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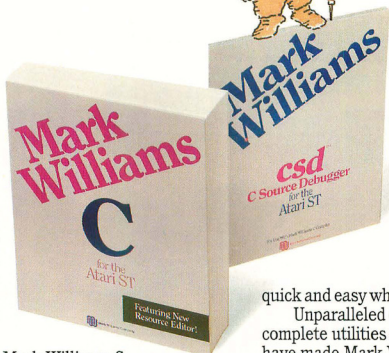


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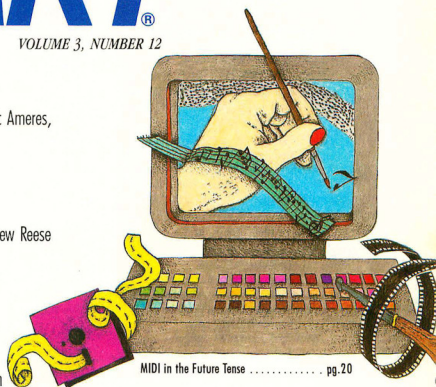
#1 GUIDE TO THE ATARI ST START®

JULY 1989

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Indicates programs included on START Disk.

START

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Editorial

It's Summer! Time for cool drinks, suntans and Super Summer Sound. And there's no one better to introduce this issue than Jim Pierson-Perry, our stalwart Contributing Editor in charge of all things aural. Much of this issue is due to Jim's hard work and dedication to the cause of ST music. Jim, that's your cue!

GUEST EDITORIAL

And now for someone completely different . . . As your guest host, I am happy to present a jam-packed collection of programs, articles and reviews—many focusing on sound and musical applications for the ST.

The ST has taken a commanding position in the MIDI market. Its future appears even brighter as multi-tasking platforms for ST MIDI software are now appearing. Four MIDI software developers give us their views on this and other trends in **Musical Workstations—The Future of MIDI?** But what can a poor musician do? Musician Rick Davies faces this stony question with tips on buying maximum equipment for minimum bucks in **Making MIDI Affordable**.

The ST is also perfectly capable of playing and manipulating sounds in its own right, without recourse to MIDI. Commercial sound digitization programs are reviewed in **Aural Presentations**. Confused by different sound file formats? Don't panic! **Babel** can read all current ST sound file formats, and convert many Macintosh and Amiga sound files to ST-compatible formats, as well. It also marks our first program written using HiSoft BASIC Professional (also reviewed in this issue).

Those who like to roll their own should check our **Programming In BASIC** column for a plain way to include sounds in GFA BASIC programs. If your taste runs more to playing than programming sounds, the **ST Theremin** may be just the ticket.

When worktime is over, there is nothing like a good arcade game for unwinding. Always here to help out, START offers **Arcade!**, with three action shooting, stomping and squashing games in one. The month also offers the monochrome version of **GFA Object**, an object-oriented drawing program (the color version appeared in our May issue).

And we're not done yet! Desktop publishing aficionados will want to read the long-awaited review of **PageStream**, formerly Publishing Partner Professional, which was previewed last November. This month we also begin a desktop publishing column as a part of **Business Applications**, launched last month.

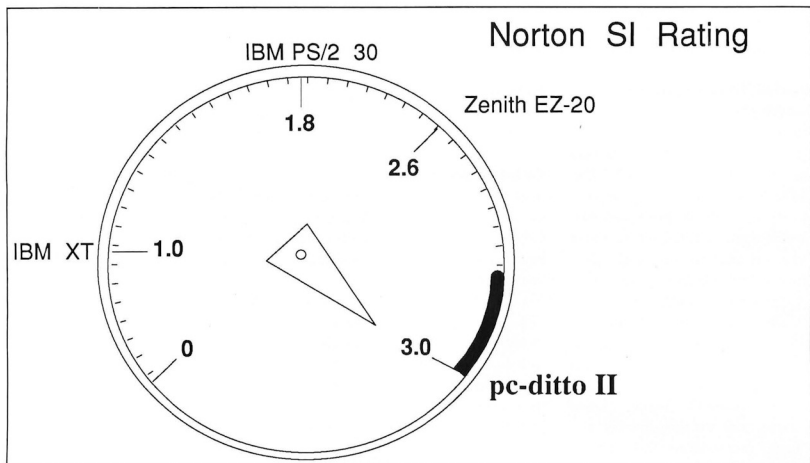
We've got a lot in our regular columns as well: DOS shell programs in Mac & PC On The ST, Dave Small continues his explanation of hard drives in **Small Tools**, cartooning on the ST in **Cyber Corner** and more on copyrights in **Getting Started**. And, of course, reviews of games, utilities and more.

Whew! I'm exhausted just going through the contents. Crank up the stereo, grab a seat, turn the page and let's rock!

Jim Pierson-Perry
START Contributing Editor

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Letters From Our Readers

Special Thanks from a Neophyte

As a neophyte ST user I must say I'm impressed with the quality of your magazine. After purchasing my 1040ST I began checking out various mags for ST support. The first one I purchased was a British magazine. It not only gave item prices in pounds, but was mostly ads—there was very little useful information, and almost no user assistance.

Upon purchasing my first issue of START (March 1989), I quickly realized what a great mag it is. The layout is easy to follow and the great programs on disk are an incredible “freebie.” I found the instructions and programming information easy to follow. And to get an awesome paint program like SEURAT for only the price of the magazine was a real surprise to a user who fully expected to spend hundreds of dollars for start-up programs. I look forward to many more issues of START magazine, and many more “free” programs.

Martin L. Hesterly
Oakland, California

Thanks for the compliments. START's editorial goal has always been to appeal to both the novice and veteran computer user. Judging from your letter we've accomplished at least part of that goal.

However, you do bring up a point that needs clarification. Even though START presents a disk version for only \$14.95 each month, the programs are still not “free.” Every program we publish is copyrighted, which means they can't be distributed with-

*out the permission of START magazine.
—START Editor*

Cyber Corner a Hit

As someone who is actively getting involved with ST animation I find START's Cyber Corner to be an absolutely excellent source of information. I encourage you to continue with this column.

I teach Music Recording at Fanshawe College in London, Ontario and although we are very seriously involved with the ST and MIDI, creating music and sound effects and then synchronizing the result to video is equally important. The ST's ability to create fabulous animations, and Video Key's service of allowing us to put this information on the VCR, sets up a wonderful stage for MIDI, video, music and animation all working through the ST. It's a wonderful computer indeed.

My department is currently installing a \$500,000 upgrade to our equipment and facilities. In the end the ST will still be there, and I think that says a lot. Thanks again for a very informative magazine.

Don Geppert
Fanshawe College
London, Ontario

Wanted: More Memory

I have owned my 520ST for about two years, and now would like to expand its memory. What, in your opinion, is the best memory upgrade with an affordable

price? I've already checked into EZ-RAM II, but found out from my vendor that only 60 percent of them install easily and pass the memory test. Another memory upgrade I checked into was one by Tech Specialties that can be socketed for 1, 2.5 or 4 megabytes of RAM. That sounded great, but wouldn't it load down the power supply? I checked into it a little further and found that it doesn't load down the power supplies because it is CMOS. If anyone is into electronics like I am would know that CMOS is very slow. That would increase the wait time of the expanded RAM to catch up with the microprocessor.

I would like to see a memory upgrade like the one Tech Specialties had but without the wait time. I don't really care about the power supply load, because I could either beef up my present power supply or customize one to fit my needs. Can you please suggest a few memory upgrades that are on the market today? I can no longer stand the message “insufficient memory to run this program.”

Joe Brooks
Plymouth, Michigan

*You might want to give Aerco's 1- to 4-megabyte memory upgrade a try. One of the START editors has had a 2.5-megabyte expansion in his 520ST for over a year with no problems. The cost is \$169 (without RAM chips), and you can order one from San Jose Computer, 640 Blossom Hill Road, San Jose, CA 95123. Phone (408) 224-8575.
—START Editor*



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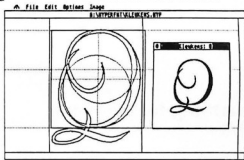
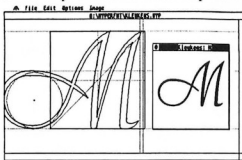
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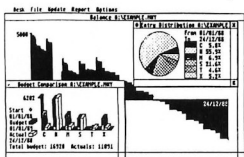
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Kudos to ISD Marketing

Last December I purchased DynaCADD from ISD Marketing. I'm not very familiar with CAD software, but I highly recommend that if anyone is at all serious about using CAD they should purchase DynaCADD. Product support is wonderful—I wrote to ISD with some questions before I purchased DynaCADD and received a quick response with all of my questions clearly answered. I have also phoned them a couple of times with questions and found them to be extremely helpful. Since ISD has responded the way they have I will be purchasing their Calamus DTP software also.

Larry A. Lund
Santa Clara, California

Something for Everyone

I fully enjoyed the April issue of START—the Jimmy Hotz article was very interesting! I always enjoy the mix of articles and of programs on disk; there seems to be something for everyone each month.

I have one comment about the revised version of ST Writer (ver. 3.0) in the April issue. When printing the manual, the output on my printer is not anywhere near the same quality as the older version was. There is no spacing at the end of a page, no page numbers and no underlining. It's just not as neat as the older version. Any suggestions?

Don Walworth
Dallas, Texas

The presentation of the ST Writer manual was a tough call for us. In the past, the manual has been on the disk in ST Writer

format, which included underlining, special formatting, page breaks, etc. The problem was that you cannot view ST Writer files by double-clicking on them from the Desktop. We found that too many new ST users were unable to access the manual at all, because in order to view the manual you needed to know how to load it into ST Writer, create a valid configuration file, and print it out—and in order to do this you first needed to read the manual! We felt it was unfair to our readers to provide them with a great word processor and then subject them to this Catch-22 situation. The manual is now in ASCII format, so you can view or print it from the Desktop.

There weren't very many changes in the new manual, so for the most part you can still use the old, formatted version. The only other suggestion we have is to load the ASCII file into ST Writer itself, add a formatting line and print it out from there; this will at least give you even page breaks.
—START Editor.

Moon Calendar Woes

I have a problem with the Moon Calendar from the February 1989 issue. It seems my printer has gone on strike for a 24-day month—it won't print out the whole calendar. I have tried everything I know to correct it, but to no avail. I would appreciate any clues you could give me. The computer is a 1040ST and the printer is a Star NP-10.

Ron Pogson
Lantzville, British Columbia

The GFA BASIC print command that Moon Calendar uses (HARDCOPY) prints the screen using the same system routine used when you press Alternate-Help. For

this reason you can change your printer parameters using the Install Printer option in the Control Panel desk accessory, or by loading an alternate printer driver using Tom Hudson's printer driver desk accessory from the Summer 1986 issue of START.

To solve the problem you're having, boot your computer with CONTROLACC on your boot disk, click on Install Printer (or Control Panel, depending on which version of CONTROLACC you have) and change the Pixels per Line option from 1280 to 960. Click on Ok and then click on Save Desktop to retain the settings.—START Editor. ■

Do you have questions about using your ST? Is there something you're not clear about? Every issue, START's editors listen to your comments and answer your questions in Dialog Box. Let us hear from you! Our address is:

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Or leave us a message on CompuServe using the Antic Online Mailbox—just log on and type GO ANTIC.

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News, Notes & Quotes

What's Happening in the Atari World

by Stephen Mortimer
START Contributing Editor

Atari Discards Federated, Posts Overall Loss in 1988

On March 8, 1989 Atari Corp. announced that it had discontinued operations of the Federated Group, the retail electronics chain purchased by Atari in 1987. Federated had not been profitable for more than a year despite stringent cost-cutting measures carried out by Atari. Federated stores are continuing normal operations.

For 1988, Atari took a \$124 million write-off because of the planned phase-out of Federated. Reserves have been established, however, so that Federated will no longer affect Atari's balance sheets negatively. Counting only Atari's continuing operations, net sales for the year were \$452.2 million compared to \$362.6 million in 1987. Net income was \$39.4 million, or \$.68 per share, compared to \$46.6 million, or \$.80 per share, in 1987. Net sales for the fourth quarter of 1988 were \$152.6 million compared to \$146.4 million with net income for the quarter at \$9.3 million (\$.16 per share), compared to \$21.2 million (\$.36 per share) in 1987.

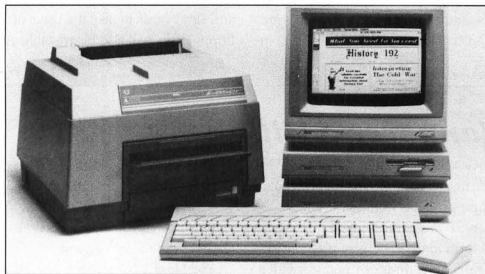
If the losses incurred by Federated are included in earnings, Atari lost \$84 million in 1988. The majority of the write-off was against fourth-quarter earnings resulting in an overall net loss of \$97 million for the quarter.

The Atari brass are currently considering various options with respect to Federated. Atari has received several inquiries from parties interested in purchasing Federated Group. Atari's lawsuit arising from its purchase of Federated will not be affected by a sale or the discontinuance of operations. Atari is seek-

ing damages based on charges that Atari was led to pay more for Federated than it was worth.

Despite higher gross sales for the year, the DRAM shortage and high prices for those chips that were available also affected Atari's 1988 net income adversely. Atari says that the shortage peaked early in the fourth quarter of 1988 and now poses no problem to the company. Greg Pratt, Chief Financial Officer of Atari, stated

that the financial health of the company is "exceedingly strong." He cited that Atari's total cash on hand was almost equal to its total debt (\$91.9 million in cash, \$93.5 million in debt). After the write-offs and reserve, Atari's net worth was \$83.2 million as of the end of 1988. The scheduled introduction of the new ST, MS-DOS, and UNIX models and an improving business environment point toward a banner year for Atari.



Atari Marketing Materializes

As promised, Atari is dramatically expanding its marketing efforts in the United States. In February, television and print advertising began in major markets across the country. The \$3,995 PostScript-compatible DTP system spearheaded the promotion. The SLM804-PCV (an SLM804 with UltraScript bundled) is \$1,495, \$1,295 for the laser printer alone. Special 1040ST deals promoted the purchase of color systems for \$999 and mono-

chrome systems for \$799, the lowest price yet for a one-megabyte Atari. Although most of these specials ended March 31, Atari seems committed to moving products out the door and into buyers' hands. Mike Dendo, Vice-President of Sales at Atari Computer, hopes to begin attacking smaller markets this summer. Dendo says that Atari is "staying on course" and that by the end of 1989, Atari will hopefully be a major player in the U.S. marketplace. ▶

Atari Folio Tours Europe

The Atari Folio, an MS-DOS compatible pocket computer, was introduced in February at London's "Which Computer?" Show. First previewed for START readers in our January 1989 European Report, the Folio was designed by DIP of Guildford, U.K., and is now made by Atari in Japan. The eight-by-four-inch computer weighs in at less than a pound and is powered by two AA batteries. It uses an 80C88 processor and a 40-character-by-eight-line LCD screen. Memory configurations allow up to 256K RAM. The operating system and several pieces of software are in ROM, including a Lotus-compatible spreadsheet, address book and text processor. "Smart" cables will allow the Folio to in-



terface with both PCs and STs.

ROM cards that contain applications and RAM cards to take the place of floppy disks will also be available. Atari

has exclusive marketing rights to the \$349 Folio. It has been shown at a number of shows throughout Europe to enthusiastic crowds.

Hannover a Hit!

The Cebit show held in Hannover, West Germany, was an important springboard for new products from Atari. The Stacy laptop ST was demonstrated in near-final form in its sleek, gray plastic case. Weighing in at under 14 pounds with a battery that reportedly lasts four hours, the Stacy will be available in June or July of this year. A system with one megabyte of RAM and a double-sided floppy drive will list at \$1,495. A second floppy drive or hard disk is optional.

Another product shown was the Megafile 44, a removable media hard-disk drive. Based on Syquest technology, each cartridge can hold 44 megabytes of data. The drive also has room for an optional 3.5-inch fixed hard disk in its Mega-style stackable case. It will retail

for \$1,195 and each cartridge will be \$150.

Atari also displayed the PC4 MS-DOS compatible computer, an 80286-based system with integrated IBM VGA graphics. Microsoft Windows is also included in the \$1995 system.

The Mega 1 computer, a one-megabyte RAM computer in a Mega case is now shipping in Europe. The Atari Transputer Workstation (ATW) was shown again in Hannover and is about to be released in Europe. When (or if) these two machines will be released in the United States is unknown. Rumors circulating at Hannover (and later confirmed by Atari President Sam Tramiel in an "Ides of March" online conference on GENie), pointed to a super game machine coming from Atari in 1990, possibly the ST-based game machine.

The 68030-based TT was reportedly shown behind closed doors in Hannover. Sam Tramiel describes the TT as "late, but great... it will offer better resolution, and raw horsepower. The machine will run TOS, and therefore most (ST) programs will run on it right out of the box. It can also run UNIX(tm) 5.3.1." Atari employees indicated that Dungeon Master works on the TT as does CAD-3D, "amazingly fast." Tramiel expects the TT to be released in August or September of this year. ■

Stephen Mortimer is a contributing editor for START and lives in Binghamton, New York.

If you have a hot tip let us know at News, Notes & Quotes, START Magazine, 544 Second Street, San Francisco, CA 94107.

