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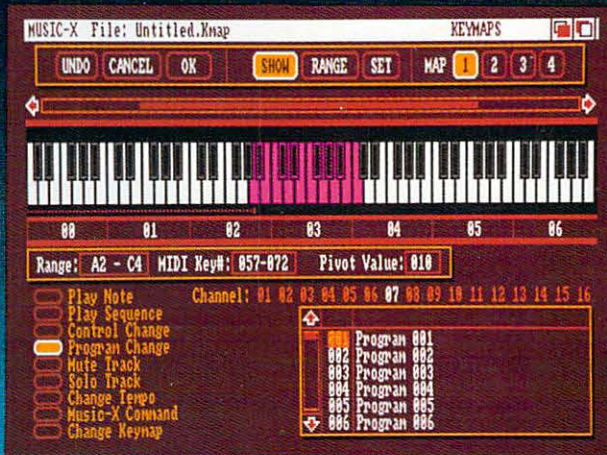
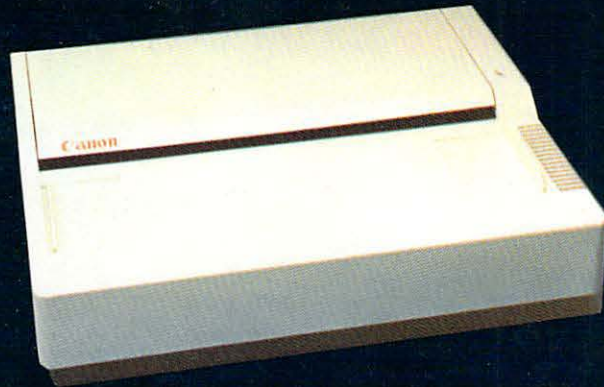
THE AMIGA[®] NEWS MAGAZINE

JULY 89
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Scanner from
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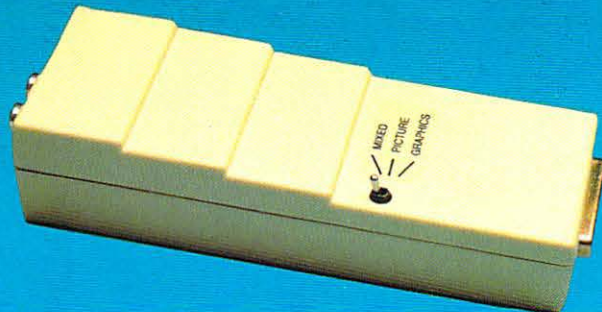


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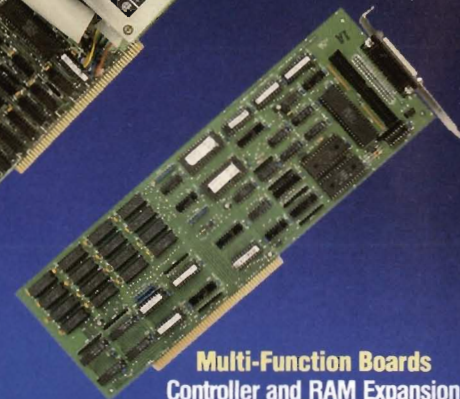


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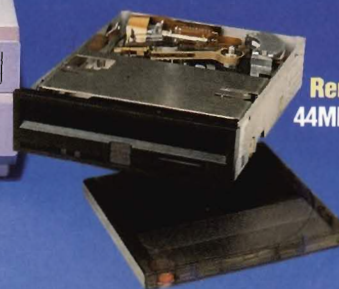
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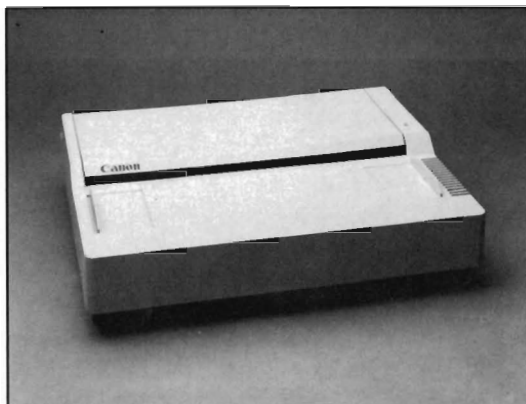
Consumers Circle 127 on Reader Service card.

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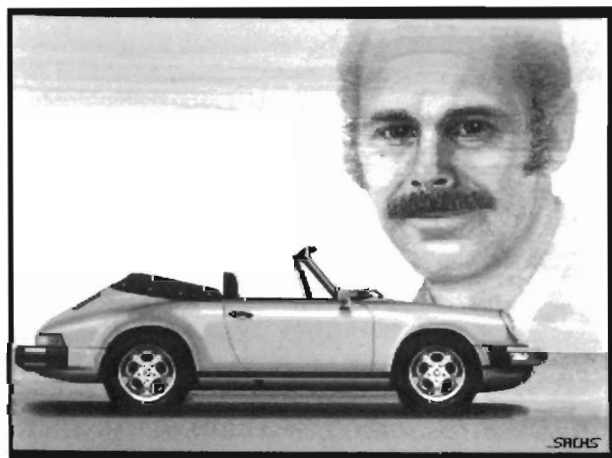
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On Point

Notes from Editor, Tom Bucklin

Guess who's having a birthday this month? No, I'm not referring to me (although that is true, as well). Well, you must have guessed that I'm talking about the Sentry. You're holding the twenty-fourth issue since July of 1987.

It has, to say the least, been an interesting two years. We've gone through some changes and made some upgrades to the product. We've seen a number of Amiga companies come and go, and in particular, a lot of Amiga magazines come. I'm happy to report that our own philosophy has been steadfast. As we move into our third year, we intend to keep doing what we do best for you, the reader.

This is probably an ideal time to say thanks to the many people who have written to us during these past two years expressing your support and encouragement. And let's not forget those who wrote in with a criticism. You helped us to sharpen our journalistic pencils and get you the stories you wanted to hear about.

Overall, I'm pleased that we've been able to make an impact in the Amiga community that has helped make many people aware of what is happening with our machine.

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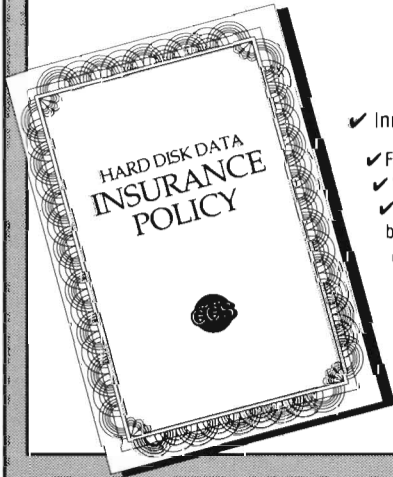
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Developer's Conference '89

New Operating System Developments Highlight the Conference

June has come and gone and with it the 1989 version of the Amiga Developers Conference. Last year's DevCon was held in Washington D.C. and focused on the forthcoming release of WB 1.3. This year the DevCon was held in San Francisco and the focus was on the forthcoming release of WB 1.4!

There were sessions on marketing Amiga products, writing for AMIX (Commodore's version of Unix), using the Janus Libraries, and the University of Lowell Graphics card, but the majority of presentations and documentation revolved around the newest version of the Amiga operating system. Last year, a Gamma version of WB 1.3 was distributed at DevCon. This year an Alpha version of WB 1.4 is the current "state of the art." Software developers define several stages of the development process: alpha, beta, gamma, and release. Alpha versions are the earliest and least stable, while Gamma is closest to the release. Commodore will not predict a release date for WB 1.4, but since it took about six months from Gamma 1.3 to release, we shouldn't expect the finished 1.4 much before early 1990. WB 1.3 drastically improved printing, enhanced the CLI, and introduced then FastFile-System. The remainder of this article

will point out the projected major enhancements under way in the WB 1.4 project.

The most noticeable changes involve WorkBench and display modes. One look at the pictures accompanying this article will show that the WorkBench is getting a "new look." In addition to the patterned background, Disk-window title bars display information about their contents. Instead of the "fuel-gauge" you'll find plain English text: the percentage full, number of free blocks, and total blocks used. The window scroll gadgets have been rearranged for easier use with both at the bottom left of the window. A new gadget on the drag-bar looks like a thick arrow pointing up. Click here to open the parent of a window.

Other visible changes are found in the Workbench menus. The first or WorkBench menu in this version has three additions. Instead of duplicating the Empty drawer, you can select "New Drawer." Rather than using the shift-click method, you will be able to "Select All" the icons in a window. Finally, you can now Quit the Workbench and return to the CLI. The 1.4 Disk menu now includes an option to format or reformat a disk. There are no visible changes in the Special menu but "Last Error" now returns a text message as well as the error number. An all new menu is Settings. The "View By" selection includes options

to show files in a new text mode. Instead of icons, you will see file names sorted by Name, Date or Size. (Shades of MacIntosh and OS/2!) Amiga owners are used to many file icons filling up the entire screen, but a clickable text display is a lot neater. Till 1.4, the only files which were known to Workbench had to have matching .info files. Select "Show All Files" and Workbench will create default icons for any files which don't have them. (I predict that this single change will go a long way towards removing the mysterious aspects of the Amiga environment for casual users).

The final menu is labelled "Tools." The new WB software will allow user menu items to be installed here. WorkBench users can activate their favorite WordProcessor, Graphics program, etc. with a simple menu selection. This is much faster than opening a disk, opening a drawer, and clicking of the program icon. A standard selection in the Tools menu is "ResetWB." This will cause all windows to be closed, WorkBench to be shut down, followed by a restart of WorkBench. Why would you want to close then restart your WorkBench? The primary use would be to switch to a different display mode without rebooting (as in the case of the A2024 routines).

Other WorkBench changes are not as visible. Many operations will be asynchronous. This means that Info, copy-

ing operations, window opening, etc. will not tie-up the entire WorkBench. The dreaded ZZZZ's will not monopolize your pointer and you can be productive with more than one WB task.

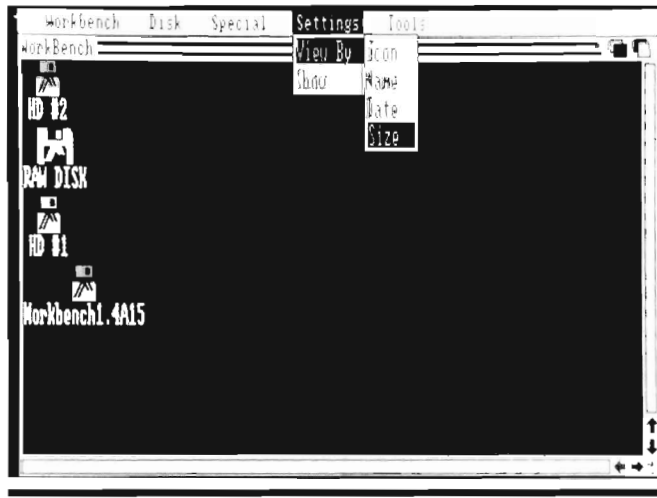
There are new mouse functions to make WB snappier, as well. Press and hold the left mouse button to enter "drag-select" mode. This works similar to a brush operation in Dpaint. A dotted line will expand as a box shape as you move the mouse and everything which you surround will become selected. The right mouse button can be clicked while dragging to cancel an operation.

The alpha release distributed at Dev-Con had no new "C" programs, system utilities or tools. There was a new drawer though, called "WBStartup." As it loads, Workbench 1.4 will automatically execute any program located in the drawer, giving WB users the equivalent of a startup-sequence!

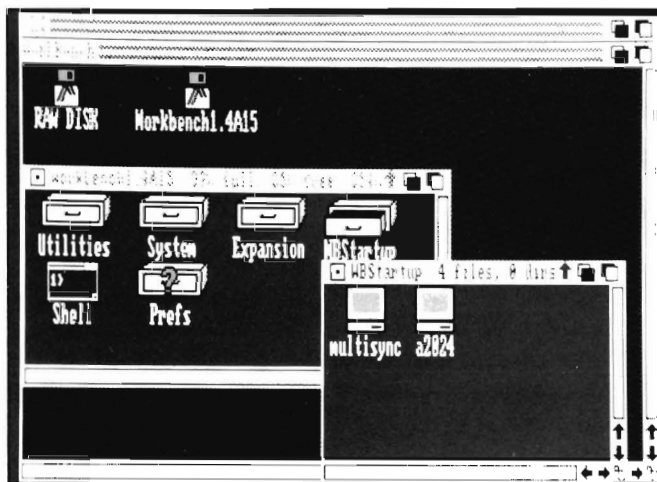
This is probably a good time to mention that none of the 1.4 features can be used by simply inserting the WB 1.4 disk when prompted. Most of the new software libraries are loaded with Kickstart 1.4. Now those of us who still use the A1000 will have no trouble making use of a new release of Kickstart and Commodore will certainly provide new 1.4 ROM chips for the A500 and A2000. But how developers test 1.4 features on the newer machines? The only way provided at present requires a 68020 and MMU, or 68030 processor. If you have an A2500, A2620 board, GVP 030 board, etc. you can use the SETCPU program to "Kick-

Rom" from a floppy disk. This program will then copy any version of

addresses. It would seem that developers will be testing 1.4 on the high-end configurations. (One unexpected feature of 1.4 Kickstart is that you can insert 1.4 WorkBench in any drive not just df0:!)!



“As it loads, Workbench 1.4 will automatically execute any program located in the drawer, giving WB users the equivalent of a Startup-Sequence”



Kickstart into 32 or 16 bit memory and uses the MMU to remap the Kickstart

You will also need the latest custom chipset to take advantage of the new 1.4 graphics modes. Commodore is shipping newer 500's and 2000's with a "fatter agnus" chip installed and with 1 Megabyte of chip ram enabled. This chip is more formally know as 8372-R3. There is also a major revision of the Denise chip known as 8373-R2a which is still being finalized. Taken together, these two chips are called the "Enhanced Chip Set" or ECS. The chips have been designed to allow several amazing capabilities but new software is required to make use of them. This new graphics.library is also part of Kickstart 1.4.

As mentioned, the new Agnus chip makes 1 Meg of chip ram available, which will be required for some of the new graphics modes. The new Agnus also increases the maximum areas that can be operated on by the "blitter." Previously limited to 1024 by 1024 pixels, the blitter can now manipulate a 32K by 32K area! Does this mean that you can have a screen of 32000 by 32000 pixel resolution? Not quite, but a scrolling bit-map that large is a reality.

Most developers now have a beta version of the ECS chips and with alpha 1.4 distributed, can begin testing the new graphic modes. Assuming that you upgrade to these chips sometime in the future, what new reso-
(continued on next page)

lutions can you expect? That all depends on your monitor. The standard Amiga monitor has a fixed-rate horizontal scan of about 15 KHz. With ECS, WB 1.4 and a standard Amiga monitor, you will have access to a new SuperHiRes mode of 1280 by 200 pixels. In "SuperHiRes" mode you are limited to 2 bit-planes or four colors out of a palette of 64 colors. This sounds like a mixed blessing, much higher horizontal resolution with severely reduced number of colors. (I suspect that this mode may have great applicability for video titling). Of course, the existing graphics modes including HAM are supported in the 1.4 software.

On the other hand, if you own a Multi-Sync monitor capable of horizontal scan rates of 31 KHz, You would have access to the new "Productivity Mode" display. This mode uses 640 horizontal by 480 vertical pixels. Again, color is limited to four chosen from a palette of 64. While this mode may sound like the existing hi-res mode, the big news is flicker. There is NONE. By using a multi-sync monitor at 31 KHz and ECS, over 400 non-interlaced lines can be displayed. For anyone who uses desktop-publishing or CAD programs, this mode will be especially valuable. (Commodore currently plans to market a lower cost Bi-Sync monitor to take advantage of Productivity Mode.)

The final resolution supported by 1.4 software and ECS is 1008 by 800 greyscale. This is the special mode used by Commodore's A2024 monitor and Moniterm's Viking monitor. This mode has no color capabilities and is of interest to those professional users who must have the maximum precision on their screen.

In addition to new display modes, the ECS provides new Genlock functions. Previously, only Color 0 could be used

for display of the external signal. With 1.4 and ECS, you could ChromaKey any color for video overlay. You can also select any bit-plane for the video overlay and make borders around the display. Obviously, software developers will need to test their packages in all these configurations, and make modifications to take advantage of some of the new capabilities expected. Some of the other 1.4 features that were described or distributed will also require software developers to test and make changes. Some of the highlights are:

Filing System: The FastFilingSystem will be the default system included in Kickstart. (The 1.3 version is a separate handler in the L: directory). This means that floppy disks can use FFS for faster directories and more storage. The original filing system will also be supported without special action by users. Other improvements include Record Locking, a feature of special interest to multiple users of databases.

AREXX: Will be a standard part of the operating system. This is William Hawes port of IBM's REXX language which has gained wide support during the past year. The alpha disks included some examples and documentation for AREXX as an interprocess handler, but did not make clear if the existing script language will be replaced.

Commands: Everything from DIR to ENDCLI will be rewritten in C. (Hopefully the rewritten programs will address consistency issues as in the ARP equivalents). C: Commands will also use built-in features of two libraries. The DOS and ASL.library provide common functions, including a standard file-requestor and font-requestor. While developers can continue to create their own requestors, it would be nice if most Amiga software presents a common method of accessing files.

Fonts: While not implemented in the Alpha release, scalable bitmap fonts should be coming. No longer will your WB disk have to have a file for every size of a font. In addition, we can expect improved support for proportional fonts in WorkBench, gadgets and requestors.

Preferences: WB 1.3 saw major additions to Preferences and 1.4 will see even more. The entire concept will be evolved into something called "ENV:."

This will be much more flexible, allowing multiple sets of selections to be saved and activated without rebooting, and of course, it will support the new graphic modes. A new prefs-handler resides in the L: directory of alpha 1.4 and test programs were provided to illustrate the concepts, but the new "Preferences Editors" are yet to be developed.

Remember that this overview is based on an early alpha version. As this project progresses, we can expect many more features and changes to some that I've described. I'm impressed at what has been done so far as well as at what's planned for the future. For those of you who thought that Commodore's software group spends too much time on the company yacht, think again. WB 1.3 is a resounding success. I don't know how we got along without it, and 1.4 looks like it will enhance the best micro-computer operating system even more. To give you some comparative perspective, Apple's latest version of "Finder" is full of serious bugs and incompatibilities and their promised multi-tasking is seriously behind schedule. IBM's PC-Dos 4.0 is a flop and isn't used by anyone who has serious work to do.

Keep up the good work Commodore and keep watching these pages for further information as the disk turns....

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Info Magazine
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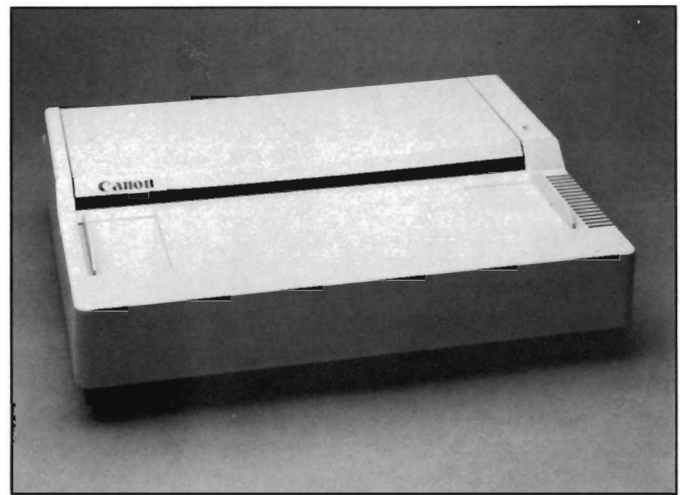
by Walter Steuber

Scanners are important graphics tools that Mac and IBM users have enjoyed for several years. They've been out of reach for most Amigans, though, for lack of the necessary software and hardware to connect them into our systems. Of course, ASDG offers a connection to the Sharp JX450 color scanner (reviewed in SENTRY, Oct 88) which is really beautiful but it's too pricey for most Amiga owners. The only other affordable scanner that can be connected to the Amiga is the black and white Canon IX-12, thanks to the Gold Disk people who now offer the software and cabling for us to run this moderately-priced machine.

Two generously long cables connect the scanner to the Amiga. You re-

move your printer cable from the parallel port and plug it into whichever scanner cable it fits. The other scanner cable is then put into the port where the printer cable was. An intriguing thing about this simple connection is that it works with any model of Amiga, automatically adjusting to the difference be-

tween the A1000 and the others. A prominent feature of this cabling arrangement is a switch (they call it a pass-through switch) that lets you alternate between using the printer and using the scanner. When one is in use, the other is disconnected. ProScan

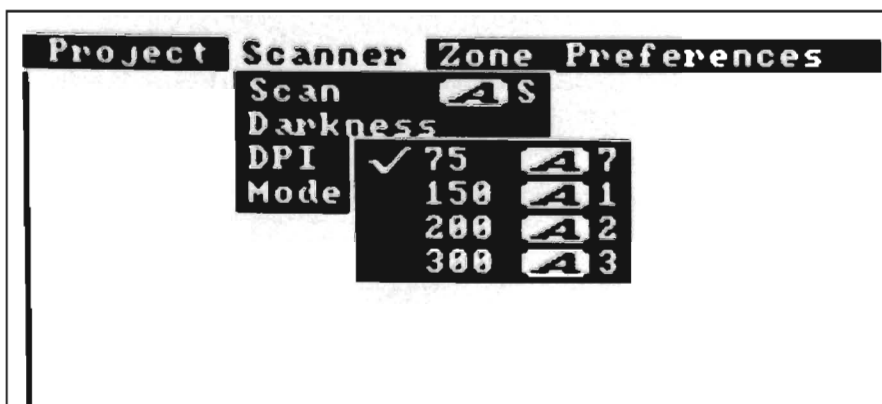


Proscan uses a compact Canon Scanner for input

software operates the Canon scanner just the way an Amigan would want it.

There are pull-down menus for mouse operation and keyboard equivalents for each action that the scanner offers. Since there are only a few things the scanner will do, the menus are short, understandable and simple to use. The scanner will operate to some extent with 512 K of memory, but for serious video or publishing work, you really should have at least 3 Meg. A hard-drive also is a big help, but not entirely necessary.

What the scanner does is copy a graphic image from paper to computer. A graphic image or photo is fed through the scanner and the ProScan system digitizes whatever it sees on the paper. It treats the artwork as a



grid of tiny squares and it reads each square as either dark or light. The scanner does not recognize shades of gray or any color, but simply registers an on/off value for each square. The user has a choice of how closely spaced these readings are to be and has some choice about how dark the square must be to be called black. The system then displays each reading as a black or white pixel on a bitmap. When the bitmap is larger than Amiga's screen, it can be quickly scrolled around with the arrow keys and examined dot-by-dot. The whole scan can be stored, if you want, as an IFF file and later processed with DPaint or any of many other programs. The software that comes with some scanners will convert a scan to ASCII text for word processing, but not ProScan. All you get is a single-bitplane IFF reproduction of the artwork. You get it quickly and you get it in such fine detail that there is no problem with jaggies.

The scanner will accept a sheet size up to 11.5 x 17 inches, reading a maximum area of 8.5 x 16 inches. The sheet is passed through the machine by a motor that will accept a fairly thick sheet, but stalls on cardboard. (A flatbed version of the Canon that operates on this same software is available if you want to copy books or uneven surfaces, but only the sheetfed model was tried out in this review.) When you want to scan something, you slip an edge of the artwork into a slot on the machine. The sheet is automatically drawn in about half an inch and held there, waiting for further orders. If you do nothing but click on "scan," the machine pulls the sheet through and in a very few seconds you have a display of a scan taken at the default spacing of 75 dots per inch. That is, you are looking at a bitmap that represents the whole sheet in 640 x 1200 black or white pixels.

