a set that represents a frog hopping, it's just a matter of "point and click" to get him to hop all



Keyboard shortcuts are available for most of the major functions within MovieSetter

like the Amiga, the ability to create animation has come home to the hobbyist. MovieSetter is a program that allows you to make animations in much the same way that cartoons characters like Bugs Bunny and Daffy Duck are made. Its unique method of grouping series of images into "sets" that can be positioned and controlled by the user makes this program a very powerful tool in making animations.

Let's say you wanted to have a frog come bouncing onto and off the screen.

A series of images must be created for every position that the frog will be in when he jumps. A frame will show him at rest, then the next frame will

series in different locations on the screen.

MovieSetter comes with four main programs. One is a Set Editor, used for the creation of Sets like our jumping frog. Another is the Scene Editor. With this you create Productions that combine different backgrounds, sets, and sounds together to make your movies. The third program, MovieSetter, is a combination of Set Editor and Scene Editor put together for users who have more than 512K memory. The fourth program is a distributable Player program so you can show your animations to people who don't have the MovieSetter program. MovieSetter is un-

around the screen. So five or six frames could be used in a loop to create a lot of the hopping in your animation.

Now that we've got our frog hopping for a bit, we can add a set that shows the frog flinging out his tongue and gulping down a bug. We can hit the button that plays the production in a loop, and our frog will merrily hop and munch bugs until we tell him to stop. We can make it more exciting if we have a set that represents a bug flying. This could be a very simple three or four frame set with the fly's wings in different positions to simulate flapping.

Now we can navigate to the point in the film where the frog catches a bug. We then load the bug set, and place frames until we have him hovering above the hopping frog. As we place the bug track, we can watch as the frog's set advances from frame to frame. This is truly a "What You See Is What You Get" animation program.

In addition to the "point & click" method of placing your sets, you can use other use other tools that will place your tracks for you on predetermined paths. Using these Guide tools you can drag out a straight line or oval and tell the program to place any number of frames of the current set along that line. This is a big time saver. MovieSetter also supports LOTS of keyboard short-cuts. Because the position of the mouse is used so much for positioning the tracks, keyboard short-cuts are needed to control the software with a minimum of mouse movement.

So now you have your frog hopping and gulping...But wait, this isn't the twenties! We need sound. With MovieSetter, you can incorporate IFF digitized sounds into your productions. Sounds are introduced into the movie as events, using the same requestor you have become familiar with when loading backgrounds and sets. You don't have as much control over a sound as

you do with a set. You're pretty much restricted to playing the sound the way it was digitized. So unless you have a sound digitizer or a large library of sound files, you won't be using that much sound (If given a choice, I would've much rather had the ability to incorporate music files from "Deluxe Music Construction Set" or "Sonix!" as opposed to digitized sound).

When your production is finished to your liking, it can be saved several different ways. You can simply save the script as a text file. (In which you'll

“Sounds are introduced into the movie as events, using the same requestor you have become familiar with when loading backgrounds and sets”

need access to all the original pieces of the production in order to play it again). Or you can save it as one entire file, pictures, sets, sounds and script all imbedded in one file that can be played alone by the player.

Although the included clip art is good, it won't be very long until you'll want to make your own sets using your own art. The process of creating a set involves the making a several frames that when played quickly in order simulate motion. We have a set of our frog hopping and another set of him zapping a fly with his tongue. A set is made by either using the drawing tools supplied with the Set Editor or loading existing IFF brushes and pictures into the editor and arranging them

in order. The Set Editor drawing tools are arranged in a menu bar along the right hand side of the screen. These tools include your standard Line Tool, Fill Tool, Airbrush Tool and Fill Tool. It seems that MovieSetter tries to follow the conventions placed by DeluxePaint whenever possible, and its supply of tools is adequate for making simple sets.

Whenever I work with a new program that supports IFF, I almost always wind up falling back on DeluxePaint for the creation of the screens. The ease of use and familiarity of DPaint will usually outweigh any features of a built in graphics editor. I found this to be somewhat the case with MovieSetter. While MovieSetter's paint tools can't really compete with the variety of tools in DPaint, Gold Disk included enough tools in the Set Editor to get you making the simple ones, and allowed you to import the more complex backgrounds and brushes as IFF files. Most of the time I'd find myself staying with the MovieSetter paint tools because of the animation tools they included. When creating cels for other "page-flipping" programs, I'd usually use Dpaint with a spare screen loaded. This way, I could have the previous frame loaded on the spare screen and could hit the Swap screen key to check the motion. Then I'd save the frame, move onto the next, copy the previous one to the spare screen, and work from there on the next frame. It's tedious work, but it gets the job done. MovieSetter, on the other hand, loads the whole set onto a stack that can be shuffled through. By clicking on the Next Face button you could easily edit many frames in memory without going to the disk, and then save the whole thing as one set when finished. As I got used to the way the Set Editor in MovieSetter worked I found myself resorting to Dpaint less and less. The only thing I

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MovieSetter (continued from previous page)

found lacking in the Set Editor was a way to easily see the previous frame when editing the next frame. I'd like to be able to lay tracing paper on a cel to

trace the next one. Perhaps something like a "pencil-test" mode, that would show a "ghost" image of the previous cel would be good. Only one frame at

a time is shown on the screen when editing your set. The controls for frame location within a set are in a vertical menu bar on the left of the screen. This menu bar uses the familiar setup you would find on a VCR. One button will advance you one frame in your set, another take you the end of your set, and so on. Anytime during the creation of your set, you can hit the Play button and watch what the whole set looks like when played in quick succession.

I did experience several problems when using the Set Editor. It gave me the most trouble when it came to palettes. Sometimes when I was grabbing part of the screen as a brush, the palette of the brush would get garbled, and the only way to get it back was to save the set and try again. I couldn't find out why it was doing this, so I can't tell you what to avoid doing. Sometimes productions that played fine for me in the Scene Editor would load with the default palette after they were saved and played with the player. Loading and saving them again worked for that problem... sometimes.

MovieSetter is definitely a very good package for either the novice or the expert. Its "easy to use" interface frees the user from the repetitive work in order to pay attention to the more creative aspects of animating. I hope I find out why my brushes and productions would sometimes come up with scrambled palettes, as I really want to start using MovieSetter for those longer productions I have in mind. My bet is that you'll soon be seeing animations done with MovieSetter as much as you see any other animation format.

MovieSetter \$ 99.95

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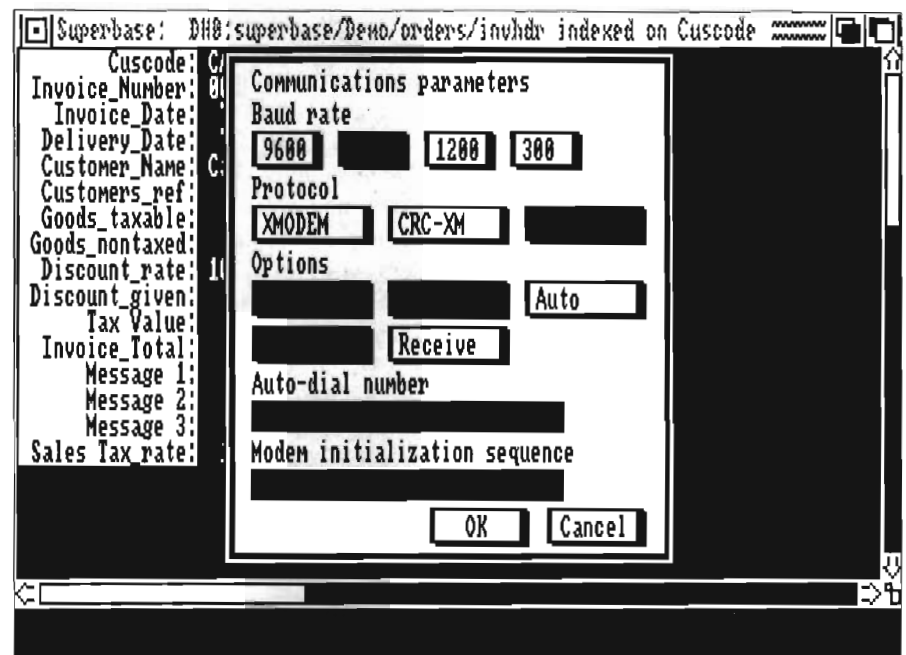
SuperBase Pro 3.0

Winner of the 1988 PC User Challenge

by Steve Dock

The Superbase lineup is growing again. Superbase Personal has been with us since 1986, when it pioneered with its VCR-like interface and ease of use. In 1988, Superbase Professional joined the product family. Superbase Pro kept the same look and feel, but added an extensive programming language, a powerful forms editor, and new data validation capabilities (see review April 88 Amiga Sentry). As we all know, both Superbase products have been very successful in the Amiga market. It's interesting that identical versions were also successfully offered in the Atari ST and IBM markets using the G.E.M. windowing system.

In late 1988, the creators of Superbase, Precision Software of London, England, opened a U.S. branch and began directly marketing their own products. Precision recently completed a re-vamping of the Superbase product line. There is still Superbase Personal for home use, but there are two advanced products to choose from. Superbase Professional 3.0 includes all the features of Superbase Professional, and adds full featured telecommunications, even more form building capabilities, enhancements to the programming language, relational capabilities,



One of the enhancements to version 3.0 is built-in communications support

and file import functions. Superbase Personal 2.0 is based on the same source code as Professional 3.0, but leaves out the programming language and telecommunications. Superbase Professional 3.0 is the Amiga version of Superbase 4.0, which has been available for the IBM market for most of 1988.

In fact Superbase 4.0 won a major database competition in England during June 1988. At a large computer show, PC User sponsored a competition where a complex real-world prob-

lem was given to teams representing many database products including Ashton Tate's DBase III, and Rbase. The winner would be the team which developed the finished application first. The Precision team won, and garnered a lot of successful publicity in doing so. It was that kind of year for Precision. Superbase was in the news again when the International Computer Programs institute awarded Precision its "Million-in-One" award for selling \$1,000,000 worth of Superbase in one year. Enough background, lets begin a
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SBPro 3.0 (continued from previous page)

detailed look at Superbase 3.0. SBPro certainly has impressive specifications; maximum file size of 16 million records, up to 999 indexes per file, up to 1000 fields per record, unlimited concurrent files open, etc. But it's more than specs that make successful commercial software. One of the most important aspects of a "professional" program is its documentation and support materials. Superbase Pro comes packaged in a sturdy 9.5" by 8" book-shaped box which will look at home next to the Lotus, WordPerfect, and Dbase packages on your shelf. Inside are three separate manuals, a two-sided "Read Me First" sheet, a dongle, and three diskettes.

Two of the manuals are identical to those included with the first version of Superbase Professional, eg; Database Text Editor, Forms Editor and Programming Language. The third is a supplement which covers additions and changes to subjects covered in the first two. It might seem a minor quibble to note that the two main manuals are spiral bound, and that the supplement is stapled. Minor unless you compare Superbase 3.0 to its competition. Three ring loose-leaf manuals are the standard for one good reason, updating. Instead of reading about changes in a supplement and referring back to the original, a professional expects to replace or insert pages in the original manual. This flaw is more than inconvenient, it slows down mastery of the new capabilities in release 3.0. Other than format, the manuals are well printed, readable, and contain illustrations of screens and short tutorials. The read-me card is an effort at providing quick-start instructions, but like the main manuals, it doesn't mention the word "harddrive installation" at all. (Fortunately no special procedures are needed. Just drag Icons to your hard-disk.) Another critical piece of documentation is on the Program disk. A

thirteen page "Read Me" file is the only documentation of SBPro 3.0's AREXX port, new cut & past capabilities, ability to read mouse events, and changes to the communication parameters in the just printed supplement! These are not minor improvements, but major new features which should not be treated in this cavalier fashion. I must conclude that the documentation is lacking in format and completeness when judged as a professional package.

Precision offers additional support for Superbase in the form of a newsletter, and an on-line technical forum for registered users. The on-line support is provided through the Official Superbase Information Network on People Link's Amiga forum. Finally, registered owners will receive an ID number which entitles them to 90 days free technical support via telephone. This package of services is comparable to those provided by WordPerfect, the acknowledged leader in micro-computer support. Precision shows its wisdom by investing time and \$ in these activities.

One last item before we discuss the program; the dongle. As most of you know, a dongle is a hardware copy protection method which plugs into the second joystick port. The version of Superbase Professional which you purchase requires use of the dongle. This is a decidedly unprofessional "feature." Anyone who is willing to pay \$349 for professional software is not likely to provide copies to his/her friends. Precision must agree, since you can include \$10 with your registration form and receive a de-dongled version by return mail. This version will be encoded with your registration information to inhibit sharing, but at least you will not live in fear of losing that black piece of plastic.

A good way to explore the strengths and weaknesses of SBpro is by booting

the program with the Data Disk in your second drive. Precision has supplied a generous set of demonstration files to work with. Lets start with the "Tutorial" directory. It holds a set of banking files which are used as examples throughout the first manual. A FILE is the basic unit of SBPro, and file layout is one of its strengths. You can define a file with required fields, validation formulas, calculated fields, date and time formats, and even table lookups using only the mouse and SBPro requesters. Open the "Clients" file and select EDIT File from the project menu for a quick overview of the various data types supported by SBPro. Need a larger field for Lastname? Simply click on the field name, then click on the text button. Another requester will appear with gadgets to increase or decrease the field width, and indicate the case and capitalization of Lastname. Two mouse clicks on OK and SBPro will dynamically change the field width in existing records and for future data entry. This flexibility is typical of the program and makes the application development process much less painful than with other database products.

All SBPro databases are indexed on at least one variable. At the end of a file definition process, you must indicate which variable(s) will be indexed. You can also add additional indexes at any time after the initial file definition. Just select New Index from the project menu and a requester will present the names of every field in the file. Click to highlight a field and click again to begin building a new index. When the disk stops spinning, you can use the Project Open Index selection to pick among the indexes available for your file. SBPro will instantly change the presentation order to that of the new index. The index files are stored independent of the actual data and contain pointers to each data record. Indexing is fast and easy,

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The Only Amiga Only

March 3 - 5, 1989

The Marriott Marquis New York, New York

but limited to single levels. If you want to view a file by Lastname within Zipcode you will have to use the Query functions.

Press the right mouse button and slide over to the "Process Query" menu. You will find several example Querys ready for examination: Select "Interest Accrued" and the Query requester will appear. This requester is the heart of database operations within the Superbase part of SBPro. By examining this example you will see how fields are selected, totaled, and grouped using the Query requesters. Once again, Precision has placed tremendous power at the click of a mouse. Selections for the report are controlled by clicking on the line labelled "Filter." SBPro's filter presents a wide variety of boolean and mathematical gadgets in addition to a list of fields which are used to construct complex selection statements. This same approach is used to perform file updates, print labels, and perform mail-merge. Need to multiply all prices by 125%? It's a snap with Process Update; want to change the status for those records which haven't placed an order in 6 or more months? Use Process Update. The power of these mouse and menu selections is tremendously practical. Many database systems require programming to accomplish this type of task. Query's and updates can be saved and re-loaded for repetitive operations with one serious limitation: A saved query will automatically open the same file it was created with, which means you cannot use the same query report with different files! (There is a way around this, simply edit the query and change the first line which names the file.)

Let's return to the Project Open menu and this time open a FORM called "Addform." The use of FORMS created with the Professional FormEditor program separates Superbase Pro

from the rest of the family. A Form is much more than a pretty screen. It can open several files displaying data from each, or load and run a DML program to present custom menus, or activate programmed function keys. This particular demo form opens the Address file and uses colors, screens, and large text to make data entry or file browsing colorful and interesting. Another form in this set is called "Clientdeps." This one loads and runs a DML program which summarizes deposits by client and date with appropriate subtotals. (DML is Data Management Language, the basic-like programming language of SBPro.) The DML program in this example was generated by the FormEditor program, which illustrates another of its functions; advanced reporting. The final form in this directory is ClientDeps. The screen which results from selecting it relates two files, clients and deposits, using a common field - Lastname. Thus, data is combined to produce information, in this case a deposit history.

Linking two or more files through a common variable is SBPro's approach to being "relational." Superbase doesn't use the usual relational terms; normalize, join and table, but talk about "master/secondary" links. This approach may not be classically relational, but it is functional, and again, flexible. On the plus side you will not have to plan every possible relation and index in advance of the first record entry. In fact, you can add a field or file to an application at any time without losing data or indexes. The downside of this approach to relations is in processing many-to-one relations. Many-to-one relationships happen when several transactions or items need to be related to a master record. The previous release of SBPro could only do this using DML and reports. SBPro 3.0 can now handle multiple transactions through the FormEditor. Looking at the Transac-

tion_Demo on the data disk will illustrate the improvements here. Many applications will involve order entry and shipping to existing customers. Obviously, there will be a client file with name and address. There may also be a file with preferred shipping information. An inventory file must be kept current to support an accurate order-entry system, and finally, a price file for products may be maintained separately. It would be simple enough to create the individual files and enter current data into the client, inventory and price files. Now we need a way to link the client file to multiple items and prices for easy order entry. A good systems analyst will use an existing business practice for this purpose; eg. an invoice. Invoices contain client, stock, shipping and price information and form the basis for billing. If we select Project Open Form from the menu and highlight Invoice, just such a form will appear.