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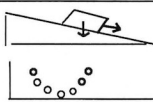
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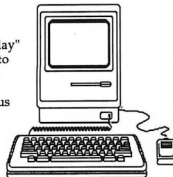
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CIRCLE 052 ON READER SERVICE CARD

Products Update

New ST Software and Hardware

Compiled By *Marta Deike*
Start Editorial Coordinator

New Games from Mindscape

Based on the enchanting film by George Lucas, Mindscape's new graphic adventure, **Willow**, sends you through a treacherous maze of dungeons, forests and ice caves in your quest to save all that is good in the world by destroying the evil Queen Bavmorda. The game follows the plot of the movie, but a reset option lets you create new maps, scenes and spells for an entirely new perspective. There are seven different game sequences in which you have eight chances to fail. Sounds easy, but fatal traps are set everywhere.

Survival in the City of Excitement is your goal in **Deja Vu II: Lost in Las Vegas**, Mindscape's sequel to **Deja Vu: A**



Nightmare Comes True. As a daring private detective, you first regain consciousness lying in a seedy hotel bathtub and realize you're in big trouble "with the mob." You have a week to come up with 100,000 smackers, or else. What

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

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Creatilities

Software Seasonings announces the release of **Creatilities**, a fully GEM-based utility for use with their PrintMaster Libraries. **Creatilities** includes its own advanced bit-map editor that lets you import any part of a DEGAS (compressed or not), Tiny or NEOchrome image into your library. The bit-map editor is designed to help you create icons or borders and includes many of the advanced functions found in other graphics packages such as block manipulation and cut and paste.

Even if you don't own PrintMaster, **Creatilities** can open the entire set of graphic libraries to other applications through the use of exporting libraries to DEGAS files. You can browse through a library, then select the icons or borders you want for exporting. And desktop-publishing programs can use the libraries as a source of clip-art. **Creatilities**, \$24.95. **Software Seasonings, 1002 Recio, San Antonio, TX 78225, (512) 533-3222.**

Books for the ST User

Everything you ever wanted to know about MIDI but were afraid to ask is now contained within a new book from M&T. **The MIDI and Sound Book for the Atari ST** covers everything from the fundamentals of MIDI to the development of MIDI programs. Topics include MIDI commands, programming the ST sound chip, control for MIDI instru-

continues on page 19

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continued from page 17

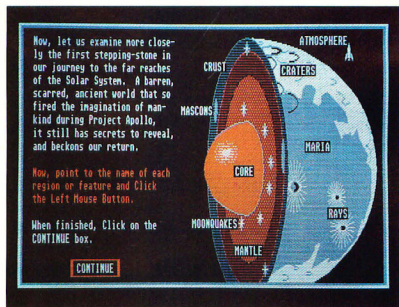
ments, everything about professional music software, MIDI programming tools and conversion tables. This is the book not only for musicians wanting to write their own ST music software, but for the musically ambitious beginner as well. MIDI and Sound Book for the Atari ST, \$17.95 (book only), \$34.95 (with disk). **M&T Books, 501 Galveston Drive, Redwood City, CA 94063, (415) 366-3600.**

For the novice and professional programmer alike, Antic Software has published the **Concise Atari ST Programmer's Reference Guide**, covering the ST's operating system as well as the Mega. This comprehensive manual describes in detail all of the ST's features and in general all facilities available such as disks, files and interfaces. The information is presented in a condensed, tabular format. The Concise Atari ST Programmer's Reference Guide, \$24.95. **Antic Software, 544 Second Street, San Francisco, CA 94107, (800) 234-7001.**

For those of you who have played, are playing or plan to play **Dungeon Master** from FTL, Computer Publications has the solution to your problems. The **Dungeon Master Adventurer's Handbook** gives detailed information on everything you need to know to conquer and enjoy **Dungeon Master**. It includes tips on characters, magic, combat and monsters, and provides level-by-level overviews as well as copies of all the dungeon maps. **Dungeon Master Adventurer's Handbook**, \$8.95. **Computer Publications, Unltd., P.O. Box 2224, Arvada, CO 80001, (303) 423-6805.**

Educational Software from Winter Tech and Computer Keys

Do you know where there's a world shaped like a peanut? Or where you would find liquid hydrogen that acts like metal? With its first entry into the ST market, WinterTech presents **The Computer Guide To The Solar System**, an "interactive space atlas" that lets you study the interior structures of the sun, moon and planets as well as interstellar physics. With over 100 screens of 3D graphics and animation, you can watch atomic particles collide in the sun's core, solar and lunar eclipses and the birth and death of the sun. **The Computer Guide to the Solar System**, \$55 (Introductory offer at \$45 expires 8/89). **WinterTech, 111 Granada Court, Orlando, FL 32803, (407) 425-1199.**



WinterTech presents **The Computer Guide To The Solar System**, an "interactive atlas" that lets you study the interior structures of the sun, moon and planets as well as interstellar physics.

Animals from Computer Keys is a fun and educational program for young children. A color-coded menu and visual symbols let your child sort, match and assemble more than 1,700 combinations of real and imaginary animals (like the Loch Ness monster). Correctly assembled animals can then be stored on a delightful animated circus train or in a pasture on the farm. There is also a unique sound-effects feature that includes train whistles, the sounds of rivers and wind and the usual voices of the animals. **Animals**, \$34.95. **Computer Keys, 21929 Makah Road, Woodway, WA 98020, (206) 776-6443.**

If you have a new product for the ST, we'd like to hear from you. Please send press releases and product photos to **Products Update**, START Magazine, 544 Second Street, San Francisco, CA 94107.

MIDI

in

the

Future

Tense



ANNE DOERING

COMPILED BY JIM PIERSON-PERRY
START CONTRIBUTING EDITOR

In the last four years, MIDI software for the ST has grown from a simple player piano emulator to sophisticated multitrack sequencers capable of real-time notation, equipment control and algorithmic composing. To give you the insider's perspective of MIDI trends for the rest of 1989 and beyond, we asked four of the most innovative MIDI software developers to describe their companies' latest products and their visions of the future of the ST MIDI market.

Tools of the Trade

by Al Hospers

Chief Executive Officer

Dr. T's Music Software

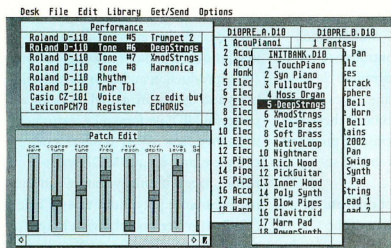
I thought this article would be a piece of cake; just whip off a list of things we are currently working on and the ideas kicking around in our collective heads. But the more I worked on it, the more complex it became, as I realized that we at Dr.T's had grown in an organic kind of way. Our vision right from the start was to create tools that would help us in our personal musical pursuits. We wanted to have a company, all right, but one which could fund development of these tools.

scription of sequences and playback by Copyist from within the MPE and a major update of our sequencer.

As a chief architect of the KCS, I have watched it grow as an evolving, almost living, entity of its own. We have taken it from its initial stages as a pure composition tool to a performance sequencer, then back to a highly advanced composition assistant. It's more evolutionary than revolutionary for us.

Tools, T-Basic and Graphics

I'd like to think we are moving towards even more powerful tools—tools that have more and better functionality and that work together better (MIDI files and the MPE are steps down that road).



X-OR from Dr. T is a universal editor/librarian that can be configured to handle any MIDI-based equipment (instrument, F/X unit, lighting, controller, etc.).

Our newest products include X-OR, a universal editor/librarian that is fully configurable to handle any MIDI-based equipment (instrument, F/X unit, lighting controller, etc.) and Tiger, an icon-oriented graphic editor that can run under our MPE or stand-alone. By the time you read this, these programs will have been out for a while.

What of the future . . . where are we going? I see our future in two areas. First will be extensions of our current tools. Examples are enhancements of Tunesmith to handle polyphony, adding more handles to the Programmable Variations Generator and Master Editor portions of KCS Level II, real-time tran-

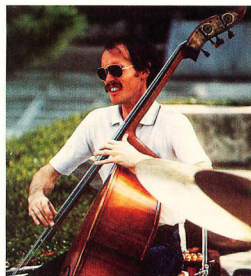
These will not necessarily be as transparent as some pundits advocate. Emile Tobenfeld—Dr.T—and I are believers in the philosophy that the best tools are those created by designers with a strong sense of vision. Tools created thusly are never bland.

One of the newest modules for the MPE is T-Basic, a full implementation of the BASIC programming language that runs inside of the KCS. It has special extensions that give you control over most functions of the sequencer, as well as direct access to the MIDI data stored in the KCS. Anyone with a smattering of BASIC programming ability would be able to create applications rivaling com-

mercial products in no time at all. You can create special-purpose functions to do almost anything you want. T-Basic takes our philosophy of giving users maximum flexibility to new limits. In this case they have almost total control; they are the programmers.

Emile recently created a new experimental program called the MIDI Axe, built on the foundation of our current Fingers program. It is a real-time performance program that runs in the MPE and lets you paint MIDI events on the computer screen. This is a program that leads in a direction that I think is very important: live interaction with other human players as well as the computer. In the right hands, this tool can be an amazing performance instrument.

Our second area for the future looks at movement towards the mass consumer marketplace. The professional music software market is a limited one. For example, we are all competing to sell high-quality (and high-priced) professional level sequencers to a select number of folks. The more general computer user—the closet-musician, so to speak—is where the next marketing opportunity lies. It's also where all the fun really is. These are the people are who can really use all of these computer-aided composition tools; the pros usually play their ▶



Al Hospers, Chief Executive Officer, Dr. T's Music Software.

own stuff. I see a lot of promise in helping those people who want to play music but can't create something of their own.

There is also going to be an interaction between music and graphics in a big way. One possibility is some melding of the MIDI Axe and a paint program. Another might be something with a full sequencer built into it or running inside the MPE with access to all of the KCS functions. Of course, it would be mouse-controlled with meaningful icons and be synchronized to SMPTE, so you could use it to play along with a film score or another sequencer. It should build naturally on the familiar styles of current paint and draw programs so that users would be able to start creating immediately with it. I wish it existed already so I could use it now!

My hope for the future is that interactive music software will be around for a long time and that creative people ('true' musicians or not) find ways to use it and make interesting music. After all, the best reward for all this work is to see (and hear!) the tools we create being used.

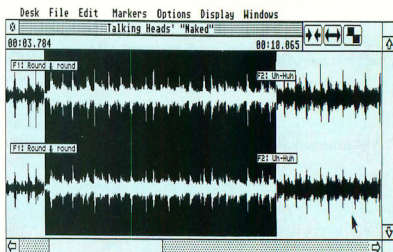


Everything is Under Total Control

by Chas Silvria
Regional Sales Director
Hybrid Arts, Inc.

Imagine a music program that can edit any MIDI synthesizer, past, present, or future. Then imagine this same program being able to edit and store presets of any MIDI-controlled signal processor. Combine these features with the ability to take a "snapshot" of your entire MIDI studio and store the information for instant recall at any time; and don't forget the real-time MIDI mixing of all of your MIDI instruments. All these features and more will be avail-

If you want to make Max Headroom stutter, you can use DRE, Hybrid Art's Digital Recorder Environment. DRE features in-and-out-point edit markers to set the range of a sample for playback. Repeating a portion of a sample several times will produce the stuttering effect.



able in GenEdit—the forthcoming editing/control program from Hybrid Arts.

This is just one example from the new generation of professional MIDI products we will release in the coming months. Following on the heels of the long-awaited Official Release Version of our "industry-standard" SMPTE-Track sequencer and Total Control systems, we have launched a program to develop user-friendly real-time interfaces for all of our new products. Some of these features will be added to existing programs such as our MIDI-Track line of sequencers.

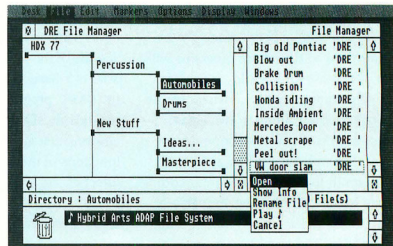
We feel that the most dramatic of these new programs is our cyclic recording feature with multi-level/multi-take spot and in-place editing, along with a vastly redesigned graphic user interface. This new addition is optimized for drum or melodic instrument recording and allows indefinite levels

and takes of cycles. You can store and edit them for easy instant recall, all in real-time.

ADAP II

This April saw the release of our digital audio system, ADAP II. This system has been designed as an open-ended system for digital audio mastering and pre-/post-production audio for motion pictures and television, as well as being a powerful MIDI performance instrument in its own right. ADAP II offers a new, complete, and unique MIDI performance page with many features, including eight-voice polyphony at 44.1 kHz (12- to 16-voice polyphony at lower sample rates), LFOs for pitch and volume modulation and an ADSR graphic interface for pitch and volume control. A new key map editor lets you set individual amplitudes for each key with full MIDI controller implementation and

The new File Manager that comes with ADAP II can provide excellent file management for professionals who have to access a large number of sound samples. It's akin to a new desktop for sound effects but can only be accessed through ADAP II.



full multi-timbral capability. Its most striking feature may be the ability it gives to instantly edit and play back sounds not only from the RAM-based editor but from any recorded direct-to-hard-disk file.

Hybrid Arts has dedicated itself to continue development of new and innovative products that will aid the musician with facile real-time interfaces. As our users' needs change, we will provide products to meet them.



The Personal Touch

Around-table discussion with Intelligent Music's Eric Ameres, author of *M* and *RealTime*, Mark Brown, author of *Cartographer*, and Richard Lainhart, I.M.'s Technical Director.

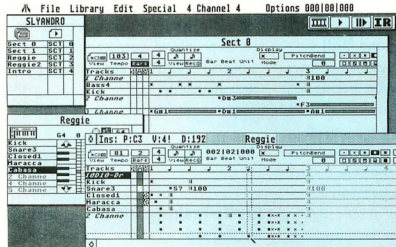
Multi-Tasking is the Wave of the Future

Eric: The future of music on the Atari ST is a true multi-tasking OS (Operating System). If a good, reliable GEM-based multi-tasking operating system came out, that would be great. MIDI, in particular, needs a way of multi-tasking because what you want to do is have a

number of applications up and running at the same time. This would let you access the power and features of any number of MIDI programs without having to stop what you're doing to jump between them. If you are doing SMPTE synchronization in one program, you can do a sequence in another and graphic animation somewhere else. You've got to have some way of locking them all together. The idea would be to have some main timer that multiple programs could access.

Some developers have come up with their own unique ways of handling this problem. We would like to see a standard way to do this.

Eric: We're eager to take part in developing a multi-tasking operating system or an enhancement to the Atari OS. Maybe it could be developed jointly with other companies, so that it would support the kinds of improvements we'd all like to see. This standard should be readily available to everyone.



RealTime from Intelligent Music lets you record and play musical ideas—so you can manipulate them in real-time. The program will provide variations on your sequences as you compose them.

Mark: Besides having a common time reference, there must be a standard way for several MIDI applications, regardless of their parent company, to share the Atari MIDI input and output ports.

Mark: In the meantime, we're going to be exploring the multi-tasking possibilities within Intelligent Music programs. We're going toward a system in which programs not only run at the same time but also work together.

Richard: . . . and still provide some access to programs from other companies. It would be a shame to be in competition with other companies when we could be working together.

A Need for Standardization with the ST.

Eric: The future of MIDI on the ST has to be linked to an organized standard from Atari for developers. Right now, the closest thing towards an honest-to-God standard is MIDI Files. With MIDI Files, something created in *M* can be brought into *RealTime* and then bumped into *Notator* to print out a score. ▶



Intelligent Music's Eric Ameres, author of *M* and *RealTime*, and Richard Lainhart, Intelligent Music's Technical Director

Mark: With the possible changes in MIDI that the IMA/MMA (MIDI standardization committee) is considering, Atari should support the new MIDI hardware themselves. Otherwise, we'll see developers all designing their own hardware again—like the different MIDI expansion products we have now. Atari should come up with a standard box that would plug into the cartridge port to support the existing MIDI standard and any new MIDI hardware requirements. Developers would be happy because there would be one standard. No more duplication of effort.

Performance Software and MIDI

Eric: MIDI software should not re-invent the past. There is no sense making your Atari into a tape recorder. A tape recorder-type sequencer is a limited tool for a composer or performer. MIDI was designed because someone wanted to press one key and have six things happen. We are starting to see programs that offer new angles on the music-making process.

Richard: . . . such as M, for composers. It's a different way of thinking about music, a different way of approaching the interaction between the composer and the computer.

Eric: Everyone's focused on editing right now. Programs like M, MidiDraw and RealTime are not about editing but more about spontaneous manipulation and editing on a global level. There's a point after which you're actually composing rather than tweaking notes.

Richard: Our programs are particularly geared for performance. That's the big idea behind the company itself. Five years ago you'd never see people using the computer in performance. Now, computers are more powerful than dedicated hardware sequencers will ever be. Using a traditional sequencer means everything is going to be exactly

the same every time. Real performance is about making music on the spot, not making it a few weeks ago and playing it back. M is designed to involve the computer in spontaneous performance. Using Cartographer as a performance processor, you can control entire banks of synthesizers and have hundreds of devices respond to your will. That's power! That's what the computer is all about—extending your power over your instruments.