This first quick scan is usually exploratory and you will probably select a section of the artwork for more detailed scanning. A portion of the scan can be specified by dragging the mouse in much the way a brush is selected in DPaint. The zone that is selected can then be scanned at greater resolution (up to 300 dots per inch) and with special conditions such as thickening the image or lightening it. The whole process is surprisingly quick and easy.

Scanning an image is only the beginning--you normally go to some other Amiga software to work with the bitmap. The original artwork could be a drawing you want to use in a CAD program, a font you want to

(continued on next page)

A small section of the ProScan manual was used as a test subject, chosen mostly because it was nice crisp line art on smooth, coated paper. This box holds a reproduction of the original, while the other boxes contain copies of it made by the Amiga:



SCANNER MENU

The *Scanner* menu controls option scanner. Bear in mind that none of the current image. They tell the sc:

Scanning at 300 dpi. The test subject was run through the ProScan machine with settings at 300 dots per inch, black & white mode, medium darkness. The file was then printed out on a 300-dpi laser printer to get a same-size, dot-for-dot reproduction of the original:



SCANNER MENU

The *Scanner* menu controls option scanner. Bear in mind that none of the current image. They tell the sc:

Scanning at 200 dpi. Printing this scan at 300 dpi results in a compressed image. (It could be printed same size, but with noticeable graininess.) ProScan has additional options of scanning at 150 or 75 dots per inch, so the effect can be carried much further:



SCANNER MENU

The *Scanner* menu controls options directly related to scanner. Bear in mind that none of the *Darkness*, *DPI* the current image. They tell the scanner to behave differently scans a page.

Digi-View is a popular way to get a graphic into the Amiga, so a DV shot of the same subject is included for the sake of comparison:



SCANNER MENU

The *Scanner* menu controls scanner. Bear in mind that the current image. They tell scans a page.

The ProScan was set at halftone mode, 300 dpi, and light tone when it scanned a colored snapshot. This product is the same size as the continuous-tone original and is printed without alteration, although it could have been processed through DPaint, Butcher, or some other graphic editor.

Colored photos are tougher for ProScan to handle than b&w photos, and they in turn are tougher than non-tonal black & white artwork.



Proscan (continued from previous page)

modify with a font editor, a picture you want to color with a paint program, a frame for an animation sequence, artwork to include in a page layout or raw material for an image processing program. Scanned images worked fine in DPaint III, PageStream, City Desk, Express Paint, Butcher and PhotoLab. There's no reason to think they wouldn't also fit in fine with the dozens of other programs that operate on graphic images.

The importance of the scanner lies solely in the fact that it converts a real-world image into a digital form that the computer can work with. It does it at high resolution and with an exactness that cannot be matched by most other ways of getting an image into the computer.

The 28-page manual explains in clear detail each of the options available with the ProScan system. It is nicely printed and nicely written, but it turns out you hardly need a manual because the whole scanning process, after playing with it for a while, becomes quite straightforward. You feed in a sheet of artwork and get out an image. That's all there is to it.

Several programs, including DPaint III, will print the bitmap dot-for-dot the same as it was generated by ProScan, as long as there is a 300-dpi printer available. This allows us to show what the scan looks like under its various operating conditions. As a test subject, the ProScan Manual was opened out flat and passed through the scanner. A small zone was marked off on this preliminary scan and then the selected area was repeatedly scanned under various settings of the pull-down menu. After the scans had all been made, that section of the manual was cut out and pasted in the first box. (It was apparently printed at 1200 dots per inch, making it virtually free of jagged edg-

es.) The next box is a scan made at the maximum resolution of 300 dots per inch and set at normal darkness and thickness. It is a fair example of how much gets lost in digitizing a graphic image. Not much, but a detectable amount. Some people in the typesetting world say it's ok and others say it's unacceptable. Going to a lighter cutoff improved the match, but only very slightly. Setting the scanner at 200 dpi resulted in the bitmap shown in the third box. The scanner simply skipped every third dot to make this image, compressing the bitmap accordingly. Going to the other options of 150 and 75 dots per inch made bitmaps that were just about unreadable.

Digi-View is a familiar way to digitize graphic material for processing in Amy, so a little comparison between it and the scanner may be in order. The biggest bitmap Digi-View can make is 640x400 pixels, compared to the scanner's maximum of 2550x4800. Digi-View gets a little blurry around the edges of an image, whereas the scanner is sharp. Digi-View records colors and shades of gray where the scanner sees only dark or light. Digi-View can enlarge or reduce a subject, whereas the scanner is always working at same-size. In other words, each has its place. Their functions overlap very little and a graphics worker really needs them both.

A special mode is used to scan photographs or other images that have lots of shading. When you click on "half-tone", the scanner generates a pattern that imitates a coarse halftone. The illustration shows what ProScan did with an ordinary colored snapshot. Not great, but not bad, considering it has no gray tones to work with. The halftone scan can be stored as a single-bitplane IFF file, just like the other scans, and later worked over in DPaint or any of the other graphics software.

To summarize my several days of fun playing with the ProScan/Canon IX-12 scanner, I'd first exclaim over its sturdiness and smooth operation--it's a very impressive machine and it turns out what apparently is a perfect bitmap.

The ProScan software worked without a hitch and was extremely user-friendly, but I wish it included character recognition. I want a scanner to read a typewritten or printed sheet and generate an ASCII file that I can then edit.

Some scanners record tones of gray and some even record color, but when I think about the memory needed to support them, I feel a single bitplane is probably the best compromise for desktop publishing and it certainly is the best for applications like font design or mechanical drawing. Scanning demands a lot of memory. For instance, a full scan by the Canon at 300 dpi requires over 1.5 Megabytes just to hold its single bitplane. The JX450 records 24 bitplanes, so enormous compromises must be made when you go to color. Even the usual 16 shades of gray require four bitplanes.

The ProScan is almost in the position of being the only choice available, but if you install a Bridgeboard, you can, at some additional expense, go into the IBM world and get a selection of scanners, including some that generate an ASCII file and also generate shades of gray.

ProScan \$ 1095.00

Gold Disk
P.O. Box 789
Streetsville, , Ontario, Canada
L5M 2C2
(416) 828-0913

Online Platinum!

The Latest Version of MSS's Popular Telecommunications Program

About three years ago, I bought a new computer called an Amiga 1000 which featured 256K of RAM and an 880K disk drive. One of the first programs I purchased was a telecommunications program called Online! from MSS. My dealer told me that MSS was an established software house that would continue to support their products. Time has proven my dealer was right, especially so with the release of Online! Platinum.

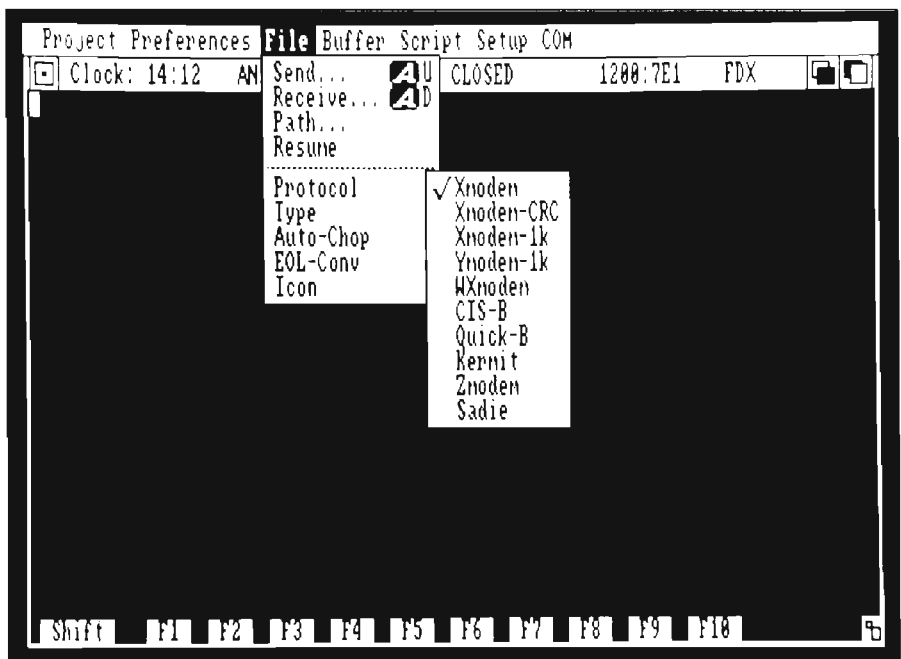
This is the third in a series of releases for Online! programs and the most comprehensive revision yet. Additions for this release include support for multiple serial ports, ARexx, and a unique new protocol. The menus have been changed around some to more closely match the layouts of the other MSS Platinum series programs. The packaging has also been improved and has a professional look to it. Online! now comes in a white three ring binder with a single program disk. The manual is clear and concise and includes some helpful information on using BBS systems. For the most part, Bulletin Board Systems are almost like exclusive clubs because there is so little documentation outside the BBSs that you have to know someone who can get you started. The first

three chapters of Online! will give the novice almost all the background to immediately use systems based on BBS PC.

Online! can run from either Workbench or the CLI. Either way, you can select which serial port to use through

the global controls for the program such as Terminal selection, Screen depth and Colors, and Printer control. The Preferences menu duplicates some of the color and screen options of the project menu, but also adds font and border options as well. You can also change how Online! interacts with

A number of powerful protocols are supported in this version of Online including MSS's "Sadie" protocol that allows transfer and chat simultaneously



the icon's info on Workbench or from command line parameters. Once started, you get an eight color custom screen with a border and menu bar. The menus include Project, Preferences, File, Buffer, Script, Setup, and COM. The Project menu has most of

your particular brand of modem. (Online! comes set up for the standard, Hayes compatible command set).

The file menu has the features that most people want a telecommunica-
(continued on next page)

Online Platinum! (continued from previous page)

tions for, and that is file transfers. MSS has revamped the Online! transfer menus slightly by adding an option to select a download path globally, which makes the batch protocols like Ymodem and Zmodem easier to use. All the popular protocols are supported, including the two previously mentioned, ASCII, Xmodem checksum and CRC, Compuserve's CIS and Quick, Kermit, and Windowed Xmodem. The new protocol unique to Online! is called Sadie, and it provides for simultaneous

re-send the most recent block if it was not received properly. The next variant on Xmodem is Xmodem CRC. The CRC is an acronym for cumulo redundancy checksum. This is almost identical to checksum, but sends a slightly longer checksum that is less likely to be fooled by a garbled 128 byte packet. Still another variant is 1K Xmodem which sends 1024 bytes followed by a CRC. Under good line conditions, 1K-Xmodem is faster than Xmodem. A newer and more powerful protocol is

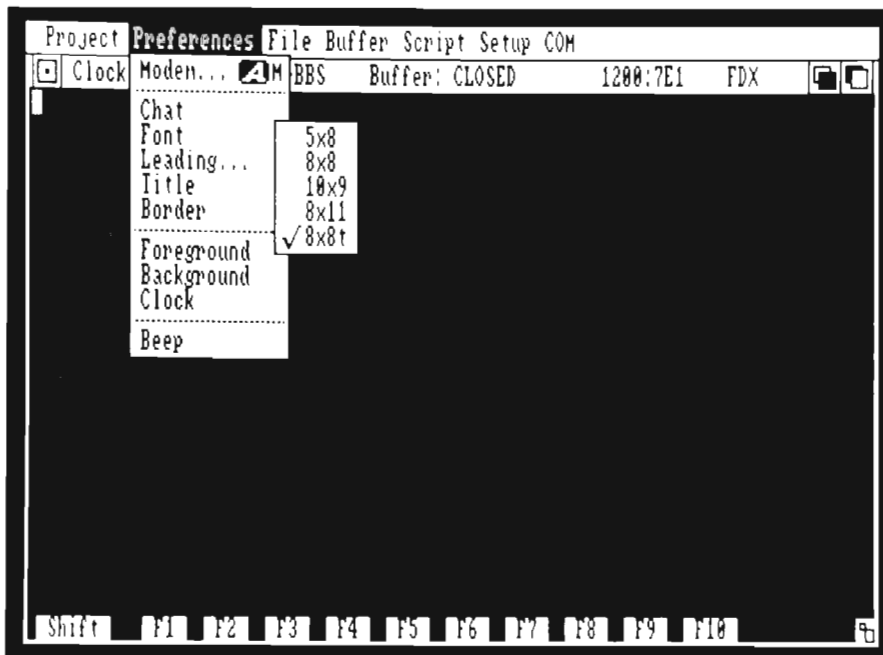
problem. Zmodem is called an ACK-less protocol since it does not require the receiver to acknowledge after each data packet has been sent. Zmodem is also a dynamic protocol that adapts its block size to the phone line conditions. On a clean line, Zmodem uses a 1024 byte block size and will automatically decrease the size to 512, 256, 128, or even 64 bytes to ensure the optimum speed under any given conditions. Zmodem can also resume aborted or interrupted transfers with the resume menu option. This protocol is widely supported and is my favorite to use. Windowed Xmodem is another Xmodem variant that is similar to Zmodem in that it can change the block size with conditions. In practice, it is not as well supported as Zmodem, but some people prefer it.

Another popular protocol is Kermit, which, while not as fast or as powerful as Zmodem, supports transfers between desktop machines and mainframe computers. The Compuserve CIS and Quick protocols are specialized transfer protocols for the one particular service.

The last of the protocols listed in the menu is a new one from MSS and not supported by any other software package other than Online!. There is a mention in the manual that BBS-PC version 4.3 from MSS will support the Sadie protocol. This was a bit of a surprise, since an earlier conversation I had with an MSS representative indicated that they were not planning an update to BBS-PC because of the low sales potential. Apparently, and hopefully, they have changed their minds about this.

The Amiga is a powerful multitasking computer, and common modems will support sending and receiving simultaneously. It is about time that a protocol for the Amiga will support two way
(continued on page 14)

Online Platinum! is one of the few programs to support configurable fonts



chat and transfer.

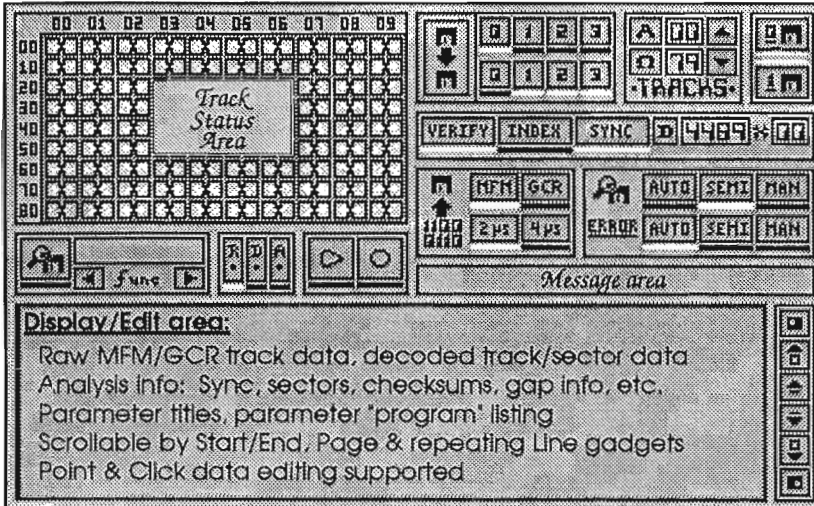
Each protocol offers some features, advantages, and disadvantages. ASCII is probably the oldest and simplest and only works with text files. The oldest of the file transfer protocols is Xmodem checksum which sends 128 bytes followed by a simple checksum. This method will wait for the receiving computer to send back an Acknowledge or a Not acknowledge (ACK or NAK) signal which tells the transmitting computer to send the next block or

called Ymodem. Often 1K-Xmodem is called Ymodem incorrectly. Ymodem, or Ymodem Batch, has a more robust checksum routine and will also send the file name for you. Under poor phone line conditions, Ymodem or 1K-Xmodem can be slower than the older Xmodem because of the frequency of errors increase in the larger blocks and a larger amount of data has to be re-sent.