This invoice is really a sophisticated order entry system with invoices linked to clients, parts linked to invoices, and pricing linked to parts. At the top of the screen are instruction; F8 to browse by client, F9 to browse by order, F10 to enter an order. Your office staff could keep this application active near the orders desk to answer client inquiries as well as place new orders. Press F10 and the order will be blanked leaving you with accurate Client information at the top. To enter a new order just fill in the dates and product information. A new invoice number is created automatically, prices will be determined with relational lookups, and tax, shipping and totals will be properly calculated. All this occurs without using DML, or programming of any kind!

Let's take a further look at the SBPro FormsEditor (which resides on its own disk). Start FormsEditor via Workbench and you'll soon see a blank

screen labelled "Untitled." Press the right mouse button to reveal Project, Page, Edit, Set, Report and Font menus. At this point, you could Open a File from the Project menu and begin creating a data entry, display or report form. Highlight "Field" on the set menu, then move the crosshair pointer onto the page and click. A requester asks whether you want a box or field name to appear automatically. Make your choice and click anywhere on the blank page. Another requester will open listing all the fields in this particular

use data from another file? Open that file and continue the process of placing fields. You will end up with a plain looking form with items from two files. Now you must select "Set Link" to establish the relationship between the two files. The requester that appears lists the fields in the current file. Highlight one field to act as the master link and click on the Link gadget. A list of other open fields will appear. Click on one to complete the relationship. (You can make nonsense relationships this way, FormsEditor doesn't check. It's up

cess lets us create calculated fields and limit other fields to a range of values or a table. FormEditor lets us do even more for fields on a form. Returning to the invoice example above, we know the parts which are in-stock, so we would want to limit any order to these parts. This can be accomplished by selecting Set Validation and clicking on the first Item line. The usual requester will appear listing all the open fields and operators. We could ensure that the field contains a positive number between 200 and 300, or that it is a character string beginning with E through K. We can even type a Lookup function in the string gadget like so:

LOOKUP

```
(Stockcode.file1, Stockcode.file2)
ELSE REQUEST "That Code Was Not
Found","Select Another",20, Stock-
code.file2, StockDesc.file2
```

Stockcode.file1 is the item we typed in the form. The lookup function will check if it is a valid code in file2. If it not in the list of valid codes, the message in quotes will appear in a window followed by a validation help Dialog. This is a significant new feature with SBPro 3.0. The ",20" portion of the lookup tells Superbase to open a Record Selection requester with a list of the valid stockcodes and descriptions. The requester will be a full "Intuition" requester. That is, you can click over an item to highlight it, then click on OK or Cancel gadgets to take action. If you click on OK the proper code and description will be copied to the blank spaces on the Invoice form. There are 20 different help Dialogs available which will present anything from a list of current file fields, to indexes, to lists of forms. This is a major addition to SBPro which is easy to implement and works consistently with the rest of the environment. We can now execute DML statements or programs from any

(continued on next page)

STOCK	QTY	DESCRIPTION	UNIT PRICE	SALE PR.	TAX	VALUE
AMI4	1		1999.99	1999.99	Y	1999.99
AMI2	1		44.95	44.95	N	44.95
AMI5	1		449.00	449.00	Y	449.00

An example of an interactive invoice/ordering form created with the Forms Editor

file. Click on one and the form will be updated with an area containing this field definition. The area will be outlined in a dotted line indicating the field length.

Proceed to place as many fields as needed on the screen. (You can select Move from the Edit menu to change the placement of any field or use the new Cut & Paste options to move whole groups of fields around.) Need to

to the form designer to ensure that there are matching fields.

You can add text using Amiga Fonts, create colored areas, lines, or boxes to enhance your form. You can even import IFF pictures to act as backgrounds. These features are nice and extremely easy to use, but the validation and calculation options are more meaningful in a commercial environment. Remember that the field definition pro-

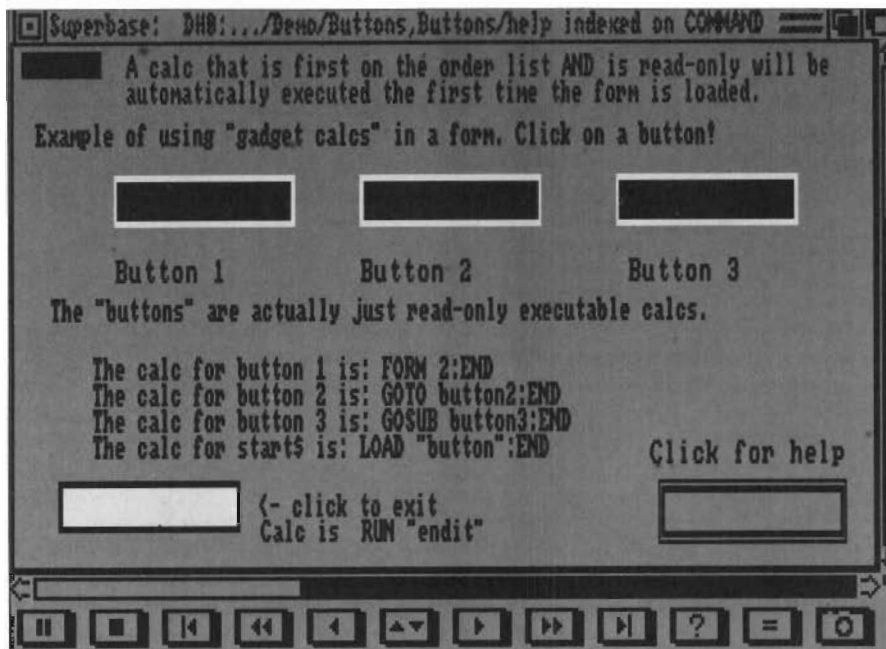
SBPro 3.0 (continued from previous page)

field within a form if the validation requester is not sufficient. If an application developer, you will be pleased to find that files can be defined and forms developed quickly and without programming. However, you will want to present a "turn-key" application to the user. Here is where the built in DML is used to link the pieces together into a finished application. DML is as close to AmigaBasic as you can get with about 50 keyword extensions to handle Superbase files and fields. Other important keywords let you create menus to replace the SBPro menus, and control a set of applications. The previous release of SBPro used the same Menu and Menu ON statements, but required a busy loop to wait for a selection. This new release adds Wait statements which don't tie up the processor in busy loops. The following is an example of the code necessary to create a menu, display it, and execute one of several actions depending on the response:

```
Menu 1,1,1,"Enter Orders","O"
Menu 2,1,1,"Add New Clients","C"
Menu 2,2,1,"Add New Products","P"
Menu 3,1,1,"Change Clients",
Menu 3,2,1,"Change Products"
Menu 4,1,1,"Perform Query","Q"
Menu 4,2,1,"Print Labels","L"
Menu ON a% b%
Wait Menu
On a% GOSUB Orders, Adds,
Change, Print
```

The Menu statements specify the column and row for the Menu text, as well as an Amiga Key equivalent. When your user selects a menu item, the row and column are returned in the variables a% and b%. It's simple then to go to the appropriate action or error trapping subroutine. All that remains is to make this program execute automatically when SBPro starts. Just name the program START and save it in the same directory as SbPro. Now when your user clicks on the Superbase Icon, the menu program takes control

COMMS menu items set the serial port and modem parameters so that you can create a terminal program in DML. In the case of COMMS, the printed documentation is less accurate than the ReadMe file. Amiga owners get additional gadgets to support WXModem, chopping of files, and converting carriage return-line feeds. It will take some communication programming experience to make daily data transfers "bullet-proof," but for those applications where several locations must feed data to a central location, this is a useful addition.



"Calcs" can be executed by clicking on the appropriate box on your form

DML now supports Mouse input using a WAIT statement similar to those for menus. We can even turn on the VCR like Panel from within forms or DML programs. My favorite new DML statement is "CALL." Using CALL you can execute any AmigaDos command or other program from within Superbase. This is particularly useful since the built-in file handling is weak. Call can also interface with AREXX or other programs which

and insulates him/her from the database. The only improvement an application developer could ask for is a DML compiler.

DML has several other new extensions, including statements to make use of the new telecommunications feature. SBPro 3.0 can communicate via modem with other computers and can automatically exchange SuperBase files with Superbase running on another Amiga, IBM, or Atari. In fact, the

have AREXX ports. SuperBase Professional opens an AREXX port named "SBPRO," and accepts messages directed to it. If DML won't meet your needs, AREXX might. Precision's soon to be introduced product "SuperPlan" will also include a named AREXX port so the two products can work interactively. One other major enhancement must be mentioned, file imports. SBPro included an ASCII import and export feature, but the new release has added direct support for Lotus,

PHA\$AR

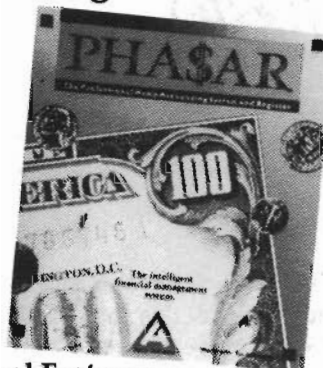
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- Integrated scheduler stores special occasions.
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Dbase II and III, Logistix/SuperPlan and DIF. I was able to test the Lotus import which worked as advertised. The ability to move data from existing applications is crucial if a developer hopes to convert a business to an Amiga/Superbase approach.

I've only covered the major features and enhancements of SBPro, there are dozens more which make Amiga business application development a reality. The tools are here, the documentation will do, and support is available. I have just three concerns which need to be addressed in the next release, documentation, file requesters and performance. I've discussed documentation at the beginning of this review and feel strongly that a 3 ring loose-leaf approach is a must. I feel just as strong about the poor functionality of the SBPro file requesters. There is no indication of a file size, creation date, protection status,

and worse yet, no way to move around in the directory structure! To change to a directory you must specify a full path, eg: df1:Orders, or go to the root level of a volume, eg: df1:. We need an intelligent requester which lists volumes, directories, and uses gadgets to select Superbase Programs, Querys, Files, or Forms by their extension. (Database systems also need the ability to copy, move and delete files, and format blank disks from within the program.)

Finally, there is the issue of performance. When used on a floppy based system, Superbase is slow. I'm not talking about menu selections, or file layout, but record retrieval. Adding buffers is part of the answer, as is a faster DOS from Commodore. However, when used on a harddrive with files of several thousand records SBPro is slower at record retrieval than compara-

ble IBM products. The industry standard products can be compiled for improved speed as well as security, this may be a good solution for SBPro.

Conclusions:

SBPro 3.0 is a capable professional database application system. While not "classically" relational, it supports variable relationships and a modern Query language. Its strengths are in file layout and forms design, with good support for Amiga graphics and sound. As we said in April 1988, SBPro is able to compete with DBase and other established products, so where are those payroll, inventory, trucking, etc. applications??

Superbase Pro 3.0 \$349.99

Precision Incorporated
8404 Sterling Street
Irving TX 75063
(214) 929-4888

PRO-BOARD 2.0

Auto-Routing Highlights the Features of this New Release

by Dave Haynie

Pro-Board, the "PROfessional pcBOARD generator," from Prolific Inc., is a program written specifically for the Amiga for circuit board layout. The main idea behind such a program is to allow a circuit schematic description, called a netlist, to be input and worked into a physical circuit board layout. The PC board layout program should at the very least manage things like proper mechanical spacings (so the

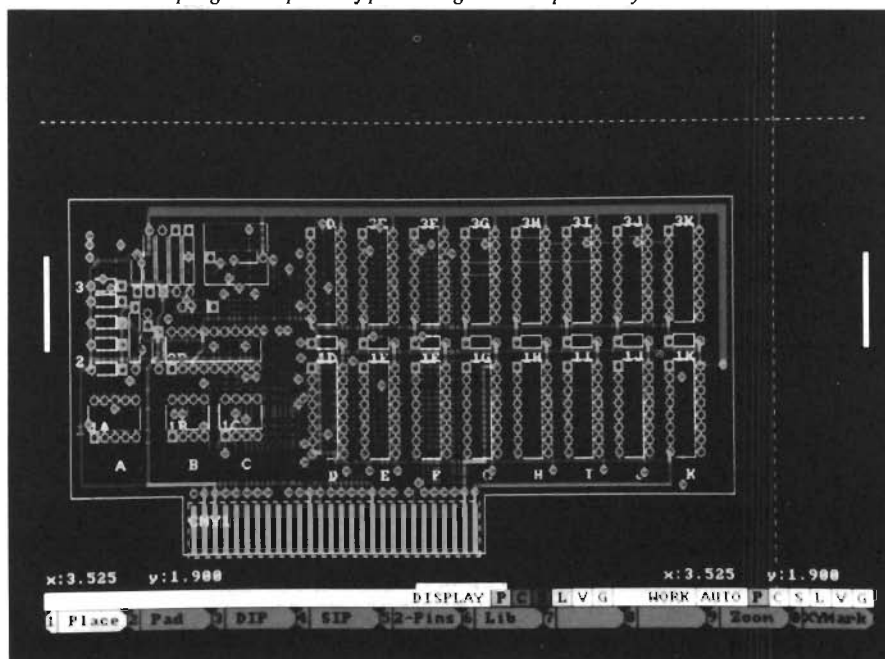
parts fit correctly in a finished board) and proper design rules (so PC board traces don't get too close to each other, which can result in defective PC boards or trouble during the building up of such a board). The more sophisticated PC board programs in use today (such as those we use at Commodore), offer more advanced features, such as the automatic routing of traces.

What you get, and what you do

Pro-Board comes in a rather flimsy box, and consists of a single Amiga disk and a spiral bound manual. The

floppy disk contains the Pro-Board program itself, a separate plotting utility called Plot-Board, library files for device footprints, a design rules file, a configuration file, and a special Epson printer driver, which claims to give better results under AmigaOS V1.2 for Epson-type printers. There's also an example design on this disk. Everything is much like Prolific's Schematic Capture program, Pro-Net, which I reviewed in the Sept '88 issue of the Sentry. Also like Pro-Net, the program works just fine on a 68020 or 68030 based Amiga, and, memory permitting, does not interfere with normal multitasking.

ProBoard is a powerful printed circuit layout program capable of producing boards up to 4 layers thick



The manual has a small overview and introduction section, followed by a short explanation of each command. Perhaps such an organization would be useful for someone already familiar with Pro-Board, but I found it extremely lacking. It's nearly impossible to use this manual to find out why something you're trying doesn't work. The program's error messages are extremely terse, and often flashed too fast. That may be really what you want, since with any tool like this, you'll probably spend much more time with it as an experienced user than as a novice. I think full and detailed explanations of what can go wrong, and how to use every little feature, belong in the manual. It could be really tempting to dismiss this program based on the manual's explanation. I nearly missed

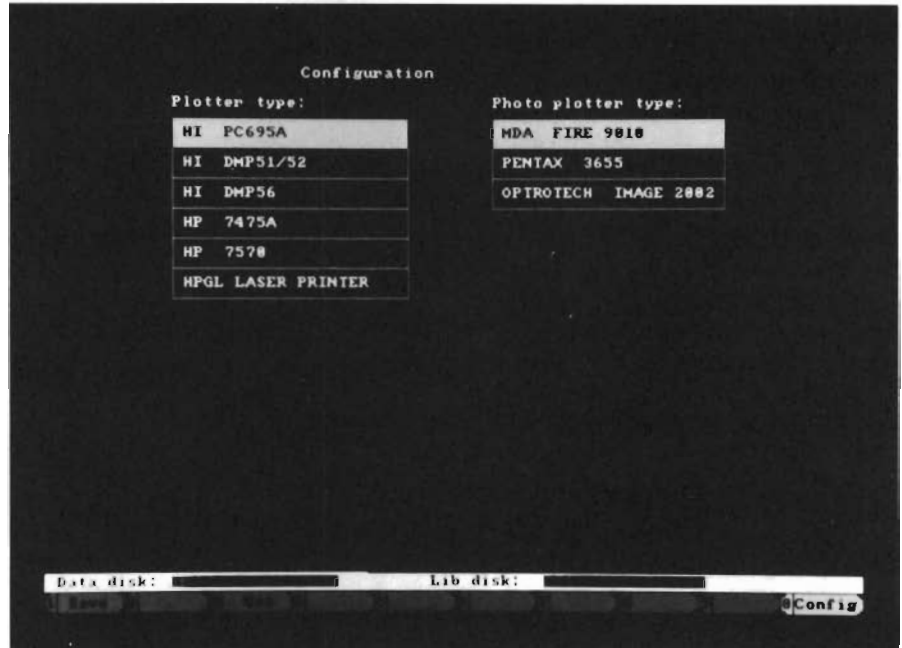
several really important features, which really would have made the difference between success and failure in the task I set out to complete with Pro-Board.