Mark: Sequencers are into features, but no one has addressed the problem of managing your gear. It's been a big barrier to people who are learning a new sequencer. RealTime and Cartographer clear all that up.

Eric: . . . programs that know about your particular instrument setups, so you can tailor them to the way you work with your system.

Richard: We have a pretty strong product line for the Atari right now. Our products are strong because they are programs and tools that can be used in any professional environment, and they all can work with programs from other companies.

Eric: The machine can support professional products. The big hurdle that Atari faces is developing people's attitude about the computer itself. The ST is not a game machine (at least not exclusively—we all enjoy a good game of Dungeon Master once in a while!).



Multi-Tasking for Musicians

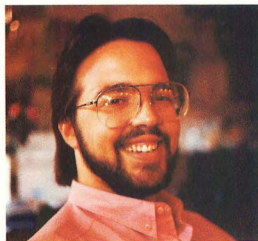
by Geoff Ryle
Product Specialist
Steinberg/Jones

Steinberg produced the first professional ST sequencing program, the PRO-24, and has since followed through with more than 18 MIDI programs for the ST. Our success is largely due to Steinberg's respect

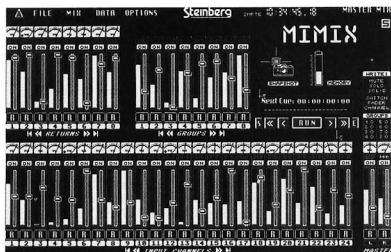
of the user as an integral part of the program development process. What's next? How about the first multi-tasking operating system for the ST specifically designed for musical applications?

M.ROS (MIDI Realtime Operating System) is the most recent breakthrough from Steinberg. Over two years in the making, it delivers true multi-tasking and lets you control several programs simultaneously on one computer. For example, working on a song with your sequencer, you could immediately move to a patch editor program—while the sequencer is still playing or recording. You could also add an automated mixing program, synchronized to your sequencer, recording all your mix movements. Previously, a separate computer had to be dedicated to each individual application.

M.ROS consists of three major components: a Message Manager, MIDI Manager and Timing Manager. The Message Manager oversees communications between concurrent programs. The MIDI Manager handles traffic going in and out



Geoff Ryle, Product Specialist, Steinberg/Jones.



MIMIX from Steinberg/Jones is an automated mixing software/hardware package that provides up to 64 channels of automation and can be installed into virtually any mixing console.

of the various MIDI ports, directing the MIDI messages to their intended programs. Either of two hardware options can be used to give up to six independently addressable MIDI Out ports. Finally, the Timing Manager handles synchronization of the various resident programs.

Timing control in M.ROS is bedrock stable due to an intelligent priority system which produces extremely accurate timing. Multiple tasks are handled efficiently, even if they involve large quantities of MIDI data. This accuracy becomes most evident when using multiple MIDI outputs, virtually eliminating MIDI delays. Two timing dimensions are supported: one for SMPTE related programs (cue-sheet type) and one for musical applications (sequencers).

The system may be synchronized to several sources: SMPTE, MTC (MIDI-Time-Code), MIDI-Clock with Song-Position Pointer and a "Human" Clock. This last option uses highly accurate interpolation algorithms that let you control tempo remotely from a MIDI trigger (keyboard note or a drum sensor). The entire system is synchronized with an accuracy of 1 SMPTE sub-frame (e.g. 0.5 milliseconds at 25 frames per second) and a musical resolution of 384 pulses per quarter-note (ppq).

Other New Programs

New programs are already beginning to

appear which build on M.ROS, including CUBIT, Steinberg's newest generation of sequencers. CUBIT provides 16 X 64 tracks, real-time editing, and four independent graphic edit pages. Various innovative quantize modes are supported including "Groove" Quantize, through which the user can create and store an individualized rhythmic style and use it to quantize any track. Intelligent window management allows several different windows to be open simultaneously. There are 16 Arrange windows, with 64 tracks in each; other windows include: Key-Edit, Score-Edit, Grid-Edit and Drum-Edit.

An ideal partner to CUBIT is MIMIX, Steinberg's automated mixing software/hardware package. MIMIX provides up to 64 channels of automation and can be installed into virtually any mixing console. It will even read your faders, converting fader movements to MIDI data. M.ROS synchronizes MIMIX with CUBIT, allowing you to locate and playback/record from any position in your song—from within either program.

Another new product is AVALON, a generic sampler editor that can be configured to work with most popular samplers. Operating within M.ROS lets you execute multiple applications, such as starting a MIDI sample-dump to your sampler and recording a song into a sequencer while waiting for the dump to finish.

Several computers can be networked together under M.ROS with control of the entire system directed from one master computer. M.ROS manages all communications and synchronization between the various programs and computers. Presently available for the Atari ST, M.ROS is scheduled to be available for Apple Macintosh and IBM PC computers before the end of the year. Imagine, each musician in a group can have his or her own work-station.

ST/MIDI users have been waiting a long time for something like M.ROS to come along. Now it's here, and Steinberg plans to take it even further. With all its present power and focus on musical applications, M.ROS will continue to evolve and improve—assisted by the help of user feedback. New developments and applications are constantly in the works. At this time, only a portion of its full potential has been realized. ■

START Contributing Editor Jim Pierson-Perry is a research chemist and semi-professional musician living in Elkton, Maryland.

FOR FURTHER INFORMATION, CONTACT

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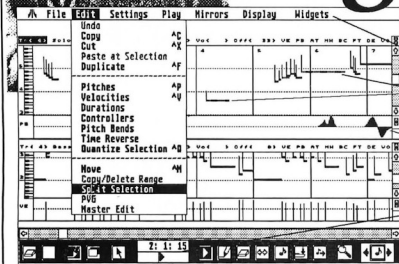
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BY JIM PIERSON-PERRY
START CONTRIBUTING EDITOR



AURAL Presentations

**Sound Digitizers For The ST—
Hear and Now**

Okay, everyone, put your hands up if you remember the "good old days" of computer music. You remember—when notes were created by carefully programmed assembly language timing loops and the only way to hear them was by holding a pocket radio next to the CPU? Boy, have we come a long way! Instead of the "square wave symphony" playing a monophonic Bach prelude, it's now a simple matter to have anything from breaking glass to the "Ride Of The Valkyries" come pouring from your computer.

The key to these feats of aural gratification is sound digitization, the same process that brings us CDs and keyboard sampler musical instruments. The concept is simple: an input sound wave is read at periodic intervals and converted into a series of digital samples. The reverse process reconstitutes the set of sample data bytes into sound-waves that can be heard through your computer speaker or stereo system.

Who's Doing It?

Currently sound digitizing systems for the ST are available from three companies: Alpha Systems' Digisound ST, MichIron's Replay4 and Navarone Industries' ST Sound Digitizer. All use some form of hardware device that plugs into the ST cartridge port and contains the analog/digital conversion circuits and audio in/out jacks. While all three products perform the same basic tasks, the ease of use, number and nature of features vary substantially from one to another.

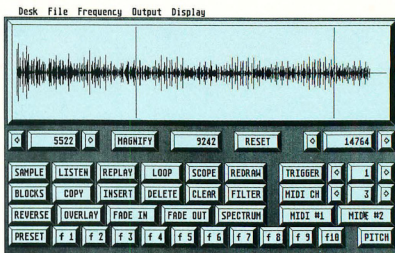
A fourth digitizer package, Soundoff!, has been introduced recently by Diverse Data Systems. This is a significantly improved version of an earlier product that had been offered by E. Arthur Brown. A unit with the new software was not available in time for this article but will be reviewed in a future issue of START.

Sampling Basics

Sounds travel as waves from their source to our ears. For digital computers such as our STs to handle sound, it's necessary to translate the continuous analog sound waves into discrete steps that can be stored and manipulated in a digital environment. This process is called *sampling* and the resulting series of data bytes is a *sample*. Electronic circuits called analog-to-digital converters (ADC) perform the sampling; the reverse digital-to-analog circuits (DAC) convert digital sample data to sound waves.

The quality of a sample depends on how well nuances of the original sound wave were captured. Two factors which determine this to a great extent are the *digitizing resolution* and the *sampling rate*. The resolution sets the scale for recognizing and measuring changes in the sound wave. A 4-bit scale allows 15 levels while a 16-bit scale (standard used for CDs) offers 65,536 levels. The sampling rate measures the number of times per second that the digitizer captures a data point and is measured in kilohertz (kHz).

Operations screen for Replay4. Segments within a sample can be marked off using the movable large cursors, either by dragging them with the mouse or by clicking with the mouse or by clicking on the screen arrow buttons.



general rule is to use a sampling rate at least twice that of the highest frequency in the sound; otherwise, the high frequencies can double back into your sample, causing distortion and noise. (This is called "aliasing.")

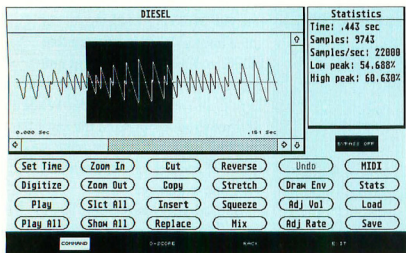
Once a sound has been digitized, sample editing programs let you make modifications to its amplitude (loudness), pitch and timbre (the tone quality and how it changes over time). Operations can be performed on the entire sample or just to a segment of it chosen by the user. Cut, copy and paste functions can be performed on sounds,

digit data order within a sample (equivalent to playing the sound backwards), digitally filtering out specific frequency ranges and mixing different sounds together. You can even use the mouse to draw your own samples or an *envelope*, which defines how the sound loudness changes over time.

While sound sculpting is fun, the bottom line is being able to hear the sound and make use of it. Options here include playing the sample through the ST monitor internal speaker or through the digitizing cartridge to an external speaker. Going through the cartridge allows additional electronic cleanup and yields sounds of higher quality than the monitor speaker. You can play back the entire sample or just a segment of it and initiate it with the mouse, ST keyboard or even via MIDI. Special effects such as reverb, echo and pitch shifting can be added to the sample while it is played. This can even be done on the fly, adding digital processing to real-time audio signals.

A major drive for sampling is to have sound files that can be incorporated in other programs. Examples here are the voice of Chessmaster 2000 by Software Toolworks, Dungeon Master sound effects by FTL and START's own Audio-Video Sequencer (AVS) in the November 1988 issue which lets you add sound samples to your animation.

Even without programming, collecting sound files can be addictive in its



This is the sample editing screen for ST Sound Digitizer. The highlighted area within the sample window represents a segment about to be edited. Note the handy status info box next to the sample window. Note also the lack of a GEM menu bar, which locks out desk accessories.

The best sampling rate for a particular sound depends on its frequency content. Those of lower frequency, such as a human voice, can use lower sampling rates than sounds including higher frequency components. The

just as you can with words in a word processor. For example, a standard way to create reverb or echo effects is by pasting in multiple copies of a sound with some fixed time offset. More sophisticated operations include revers-

own right! Since there's no generic Atari operating system function for sound management, each developer is left to provide driver software for data files. Most products typically include such an assembly code driver along with the necessary program hooks and usage examples for several programming languages. Sound file formats are also relatively similar between the ST products, not to mention the Macintosh and Amiga. (Editor's note: *Jim Pierson-Perry's program Babel on this issue's START Disk can convert sound files between ST formats—and even from Amiga, Mac and some MIDI formats!*)

ST Sound Digitizer

This product was the first sound digitizer for ST computers, initially sold as the Hippo Sound Digitizer before being picked up by Navarone Industries. Unlike its competitors, the internal monitor speaker is not supported. It can only play back samples through the cartridge to an external speaker. On the other hand, it offers the widest range of sampling rates—from 1 to 64 kHz in 1 kHz increments.

Virtually all operations are done from a single work screen by clicking on the appropriate screen buttons. Some screen buttons serve dual roles; double-clicking brings up a hidden second function—you have to read that manual carefully! You can't use desk accessories from within the program. The manual is adequate but needs descriptive illustrations and jumps into program mechanics before explaining the jargon.

An oscilloscope screen is used to adjust the incoming audio signal loudness. Sampling can be done over a fixed time window or until memory is filled, whichever comes first. Once started, sampling cannot be aborted. Similarly, once triggered, a sample plays through once, then stops; looping is not supported. Markers can be set with the mouse to define a segment of the sam-

ple for various editing and playback operations.

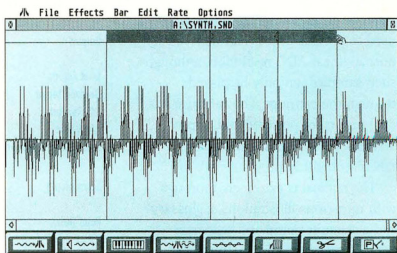
Waveform segments can be subjected to a variety of editing manipulations including cut, copy, insert, replace, mix and time reverse. Overall amplitude and pitch can be adjusted to tailor the sound tone. An Undo command is always at hand to reverse the most recent change. Waveforms and a separate amplitude envelope can be drawn by hand to create fade in/out effects.

Samples can be triggered and played through MIDI input, but all MIDI chan-

ble of contents and index but still lacks screen shots of program operations.

Replay4 sports several unique features not offered in the other products: level triggering, multi-sample memory and digital filtering. Level triggering automatically starts the sampling process when the audio input passes a preset threshold amplitude. Multi-sample memory lets you keep up to 10 samples in memory at the same time—memory permitting—with each assigned to an ST function key. (We have made good use of this in children's theater productions

The main screen of Digisound Professional. The large sample edit window shows two sets of markers; the inner markers are for a sustain loop (used during playback) while the outer markers denote the sample segment for subsequent editing work.



nels are recognized without discrimination. Echo and reverb effects can be added to the sample in memory or to incoming audio input in real time. Adding effects to a sample cannot be auditioned but can be undone and retried until you get the desired results.

And as a plus, the cartridge case is notched to accommodate the Mega keyboard cable.

Replay4

This product was previously reviewed in the April 1989 issue of START. Since then, MichTron has included DrumBeat (formerly sold commercially as Digidrums) with Replay4 and upgraded the manual. DrumBeat turns your ST into a drum machine, using samples created with Replay4, and can play two sounds at once. The manual now contains a ta-

ble to handle multiple sound effects, triggering them as needed from the ST function keys.) Individual samples can be triggered by the function key or a particular MIDI note. A low-pass digital filter can be applied to clean up samples, particularly those recorded at the lower sampling rates.

A separate program is provided to demonstrate application of the Replay4 sampling capabilities for real-time audio processing. Echo, reverb, distortion and pitch-shifting effects can be added into an input audio signal. Unfortunately, there is no way to add these effects directly into a sample.

MichTron has been very successful in promoting Replay4 as the ST standard for sample files. The program disk includes a playback driver with examples of its use in several programming lan- ▶

guages (additional examples, along with sample files and auxiliary programs, can be found on GENie and CompuServe). Users of Hisoft BASIC, the parent language of Replay4, are particularly lucky. A set of machine language routines is included that can be merged with the Hisoft BASIC library, providing new BASIC commands to control sampling and sample playback.

Digisound Professional

Digisound Pro is the Cadillac of ST sound digitizing packages. It sports playback through either monitor or external speaker via the cartridge. A special logarithmic sampling mode can be used to provide improved fidelity over normal linear ADC resolution, although such samples can only be played through the cartridge. The cartridge has dual inputs for powered and unpowered sources with the mixed input taken for digitization.

The manual is extremely thorough, with numerous illustrations, a glossary and a separate command reference sheet. A standard GEM menu bar is used to select program commands and provides access to desk accessories. Eight icons at the bottom of the screen provide shortcut access to the most common operations. Digisound can import and export sample files in ST Sound Digitizer format.