Omen Technologies introduced the Zmodem protocol to help alleviate this

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```
*AmigaDOS (parameter name)
0-79:sync on normal (s<9,s>12 any_sync)
```

Means: for tracks 0-79 do: turn Sync on, try normal track format, (if sectors <9 or >12, try ANY sync).

Totally User programmable ASCII parameter file.

(The Reaper Available 3rd qtr '89)

The Reaper.....39⁹⁵

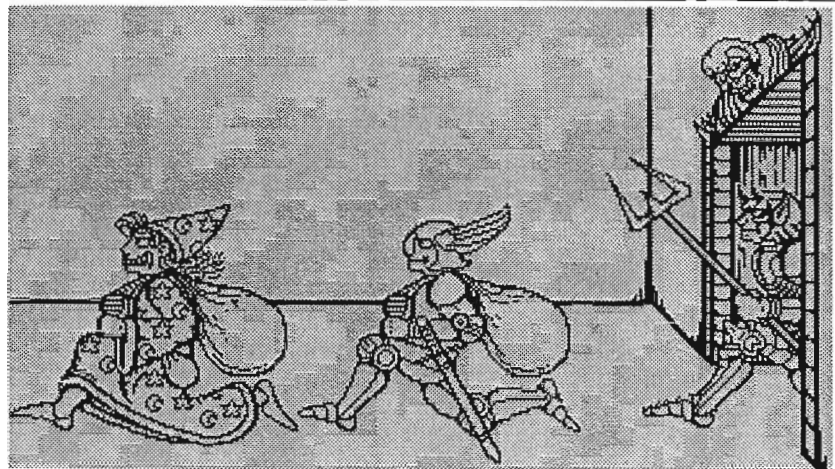
Software from Hell.... 69⁹⁵

California Residents: Please add appropriate sales tax

Software from Hell...

Routines & Utilities for the programmer

AUDIO	
open_audio	close_audio
open_channel	open_stereo
open_anychan	getchannel
close_channel	PlayNote
PlayFreq	PlaySamp
start_channel	stop_channel
reset_channel	flush_channel
donote	dofreq
dosamp	control_channel
lock_channel	unlock_channel
set_chpri	FreeNotes
MayGetNote	SetCycles
initIOA	FreeIOA

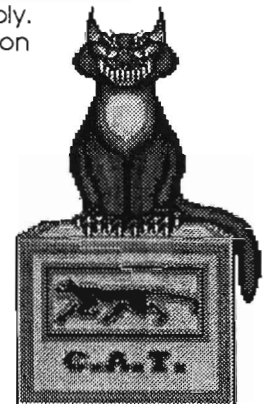


Audio, Screen, Utilities - C source; Disk - Assembly.
Get over that LONG learning curve and focus on writing the software you want to write!

DISK	
SetBusy	ClrBusy
MotorOn	MotorOff
HeadSelect	HeadIn
HeadHome	HeadOut
HeadPos	IndexWait
ReadTrack	WriteTrack
TestProtect	DiskInDrive
CountTrackBytes	
TimeDelay	

SCREEN	
init_screen	read_screen
read_background	read_palette
ReadCMAP	FindIFF
IFFRead	ReadBrush
load_menu	load_shape
put_shape	free_shape
rprint	gprintf
BlitCopy	BlitShape
FreeShapeList	...and more...

UTILITIES
atags
stags
copyfrom
copytll
man
showincs
sweep
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Online Platinum! *(continued from page 12)*

file transfers or a transfer and chat. Sadie actually supports chat and two way transfers at the same time. To use Sadie, simply select that protocol from the File menu, and select send or receive. A new window will open with four sections. The top two display statistics on the files being sent and received. The next two sections are blank areas which provide about seven lines for chatting. In real-world tests using 2400 baud modems, both participants were impressed with the performance of Sadie. We were able to send large files at about 210 characters per second, and carry on conversations simultaneously. Of course, chat mode slows down the file transfer a bit and produces some typing delays but the worst we experienced was a second or two. There is not much that can be done with any protocol to improve on this, but as modem speeds continue to rise above the 2400 Baud mark, the delays will become invisible. It would be nice, however, if Sadie had larger chat areas or scroll bars for review of recent messages.

If you have friends who you telecommunicate with, then Online! with Sadie is useful. For most of us, Sadie will remain a curiosity until MSS can gain support for Sadie from companies other than MSS to become a "standard." A protocol called bimodem is circulating in the MS-DOS world and it supports two way transfers. Skypics graphics protocol from Incognito is showing up in a few programs because of their published standards. MSS will have to do this as well to get Sadie widely accepted.

The buffer menu lets the user control the size of the buffer built into the program that typically saves the last 8K of a session in RAM except for the files transferred. The buffer size can be increased, the buffer reviewed and edited, and then saved to disk from this

menu. This facilitates retrieving and reading mail without tying up the BBS for long periods of time.

The Scripts menu gets things interesting and shows off some of the power of Online!. The script language is sim-

“In real-world tests using 2400 baud modems, both participants were impressed with the performance of Sadie. We were able to send large files at about 210 characters per second”

ilar to the AmigaDOS script in feel and programming difficulty. I found the script language easier and more powerful in ATalk III, but it lacks one feature that makes Online! easy to program. There is a keyboard activated learn mode that will generate a program, or macro, from an actual session. You can set up basic scripts without knowing a thing about programming! For those people with ARexx, Online! will support the communications through ARexx to other programs and can even spawn other ARexx processes.

The last two menus support the communications parameters between the computer and the modem and between the Online! program terminal emulation and the host computer. The most common ANSI terminal is the default and the popular VT and TTY series of terminals are also emulated. The only major emulation missing is the Tektronix graphics terminal.

I am very happy with this release of Online! and can recommend it. I use

Online! more than most other terminal programs (principally since I learned it first). ATalk-III is an equally capable program and a newcomer shareware program soon to be commercial called JRComm will also be a contender. Online only supports forty entries in a phone book, but does allow multiple phone books. I would prefer to have the option of a larger phone book, but that's not essential and does not change the usefulness of the program. I do like the option of the screen sizes, colors, interlace, and overscan support.

Online! Platinum is not copy protected and even includes a disk check program that ensures your disk arrives to you intact. There is a small section against piracy in the manual and I hope that the members of the Amiga community read it. If we want software support to rival that in the Macintosh and MS-DOS worlds, we have to support the software publishers through purchases. Technical support is available and requires the registration number from the manual. Considering the quality of the package and the easy to understand menus, this should be unnecessary. There is a convenient hard disk installation icon, but it is geared for the 2090 controller. Documentation on the disk includes the updates to the manual and examples on installing Online! on other brands of hard disks. MSS has a real winner here in Online! Platinum and I have an old, new favorite telecommunications program.

Online! Platinum \$ 99.95

Micro-Systems Software, Inc.
12798 Forest Hill Boulevard, Suite 202
West Palm Beach, FL 33414

(407) 790-0772

Madrigal Libraries

Pre-Drawn Objects Ready for Importing into Your CAD Program

by Paul R. Miller

The Madrigal Series is the first offering of CAD libraries directed towards the "architectural" community that I have encountered. In the serious and expensive world of professional and commercial Computer Assisted Design (i.e. AutoCad, VersaCad, InterGraph, Prime Medusa and Computer-Vision, and the like) libraries abound, either by virtue of having been created in house by mainframe users, or in packages offered by suppliers and vendors of components and parts for the building industry. The most notable example is, of course, AutoCad which, by virtue of its wide distribution on MS-DOS PC's, has the widest assortment of ready-made parts. Virtually all the major manufacturers of building systems, from Andersen Windows to the major suppliers of contract furniture like Steelcase, offer a database of parts, details, inventory numbers and prices on floppy disks and CD ROM. What's happening to the Amiga in the midst of all this perceived bounty? Well, not a whole lot. Consider the reasons. First, our favorite computer isn't taken very seriously by the "serious" business world (remember that most CAD managers come from the world of mainframe M.I.S. -- enough said). Second, there hasn't been any real professional level CAD

software available for the Amiga (although the re-introduction of the new X-CAD programs may remedy this -- see review elsewhere in this issue). Third, even given the proper software, the utilization of CAD involves some considerable expenditure for equipment (good monitors, plotters, tablets), an equally considerable expenditure of time to master the software (CAD is definitely not easy), and a valid reason to spend the time and money in the first place, namely a business reason. The Amiga has the potential to fill a niche in the practice of architecture for several good reasons.

First, the machine is obviously well suited to graphics applications, from the incredibly fast screen refreshes of X-CAD vectors, to the comprehensive integration of paint, 3-D rendering, desktop publishing and video animation programs, a potentially perfect mix for architects. Second, the vast majority of architectural offices are small, from 5 to 10 people. Here again, the appeal of the Amiga with superior price and performance ratios. What else is needed to fulfill this potential?

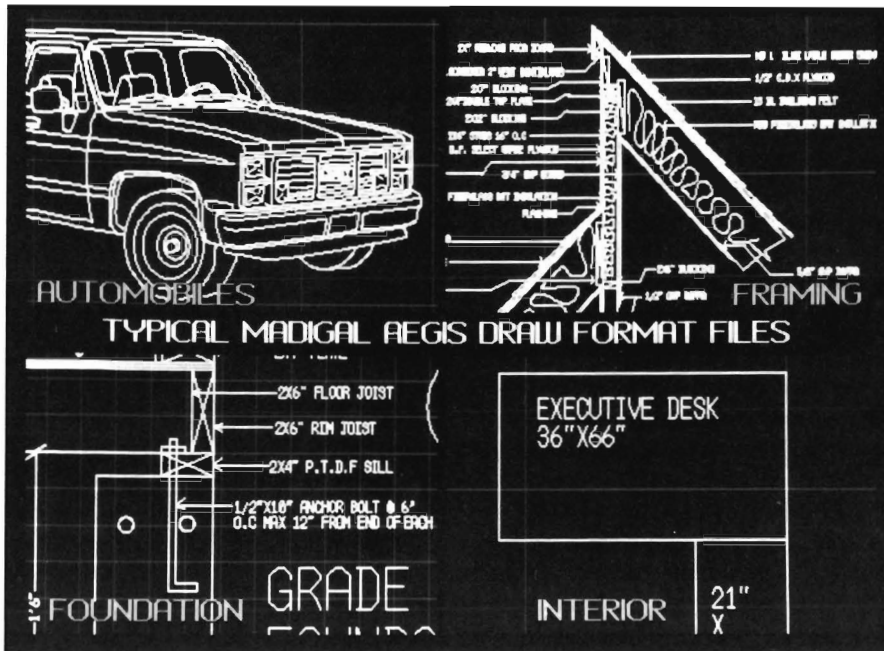
CAD: The Myths Dispelled

Start with an understanding of why CAD is used in the first place. The reader is herein warned that the following are strictly opinions based on my own observations. Although I am

a professional with some 20 years experience, I must confess that I am not a direct CAD user in my everyday work. The process at the large firm I work for involves mainframe computers and dedicated CAD draftspersons who required a lengthy training and acclimation period before they became productive. "Productive" is a term that needs some clarification, though.

In the first place, CAD is rarely faster than drawing by hand -- except for cases involving the most experienced and adept users, and even then only in cases that involve repetitive elements or pre-defined parts. Faster the first time isn't the point. The real point of CAD involves issues like consistency and clarity of drawing styles, standardized libraries, layering for multiple disciplines like mechanical, plumbing, electrical, etc., and the ability to change and edit documents after they are created. Other factors involve the creation of dynamically linked databases (a bill of materials that is created with the plan), archival drawings for clients, etc. The reality is that CAD is generally a *more expensive* way to produce documents (at least for first cost), but the design profession is adopting CAD because it is certainly the wave of the future, clients are demanding it, the competition is doing it, the long term costs will be effective, and finally, clients are beginning to understand and appreciate (i.e. pay
(continued on next page)

Madrigal (continued from previous page)



The Madrigal series of designs come in a variety of specialized forms

for) the added value. Where can the Amiga play a role in this evolution? For starters, it could be a part of the process of "decentralized" CAD. The current trend is towards individual workstations. The workstations allow programs to be run at distributed CPU's (makes for quicker process) with centralized file archives (everyone can access the database, but you don't have to time-share the central CPU). The other trend is to get the terminals in the hands of the designers rather than having to rely on dedicated CAD draftsmen, who generally are not designers. Why should I have make a sketch to give to someone else if I had access to a terminal and could justify the time and expense of learning the system? Sounds good, how about an Amiga based system that could be used at home and at the office. We need it at home, because we will require that "extra-curricular" time to learn enough to become productive, and we need a viable link to the "real world" of CAD. At present the reality is that we have an Amiga CAD environment that is

suitable for the hobbyist or amateur only. The Madrigal Architectural Libraries are the first offering of ready made parts, and they too fall into this category. Guillermo Madrigal is a

West Coast residential designer who has taken the time and trouble to create six disks full of Aegis Draw vector files that are organized into the following sets:

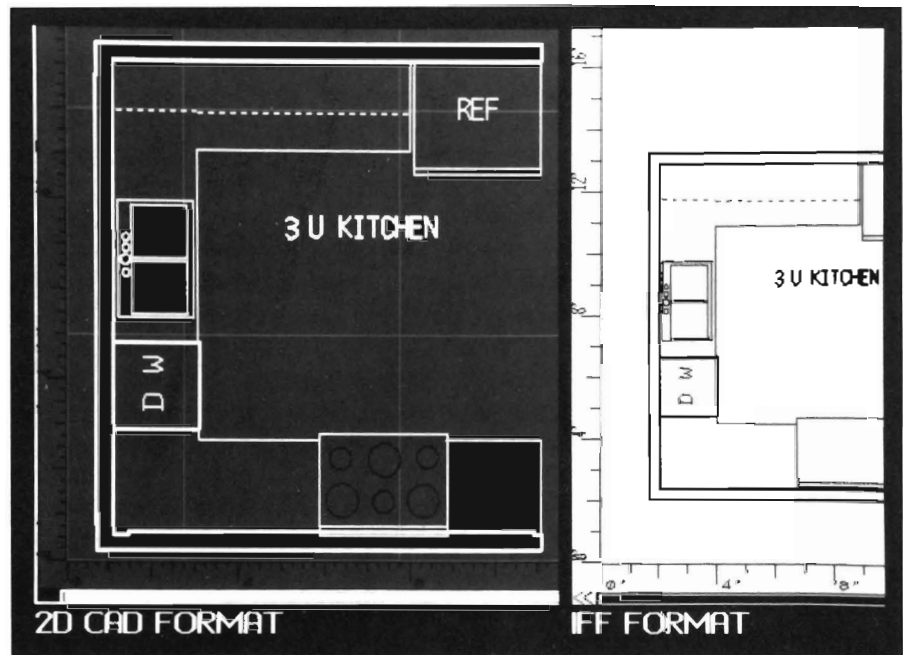
Floor Plan Parts and Room Modules comprising two disks of plan view parts which include: Corners, Doors, Windows, Bow Windows, Fireplaces, Toilets, Tubs, Showers, Sinks, Bidets, Urinals, Dishwashers, Trash Compactors, Stoves, Refrigerators, Stairs, Wall Parts, and complete Room Modules of 12 different Baths and Kitchens.

Foundation and Framing Details -- another two disks of residential details that include 20 foundation and 28 framing sections.

Interior Design (furniture) -- a disk full of nearly 50 general types of furniture, mostly residential but with some office pieces, with anywhere from 2 to 25 variations in each type.

(continued on page 18)

The designs are also available in IFF format



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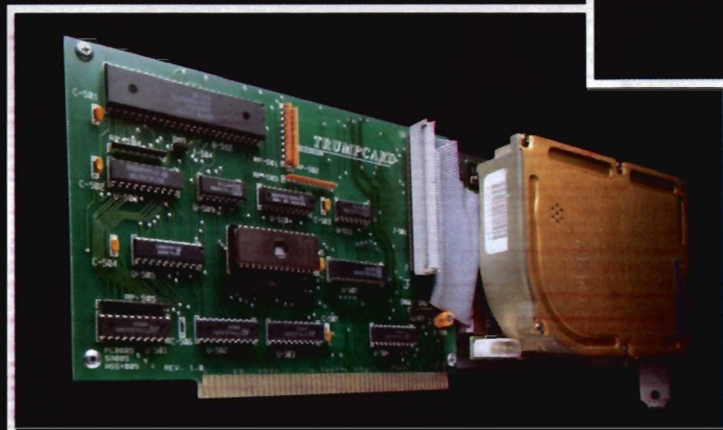


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Madrigal (continued from page 16)

Automotive Volume 1 -- 20 vehicles (in 3/4 perspective view) ranging from Rolls Royce to VW BUG to family sedans to pickup trucks.

All of the above, with the exception of the Framing and Foundation Details, are also offered in IFF bitmap format, and Madrigal plans to supplement their offerings with Architectural elevations, Isometric Designs, Landscape Plans, and additional automotive disks.

Each collection is packaged in rigid binders complete with illustrations and instructions for their use, either by IFF format or 2D CAD files. In the latter case, you get clear instructions for importing into Aegis Draw, and you also get some handy tips about the program itself. Especially useful is a section that gives a clear table of Drawing Scale, Sheet Width and Height, and Plot Scales, and a patch that makes Draw Plus compatible with the HP 7475A "B" plotter configuration.

In their IFF versions, these items will be limited to use in illustration only. The drawings have been created in Aegis Draw Plus, then saved in that program's IFF screen save option. All the components have been saved at the same scale in black on light grey hi-res screens (complete with the Draw Plus borders and ruler markings). If you can utilize these parts within the limitations of the overall scale which results in a maximum area of 18 by 30 feet, you may then employ the tools available in the various paint and animation programs to gussy them up. Of course you may also enlarge or reduce these bitmaps (using DPaint's half or double brush sizing works well), then use the paint tools to clean up pixel artifacts. I have used a parallel technique in downloading CAD files from mainframe systems (using ATalk's Tektro-nix emulation). With some effort the results can be quite striking, and in the

"real world" they have been employed by me in major presentations to corporate clients with suitable oohs and aahs from the audience. Judicious use of paint tools like drop shadows, gradient fills, and the shade mode produce very effective results.

If you own and use any of the Aegis Draw series, and if any of your applications involve desktop publishing or 3-D modeling, by all means purchase the 2D CAD versions (you can produce your own IFF files). Aegis Draw users will import the files either as whole drawings (in the case of room modules) or as parts (the vast majority of the libraries). If you own ProPage, Modeler 3D, the InterChange Modules, or PageStream you can also import these files directly, so CAD use is not the essential need. In fact, the nature of most of these parts lend them more to illustrative, rather than technical use.

This is certainly the case with the automotive series, and to a large extent also true of the architectural parts. As vast as the collection would appear at first blush, the reality is that just one real residential window line would require, to accommodate the whole range of variations of types, dimensions, and wall conditions, a vastly greater library than the whole Madrigal collection. Given the limitations of Aegis Draw in use as a higher application CAD package and the limitations of the scope of these parts, coupled with the fact that residential design is probably the *least* likely candidate for serious CAD production, we arrive back at the point of illustration, hobby-experimentation, or amateur use.

This is by no means a criticism of this collection. On the contrary, I think they constitute a useful tool for illustrative purposes and would be valuable in learning the basics skills in structured drawing techniques. Guil-

lermo Madrigal has expended no small effort in the production of this collection. What remains to be seen is whether the Amiga can enter the mainstream of CAD applications. The emergence of a revised X-CAD, the possible introduction of Progressive's Ultra-CAD, the introduction of 1.4 and higher resolution screens, more third party support in items like graphics tablets and plotters -- all factor into the question. The hardware is certainly up to the task, what remains to be seen is whether the software will meet the demands of the professional users.

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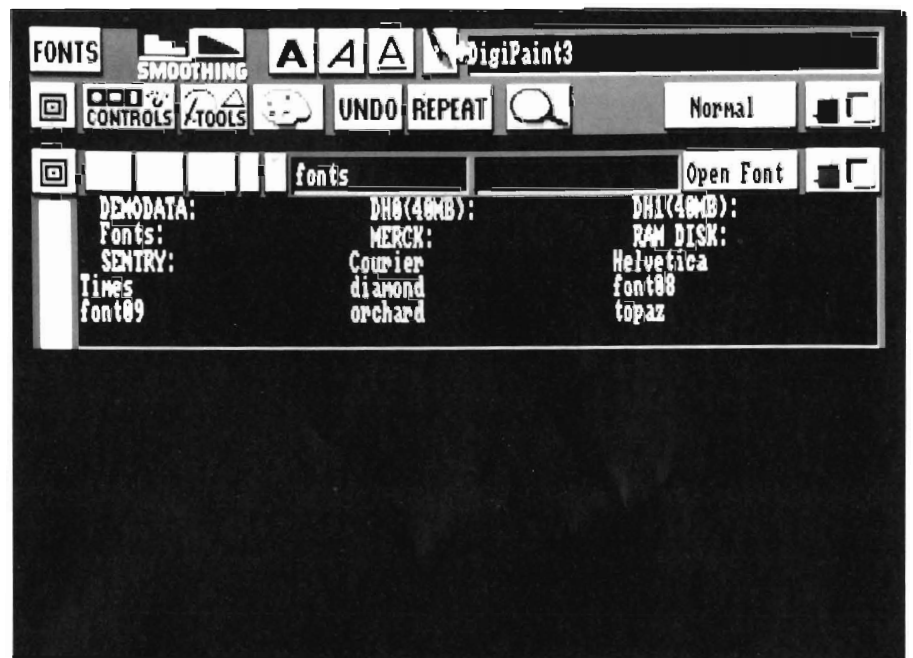
Digi-Paint 3.0

A New Generation Ham Painting Program from Newtek

by Steve Kenworth

NewTek produced the very first HAM paint program, Digi-Paint, over two years ago, and when it was introduced it was a revelation. Having a palette of 4,096 colors all at once, along with the wonderful ability to blend, tint, and "rub-thru" from underneath paintings gave the Amiga capabilities associated with high end workstations and the kinds of subtle effects produced on network television megabuck paint programs. In its first incarnation, Digi-Paint was a bit clumsy and slow compared with DPaint, but we suffered with the "fringes," illegible cursors, the key-word protection and the like because we had no choice.

As a stand-alone paint program the original wasn't exactly a joy, and found its greatest usefulness in touching up files created in DPaint, imported from Digi-View, or from the 3D rendering programs. With the introduction of Photon Paint and Deluxe Photo Lab, the so-called "HAM" wars were commenced. Each program could claim its own unique features, and the serious Amiga painter found it necessary to use all three, depending on the required effect. With the advent of Photon Paint II, I retired the others from my hard disk, thinking that I could finally settle down to just one program....



Digi-Paint 3.0 offers new support for fonts

No chance of that, because Digi-Paint is back with a vengeance. Now titled version 3 (not because there was a version 2 -- there wasn't -- but because 3 man-years went into it), Digi-Paint is so revised that it constitutes a completely new program. New or enhanced features include:

A new user interface designed with the influence of Jim Sachs that makes the tools and painting modes much more intuitive and comprehensible. Several new drawing tools, including a vast array of built-in brushes. A very nice palette device (possibly the

best yet approach to dealing with 4,096 colors). New painting modes for lighten, darken, colorize, blur and range. Three modes of dithering. Support for X-Specs, and compatibility with AREXX. Inclusion of "Transfer 24," the image processing program from Digi-View for complete flexibility in importing from or exporting to other programs. Screen sizes from 320 by 200 up to virtual pages up to 1024 wide or high, plus "auto-scrolling" as you work in super bit-maps. Digi-Paint now handles text with a separate "text rendering" window
(continued on next page)

Digi-Paint 3 (continued from previous page)

dow, and supports multiple font directories. Copy protection is gone, and the program is supported by a 127 page manual with clear explanations, tutorials, useful tips, and extensive reference and appendices. Previously arcane painting modes like blend, tint, and add have been consolidated into a total of 11 modes, including transparency and texture mapping. The former has the best interface yet, and the latter includes a "smoothing" anti-aliasing function along with another good control interface that yields the best HAM texture mapping yet as well and can even provide "real time" variation during the rendering process. To top it off, Digi-Paint 3 is written entirely in assembly language and has been optimized to support 60820 processors, so it's super fast. All these elements combine to yield the cleanest and most "fringe-free" HAM pictures I've seen to date, and the combination of speed and reorganized paint modes make it the most "painterly" of Amiga graphics programs.

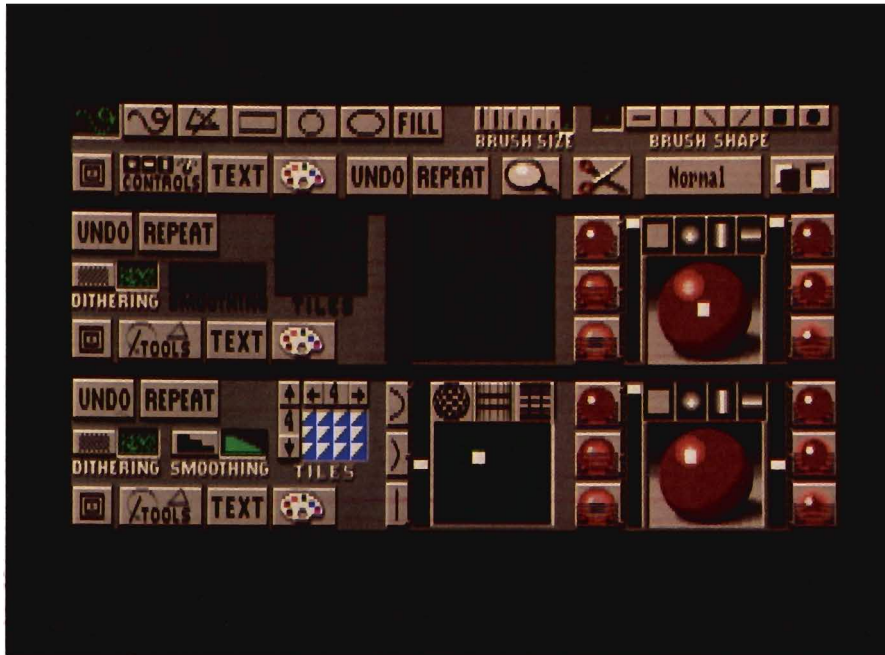
While old time users of the original will recognize some vestiges of its structure in 3, the rework is so substantial that a complete tour of all the menus and tools is required. The package includes 2 disks: a bootable program disk with fonts and utilities, and a tutorial art disk which includes the Transfer24 program. 512K is a minimum requirement, but 1 meg is recommended

(and required for some functions). Virtual pages are limited by available chip RAM, so the fatter Agnes is essential here to get bigger than your screen (even with 1 meg of chip RAM you are limited to a maximum 960 by 960 pixels). In place of the all-too-brief booklet of version 1, you get a substantial manual that covers everything clearly and in depth. Nine chapters and appendices take you through: Get Started (minimum hardware and hard disk installation); What's New

tail; Transfer24, and 4 appendices (Keyboard Equivalents, HAM theory, ARexx, and Technical Support).

First, we'll focus on the control interface. Previously, there was one control panel that combined tools and a few menu bar commands, but it was devoted largely to the palette. Behind that panel lived a series of pull down menus for Picture, Brush, Effect, Mode and Preferences. DigiPaint3 is vastly enhanced with four dedicated control

windows, plus the familiar pull-downs. The default Tool panel consists of two rows of buttons stretched across the bottom of the screen, with gadgets to select drawing tools (free-hand dotted, freehand continuous, line/polygon, circle, and ellipse), plus a fill button that operates with all the previous modes except dotted. Built-in brushes are defined with two sets of buttons. Seven that determine size and seven that determine shape. Below are icon gadgets to toggle off the panel, take you



Powerful tools for determining light direction and fills are part of this new revision

(summary explanations of the enhancements and re-structuring); Guided Tour (a quick tutorial that touches all the major features); Tutorials (eleven lessons that include range painting, shadows, sizing, rubthru, backgrounds, colorizing, montage, perspective, and text rendering); Dedicated chapters on Transparency Controls and Texture Mapping; Tips and Hints (X-Specs, Digi-View, Resolution Modes, RGB files, Overscan, etc.); a Reference Chapter that covers each tool, menu command, and control window in de-

to the other panels (Controls, Text, or Palette), Magnify, Scissor (brush pick-up), a Front/Back gadget for your screen, and Mode Indicator which can be toggled to display coordinates. Common to all the panels are the UNDO and REPEAT buttons. Digi-Paint combines these two in a unique way that offers exceptional flexibility for experimentation in the painting modes, and to emulate certain operations that other paint programs achieve with the right mouse button. The latter is necessary because DigiPaint does

not employ the right button at all for painting, reserving it entirely for menu access. Also common to the four panels is a separate palette strip that displays just above the control window. At the left are the 16 base register colors that permit "fringe free" painting. Default palette is black background, then white, 2 gray levels, and a spectrum range from violet to indigo. Next to these are a current color indicator and a range array that provides 16 shades as determined by your selections for end points. When you activate the range painting mode, your current color becomes a spread of these hues and values and is applied according to your transparency settings.