First things for me, of course, is to set the program up on my hard disk. Prolific supplies a script file for such a purpose, and it succeeded as far as the installation of the actual program. However, the user must set up logical names for the program directory (actually, the directory containing the library files) and the data directory (where your design is kept). The choice of the logical name is up to the user, and Pro-Board will store such names in a file it reads at startup time.

The manual doesn't list any system requirements, though it does mention that if you're running from CLI, you should have your stack set to at least 15000 bytes. The program itself is about 367K bytes long, and it allocates stuff once loaded. On my system, I found that with the first example from the Pro-Board disk loaded, the program ate up almost 765K, while with the reasonably large example I set up for this review loaded (only partially routed), the program uses about a megabyte, so I suspect at least 1.5 megs would be required to get much use out of Pro-Board. This probably explains why such PC Board layout programs were not available on IBM PC type computer for a long time, and even today, they have to resort to various kludges to actually work well on such machines.

Striking out on my own

In reviewing this program, I had to try and take into account its intended audience. At Commodore, we have two designers who do nothing but PC board layout, and we have several dedicated PC layout computers for just such purposes (interestingly, one of the ma-



A variety of plotters are supported for camera-ready output

chines, a SciCards computer from Scientific Calculations, Inc., is based on the 68020, and is probably about as powerful as an Amiga 2500, though the display is much higher resolution). These dedicated machines have very sophisticated auto routing software than can generally route a PC board the size of an A2000 or A2620 to completion overnight. So I wouldn't expect to use this program in my job at Commodore, and I expect it's pretty much that case at other large companies. However, in a smaller company, a systems engineer such as myself might very likely lay out the board on his or her own, rather than hire an outsider to do it on a big system, and that's where I feel Pro-Board is positioned.

With that said, I set out to try and push the program to its limits. The first phase of any computer aided PC board layout is preparation of the netlist. And if you're using computers all the way through the design process, this should already have been done by

the time you start to actually think about laying out a board. While Pro-Board is designed specifically to handle netlists produced by Pro-Net, naturally, the netlist format is also the same format used by our Calay computers. Since I just happen to have several of my designs available in this ASCII netlist format, I decided I'd see if Pro-Board was equal to one of my existing designs.

My first thought was to put the A2620 on it, but that turned out to be impossible. The A2620 is a pretty tightly packed 4-layer design, and the traces are what we call "fine-line" traces, which means that two such traces can be routed between any two pads on the board (these fine traces are required because of the large Motorola chips on the A2620). Pro-Board only allows standard lines. I could still probably do the A2620 on a 4 or 6 layer board with some of the traces on inner layers, but alas, while Pro-Board does allow 4-layer

(continued on next page)

ProBoard 2.0 (continued from previous page)

boards, it doesn't allow inner-layer traces. So I moved on to the Amiga 2000. The A2000 board that we did in West Chester is a 2-layer design using standard lines. While it's quite a bit larger than the A2620, the PCB design is much less demanding. The A2000 PCB design was done on the SciCards computer over the course of about 3 weeks by an expert designer (Terry Fisher), before the days of good auto-routing software. Since I'm a beginner at PC board layout, I decided to do this version of the A2000 as a 4-layer board. This will make layout simpler, but an average 4-layer board costs about 2.7183 times as much as a comparable 2-layer board, so in a real-life situation, that could turn out to be an expensive decision (4-layer boards have better high-speed characteristics, too, so layout isn't the only reason one would go to a 4-layer design). I started up Pro-Board, and get a screen very much like the Pro-Net startup screen. All operations are based around "intelligent function keys," or IFK's. At the bottom of the screen are 10 keys, corresponding to the Amiga's 10 function keys, which list functions. Once one key is pressed, a new set of keys is displayed. The ESC key will move back up a level. Since I'm quite familiar with Pro-Net, this interface was very natural to me.

Anyway, I select IFK [EDIT] followed by [NEW], and I'm prompted for a name for this new design. This brings up a design rule sheet. Here I can choose the number of PCB layers, the size of the board, and various other design constraints. The maximum board size is determined by available memory; I have enough for a 30" x 30" board, but knowing the A2000 board is somewhat smaller than 14.5" x 17," I enter that as the maximum board size. This must be done with some care, as there's no way to enlarge the specified maximum size of a board in Pro-Board.

While the program would read my Calay netlist unmodified, I edited it slightly to add layer information, since I decided to make this a 4-layer board. A Pro-Net user shouldn't need to do any editing. The next thing to do after that is lay out the PC board's border. The border's easy to draw; there's a constant update of absolute location on screen, and a relative measure available as well, to aid in accurate sizing of the circuit board. Cutouts are drawn by lines as well, in one design layer; circular and square voids can be drawn in a different layer. The board outline is based on a grid in 0.025" steps. That's probably enough resolution for most things, and component shapes can actually be designed to 0.001" rules if necessary instead, though the co-ordinates for pads at that resolution must be entered numerically, rather than with the mouse. However, the 0.025" increment was sufficient for almost everything I needed to layout an A2000.

Shapes and Placement

The next phase in the layout cycle is component placement. Pro-Board allows each component defined in the netlist to be represented using a generic form, such as SIP, DIP, and 2-pin device. These will cover the vast majority of parts, and it's a nice feature; some PC board programs require a custom shape for each slightly different part. For special parts, a shape editor is available within Pro-Board, though you'll have to leave the main editor in order to create a new custom shape (you switch editors at the top level of Pro-Board, and don't actually have to leave Pro-Board). The generic parts are easiest to use; to call up the 20 pin TTL buffer U540 on the A2000 and place it, I simply select the [DIP] IFK, then fill in the part number, number of pins, width (0.300" in this case), and the orientation, then I place it on the PCB. This is real easy. After I got

into it, though, I found the Pro-Board placement mechanism to be kind of primitive. I did a good deal of the component placement on the real A2000 using the SciCards system. In that system, you start out editing with all components already matched to shapes. You then pick up a part with the mouse, move to the section of the board you're interested in, and place it. It's essentially WYSIWYG placement, and you can very easily rotate the part before placing it. Also, the wires going to the part are continuously displayed if you desire, which helps greatly in accurate parts placement. Pro-Board's placement isn't as sophisticated.

While it's possible to choose orientation and pick the destination of the part, this is done without actually seeing an outline of the part. The outline isn't seen until the part is actually placed if it's a generic part. A library part is a bit easier to work with; you stay in a positioning mode in which each kick of the mouse moves pin 1 under the mouse, then hit an IFK to fix the part there. Better, but not all the way there yet.

If the part or a group of parts are incorrectly placed, they can be repositioned with the MOVE command. MOVE lets you draw a box around the things you'd like to move, and it will display the outline of that box to aid in positioning. Unfortunately, that outline isn't as nice as moving the actual object, and I found that it often takes a few tries to get the positioning just right using this method. Also, to change the part's orientation, you have to go back to the [PLACE] level, delete the part in question, and call it back up with a different orientation. Finally, Pro-Board has the provision to allow a "rat's nest" view of the wires going to each part, but you can't see the wires going to even a single part until all the parts are placed, and this view is in a special level of it's own, where it really

should be a mode that can operated continuously. Switching between PLACE and NEST modes is a very slow substitute for this. When it comes right down to it, Pro-Board's placement functions let me do everything I wanted to do with them, they're just not as nice as those I've used in the past. I guess that the \$40,000 or so extra we paid for the SciCards machine actually got us something. I will say that through placement, Pro-Board was very fast in all it's operations. Another really nice feature is that different layers of the board can be instantly turned on and off, which makes it easy to concentrate on certain aspects of the board without all the other elements distracting the view.

I built several custom shapes for this example. The A2000 has a number of D-Type connectors on it: D25, D23, and D9 types. Pro-Board comes with an example D25P and D25S shape, and using these, it was easy to make D23 and D9 connectors. This was nice, since the D type connectors are one part that's not on .025" centers, so basing my new D's on the old ones was much easier than calculating all the coordinate numbers necessary to enter the parts in 0.001" mode.

The next custom shape I needed for this example was a shape for a Fat Agnus chip. Fat Agnus sits in an 84 pin PLCC package, which is square and can't be represented with the generic DIP or SIP primitives. Unfortunately, it doesn't seem that it can be generated in the shape editor either. The shape editor stops allowing pads to be added after the 49th pad in a shape! Nowhere is this fact mentioned, and it's annoying. You get around this by building 4 separate custom shapes which, when butted together, would fit the pinout of the Fat Agnus chip. As long as the separate parts are numbered consistently, Pro-Board will let them be merged

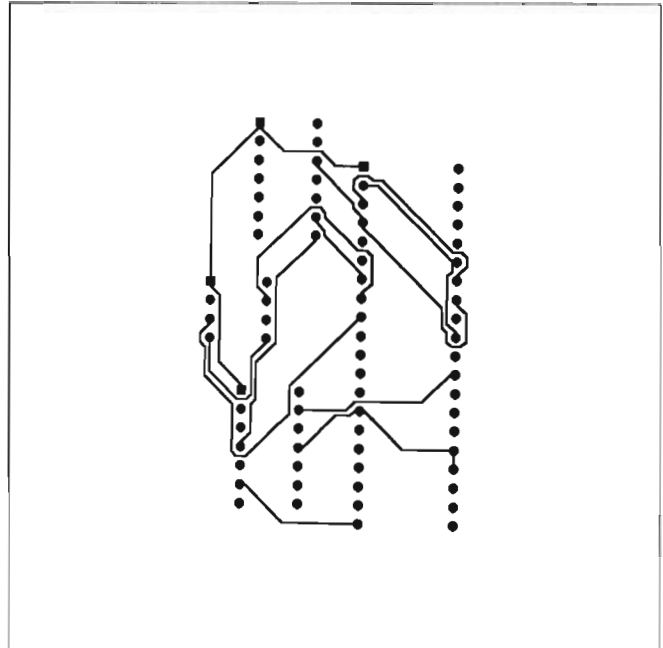
into a single logical part. While this at least lets me define large parts like Fat Agnus, it would certainly be lots of extra work to define all the pads for any larger part, though I expect you start to run into routing problems with any really large parts. It's also possible to build shapes with rectangular boxes, rather than pads, for surface mounting components.

Routing

The next step in the process is to actually route the circuit traces. What you really end up doing is looping between routing and placement; once everything's placed, stitching in some traces is the only real way to tell how well your placement is going to work. Fortunately, it's pretty quick going between ROUTE and PLACE modes in Pro-Board. Before any real work takes place, the netlist and actual placement of parts should be checked; you're asked about this automatically upon leaving PLACE.

Most of the errors I ran into were things like parts being incorrectly named, or parts that I forgot to place. As the number of placed parts gets larger, the checking time increases, but it's never more than 30 seconds or so. The ROUTE/NET level contains some parameters that control the checking of parts against the netlist.

You start routing by turning on GUIDE lines. There are basically the same type of lines I'm used to having on SciCards during placement; they in-



A Laser-Plot generated by ProBoard 2.0 at 300 dpi under HPGL plotter emulation

dicating the nets in the system that haven't been routed. Here, you start off having a single net shown in unrouted form, and the idea is that you'll follow this one line and stitch the whole thing, then move on to the next one, and it works pretty well, too. A hot key is available to locate the active guide, in case, when switching to a new guide line, that one's not on-screen. The guides for a large net tend to go all over the place, as they're apparently just based on netlist order. This is fine to start out with, though routing would be much easier if the guide lines adjusted their points of connection to follow closer to traces once they're down. The way it works now, it starts to get hard to tell if the whole net has been routed.

It's often more important to route a specific area of the board first than in the rather arbitrary order Pro-Board will give you. While there's a facility in Pro-Net to add "importance" to each net, my netlist doesn't have that fea-

ProBoard 2.0 (continued from previous page)

ture. Fortunately, Pro-Net has a feature that lets you select a particular net by name as the current guide line. There's also an option to select as the guide line the first of the skipped nets, as well as the first of the nets in the current section.

The actual routing process is pretty easy. If you're stitching in normally sized lines, you can lay in a trace over a short distance simply by clicking on one pad, then the next. Pro-Board will route between the two, avoiding anything in the way. This seems to work pretty well, and can certainly save a great deal of time. This routing tool is smart enough to connect the nearest pad that's already been routed on a given net, even if the guide indicates a pad a long distance away. I would expect a board done completely using this method to look pretty chaotic, since the auto-placed traces try to take the shortest path between the two points, which usually means that they go diagonally across the board (vias aren't automatically placed). For a reasonable board to be routable, you'll really need to stick to horizontal and vertical lines, each on their own layer. But for short distances, and highly repetitive things like stitching buses, it's great.

Pro-Board can also be set to automatically choose top or bottom for a trace, depending on whether it goes horizontally or vertically (the choice of which direction goes on which layer is part of the design rule you specify when you create a new board). Even if you're not using this auto-layer mode, it's smart enough to know to switch layers when you place a via. Finally, wide traces can also be stitched; you have your choice of trace width, but the automatic routing between pads feature is disabled for any size of wide trace. One caution: Pro-Board does not enforce the netlist during the routing process. So it's very possible, if you're not careful, to con-

nect to the wrong pins on a device. I found that, on many occasions, some parts needed moving or reorientation. Moving is no problem; you just leave the ROUTE level, select MOVE, and go from there. The guide stays in effect when you leave ROUTE. However, the only way I found to change the orientation of a part is to go back to the PLACE level, delete the part, and call it back up with a different orientation. This takes much longer than it should; Pro-Board should really have some kind of rotate command that works at least as well as MOVE does.

Printing and Plotting

As in Pro-Net, you really want a plotter or equivalent for good working copies of the output. Pro-Board has a separate program, called Plot-Board, which is a really good program. It offers you complete control over which layers are plotted, the color for each layer, scaling, and other things. Thus, it's possible to instruct Plot-Board to plot each layer in a different color on the same sheet, each layer on its own sheet, or anything in-between. We use these kind of facilities at work, and they're often indispensable. Plotting can go to a port or to a disk file, and there are several plotters to choose from, including a setting for an HPGL comparable laser printer. I got decent output on an EIcon laser printer using that option and an HPGL to PostScript conversion program. There's also a similar facility for Preferences managed printers, though it doesn't support color printers.

Of course, for circuit board plots, you're not going to get photo ready artwork from a pen plotter or laser printer. To handle this, Plot-Board handles three types of Gerber-comparable photo plotters (most of the photo plotters out there only accept a subset of the Gerber commands). If a PC board house can't

plot such files on their own, you (or they) can find a photo house who'll do it for you. We often work this way, sending PC boards by modem to a photo house, who'll plot the files and pass them on to the board house.

Conclusions

Overall, I think Pro-Board is a decent effort, and I'd certainly recommend it to anyone interested in computer aided board design on the Amiga. The main thing is to be aware of its current limitations. It'll do a good job on boards mainly consisting of DIPs and SIPs, though you can do PLCC, ZIP, and small PGA packages by using multiple shape definitions. I certainly hope that the folks at Prolific continue to improve this program, and Pro-Net too. For the moment, these are both decent tools for relatively small designs, though perhaps a bit of struggle to use on very large designs.

If you're currently paying for boards to be done on the outside, and would rather instead spend a little time doing it yourself, you could probably pay for the cost of Pro-Board after your second board, if not your first. Depending on who's doing your boards, you may even get the board design done faster this way, and you certainly have more control over the final outcome than if someone else is doing the whole thing from start to finish.

ProBoard 2.0 \$475.

Prolific Inc.
1808 W. Southgate Ave.
Fullerton, CA 92633
(714) 447-8792

Data Acquisition Unit

Turn your Amiga into a Digital Storage Oscilloscope

by Walter Steuber

Making electrical measurements could be an important application for the Amiga, but the necessary peripheral equipment has been very slow coming forth. Now Datal offers an inexpensive Data Acquisition Unit that transforms Amiga into a powerful tool for examining electrical events and collecting scientific data. It is a hardware/software combination that can be used for looking at a circuit the way you would use a regular oscilloscope or, more importantly, the way you would use an expensive storage oscilloscope. The DAU is at its best when it is capturing a transient event, something that happens once and is gone. It makes periodic readings of two voltages, digitizing the readings and storing them in its own built-in memory. It then nicely displays the collected samples for leisurely examination.