This is the only digitizer surveyed that provides for sustain loops within samples—similar to those found in musical sampling keyboards. A segment within the sample is defined with the mouse for looping. When the sample is triggered, it plays from its start to the loop endpoint and then continuously repeats the loop. Releasing the trigger, e.g. a MIDI key, lets the sample continue on to its end. The loop segment is different from just playing a normal segment of the sample; in fact, a loop can be set up within a sample segment rather than always having to use the entire sample. Digisound is extremely flex-

ST Sound Digitizers Comparison Chart

	DIGISOUND PROFESSIONAL	REPLAY4	ST SOUND DIGITIZER
General			
Version	1.6.2	4.1	1.1
Price	\$149.95	\$99	\$99.95
Distributor	Alpha Systems	MidTron	Navarre Industries
Warranty Period	90 days	30 days	30 days
GEM Utilization	full	minimal	minimal
Use Desk Accessories	yes	yes	no
UNDO command	yes(a)	no	yes
Hardware			
Inputs	auxmic(b) (minijack)	aux (RCA jack)	aux (minijack)
Outputs	one(c) (minijack)	one (RCA jack)	one (minijack)
Level Adjusts	in/out	no	in/out
Overload Sensor	yes	no	no
A/D Resolution	8-bit	8-bit	8-bit
A/D Modes	linear/log	linear	linear
Independent Playback(d)	yes	yes	no
Sampling			
Rates (kHz)	5, 8, 10, 16, 20, 25, 32, 40	5, 7.5, 10, 10, 15, 20, 31, 40, 50	1 to 64 (by 1 kHz)
Level Triggering	no	yes	no
Timed Sampling	yes	yes	yes
Abort Sampling	no	yes	no
Monitor Audio In	yes	yes	yes
Oscilloscope View	yes	yes	yes
Spectrum Analyzer	no	yes	no
Multisample Memory	no	yes	no
Playback			
Outputs	mon/ext	mon/ext(e)	ext
Play Segment	yes	yes	yes
Repeat Segment	yes	yes	no
Sustain Loop	yes	no	no
ST Musical Keyboard	yes	yes	yes
Import	no	no	no
Export	SD(f)	no	no
MIDI Features			
Trigger Sample	yes	yes	yes
Vary Pitch	yes	yes	yes
Trigger Multisamples	no	yes	no
Assign MIDI Channel	no	yes	no

Sample Editing

	DIGISOUND PROFESSIONAL	REPLAY4	ST SOUND DIGITIZER
Cut/Copy	both	both	both
Insert	yes	yes	yes
Overwrite	no	yes	yes
Mix	yes	yes	yes
Delete	yes	yes	yes
Clear	yes	yes	no
Zoom In/Out	yes	yes	yes
Max Zoom (Samples/Screen)	640	600	416
Draw Waveform	yes	yes	yes
Draw Envelope	yes	no	yes
Sample Info Box	yes	no	yes

Sample Processing

Adjust Pitch	yes	no	yes
Adjust Amplitude	yes	no	yes
Adjust Level	yes	no	yes
Fade In/Out	yes	yes	yes(g)
Reverse Time	yes	yes	yes
Filter Frequencies	no	lo-pass	no
Add FX Into Sample	echo, pitch change	no	echo, reverb

Performance Effects

Pitch Shift	yes	yes	no
Echo	yes	yes(g)	yes
Reverb	yes	yes(g)	yes
Distortion	yes	yes(g)	no

Notes:

- May be disabled to conserve memory.
- Standard model has only the aux input jack.
- Standard model has no output for external speaker, playback is by monitor speaker only.
- Refers to ability to play samples without cartridge installed.
- Rates above 31 kHz can only be played through the cartridge to an external speaker, not through the monitor speaker.
- Can read/write ST Sound Digitizer formatted sample files (termed "data files with header").
- Function not available directly, but can be done by drawing sound envelope.
- Effects provided through an included auxiliary program, not part of Replay4 itself.

ible in handling these features.

Samples can be played back on a one-shot or looped basis, triggered from the mouse, ST keyboard or MIDI, but only MIDI channel 1 is read. The pitch can be set to vary with MIDI or ST key, letting you play the sample musically.

Echo effects can be auditioned and added into sample playback, as can a sound amplitude envelope. Standard oscilloscope and listen functions are provided to set up proper sampling conditions. The red power light on the cartridge (Pro model only) also acts as a

clipping indicator by flashing when there is an input signal overload.

All standard editing operations are supported and the Undo function can be turned off to conserve memory. The pitch of the sample can be adjusted permanently, useful for tuning musical samples to a desired key. Both a sound waveform and amplitude envelope can be drawn by the user. Echo and pitch variation effects can be added to an input audio signal in real time, subject to sampling rate limits.

Alpha Systems offers two Digisound models, the Standard and Professional. This review was done with the Professional model. The Standard model uses the same software but has only a single input, no cartridge output for external speakers and does not have the circuitry for logarithmic sampling/playback.

While Digisound Pro is an *extremely* capable program, three problems in the current version mar its utility. An active sensing command sent by a few MIDI keyboards, particularly Yamaha, prevents the oscilloscope, test input and MIDI playback features from working properly. This did not happen with Casio or Oberheim keyboards. Even with a problem Yamaha unit, however, actual sampling was fine. Alpha Systems is aware of this and expects to have it fixed by the time you read this review. Also, a bug had crept into this version which restricts sampling time to 99 seconds or less, even if you have memory for larger samples, but this is also being corrected.

The third problem with Digisound Pro is more serious, but applies to Mega owners only. The cartridge case was designed for the 520/1040ST models and does not provide room for the Mega keyboard cable. While you can mash the cartridge into place, there is a risk of it pulling free or loose, which could seriously hurt your Mega. The case is being redesigned for a better fit with Mega models. ▶

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Review Aural Presentations

The Digsound sampling program/cartridge is the base of a projected series of add-on modules. The first of these, Beat Box, is similar to a drum machine program but can playback up to four independent samples at once! Using synth or voice samples instead of drums turns it into a credible ST-based synthesizer. A second module in the series will provide advanced MIDI capabilities.

Summary

What's the best bet? From subjective tests of voice and electronic music instrument samples, all give good results—particularly through external speakers. To my jaded ears, the Digsound Pro model had the edge in sample quality, even without resorting to the logarithmic sampling enhancements, followed by ST Sound Digitizer then Replay4. Unfortunately, ST Sound Digitizer is crippled by its inability to replay samples through the ST speaker

and the lack of a software driver to include samples within programs (even if you accept the cartridge-only playback limitation).

This leaves Digsound and Replay4 as viable candidates. Without question, Digsound is the better product in terms of sound quality and sample editing capabilities—but at a cost penalty. If you will be going to the monitor speaker for playback, there is not that much difference in sound quality between the two. Both parent companies also are solidly behind their products with good customer support and auxiliary software.

The decision rests with your needs: if you plan any serious sampling and sample editing, go with Digsound; otherwise Replay 4 should do fine. A special class of user may be swayed by Replay4's multi-sample capability. ■
START Contributing Editor Jim Pierson-Perry is a research chemist and semi-professional musician living in Elkton, Maryland.

PRODUCTS MENTIONED

Digsound, \$89.95;
Digsound Professional, \$149.95. Alpha Systems, 1012 Skyland Drive, Macedonia, OH 44224, (216) 467-5665.
CIRCLE 157 ON READER SERVICE CARD

Replay4, \$99. Michtron, 576 South Telegraph, Pontiac, MI 48053, (313) 334-5700.
CIRCLE 153 ON READER SERVICE CARD

SoundOff version 2, \$64.95. Diverse Data Systems, 8 Greenwood Drive, Freehold, NJ 07728, (201) 780-2019.
CIRCLE 158 ON READER SERVICE CARD

ST Sound Digitizer, \$99.95. Navarone Industries, Inc., 454 Kenneth Avenue, Campbell, CA 95008, (408) 378-8177.
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BABEL

The biblical Tower of Babel lends an effective metaphor to the present state of sound file compatibility. Just as the builders of the tower couldn't understand each other, sound file formats aren't compatible, either—or weren't, until now. Contributing editor Jim Pierson-Perry developed Babel so the ST can transfer sound files from format to format, easily and painlessly.

Sound files—any old way you choose them. File BABEL.ARC on your START disk.

I love to collect digitized sounds and use them for anything from spicing up the autoboot sequence in one of my programs to making music. Working against me, though, is the absence of a common file format for all of my digitized samples.

Babel grew out this need to transfer

BY JIM PIERSON-PERRY

Sound File Conversion for the ST

freely between the various ST file formats. The program also has the ability to import sound files from other sources such as Mac Sound-Cap/SoundMaster, Amiga IFF, Hybrid Arts' ADAP and Digidesign's Sound Designer/Softsynth. And there are hundreds of sound files on bulletin board systems across the country that

The File menu is where all the action is. Click on Load Sample to load a sound file. As the file is read, its internal structure is checked to identify its type. Babel recognizes the formats for Replay4, Digisound, ST Sound Digitizer, Sound Designer/Softsynth, Macintosh SoundCaps/SoundMaster and Amiga IFF. The default is Replay4. Note that

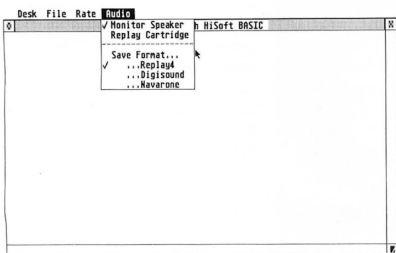
currently active Save Format choice from the Audio menu. The sound data can be saved in any one of the three current ST sound file formats (Replay4, Digisound and Navarone/Hippo).

A word of warning: Babel does not check a sound file to make sure there is sufficient room on the disk before saving it. Also, it doesn't let you format disks and disables all desk accessories. Since sound files are notoriously long, always have a supply of blank, formatted disks ready before you start playing with Babel.

For a quick test of Babel, click on String Synth to numerically create a sample that sounds convincingly like a plucked string. A dialog box will appear asking for your choice of wavetable size. As the wavetable size increases, the sound gets deeper and lasts longer. String Synth is based on the industry-standard Karplus-Strong algorithm, which in turn is based on Bob Damiano's Apple II code implementation in the December 1987 issue of *Electronic Musician*. It's just a tiny taste of what can be produced by more sophisticated sound-generation programs like Digidesign's Softsynth and Dr. T's Sample Maker.

Shift Base takes the current sample in memory and shifts it from a signed integer basis (like Digisound) to an unsigned integer basis (like Replay4). If you're hearing a lot of background noise over your sample, click on Shift Base to correct the problem.

Rate and Audio control your preferences as to the sound-playback rate, audio-out destination and format for saving files. The default settings are 20 KHz replay rate, with the sound to be played through the monitor speaker and files saved in Replay4 format. You must have the Replay4 or Digisound Professional cartridge installed before you ▶



Looks can be deceiving. The Babel screen doesn't have much to it, so it seems, but you don't need fancy graphics to import and convert sound samples.

Babel will recognize. (Editor's Note: See Jim's comparison review of three sound digitizers for the ST in this issue.)

To run Babel, copy the files BABEL.ARC and ARCXTTP onto a blank, formatted disk and un-ARC BABEL.ARC following the Disk Instructions elsewhere in this issue. Now, double-click on BABEL.PRG to access the program. I've included a few sample files for you to experiment with. Babel was written in HiSoft BASIC and runs in all three resolutions.

Straightforward Operation

Babel is controlled from the menu bar. (Sorry, no fancy graphics or GEM window screens. Babel is a straightforward file utility program—I wanted to save as much memory as possible to accommodate large sound files.) The menu headings are File, Rate and Audio.

any file will be taken even if it's not a sound file. Go ahead and listen to your ST Writer text files—noise to most, though some could call it experimental.

Once the sound is loaded, click on Audition to play it through. I incorporated Replay4 into Babel to run the sampled sounds, so the rates given under the Replay menu are limited to those supported by that program. While the sound is running, press the spacebar if you want to hear it again from the beginning. Adjust the replay rate and listen to the pitch shift up or down. The highest rates are only supported through the cartridge audio out (a Replay4 restriction). A sample in memory will stay there until another is read in; you can save multiple copies in different sound file formats.

Click on Save Sample to save the data to disk. It will be saved using the

Tracking Down Sound Files

When it comes time to beef up your sound file collection, the best places to go hunting are the national bulletin board services. The Atari and MichiTron areas in GENie and CompuServe have a number of files, mostly in Replay4 format. Another great source is the MIDI roundtable in GENie which features many files in Sound Designer format (ADAP files also use this format) with new ones constantly added. Musically oriented samples are the forte of PAN, which offers a large variety in Sound Designer format.

The more adventuresome may want to try the Mac and Amiga libraries. Beware of Mac sound files containing the extenders .PIT or .SIT; these are compressed (similar to .ARC files) and cannot be translated directly by Babel. If you have access to the Magic Sac or Spectre 128, download them with a Mac terminal program and decompress them with the appropriate utility (Packit or Stuffit). You can then use a program like Transverter or Mover to take them from Magic/Spectre into GEM format. Doing this, however, trims the 128-byte Mac header that Babel uses to recognize Mac sound files. Fortunately, the resultant trimmed sound file is identical to and is read as a Replay4 file.

Two things to remember: Mac users don't seem to be very reliable about mentioning if files have been compressed. If Babel spits out garbage from what you thought was a normal Mac sound file, take a look at the input file with a file editing program. If you see the dreaded extenders .PIT or .SIT within the first

128 bytes, you've been nailed. The other things to remember is that there are several different types of sound-file resources on the Mac. The only ones I have tested with Babel are of the Soundcap and Soundmaster genres. Files described as start-up INITs will definitely not work because they contain additional system coding. Then again, maybe if you just trim off the first couple of hundred bytes the sound itself may be OK. I suggest trying this one with one of the ST sound digitizing packages instead of a file editing utility so you can get visual clues to work with.

Mac-based Sound Designer files require special handling. If you download them directly into GEM files (using FLASH!), you must manually trim the Mac header before Babel will recognize the Sound Designer format. The easiest way to do this is with a file-editing program like the Byte Mechanic (SIART Special Issue #4). Downloading as a Mac file under Magic Sac/Spectre 128 does not require this step because the trim automatically occurs when you bring the files into GEM as described above. Whew!

Finally, there are a couple of good shareware programs on the BBSs that work with these sound files. Autoplay by David Sullivan lets you designate a sound file to be played when you first boot your ST. Another good one is Playback (by Ric Clayton) which comes in both a desk accessory and normal program versions. In addition to playing any designated Replay4 sound file, it also can be set up to play a startup sound.

boot. (Remember: Never plug a cartridge in while the computer is on unless you seriously want to trash your equipment!) Note that the Navarone cartridge uses a different scheme than the others and will not work with Babel. You can, however, save files in the Navarone format and play them with the Navarone sound software.

Some Program Take-Apart

The majority of file-format conversions consisted of simply removing a header and adjusting 8-bit integer values from a signed (range of -128 to 127) to an unsigned (0 to 255) system. The Sound Designer format is slightly different because it stores data as 16-bit signed integers. For these, I just took the most significant byte. Macintosh sound files have a different sampling-rate base than Replay4 or Digisound (typically 22 or 11 KHz instead of 20 or 10 KHz). If I were to convert the sound directly, the 10-percent sampling-rate difference would cause a change in pitch and voices would sound a little deeper. I opted to "downsample" Mac sound files by throwing out every sixth data byte. This preserved the pitch of the initial sound file without any apparent loss of fidelity. The same process was done for Amiga IFF files that typically run at 8.3 KHz, versus the closest Replay4 equivalent of 7.5 KHz.

There is a "hidden" file-import module that handles sound files created by the IBM MEDIUM librarian program for the Mirage sampler. This is probably of limited interest to most users, unless you have a Mirage or access to MEDIUM data files, but it's there. The only clue to a file being in MEDIUM versus Replay4 format (neither use any recognizable header) is that MEDIUM files are always 61661 bytes long. If you're converting a Replay4 file that matches this length exactly (not likely!) you'll get a dialog box asking if it is a MEDIUM file. Just say no.

The standard in Replay4 file format is a straight sample data dump with no

additional information. I have followed the lead of public-domain programs that use Replay4 files and included an additional byte at the start of the sound file denoting the appropriate replay rate.

The BASICS

Babel was written in HiSoft BASIC Professional. Since most of the preliminary file-conversion code had been hacked using GFA BASIC, I decided to stay with a BASIC language.

However, I needed a language that supported SELECT CASE statement constructions and had a compiler. That ruled out GFA BASIC (versions 2.0 and 3.0). The clincher came with the inclusion of a library file on the Replay4 program disk that could be bound into the standard HiSoft BASIC compiler library (Replay4 was written in HiSoft BASIC). Doing this gave me the ability to read, play and create samples directly from new BASIC commands. Another good argument for using HiSoft BASIC is that

The File menu is where all the action is.

the only limit on string size is the available computer memory—no more 32K restrictions. This let me read a sound file in a single operation as well as simplify cut-and-paste operations between large strings. Thanks, HiSoft! (Editor's Note: *Look elsewhere in this issue for a review of HiSoft BASIC and HiSoft BASIC Professional.*)

Wrap-Up

Anyone interested in MIDI applications will want to use Babel as a tool for getting high-quality sound files from Sound Designer format into

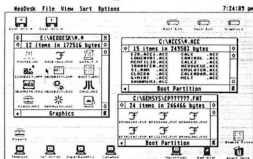
Replay4/Digisound format. Using the MIDI play functions of these programs turned the ST into a reasonable quality low-budget sampler. Sound files can also be used with Digidrums (by MichIron) and Beat Box (by Digisound) to turn your ST into a drum machine and play multiple sounds simultaneously. Another use for Babel is to prep sound files to work with START's AVS program (November 1988 issue) that marries sound effects with Cyber animation sequences.

It is appropriate to put in a word concerning the ethics of sampling. This is a very heated topic in music circles (see "An American Sampler" in the December 1988 issue of START for more background). But as long as you do it for your own personal use, there shouldn't be a problem. ■

Contributing Editor Jim Pierson-Perry is a chemical engineer who lives in Elkton, Maryland. This is his first program for START.

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New PAN Offer

In START's Online column in the March 1989 issue, Contributing Editor Jim Pierson-Perry announced a special offer from PAN, the Performing Arts Network: any ST user who joined PAN during the month of February would have the \$150 sign-up fee waived.

But the wrong password appeared in the article, so would-be PAN users found themselves unable to log onto the PAN BBS. Even with this problem, however, Perry Leopard, the president of PAN, was so pleased with the response from START readers that he's now offering an additional period of free sign-up: from June 15 to July 15.

Here's how to reach the PAN BBS: for direct access, dial (617) 576-0862. When you connect, enter 1 or 2 and press Return. At the "USER-NAME:" prompt, enter your name or handle; at the "PASSWORD:" prompt, enter (drum roll, please. . .) PANJOIN.

Going via Telenet, dial your local network access number. When you connect, press Return three times. At the "*" prompt, enter C PAN, then follow the username and password instructions above.