The second panel, "Controls," is devoted to management of the Transparency and Texture Mapping functions. Where the original program had offered 12 different paint modes (Solid, Blend, Tint, Light Tint, Minimum, Maximum, Add, Subtract, Xor, And, Or, and Shading) whose effects were sometimes mysterious or unpredictable, DigiPaint3 shows that considerable thought has been given to what graphic artists really need to control their results. Now we have an overall transparency console that effects all the paint modes resulting in much greater utility. Transparency is controlled through settings for "hotspot" and "edge" with icon devices and sliders that are crystal clear. The hotspot or highlight can be of four orientations: none, point, vertical or horizontal, displayed respectively as a white block, or a point or band superimposed on a sphere icon. Dragging the point or band sets the location. In addition, you can control the relative transparency values of both the hotspot and edges, from full 100% to 0% with separate calibrated sliders, each flanked by three miniature spheres that give graphic clues to the full, mid, and zero level effects. As these settings can af-



fect all the paint modes, the possibilities are legion and nearly any effect can be achieved. For example, the use of a point hotspot with low edge transparency in a range paint mode of light to dark green and with a filled circle tool would yield a nice Granny Smith apple. The same transparency setting

in rubthru yield a graduated vignette of a spare screen picture fading into the overlay front screen. Or a "none" hotspot mode would be utilized for tinting, or overlay of transparent colors. What makes DigiPaint3 uniquely powerful is the combination of the transparency ef-
(continued on next page)



Digi-Paint 3 (continued from previous page)

fects and the UNDO/REPEAT buttons. For any given painting action, you can activate the undo, then change settings or mode, then use repeat to perform the same action (say drawing a filled circle) with the new settings. By itself, REPEAT allows for easy overlay of multiple effects on the same action, like adding a lighten or darken highlight to that range painted apple. Still more control is granted in the choice of dithering types, either none (contour bands of colors), random, or pattern, according to your button selections. While these choices may seem more restrictive than other HAM programs, I found the results to be the best and cleanest I've seen yet. NewTek boasts of 30 bits per pixel dithering routines. Whatever methods they employed seem to have done the job.

The remainder of the Control window deals with warping and texture mapping functions, and offers equally convenient gadgets. The first step in texture mapping is to pick up a portion of your canvas as a brush (use the scissors tool and any of the tools -- freehand, rectangle, circle, etc.), then store the brush in the swap buffer under the pull down brush menu. Having done this, you may now activate TxMap in the mode menu, which in turn activates the Texture Map gadgets in the Control console. (By the way, DigiPaint3 offers keyboard equivalents for just about everything, including a representative group of transparency pre-sets, and many of the tool commands correspond to DPaint keys that are now embedded in our consciousness. Thanks to NewTek for acknowledging this reality and making life a little easier.)

Texture Mapping offers an array of icons that parallel Transparency: Three wire-frame spheres that correspond to Warp locations for point, vertical or horizontal orientation, plus a slider control and mini-icons for Warp

Amount, from none to severe. Depending on the shape you choose to make (i.e. that shape which is to receive a texture map of your brush), the combination of warp points and degree of warping (plus transparency if you so choose) determines the results. To simulate perspective in a horizontal plane you would set location to horizontal (and centered), warp amount to none, then draw a trapezoid shape to simulate that plane foreshortened into the distance. To wrap around a sphere you would choose point location (warping in both directions), and say, a medium degree of warp amount, then use the filled circle tool. Compared with the perspective tools in DPaint 3, this process requires a good deal more judgement and intuition on the part of the user as you must simulate the outline of your receding plane, and you lack the precision tools of grid, axis and angle readouts. On the other hand, and when compared to the other HAM paint programs, DigiPaint3 gives superior results, especially as it offers a toggle for automatic smoothing (anti-aliasing) in the texture map mode. Combined with the effects of transparency and supplemental modes of lightening and darkening, the effects can be startlingly realistic. Again, the handy combination of UNDO and REPEAT, and the very, very quick rendering times lend themselves to the kind of experimentation that can produce these results.

How fast is it? Results of my rather unscientific comparisons of shaded freehand fills and texture mappings in both Photon Paint II and DigiPaint 3 found the latter to be anywhere from 6 to 10 times faster. (Part of these results could be attributed to Newtek's concentration on co-processor support).

Another key test for me is filled freehand drawing. Here DigiPaint3 met my criteria of laying down accurate

quick brush strokes, with no perceptible lags or glitches, no matter how fast my strokes! I'd buy it for this alone, because it's so much like real sketching.

Before leaving the "Control" window, mention must be made of real time interactive adjustments to both warping and transparency controls. In conjunction with the UNDO/REPEAT pair, this feature lets you vary the amount of warpage or transparency as the image renders. It could be explained by saying for any action involving texture mapping or transparency, you simply undo and repeat, then quickly grab the appropriate sliders to vary the effect as the image renders. In this way you can simulate wavy effects in mapping and variable edge transparency (hard to soft edge).

In actual practice this requires some very quick movements (keyboard commands are essential) because the program is so fast. You need your image to be big, for one, and smoothing on is a requisite in mapping to slow it down. I found two problems with this workaround: If the image is too big you lose the control panel (DigiPaint3 automatically gets it out of your way in all paint actions that intrude into its area) so you can't actually move the sliders; and the cursor turns into the Zzzz icon as soon as you begin making it difficult to position. What we need here is some key and arrow cursor combos, but I couldn't find any mention in the manual.

The third console is devoted to the Palette, and manages all those HAM colors in a very smart manner. Supplemental functions are logically arrayed directly below the ubiquitous standard color display. Below each of the 16 base colors is a range from lightest to darkest value for the respective base hues (this is a handy device for picking

variants). Then, below the current color are the familiar RGB sliders (calibrated 0 to 15, a method I find much better than the hexadecimal). Below the range reside the color squares that show the color cube variants with constant R, G, and B components. A Pick gadget lets you choose directly from the screen, or you can use the sliders, or just click and hold on the current box, then move to the value or hue variant of your choice in any of the devices. Changes to the base color registers require a trip to the Palette menu bar, where you can Copy custom colors to your base, then Remap your picture to restore the proper appearance.

The fourth and final console is for Text, which is completely new to DigiPaint, as the original program had no text capabilities at all. In order to avoid any fringing with text, and also to take advantage of all the various paint mode capabilities with text, DigiPaint3 requires you to enter your text string into a requester window first and set your style (bold, italic, underline) preferences. A click on the Text-to-Brush gadget then attaches your words to the cursor for positioning on the canvas. Another gadget toggles automatic smoothing (anti-aliasing), and this too proceeds very quickly so it will probably be your default mode. Changes in font, color or style selection will require another click on the Text-to-Brush button.

DigiPaint3 is up-to-date in permitting access to multiple font directories through the Font Button, and in fact is superior to DPaint in this respect as it gives you standard directory listings (no need to have memorized your paths or type a string). A quick "copy this brush" command in the Brush/Swaps sub-menu will permit you access to texture mapping and text warping, not to mention the permutations of all the other modes and settings. NewTek

even includes a series of its own fonts for your experimentation.

One more window, the pull-down menus, completes the controls. Actions here are strictly standard right button highlight and release, and yield the appropriate requestors. Picture enables the Load (works with all other formats, and gives an option to remap hi-res to lo-res or enter super bit-map), Save, Print, Clear (to current color background or keyboard shortcut to color register 1), and Quit. View toggles either normal or severe overscan for your preview. Swap yields the familiar Digi-Paint choices for your spare screen, copy, exchange, delete or merge. The fun begins with Size which enables you to work in virtual pages limited only by chip memory. Separate nested arrow gadgets control gross or fine incremental changes in horizontal or vertical page size, up to a maximum 1024 pixels. A separate button toggles interlace, and another button restores the default 320 x 200 environment.

Once you've created a bigger page, DigiPaint3 makes life quite convenient. As you approach the limits of your current screen view, the program automatically scrolls with you and very rapidly. I tested the limits by attempting 960 by 800 freehand filled transparent shapes. As I hit the edge of the current screen I was forced to maintain a very steady hand in order to preserve a smooth curve. Best results are obtained when you keep your freehand moves within the current screen view. Still, it's a wonderful convenience with virtual pages.

Brush lets you load and save, toggle transparent background, and swap into the buffer for texture mapping, or just to save a brush in memory for convenience. Palette provides the previously mentioned options for altering the base

colors and remapping your pictures, along with an undo to void the copy and remap commands.

Effect will flip your current custom brush along the X or Y axes, or rotate in 90 degree increments.

Preferences will open or close the Workbench (to conserve memory), while the Genlock command forces the program to ignore color zero, thus insuring that the areas you want to reserve for video background are correct.

Lastly, Mode presents the eleven options for how you apply your paint: Normal (current color); Range (your custom defined color spread); Lighten and Darken, Colorize (current color hue/saturation but maintaining canvas brightness), RubThru (brings the rear spare screen through to the front); Blur (edge softening); TxMap; And (a binary operation that emulates a color filter); and the more unpredictable binaries of Or and Xor. Again, the real power of DigiPaint3 is enabled by the use of all these modes, along with the transparency settings, a custom brush, and the various drawing tools.

What's best about DigiPaint3? It's much faster than the others, with quick fills and anti-aliased texture maps, and brush strokes as quick as paint on paper. It's got the cleanest and smoothest HAM effects of any, with wonderful intuitive modes like lighten and darken that are just like real painting. I think you could achieve just about any effect you could imagine with minimal hassle. It's "painterly," for lack of a better word.

That's not to say that there aren't some things I don't like, nor is there no room for improvement. For starters, I'd prefer the menus across the top of the screen. They seem too intrusive at the

(continued on page 62)

DigiWorks 3D

Sophisticated Auto-Trace Routines

by Paul R. Miller

Once again, Access Technologies has filled an important gap in Amiga software. Their first product was a series of elegant 3-Dimensional fonts (the "Fancy Fonts"), carefully constructed vector outline files for use in solid rendering, or by translation via InterFont Modules into Desktop Publishing. Next they introduced A-CAD, the Amiga's first link to the vast resource of AutoCAD format .DXF

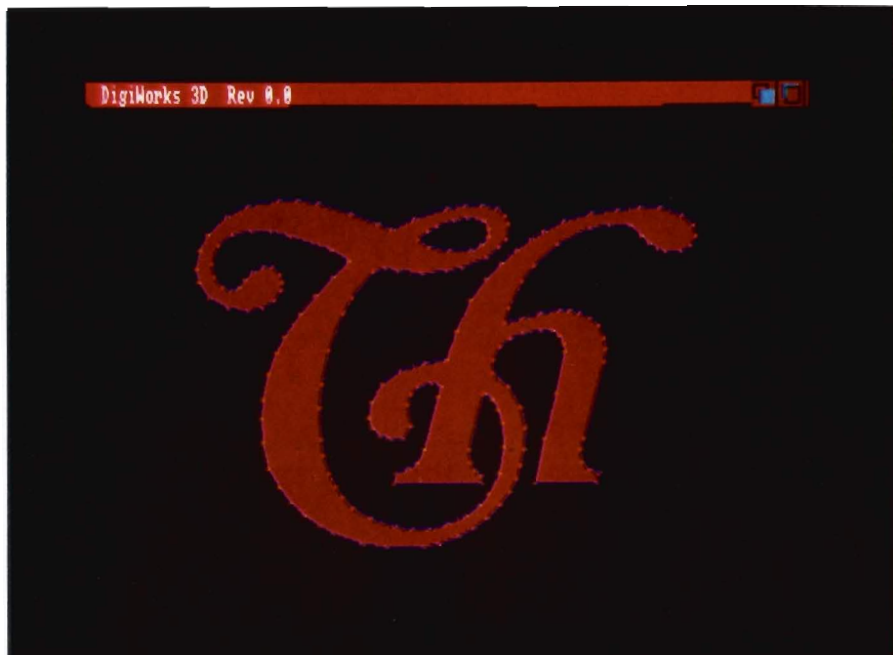
files, the more or less "industry standard" of vector mapped drawing files. Now with DigiWorks 3D they have answered the prayers of what will probably be their largest audience. In a word, it's "auto-trace," and it's exactly what we have needed.

Say you are producing a corporate video or slide show (or a publication) and you have need to incorporate a logo, a bit of clip art or a unique typeface. Previously you would have had to resort to rather tedious methods. You could have digitized the image, then imported to ProDraw and traced the

outline (much fun with Bezier curves!). Or you could genlock to the background of Aegis Draw, and "cad" your way around the edges. Need 3-D? Back to the genlock or graphics tablet, and a lengthy session in a solid modeling editor. I don't know about you, but I only want to use CAD or 3-D editing when I have too, and that means to create something that doesn't already exist. Given a ready made image, I just want to take my DigiView bitmap and convert it automatically to a vector file. Or, I'd like to be able to use the quick and versatile construction tools offered by DPaint to make something, and then convert easily to a structured drawing. Evidently, many other Amiga users have had the same desire because Access reports multiple inquiries into the possibility of their commercial release of the "proprietary process" that led to their fonts. That process involved the "Heuristic Automatic Tracing Algorithm," and that algorithm, plus the addition of a friendly environment and useful editing and tweaking tools constitutes "DigiWorks 3D."

DigiWorks comes packaged in a snappy black box adorned with a ray-traced rendering that combines CBM's nautical "C" logo, the new curvy "Amiga" logo, and what looks like a bit of Caslon Swash ligatured typeface thrown in just to make the point clear - anything you can digitize or scan is fair game. The program isn't very big

When Digiworks autotraces a 2D image, vertex points are established around the perimeter



(about 38K bytes) and the tutorial images that accompany still leave a mostly empty disk. Works requires only 512K memory and is not protected; installation on a hard drive is pure and simple. Just drag the icon over. The neat and clean manual requires only 50 pages for thorough explanations of program functions, and 4 tutorials to cover all the refinements. In less than an hour you can master all its functions, as the process is very clear and straightforward:

Select and load a bit-mapped image and "DWorks" immediately yields an auto-traced image; use the tools to define your work area, move, delete, or add vertices to the edge-detected outlines; draw and scale your own outlines; flood fill your creations to check their appearance; select a polygon fill command to create a two-dimensional plane; select your 3-D format, colors, textures and depth of extrusion; and save your file for rendering. Along the way you have options to save your work in progress, reactivate the edge detection process, modify your colors, consolidate vertices, set your preferences for coordinate display, set a threshold value for edge detection, select various arrays of bit-planes, and determine the size and aspect ratio of your objects.

A tour through the menus will detail the whole process. DWorks opens a medium-res 640 by 200 image screen in a 16 color environment. Don't worry about importing hi-res images, the program automatically reformats them, and the point here is to form vector outlines which are not dependent on pixel resolution. Thus, an interlace image is imported with every other line omitted and 320 pixel wide images will get every horizontal pixel doubled. DWorks is limited to 4 bit planes, so 32 color or HAM images will be suitably remapped. Of course,



All of these objects were created through Digiworks 3D.

you should be trying to import two-color images in the first place (use DigiView's "line art" or 2-color mode).

Four pull-down menus reside in the title bar, which stretches halfway across the top, and which can be dragged or gadgeted behind. Every menu command has a keyboard equivalent (also listed in the menu displays), but life is so simple in this program that you may never even need this nicety.

PROJECT includes the familiar Load, Save, Erase, Quit, and Color options, plus three commands particular to DWorks: Snapshot, Redraw, and ReCalc. Access has given us intelligent file requesters that recognize your devices and provide windows to click on directories and files (or you can type in the pathname). Bonus gadgets let you Delete, Copy and Rename files and even make directories without exiting the program. Color is strictly for your viewing convenience (to make edge lines, vertices, etc. easier on your eyes) and bears no relation to the actual object colors, which are selected before

you save your final file. Redraw refreshes your screen, and serves to eliminate stray pixels from previous editing efforts. It also eliminates "polyfill" lines from your display. ReCalc discards all lines, edges and vertices from previous edits and executes a re-trace. Snapshot opens the intelligent file requester again, and permits you to save work in progress with edits intact, for later sessions or to simplify alternate schemes. Erase offers options to clear the whole screen or just eliminate current edges and vertices as previous Area and Invert commands remain in effect.

EDIT contains the commands that direct edge and vertex placement, and is the primary workspace. Move lets you reposition your vertex points. Just locate the cursor over the desired point, click and drag (or abort by dragging to title bar). Insert adds a point along a pre-existing line with a mouse click, then automatically reverts to Move for positioning. Releasing the button
(continued on next page)

Digiworks 3D (continued from previous page)

sends you back to Insert for further points. Delete is accomplished by mouse click as well, but you must first select whether you want to eliminate vertices or edges. In each case the cursor takes on a unique cross-hair configuration to indicate the type of edit. Coord transforms your cursor into a measuring device; click on one point then hold and drag to the second point to reveal delta X and Y values. Close consolidates adjacent vertices into one point depending on the integer value (from 0 to 9) you specify in the requester. Draw lets you create points, lines, or connected line segments independent of the program's auto-traced image. A single click yields a point, click, drag and release gets you a line. Click, drag, and right button select enables multiple segments.

The IMAGE menu affects the display on your editing screen and permits you

to modify the trace criteria. Invert swaps the foreground/background values of the image on screen and functions together with the Area command to permit you to exclude extraneous data from your image. Depending on what bitmap you import, DWorks may have selected (as displayed in red) the background as the object.

Access gives you a clear example in the first tutorial with the letter Z on a page that was digitized from a sheet of rub-on letters. There are parts of other letters in the viewing field, and the first iteration of auto-trace has interpreted the ground as the figure. Invert rectifies this, and then permits you to use the Area command to box (click and drag a rectangle) the portion you want, then release to refresh the screen without the unwanted parts. Abs Coord toggles between title bar display of screen cursor position (639 by 199

field) or Relative Coordinates, which gives you a readout of position relative to your last activated point. Threshold controls the program's edge detection algorithm -- default value is 1 pixel, but you can raise (up to 999) or lower (I tried 0 and negative numbers). Raising has the effect of ignoring rough edges (less "resolution"), lowering makes the program more sensitive to minor items (and yields lots of points!).

Closure is another user definable trace feature that controls how the program decides to consolidate nearby vertices into single points. Fill image lets you see the results of moving, deleting and adding points, and also gives you a solid image of figures created from scratch with the Draw command. Plane enables you to select up to 5 bit planes, on an "and"/"or" basis, and is helpful in dealing with multi-color imports. While the actual color does not

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"It was a dark day.

A day so dark, I needed a flashlight to put my socks on the right feet. My secretary Gladys had quit the day before, walking out with my heart and my Rolodex. I was lost. Then, a mysterious woman walked in...



She had a great software package, the kind of goods you want to take home to Mother. She whispered, **'Who!What!When!Where!'** then handed me the box and exited stage right. I never learned her name, but that woman changed my life.

Now, I use **Who!What!When!Where!** to schedule appointments, to remind me of upcoming events, to dial the phone, to print address labels, and as a calendar, alarm clock, and yes, as a Rolodex, too.

Of course, Gladys made better coffee, but then **Who!What!When!Where!** doesn't demand profit-sharing..."

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What!
When!
Where!**

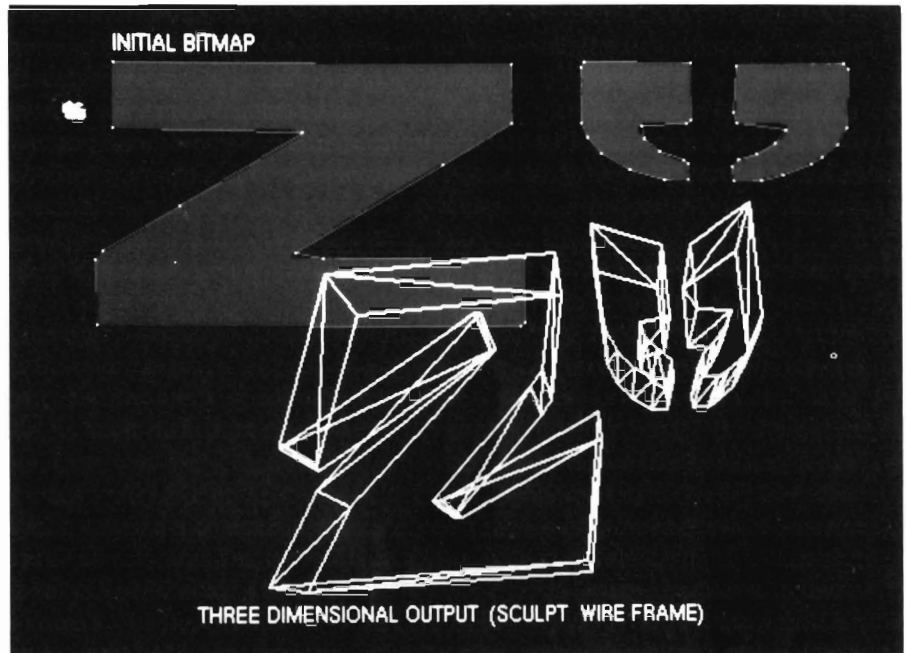
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appear on screen, the activation of additional bit-planes will permit DWorks to incorporate the information from those planes into the figure. The manual provides a tutorial with a multi-color DPaint construction that clarifies the issues neatly.

Finally, OUTPUT determines the commands and options that affect the data that results from a Project SAVE command. Y Size determines the scale of an object; default value is 1000, with alternate user entries to relative sizes as a fraction of that default. Uniform Size is dandy as it ensures that images of varying vertical heights, even edited at separate times, will be output at the same size in the 3-D format. This is invaluable with camera digitizing as your focal length is subject to variation, and even better, it insures that disparate typeface will all come out the same! Aspect relates to the ratio of pixel



From your two-dimensional trace, Digiworks can create three dimensional output for use in programs like sculpt 3D

(continued on page 30)

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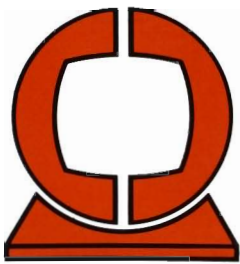
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Digiworks (continued from page 27)