The DAU is available for the A1000, but the unit I evaluated was built for the 500/2000. The hardware is contained in a sturdy metal case (about 4x7x2 inches) with a separate small plug-in power supply and a short cable that connects into your parallel port. The outside of the box has an on/off light, a toggle to switch a dc blocking capacitor in or out, and input

connectors for the two channels. Inside the box there is a board with 8 Kbytes of memory, a few chips for the amplifiers and control circuitry, and a 6-bit flash A/D converter. This gives the DAU enough space in its built-in memory to hold 4000 samples in each

channel for all ranges. Each voltage sample is saved as a positive integer in the range 0 to 63. (The designers explain in the manual that they did not build in an A/D converter that will collect a bigger sample due to the significantly higher cost.) At first, this

The system includes a hardware interface with dual BNC connectors to support the two channel capabilities of the software



of its two channels. Its multi-step controls can nominally be set to fill up these storage slots as fast as 2,500,000 samples per second (in each channel) or so slowly that it takes 10 hours. The input voltage range may be set anywhere from 0-100mv to 0-10v, and the input impedance is 1.0 Me-

ohm for all ranges. Each voltage sample is saved as a positive integer in the range 0 to 63. (The designers explain in the manual that they did not build in an A/D converter that will collect a bigger sample due to the significantly higher cost.) At first, this

(continued on next page)

DAU (continued from previous page)

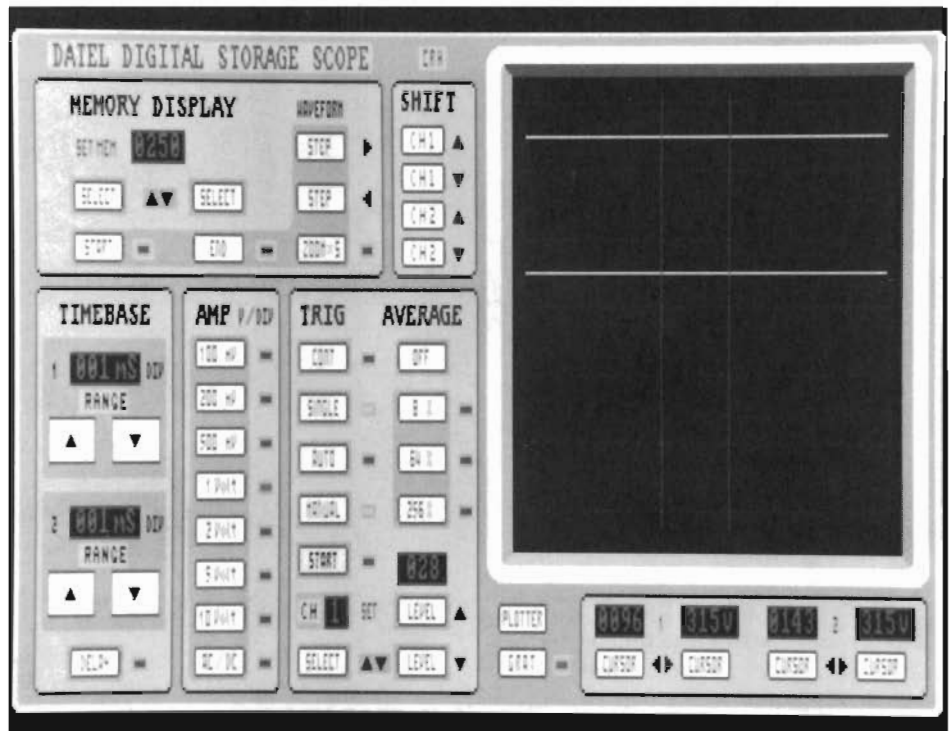
8K, but that, too, turns out to be quite effective for most measurements.

The software that operates the DAU and displays the data after it has been collected is fully Amigatized and is superbly easy and pleasant to use. It presents all its controls in attractive graphics with pictures of buttons you click with the mouse. The software comes on a self-booting disk, so you never see the Workbench icons. (You can, if you want, run it from CLI, but it hogs so much of the processor that anything else you are running is visibly slowed down.) Upon startup, the program plays some music and shows a picture of an electronics workbench.

I think this is an unfortunate choice because it makes it look like some kind of game instead of a serious tool for measurement. It soon comes up with the main screen, a graphic representation of an oscilloscope, and its array of controls.

A 10-page manual clearly explains what each control does and how to use it. This is not a fancy or verbose manual, but readable and factual. I used a typical shop oscilloscope (Hitachi 30MHz) to monitor signals into the DAU, and it was amusing to see how much alike the real oscilloscope and the picture were. The controls on the Dattel DAU (that is, the pictures of controls) were operated by clicking with the mouse, while the corresponding Hitachi controls had to be operated with human fingers, of course. Other than that, they worked just about the same. They both used the same units and same step-sizes for timebase and for amplification. Both machines had dual traces and had BNC sockets to connect the probes.

To test drive this exciting new addition for the Amiga, I first set up a simple signal generator. It could supply



The Data Acquisition Unit's main screen closely emulates that of a high-end oscilloscope

repetitive signals as either sine waves or square waves over a wide range of frequency and voltage. It could also supply single pulses whose rise and fall time constant could be varied from a microsecond to several minutes. Before feeding these signals into the DAU, though, I found I had to replace one of its BNC sockets because it was slightly too large to accept a standard probe. The other socket was also too large, but I forced a probe on it, anyway. The first trial, one in which a 1000-Hz sine wave was put into one channel and a square wave into the other channel, was apple pie easy for both the DAU and the Hitachi. It was really surprising how much the Dattel picture of an operating oscilloscope looked like the real Hitachi. The traces on the Dattel DAU were made up of dots, representing individual samples, but there was a pull-down option that gave one the option of joining them together and then the curves were as smooth as the

Hitachi's analog trace. This says a lot for the quality of the software and the author's use of the Amiga's graphic hardware.

Stepping up the frequency was the next test of the DAU. As sweep speeds and signal frequency were increased notch by notch, the DAU and Hitachi continued to look the same and tell the same story, even up to a sweep setting of 50 microseconds per div. At this setting, the DAU was collecting data at the rate of 500,000 samples per second and looking good. There were two more notches on the timebase control, but the DAU had reached its limit. In going to the next notch, its display became erratic, the two channels began to affect each other and the square waves were highly distorted. From this, I took 500,000 samp/sec (with a signal frequency of about 50,000-Hz) to be the DAU's upper limit. Even though 500,000 is appreciably below its nomi-

nal upper limit, it is a tremendous data-gathering tool.

Recording a rapid transient event is a much more interesting problem to put to the DAU. A typical event that often causes trouble is key-bounce, a characteristic of most mechanical switches. During the first few hundred microseconds after a switch is closed, it bounces back open, closes again and repeats the bounce several more times. I set up DAU to measure this phenomenon by wiring in series a 10-volt source, a 1000-ohm resistor, a switch to be tested, and a 1-mfd capacitor. The first rise in voltage was to trigger the sampling, and sampling was to continue at full blast, recording any erratic variations in voltage as the capacitor charged up. At 500,000 samples per second, this would be just right for looking closely at 8 milliseconds of action. DAU has a nice trigger to do this, but I could not get it to work. The trigger was apparently inoperative on my unit. Key-bounce happens slowly enough that I could sometimes catch instances of it by manually starting the sweep at a rate of 12,500 samples per second and manually closing the switch sometime during the 0.32 second that the sampling was active, but I really needed an operating trigger. So much for rapid transient events.

Another important capability of DAU is to record slow transients. It presents a different screen for this, a good-looking representation of a pen plotter. The time required for a sweep across the screen can be selected in the usual steps, with the fastest sweep taking one second and the slowest taking 10 hours!

The slowest setting on the Hitachi is 4 seconds, so there is some overlap in the two machines, but the Hitachi can show only a moving dot, whereas the DAU image stays on the screen. The DAU is obviously far better suited for looking at this kind of action. It was

fascinating to feed miscellaneous signals into DAU and see them dutifully plotted. With a 10-minute sweep, for instance, there was plenty of time to put a variety of signals into the DAU. Sine waves, slow pulses, and output from a hand-operated potentiometer were all faithfully reproduced, making the screen look like the paper record in a pen-plotter. All the operations I tried with this plotter simulation worked fine.

Data acquired by DAU in either the pen-plotter mode or the oscilloscope mode is stored in its on-board memory. It can be saved at any time to a disk file through use of a pull-down menu or can be replaced by data that was previously saved. Other pull-down options allow you to examine the numerical values of individual samples or to plot them on still another screen. Having a waveform digitized and saved in memory this way allows one to do things with it that are completely beyond the capabilities of an ordinary oscilloscope. For instance, you might be looking at a signal that does not quite repeat itself, so the image keeps jittering around. DAU has an option of calculating the average of several sweeps and then presenting a rock steady display of the average. The DAU oscilloscope face is 250 pixels wide, so that is the number of samples that get shown. (This is about equal to the amount of information presented on a regular shop oscilloscope.) But DAU has as many as 4000 samples in memory, and is set up to make it easy to scroll back and forth through them all. Thus, you really have a trace that is 16 scope-faces wide. With certain kinds of input, this is an absolutely enormous advantage.

To sum up my feelings about this ingenious device, I'll say that the Data Acquisition Unit is a beautiful gadget and lots of fun to play with just as it

is. But, in its current form, it is not reliable enough to be used as a professional tool in an electronics shop or laboratory. The software and graphics are so good and using it is so quick and intuitive that Datel should consider developing a more expensive "Professional" version of the hardware with better quality components, with amplifiers that are more stable and with 8-bit samples.

In the meantime, I applaud Datel's introduction of the first useful data acquisition unit for the Amiga, and will continue to use it productively in my home activities. If you have been waiting for oscilloscope software for your Amiga, you owe it to yourself to see this one in action. My guess is you'll be impressed enough to buy it right now!

Data Acquisition Unit \$179.99
Datel Computers
3450 E. Tropicana Ave
Las Vegas, NV 89121
(800) 782-9110

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The Securities Analyst

Track Your Stock Portfolio Performance

by George Graves

The Securities Analyst won't make you rich, but with a modest amount of time and effort and considerable patience, it will surely help. This program, published by Free Spirit Software, is designed for what I call the "casual" investor. Those millions of us who participate in the equities markets as a serious hobby and not as a full-time, minute-by-minute, twenty-four hour a day occupation. (You probably wouldn't be reading this article if you were one of those, now would you?) Many of us have portfolios of stocks, and all of us would like to have more money. This program is an investment aid which can forward that goal.

Features:

The Securities Analyst requires a 512k Amiga with Workbench 1.2 or higher. It will run on a single floppy disk drive system. For ease of use a system with two floppy drives or a hard disk is recommended. The product consists of a manual, a registration card and two disks, a bootable program disk and a data disk. The package is a stock market analysis program. According to the authors, it is designed for the "individual investor." Rather than charting trading ranges and vol-

umes on a daily basis, it is geared to the entry and analysis of information by weeks. Data is entered from the keyboard for each stock to be charted.

charting is done by: *Moving Average* - A nine week moving average may be charted. This method smooths out the up and down ticks in weekly trading

Entry	High	Low	Close	Volume	Indicator
1	88.10	87.80	87.50	15.00	1930.00
2	87.60	83.20	85.80	18.00	1927.00
3	91.20	86.70	90.80	35.00	2005.00
4	99.50	90.60	96.80	48.00	2076.00
5	101.00	94.20	95.00	36.00	2101.00
6	98.80	94.70	97.80	31.00	2150.00
7	102.70	97.00	101.30	30.00	2186.00
8	101.30	96.80	98.60	28.00	2183.00
9	105.10	98.70	100.20	30.00	2235.00
10	100.50	96.50	100.00	26.00	2223.00
11	105.20	99.00	105.20	25.00	2280.00
12	110.20	104.00	107.50	31.00	2250.00
13	114.70	106.00	114.70	31.00	2333.00
14	118.80	114.50	115.50	27.00	2335.00
15	119.70	110.00	119.60	37.00	2390.00
16	123.00	113.50	115.50	38.00	2330.00
17	117.00	108.50	116.00	40.00	2275.00
18	117.80	111.70	112.50	33.00	2235.00
19	114.70	108.00	110.20	33.00	2200.00

To Continue: press a key

Stock performance is listed as numerical data, then...

Historical data files are developed which can be analyzed by a number of different methods over a period of time. There are 10 analyses available to the user, nine of which are dependent on file contents and one of which requires some information not captured in the weekly entries. Of the ten, eight are graphs which may be viewed on the screen or printed. The other two are character displays. Data base

and shows trends. Actually, two charts are presented by this selection, the first being the actual nine week moving average, and a second "oscillator" chart which shows weekly variance from the moving average line.

Accumulation / Distribution - This chart shows a stocks "public interest" by plotting a formula based on pricing

and volume. This sort of charting minimizes the effect of price swings based on low volume and emphasizes the effect of growing volumes. Again, two graphs are used to chart the information, one showing weekly price ranges, and a second showing the accumulation/distribution ratio.

Relative Strength - This chart presents two lines, one for the selected stock, and one for the market indicator used. The market indicator is input when the stock data is input, thereby allowing the choice of any indicator you wish.

which, in turn, indicate buy-sell-hold calls.

Trailing / Stops - This analysis produces an annotated chart which indicates the immediate price trend (bullish / bearish) and suggests stop order points for buy and sell orders. This presentation is simple and quick to interpret.

Stock Chart - This is a basic tick chart showing high, low, and weekly close points in an upper chart and weekly volumes in a separate lower chart.

down, it is still in the air. The stock theory is exactly the same. Price momentum is zero just before the change in price trends. This analysis displays the momentum values by which to make buy and sell calls.

The remaining two analyses are presented in character format.

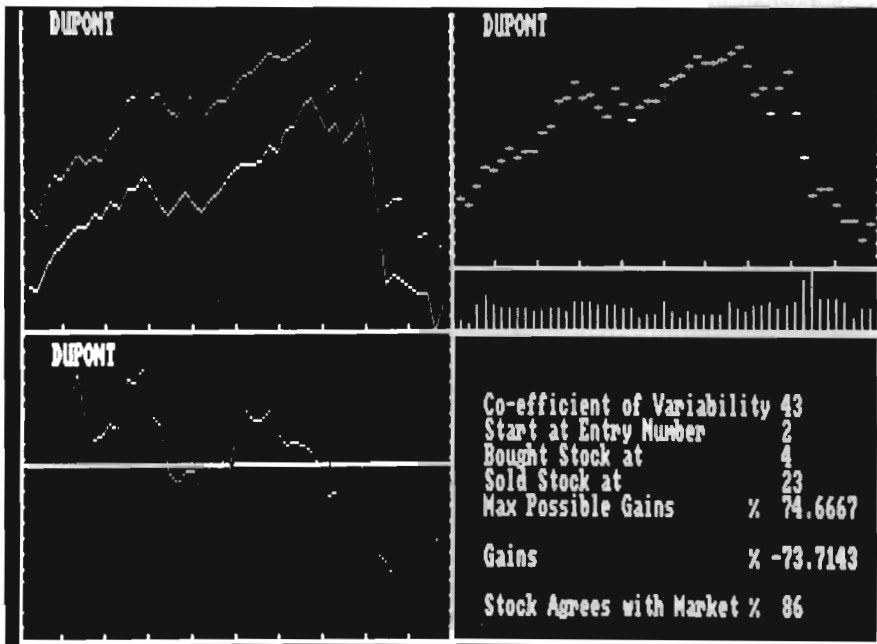
They are:

Price/Earnings Analysis - an analysis based on assessment of a stocks "glamour," current bond yields, past and projected compound growth in earnings, and its current price to earnings ratio. A recommendation is determined (buy/sell/hold) and a "true" price to earnings ratio is calculated, along with a "true" stock price. While this quick analysis ignores more factors than it considers, it can be a worthwhile tool if used with other information.

Performance Analysis - related to the Performance chart, this analysis determines the risk incurred in investing in a stock (the formula compares its price variability to market variability). It also shows the maximum theoretical gains (or losses) in the stock, as well as the selected market indicator if you had executed the optimal orders. Actual gains are compared to market gains and the percentage of time the stock agrees with market trends is calculated and displayed.

The Securities Analyst may be controlled from either mouse or keyboard. Most commands are available from keyboard short-cuts (Right Amiga-Letter). Data entry is exclusively via the keyboard. Program functions are selected from six simple menu categories. First is the Project Menu, which either sets up for another stock by clearing data, or exits the program. The second is the Disk menu, which obviously, controls

(continued on next page)



...performance can be charted

Performance - Displays a bar chart which indicates percentage increase/decrease in the selected stock versus market percentage increase/decrease.

Point and figure - Produces an extremely simplified chart which displays price significant movements with a pattern of X's (indicating upward movement) and O's (downward movement). This information is used to develop patterns

Momentum - This analysis attempts to predict turnarounds in price movements. Two lines are displayed, the moving average line and the momentum line. The theory behind the calculation of the momentum of stock prices is related to physics. A ball, thrown into the air goes up until it begins to fall. If we look at the velocity of the ball just before it begins its descent, it is zero. It is moving neither up nor

The Securities Analyst (continued from previous page)

loading or storing data to and from disk. Data may be stored in internal file format, or in ASCII character format. The Operations menu allows data entry and edit, file name and note changes, and allows a list of all the data in a stock file to be printed or viewed on the screen.