On Tymnet, dial your local number. When a series of random characters appears on your screen, type "A". At the "PLEASE LOG IN" prompt, type PAN and press Return; then follow the username and password instructions above.

We apologize for the mixup in the March issue, and we promise that the correct password really is PANJOIN - START Editor. ■

So You Want To Be A Cartoonist!

*Part I of A Step-By-Step Guide
to Computer Cartooning*

BY MARCUS BADGELEY

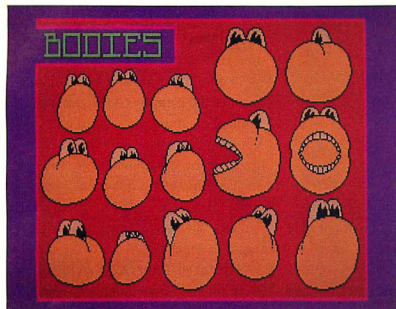


Figure 1.

"Why don't you go out and get a respectable job like a doctor or lawyer, something that makes some money?" That's what they say.

The pull towards cartooning is not something I can readily put into words. Strange and wondrous images float or scamper through my cerebral chambers, talking in tweaked-up voices about dra-

matic, yet silly issues with no purposes other than to make people laugh, ponder in dumbfounded amazement or escape reality momentarily.

You'll know you've got the itch when you can feel your cartoon creations and hear their funny voices. At times it's like Mel Blanc living inside you. Actually, "Who Framed Roger Rabbit?" has come

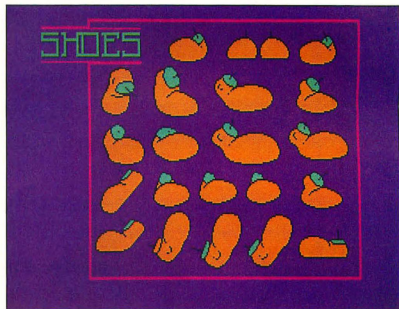


Figure 2

the closest to capturing the spontaneous hilarity and childlike joy of living with "Toons, except that in our real world, it all happens inside our heads.

I set forth upon quite an expedition when I bought my ST three years ago. I've spent enormous amounts of time learning to convert hand-drawn images—to me, intrinsically more "natu- ▶



Figure 3

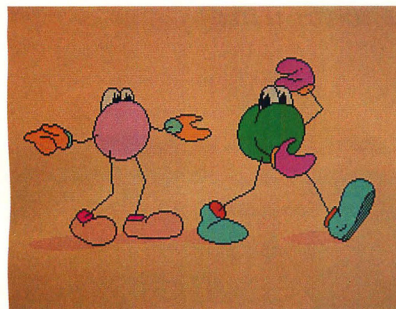


Figure 4

ral"—into a form which works only in straight lines and geometric shapes, not to mention the other obvious limitations, such as limited resolutions and palettes.

When I first started drawing on the ST, I found that creating an image on the computer took a great deal longer than doing it by hand, destroying the myth that computers are time-savers. The question for me was, and still is: "How can I create images to be as 'real' as possible on the computer—and as quickly as possible?"

In this series, I'll describe some of the basic techniques I've discovered to create cartoon images. I hope that these

If you're serious about cartooning, one approach is to use a graphic database consisting of different parts of your characters, such as the Beschnoone Bits in Figures 1-4.

By simply moving the mouse along a desired arc and pressing the mouse button in rapid succession, I was able to get a line that required less magnified reworking. Because of the low resolution of the Atari screen, exact pixel placement really makes a difference; that's why I use a magnified mode ("Zoom") to touch-up almost everything I do.

MMy favorite technique begins by drawing the image by hand on paper and then scanning it into the computer.

Techniques

Imagine that it's early in the day and I walk into my studio and sit down in front of my computer. I feel the urge coming on and a silly, crazed grin comes over my face. And then I hear high, whiny voices inside me pleading to "Let 'em out!" At this point I know what I have to do and I have several choices how to create the image that beckons to me.

First of all, I can create an image from scratch in the computer. This method usually takes the most time, depending on the image and detail.

The second option is to create a database of characters. This is useful only after I've already created several images. It requires an initial investment of time, but is so quick and easy to use thereafter. Look at Figures 1 through 4, where I've pasted different parts of my old "Beschnoones" characters into a graphic database that I can use to create new characters.

tips prove useful for the first-time cartoonist and seasoned professional alike.

A Good, Quick Tip

Because of my own drawing style, I am very particular as to how "natural" lines look on the computer; I'll spend a lot of time getting a line to look exactly right.

I think the first shortcut I found to approach the kind of line I wanted was to use the connected line function found in paint programs, rather than drawing free-hand with the mouse. (In DEGAS Elite, the connected line mode is called K-Line; in Cyber Paint, you must select Line from the Draw Menu and Connected from the Mode menu.)



Figure 5

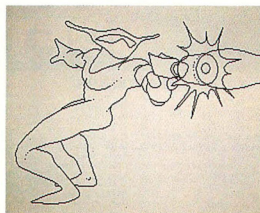


Figure 6

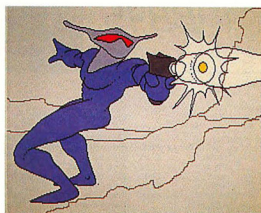


Figure 7

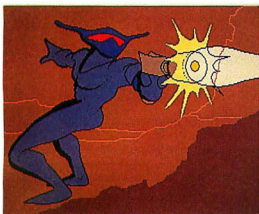


Figure 8

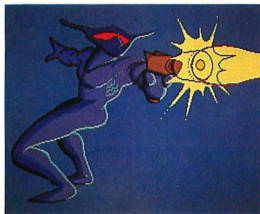


Figure 9



Figure 10

In case you're more comfortable drawing on paper than on the screen, Figures 5-10 show how an original drawing was scanned with a digital scanner, cleaned up in DEGAS Elite and then imported into Unispec.

The third technique—my favorite—begins by drawing the image by hand on paper and then scanning it into the computer. I then rework it in whichever art program seems appropriate for the type of image I'm looking for. I've been using the Seymour-Radix scanner, which works moderately well. (I hear that the recent update works even better.) I find that this method recreates the *movement*—the feeling of life—in a paper-drawn image better than I can create it in the computer.

In Figures 5 through 10, you'll see a step-by-step example of this scanning technique. This image was scanned in, cleaned up in DEGAS Elite and then imported into Unispec.

A fourth option is to design characters in CAD-3D, paste them to a background and then rework the images as needed in a paint program. Doing it this way means that a character can be shown from any angle and in any lighting. Since I have almost no experience

For a cartoon image to work, it must be grounded in reality to some degree.

with the CYBER family (except for Cyber Paint), I won't show any examples; however it is conceptually sound.

Keep in mind that there are *no* rules for the process of creation and you can intermix these methods as you choose. The only rule—which is actually a non-rule—is "If it works, use it."

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A Philosophical Note

In terms of the deeper, more serious issues, I believe that for a cartoon image to work, it must be grounded in reality to some degree. Just as the Old Masters did, a cartoonist should begin by working from nature, gaining as much drawing experience as possible. Then the cartoon images and forms that come later will be more believable and convincing.

Next column, we'll look at a technique for creating cartoon faces that's so simple that any beginner can do it. In the following column, we'll focus on scanning and throw in a few other tips to make your cartooning life easier. ■ **Marcus Badgley is the owner and director of Gravity Design, a graphic design studio in San Francisco.**



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CIRCLE 016 ON READER SERVICE CARD

Mac and PC On The ST

Making MS-DOS More User-Friendly

BY DAVID PLOTKIN
START CONTRIBUTING EDITOR

Editor's Note: If you're a new reader of this column, it's aimed at ST owners who use pc-ditto to emulate IBM-type computers and Magic Sac+ or Spectre 128 to emulate Apple Macintosh computers. Our goals in this column are to take a look at tools to make those unfamiliar computing environments easier, to review notable programs that are otherwise unavailable to ST owners and to report on developments in the area of ST emulations.

Last column, for you pc-ditto users, I took a look at Spinnaker's Easy Working DOS Shell that makes MS-DOS easier to use. This month, I'll take a look at another software tool for the same purpose, Precursor from The Aldridge Company, and also fulfill the promise I made in the November 1988 issue to examine batch files more closely. Let's take a look at batch files first.

Batch Files

As you should be aware, MS-DOS (PC-DOS) is a command-oriented operating system—you direct its actions by typing

in commands. For example, to change directories, you would type: CD (or cd) followed by the new directory path. Batch files can automate the process of issuing commands. In essence, they are ASCII text files of DOS commands which are executed by the computer in the order they appear in the file.

Batch files are immensely powerful: you can pass parameters to them and jump to a different place in the batch file based on some rudimentary decision-making capability. You can also run programs from batch files (remember, machine language programs are essentially just another type of DOS command). It is beyond the scope of this column to look at all of the complicated ways that batch files can be used, but let's look at some simple ways that they can be used to make MS-DOS less painful.

Rolling Your Own Menu

One of the more difficult aspects of using MS-DOS is that you must remember the exact syntax of each command and

the precise location of your programs. A simple menu can be built using batch files to make all of this easier. Because batch files are simple ASCII text files, you can construct one with any word processor that can save in ASCII format. Alternatively, you can use MS-DOS itself as a simple text editor.

Batch files always have a .BAT file-name extender. You can execute a batch file at the MS-DOS prompt by typing its name (the .BAT is optional) just like other MS-DOS commands and programs. In order to build a menu batch file using MS-DOS, type in: copy con menu.bat. This tells the computer to copy everything typed at the keyboard (the "con'sole) into the file menu.bat. Then type the following:

```
echo off
cls
echo Do you want to:
echo 1. Use word processing
echo 2. Use DOS Shell
echo Type the number and press Return
```

Now press function key F6 and then ▶

Return. This short batch file will be saved to disk. The first line turns off the "echoing" of DOS commands, so that they are not repeated to the screen, the next line clears the screen, and the rest of the lines simply print information on the screen. To run this program, type in MENU at the MS-DOS prompt. Of course, all that happens is that the little menu is printed on the screen and the program ends, leaving you with the prompt. Here is where we get a little tricky. To use both choices in the menu above, you'd need to create two batch files, called "1.BAT" and "2.BAT". As an example, to run EWEXE (Easy Working Word Processor in, say, directory EW) in response to menu choice number one, the following "1.BAT" file would work:

```
CD \EW [change to proper
        directory]
EWEXE [Run the program]
CD \ [After the program, re-
      turn to the root
      directory]
MENU.BAT [Run the menu batch
          file again]
```

If you type this in using copy con 1.bat (don't type in the comments in brackets), remember to press F6 at the end and then press Return. Notice that we ran another program from within the batch file, and also called another batch file (MENU). So what happens? We run MENU and it prints its messages on the screen, ending with a request for you to print the number of the application you want to run. When we type in the numeral 1 at the prompt, it runs the batch file "1.BAT" which in turn runs the program EWEXE. You should be able to see how to extend this to many program selections.

As you can see, batch files can make your life easier. A batch file can even be executed automatically on startup if it is named AUTOEXEC.BAT—something like the ST's AUTO folder. It can be used to set up the system, run configuration

programs, etc. For example, my AUTOEXEC.BAT file installs the serial mouse driver, sets the time and date and other tasks I always want done whenever I start up.

Or Buying One . . .

If you don't feel like designing your own menus, try Precursor from The Aldridge

Precursor supports multiple menu pages and each page can hold 12 selections.

Company. It's designed to making running programs from your hard disk much easier by setting up a menuing system. After copying it into a directory on your hard drive, you type INSTALL and the program prompts you for the information it needs to build the associated files. Once Precursor has been installed, you can start the Maintenance program, where you add or remove programs from the menus, set up password protection, activate a user log, set your colors and other functions.

Precursor supports multiple menu pages and each page can hold 12 selections. Each menu page can be named (i.e. WORD PROCESSORS) so that you can group programs appropriately on separate pages. To install a program in the menu, you need only to type in what you want to show up on the menu (LOTUS 1-2-3, for example) and the name of the program you want run when that menu selection is made (i.e. 123.COM). When you have entered all the menu selections and files, pressing F7 activates an autosearch, so that Precursor will search through the disk

directories to find the programs.

Running programs from Precursor is simplicity itself. Just type the number of the item you want or highlight the item and press Return. When you are through running the program you are taken back to Precursor to make another selection. One thing you should do is set the system path (using the PATH command in your AUTOEXEC.BAT file) to include the Precursor's directory, so that you can simply type PREMENU from wherever you are to activate the program. You can even run Precursor automatically when you start up (that's how I do it) by including the PREMENU command in your AUTOEXEC.BAT file. In fact, the Precursor installation file will write out an AUTOEXEC.BAT file for you that includes the proper path command and calls PREMENU.

Precursor goes a long way to making MS-DOS friendlier, but there are still other ways, like using ANSYSYS or commercial macro programs. So stay tuned. . . ■

David Plotkin is a chemical engineer with Chevron USA and a long-time contributor to START.

PRODUCTS MENTIONED

pc-ditto, \$89.95. Avant-Garde Software, 381 Pablo Point Drive, Jacksonville, FL 32225, (904) 221-2904.
CIRCLE 160 ON READER SERVICE CARD

Precursor (version 3.1), \$69. The Aldridge Company, 2500 City West Blvd., Suite 575, Houston, TX 77042, (713) 953-1940.
CIRCLE 161 ON READER SERVICE CARD

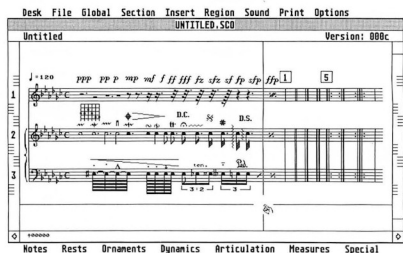
Challenge Tradition with EZ-Score Plus

Create Music Scores Quickly and Easily

BY LARRY A. MAGNELLO

The ST's MIDI interface makes it one of the easiest computers to use for musical applications. EZ-Score Plus from Hybrid Arts builds on this to provide a powerful yet easy-to-use way to create musical scores for both beginning and experienced musicians. Entering music is as easy as playing a MIDI instrument and using the computer keyboard or mouse. You can have EZ-Score Plus play back your score through the ST monitor speaker or through your MIDI instrument (up to six channels at once). The customized printer drivers for Epson-compatible printers produce results that rival professionally typeset musical scores.

EZ-Score Plus uses key disk copy protection. It supports all ST and Mega computers in both medium and high resolution, but because of the program's memory requirements, 520ST users must run printing functions as a separate program module from the editor. EZ-Score Plus recognizes HybriSwitch and can coexist with EZ-Track Plus or a MIDI Track sequencer. This eliminates the need to reboot when switching between the programs, although they do not share data. A form of this will be available in a later release.



Sample of the many notational symbols available within EZ-Score Plus for creating musical scores.

Point-and-Click

EZ-Score Plus' point-and-click editor has a good feel and employs both drop-down and pop-up menus. It supports up to three staves in a score, using one of four formats. Entering notes is as simple as lifting symbols from the icons in the pop-up menus and dropping them onto the staves. The mouse pointer takes on the shape of the symbol you are currently manipulating. Or, you can opt for the CADD-type full-screen cross-hair which "carries" the symbol you are manipulating at its ver-

tex. This works best when entering notes on ledger lines outside the staff body.

Over 140 notational symbols are available, including notes, rests, accidentals, clefs, bar lines, dynamics, articulations and repeat signs. Notehead styles include round, diamond, invisible "X" (percussion notation), harmonic and stems. EZ-Score Plus was the first program to support sixty-fourth notes, though several other programs now include this feature. Grace notes, however, are missing. ▶

Beams, ties, slurs, crescendo/decrecendo, lines and more can be inserted under detailed user control. For example, you can control the placement, height, thickness, slant and curve direction of slurs. Tiny amounts of space between symbols can be inserted or deleted, providing the ultimate in manual control. Slanted beaming is not supported.

Time signatures from 1/1 to 99/64 are supported, with all major and minor key signatures. You can create up to eight repeat endings. Score formats supported are solo, piano, piano with vocal, and trio. The amount of space between staves is determined by screen limits, permitting you to insert multiple verses of lyrics above or below any staff. You can automatically center lyrics beneath notes if desired.

Chord symbols are completely variable, from simple to complex: major/minor seventh, ninth, eleventh, thirteenth, suspensions, augmented, diminished and more. Guitar chord frames are preset or can be changed through the chord editor. The chord edit page is just as easy to use as the main editor and allows the creation of all possible combinations of chord symbols through a dialog box.

Labor-Saving Devices

Along with its musically-oriented flexibility, the editor includes some work-saving features as well. Cutting, copying and pasting sections within the same score or between multiple scores is easy. Deleting a symbol is as easy as clicking on it. You can instantly search and locate any bar number or rehearsal mark. (A warning here for Mega 4 users: A program bug will bomb you back to the Desktop if you scroll past the start of a score and use the Clear Score command.)

There are several levels of safety and convenience features such as automatic stem direction, where the program applies music theory for you. You can also customize the work environment and

save it for subsequent sessions.