height to width, and is defaulted to the standard Amiga 2.31 for medium-res. Thus a square edited on the med-res screen will be correct in any rendering program regardless of resolution on a standard Amiga monitor. Variation here could compensate for future monitor standards. Poly Fill subdivides the outlined face into triangles (the Sculpt and Silver standards), and will even warn you about unfilled polygons, display them in a different color, and permit you to go back and close them.

Extrude yields a simple requester to specify side and face color and texture (again, the Sculpt conventions), and the depth of the extrusion. Note that you are not required to fill the face with polygons, nor need you extrude. These cases would apply if your final goal is rendering in VideoScape or use in Desktop Publishing. In these cases, you will have to resort to translating

your files from the Sculpt or Turbo Silver output with Interchange or Modeler 3D. Finally, Output Format lets you choose Sculpt 3D or Turbo Silver.

I found the program to be extremely easy to use, and well stocked with features that reflect an understanding of the graphics users needs. I tried testing its stability with a digitized color photo with lots of shading, but DWorks remained rock solid, even though it took some minutes to recalculate the thousands of vertices. I only was able to crash it once in multi-tasking, but that may be due to some overly quick mouse clicks and the fact that my Workbench boots in hi-res, with Scribble! in interlaced and overscanned modes, while DWorks wants medium-res. If I have a quibble, it's just that Access seems only to recognize Sculpt and Silver as the recipients of this process. VideoScape happens to be my

rendering program of choice, but I think a much more extensive use will be made in DeskTop publishing. While it's true that you can use Interchange to convert to the DrawPlus/ProPage/PageStream format, it would be nice to do so directly from DWorks.

Oh well, that at least gives Access a possible upgrade path, because in every other respect the program fills the bill.

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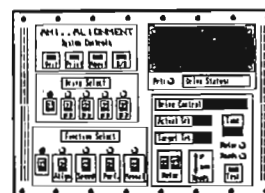
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MiniGen

A New Low Priced Video Genlock from Progressive Peripherals

by Tom Reed

Minigen is a new genlock from Progressive Peripherals which is billed as the first low cost and high quality genlock. Priced at around \$200, it is a relatively low cost genlock unit. With a price tag like this, one of the first questions that will inevitably come to mind is, "how does it perform?"

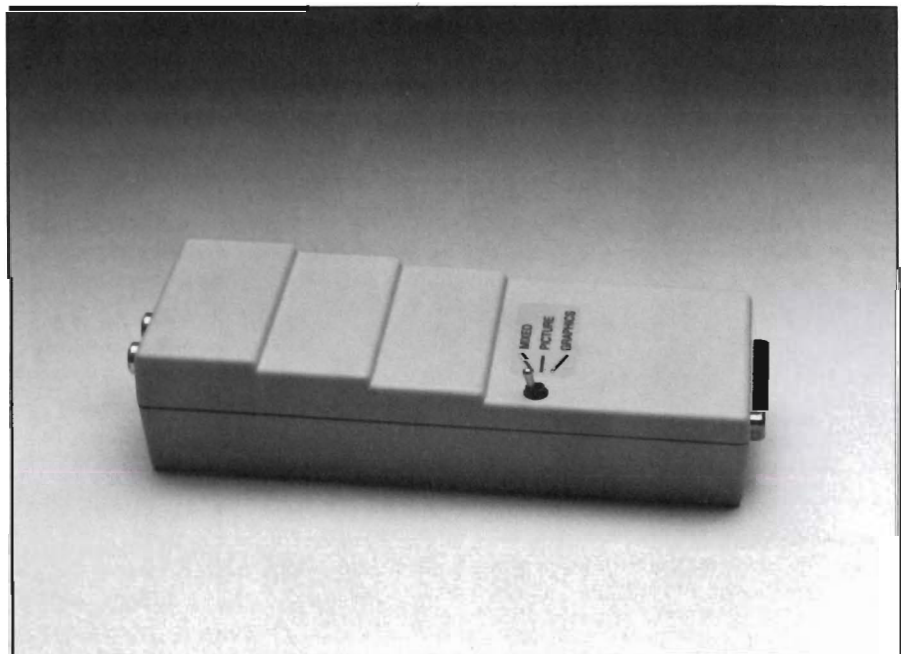
Most peoples' interest in a genlock is to overlay a computer graphic with an NTSC video signal. In my own case, the first interest in the Amiga was for its graphic capabilities. Specifically, I wanted to put titles and graphics on videos that I was doing. And, as a matter of fact, graphics and video still are my overriding interest in the Amiga. Word processing, data bases, and spreadsheets are run on my machines, but it is the paint programs, animation programs, and graphic applications that get the bulk of my computer time.

Combining a computer signal and a video signal is not the easiest of tasks. The following explanation represents a short and elementary overview of the complexities of overlaying a video signal and a computer signal may give you a better appreciation of the difficulty involved in producing a good or even excellent genlocked output im-

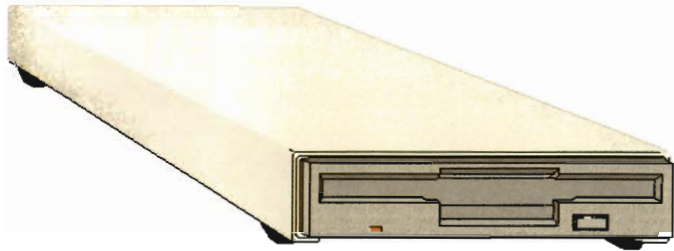
age: The design and implementation of the modern video signal was developed to answer a need to broadcast moving images over the air waves to the masses. The central area of the screen held most of the visual attention and information for the viewer. The edges and corners were treated peripherally.

The broadcast standards adopted also limited the amount of visual information (resolution) that the signal could carry. The viewer is actually expected to provide or fill in a large amount of information for the system to work effectively. A basic example is the fact that a viewer's persistence

of vision provides the apparent motion from the still images flashed on the picture tube. The computer image, on the other hand, was developed to display a static image with detailed information. The visual information in the corner of a computer screen is equally important as the information at the center of the screen. Another difference between the two systems is that of over/under scanning. The general computer screen is underscanned. That is, the electron beam "draws" a picture that is smaller than the face of the picture tube. However, a broadcast video image is overscanned by 15 per cent. (The electron beam in this case
(continued on page 34)



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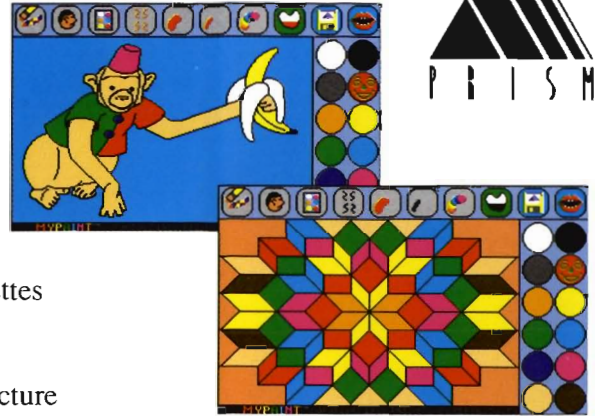
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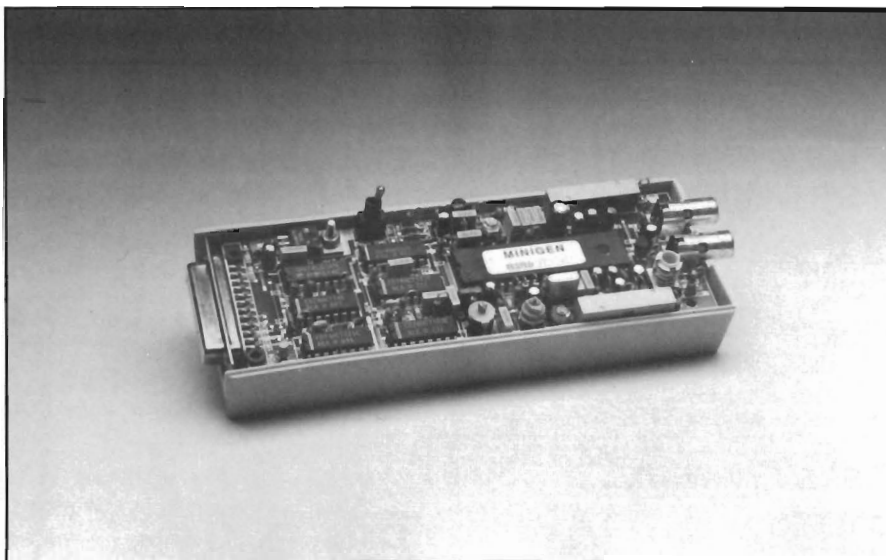
MiniGen (continued from page 31)

"draws" a picture that is larger than the picture tube.) These different visual functions led to the different handling and implementation of the displayed images. The differences include considerations like band width, scan rate, retrace and blanking intervals, as well as the over/under scan issues. To say the least, it is a challenge to mesh these two signals harmoniously and

have the resulting composite output signal accurately portray the visual information of both the video and computer signals. One of the important ways that Amiga graphics and animations are shared is by this video medium. Television stations and specific television shows are currently using Amiga graphics and animations. And, since you are using the same computer equipment as they are, there is no reason why you should not put your graphics onto video tape to create a wider audience for your masterpieces.

A genlock system may be the answer to encoding your graphics onto video tape. Of course, for the Amiga 1000 owners you can use the color composite video out on your machines to effect this transfer. However, to combine your Amiga graphics and an incoming video signal, you will need the help of a genlock. Genlocks take an incoming NTSC composite video signal and sync this signal with the computer's signal.

Because the computer signal is the easiest to change, the Amiga signal is usually locked to the incoming video



For its small size, the Minigen is packed with sophisticated circuitry

signal. With these two signals now working "in phase," you can combine your Amiga graphics and any other NTSC video signal.

A Genlock makes it possible for you to combine your computer graphics with your vacation to commercial videos. (I must admit to using a genlock for another application while doing rather mundane and routine computer work. Aiming a video camera at a TV screen in another room provides a much more interesting screen backdrop than color zero.)

I also use a genlock in doing business and graphic slides. The genlock provides an effective way for me to combine a product shot (or anything else for that matter) using a video camera and overlay information via the Amiga's graphics and titling. The Minigen is simplicity itself, at least on the exterior. The unit is approximately 6 inches long by 2 inches wide by 2 1/4 inches high. Ports consist of a 23 pin connector at one end that goes into the RGB out on your Amiga and two RCA connections for video in and video out.

The top of the unit has a three position

toggle switch for switching between Amiga graphics only, the incoming video signal only, or combining the signals from computer and video sources.

My testing of the unit involved the recording of a current titling project to video tape using the Minigen. I ran the same test project with Commodore's 1300 genlock and a Super Gen unit for comparison. The

outcome using the 1300 and the Minigen were comparable, which was not surprising as these units are in the same general price range. However, the 1300 is a unit that was made specifically for the Amiga 1000. Since this model of Amiga is out of production this genlock unit is also out of production.

The results using the Super Gen were, as expected, superior to the Minigen. But then again, the price was also superior. The differences were primarily in the rendering of colors. The colors on the Minigen were somewhat washed out when compared to those on the Super Gen. However, without this "side by side" comparison, the loss of color intensity would be difficult to notice. I found the genlocked signal from the Minigen relatively clean and noise free.

On the DeluxePaint III titles that I was recording for these comparisons I noticed a shift in the graphics once the video signal was introduced. The same thing happened when I used the Commodore 1300, but not with the Super Gen. In most titling applications this would not be very noticeable. Howev-

er, the title that I was doing had a window filled with color zero to show the video image through to simulate a movie screen. The graphics looked fine up until the video system was turned on to put the "live" videos on my computer generated screen. At that point, the right hand edge of my simulated movie screen went off the right hand side of the screen. To test this out I measured the shift on my 13 inch Commodore monitor. The 1300 genlock shifted the graphics over 3/4 of an inch to the right. The Minigen unit caused a shift of about 1/2 of an inch in that same direction. In most cases, with the graphics and titles in the center area of the screen this would not be much of a problem. With more precisely placed graphics utilizing the edges of your screen, however, this could certainly be a problem.

The limited number of video outputs on the Minigen allows you only to view what you are doing from the video out on your VCR. If your work is well planned, this need not be much of a problem. But, if touch up work on your graphics is needed this could be inconvenient. The physical dimensions of the Minigen did make the unit somewhat vulnerable in my set up. Of necessity, the Minigen must protrude six inches beyond your computer. Since I change cables often and move my computer around, I felt that the Minigen could be susceptible to dislodging by a passing cable. But, since the Minigen would only be installed for a specific project this may not be too big of an objection.

All in all, the Minigen works well and produces an acceptable signal that would be advantageous for the nonprofessional user. The important point to remember here is that you are getting what you are paying for, and users with more stringent requirements (or just perfectionists) would not find this

low-end unit suitable. It is, however, certainly worth the price if you are looking for a low cost way of combining your videos with some of the newly available Amiga graphics and tiling programs.

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X-Cad Designer

A Powerful New Revision Brings Professional Capabilities

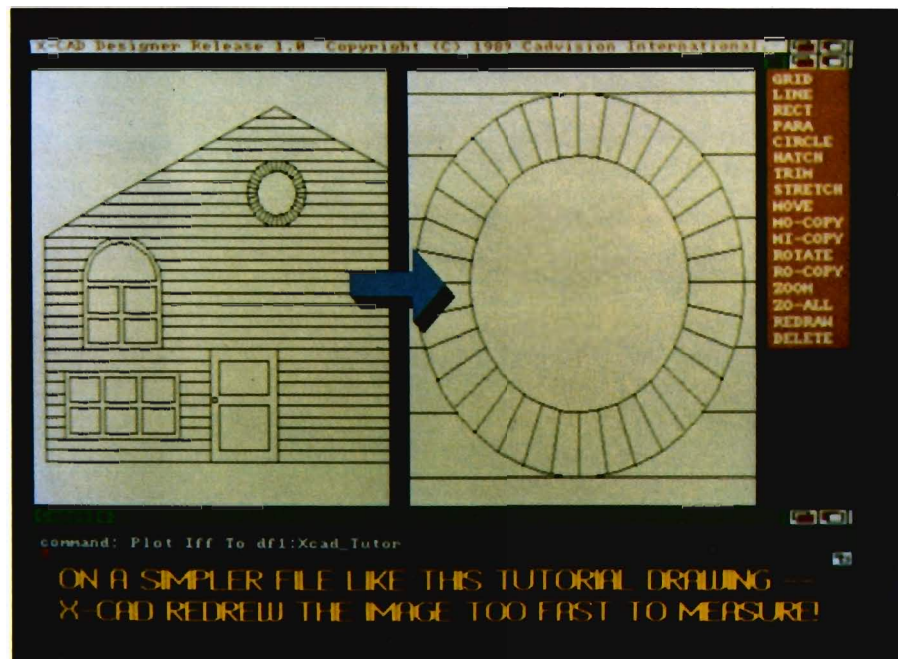
by Paul R. Miller

X-Cad you say? Isn't that the CAD program that's supposed to be fast and powerful, but too difficult to use? Haven't other magazines reviewed this in the past? The answers are Yes, and Yes. But when there is a major new release of an old program, it's big news. It's true, X-Cad has been around awhile and has generally caused consternation because it has the potential to outperform such industry standards as AutoCAD, yet has not fulfilled that promise owing to poor technical support, a confusing and incomplete manual, some buggy behavior, uncertainties as to its distribution and future, and perhaps some unrealistic notions about the nature of real CAD applications and the complexity of these programs.

Well X-Cad is back again, this time in a new package and under new auspices, including (at least in the U.K.) the official support of CBM and the familiar red and blue nautical logo on the box and manual cover. X-Cad was developed in England and traces its roots to Cambridge Interactive, most especially (Prime) ComputerVision. In its first release by Taurus Impex, it bore a price of \$ 600 and was touted to be a full featured 2D design package. Considering the limited Amiga market

(how many , are really doing professional CAD with the Amiga?), the price, the fact that you need a plotter (say \$ 1,500 to \$ 3,000), and the learning curve of any cad program, it's not

may mark the beginning of a new era in Amiga CAD. X-Cad Designer is offered as the "home" version. It requires only 1 meg of memory, has more standard-style Amiga pull down



"X-Cad" is another way to spell SPEED when it comes to screen redraws

surprising that it hasn't become a household word. Still, you only have to read between the lines of past reviews that mixed excitement with frustration to see that there are a number of Amiga users who would like to have the real thing. X-Cad Designer is the first part of a two-part response to that desire which addresses many of the complaints about the original, and

menus, supports HPGL plotter language (but also offers Epson super bit-map plots and screen dumps to preference printers), saves IFF files, and carries a price tag of only \$ 149.95 -- low enough so the average Amiga owner may take the plunge. To add to the enticement, CadVision offers part-two, X-Cad Professional, which boasts no less than 5000 commands,

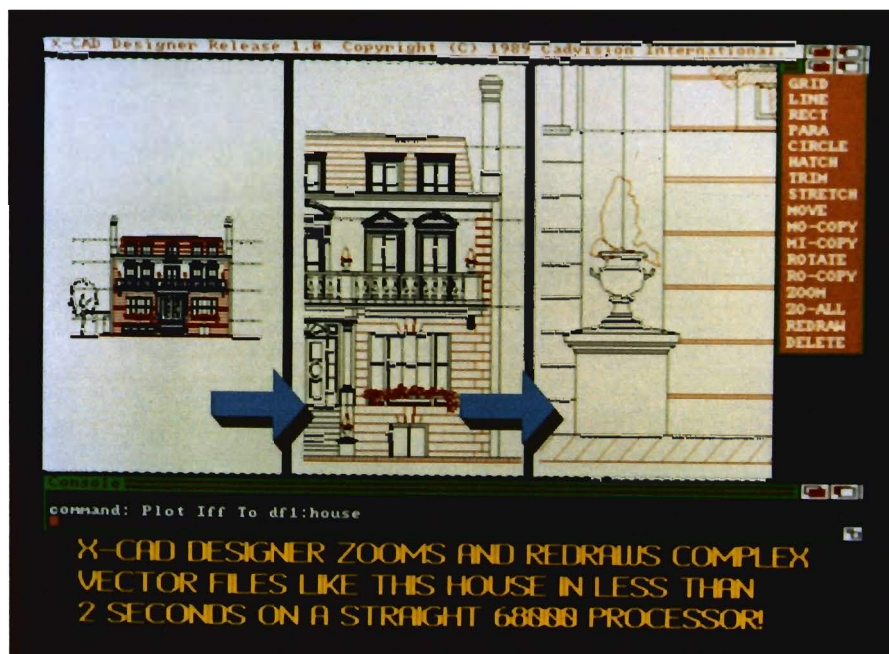
associated database (i.e. inventory takeoff), reads and writes AutoCAD .DXF files, outputs to Professional Page, Sculpt3D, IFF, supports more printers at high resolution, supports tablets for command menus, and should sell for around \$ 500 (about 1/5th the cost of AutoCAD). We will consider that program in next month's issue, but for now limit our scope to the simpler package.

Designer comes in a handsome package (binder and slipcase with nice graphics) with one disk, a comprehensive, well illustrated manual, and a little blue dongle that plugs into mouse

through the 250 pages in its binder (unless you have a mentor). This is simply the nature of advanced CAD work.

The manual starts with a tutorial that has you draw a simple house facade, then proceeds to a simple plan with dimensions. It takes 70 pages, and it only scratches the surface of the command possibilities. Another 170 pages or so are devoted to an explanation of the command structure with item-by-item explanations and illustrated examples. The fact of the matter is that in order to create and manipulate technical drawings with accuracy and control, you need a complex program.

will make life easier. The manual is clear on hard disk installation: you to create a directory, copy the six segments of the program and make the logical assigns. The only bug I encountered was with the so-called "optional" directories for user defined menus and drawings. Unless you assign these items, subsequent file command calls to them will erase the sheet data window at the bottom of your screen. Booting from the program disk will do this automatically and also contains a startup-sequence that activates a sample user menu. The X-Cad screen contains a total of 5 separate windows arrayed as follows, top to bottom, left to right:



You can zoom in on your work with amazing speed and precision

port 2. The dongle enables plotting, saving, and symbol definition. While I'm not thrilled with a dongle, I prefer it to keyword or disk protection, and you have to grant the reality of piracy. But given the complexity of this program, and the absolute need for the lengthy manual, it hardly seems necessary because X-Cad *will* require that you spend a good deal of time pouring

Even with the most recognized brand name mainframe programs, it takes months to learn the ropes, and even more months of practice to achieve the proficiency that makes for cost effectiveness.

Designer resides on a bootable disk and can get by with 1 meg and one drive. More memory and a hard drive

MENU STRIP -- a standard Amiga format pull down series of the 11 command categories: File, Draw, Text, Symbol, Dimension, Edit, Display, View, Layer, Plot, and Verify. In this menu you will also find a hierarchy of 7 commands which are dependent on and available only after the first level is activated (Action, Coor, Location, Entity, Display, Mask, and Trap).

DRAWING SHEET -- in which your selected sheet (from standard ISO, BS, or ANSI permutations, or custom) is displayed.

MENU STRIP -- a vertical window to the right of the drawing sheet that reveals user defined menus

CONSOLE -- a horizontal window below the drawing which is a text string of commands, actions, data, program prompts, and the previous command line editor. X-Cad mixes keyboard, mouse, and menu input automatically.

SHEET DATA -- displays layer, viewport, sheet height and width, unit measure, and available memory.

(continued on next page)

X-Cad Designer (continued from previous page)

While the data and command input to the program can come from keyboard, pull down menu, pop-up menus, or user defined macro menus, all entry follows the fundamental structure of the X-Cad command format syntax, which consists of three separate parts:

Command - Modifiers - Idents

The command always consists of two words, a verb and a noun (eg. Draw Circle). The eleven categories of commands are what make up the top menu strip.

In most cases, the command requires a Modifier for additional data or options (eg. Draw Circle, Radius 5), in which case "Radius" is a keyword which takes an additional data part "5." Modifiers are of 6 types: Flag (option like "circle"); Toggle (eg. "on" or "off" for a grid); Integer (eg. layer "100"); Real (eg. length "12.4"); String (text); or Filename (AmigaDos standard path names). Menu command entry yields the appropriate display of modifiers in left to right nested configuration of hierarchy levels. When options are exclusive, the program appropriately ghosts the display. When required, pop-up menus appear for numerical data entry (you can, of course, use the keyboard).

Command name entry activates the appearance of the Actions Menu and converts the remainder of the top menu strip into the "Idents" categories. Actions are of four types: Return (keyboard equivalent carriage return, which enters the command when all syntax requirements have been met); Action (keyboard equivalent colon key, which sets the stage for idents data); Rub Last (keyboard backspace, that rubs out the last action entered); or Quit (which aborts the command).

Idents stands for "interactive digitize

and entry selection" and consists of the selections and entries that fulfill command requirements for data relating to locations, entities (the chosen objects) or views. For example, the command Draw Line is activated for an ident "location" (either through the menu options or keyboard); the program then prompts for the appropriate entries according to the ident type, in this case end points (screen mouse clicks). Idents then permits execution (return) or multiple locations (with the "next" action). For example, the command sequence: "Draw Line :Location x1 x2 x3 :Location x4 x5 (return)" draws two lines spanning locations 1, 2, and 3, and a third line spanning locations 3 and 4. The command "Delete Entity :Entity" will prompt you to select (mouse click to highlight) the object to be deleted. Depending on your Commands and Modifier choices the Idents required will be of 6 types: Coor (absolute coordinate data); Location (mouse clicks on screen, absolute coordinate data, or point-on-entity (which references existing objects to locate something new); Entity (mouse clicks, coordinates, or groups in defined windows -- inside, outside or cross options); Display (viewports); Mask (limits choices of entity types in crowded areas); and Trap (sets the range of "nearness" to your cursor in selection). X-Cad Designer grants you the option in "environment control" to action certain commands automatically when the proper number of data elements have been entered (eg. three points in a 3-point circle draw method), or to maintain the default mode of "return" confirmation.

X-Cad permits the abortion of commands through the quit action, and also provides for a ctl-c abort in progress, but the drawing command must be fairly involved or X-Cad will have finished before you hit the keys. Also provided is an Undo Last edit com-

mand. This undo function is limited in the respect that it pertains only to the modification or deletion of entities, not to their creation. Thus you can reverse the effects of having, say, changed a dimension, moved a line, or deleted an object, but you cannot undo having created a line, you must delete it. The Undo memory buffer is set at a default 64K, but may be increased up to 1 meg. Finally, you may invoke the command line editor restoring the last command string for modification and re-execution.

There is no way I could possibly begin to list all the drawing features (it takes the manual 170 pages!). Consider that there are 8 different draw entities -- Construction Point, Line, Arc, Ellipse, Spline, String, Polygon, and Hatch. Now add the different cases just of line: Layer, Length, Perpendicular, Angle, Tangential, Parallel, Rectangle, Font.... A partial list of the capabilities includes:

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Location input for grid snap, entity snap-end, org, near, intof.... Incremental or cartesian coordinate (linear and angular), orthogonal and isometric grids. In addition to the unparalleled number of professional drawing capabilities (especially at this price), three aspects of X-Cad stand out: Its extraordinary speed, the practicality of its sheet and viewport method of drawing, and its ability to create user defined menus that short cut the complex command syntax.

It's probably time to mentioned the matter of speed. This product's box proclaims "undoubtedly the fastest redraw, zoom and pan of any combination of software and standard PC." My first test was to demo the program at a large architectural and engineering firm. Initial reactions included remarks about the screen similarities to both AutoCad and the mainframe Prime Me-

dusa system in use, and the comparable command capabilities. The next reaction was the raised eyebrows when X-Cad zoomed and re-drew complex drawings, and did so clearly faster than AutoCad. The next amazement came after conveying the price of this product.

I also constructed identical arrays of 1200 line vectors in each program and tested for zoom and redraw on a straight 68000 Amiga for the purpose of making a comparison with Draw 2000. Where Draw 2000 took 21 seconds to refresh the display, X-Cad took 2 seconds. In fairness, Draw 2000 does offer a 68881 version that about halves the redraw time. On the other hand, it seemed that no matter what I loaded into X-Cad, including very involved sample drawings involving many more vectors, redraw always took about 2 seconds. To further com-

plicate matters, the professional version of X-Cad offers 68881 support as well. Suffice to say that you will never be slowed in your work by screen refresh with this product.

I particularly like X-Cad's approach to drawing sheets. X-Cad begins by loading a sheetsize which is related to your plotter capabilities or choices. The sheet becomes the base "viewport" out of a total of 32 possible views. Thus can you avoid the hassle of scale and plot ratios. Drawing at any scale merely involves the definition of a viewport on the sheet, establishing the real world units and the scale ratio (eg. 1/8" to the foot as 1 to 96), and then working in your viewport at real units. In this way, you may easily define multiple sections on a sheet at different scales -- say a plan portion at 1/8" and details at 3" = 1'-0". Life is further simplified by