The Graphs menu allows for graphs to be printed, either one to a page or screen, or four to a page or screen. If the four graph option is taken, the program permits you to choose the four analyses to be displayed. There is also an option to perform a total analysis on a stock, in which case each of the ten analyses is both displayed and printed. The Choices menu allows selection of the particular analysis desired in the one and four-graph options. This menu is only available for selection after a selection is made from the Graphs menu. One final menu contains the program credits and the ability to select whether charts are produced in black and white, or color.

Charts are presented very simply, with little or no annotation. On most graphs the name of the stock, the title of the chart, and the period being plotted is displayed. No information about price ranges, no legend and no marking of interesting data points is noted. As mentioned before, the exception to this is the Trailing / Stops chart.

Performance:

This program performs adequately from either floppy disk or hard drive. Data for each stock is stored in a separate file and an icon is created for each data file. Data entry is straight forward and editing is simple. New records may be placed at any point in the file, including either before or after a particular existing record. The program is written in True Basic (a compiled Basic) which is faster than AmigaBasic,

but is slower than most other compiled languages. You will spend some time waiting on screens to appear, but the annoyance is minimal.

The screens are simple, perhaps to the point of being too sparse, but those who like to make pencil annotations on the charts will appreciate that. Printing is somewhat of a problem, since all printouts are screen dumps. Unless preferences has been set to reverse the image printed, printouts will be formatted as a black background with white letters, exactly as appearing on the screen. This can be corrected by selecting reverse image from preferences, but is an annoyance to those who execute from a hard disk and would rather not modify preferences for a particular program. The inclusion of a full range of keyboard shortcuts is a benefit to those who dislike switching from keyboard to mouse and back.

Documentation:

Documentation consists of a twenty-eight page manual which includes examples of the charts which are produced by the program, and a brief discussion of their meaning. Obviously, documentation of this brevity is not intended to be a course to stock analysis, but it does illustrate the concepts of the analysis and its application. A selected bibliography is included at the end of the manual for further study. A number of examples are included on the data disk including ATT & Dupont. These are also the stocks used for illustration. Computer documentation is adequate for anyone already familiar with the AmigaDos operating system. Although basic in nature, the stock analysis documentation is adequate for this level of sophistication. Anyone purchasing this program should have prior knowledge of charting techniques or interest in learning more elsewhere. You simply cannot become a Wall Street

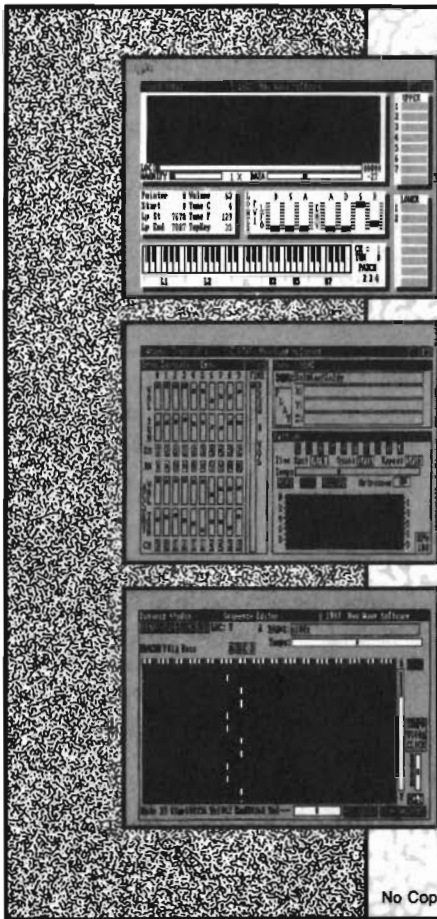
mogul from reading a thirty (or three hundred) page document. It is simple to learn to use the program. About ten minutes with the manual and the sample data bases included and you're in business.

Ease of Use:

The Security Analyst's interface is simple to use. However, I have the sense that there was little investment in designing a user interface with this product. File requesters are among the least useful and least attractive I have encountered in commercial software. I could not switch screens or adjust screen sizes with the program running. The program lacks the intuition features available on the Amiga which users have come to expect. Perhaps these are limitations of True Basic, but the development language is one of the things which must be considered in product development.

Data entry is simple, but data cannot be downloaded directly into the program, and there is no provision for converting ASCII files to data files. Since moving averages require at least nine weeks of information and many people insist on at least one year's worth of history, it is a major task to enter a new stock. The indicator, too, must be entered on each entry panel. This means that the Dow-Jones average for each week must be entered for each stock tracked, a minor, but unnecessary, annoyance. A simpler way would be to have the indicator specified, and pull the figures from an indicator data base.

The greatest shortcoming, I feel, is the limited use of Amiga graphics for chart annotation. Since the Amiga has a powerful graphic interface, it's almost a requirement to have programs use this to point out interesting events on charts such as these. These graphs present a passive analysis of stock per-



Sound Oasis

\$99⁹⁵

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

dynamic drums

\$79⁹⁵

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

DYNAMIC STUDIO

\$199⁹⁵

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

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formance and don't implement significant information such as lines of resistance or support. There is no way to drag your mouse around an area and zoom in for more detailed analysis.

Error Handling:

A major weak point, The Securities Analyst does not excell at handling errors. It can be prone to visits from the Guru when things are not done in proper sequence (for example if some file has not been loaded before charting). The lack of error handling makes the program an annoyance when it is used on a hard disk system with other applications active.

Support:

Gregory M. Schueman lists his Com-puserve I.D. in the Info box in the program, but the documentation suggests

that it is better to contact him through Free Spirit Software, the publisher. We suggest that if you purchase the program that you copy down the name and address of Free Spirit and keep it handy. You'll want to stay in touch with them regarding program upgrades.

Value:

The Securities Analyst is no doubt of value to those looking for a way to computerize their stock trend projections. My main reservation towards The Securities Analyst has to do with the overall look and performance of the program.

At its \$79.95 list price, I expected more of the polish of comparably priced software. Instead, one gets the impression of a public domain software offering, especially in the area of the error handling. More effective use of

the graphic capabilities of the Amiga could have been integrated into this package to further increase the value.

If you have an Amiga, no access to an MS/DOS machine, a stock portfolio which you would like to track, a good measure of patience, and the time to do something the computer could do much faster and easier, I have no doubt that this program can pay for itself, given a little good judgement on your part.

The Securities Analyst
Suggest List Price: \$79.95

Free Spirit Software
58 Noble Street
Kutztown, PA 19530
(215) 683-5609

Audiomaster II

Work with Sampling Rates up to the CD ROM Range

by Walter Steuber

This is a prejudiced review in that I have been using the original Audiomaster for about a year now and have grown to love it. Other programs have come into favor and then faded away, but Peter Norman's Audiomaster has continued to be one of the familiar old friends that make up my Amiga system. It has always worked just right, so I have a strong prejudice against any changes in it. It wasn't

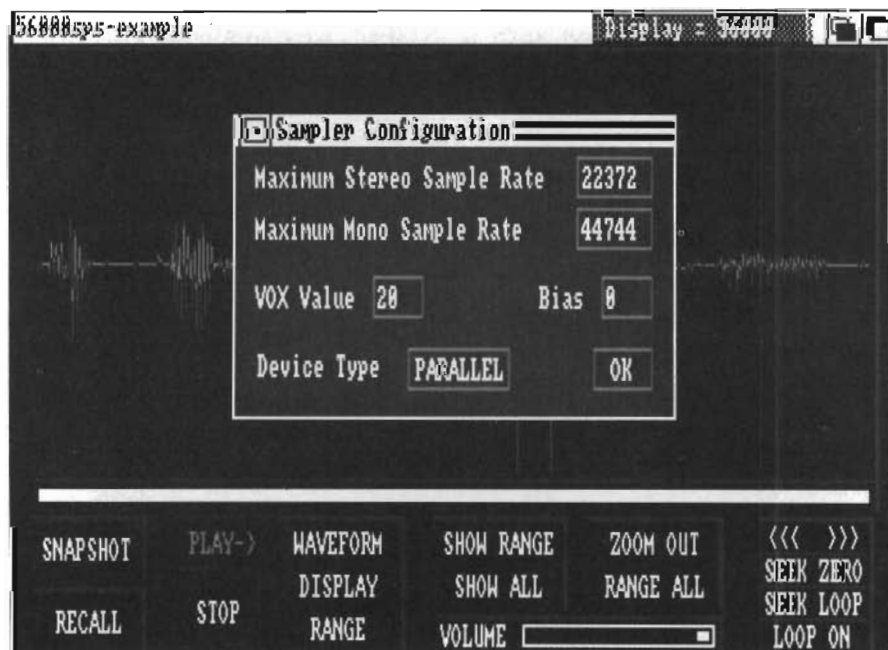
broken, so I thought it shouldn't need fixing. One of the things I liked about the old version was its simplicity. It did not confuse me by trying to do a hundred different things, but instead limited itself to straightforward editing of sound. The sound could be a single note from a Sonix instrument file, a musical passage in an IFF file, or a sample from an audio digitizer. Audiomaster displayed a big, clear oscilloscope-like graph of whatever sound was being edited and made it easy to cut and paste sections, to make parts louder or softer, to change the pitch, to mix and flange, to insert echos, and to

modify it in a few other ways. In other words, it made modifying a sound as straightforward and intuitive as it is to modify a picture with dPaint.

Audiomaster II does all the things the original version did and, happily, retains its high level of user-friendliness. In many ways, it is the same program, with some unobtrusive improvements and extensions. In certain other ways, though, it has become far more powerful and useful. My fear that a "new, improved" version would spoil my comfort has vanished and been replaced by a strong new prejudice in favor of AudioMaster II.

The way I use Audiomaster the most is to capture sounds with a digitizer, examine the resulting waveforms in close-up detail, and then change them around. I use a FutureSound audio digitizer, sometimes connected to a microphone and sometimes connected to a tape deck. The maximum sampling rate used to be 20,000 per second, an upper limit that I thought was imposed by the Amiga hardware. Even though this sampling rate burned up memory at a furious rate, it was not high enough to get really satisfactory fidelity. With Audiomaster II, wonder of wonders, the very same hardware can handle 44,744 samples per second! The improvement in clarity of a clarinet or beauty of a birdcall is substantial, changing them from being almost

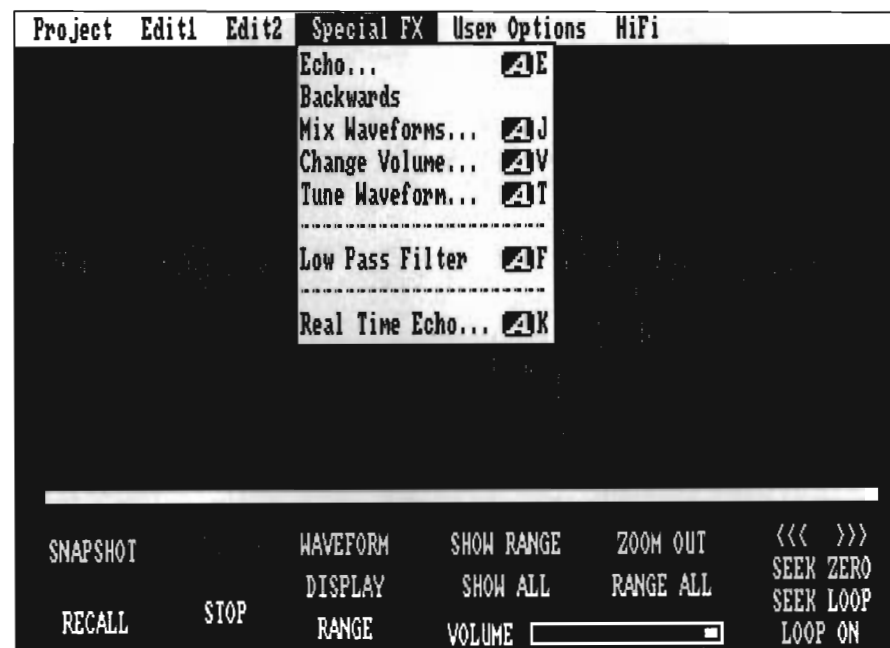
Audiomaster II offers an incredible 44,000 sampling rate in mono mode



satisfactory to completely delightful. Besides that, a sound digitized at 20,000 samples per second loses too much information to study its high-frequency components. Voices, too, are improved by digitizing them at this new high rate, but not as dramatically as clarinets and birds. Although human speech at first sounds about the same at these two sampling rates, intonations and subtle characteristics become detectable at the higher rate. Commercial laser disks and CD ROMs get their high fidelity by digitizing at 40,000 samples per second, and now the Amiga is in the same league! Laser disks take a bigger sample, so they have a much bigger range between loud and quiet sounds, but this doesn't seem to be as important to fidelity as the sampling rate.

Not only does the new version of Audiomaster double the sampling rate for a regular A1000 -- if your Amiga happens to be operating with a 68020 processor, sampling can be taken up to the hitherto unheard-of rate of 55,930! I used a Commodore 2620 Accelerator Board to hear what the sounds would be like at this higher level. The digitizer properly delivered its samples and the Amiga accepted them ok, but the final results did not sound all that much different from those recorded at 44,744. It was kind of disappointing not to hear a greater improvement, but it was heartening to find I did not absolutely have to get a 68020 processor. A person with more sensitive hearing surely would have noticed an important improvement in going from 45 to 60,000, but to my ears it was only marginally better and not worth changing my computer system.

The selection of sampling rate in the first version of Audiomaster was limited to two choices, low (8363) or high (19,886). Now you can specify any value from 2000 to 55,930. This addi-



A variety of effects may be applied to the sample

tional control turns out to be highly useful in the preparation of sound files, because a user is constantly compromising between high fidelity on the one hand and keeping the file down to a reasonable size on the other hand. With one kind of sound, an acceptable sampling rate might turn out to be 7000, while some other kind might not sound right until you allocate four or five times more memory to it. Voices and music sampled at rates below 4000 both sound absolutely dreadful (although it's fun to play with them) and above 40,000 they make you proud of your machine. Some place in between is probably the best compromise for each particular case. The actual digitizing process consists of making thousands of measurements or samples per second. These measurements of a sound are the moment-to-moment values of a fluctuating voltage. This need not come from a microphone. The Amiga could be acquiring data from a laboratory instrument such as, say, a fast-changing pressure transducer. Audiomaster will then display the data in os-

cilloscope fashion so that a transient event of short duration can be examined at leisure and in great detail. Using it this way turns the Amiga into a scientific tool that is considerably cheaper than the instruments that are now in the laboratories. There are other products more specifically designed for this purpose, Dattel's Data Acquisition Unit for instance, but it is worth noting that Audiomaster is taking information from the outside world and putting it into your machine in useful form. The option of working in stereo is the other big extension added to Audiomaster I. The two channels of a stereo sound are displayed simultaneously so that the user can edit them individually. (One enjoyable way to use this feature is to enter the same sound into each channel and then to edit the separate channels in a way that generates stereo effects.) You might expect that going from monaural to stereo would add complication, but it turns out to be quite reasonable in AudiomasterII. Of course, you need a stereo sound system to take advantage of
(continued on next page)

Audiomaster II (continued from previous page)

but that is easy if you have one of the new stereo monitors or are already plugged into a home stereo sound system. Stereo sound files can be loaded into the display or stored on disk in just about the same way the early version handled single-channel sound. The new version will also read output from a stereo digitizer in a procedure that is almost identical to the way it reads a single-channel digitizer. Setting up stereo microphones is certainly more complicated than setting up a single one, but capturing stereo from a tape deck only involves a little change in the cables. A price you pay for going to stereo is a doubling of the amount of memory consumed when you keep the same sampling rate. Since stereo sampling is twice the work, the maximum

sampling rate is only half that of monaural recording. This presents the interesting choice between the higher fidelity of a monaural product or the greater aural pleasure of stereo. Several other extensions in the new version, although less sweeping than high sampling rate and stereo, will be recognized by users of the original Audiomaster as very nice improvements. This list does not include all the changes, just the ones that especially appealed to me:

* Sometimes, when recording a sound, it isn't clear when to start the sampling. VOX (short for Voice Activation) is a menu selection that will automatically start the sampling whenever the sound level reaches a value you have requested.

* Where are you in the sample? Sometimes in cut & paste operations, this is a burning question. A little box in the title bar shows exactly where the cursor is, and you are given a choice of whether it is in bytes or in seconds.

* Displaying RAM. The original version allowed you to display chip RAM, but using expansion RAM made the data unreachable. Now AudiomasterII lets you look at both kinds of RAM. In this mode, it shows the cursor position in units of absolute memory location and it displays as much or as little of the contents of RAM as you want. This feature is of no use whatever that I can see in making musical instruments, but it greatly increases the usefulness of the Amiga when it is being used as a scientific data acquisition system.

* Printing a hardcopy of the waveform display can now be called up with the press of a button.

I have played with several other sampling and editing programs that display a sound in oscilloscope fashion and I just seem to prefer Audiomaster II. They all perform about the same functions, so it is has to be called personal bias, but I prefer the way Audiomaster displays its data, and the way the menu choices are presented. I am most comfortable with it.