EZ-Score Plus imports Hybrid Arts sequencer files through an "auto-score" feature. The recently released MIDI file-to-Hybrid Arts format conversion program (available on many bulletin boards or through Hybrid Arts itself) lets EZ-Score Plus work with song files from any sequencer program that supports

EZ-Score Plus lets you center lyrics beneath notes automatically.

the MIDI-standard file format. This file exchange works one way only—you cannot convert scores into sequencer song files.

You can use MIDI for step data entry. Play the notes on your MIDI instrument and watch them appear on the screen immediately. If you're not musically inclined, you can enter notes via the mouse or computer keyboard. All entry methods (mouse, keyboard, MIDI, import) are available simultaneously in medium or high resolution. Only note pitch is controlled by MIDI—there is no support for velocity or controller data.

Input Output U.S.A.

So much for input. How about output? Here is where EZ-Score Plus really shines. If you play back through the monitor speaker, you're limited to the three sound channels of your ST's sound chip. Playing back through the MIDI port lets you use a single MIDI instrument or assign two instruments per staff (one for each note stem direction). You can play the entire score, a range of measures, individual chords or a single note. It's easy to hear the results of your editing efforts. If you're not pleased,

simply edit. When you are pleased, print.

And what a printout! At arm's length, it's hard to distinguish final copy from a professionally produced piece of sheet music (though it takes some time to print). You have several printing options including insertion of a copyright notice, flexible title page design and page numbers, all selected through an intuitive GEM dialog box. Unfortunately, only Epson-compatible 9- and 24-pin dot-matrix printers are supported. There are no plans yet to support the Atari SLM804 laser or HP Deskjet printers.

Overall

My general impression of EZ-Score is a good one. Final printouts of scores are easy to produce and are of near-professional quality. MIDI playback is also excellent, within the restrictions given above. The only trouble I experienced was that playing triplets on one staff line against slower notes on a second staff line caused the triplets to be slightly off-time. I overcame this minor snag with some tricky manipulation.

The documentation is clear, concise and well-written with both the novice and professional in mind. The amateur will find this program an easy introduction to scoring on the ST, while the professional will not feel restricted, except for the three-staff limitation. ■

Larry Magnello is a professional musician from Girard, Ohio. He is in the process of releasing a symphonic work produced largely with the ST, Hybrid Arts software and samplings of rare musical instruments.

PRODUCTS MENTIONED

EZ-Score Plus, version 1.1; \$149.95. Hybrid Arts Inc., 11920 West Olympic Blvd., Los Angeles, CA 90064, (213) 826-3777.

CIRCLE 165 ON READER SERVICE CARD

Of Drives, Power Supplies and Power Systems

Hard Disk Hardware Explained, Part II

BY DAVID SMALL
START CONTRIBUTING EDITOR
WITH DAN MOORE

Now we get to the hard disk mechanism itself. (Finally!) Generally, the hard disk contains still another microprocessor! The hard disk receives its instructions via the 34-pin cable and sends/receives data over the 20-pin cable. The microprocessor onboard does things like stepping the hard disk head, spinning up the drive to speed, maintaining the speed at 3,600 RPM and so forth.

The actual mechanisms come in many flavors. First, there are full-height and half-height 5¼-inch mechanisms. Then, there are 3½-inch mechanisms—these are newer designs. The actual number of platters and heads inside determines the capacity of the drive; the stepper design determines the seek speed, but *all* of them spin at 3,600 RPM.

Atari's used several hard disk mechanisms that I've seen. They began with that old workhorse, the Seagate ST-

225, a half-height 5¼" mechanism. They've also put a 3½-inch Toshiba hard disk in an adapter bracket and I've heard reports of other mechanisms as well.

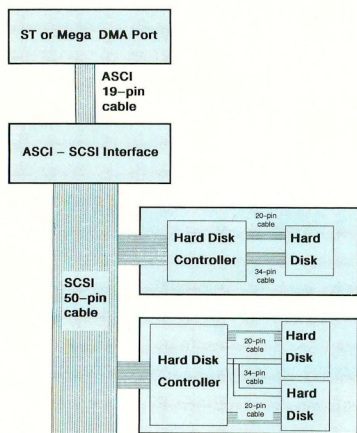
The ST-225 has an average access time of 65 milliseconds, which is about medium speed. It's easy to swap the ST-225 for something like a Seagate ST-251, which is the same size—40-megabytes—and *much* faster: 40 milliseconds access time. If you want to hot-rod, go for the ST-251-1, which has a 28 milliseconds access time—appreciably faster.

The actual hard disk has several platters within it. It looks something like what you'd have if you glued two floppy disks together with a common hub. Each platter has a read/write head on its top and bottom surface. There are 17 sectors per track and 615 tracks across the hard disk. On some drives, you can actually see the "stepper" mechanism as

it moves the head back and forth; on others, the whole works is a sealed unit. (Almost always, though, you can feel the hard drive stepping the head).

On power-up, the Adaptec controller wakes up instantly, says, "Gee, I'm powering up; let me wait for the hard disk to spin up." The hard disk spins up to 3,600 RPM, pulling a great deal of current from the power supply; this takes 10 to 30 seconds. Whenever the hard disk signals the Adaptec that it's awake and at speed, the Adaptec begins doing things to it. First, the Adaptec pulls the head to track 00, to verify that it can; then, it scans across the hard disk, looking for "bad track" information that's stored on the hard disk.

You can't miss the sound of this process. *It's important that you get to know it*, for the spin-up sound ("vroooooom") and the Adaptec wake-up cycle sound ("whick-whick-whick") should happen ▶



A rat's-eye view of the cabling in an ST hard disk system. Not only do you have to contend with the SCSI, ST506 and power cabling common to hard drives everywhere, you also have ACSI—Atari's own DMA port communications standard.

every time you power up the hard disk. (If you have a very quiet mechanism, it's harder to hear over the fan, but it's still there.)

If your hard disk or controller or cables or power supply fails, the first warning you may have is that power-up will be different. Maybe the disk won't spin up; maybe it won't "whick-whick" as the Adaptec wakes it up. This is like an early warning light.

For instance, my ST-225 gives a good loud "shudder" while waking up. The ST-277R (60-megabyte with RLL formatting) is very quiet and wakes up extremely quickly. The 40-megabyte Mini-scribe 6350's take forever to spin up, then give a loud "Snort" as the Adaptec wakes them up.

If you have two drives, the Adaptec lets them spin up individually, then checks them both out. It does this as each wakes up, so if they're different brands, all is well.

Important: if the checkout fails, the Adaptec often will shut down the drive.

At this point, the Adaptec will sit and blink its onboard LED light according to an error code established by the company. It will also do this, if it can, if it diagnoses itself as having a problem. You can then look up this code in the ACB-4000 service manual and find out what's wrong. (Naturally, if the ACB is too far gone, it won't do anything.)

So, when checking out a hard disk, you should always be able to power it up, and hear/watch the Adaptec check it out. If that doesn't happen, you have a sick controller, hard disk, power supply or cabling; in the years I've been using hard drives, I have had all of these components go bad at one time or another. I would arbitrarily say, trust the cables least, the power supply next least, then the hard disk, then the controller and finally the ACSI-SCSI board.

RLL

Some hard disk manufacturers use something called RLL. RLL is a different way of recording data on the disk drive.

Previously, the industry standard was MFM (Modified Frequency Modulation), or "double density," the same technique used on a floppy disk. RLL (Run Length Limited) lets you pack more data onto the hard disk, a sort of "double-double" density. In practice, it gives you about 1.5 times the amount of storage you presently have. For example, a 20-megabyte drive can become a 30-megabyte drive, just by changing the disk controller and reformatting.

Two popular RLL controllers are the Adaptec 4070 and the Omti 3527. Supra thinks highly of the OMTI controller because it uses a 1:1 interleave *and* it gives you RLL capacity; this makes it unbelievably fast. I've only recently received the Omti 3527, because they're in short supply (probably because they're so popular). Street price of the Adaptec is around \$100, while the OMTI costs around \$140.

You'll often see ads in Atari magazines for "build your own" hard disks; I'm trying to familiarize you with the names (ACB-4070, for instance), so you'll know what you're reading about. Controllers aren't switchable between MFM and RLL. Be careful to know what you're buying. Adaptec 4000 is MFM; Adaptec 4070 and Omti 3527 are RLL.

As with many pluses, there's a minus. RLL makes the hard disk work a lot harder and is far less tolerant of minor disk errors than MFM. Hence, if you use RLL, you must use it with a disk mechanism that is "RLL Certified" or "RLL Compatible." Generally, this means the disk platters within the drives are "plated media," which is a little better than the usual media.

Now, the ST-225 and the Toshiba mechanism are *not RLL certified*. So don't try changing out Atari's ACB-4000 for a 4070 and expect to have a 30-megabyte drive. You'll have to change the drive as well. However, if you are planning on getting more storage and changing drives anyway, why not go RLL and get one-and-a-half of the drives you're buy-

ing for the price of the controller? Many RLL-rated drives cost only \$20-\$50 more than the standard MFM mechanism. For example, I use the Seagate ST-277R (60-megabyte, \$359 street price) RLL drive. Give RLL some thought.

One note Supra tells me about: the very popular Seagate ST-238 (RLL and 30-megabyte) and ACB-4070 RLL Controller combination will fail intermittently if you don't shield them from each other; they're sensitive to electrical interference that the other generates.

Heard of ESDI? That's just another way to hook the hard disk to the controller; it's a different ST-506, you might say. No one I know is doing anything with ESDI in the ST world; it's pretty much restricted to IBM.

Again, there are various suppliers who will build a hard drive according to your specifications, such as Tech Specialties and Berkeley Microsystems. If you're truly brave, you can "roll your own." Supra and ICD will be happy to sell you the only hard-to-find part, the SCSI-SCSI converter, for around \$140. You won't save a tremendous amount of money building your own, but it is a fun project.

The Power Supply

Finally, we come to the power supply.

The power supply takes in 110 VAC from your neighborhood power plant, and converts it to +5 and +12 volts. The SCSI-SCSI interface board requires 5 volts. The Adaptec ACB-4000 requires +5 and +12 volts, and uses the industry standard "keyed" 4-pin power plug; this prevents you from plugging it in backwards and blowing up the drive. The hard disks require the same and use the same plug.

You might look briefly at your power supply, but be darned careful not to touch it. You can then determine if you can add a second hard disk or a bigger hard disk without stressing the supply. The amount of current (amps) at +5 and +12 volts available is listed on both

the supply and the hard disk. (The interface boards don't really "drink" enough electricity to worry about).

For example, a full-height Miniscribe 40-meg drive takes 1.8 amps at 12 volts, and 0.9 amps at 5 volts. The power supply I'm using supplies 4 amps at 12 volts, and 10 amps at 5 volts, so I'm well within the safe range. (In fact, you can get into trouble if you don't load some power supplies *enough!* Many people use IBM clone 200-watt power supplies when building up their own hard disks, and only hang one half-height drive on

RLL lets you pack more data onto the hard disk.

it; this insufficiently loads the supply, which then hiccups on the power lines. Two drives, please, for a 150-watt supply; one drive is fine with an old 65-watt supply).

Last But Not Least

If you don't use any interface other than the Atari (which has a hardware bug), you can connect many, many physical drives to your ST. As I write this, I have six drives connected to my ST with about 240 megabytes of storage. If 240 megabytes seems excessive, remember that with Spectre 128, my ST is both a Mac and an ST. I have lots of software for both, plus backups and backups of the backups. (I've gotten paranoid after killing so many hard disks in so many creative ways.)

To do this, you need to learn about SCSI enough to use it, and if you want to do it, make a custom 50-pin cable with as many clamp-on 50-pin female connectors as you want to hook controllers up to. You can then hang up to

eight Adaptec, Omti, or whichever controllers onto this cable, plug the end into the SCSI-SCSI board, and you're off and working.

Each controller, in turn, can handle two drives (some more, but two is usual), so you could put 16 drives on your ST. Believe it or not, if you use 100-megabyte drives, a billion-byte (gigabyte) system of Atari hardware is possible! Now, of course, you'll need separate power supplies and what-not, but it can be done. Apple even makes "stackable" SCSI drives using just this principle!

One excellent way to do this is to get an IBM clone case, preferably with flip-top lid (\$40 or so), and an IBM clone power supply. Put the hard disks where they usually go in an IBM and the controllers where the IBM's motherboard usually goes. Then, you weave the SCSI 50-pin cable through the chassis and everything is neat and secure. Most importantly, you then have the drives and controllers being cooled by the power supply's fan—and that makes them last a lot longer. It's fun to see the Atari sitting in front of what looks to be an IBM.

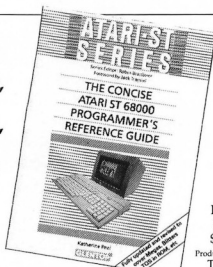
I mention this because having a multi-drive system greatly increases your immunity to failure. First, you have backup, alternate drives and controllers to swap in and out for tests. Second, you have a convenient place for a very quick back-up of your data. Third, you'll have gained the knowledge to hook this stuff up—and that's one of the best things of all to have.

Well, that's an overview of the disk drive hardware, with all sorts of experimenter's and debugger's notes.

See you next time! ■

START Contributing Editor David Small is the creator of the Magic Sac, Translator 1 and Spectre 128. Dan Moore is the author of Paper Clip for the 8-bit Atari and the never-released Paper Clip Elite for the ST.

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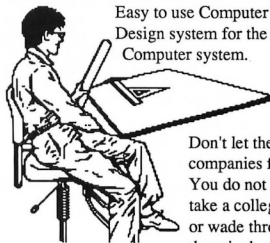


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GFA Object

Now in Monochrome

PROGRAM BY GFA SYSTEMTECHNIK
ARTICLE BY ANDREW REESE, START EDITOR

In the May 1989 issue of START, we brought the color version of GFA Object to your START disk. In order for every ST owner to be able to use this great program, we now bring you the monochrome version. GFA Object lets you create three-dimensional objects that you can use in your own GFA BASIC programs. If you're at all interested in 3D, read on. . .

Monochrome owners, rejoice! GFA Object is on your START Disk in the files OBJMONO.ARC, OBJDOCS.ARC and ANIMATOR.ARC.

Most of you are aware of the power of GFA BASIC. Version 2.0 of the Interpreter has become the standard against which all BASICS for the ST are judged. Because of its power, GFA Systemtech-

nik created a whole series of programs designed to work with it—and many were actually written in GFA BASIC itself. GFA Object is an example of such a program.

We originally featured the color version of GFA Object on the May 1989 START disk. But to make it accessible to all START readers, we're including the monochrome version this month. You can use it to create objects or images for

use in your own GFA BASIC programs or as macro-data for use in GFA Draft Plus. You can also use objects created in GFA Object with GFA Vector, GFA's 3D animation program on your June 1989 START disk.

Getting Started

GFA Object is on your START disk in the file OBJMONO.ARC along with six module files. Copy OBJMONO.ARC to a blank, formatted disk and un-ARC it, following the Disk Instructions located elsewhere in this issue. When you are finished, double-click on the OBJMONO.PRG icon to run the program. You will need an ST or Mega system with a monochrome monitor to run this version of GFA Object.

If you have a copy of the May 1989 issue, you may want to turn to page 55 for instructions on how to use GFA Object. If you don't have that issue, we've included the same instructions in the file OBJDOCS.ARC on this issue's START disk. Simply copy GFADOC.ARC to a blank, formatted disk and un-ARC it. You can then View or Print the ASCII ▶



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GFA Object

instructions file, OBJDOCS.ASC, from the Desktop.

Animation with GFA Object

We've also included on your START disk an animator program that does two things: First, it lets you convert your GFA Object .OBJ files into .DAT vector files so that you can load them into GFA

Vector and GFA BASIC as objects. Second, it lets you experiment with animation of any object with fewer than 1,024 points.

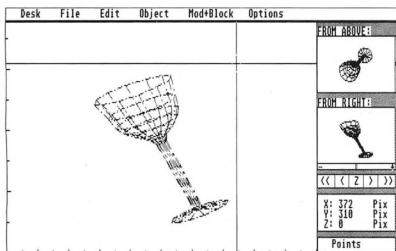
The Animator program is called ANIMATOR.PRG; you will also need to have ANIMATOR.CHN in the same directory to run Animator. These two files are contained in a separate ARC file named ANIMATOR.ARC. To use Animator, un-

ARC ANIMATOR.ARC following the Disk Instructions located elsewhere in this issue and then double-click on ANIMATOR.PRG in either medium (color) or high (monochrome) resolution.

Manuals

Depending upon the demand from our May publication of GFA Object, we may still have available some of the original 150-page manuals for GFA Object. The price for the manual is \$12.95, plus \$3.50 shipping and handling. For VISA and MasterCard orders, simply call the Disk Desk toll-free at (800) 234-7001 and ask for #TH002 or send your check or money order in the amount of \$16.45 to: GFA Object Book Offer, 544 Second Street, San Francisco, CA 94107.

We're sorry to report that our entire stock of manuals for GFA BASIC 2.0 published in the January 1989 issue has been sold out. ■



GFA Object's Edit Field, in which you create and modify your objects. All functions are selected from the extensive drop-down menus for easy operation.

Sound Wave Stylist

BY SAL GUTIERREZ

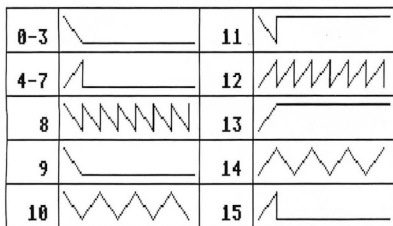


Figure 1. The wave forms (envelopes) available for the WAVE command. The numbers are the values you need to enter in the WAVE command to use the corresponding wave form.