(continued on page 63)

Music-X

The New Midi Workstation from Microillusions

by Tom Bucklin

By now, we have all gotten used to the concept of pre-announced, or pre-advertised products. The frustration associated with this phenomenon rises proportionately with the significance of the product. (A case in point would be Pagestream). Unfortunately, Music-X is one of those Amiga products that has been advertised and talked about for an eternity, but has gone through

seemingly endless tweaks and delays. Now, for better or worse, Music-X has arrived. The spec-sheets on the product are nothing less than flashy, calling out an impressive array of high-end Midi capabilities. But can it live up to these ambitious claims? I'll endeavor to answer that question by taking you on a detailed walk through the program.

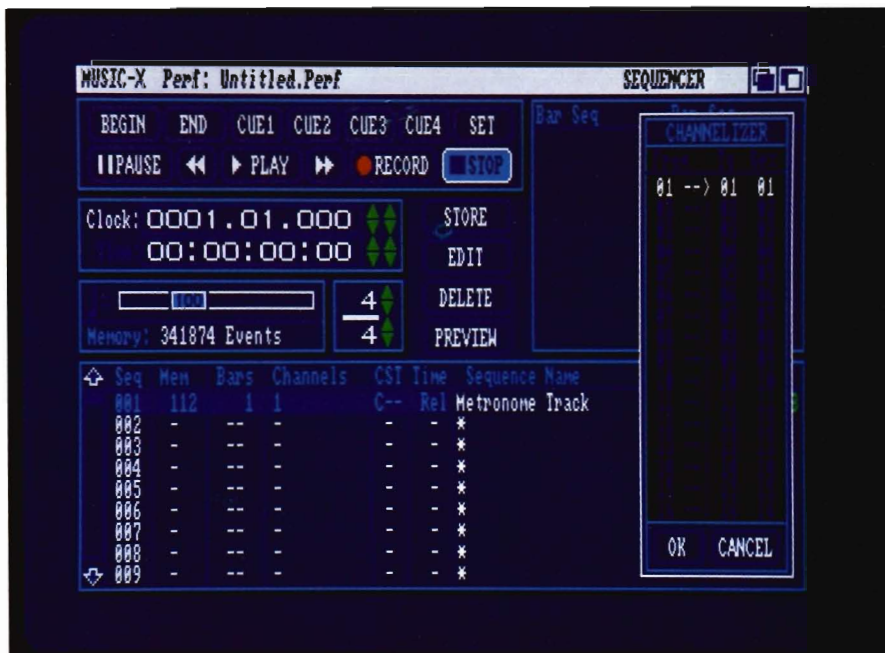
Music-X comes with three non-copy protected disks; the main program disk, a utilities disk, and an examples disk. In addition to Music-X, the main program diskette contains the

protocols for various synths supported, as well as the Modules drawer (more on that later). The Utilities disk is where you will find a harddrive installation program and conversion utilities for converting Music-X files to SMUS and standard MIDI format (bilaterally). The Examples disk is where you will find library files for several synths, patch editors, keymaps, and Amiga sound samples.

The manual for this product is a massive 480 pages, including a very extensive index and a glossary covering a variety of terms associated with matters ranging from basic Amiga operation to video terminology. It provides clear illustrations early on that cover basic MIDI cabling, on up through Music-X Librarian Protocol creation procedures. The emphasis of this manual is established in the beginning pages where manual author Matt Nathan states, "when you want more detail, or if you feel stuck, you'll find that this manual has been designed to keep you moving as quickly as possible." In this goal, the manual succeeds quite well. Relevant sections are clearly captioned in the table of contents, and laid out in the form of independent sections on the subject. A bonus to this process is the footnotes below discussions of individual topics that reference other related sections.

Although this manual's concept and layout is a superior tool for a "get it as

Music-X's opening Sequence page shown with the channelizer active



you need it" approach, there are some inconsistencies that cause the information provided to be unbalanced. The early part of the manual covers topics such as using Amiga file requesters and defining and using directories on the Amiga. On the surface, this may appear too elementary to be included in any place except the Amiga's user manual. However, if we assume that Microillusions included this information to address those individuals who might purchase an Amiga for the purpose of using the Music-X system, it is a very intelligent move. By following the Music-X manual, a new user could find his way through the Amiga's O.S. and conventions and be using the program in a short time. Ironically, there is an absence of what I would consider a good tutorial on the subject of Music-X. For many, the myriad of capabilities contained in Music-X may prove much more intimidating to a new user than AmigaDos.

The program can be loaded from either Workbench or CLI, and requires a minimum of 512K, although at least 1 meg is recommended. Upon loading, Music-X will grab as much ram as possible. (You can restrict this amount by setting the buffer size in the program's info Tool Type).

Sequencer Page: An Overview

As with most sequencers, you are immediately brought into the Sequencer screen. Music-X calls this the sequencer "page," and refers to other screens in the same manner. This is where most of your recording will take place (although you can also record in the edit page). The sequencer window is the most prominent feature on this page, and numbered sequences are arranged vertically with sequence specifications arranged left to right. Specific information regarding sequences available through this screen includes:



The Filters Page allows you to set parameters for some of Music-X's most powerful functions

memory used in bytes (Mem); how many bars long a sequence is (Bars); MIDI channels contained in the sequence (Channels); the presence of Music-X events in the sequence (CST); the time mode used to record this sequence (Time); sequence name; Output Bank (Out); and adjustment of sequence offset (<<>>).

There are 250 memory resident sequences possible with Music-X (dependent on memory constraints). Now, this number might evoke some confusion when considering the fact that the program is a 20 track sequencer. What this means is that the maximum number for simultaneous output is 20, but the tracks may be composed of many more sequences. This is of great benefit when considering that Music-X supports functions like the reception/transmission of System Exclusive data which may be recorded as sequences. With the available number of sequences, dedicated control sequences can be created which can be tied to the clock to perform functions such as Music-X's

internal events like Play Sequence (PSEQ) and Change Tempo (TEMP).

In the upper left of this page is the tape transport-style controls that have become the standard analogy for controlling sequencers. In addition, Cue points may be set from this panel. Also in the upper left of the Sequencer screen are the clock displays. The program supports both Relative and Absolute time. Music-X defines Relative time as that which is linked to musical beats and measures. Absolute time is expressed in hours, minutes, seconds, and frames. (This time mode is used most commonly in conjunction with SMPTE functions). These clocks may be edited manually to get to a given point in a composition.

The main Tempo slider resides immediately below and can be used to control the tempo of the overall performance. The indicator on the slider displays a value that changes as you adjust your tempo, giving indications of

(continued on page 44)

The Three Bears

The Latest Robot Reader Educational Program for Children

by Elaine White

If you are interested in children's programming for the Amiga, then you have probably discovered Hilton Android Corporation's Robot Readers. If you haven't seen one of these programs yet, not only have you overlooked half a dozen children's programs, but you have missed some good educational programming for the young child. The latest story to arrive is "The Three Bears (Goldilocks)." Everyone should

be familiar with this story about Papa Bear, Mama Bear and Baby Bear and their porridge, chairs and beds. Stories that are already available for the Amiga include "Chicken Little," "The Three Little Pigs," "Little Red Hen," "The Ugly Duckling," "Aesop's Fables" and "Noah's Ark."

These stories are designed to help teach young children how to read. They are easy for a young child to use because the programs are operated entirely by using the mouse. The keyboard can be moved out of the way if you wish. For ease of use, either

mouse button may be pressed. The program controls, actions and results are the same for all the Robot Readers - when you know how to run one story, you can run them all. The best example of this is the two page instruction manual included, which is not specific to "The Three Bears," but is common to all Robot Readers. The disks are not copy protected, and the manual recommends that you make a backup copy, a good idea when children are the users.

"The Three Bears" is a faithful retelling of the popular story of Goldilocks and the Three Bears. The language is kept simple, but the story also contains a few more challenging words. Words like, "answered, squeaky, and medium" appear periodically in the story, so that they become familiar. The pictures are bright and colorful and objects are easily recognizable. The text is large and easy to see. "The Three Bears" story is thirty screens long, and each screen has one to three sentences of text. After the last screen, the program automatically returns to the title screen to start the story over again. The Amiga must be turned off or rebooted to stop the Robot Reader (which is a poor substitute for a quit option).

A control bar appears at the top of each screen. It contains five actions that can be selected. When you click the mouse button on [page], the next

Characters in "Three Bears" are depicted in bright colors to hold the child's attention



page or screen of the story will appear. When you select [read], the text will be read aloud. As the Amiga reads each word, that word is highlighted. In this story, the color of the words change from black to red. You can stop the voice at any time by pressing either mouse button.

The speed at which the voice reads the text can be changed by using the [F] (for faster) and [S] (for slower) items in the control bar. Reading speed can be varied in increments from 40 words per minute to 400 words per minute. The program announces the speed at which it will read the text. The default speed is 125 words per minute, which is a good speed for a child to listen to the story. At fifty words per minute, the speed is good for a child to be able to look at each word as it is read. Any speed over 200 words per minute has all the appeal of playing those old 45 records at 78 RPM.

The remaining item on the control bar is the [G]. Selecting the [G] activates a word recognition game. The voice will ask the child to find a particular word in the text. If the child moves the arrow to the right word and clicks the mouse button, there will be a friendly beep and the word will be spoken and change to red. The game will repeat the question if the [G] is selected again. When all the words on the screen have been correctly selected, the entire text changes to blue, then back to black.

A very nice feature of Robot Readers is its ability to sound out the words for the child. When any word of the text is selected by moving the arrow to the word and clicking on it, the word is highlighted in red and pronounced. If the same word is selected again, three steps then occur. The word is pronounced by syllables, with each syllable highlighted in blue as it is spoken.



By clicking on major features in your picture the program will cause the word corresponding to the picture to be spoken by the Amiga

Then the word is sounded out by letter sounds, with each letter sound highlighted in purple as it is spoken. And finally, the whole word is highlighted in red as it is pronounced once more. This feature seems particularly suited to the slightly older beginning reader who might want to try reading the text by himself, but needs some help on the more difficult words.

There is also a feature that appeals to all children, but especially the very small non-reader. If the child moves the arrow to one of the story characters in the illustration on the screen and presses the mouse button, that character will be highlighted and its name spoken. This also works for many of the other objects in the illustration.

It is a simple matter to select a mixing bowl, a spoon, porridge and even the steam rising from the porridge. But it was disappointing that this attention to detail was not uniform. While I could be told about every very tiny white flower, pink flower and violet

flower in front of the bear's house, when I hoped to hear about the roof, chimney, door, windows or shutters, all I heard was "house."

I feel they missed the same educational opportunity with Goldilocks, where I hoped to hear things like hair, shoes, socks and dress, rather than just "Goldilocks." I appreciated these descriptions much more, however, when I went back and reviewed "The Three Little Pigs" and "Aesop's Fables" for comparison. In those stories, sometimes only the characters and one or two other objects could be named. So now, I find I need to commend "The Three Bears" on its improved naming capabilities. But I'm still looking for more.

I am impressed with the quality of the speech in this story. The words are clear and easy to understand at any speed a sane person would want to use. The pronunciation of the words by syllable and by letter sound is of good quality as well. I found that I needed to

(continued on page 62)

Music-X (continued from page 41)

both a relative position along the track, as well as a numeric value.

Adjacent to the tempo slider is the Time Signature indicator. Music-X supports a time signature range of 1/1, through 64/16. The track window is located in the upper right of the sequencer page. During playback, a visual status of track activity is shown in the form of which sequence number (Seq) is currently playing and the rela-

also available through Music-X's extensive keyboard shortcuts). Looking at some of these controls, from left to right:

Mode menu - Selections for moving between the Sequencer, Filters/Keymap, Samples, and Librarian pages. This menu also contains a "Suspend" command that releases the otherwise monopolized serial port for other serial functions.

any combination of standard MIDI events, Music-X internal events, or System Exclusive events. When Copying or Merging sequences, a requester prompts for your destination sequence (since the "from" sequence is always the one that is highlighted). You can also set punch-in/punch-out points from here (although using these keys F1 and F2 equivalents would make a whole lot more sense).

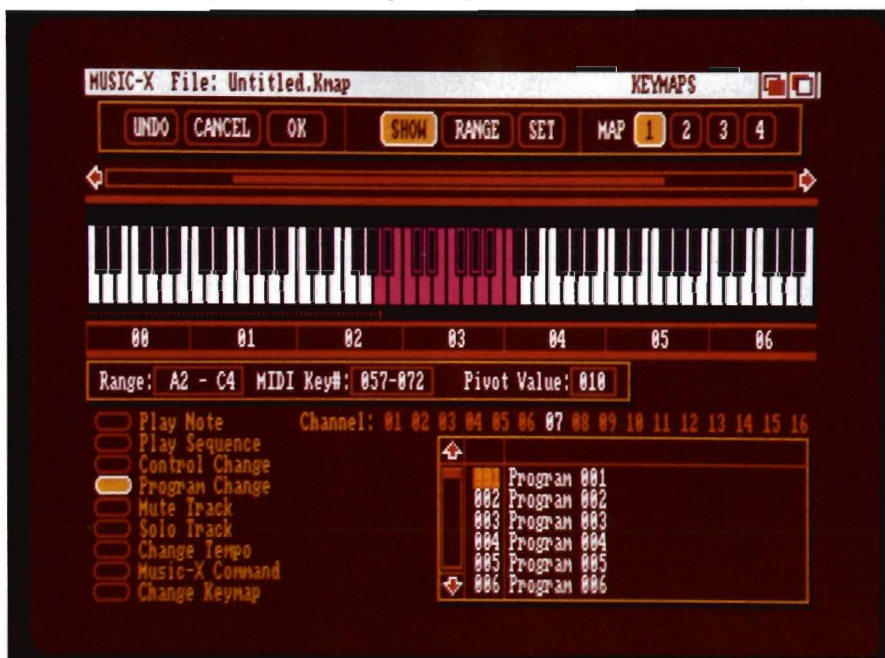
Another important feature contained in the Options menu is a selection for activating the Output Channel window.

This "Channelizer" allows you to map selected MIDI channels to other ones during playback. This is a great time saver when you are working with a variety of multi-timbral modules, looking for just the right sound for that happening part you just created. Although this method of Channel re-routing is not new to sequencer programs, I particularly appreciate the fact that you can operate this panel *while* the sequencer is playing back. By setting up a sequence loop and auditioning various instruments through a given MIDI channel, you can save a lot of time in making these kinds of determinations.

Sync menu - Choices for the Sequencer Master Clock are at the top of this menu's list, and a variety of settings are available, including syncing to the Internal clock, MIDI clocks, Video Clock, Midi Time Code Reader, or SMPTE. In the case of syncing to Video clock, a time reference is established by latching up with the Amiga vertical blanking interval signal. A Time Code rate may also be specified through this menu, with rates of 24 FPS (frames per second), 25 FPS, Non-Drop frame, or Drop frame available. Other Midi related functions are enabled from the sync menu, including Midi Start/Stop recognition, Midi sync out, and Song Position Pointer.

(continued on page 46)

Keymapping is used to accomplish sophisticated event changes remotely



tive location (Bar) of the sequence in real-time. Recording a sequence is very straight forward in Music-X. By clicking on the Record gadget (or pressing "R" on the keyboard) you call up the Record Sequence window. This allows you to set up certain record parameters, such as Loop or Mix Down modes. You can also specify count-in and total record times expressed in bars.

In the title bar of the sequencer page, a variety of controls are available through the pull-down menus (they are

File menu - This menu is where you Load, Save, and Merge Performances. There is also an option for loading individual sequences. Saving your work as a Performance file in Music-X will store the status of all parameters, including information from the other pages, such as Amiga samples.

Options menu - This is where you will find provisions for Copying or Merging individual sequences. You may also choose to Extract a sequence. This function is MIDI channel specific and allows you to extract a sequence on

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Modules menu - This menu differs from the others in two ways. First, the modules change according to which page you are in. Secondly, this is an expandable menu where newly developed modules from either Microillusions or third party companies can be installed to be recognized upon startup. Currently, commands for opening both a new CLI or Shell reside under the Modules heading in the Sequencer page.

The Editors

Clicking on the "Edit" gadget will take you to the program's Bar Editor page. The main screen displays the Midi events in graphic form, with time on the horizontal plane and pitch on the vertical. A vertical line is used as a locator for current position within the sequence. The piano-style keyboard along the left border supplies a pitch reference, and editing tools such as Add, Move, Select, and Zoom occupy the right side border. Feedback for your editing sessions offers two choices, Midi or Amiga, while sequence output may be chosen separately with the same two options.

Modules present from within the Edit screen are Quantize, Scale Velocity, and Scale Aftertouch. The Quantize implementation is thorough, as filters can be set to Quantize based on event Start, Stop, Duration, or a combination of two. Further discrimination is available by setting a minimum and maximum threshold and determining whether all or selected events will be affected.

While certainly not claiming to be a variations generator, this is a respectable implementation of quantizing selectivity. To help establish a fixed order to these time related functions, Music-X uses a "Grid" system that provides a timing reference. The function of the

Grid is very straight forward in that the smaller the Grid, the tighter the corrective movements of the Quantizer. In addition to Initial and Final Level controls, the Velocity and Aftertouch Scaling modules allow incorporation of a random factor that is user set to determine a level of consistency for the desired effect.

One of the nice touches to the editing process in Music-X is the ability to selectively restrict the display of specific event types. You may, for instance, have embedded Program Change messages (PGM) in a sequence that need to be edited. By activating the appropriate switches, you can effectively isolate your Program Change events for editing. This capability also serves as a great learning tool in the Bar editor as you can "disassemble" a complex sequence into its graphic components to familiarize yourself with the way Music-X displays this data.

The Event Editor is accessed through a menu selection in the Edit menu. The event window displays information for the various types of Midi data. This page uses almost the full screen width to display the data, and consequently is able to give a more verbose description of events and their associated velocity/duration. To simplify procedures like adding or changing event types, Music-X incorporates a "quick list" located immediately below the edit window. Activating the desired position on the edit list and clicking on your desired event will change the event type at that location on the edit list.

For events that are based on numerical values, there are at least three ways to alter them. For example, you may need to change a duration value for a given event. All edits start with activating the desired event by selecting it

with the mouse. The first way to change the event is to simply type over the numerals with a new figure. Secondly, you can use the (+) and (-) signs to increment the figures. And third, you can use the editor's "Virtual Sliders" located in the bottom right of the page. These sliders automatically reflect the numerical settings and title of a selected event. You have only to move them in the direction of your desired increment.

A unique and powerful feature common to both editing modes is the ability to record incoming Midi data from within the Editor pages. This capability also brings up a forth way of editing MIDI data. By activating, say, a Midi note value in the event list while tied into a Midi capable instrument, hitting a note on the instrument will result in the note in the event list changing to the note that was sent.

The second highly significant attribute about Music-X's editors is the scrolling function. While a sequence is playing, the corresponding events are highlighted in real-time in the event window. In the same way, the Bar Editor displays a moving vertical line that serves as a synchronous marker for relative position within the sequence. Surprisingly, this capability does not exist in all sequencers, but I have found it to be invaluable for purposes of additions and "debugging" a sequence. A further extension of this handy feature is the fact that you can cursor up or down the event list triggering the events as the cursor passes for really fine control.

The last editing mode is Step-Recording. Music-X allows strictly manual step recording, or the less intimidating Auto-Step function. With Auto-Step activated, the sequencer clock will advance forward in increments equal to the current Grid size setting.

Palette Printer

Optimize Your Color Printer with this Handy Utility

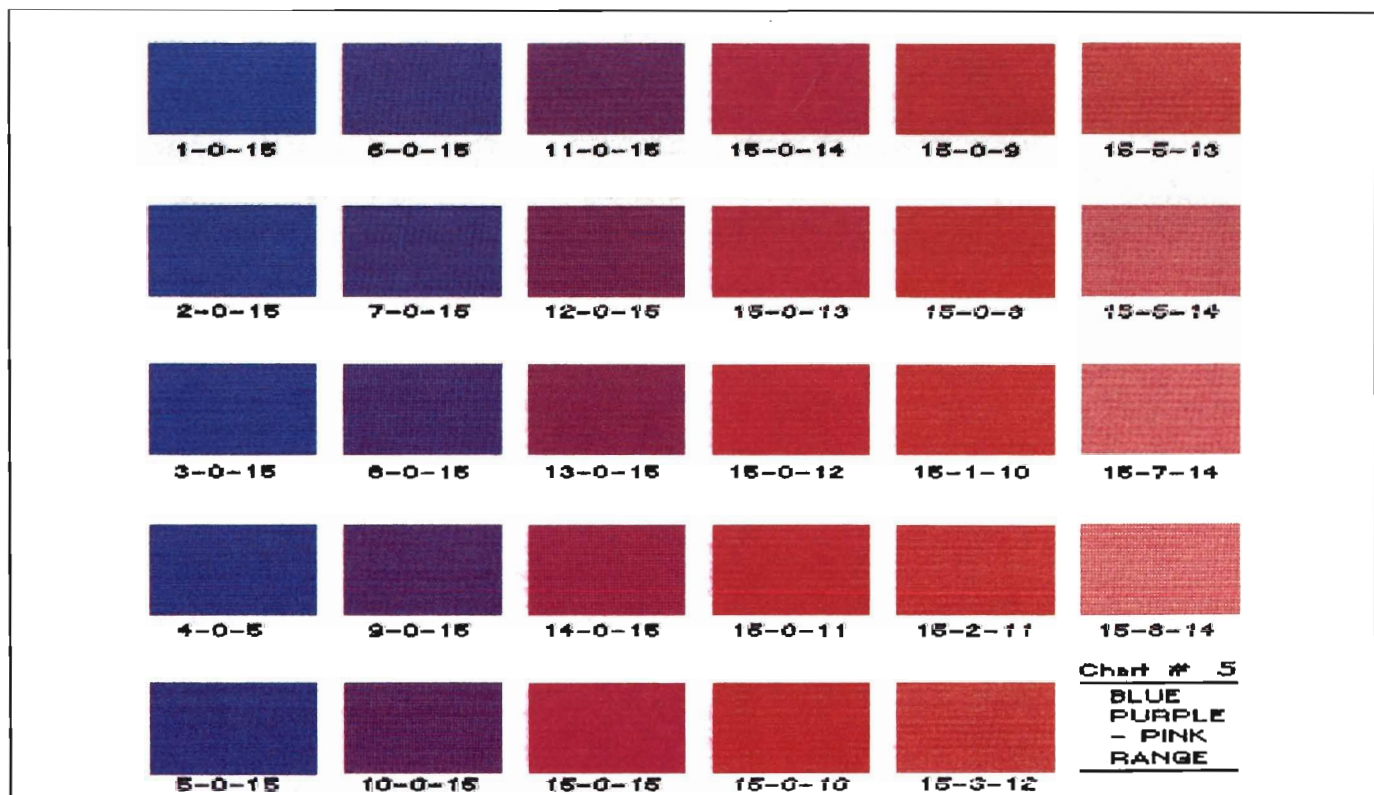
by Steve Kenworth

One of the first peripheral purchases I made for my original Amiga was a color printer, an Okimate 20. Back in the summer of '86 there wasn't much else available, and the Oki was all I could afford anyway. Granted a little patience (screen dumps could take 10 minutes), the re-

sults were very impressive indeed considering the low price, except for a few problems. First, of course, was the CBM printer drivers in 1.1 and 1.2. Printing time aside, you often got color output that bore no resemblance to those on the screen. Blue's especially were troublesome -- pure blues came out purple, and the slightest element of green in your mix gave hit or miss results. To complicate matters, color printers produced hues other than the pure Red/Yellow/Blue/Black

by dithering and dot sizing. I used up many a cartridge of Okimate transfer ribbon in printing out test patterns of various colors so that I might gain some ability to predict the printed results of screen colors.

Early in '87 I saw a Xerox 4020 in action at CBM's booth at the NCGA show, and knew right away that I would have to have one -- the color saturation and resolution were superb, and best of all, the inkjets produced



Palette Printer (continued from previous page)

copy with no horizontal lines. With over two years use, and in the production of hundreds of printouts I've never had a mechanical problem, but even with the driver enhancements of 1.3 and the advent of color correction in the Graphics 2 console, I still experience some color surprises -- again, typically in the blue/green mixtures. I always intended to print-out a bunch of color reference sheets, but somehow never got around to it. After all, it would take 128 sheets to get all 4,096 colors -- who want's to use up all that ink?

Fortunately someone else was willing to go to the effort to make the reference palettes, provide the RGB slider settings, and organize them into a manageable package of 30 IFF files (about one set of ink cartridges on the 4020) that address the most representative and tricky color settings.

"Palette Printer" consists of a single disk (color of course!) with 30 interlaced IFF files, each with an array of 32 color rectangles, with RGB values (0 to 15 system) for each. A tiny pamphlet is included which gives a table of RGB values in both decimal,