In summary, I'll repeat my confession of bias towards Audiomaster. There are many other sound editors out there that do a good job, but I totally enjoy using Audiomaster and have no reservations or complaints whatever about it. It is just right for use with my audio digitizer, or for editing voice and music files.

Audiomaster \$ 99.95

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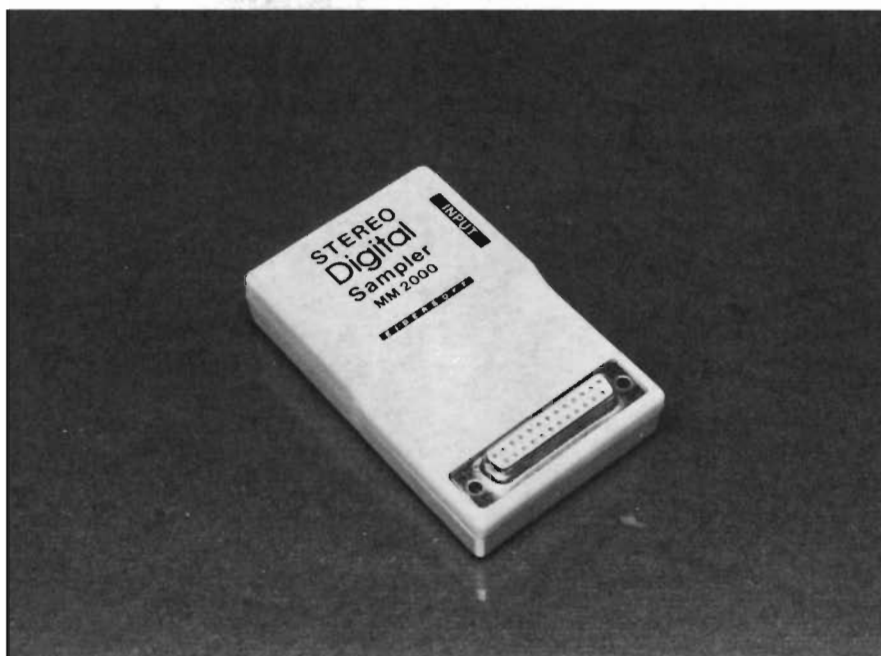
ProSound

Power Sound Sample Manipulation from Precision

by Walter Steuber

ProSound Designer Gold is an audio sampling and editing package with three totally separate parts from Precision Inc. One item in the package is a piece of hardware that will digitize, in stereo if desired, sound signals from a microphone, tape deck, radio or whatever. (Those who already own a digitizer can buy the package without this hardware.) Another item in the package, ProMidi Plus, is a four-channel midi sample player program. It gives you control over input to a midi interface, if you have one installed on your machine. The third item in the ProSound package, and the one that will be reviewed here, is called "Gold." ProSound Designer Gold (from now on, simply ProSound) is an extensive piece of software that allows you to edit and manipulate sounds. The sounds may be input from either a digitizer or a diskfile. They may be either stereo or mono. They may be any kind of sound, but the slant of the program is toward making synthetic musical instruments.

ProSound does many of the same things that AudiomasterII does. In fact, it is head-on competition, feature-by-feature, to AudiomasterII. There are other programs, too, that are designed to generate new sounds from



The full ProSound setup includes a stereo sound digitizer and an adapter to allow the module to be used on both the A1000 and A500/A2000

existing ones for use as musical instruments, or as the sound effects in a game, but, to keep things simple, comparison will be limited to just these two editors. Both make good use of the great sound facilities of our Amigas. Though they do nearly the same things, ProSound has some additional capabilities that AudiomasterII has omitted. Precision's approach to the user and the way the software operates, is drastically different. The question from now on will be, "Which of these two sound editors will fit best with an individual user's personality

and needs?" The situation reminds me of two word processors, WordPerfect and Scribble. One is very powerful (but confusing) with its hundreds of commands, while the other is simple and intuitive (but unable to do certain things).

ProSound comes to life with a good-looking screen that contains several windows that are surrounded by a combined total of 45 control buttons. All operations are carried out by mouseclicks on these buttons or by

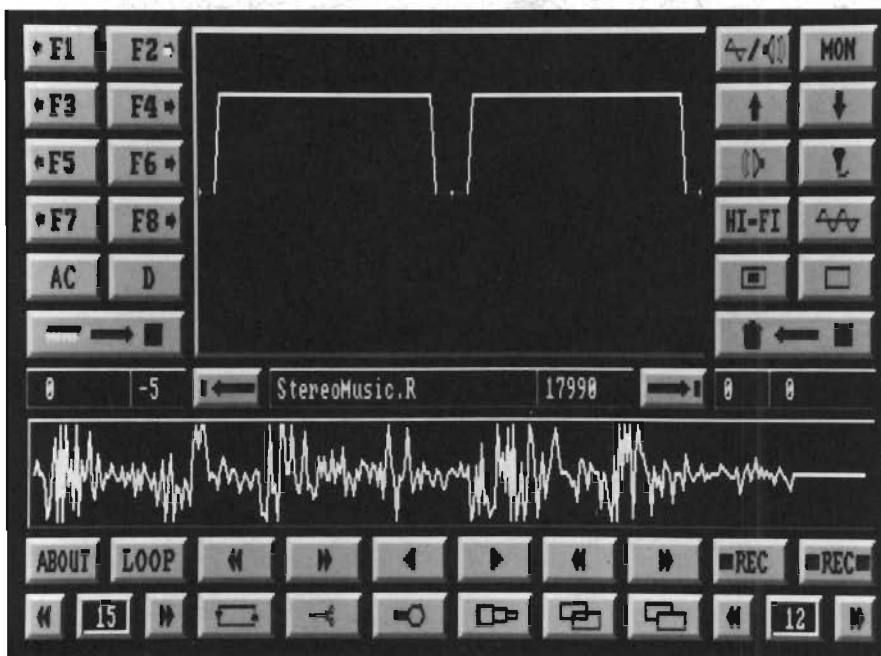
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ProSound (continued from previous page)

keyboard entries. There are no pull-down menus! Each button is identified by a small symbol that you eventually come to recognize, but there is a period during which you must constantly go to the manual to learn what the heck it does. Many of the buttons have different actions depending on whether you click with the left or the right mouse button, and one particular button will bring in a set of eight new buttons! With all these options, you will be right if you conclude that ProSound can do many, many things with a

edit a waveform point by point. (Audiomaster *also* does all these marvelous editing functions, and in about the same way.) Besides that, ProSound will expand or shrink a sample, or add a value. As an example of how non-intuitive these buttons are, let's take the "Echo" function. It is called by pushing a button that is marked by two overlapping rectangles. Don't click it with the LEFT mouse button, because that gives you some different function. Press the RIGHT mouse button and you get a requester that looks just like

about the subject, but it is careful not to use jargon terms without explanation and it is very good at clearly telling what will happen when you push one of those buttons. 32 pages of well-printed text (not counting the Midi section) is also used as a protection scheme. We all know how much of a nuisance it is to have to look up a password in the manual before a program will start operating, and how little protection this is against serious pirates. Using manual protection is especially dubious in the case of ProSound, because its main use is with digitizer hardware that you buy with it. Beyond that, the implementation of the manual protection is greatly hampered by the layout of the manual. With its fine print and missing line numbers, the solution to a puzzle like "Type in word 5 from line 23 on page 20" can be more than a nuisance. Most programs incorporating the manual protection method use line numbers of a sufficiently large type so as to make this process as painless as possible to the legitimate owner. Still, the copy protection used here points up again how serious the piracy problem is with software producers and reminds us users that it is in our own interest to keep those programming geniuses happy and producing.



All functions are controlled by clicking on the appropriate gadget with either the left or right mouse button

sound sample. Audiomaster presents the user with a sparser, but intuitive panel, in which the buttons are labelled in a more explanatory way.

In ProSound, editing functions that are initiated by clicking on buttons include cut, move, merge, echo, adjust volume, and reverse. The editing can be limited to just a part of a sample by placing pointers, and these can be used to find next zero, to magnify, and to

the requester you get in Audiomaster when you click on a pull-down menu that says "Echo." The designers of ProSound clearly wanted to pack many functions into their system, and that is fine - after you learn them.

The general subject of sound files and their manipulation is complicated and can be terribly confusing when you first approach it. The ProSound manual expects you to know a little something

ProSound's biggest feature is the ability to juggle eight sounds at once. There are eight sections of memory into which the user may load separate sound samples. (Four stereo pairs, eight mono samples, or a combination of the two.) Memory sections expand and contract as needed, so available computer memory is put to its maximum use. By judicious clicking of controls, any one of the samples can be edited in any of the ways enumerated above. More exciting, though, is ProSound's capability of listening to as many as four samples at once, and of mixing and combining them at will. Thus, a new-

(continued on next page)

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comer, and especially one with musical talent, can massage a sound sample in extremely complicated ways (or in strange personal ways), listen to the result, and either save it or dump it. Any of the samples may be saved to disk as either an IFF file or as raw data to be worked with later. The buttons are arranged to make it easy, once you are used to them, to carry out all these operations, and it is gratifying to see the speed with which they respond. The operations of loading and saving to file, especially, seem surprisingly quick. The management of eight samples at once, while requiring a prodigious amount of memory, gives the user enormous versatility and flexibility to create special effects. AudiomasterII, it must be said, does all these things, too, but is limited to two stereo samples at a time.

ProSound and AudiomasterII both can operate on existing sound files; consequently, much creative editing and manipulating can be carried out without using an audio digitizer at all. Still, an awful lot of the fun with either program comes from playing with sounds sampled through a digitizer. Both programs will work with any of several brands of digitizer. ProSound asks the user which brand is connected and lists as possibilities Perfect Sound 1, Perfect Sound 2, FutureSound, Datal PSS, and, of course, its own Eidersoft brand. (It omits StarVision, but that probably works ok, too.) Each of these pieces of hardware has its own advantages and limitations (but that is another article). Assuming the digitizer is working perfectly, ProSound will sample a monaural input at any rate from 1,000 to 28,000 samples per second. AudiomasterII can substantially beat that spec with its range of 2,000 to 44,744 in a standard Amiga (and even more with an accelerated Amiga). Stereo input is sampled by ProSound at a maximum rate of 17,000 and by AudiomasterII at

28,000. Either program will save the file, if you want, as a 5-octave IFF instrument file.

Audiomaster some time ago made an advance over its predecessors when it recognized expansion memory, knowing that people who work with sound samples have to feed their Amigas ever increasing amounts of memory to satisfy the ram requirements of sophisticated and sustained samples. ProSound, too, will recognize expansion memory, but only if the user breaks down and reads the manual to find the secret button that enables it. There is some speed advantage to using chip memory exclusively, so ProSound makes that the default choice.

To sum up this listing of the similarities and differences between two great sound editors, I'd first say that they do almost exactly the same thing. ProSound has an important advantage with its eight sound samples in memory at once and AudiomasterII has an important advantage of higher sampling rate. If you use ProSound just about every day, you will soon know the buttons by heart and their faster, easier use will be a big advantage. Contrariwise, with infrequent use, you will have to hunt through the manual a lot to remind yourself how to carry out an editing function. I expect, that the button style of operation will be a major frustration. My personal taste leads to writing this review with Scribble! because it is plain and simple. I find myself leaning towards AudiomasterII for the same reason, but to each his own.

ProSound Designer
GOLD \$159.95

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DUNGEON MASTER

Unfriendly Graphic Adventure in the Darkness of the Dungeon

By Anthony Bevivino

"Step into the world of Dungeon Master and see fantasy come to life. Set in the depths of the mysterious underground, Dungeon Master puts you inside the most detailed dungeon ever created in software. Every twist and turn, every nook and every corner looks real. Everything moves and works! Pick up objects with the mouse and take them with you. Or,

pick up the key and try it in the locked door. Maybe there's treasure on the other side, or maybe there's a hungry monster! Choose your companions for this adventure carefully, because you'll need strong fighters and powerful magicians to survive. Their skills will be tested by the intricate puzzles and cunning traps hidden inside."

The paragraph above is from the back of the Dungeon Master package, and it makes quite a few statements that are very hard to live up to. Does every twist and turn look real? Is this

the most detailed dungeon ever created in software? How intricate are the puzzles? How cunning are the traps? These are the questions I felt needed some answers, and I hoped that these answers would make Dungeon Master the game it claimed to be.

In Dungeon Master, you are Theron, once the apprentice to the Grey Lord, the mightiest magic user in existence. But now you are the last hope for your world. The Grey Lord found the Power Gem hidden in the depths of his mountain domain. Using his magic, the Grey Lord tried to gain control of the Power Gem, but even his magic was not enough. The Gem split the Grey Lord into two beings, Librasulus, the restorer of Order, and Lord Chaos, the evil one. Lord Chaos now controls the mountain of your master, and his good half, Librasulus, is banished to Limbo and needs your help. While you cannot directly enter the mountain, you can guide the souls of four mighty adventurers to complete the task. You must go to the Hall of Champions and give new life to the spirits of four of the twenty-four champions whose lifeforces are trapped in magical mirrors by Lord Chaos. Choose wisely and perhaps you will succeed where hundreds of others have failed. You must reclaim the Firestaff and return it to your master so that he may use the Power Gem to defeat Lord Chaos and bring peace to the world. Your quest begins in the Hall of Champions. You

A detailed explanation of each character's attributes provides a means for making strategic decisions on which characters to reincarnate

The screenshot displays the character management screen for 'APPRENTICE NINJA' and 'NOVICE PRIEST'. It includes portraits for 'JOYCE', 'AZIZI', and 'STANN', and a larger portrait for 'HUUF THE BIKA'. The interface shows various icons for skills and items, and a grid for character placement. The attribute table for the selected character is as follows:

STRENGTH	33/ 33
DEXTERITY	57/ 57
WISDOM	45/ 45
VITALITY	40/ 40
ANTI-MAGIC	35/ 35
ANTI-FIRE	40/ 40

Additional stats shown include: HEALTH 40/ 40, STAMINA 50/ 50, MANA 30/ 30, and LOAD 0.8/ 37 KG.

must choose from among the twenty-four souls and find the four whom you feel will succeed. Each hero has his or her life force trapped in a mirror, and by looking into the mirror you can see their abilities, equipment, class, and level of experience. You may then either resurrect the hero as he was before death or reincarnate them as a new character with higher natural abilities to be shaped as you wish. The choice is yours to make.

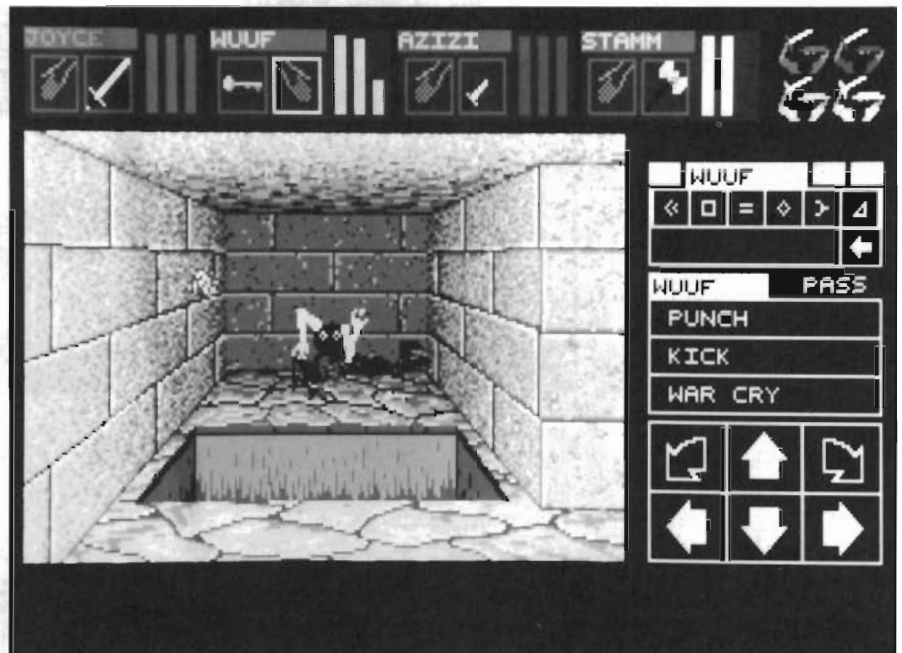
The natural attributes the heroes possess are strength, dexterity, wisdom, vitality, anti-magic, and anti-fire. Strength affects the striking power of weapons and the load the hero may carry. Dexterity is the coordination and speed of the champion and affects the chance of hitting with a weapon and dodging blows. Wisdom determines the spell ability and spell power. Vitality governs recovery from injury and resistance to injury. Anti-Magic is resistance to magic attacks and Anti-Fire is resistance to fire attacks.