Create sound effects in real-time, then let the Stylist write the BASIC code for you! File *STYLIST.ARC* on your *START* disk.

The ST is capable of making some pretty good sound effects. You and I know it, because we've heard them in commercial programs. The problem is that there is very little documentation about how to tap this almost hidden resource. You can generate sound using the SOUND and WAVE commands, but it's hard to get just the right effect. I developed the Sound Wave Stylist as a graphic sound-designing tool that will generate BASIC code compatible with

GFA BASIC versions 2 and 3, HiSoft BASIC and HiSoft BASIC Professional.

The SOUND and WAVE Commands

The SOUND and WAVE commands used to control sound output are common to GFA, HiSoft and ST BASIC. The syntax of the commands is:

SOUND voice, volume, pitch, octave
[,duration]

and

WAVE voice, envelope, form, length,
duration

By itself, the SOUND command manipulates voice, volume, pitch, octave

and time duration before the next command is executed. There are three voices available from the ST's built-in Yamaha sound chip. Volume is set with an integer value between 0 and 15 (0 turns the volume off and 15 turns it up full blast). Pitch can be any integer value between 1 and 12, 1 being the lowest frequency selectable within the octave and 12 being the highest. The octave value can be any integer value between 1 and 8, with 1 being the lowest. The duration is an integer value that specifies the length of time (in 1/50ths of a second) to play the sound.

The WAVE command does not produce any sound; rather, it defines the parameters for the SOUND command. Its parameters are voice, envelope, form, length and duration. The wave voice determines which of the three sound voices will be active and in what combinations.

Wave Voice 1—Sound voice 1
2—Sound voice 2
4—Sound voice 3
8—Noise on channel 1
16—Noise on channel 2
32—Noise on channel 3 ▶

Notice that you can produce noise on each of three channels. Noise takes the shape of the form selected and is played regardless of what pitch or octave values are set in its corresponding sound voice. Selecting noise on a particular channel does *not* mean that you can't select the normal sound voice on the same channel at the same time. To establish your wave-voice value, determine which sound voices you want to be heard, and any noise, and then add up the corresponding voice values. For example, to hear sound voices 1 and 2

set to play noise in this value, will play pure tone.

The form value is that of the shape of the wave. (See Figure 1.) Remember that this selection will only affect the sound voices set in the wave envelope parameter. The length value tells the WAVE command how many units of time (in 1/8,000ths of a second) to use to complete one full cycle of the wave form. For example, if form 8 has been selected with a length of 16,000, it will take two seconds to complete one cycle to linearly rise from a zero volume level

these commands can be a frustrating experience at first, they will let you create some awesome sound effects. The bottom line is that if you want pure sound only, simply use the SOUND command for the three voices and disregard the WAVE command. However, if you want to use the WAVE command, establish the pitch and octaves for the sound voices using the SOUND command first, leaving the durations set at zero. Then use the WAVE command to set active voices, envelope, form, length (of form cycle) and duration of play.

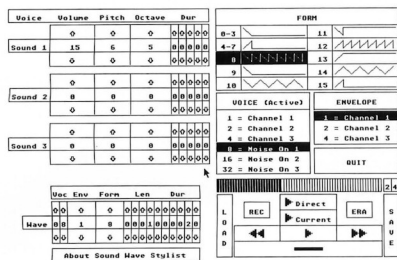


Figure 2. Sound Wave Stylist is a fun and easy-to-use tool for experimenting with the ST's sound chip. If you're a programmer, Sound Wave Stylist can even generate sound code files that you can load into your own HiSoft, GFA or ST BASIC programs.

Making It Sound Right

Unless you know the exact parameters required for any particular sound effect, you normally must endure a lot of hit-and-miss programming. My Sound Wave Stylist displays all of the controls needed to alter parameters in SOUND and WAVE commands in real-time—while you hear the sound. Un-ARC STYLIST.ARC, following the Disk Instructions elsewhere in this issue. Double-click on STYLIST.PRG in medium or high resolution to bring up the screen shown in Figure 2.

On the left side of the screen are the command blocks for the three sound voices and the wave function. Click the left mouse button in a box containing an arrow to change all the values. You can't alter the pitch and octave values for the SOUND commands unless the volume is set to a value greater than 0 for that channel. Setting the volume value to 0 sets pitch and octave values to 0 automatically. If the voice parameter in the WAVE command block is zero, sounds will be played as pure tones regardless of any other values.

In the upper right part of the screen are the FORMS, VOICE and ENVELOPE boxes. They not only serve as a reference to the possible wave configurations, but you can also use them to set the wave-command block directly. Simply left-click on the desired form, voice or envelope (or click on a box

plus noise on channel 1, add 1 for sound voice 1, 2 for sound voice 2, and 8 for noise on channel 1. The total, 11, is the wave-voice value.

The envelope parameter reflects which of the three sound voices will be directly shaped by the chosen wave form.

- Wave Envelope 1—Sound voice 1
- 2—Sound voice 2
- 4—Sound voice 3

The wave envelope, like the wave voice, can include more than one voice by adding together the corresponding sound-voice values (1, 2 or 4). Notice that the sound voices are the only ones available here; the noise channels are automatically set to output by their selection in the wave-voice parameter. Any sound voice that is active, but not

to full volume and back to zero volume again.

The function of the duration value for the WAVE command is identical to the duration value in the SOUND command; it determines how long to play the sound before execution of the next command.

Although becoming familiar with

The WAVE command defines the parameters for the SOUND command.

again to deselect it). The appropriate parameter in the command block will be updated with the new value. Notice that since only one form can be specified at a time, any previously highlighted form will be deselected in favor of the new. Voice and envelope parameters, on the other hand, can be selected in any combination.

At the lower right part of the screen is, essentially, a tape recorder/player that lets you record the contents of the command blocks currently on the screen for subsequent playback. You can also save your recorded sounds to disk in ASCII files that you can merge into your BASIC programs.

The Tape-Recorder Controls

Tape Counter and Strip The strip represents the 64 screens (0-63) of command-block information that are available for recording. As each screen is recorded, the strip will highlight the next empty slot and increment the tape counter by one.

Direct PLAY When selected, this box will highlight and the program will play any sound on the screen at that time. At this point you can change any parameter and hear the result immediately. A duration value in either the SOUND or WAVE command block is ignored in this mode. Sounds are played in this order Sound 1, Sound 2, Sound 3 then Wave. Unless you have a voice parameter other than 0 in the WAVE command block, you will only hear the last sound with a volume greater than 0. Click on STOP to exit this mode.

Current PLAY Click here to highlight the Current box and play the SOUND and WAVE command blocks. Unlike Direct PLAY the duration values are taken into account here, so the command will automatically end at the times specified by the durations. This is exactly what the sequence will sound like in your program.

PLAY Click here to highlight the PLAY box and play back the

prerecorded screens in sequence. The tape strip, counter and command-block data are updated. The program stops playing when either the end of the recorded tape is reached or you click on the STOP button.

REWIND/FAST FORWARD These options highlight the rewind or fast-forward button and rewind or advance the tape. The tape strip, counter and command block are updated. This com-

Although becoming familiar with the SOUND and WAVE commands can be a frustrating experience, you can create some awesome sound effects with them.

mand ends either automatically at the beginning or end of the tape or when you click on the STOP button. To move to a specific counter number, hold the left mouse down while and select rewind or fast forward, then move the mouse to the STOP button when you reach the desired number.

STOP Used to end PLAY, Direct PLAY, REWIND and FAST FORWARD.

REC Records current command-block parameters to tape. The tape strip and counter are updated to the next available slot. If you click the right mouse button while holding the left button down, the current command-block parameters will be copied to next screen. This is a handy option when you're recording a sequence that is similar in each frame. If the right mouse

button is not pressed, all command blocks are zeroed. This command ends when you release the left mouse button.

ERA This command will erase the tape from the current tape counter/strip position to the end of tape. An alert box verifies your choice. ERA does not clear the current command blocks.

LOAD Any previously saved recorded sequence can be loaded by this command. A file-selector box will prompt for a filename with an .LST extension. Tape strip and counter will reset to the beginning of the tape. The command blocks will reflect the parameter of the first screen recorded.

SAVE A file-selector box will prompt for a filename for the current recorded tape. A filename extender of .LST will be appended to the filename automatically if none is specified. You can load files into this program at any time or use them in your BASIC programs. You can load Stylist files directly into HiSoft BASIC; load them into GFA BASIC using the Merge command. The command syntax of SOUND and WAVE works with ST BASIC programs; however, you will need to add line numbers to the beginning of each line before loading the file. The order in which the commands will appear in the listing will be: Sound 1, Sound 2, Sound 3 then Wave.

Make a Lot of Noise

I hope this program will help you develop the sound effects that will best complement your programs. Any comments or suggestions to enhance this program are invited. I believe that all programmers who are trying to put their STs to the best possible use should be able to do so as effortlessly as possible. ■

Sal Gutierrez lives in Valdosta, Georgia. He wrote the Morse-code aid, Dah-Ditter, in the February 1989 issue of START.



Photo by Mary Ross

With a wave of his hand, . . . he makes music. Theremin virtuoso Eric Ross is shown playing a modernized digital version of the eerie-sounding instrument that originated in 1924. With the ST Theremin, you can make the same kinds of sounds with your ST.

BY STERLING K. WEBB

The theremin is famous for producing the wailing, eerie sounds that have become synonymous with science-fiction cinema. Inspired by the classic *Forbidden Planet*, SEURAT author Sterling Webb developed his version of the theremin for the ST. ST Theremin runs in all three resolutions.

The ST

Make synthesized sound the old-fashioned way. File THERE-MIN.ARC on your START disk.

The theremin—a buzzing, humming box of haunting sounds invented in 1929 by the Russian engineer Leo Theremin—was the first instrument to generate music electronically. It produced tones that were actually *synthesized* rather than modified and amplified from sounds produced by traditional physical means such as plucking a string, banging a drum or hooting into a hollow tube. It's the true ancestor of whole generations of electronic instruments.

The original theremin sported two wands, or antennas—one horizontal and one vertical. The thereminist moved, waved, flapped, fluttered and wobbled both hands around these wands to produce the eerie hums and buzzes that were to be the instrument's trademark. The capacitance (electric charge) of human hands controlled the pitch and volume of the theremin, and the thereminist's odd motions wove a song into the air.

In 1956, the theremin reached its largest audience ever. That year it was used to produce the complete soundtrack of the science-fiction movie epic, *Forbidden Planet*. The theremin created

THEREMIN

START's Eerie Sound Generator

all the sounds needed by the movie, from the weird revolving hum of the flying-saucer-like starship to the tinkling waterfall in a garden.

Getting Started

ST Theremin emulates the theremin on the ST. The mouse replaces the human hand, controlling volume by its vertical position and pitch by its horizontal position. You'll be amazed at how simple it really is.

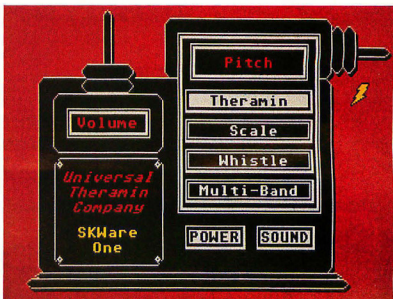
To run ST Theremin, copy THEREMIN.ARC and ARCX.TTP onto a blank, formatted disk and un-ARC THEREMIN.ARC following the Disk Instructions found elsewhere in this issue. The program was written in GFA BASIC and runs in all three resolutions.

At the Desktop, double-click on THEREMIN.PRG and you're there. Turn up the volume on your monitor and move the mouse around the screen—you'll get a kick out of all the crazy sounds emanating from your monitor speaker. Move the lightning-bolt cursor up for louder sounds and down for lower volume. Move the cursor to the right to raise the pitch and move it left to lower it. What's that sound? Are flying saucers landing in the backyard?

The Controls

This is a second-generation, solid-state

The ST Theremin screen. Use your mouse to move the lightning-rod cursor up and down the screen to increase the volume or back and forth to change the pitch. It's fun—and it will annoy your neighbors!



theremin, so there are four pitch/scale options.

The Theremin mode is active when you load the program. Click on Scale to break the continuous tones of the theremin mode into the stepped notes of a scale. Whistle reads pitch from the mouse in a logarithmic scale, producing tones like those of a slide whistle. The Multiband mode zones the screen into eight separate theremins ranged along the horizontal axis. Test them all for yourself.

The SOUND button lets you turn off tone generation, just in case you have to leave your ST for a minute (or your ears need a rest). Click on SOUND again to

restore the sound. Click on POWER to return to the Desktop, but be ready to jump when you do (don't say I didn't warn you!).

Wrap-Up

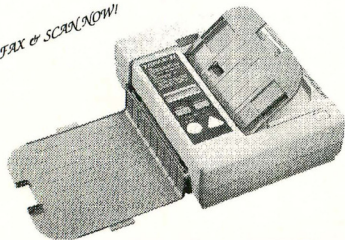
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Sterling K. Webb lives and works in Bunker Hill, Illinois. He wrote SEURAT, the popular draw-and-paint program published in the March 1989 issue of START.

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CIRCLE 043 ON READER SERVICE CARD

Copyright Registration, Trademarks and Lawyers

BY ANDREW REESE
START EDITOR

In the last column, we looked at what a copyright is and how you obtain one. In this column, we'll examine the registration of a copyright, the differences between a copyright and a trademark and some other facets of copyright law.

Why Register a Copyright?

Let's continue with the example we used last column—a dynamite new game. At the very second you type your original code into your ST, you have a copyright in it under federal law. And further, if you add a proper Copyright Notice to it, you are protected against *infringement*, i.e. anyone copying your code. So why does anyone bother to register a copyright with the Copyright Office?

A copyright is a form of property, defined and limited by federal law. As such, in order to maintain the rights given to a copyright owner, you must follow the federal law *exactly*. If the law said that you must have a Copyright Notice in three-foot glowing fuschia letters for it to be effective, well, you'd have to have a three-foot, glowing fuschia Copyright Notice or it would fail. But if you properly register your copyright with the Copyright Office, you may be

protected even if your game was distributed with an improper Copyright Notice.

There's still another reason to register your game: as a creature of the law, a copyright can only be enforced through the courts. Even if you have a valid copyright, you can't even get into court to keep someone from infringing on your copyright unless and until you have registered it with the United States Copyright Office. (There's a certain amount of leeway allowed for published works, but the bottom line is, "No registration, no lawsuit.")

As a lawyer, I was often asked the question, "Well, can I sue?" My answer always was, "Sure, but the question is: Can you *win*?" Registration of a copyright not only lets you *sue*, but it also lets you collect attorneys' fees and certain specified damages from the date of your first publication. Moreover, since you must deposit a copy of your work with the Register of Copyrights, this gives you an easy way of proving the exact state of your program on the date of registration. You programmers—think how hard it would be to prove the exact state of your program on that fateful day that you gave a copy of it to a "friend."

The Mechanics of Registration

To register a copyright, you will need to obtain Form TX from the Copyright Office at the address at the end of this column. See *Figure 1*. There are several different forms for various types of works, so be sure that you ask for the correct one. You will also want to ask for a copy of Circular 61, which gives you some of the basic information you'll need.

Once you have completed the form, you will need to send it along with a check or money order for \$10, payable to the Register of Copyright, and a *deposit* of your work. For computer programs, this means a paper copy of the first 25 pages and the last 25 pages of your code. Do not send a disk with either source or executable code; the Copyright Office does not want it. Also, special rules apply to databases which are beyond the scope of this column.

Once you have properly complied with all of the requirements for registration, the Copyright Office will send you a Certificate of Registration. While it does not in itself prove the validity of your copyright, it is convenient to have for reference.

The image shows two overlapping forms. The top form is 'FORM TX' (Copyright Registration Form) with sections for 'REGISTRATION INFORMATION', 'AUTHOR INFORMATION', 'TITLE OF WORK', and 'COPYRIGHT INFORMATION'. The bottom form is 'FORM 1040' (Copyright Registration Fee Schedule) with a table of fees for different types of works and registration methods. The forms are numbered 1 through 11 on the right side.

If you can complete your Form 1040 without getting audited, then you should be able to complete this Copyright Registration Form TX. If it looks too intimidating, or if you just want to make sure it's done right the first time, you probably should talk to a lawyer.

Copyright Versus Trademark

Although the complexities of our society have made clear dividing lines difficult, some basic distinctions can be drawn between a copyright and a trademark. A trademark is a word, phrase, slogan or title that is used to identify a product or service. For example, Atari, 520ST, 1040ST and Mega are all registered trademarks of Atari Corp., and START is a trademark of Antic Publishing, Inc. From the standpoint of the Copyright Office, these words are too trivial to merit copyright protection.

Do You Need a Lawyer?

If you think that your game has real commercial possibilities (Be honest, now!), then you should probably see a lawyer versed in Intellectual Property—that's the specialty that deals with copyrights. But if you can complete your Form 1040 and the schedules for the IRS without being audited and don't plan to make buckets of cash from your game anyway, then you can probably do

the basics yourself. It's all a matter of how much your game is worth to you—and to the rest of the world.