hexidecimal (i.e. the 0 to 9, A to F method), and the equivalent YMC (yellow, magenta, cyan) percentage values.

To convert any color to YMC you refer first to the RGB values below the sample box, then to the YMC percentage table, then proceed to substitute, say, a Red value of 8 to 47% Cyan, a Green value of 6 to 60% Magenta, and a Blue value of 12 to 20% Yellow.

One major application for this is to make it possible for you to produce color proof sheets for client approvals on a "relatively" inexpensive color printer like the 4020 or HP PaintJet prior to final printing on the service bureau color Postscript machines. The process would involve selection of YMC colors from the printing industry standard charts, then finding a match to your printers output in the Palette Printer samples (i.e. on paper, not on the screen!). Now adjust your screen colors to the values you need and make your color proof.

In my case, I need to be able to achieve color matches to building materials and the like, with my final output on the inkjet print-out. The procedure is the same. Find a match on the

charts, then adjust screen colors accordingly. The colors you end up with on screen will often appear bizarre -- to get medium blue/green on paper you may have a bilious hue on your monitor, but the end result is correct.

"PP" gives you about 850 color samples out of the 4,096, and

they are usefully organized by hues, values, and the tricky mixes as follows:

The pamphlet makes reference to two color chart pages which include the YMC conversions already worked out, but these were not included with my review package.

Ontological also plans to offer high resolution 4-color process printed charts of these files to registered owners. I did receive, however, an interesting series of print-outs of the especially ticklish "Lake and Sea Range" of blue/greens as produced by the 4020, the HP PaintJet and the Star-Micronics NX-1000 Rainbow printers. Side by side comparisons showed not much difference between the Xerox and the HP (slight hue variances, some slight differences in saturation, more dot texture on the Xerox, but noticeable horizontal patterns on the HP), but the Star yielded much darker and muddier colors.

While it's true that you could produce color charts for yourself and save the \$ 29.95, it is not an insignificant amount of effort and time to do so, and the color choices made by the author, Curt Kass, are quite thoughtful. Compared to many offerings of clip art and the like that I have seen at comparable prices, the Palette Printer represents a really useful effort aimed at professional applications for the Amiga.

Palette Printer \$29.95

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Lake&Sea	Magenta-Purple
Magenta-High to Low Values	Olive Green to Brown
Orange-Ocher	Orange-Brown
Orange-High to Low Values	Purple-Pink
Red-High to Low Values	Red Range
Sky&Sea	Accents & Sea
Umber-Sienna	Value & Colors
Yellow-Red	Yellow-High to Low Values

Source Level Debugger

A New Utility for Benchmark Modula2

by Dave Haynie

It's been about a year since I looked at the first source level debugger out for the Amiga, that being SDB for Manx's C language compiler. Since then, Lattice has released a clever source level debugger with their latest C compiler. Now Avant-Garde Software has released one to go with their excellent Modula-2 compiler system, and in many ways, it's the best source level debugger I've seen on the Amiga to date.

What You Get, What You Need

The Source Level Debugger package is an add-on program to the basic Benchmark Modula-2 compiler system. It comes on a single floppy disk with a bound instruction manual. The bootable disk contains a new version of the Modula-2 compiler (M2), two versions of the debugger itself (M2Debug), the latest notes on this particular release, some utility programs, a debugger support module, and files to support a tutorial on the debugger. If you're familiar with other elements of Avant-Garde's "Modula-2 Software Construction Set" (M2SCS) environment, this part has pretty much the same feel as the others. The system requires only 512k and single floppy disk, though of

course, it's much nicer on a system with hard disk and more memory. Apparently they've gone to great deal of trouble to make a system that will work in 512K; the compiler can be reconfigured to use less memory, there's a special low-memory version of the debugger, and they even have a tool that will drop the Workbench screen down to 1 bitplane, leaving the rest for the programs. On the other end, everything worked perfectly on my fully loaded 68030 based Amiga. All programs in the M2SCS package are launched from the CLI, though once up, they're heavily Intuition-ized where appropriate.

What's It All About

Until you have a decent debugger, you're pretty much in the dark when it comes to tracking down elusive programming errors. If you're only programming in BASIC, your BASIC environment is your debugger. With any other language, you need a separate debugger or you're doomed to lots of recompiles as you insert and delete various diagnostic Write(s) or printf(s) etc. Symbolic debuggers, which can use symbolic label information generated by assembler or compiler, have been around for quite awhile, and were certainly a step in the right direction. If you're programming in Assembly language, it's the perfect debugging tool. But for high-level languages, it's appropriate to debug, at

least most of the time, in the high-level language of choice.

The power of a source level debugger is its capability to examine code just as it was written. So you're single stepping, in this case, by individual Modula-2 instructions, rather than by assembly instructions. Similarly, variables are examined by name and type, so no great knowledge of just how a compiler produces such code is required; you want to see what's in a RECORD, you just examine the record variable. You step in and out of procedure or function calls in HLL terms, not having to worry just how the compiler managed to organize the function calls.

The basics of Avant-Garde's Source Level Debugger are very similar in intent to both of the C language source level debuggers for the Amiga: It allows single stepping with optional step into a procedure/function, variables to be examined and modified, and multiple program breakpoints to be defined.

As with the others, the debugger also supports a number of traditional debugger functions, including display of CPU registers, disassembled output, and display and modification of raw memory.

Set Up For Debugging

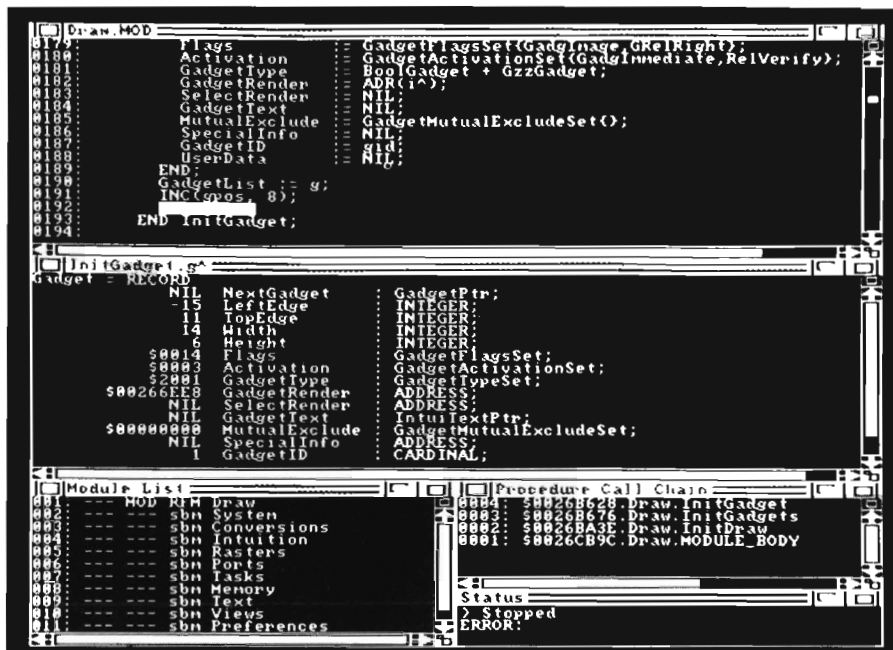
The new version of the Benchmark M2 compiler shipped with the Source

Level Debugger is required to generate useful debugging information. At compile time, the "-g" option is supplied to the disk loaded compiler and linker (an option in the M2Ed program will also take care of this when you're using that editor's integrated linker).

When a program is compiled for debugging, it produces a separate ".RFM" file of debugging information. This is much the same approach that Manx uses with SDB, and while it's not taking advantage of the more standardized debug-hunk facility supported by the Amiga load file format and used by Lattice for their debugger, the additional file size seems to be pretty reasonable, whereas the Lattice output file size can grow extremely large (I've seen about a factor of 10 growth myself).

A Good Example Of Amiga Power

What really sets this debugger off from both the Manx and the Lattice debuggers (other than the fact it's for Modula-2 rather than C) is it's clever use of Intuition objects. While Manx's



SDB is basically a command line driven debugger adequately hooking into an Amiga window, and Lattice's Code-Probe uses menus and a few other Intuition features well, this program manages to make a significant enhancement to it's usefulness through the use of multiple output windows combined with a basically menu and

requester driven user interface. Just about anything you're interested in viewing: the source code, symbolic variables, procedure call chains, raw memory, code disassembly, lists of modules or breakpoints, even data on Amiga system lists like active tasks or available memory, comes up in it's own scrolling window. As things change, they're updated in the appropriate window. While there's no information here that's not available to either of the other source level debuggers, this kind of presentation of the available data constitutes a significant difference.

For example, let's assume we're single stepping through a section of code that's filling a RECORD type. This debugger let's you see the whole operation, interactively. You'd first call up the Symbolic Data window, which scrolls to show every procedure local or module global variable in your current module. This is basically a variable "browser." Using just the mouse, you can walk into and out of RECORDs, dereferencing where appropriate. Once the variable of interest

(continued on next page)



Debugger (continued from previous page)

is displayed, single stepping will cause immediate changes in the variable to be reflected on screen. So it's real easy to follow how the code actually changes the data. If you'd like to change the value of any variable, just select it and press F9. Up comes a requester prompting for the new value. Any of the source debuggers will let you examine a structure of some kind, although once again, this debugger presents this information well.

Another neat thing is the single stepping control. Like most debuggers, this one allows single stepping of the source code, with the option to step into functions and procedures, or to run them at full speed (eg, step them as if they were a single instruction). It's certainly much faster to apparently step around a function call, but should a problem develop down in the subprogram somewhere, you may get hung up. This debugger offers a special continuous single stepping option, which allows a subroutine, or even the whole program to be automatically single stepped. This has all the benefits of manual single stepping, but it's far faster, and the user always has the option to stop the continuous single stepping at any time.

As I mentioned, you have your option of stepping in terms of Modula-2 statements or in terms of Assembly instructions. The nice thing is that you have a window for following each, and the stepping works very nicely in both window regardless of which increment you're stepping by. So it's very possible to see just how the compiler produced assembly code in any situation (and it looks to be quite efficient), though the Assembly window and assembly stepping is probably better for following through any suspect assembly routines called from a Modula-2 program.

He Can Break!

One of the more important features of a debugger is its breakpoint facilities. When you're tracking down a bug in a large program, you probably don't have a desire to single step all the way to the problem area, even if you can step around many subprograms. Breakpoints are set very simply. You just point to a source line in the Source window and click on it twice.

If the Breakpoint window is open, you'll see that line added to the breakpoint list. These are permanent breakpoints in that they stay around until specifically told to go away (again, by double clicking on the source line, or by selecting the breakpoint from the Breakpoint window and choosing "Clear" from the Breakpoint menu).

It's also possible to select a temporary breakpoint by selecting a line and then hitting the F7 key or the temporary breakpoint selection from the Breakpoint menu. Temporary breakpoints work like regular ones except that, upon breaking, the breakpoint is cleared. I've used this kind of breakpoint extensively in both SDB and CodeProbe, and they're really useful for jumping around loops and other similar operations.

The one thing that seems to be missing here is the capability to break on a variable changing value. This feature is available in CodeProbe, and while it can really slow program operation, it's often a very useful feature.

Other Debugger Functions

As with other source level debuggers, there are other features here in common with traditional debuggers. Perhaps the most common of these is a memory display/modification facility. This one is probably the most complete

I've seen. Along with the normal capability to display memory data as byte, word, or longword data, here it can be displayed in any of the 4 commonly used numeric bases, as signed or unsigned integers, as floating point, character, or string. A mouse click on a number and a press of the F9 key lets its value be modified. There are also menu-based commands to search, fill, and copy memory blocks.

Another useful display is the CPU registers display. Registers are always displayed in hexadecimal, though changes can be entered in any of the popular bases. The register display includes all normal 68000 user registers, program counter, status register, and specific indications of the status bits. None of the 68020/68030 or 68881/68882 registers are currently displayed. It would be a nice feature, but not strictly necessary until the Benchmark Modula-2 compiler itself starts to support 68020/30 special instructions or inline FPU codes.

One really nice extra is the Information window, which provides a running display of any number of Amiga system objects, such as resources, devices, libraries, ports, tasks, or memory. While I've used other programs that do the same kind of thing, it's far nicer to have this kind of functionality integrated into your primary debugging tool. Similarly, there's a built-in directory browser tool. It's not exactly required here, but it is sure nice to have handy when you find you need it. The one extra feature I consider "missing" is one I found very useful in Manx's SDB, an operation which Manx calls the "execute" function. Basically, "execute" lets you type in any arbitrary C expression and, providing the required functions exist in your code, the function is

(continued on page 54)

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Debugger (continued from page 52)

evaluated. Being able to evaluate a Modula-2 expression from within the program would be a very useful thing to have around, though I wouldn't call it essential. It would also be nice to see some AREXX interface hooked into the M2SCS system as a whole. Some folks have done pretty neat things with AREXX so far, and it's just getting started.

One Last Feature

The one thing I have yet to cover is the PMD module, which comes with this debugger. This module can be linked into your code during debugging and it's got one procedure, which basically sets up paths to the program source and the location of the M2Debug program. Once this is set up, the program will run normally until some kind of error/exception takes place. At this point, instead of exiting or even crashing in most cases, the program will call up the debugger instead. This has two main uses. The first is obviously for post-mortem debugging, where you only get thrown into the debugger in the event of some drastic crash. Manx's symbolic debugger can do this kind of thing, but neither Manx's SDB nor Lattice CodeProbe seems set up for this kind of operation.

The second use of this is for debugging WorkBench launched programs. The other source level debuggers, for the most part, are only set up to debug command-line driven programs (SDB does have a facility to help out with library/device programming). With the PMD module linked in and properly set up, the programmer can insert a TRAP #0 instruction at the beginning of a Workbench-launched program, which will result in the debugger being called up shortly after Workbench starts the program up. Again, this isn't directly supported by the others, and it's a really useful feature.

Conclusions

In case it's not obvious, I think the Avant-Garde's Source Level Debugger for Benchmark Modula-2 is excellent, as is the Benchmark system itself. The debugger is missing a couple of features some of the C-language source level debuggers provide, and it has a couple unique ones of it's own. But the user interface is far and away the best of the three, as well as one of the best examples of an Amiga user interface I have yet to use.

Lots of thought has been given to user interface issues, far and above what normally falls out of Intuition. Every window scrolls in both directions, and the scrolling is real-time (eg, you see it scrolling as you move the scroll bar). You can pick the color scheme of each window, to set them apart from one another. After you have everything the way you like it, you can save that setup to disk. Take your pick of locating your debugging screens on Workbench, custom, or interlaced custom screens.

I first met Leon Frenkel, now president of Avant-Garde and author of most of the Benchmark system, including this debugger, maybe a year or two ago at a Comdex show, and I was extremely impressed with what I saw from the Benchmark development system back then. It seemed clear that the C compiler people could learn quite a bit from the Benchmark system. Benchmark works from a CLI, but nicely integrates into the Emacs based editor without missing a step, whereas all the C packages look pretty much like what they've had for years under UNIX. I think the Benchmark debugger would stand up to either Manx's or Lattice's, all things being equal. Since it is for a different language, there's now more reason than ever to learn Modula-2 on the Amiga, as with this

debugger (as well as the various support packages available as part of the M2SCS system), this Modula-2 Software Construction Set may be the best high level development system on the Amiga.

Source Level Debugger for Benchmark Modula2

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Deathbringer

Discovering the secrets of the Gems of Zator

by Anthony Bevivino

"**A**ll was peaceful in Mezron until the blackhearted DeathBringer returned... his wizard's corpse resurrected into living flesh. Now the landshivers with the screams of the innocent. The blood of brave warriors stains the once tranquil sea.

Azazael the DeathBringer is alive and well, and he hungers for revenge on those who buried him. Should he

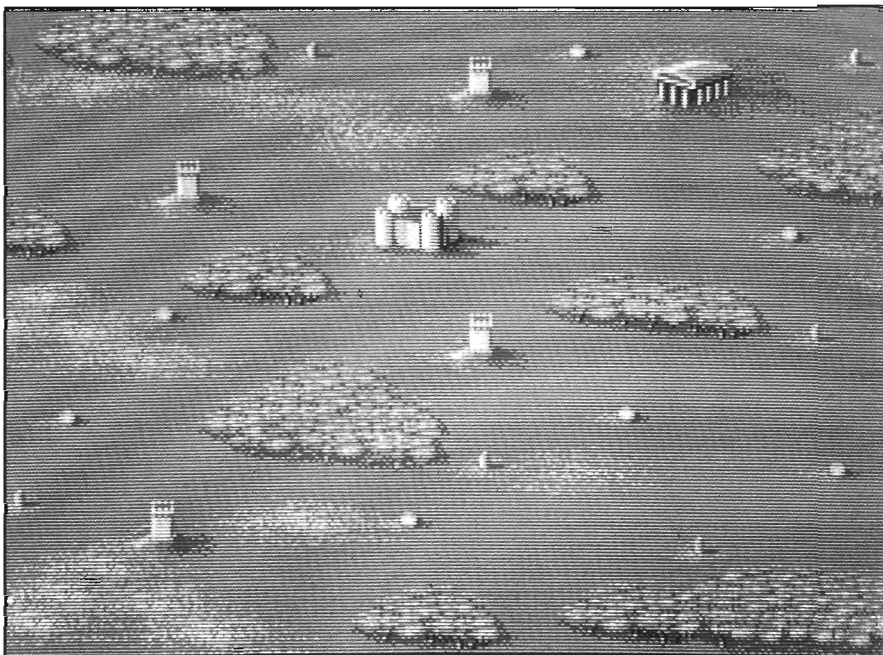
recover the five gems of Zator, his magical powers will be unstoppable-- unless you discover the whereabouts of the gems first!

Become the leather-skinned barbarian who ventures to save Mezron from certain destruction. Armed with a simple dagger and the most basic supplies, you will explore a vast countryside to discover the secrets of the gems of Zator and those who guard them. Much will be required as you come face to face with the most blood-curdling creatures ever to roam this universe. Leave no stone unturned and

you may yet discover the magic, weapons and armor required to defeat the DeathBringer!"

DeathBringer is a newly released fantasy adventure game from Cinemaware. In this game, you are the barbarian hero who must find five magical gems, each hidden in an unknown and deadly corner of the realm, and return them to the King, so that he may defeat the evil and powerful Azazael the DeathBringer. You start out with the most basic of supplies and must journey from the castle to complete your adventure. Be prepared to meet deadly foes, powerful magic, perplexing dungeons and high adventure.

An overhead view of the Deathbringer playfield



This game is touted as the successor to Dungeon Master, a game I reviewed previously and feel is one of the best adventure games released to date. Because of this claim, I will make many comparisons between these two games, and will see which one is truly the best.

DeathBringer is primarily a graphics-adventure game, and as such, the graphics are extremely important. The format of the graphics is very similar to Dungeon Master. You get a first person, head on view, and this is done very well. The perspectives are good and add to the game. The graphics are of very high quality, but I found this quality to be unevenly distributed.

(continued on next page)

Deathbringer (continued from previous page)

Some characters, scenes or items were so well done I was astounded, while others were average at best. As to whether or not the graphics are better than *Dungeon Master*, it is difficult to say as the graphic styles are too different to compare. *DeathBringer* does make excellent use of color. Almost every screen is vivid and alive with tasteful colors well-suited to what the scene is portraying. Once again, though, some of the characters and rooms are exceptional, far above what I found in *Dungeon Master*, while others are substandard.

While *DeathBringer* holds its own against *Dungeon Master* in the graphics department, it is far behind when it comes to sound. There is hardly any sound at all in the game, but to its credit, the limited sound is well done. *Dungeon Master* impressed me with the accuracy of its sound; if you heard a slithering on the left speaker, you could be sure there was a monster roaming somewhere to your left. This is not the case for *DeathBringer*. For most of the time, the game is silent, no background music, no sounds of movement, etc. There are sounds during combat, and occasionally some background noise, such as the howling of wolves in the Gnome Forest, and while these are good, they are not frequent enough to have any great impact on the game. I am a supporter of quality sound in games and a sufficient quantity as well. Unfortunately, I was not satisfied with this area in *DeathBringer*.

The screen set-up and organization for *DeathBringer* is similar to that of *Dungeon Master*, and for this I am grateful. Almost all of the graphic information you will need to play is on the screen at once, so you do not have to flip through four or five different screens constantly. This allows for fast moving action and ease of control. The top half of the screen is the Action

Screen (this is what the eyes of your character see). Just below this is a thin Message Window where messages scroll across. I was pleased to note that the speed of scrolling was brisk but very readable. Below this is the control center for the game. In the middle is the Commands Screen where your command options are available. To the right of this is the Movement Arrows. Just click on one of the four directional arrows and you move in that direction. It is also possible to move using the arrow keys on the keyboard. To the left are the Command Icons, of which there are six, and each one is important to the game.

The small sword is the combat icon, and you click on this to bring up a list of weapons to use and then click on the enemy you wish to strike. To the right of this is the compass window, it indicates the direction you are facing (N, S, E, or W) and is always accurate, as well as useful for mapping. Next to this is the potion icon. Clicking here brings up a list of the potions you have, after which you can click on that potion to quaff a dose. There is also the heart-shaped Fitness Icon. This informs you of your Health, Stamina, and Strength respectively, and you MUST keep careful track of these stats if you want to survive for any length of time.

There is also the Commands Icon which lets you perform a variety of functions, such as talk, run or buy healing. The final icon is Scroll, and this brings up a list of spells you are able to cast, these being determined by the scrolls or spell books you have found in your travels. Learn to use these icons wisely and well. You must move quickly with them if you hope to survive.