The four classes your hero may have are Fighter, Wizard, Ninja, and Priest. Fighters are masters of hand-to-hand combat. They use the heavier weapons and armor with great skill. Strength is needed to be a fighter. Ninjas are masters of the thrown weapon and the lighter, more precise weapons. Dexterity is important to be a Ninja. Wizards and Priests are the practitioners of magic. Wizards have mainly offensive spells, while Priests heal and protect. A high wisdom is critical for a Priest or Wizard.

One of the best and most interesting features of Dungeon Master is the way class is used. The only way to get better is to do it!! Fighters get better by fighting, Wizards get better by casting spells, etc. Because of this, you are not limited by what you choose in the beginning. If you want your Ninja to

become a Wizard, have him try to cast Wizard spells, and sooner or later he will become good enough to be a Neophyte Wizard and can work his way up. This feature makes it possible to develop very diverse characters or very specialized characters and adds a new aspect to overall game strategy. It was great to be able to develop my characters by the the actions I make them do and not by the choice of class I make in the beginning of the game. Another feature

Priest spells, and some are nonsense. The player must experiment to find out which combinations give which spells. I found this to be a very imaginative and effective system. My only complaint is that some spells that are very important give no real sign of what they do. The spell "Weaken Non-Material Beings" is the only thing aside from magical weapons that will kill spirit beings, but there is no real way to find this out unless you have a spirit



You really do have to watch where you are walking in this game

that impressed me, and in fact is what I consider a true breakthrough in adventure games is the magic system used in Dungeon Master. All magic uses Mana, or magical energy. However, mana alone is not enough. All users of magic need the runes to control the magical energy. There are four classes of runes: Power, Elemental Influence, Form, and Class/Alignment. There are six runes for each of the four classes of runes. The magic user must put together the combination spell. Some combinations give Wizardspells, some give

being that you can cast random spells at, and this just does not happen. There are a few scrolls that list spells, but these are too few and usually come too late. Aside from this, I found this magic system to be one of the best I have played.

When you bring up the information screen for your champion, you are in for a pleasant surprise. There is a picture of your hero, and a stick figure of his body. To place armor on him, pick
(continued on next page)

Dungeon Master (continued from previous page)

up the armor and click on his torso, to put on a helm, pick up a helm and click on his head. You can place items in the backpack, pouch or quiver. To eat or drink, place the food or water in the mouth icon and click. To examine an object, pick it up and click on the eye icon. Click on the eye icon alone to examine your hero's stats. This is a very efficient and realistic way to keep track of what each character has. At first, I found it to be awkward. But as time went on, I realized that this was the best way yet to keep track of a character and his possessions that I have ever used.

I was somewhat disappointed with the monsters in *Dungeon Master*. First of all, I did not find a lot of variety. I would say I encountered less than fifteen types of monsters. I seemed to be fighting the same monsters over and over again. Another complaint I have is that there are no names for the monsters. The best you can say is "I fought this blue thing with red eyes and a club." It would have been nice to know I was fighting a Troll or a Spectre or whatever, rather than just being able to describe the monsters appearance. While the monsters I fought were challenging, I felt that this area of the game was weak.

One area of the game I was very happy with was the objects found. In searching the dungeon I came across all kinds of weapons, armor and magic items, and figuring out how each was best used is a fun part of the game. Which character should have the missile weapon? Who should use the magic staff? Who gets the chain mail? All of these decisions are very important to the game. Also, the magic items were

well done. It was rare that a magical item was found, but important if used properly. Items such as a Vorpal blade, Yew staff, Horn of Fear, and Mace of Order are hard to find and use, but turned out to be a great help. This was one area where *Dungeon Master* excelled over most other adventure games. The



graphics in *Dungeon Master* were above average but not quite up to the quality of the *Bard's Tale*. There is a lot of detail and some good color, and the scenes are easy to look at for long hours. The game is presented from a "first person" viewpoint with simulated 3D, much like the *Bard's Tale* games. This perspective can be hard to use effectively, but it is done well in *Dungeon Master*. All in all, *Dungeon Master* is not the very best in the graphics area, but it is a cut or two above the crowd.

Like most adventure games, there is very little sound in *Dungeon Master*. There are thumps, swishes, explosions and screams, but sound is not a constant. It would have been nice to have some background music, but this can be overlooked. The sound that was used was, for the most part, very well done. Nothing seemed fake or shabby. One

thing I did like is that if you listened, you could hear the monsters approaching. There was always a tell-tale slither, clink or clomp as a monster approached, so you had to pay attention.

The true test of any adventure game is gameplay. How long can you play the game and how much do you want to beat it. In this area, *Dungeon Master* scored well. I could play it for hours, and after a break, I always wanted to come back. Some of the puzzle rooms were a bit too frustrating, but after a few hours the solution would pop into my head. I really wanted to beat this game, and so I kept playing. The "Save Game" option was easily used, and made it a snap to take a break and continue right where you left off.

The package for *Dungeon Master* may have made big claims, but in my opinion, the game lived up to them. While *Dungeon Master* may not be the absolute best adventure game available, it is exceptionally well done and is one of the best out there. It is fun to play and has good graphics. I feel that the magic system and character overview are the best in any adventure game to date, and I would like to see them used again in other games. I highly recommend *Dungeon Master* to all those interested in a high quality, challenging adventure game.

***Dungeon Master* \$ 39.95**

FTL Games
6160 Lusk Blvd.
SanDiego, CA 92121
(619) 453-5711

Sword of Sodan

Wizards, Zombies, and a Quest for a Rightful Heir

By Anthony Bevino

The once jeweled cities of the Northern Kingdoms have been plunged into darkness. Zoras the Necromancer slew your father, the King, and thus began an unbridled reign of terror. Horrifying beings roam the corridors and courtyards of your father's castle where the sorcerer now practices his evil craft. You escaped the slaughter, but not the memory of that fateful day. Trained in the ways of the sword, you

have vowed to avenge your fathers death - returning honor to the throne, and peace to the kingdom.

Sword of Sodan is a new graphic adventure game released by Discovery Software which promises an epic clash of good and evil. A fight between a mighty warrior and the evil wizard. Sword of Sodan has eleven screens and a variety of challenges, from axe-wielding soldiers to zombies, to crushing stone blocks. You, as the child of the King and rightful heir to the Sword of Sodan, must defeat all obstacles in your quest to destroy Zoras, the Necro-

mancer. In ages past, Zoras the Necromancer used his magic to summon the spirits of the dead to conquer the land. An icy mist descended upon the land, and no fire would burn. Many people fell to the cold, and even more perished at the hands of the undead, because no sword could harm their spirit forms. But one day, a hero came. His name was Sodan, and he left his only son in the care of peasants to take up the greatest sword ever made and fight the spirits of the dead. None could stand before this greatest of warriors and his greatest of swords, the Sword of Sodan. Thus was Zoras defeated.

Sword of Sodan's strength lies in its detailed graphics and animation



After defeating the enemy, Sodan felt a great sadness. He had no idea what became of his son during the many years of the war, and so he left mankind and became a hermit. In the years to come, Sodan's son, Lordan, grew up and through his skill and wisdom became King of the Northern Kingdoms. The years pass, and Lordan had two children. They were twins, a boy and a girl, named Brodan and Shar-dan. When the children were very young, the King felt the return of the Cold Death, and sent his children to be hid in the woods. This happened none too soon, as Zoras summoned even greater powers and slew the king and took over his castle.

The twins were taken deep into the forests, and as fate would have it, came
(continued on next page)

Sword of Sodan (continued from previous page)

upon the hut of Sodan, their grandfather. Upon hearing their story, Sodan vowed revenge. Since he was too old to fight, he taught his grandchildren all of his knowledge of the art of the sword. After many years, they grew to be masters, and the time came for the Quest. Only one of the twins could wield the Sword of Sodan, and that is the first choice you must make on your journey; select which twin you will play.

Because *Sword of Sodan* is a graphic action-adventure, the graphics are, of course, the most important part of the game. I was very impressed by the look of *Sword of Sodan*. Every aspect of the graphics was well done. Your character, whether male or female, has a very impressive appearance, bulging with muscles and ready for action. The enemies were also realistic. The human guards looked capable, but paled in comparison to their (literally) giant commander. The monsters, such as the zombies and jungle beasts, also looked deadly. I was also pleased with the backgrounds used. The city scenes had a variety of houses and storefronts, the jungle was filled with foliage, and the castle had flickering torches and shadowy recesses. This added to the game by creating a more realistic and complete atmosphere.

All of these graphics would be useless unless animated well, and *Sword of Sodan* comes through again. All movements, either by your character or the monsters are very fluid and lifelike. The combat scenes are easy to follow, and in fact, quite bloody. So the excellent graphics are showcased by good animation, and this is quite a combination.

There is not much sound used in *Sword of Sodan*, but it is put to good use. The combat sounds and death screams, etc. are all very well done. Each of the sounds used adds to the



Magic, mayhem, and romance..what else do you need?

game without making it too difficult to concentrate on the action. The sounds are high quality, digitized, and show good judgement in their use.

So far, *Sword of Sodan* is an excellent game. It excels in graphics, animation, and sound. However, I found that it came up short in a very crucial aspect of any game, playability. To put it bluntly, *Sword of Sodan* bored me. The combat scenes were very limited, your character can only attack in three ways, sword high, middle, and low. There is very little skill involved, as most enemies can be killed by waiting in one place and swinging continuously. Also, the magic items, zappers and shields, were not merely help, they are necessary. What I mean by this is that the enemies that can be killed can be killed quite easily, and to kill the rest you need magic or you will die. Since this game is primarily sword combat, I feel that a lot more attention should have been given to this portion of the game. *Sword of Sodan* is also very

short. There are eleven screens, and the second time I played the game I got to screen eight. By the fourth time playing, I was at the end. It does not take very long to get through the screens, either. What I see in *Sword of Sodan* is a quality game, but without enough quantity. Although I was pleased with what was contained on the three disk set, there was just not enough to satisfy my quest for challenge.

In summary, *Sword of Sodan* is an action-adventure game with superior graphics, animation, and sound. Unfortunately, it is too easy and too quickly beaten. Not enough emphasis was placed on combat, or any other area that might have required higher levels of skill. Maybe in *Sword of Sodan II*?

***Sword of Sodan* \$49.95**
Discovery Software International
163 Conduit St.
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(301) 268-9877

MIDI STAR

A Professional Level MIDI Interface

by Tom Bucklin

There are, to be certain, a number of great myths in the world, not the least of which is the one about the "computer/paperless" society. Given a choice of which myth I would like to see come true, I would immediately opt for a "cableless" society; one in which you can drag your computers all over the place without sling-shotting that mouse off the desk where it con-

tacts the floor with great enthusiasm (sometimes providing a free lesson in electronics).

It is no coincidence that the advent of MIDI capable synthesizers that are microprocessor based brought with them, you guessed it, more cables! For those who have been inspired by the recent influx of MIDI related software for the Amiga (editors, sequencers, etc..) and have begun to add MIDI equipment to their setup, the problem becomes quickly apparent. For example, most editors require that you have

a looped MIDI data stream between the Amiga interface in/out and your MIDI device's in/out (this creates an interactive loop between the Amiga and the device for purposes of storage, retrieval, and verification of the same). So far, so good. The problem arises when you want to record some riffs into your sequencer from your keyboard, but also want to keep the editor's lines intact so that you can edit and retrieve sounds on the fly.

Some editors have addressed this situation by providing limited chord, note, and glissando MIDI out signal to the device, but sooner or later, you're going to find yourself in contention for you MIDI IN port of your interface. What usually happens (in absence of a better solution) is severe cable-swapping. This is particularly fun if you have a lot of gear and you're always reaching behind something to try to play "pin the cable on the port."

Out of great pity for all of us cable-swappers out there (and maybe a little motivation towards profit) Spirit Technology has introduced a high-end MIDI interface for the Amiga that can solve your dilemma. The *MIDI STAR* interface is a two in, six out/through unit that provides a multitude of possibilities for the MIDI enthusiast.

The first welcome sight built into *MIDI STAR* is the inclusion of MIDI
(continued on next page)

MIDI STAR features LED status indicators for data transmission verification and routing information



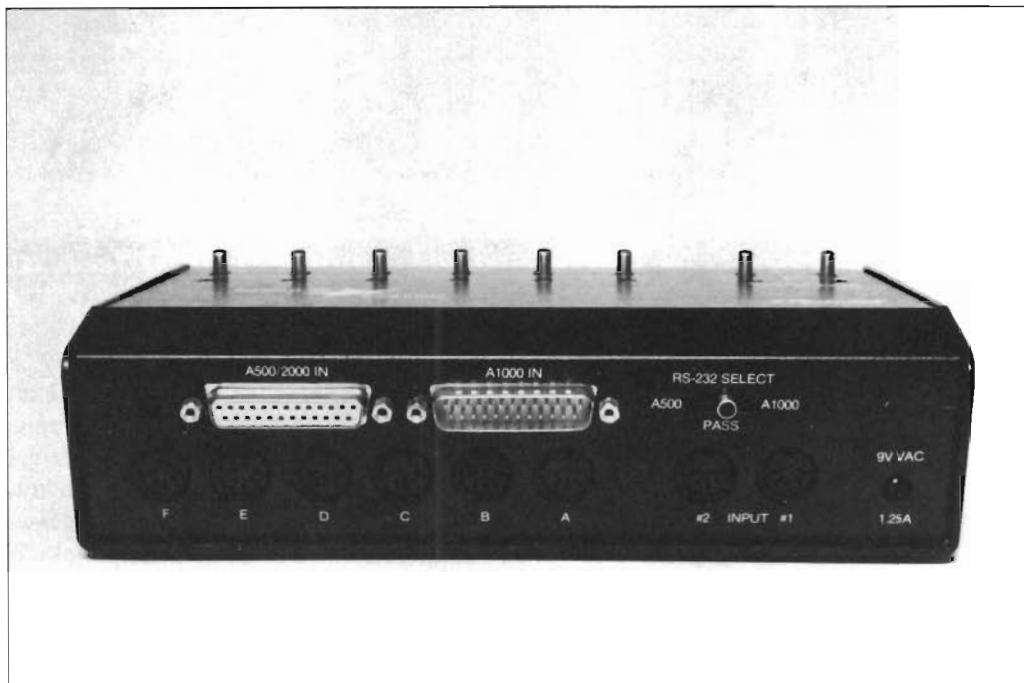
MIDI STAR (continued from previous page)

status LED's. These multi-purpose indicators give visual indications of MIDI data flow, the MIDI IN to OUT configuration, and OUT or THROUGH status of the six outputs. They are dual element and glow either red, green, or yellow depending on their location and status. In an effort to capitalize upon this design, the front panel is sloped, allowing the status lights to be clearly visible from across the room.

All data stream routing through the MIDI ports is controlled by means of (8) three-position toggle switches. The dual MIDI IN's are selectable in an either/or configuration (non-merging). A second toggle can provide a split mode in which the individual MIDI IN's can be assigned to the first or second set of three MIDI out/through ports.

The accompanying view of the rear panel illustrates the flexibility of MIDI STAR. Both the A1000 and A500/A2000 serial configurations are supported and selectable by means of the rear-mounted toggle. The center position on this switch provides for an RS-232 serial pass through so that you may operate other serial-dependent devices in instead of the interface without rerouting your cables. Since both male and female 25 pin connectors reside on the rear panel, the unused one serves as the pass-through in this mode.

The interface is powered by a separate wall-type transformer, which brings up the great fact that the unit can operate independently from the Amiga as a MIDI THROUGH box. The fact that MIDI STAR possesses this capability increases the value of this device. You



A rear view of MIDI STAR showing a multitude of ports

can use the full compliment of the unit's capabilities in conjunction with the Amiga, and then use the unit for live performance as well.

Testing...1..2

I first tested the MIDI STAR in a number of setup configurations and with a number of MIDI devices. Not only did it perform as expected, but the inclusion of so many monitoring and rerouting features made using the MIDI STAR a genuine pleasure. The unit performed equally well tied to either the A1000 or A500/A2000 ports, as did the serial pass through for modem operation. It should be noted, however, that serial port power is not passed through the unit. (the manual states that if you have an application that requires the serial power to pass, you should contact Spirit for instructions). Inspection of the unit after several hours of extended use in various modes showed no appreciable amount of heat buildup.

Conclusions:

You may not need the flexibility or features of MIDI STAR. If you have a small one or two piece MIDI set up and do very little editing, one of the brands of \$49.95 interfaces will probably suit your needs fine. MIDI STAR was conceived for individuals with stronger requirements who would place a high value on the flexibility that this interface can offer. This unit fills a gap in the Amiga-MIDI connection for the avid MIDI user and does so with a touch of elegance.

The only real problem with Spirit's MIDI STAR interface may be that once you've used it, you'll never want to use anything else.

MIDI STAR INTERFACE

Suggested List Price: \$263.00

Spirit Technology Corporation
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Salt Lake City, UT 84115
(801) 485-4233

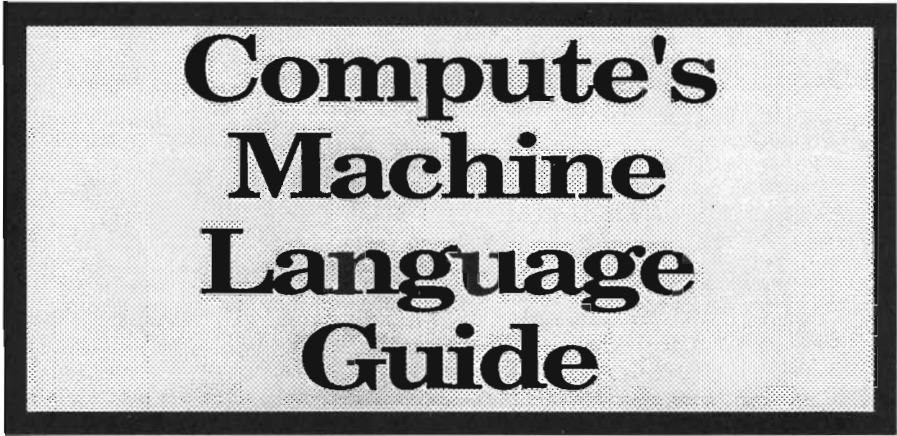


Book Review

by Walter Steuber

When the Amiga was new and documentation was scarce, the Compute! people were quick on the market with their *Amiga PROGRAMMER'S GUIDE*. Like so many other Amigas, I grabbed a copy, but had to swallow my disappointment at its inadequate contents. So, it was put it aside, but the hurt was not forgotten. When Wolf and Leavitt's book came out with a very similar cover and name, I automatically ignored it. That was a mistake. This *Machine Language Programming Guide* is an important addition to our Amiga literature. It is a proper textbook that teaches how to program Amy in assembler language.

Wolf & Leavitt do not require their reader to have prior knowledge of other programming languages or even to know how to use the CLI, but it is bound to be really tough going for anyone who hasn't already played around a fair amount with the Amiga. It's a difficult subject to digest unless you're building on earlier programming experience of some kind. Most people have already developed a pretty clear idea of when they are ready to undertake the substantial effort it requires. They have been doing some programming and have been exploring



Compute's Machine Language Guide

whatever hidden areas of Amiga they could get into. They have become aware, at least vaguely, that there are many more areas of the system that they can get into only by talking to the machine in its own language. Or, maybe, they have a program they want to run far, far faster while taking up much less space in memory. This effort is directed straight at them.

The book is 414 pages of a clear, detailed exposition in a lie-flat binding. (I wish all computer tutorials would lie flat while my hands are occupied at the keyboard; there ought to be a law.) It has the usual scattering of typos, but they aren't too serious. Along with the book, a disk is offered that contains an assembler and several support files needed to write a finished program. The disk also contains, naturally, the illustrative programs that appear in the book. Their assembler is a streamlined, shortened version that is designed to make it as simple as possible to run the tutorials and to manage programs that you write yourself. It is expected that you will later graduate to using a full-fledged macro assembler, such as Metacomco or Aztec.

A few years ago, the typical book on machine language would spend many boring pages explaining individual microprocessor directives, but this one makes that a minor thing, letting the user pick up the meanings of the directives mostly through seeing them

used in the examples. Instead, special features of the Amiga get the big coverage. Even these are not all covered, but instead, selected ones are explained in depth. It is really only an introduction to the vast reaches of the Amiga, but it covers enough to make it easy to pick up the remaining topics from other sources.

Competition for your attention, if you are about to invest a large amount of effort in learning machine language from scratch, comes mainly from Dittrich's "Amiga Machine Language" (reviewed in the August Sentry). The Wolf/Leavitt approach is startlingly different from Dittrich's, considering they ostensibly are covering the very same subject matter. An effort will be made to indicate the major differences between these two books, although either one will teach you the subject if you go to the trouble of doing the exercises and sticking with it. They are so different, though, that if you lock into the procedures of one, you won't know what the other is talking about.

By the way, it is a gross misuse of the word to call it "machine" language, even though everybody does so. What we are really talking about is "assembler" language. Assembler language is expressed in ASCII text and is addressed to a specific computer program (called an assembler). So, it turns out that we are not talking direct-

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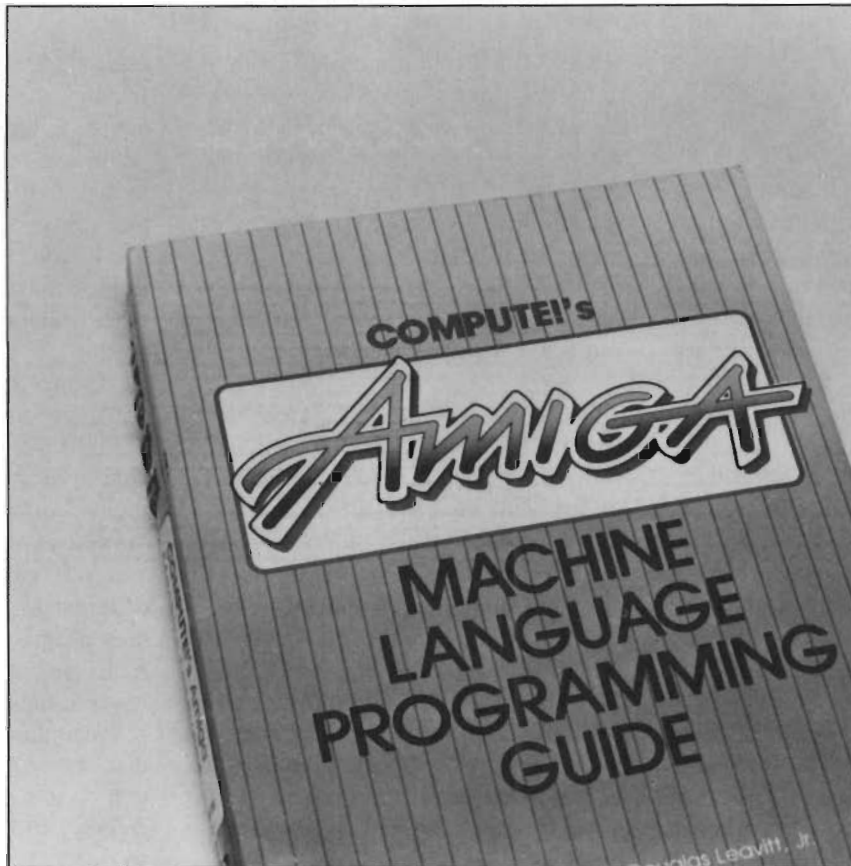
Machine Language (continued from previous page)

ly to the machine but are talking to a program that will translate our words as it sees fit and pass them on. There are many of these assembler programs and they unfortunately have different ways of translating an ASCII text. All the assembler programs agree to follow Motorola's rules for directives to the microprocessor, so there's no trouble there. The differences come in directives to the assembler itself. Wolf/Leavitt base their whole approach on using the kind of directives that are understood by the Metacomco or Aztec assembler, while Dittrich's discussion is based on the AssemPro assembler. These are so different that your choice of tutorial depends a lot on what assembler you are going to be living with.

The very first tutorial program starts out with a macro definition and it makes heavy use of macros throughout its other programs. The authors have a chapter that beautifully explains how to use macros to write cleaner, more readable code and they are very persuasive in urging the programmer to always think macro. They include a file of about 40 macros that they use in assembler text in a way that makes them look a lot like AmigaBasic commands. They urge the user to compose his own macros to increase this parallel with AmigaBasic and they find something to say about macros on almost every page. Dittrich, on the other hand, never mentions the subject of macros, and As-

semPro is not able to handle text that contains a macro. Subroutines and other programming tools can, of course, be used in a way that makes macros totally unnecessary. The difference is one of programming philosophy, rather than necessity.

Wolf & Leavitt convey a good feeling towards the many libraries and



structures that make up so much of the Amiga system. They emphasize that writing assembler code consists largely of calling up library routines and reading or writing to structures, so they've tailored their tutorials and compiler to make these operations natural and easy.

Their support files, however, cover only a selected portion of the whole system and they leave it to other sources to cover the full complexity.

Presenting an abridged version of the system is certainly a good teaching approach, since dumping the whole works on a newcomer is apt to result in tachycardia and fibrillation. About 295 pages are spent discussing just four of the twenty-eight or so system libraries--those associated with AmigaDOS, Intuition, Graphics, and Floating-Point Math. Their discussion includes many fragments of code in addition to many short (but complete) routines. These amount to warmups to the four major programs they list at the end of the book.

The real learning takes place when the reader plows line-by-line through these 98 pages of assembler code and then changes them, here and there. As programmers often point out, you don't really understand a program until you've rearranged it some and have gotten it to do something different. The disk you can get with the book has these programs all written out, in case you are appalled at the thought of typing 98

pages of code without any typing errors. Dittrich covers much of this same subject matter, also with examples and complete programs on an accompanying disk, but in a different order, with much more emphasis on hardware, and in a different programming style. I recommend going to a bookstore and browsing both books to see which one you want to spend many, many hours with. Each book, surprisingly enough,

(continued on next page)

has a substantial amount of information the other doesn't have, so you wouldn't go wrong getting both.

Writing assembler code pushes one closer to the hardware of the machine. Or conversely, if you want to get closer to the hardware and do things like acquire data through digitizers, you are pushed towards assembler. Writing in assembler also raises questions in your mind about where the resulting machine code is located and what it looks like. When a program does not behave as expected, you want to trace through it and find where it goes wrong. Wolf & Leavitt don't spend time on any of these subjects, but Dittrich, using As-

semPro, caters to them. Wolf & Leavitt, on the other hand, somehow convey a better feeling for the software aspects of the awesome Amiga.

In summary, I'd say the comprehensive book that makes it simple to learn Amiga assembler programming hasn't been written yet, but Compute!'s Amiga Machine Language Programming Guide comes as close as we can reasonably expect. Wolf & Leavitt present careful, detailed (one could say verbose) explanations of the difficult areas and have good program fragments to illustrate them. In comparison with Dittrich, I prefer their writing style and the way they teach. At the same time, I

very much like the way Dittrich discusses hardware registers and the way AssemPro displays what is going on in a program. It looks like there is room for a new offering that combines the best of each of these current approaches.

Amiga Machine Language Programming Guide \$ 19.95

Compute! Books
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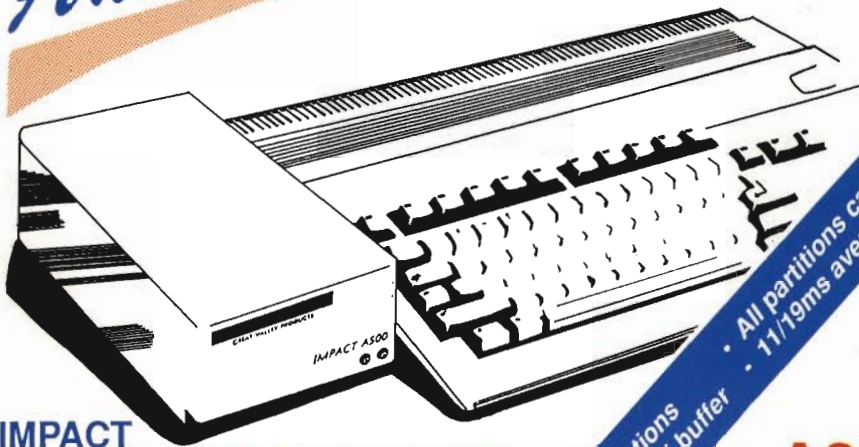
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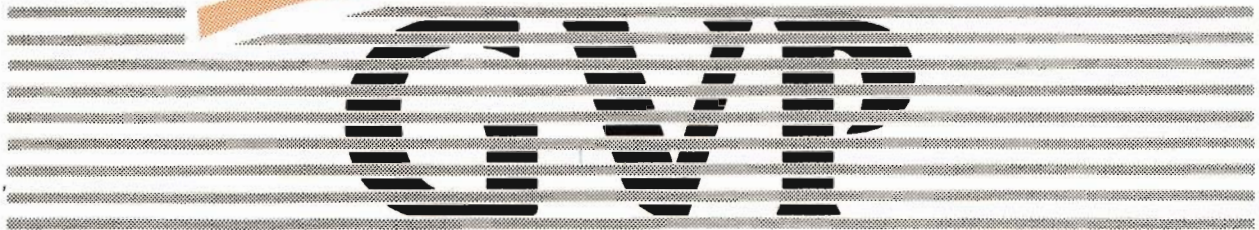
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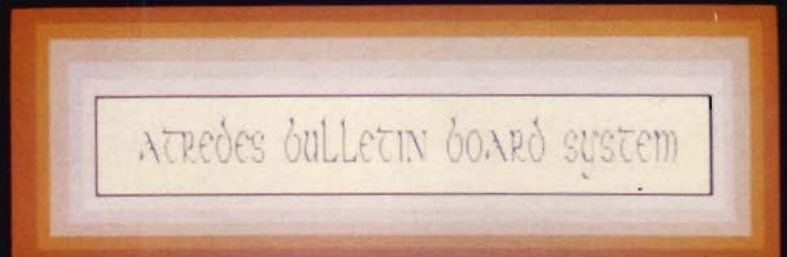
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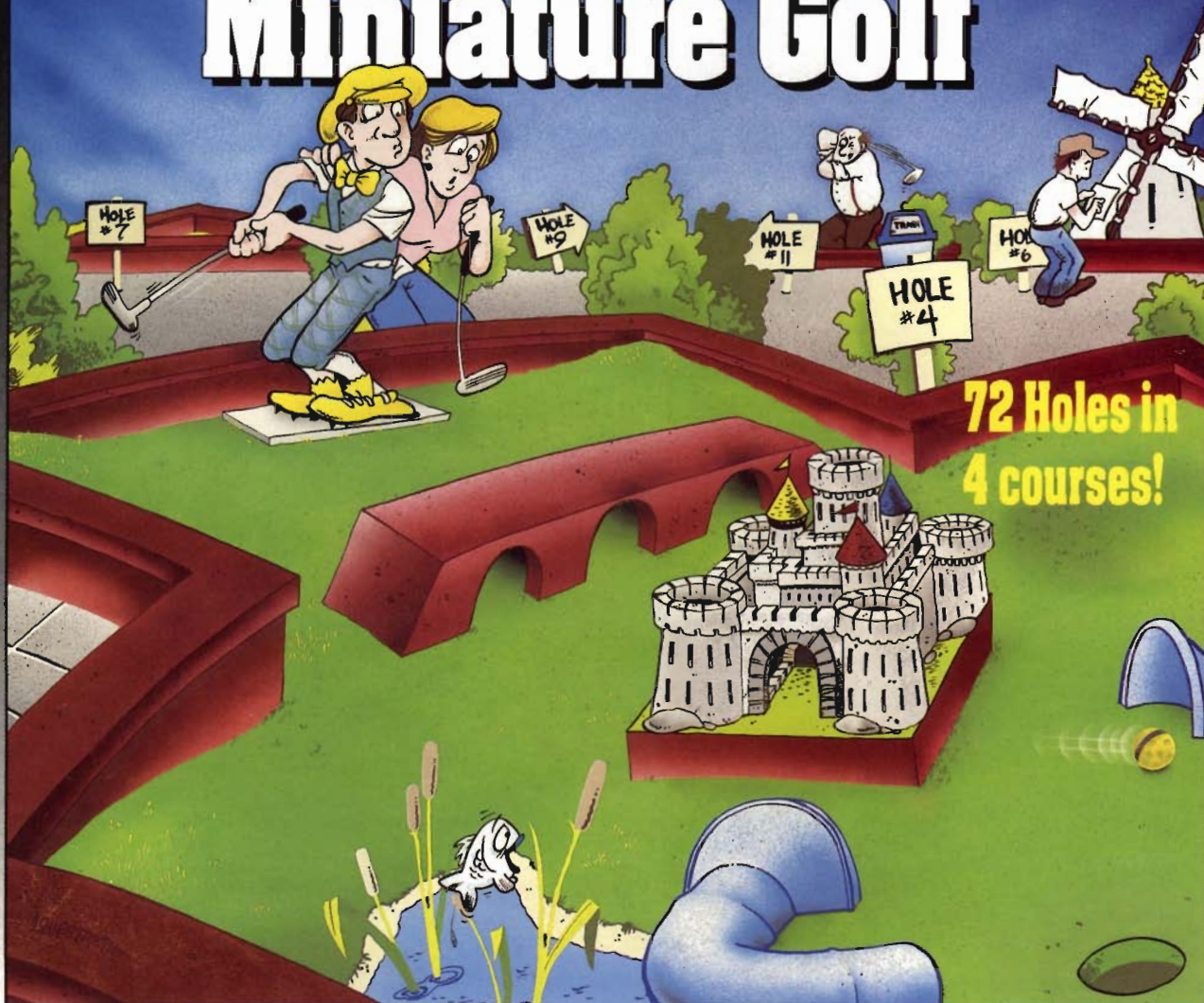
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Actual graphics as viewed over the modem.

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Amiga versions shown here.

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