Like *Dungeon Master*, the entire game is controlled with the mouse.

Also like *Dungeon Master* control is both fast and accurate. There are a few commands that can be accessed by the keyboard, but most commands are from the mouse. I was very pleased with this method of control, and it made long hours of gameplay simple and easy. Combat in *DeathBringer* is similar to that in *Dungeon Master*, but simpler. You click on the Combat Icon, select a weapon in your possession, and click on the enemy you wish to strike. There are no thrown weapons, and combat is less engaging than in *Dungeon Master*, but it is still acceptable.

In the area of magic, *DeathBringer* falls far short of the excellence of *Dungeon Master*. Once again, there is an emphasis on simplicity rather than intricacy, and this takes away from the game. The only way to cast a spell is to have a scroll with one of the seven spells in the game on it and read the scroll using the Scroll Icon, at which time the spell is cast and the scroll is gone. I was disappointed that there were only seven spells, and no magic points or spellcasting ability to determine what was cast.

As to the monsters you must fight in the game, there are both good and bad points. There is a good variety of monsters, much more than in *Dungeon Master*. I was very happy with the different types of monsters and the way they were suited to the terrain. I was also impressed with the detail of the monsters. Each type looked different and was easily discernible. What I was not happy with was the size of the monsters.

Unlike *Dungeon Master*, the monsters do not appear three or four moves away and gradually get larger as they approach. They are only visible when they are in position to attack, and are all about the same size.

Once you have slain the monsters, you get to one of the more enjoyable parts of the game: getting your treasure! This area of the game is average. There is no great diversity of items, but you don't always find the same old treasure. I am sure that as you get into the lower levels of the dungeons, more of the reported six-hundred items will surface and make for more interesting treasure troves.

Once you have found an item, what do you do with it?? This question was answered in an exceptional fashion by Dungeon Master which had the best system of inventory organization of any adventure game I have played. DeathBringer tries to emulate this method, and while it falls short, it still is well above average. You are given a picture of your man and you can bring down a window which shows his inventory. To the right is the inventory in the area you are in, including items on dead monsters. Just drag items from one window to another and it is done. You are only limited by weight, so don't load up early and have to leave something behind. This is a good system to use, and while not as easy to use as Dungeon Master, it was very usable.

The one major flaw I found in Deathbringer is the slow transition from screen to screen. There is a slight pause when moving that I found to be annoying. When I knew an area well, I



Deathbringer's screen is laid out logically for quick access to your survival tools

wanted to breeze through it but had to wait because of the transitions. I played DeathBringer on an Amiga 1000, and on an Amiga 2000 with 1 meg of chip ram and a 68020, and there was no change in these transition times.

Another complaint is that only one drive is used, regardless of how many you may own. In a game that requires two game disks and a save game disk, there is no reason that players should be limited to one drive if they own more. This does not really slow the game, but it annoys me because the problem should not even be here (especially from Cinemaware) to complain about if some thought were given to this very basic programming consideration.

As far as gameplay goes, though, DeathBringer is exceptional. I truly

liked this game. It is very challenging and offers many aspects of adventure gaming that I am sure will appeal to a wide variety of players. It is fast, and yet has a lot of complexity, which should appeal to veteran gamers.

In the final analysis, I do not feel that DeathBringer is as good as Dungeon Master, but it is definitely a close race. (Considering the high quality of Dungeon Master, that is certainly a compliment.) DeathBringer would definitely be a great follow-up for any gamer who enjoyed Dungeon Master.

Deathbringer \$ 39.95

Cinemaware Corporation
4165 Thousand Oak Blvd., Suite 180
Westlake Village, CA 91362

(805) 495-6515

Sim City

You Are in Control as you SIMulate the Problems of a City

by Steve Ushioda

Just about everyone has complaints about cities. Taxes are high. Crime is rampant. Roads are congested. Have you ever thought YOU could do a better job? Create and maintain a better Metropolis? SimCity, an entertainment/educational simulation from Maxis Software, gives you the tools to do just that. With it, you can be the mayor of an existing city, or city planner of some undeveloped land. You can zone areas, build public services, alter budgets, and generally take control of a city. You may also choose to serve as Mother Nature by creating natural disasters such as earthquakes, floods, tornadoes, and Godzilla attacks. There are also eight scenarios in which a pre-made city has a major problem (such as crime or traffic), or is about to experience a disaster. The object here is to correct the problem or recover from the disaster in the allotted time.

Of course, no city would be complete without its citizens. All Simulated Cities are inhabited by Simulated Citizens (or Sims, for short). Much like real people, they build buildings, create problems, complain about the problems, get into traffic jams, and do practically everything else typical of city inhabitants. SimCity is primarily controlled from the "editor" window,

using the mouse and keyboard. This screen consists of a close up map, a box of icons, and a menu bar. The map shows a bird's eye view of the selected area, and can be scrolled in any direction. All landmarks such as zones, transit systems, and public buildings are graphically depicted. Natural terrain, like forests and waterways, are also shown. The graphics in the editor window are separated into blocks of land, so that only one type of terrain (natural or otherwise) can fill the block. Information about a block of terrain can be estimated by the graphic occupying it, or by using the query command from the keyboard.

The icons contain all of the tools needed to build or change a city. They are very similar to those used in most painting programs, but instead of painting tools, the icons represent parts of a city. There are three types of zoning icons: residential, commercial, and industrial. The powerplant icon must also be used, and the resulting plant connected to zones with power lines (a separate tool).

Other buildings like police departments, stadiums, seaports, and airports, are also represented by icons. Road and/or rail tools are needed to lay transportation routes, while the park tool is used to bring up property values in depressed areas. Prior to building anything over natural terrain, you must use the bulldoze tool (or the

auto bulldoze menu command) to clear the area. After doing this, simply select an icon and click on the map where you want it to be.

File commands, options, disasters, and other windows can be accessed using the menu bar. Cities can be loaded, saved, or printed using the files menu. You may print a city on one page, or make a multi-page poster.

The options menu lets you turn on or off parameters such as AUTO BUDGET, AUTO BULLDOZER, AUTO GOTO EVENT, POWER BOLTS, and sound. The AUTO BUDGET keeps the same budget every game year without asking if you want to change it. Normally, a budget window appears every year for your approval. AUTO BULLDOZE automatically clears any forest or coastline that you build on. GOTO EVENT moves the editor map to the sight of a disaster or major event if one occurs. POWER BOLTS signal unpowered zones and buildings by a flashing lightning bolt. The game speed is also controlled in the options menu. It can be set at fast, medium, slow, or paused.

The disaster menu allows you to create natural disasters in a city. Fires, floods, airplane crashes, tornadoes, earthquakes and monster attacks are the selectable disasters. They can also occur "naturally" by chance or by bad

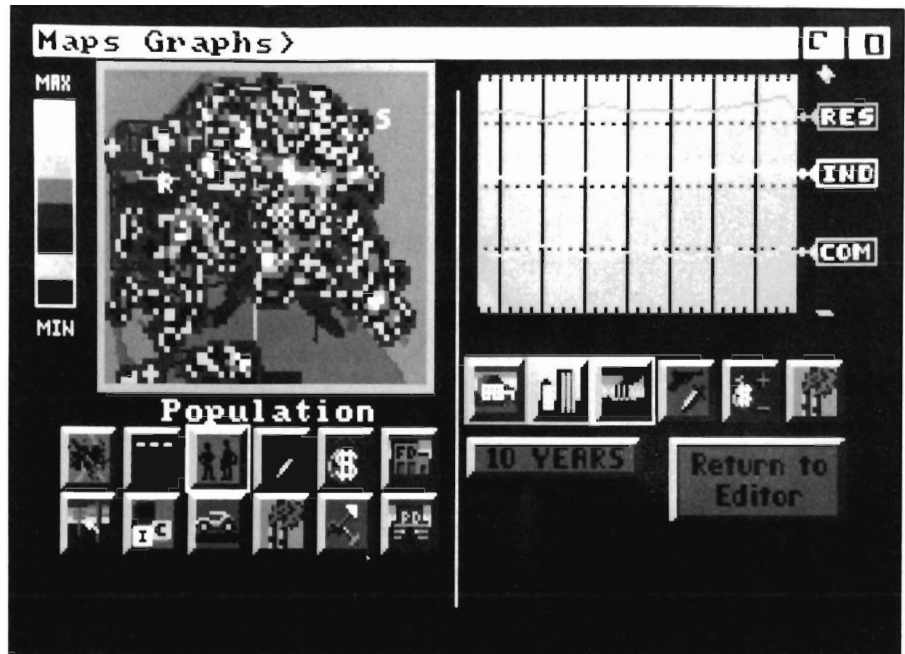
city planning (a monster attack, for example, is provoked by too much pollution). Nuclear meltdowns and shipwrecks can also occur naturally but are not accessible by the disaster menu.

The budget, evaluation, or map and graph windows can be accessed through the windows menu. The budget window allows you to set the tax rate and funding for city services (police, fire, and transit). It also calculates the city's income by subtracting funding from tax collections. This window normally appears every year (in game time), unless AUTO BUDGET has been selected.

Every year there is a poll taken among the citizens of a city, rating your performance and identifying major problems. Statistics of your city are also tabulated, resulting in the evaluation window. The public opinion section tells what percent of the population thinks the mayor (you) is doing a good job. The four worst problems of the city are displayed in descending order with the percentage of votes next to them.

Common problems include taxes, housing, crime, traffic, pollution, and unemployment. The statistics portion of the evaluation window displays population, net migration per year, value of city owned property, category based on population (village, town, metropolis, etc.), game level, and overall city score. The initial game level you select determines how much starting money you receive, the chance of natural disaster, and the tolerance of citizens to hardships. Overall city score is a relative number based on many factors like crime, pollution, taxes, and unemployment.

For any city planner, the "big picture" must be remembered at all times. The map and graph window allows

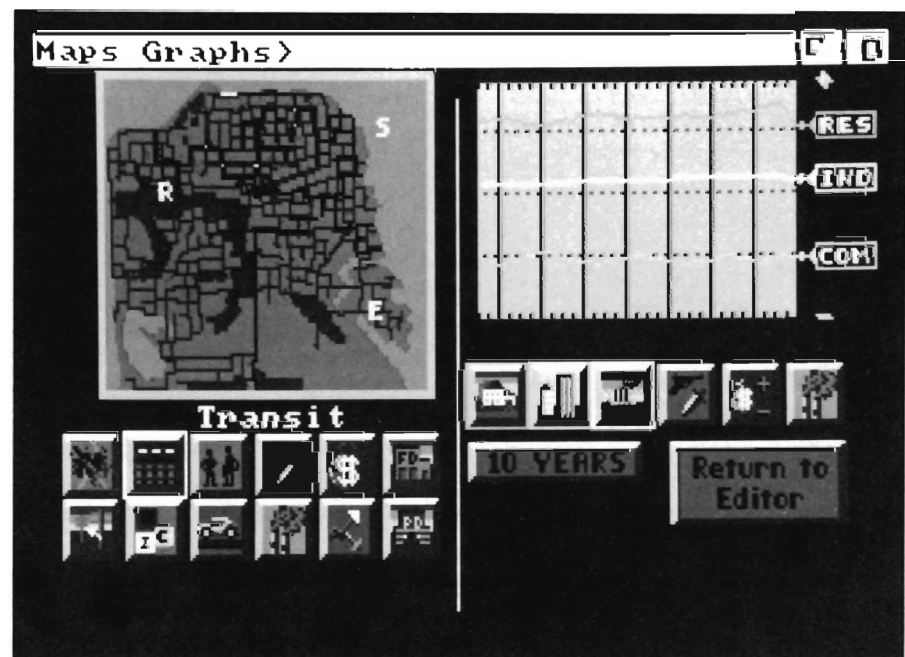


Statistics on population and transit are plotted in your graphs display

you to look at your city from a distance, or view its progress over time. The map portion is a "satellite's eye" (as opposed to "birds eye") view of the ten mile square area that the city occupies. Only the largest of cities fill the entire area, so boundaries are usually

not a problem in the early stages of building. Twelve different maps describe different aspects of a city and its people: City form, power, transit, zones, population, traffic, crime, pollution, land value, growth rate, fire pro-

(continued on next page)



Sim City (continued from previous page)

tection, and police protection. Maps are useful for finding out what is going on where, but the graphs section of the maps and graphs window is necessary for monitoring the history of your city. It can also be used to find trends and adjust playing style to benefit future plans for a city. This window is in line graph format with different color lines indicating different categories. Residential, commercial, and industrial growth is indicated on a ten or 120 year scale. Averages of crime, pollution, and city funding are also calculated and displayed over time.

In addition to creating and managing your own city, you can manage one of the eight pre-made cities, with or without an impending disaster. The cities and their problems/disasters include: San Francisco (earthquake), Bern (traffic), Hamburg (bombing), Rio de Janeiro (flooding), Detroit (crime), Boston (nuclear meltdown), Dullsville (boredom), and Tokyo (Godzilla attack). After loading a scenario, a brief

description of the problem or disaster is displayed along with the time allotted. When this time expires, a special vote is held deciding whether you handled the situation well enough.

The documentation and packaging for SimCity is excellent. The manual includes an article on the history of cities and a section with some strategies for playing. A bibliography and reading list is also included for anyone interested. The package cover is a clever drawing of a handheld SimCity machine. Complete with buttons and dials for disasters, budget settings, energy levels, and dates, it can only be fully appreciated after using the software.

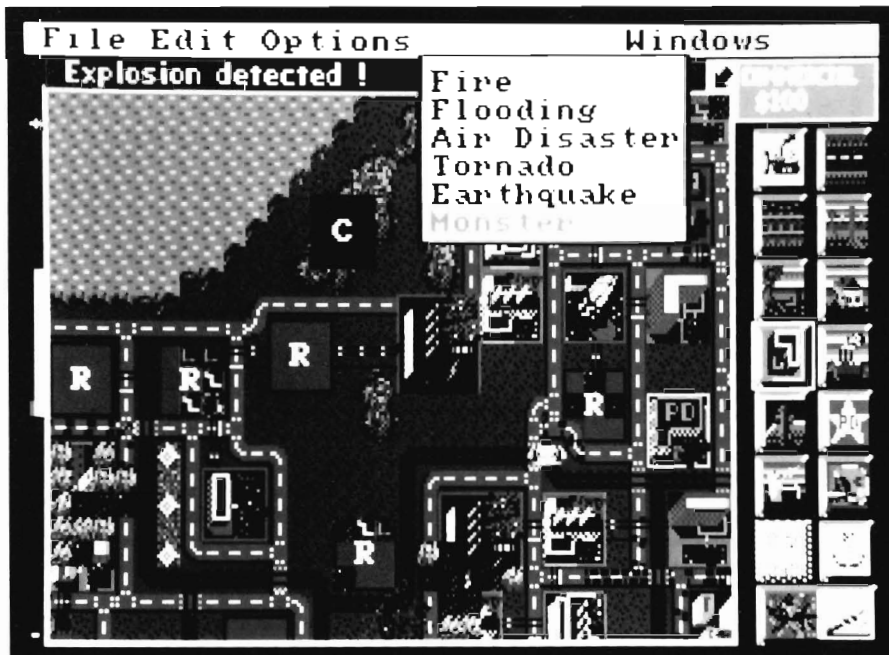
SimCity can be easily installed on hard disk, and uses a key disk based copy protection system. It loads quickly from one disk and can be booted from workbench. However, when I first started playing SimCity, I could not seem to load some of my saved cit-

ies. This was solved by a call to the manufacturer, who acknowledged a bug in the program when a city is saved while paused.

I have been very pleased with SimCity in virtually every way. It requires a long term effort that is usually only characteristic of adventure games which have no "real-time" action. The graphics are clear and well animated. Traffic moves, buildings rise, smokestacks churn, trains run. In fact, the entire game is reminiscent of a futuristic "train set" which doesn't require as much of an imagination as the old fashion kind. It is also similar to "Little Computer People", although on a much larger and more sophisticated scale.

The instruction booklet designates SimCity as "the first of a new type of education/entertainment software called SYSTEM SIMULATIONS." The object of a system simulation is not to "win" or "lose", but to figure out the system and take control of it. I found taking control of my city thoroughly enjoyable and look forward to seeing more system simulations Maxis Software. Until then, however, I encourage you to purchase SimCity and hope you find it as excellent as I have.

You simply pull down the disaster menu and order up anything from a fire to Godzilla



SimCity \$ 44.95

Maxis Software
953 Mountain View Drive
Suite #113
Lafayette, CA 94549

(415) 376-6434

DejaVu II

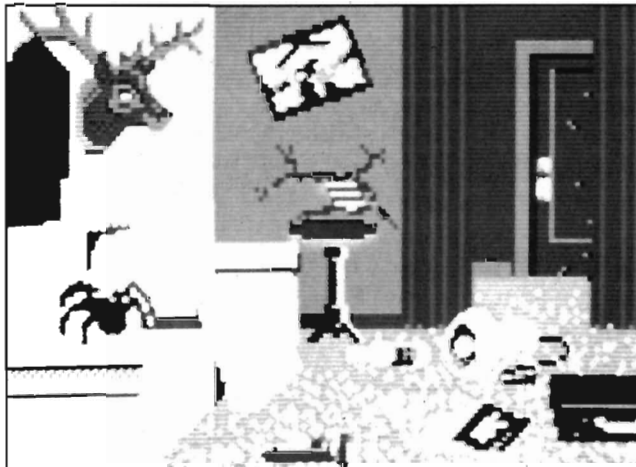
Lost in Las Vegas

by Steve Ushioda

You wake up from a stupor that feels like a chronic hangover after a wild week in Vegas. There is a throbbing bump on the back of your head... As you come out of the fog, you breath a sigh of relief as you realize that you still know your own moniker, Ace Harding. With that, the events of the previous 48 hours start to float back... You recall being abducted from Chicago by two thugs who then brought you to their boss, Tony Malone -- the notorious Las Vegas mobster. According to the word on the street, there had been some kind of connection between Malone and Joey Siegel, the racketeer of whose murder you had recently been cleared. As you discovered last night, Siegel had been running rackets in Chicago as Malone's leg man, and his untimely demise left \$112,000 of Malone's money unaccounted for. Since YOU are the logical scapegoat, Malone has now made you an offer you can't refuse: either cough up his hundred and twelve grand in one week's time or it'll be the classic "or else" for you! Just to make sure you don't get any funny ideas, you'll be watched closely by Stogie Martin -- Malone's personal tor-

pedo." This is the opening message in "Deja Vu II," the sequel to the game "Deja Vu: A Nightmare Come True." "Lost in Las Vegas" uses the same gaming system as the original, but has an improved and expanded "world" in which to adventure.

The basic idea of the system is to allow the user to have the flexibility of a



word parser, without having to type and guess which words the program is looking for. Although word parsers have been virtually perfected by companies like Infocom, they can become frustrating if you don't use the correct words. Icom Simulations has done a very impressive job of solving this problem, using the mouse as the sole input device.

The adventuring screen is divided into six windows: graphics, com-

mands, inventory, text, exits, and the "self" window. The graphic window contains all the objects in the room as well as its background. All objects are in the form of selectable icons. When used with verbs located in the command window, objects can be handled with ease.

The command window includes actions such as EXAMINE, OPEN, CLOSE, SPEAK, OPERATE, GO, HIT, and CONSUME. To perform an action on an object, the object and verb must be clicked on one after the other (in either order). An exception to this is the OPERATE command which can handle two objects. This command must be employed when more than one object needs to be specified. If you wanted to drop a quarter into a slot machine, for example, you would click the OPERATE icon and select the quarter and slot machine. Conspicuously absent from the list of verbs are the "take" and "drop" commands. Another clever system is used for these actions. Objects (icons) need simply to be dragged to and from the inventory window. There are also many shortcuts using verbs and objects. For example, double clicking on a door will automatically open it. Anything you are carrying on your person is displayed as a graphic icon in the inven-

(continued on next page)

DejaVu II

(continued from page 61)

tory window. Objects can also contain other objects, which can only be accessed by OPENing them (this holds true in the graphics window as well). The text window simply tells you the results of any actions that you take. It has no cursor, however, since the mouse controls everything. Any exits to a room are found in the exit window.

It is needed to display exits that are behind you or out of your view (the graphics window). Exits in the window that ARE in view are treated as "synonyms" for the graphics (doors, entryways, etc.) that are already in the graphics window. The "self" window is simply an icon representing yourself. It is sometimes necessary when you need to perform an action on yourself, or when using something on yourself. If you needed to put on a coat, for example, you would click OPERATE, then the coat graphic, and then the "self" window.

The graphics are quite good considering their interactive qualities. Frequent use of sound and animation adds tremendously to the gameplay. More realism is achieved by the use of objects and people not needed to solve the adventure, but expected in real life. The input system using the mouse is remarkably flexible and easy to use.

Unfortunately I did encounter an occasional lockup with "Deja Vu II." These usually only occurred immediately after saving a game, however, so they didn't lead to any great losses. Other than this, I could find no serious problems in the game. I found *Deja Vu II* to be an entertaining adventure that successfully avoided the "guess what the parser is looking for game."

Deja Vu II \$49.95

Mindscape, Inc
3444 Dundee Road
Northbrook, IL 60062
(312) 480-7667

Digi-Paint 3

(continued from page 23)

bottom, and are overly large (the Control console takes up a third of the screen). The icons and buttons could have been smaller (so we could see both coordinates and mode at once instead of having to toggle). There's no provision for flood fill or pattern (save a tile feature in the texture map mode), nor is there a grid, a feature I find extremely useful in graphic constructions. I'm also used to the convenience of using the right button in painting and removing custom brushes from the canvas. *DigiPaint3* doesn't use the right button at all for painting. Also, I'd prefer a more controllable magnify screen. The program provides only one level of magnification, and it's a full width pull up screen. Other complaints would have to include the lack of a restore palette command.

While I'm not ready to retire my arsenal of other paint programs, I think that *DigiPaint3* will certainly become my HAM workhorse, while resorting to *Photon* for animation. However, for ease and sheer power in the creation of realistic and subtle effects that only HAM can produce, *DigiPaint3* is a superior product. It's pure pleasure just to put paint on *DigiPaint3*'s canvas. Considering NewTek's very reasonable upgrade price of only \$ 29.95 and their even more reasonable offer to owners of competitive programs (\$ 49.95 plus a page from your manual), *DigiPaint3* will no doubt become a standard.

Digi-Paint 3 \$ 99.95

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115 West Crane Street
Topeka, KS 66603
(800) 843-8934

2 Disks: Program, Fonts, Tutorial Art,
Transfer24
128 Page Manual
ARexx Support

The Three Bears

(continued from page 43)

raise the volume control a little to be able to hear all of the letter sounds, since some (such as "d") are fairly quiet.

How strongly I recommend this program is proportional to how many children will be using it. In a school, where many children would be able to use "The Three Bears," I think this would be very valuable and recommend it highly. But for only one child, since nothing in the program is variable, I think it would be unlikely that you would get your money's worth. Your best bet would be to give it to your three-year-old for that stage when they want to hear stories again and again. And you might still get another four years of use from it. For any number of children between one and many, you are on your own.

I think that *Robot Readers* would appeal most to ages three through seven or eight. *Hilton Android* also recommends them for use with students with learning difficulties and students for whom English is a second language. Of the *Robot Readers* that I've seen, I like "The Three Bears" the best. The developers plan to add more stories to their collection, and they even ask for suggestions on their registration card.

My suggestion is to put these same stories out in other languages for everyone, but especially for those for whom English is not their first language. It would open up a whole new market.

The Three Bears \$ 29.95

Hilton Android Corporation
P.O. Box 7437
Huntington Beach, Ca 92615
(714) 963-4584

X-Cad Designer (continued from page 39)

the creation of sheet templates with standard title blocks, text parameters, etc. and using X-Cad's "Open As" load option to create new sheets for each drawing.

The final plus is the ability to create custom screen menus to invoke command sequences. Use Ed or any standard text editor to create an ASCII file consisting of a key word (the menu strip adjusts to accommodate the longest keyword in a menufile), plus a text string in X-Cad command syntax. When called in the program under the open menustrip command, these custom macros allow you to short cut the typical command and modifier steps. In most respects, this revised X-Cad re-

addresses most of previous complaints: a new manual with index, clear illustrated command explanations, and tutorial; more familiar Amiga pull down menus; on-screen console prompts in the command process; easier user defined menus; and standard AmigaDos file access and commands. It is certainly the only CAD program yet available with the scope of drawing capabilities that are required for professional level work, it's amazingly fast, and very affordable. Barring the appearance of Progressive's UltraCad, X-Cad Designer offers the most you can presently do with Amiga CAD. Given the price, it presents a very favorable tool with which to learn the ins and outs of computer assisted drawing. Whether

or not the future of Amiga CAD lies with Cadvision, though, may depend more on the professional version -- with its links to the industry standard world of AutoCad .DXF files, the utility of its tablet menus, and the availability of technical support.

X-Cad Designer \$ 149.95

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