Finding a lawyer skilled in copyright is another question, however. It's not a specialty that's widely practiced outside of the publishing centers of the country. Still, most business lawyers, even in small towns, must address copyright issues at some time for their clients. You may find a competent copyright lawyer right around the corner from you.

There are three good ways to find a competent copyright lawyer—or any other kind, for that matter. First, ask your friends who may have had to deal with business lawyers for a recommendation. Even if their recommendations are for lawyers who don't practice copyright law, any ethical lawyer will always attempt to steer a client to someone who can do a good job in that area of law. Second, pick up your yellow pages and look at the listings under Attorneys—Copyright. Then call a few who are listed. Ask questions: What percentage

of their practice is spent on copyrights? How will you be charged? Is there a fee for an initial consultation? And don't be cowed by lawyers; you're paying the freight and you can run the train.

Finally, go to the law library in your county seat. It should be open to the public. Ask the librarian to let you look at the Martindale-Hubbell Directory of Attorneys for your state. It's a set of b-i-g books that list almost all practicing attorneys by city and gives the specializations, experience and an overall rating. It's not the best way to find a lawyer, but it's way ahead of using a dartboard.

I hope that these columns have been of some interest and use to you. They probably raised more questions than they answered, so if you have any questions of a general nature that I could answer in future issues, please feel free to write. I cannot answer specific legal questions, nor give legal advice, however. ■

Update

As of March 1, 1989, the United States began following the Berne copyright convention—the international treaty on copyrights. This changes the law somewhat. For works published after March 1, 1989, a copyright notice will *not* be required to have a work protected. It will still be useful as a warning to potential infringers.

Additionally, there is no deposit requirement for works that originate outside the U.S., although it continues for works of domestic origin. ■

Andrew Reese is the Editor of START and a former attorney.

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CIRCLE 036 ON READER SERVICE CARD

Clipboard

Tips and Tricks for the ST Owner

By Heidi Brumbaugh
START Programs Editor

Super Tip

Superbase Professional has some great reporting features, but they lack one key feature—you cannot print out the contents of an external text file. Fortunately, you can use Superbase's Database Management Language (DML) to write a program to print your own report, including the contents of an external field. Include the following subroutine in your DML program:

Showfile:

```
OPEN extfield.MYFILE FOR INPUT
INPUT LINE a$:REM get rid of ruler
WHILE NOT EOF ("*")
  INPUT LINE a$
  REM get rid of special character
  IF ASC( RIGHT$( a$,1))=4 THEN
    ? LEFT$( a$, LEN (a$)-1)
  ELSE
    ? a$
  END IF
WEND
CLOSE INPUT
RETURN
```

You can still graphically edit your report using the Superbase Forms Editor. Save your form in report format, load it into the programs editor and delete all the REPORT commands. Put the print statements in a loop:

```
OPEN FILE "MYFILE"
SELECT FIRST
FOR i% = 1 TO RECCOUNT ("")
  { report printing commands }
  { including branch to Showfile
  subroutine }
  SELECT NEXT
NEXT i%
```

Word Writer Print Spooler

Word Writer's print spooler makes a temporary copy of a file on disk, and then prints directly from disk so you can use the word processor for other things while it is printing. The designers of this feature were a little over-enthusiastic about it—they didn't give you a way to turn it off. This means the print spooler's disk access can take a good two or three times longer than the actual print operation, especially for a short document.

You can speed up printing by directing the print spooler to a hard disk or RAM disk. To do this, all you need to do is access your hard disk or RAM disk before printing. For example, if you've loaded a file from drive A, click on Save As. . ., select your faster drive from the GEM file selector (for example, C or D), and click on Cancel.

There's More Here Than Meets the Eye

You've started using GFA BASIC menu commands such as ON MENU MOUSE GOSUB and ON MENU KEY GOSUB, but you've found that you need information that these commands don't give you. Keep in mind that GFA BASIC is sending your commands to AES, and in many cases the corresponding function calls return information to the AES parameter block. You can access this information through the GFA BASIC MENU() array, or from the AES parameter block directly.

For example, after a procedure branch from an ON MENU BUTTON command, you can find out whether a

Shift, Alternate or Control key was pressed by examining MENU(13) or DPEEK (GINTOUT+8). A good book on GEM programming will give you the specific values returned from various AES calls, which you can use to make your programs more sophisticated.

Don't Tell Rainbird

David Litchman of Stamford, Connecticut sends this clever ploy to increase missile stores in Rainbird's Carrier Command: "When you're outfitting a Walrus tank, place nine Harbinger surface-to-surface missiles in its weapon's bay. Then, remove those missiles and replace them with an Avatar chemical laser. When you launch the Walrus from the carrier, you should have both the laser and the missiles available for use. If you don't use the missiles they will be added back into the carrier's inventory when you return, so there will be the missiles that were removed initially from the walrus plus the ones you brought back, making more missiles than when you started! You can build the carrier's stores up to maximum by doing this a few times."

Well, sounds like a bug to me, David, but who am I to knock free missiles? I won't tell Rainbird if you won't. . .

Got an ST trick or tip to share? We're interested in tips for the rank beginner or expert programmer, for exploring the Desktop or for getting the most out of any popular ST program. Send your tips to the Clipboard, START Magazine, 544 Second St., San Francisco, CA 94107. ■

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-Ralph Mariano, ST Report



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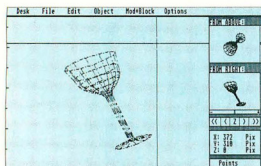
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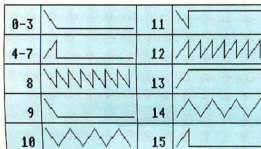
Disk Contents



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START Arcade . . . Page 86

Super Summer Sounds!

When START published the Audio Visual Sequencer in the November 1988 issue, the one question we heard over and over from our readers was, "How can I combine my Digisound files with Cyber Paint sequences?" Well, now you can, using **Babel**, START's sound file conversion program by Contributing Editor Jim Pierson-Perry. Babel, START's first program written in HiSoft BASIC, converts sound files from any ST format to any other ST format—including the ST Replay format required by AVS. Not only that, but you can convert Mac and Amiga sounds to your ST, so you can download sounds from online forums across the country. Babel even supports some MIDI formats; see the article for more details. File BABEL.ARC; runs in medium or high resolution.

To get you started sounding great, we put some **digitized sounds** on your disk—you can play them back by loading them into Babel. File SOUNDS.ARC.

This issue START offers monochrome owners the power of **GFA Object!** We published the color version of this powerful 3D modeler in our May 1989 issue (the entire text of the accompanying article is on your May START disk). Also included is the Animator program, which converts object files to .DAT vector files so you can load them in to GFA BASIC and GFA Vector. Files OBJMONO.ARC (GFA Object), ANIMATOR.ARC (Animator) and OBJDOCS.ARC (documentation in ASCII format); requires a monochrome monitor.

This issue's Programming in BASIC concentrates on creating sound using the SOUND and WAVE commands. The **Sound Wave Stylist** by Sal Gutierrez lets you graphically edit your sounds and then save them to disk and merge them with your programs. The Sound Wave Stylist generates files compatible with GFA and HiSoft BASIC; you can also use these files with ST BASIC if you add line numbers. File STYLIST.ARC; runs in medium or high resolution.

If that's not already an earful, tune up **ST Theremin**, a computer program based on the old fashioned Theremin sound effects generator ST Theremin was written by Sterling Webb, author of the SEURAT paint program from the March 1989 issue. File THEREMIN.ARC; runs in all resolutions.

For entertainment this month, try the **START Arcade**—three fast-paced, exciting games in one. From the Arcade menu select either Raymond Pompon's Cheese Munchers or Skeet or Immunity by Richard Betson. Gear up for fun with ARCADE.ARC; runs in low resolution and requires a meg of memory.

Finally, see how HiSoft BASIC measures up with Dave Plotkin's **HiSoft Benchmarks**. Compare the results to those published in our October 1988 issue—then see which BASIC is best for you. File HISBENCH.ARC; runs in medium or high resolution. ■

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Disk Instructions

How to Get Our Programs Up and Running

Each article in this issue with a disk icon next to its title on the Table of Contents or "On Disk" on its first page has an accompanying file on your START disk. These files are *archive* files—they've been *compressed* with the Archive Utilities Set, or ARC, a public domain program available for many personal computers. We use the ARC utility to squeeze the many files that may go with a particular article into *one* compressed file, which may be only 40 percent the total size of the original files.

In addition to the archive files, you'll find the program ARCX.TTP, which stands for ARChive eXtract, on your START disk. You'll use this program to *decompress*, or *extract*, the disk files we've shrunk down with ARC.

All programs on your START disk are copyrighted. They are for your own private use, and are not public domain.

Getting Started

To use the files and programs on your START disk, please follow these simple instructions. You'll need two blank, formatted single- or double-sided disks to properly extract the files.

Your START disk is not copy-protected and you should make a copy of it *immediately* to the first blank disk. Make sure the write-protect window is open on the START disk at all times to insure that you don't accidentally erase the disk.

Note: If you are unsure how to format a disk, copy a disk or copy individual files, please refer to your original Atari ST or Mega manual and study these procedures carefully before going on.

After you've copied your original START disk, store it in a safe place and label the copy disk "START Backup."

Now, put your START Backup disk in Drive A of your computer and double-click on the Drive A icon to see the disk's contents.

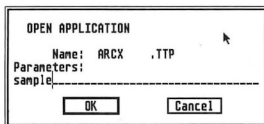
Un-ARCing the Files

To use START's compressed disk files, please follow these steps:

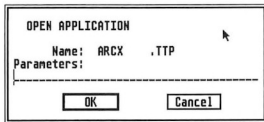
1. Copy the ARCEd file you wish to use and the program ARCX.TTP from

your START Backup disk onto your second blank formatted disk. When you're finished, label it *Un-ARC disk*.

2. Now you'll extract the compressed files from the ARC file you just copied. Insert your Un-ARC disk into Drive A. If the Drive A window is already open on the Desktop, you can press the Escape key to see the new disk directory. Otherwise, double-click on the Drive A icon to see the directory. Double-click on ARCX.TTP. The following dialog box will appear:



3. Type in the name of the ARC file you just copied over to your Un-ARC disk and press Return. You do not have to type in the extender .ARC. You can type in the name in upper or lower case.



(Note: If ARCX.TTP can't find a file, it may be because you have misspelled

the name of the ARC file. You must type the filename *exactly* as it appears in the directory.)

4. As the program runs, it will display the names of the individual files as it extracts them, similar to the example below.

```
Archive: SAMPLE.ARC
Extracting file: EXAMPLE.PRG
Extracting file: FILE.TXT
Extracting file: SAMPLE.PIC
Extracting file: README
```

When ARC has successfully extracted all the files, it will return to the Desktop and you will see the original files within the directory window, along with the archive file and the ARCX.TTP program. You may now use any of the START files as you wish; just follow the instructions in the appropriate article in this issue.

To use any other archive files on your START disk, simply repeat the above procedures. Be sure you begin each time with a blank, formatted disk.

In addition to the runnable programs, some ARC files may also contain source code listings or an ASCII text file (called BREAKDOWN.TXT, for example) which describes the program's structure. You can examine such a file from the ST Desktop by double-clicking on its icon and then clicking on Show (to see it on the monitor) or Print (to print it out). ■

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Making MIDI Affordable

BY RICK DAVIES

Are yesterday's breakthroughs today's classics or just garage-sale bargains? With the rising cost of synthesizers and samplers, setting up a personal MIDI studio can be expensive.

Rick Davies, musician and MIDI consultant, presents a few things to look for when shopping for MIDI hardware.



Whether you applaud or curse the evolution of commercial synthesizers, there's no denying it's hard to keep track of every keyboard and module on the market. Some synths are worth buying new; others are worth waiting for.

In the following article, I offer some ideas on what to look for when you're out shopping for a synth or sampler to accompany your ST. I've also included a section on samplers. The article does assume some knowledge of synthesizers and samplers on the reader's part. (For two excellent introductory articles on setting up your own MIDI studio, see Jan Paul Moorhead's "Synths, Samplers and Drums" and Jim Pierson-Perry's "Home Recording on a Budget," both in START Special Issue #2.)

Before You Buy

Before you get talked into blowing all your hard-earned cash on the latest "state-of-the-art" equipment, ask yourself if you really need it. Multi-timbral

effects, full MIDI implementations, Mode 4, 12-bits and other buzz words don't mean a thing if you have no use for them. Some questions to consider:

Would you be better off with a modest setup that sounds great or a flexible setup that gives you only so-so sounds? If you want to sketch out arrangements with a multi-timbral synth, then your path is set. On the other hand, you might be more comfortable composing with a synth that's easier to operate.

What if you plan to end up in a multi-track studio? Then you'd be better off picking up one synth capable of a wide range of useful sounds, rather than a multi-timbral one that wows you with what it can do all at once.

Do you plan to do multi-part sequencing? Then you need a synth that operates in MIDI Mode 4 (otherwise known as Mono Mode). Even if the synth isn't multi-timbral, Mode 4 usually allows each voice to be played as an independent synthesizer, with its

own pitch bend and modulation. This becomes extremely important for sequencing. The TX81Z and FB01 by Yamaha provide excellent examples of Mode 4 operation.

New or Used?

Once you consider the factors mentioned above, you might just decide to wait until you can afford a new Ensoniq ESQ1, Roland D10 or Korg M1 and save yourself the anxiety of not knowing whether you made a mistake by buying second-hand. But before you decide either way, however, consider carefully what your new synth of choice may be worth in a year or two. Also, figure out whether or not you're going to extract that much more performance out of a new synth than you would out of a used one.

Second-hand package systems can often outperform the all-in-ones. For example, layering two "simple" synths with MIDI makes it easy to try out ▶



different sound blends and the synths can be treated independently with equalization and effects (if you have any).

On the other hand you'll also need to organize two sets of patches. It's up to you to decide whether the difference justifies the higher price.

Where do you find used equipment? Drop into your local music stores, check the "for sale" section of your local newspaper and the classified ads in *Keyboard* and *Electronic Musician* magazine. All of these are good sources of sweet musical deals.

More Buying Tips

Before you go out shopping, learn to interpret MIDI implementation charts. Although these charts don't reflect such aspects as how easy it is to do multi-timbral sequencing, or how fast that particular synth responds to MIDI data, they do indicate approximately how much MIDI the synth has.

Look for MIDI Thru ports on older synths. MIDI Thru ports allow several instruments to play off the same stream of MIDI messages without adding switchers and splitters. If your system is still in its infancy, then you can probably get by without a Thru for now. It doesn't take long to build up a multi-instrument system, so think carefully about how much you're really saving by buying a no-Thru instrument.

Get a suitable "master" synth controller if you don't already have one. If you're shopping for a main keyboard, then try to get one with velocity and/or after-touch sensitivity. This is what continues to make the Yamaha DX7 a good bet and why the classics continue to get passed up by the first-time synth player.

Some equipment limitations, such as the Yamaha DX7's ability to transmit only on MIDI channel 1, can be compensated for by appropriate music software that allows MIDI echoing on multiple channels. The right software also

allows sequence tracks to be "channeled," so don't let MIDI capability be the only deciding factor.

Synthesizers

There are a few synths everyone should consider purchasing at some point in their life: the original Yamaha DX7, TX81Z and FB01, the Roland MT32 and the Casio CZ101. There have been plenty of other modules and keyboards in between each of these and bigger and littler brothers are sure to follow. Nonetheless, these instruments continue to be good value.

The DX7, having been discontinued to make way for the DX7II and DX7S, has dropped in resale price but is still a great buy for under \$1000. It is, however, not multi-timbral. Also, without the Grey Matter Response E! board, the DX7 transmits on channel 1 only. The E! board earns every cent of its \$299 retail price.

Now unless you want to pay bigger bucks for the TX816 or TX802 system, with their virtually nonexistent front panels, you'd better look at the FB01 or TX81Z, both of which are eight-voice, multi-timbral, four-operator jobs. They aren't easy to program and don't have quite the scope of sound that the DX7 has, but can produce nice layered textures.

The MT32 uses LA synthesis and is in the low end of Roland's D series. The MT32's sound is much simpler than the D-50's, but it makes up for this limitation by being multi-timbral. But the big problem with the MT32 is that it has no battery back-up, which essentially turns it into a preset instrument unless you have patch librarian life-support. On the plus side, the MT32's presets include many useful sounds and the built-in percussion samples make it a handy first module.

The Casio CZ101 is still a great way to get started for some pretty simple reasons: it has eight voices (although better sounds reduce it to four-voice),

it's multi-timbral, has a keyboard (albeit very small) and can be purchased for around \$200. There are plenty of patch editor/librarians for the CZ101, thousands of sounds available through dozens of synth patch companies and it sounds quite good for what it is. I've heard live recordings made with no more than a CZ101 and a drum machine and have been very impressed. There are no independent outputs, but if you're careful, you can strike a good mix with judicious selection of sounds and thoughtful orchestration. Considering the CZ101 was the first in the phase-distortion synthesis series, it set quite an example for its descendants.

Classic Synths

The reliability of classic synthesizers is worth keeping in mind because they generally contain an incredible number of components compared to the VLSI wonder-synths of recent years. I like to compare these classic instruments to British sports cars because you have to be prepared to pamper them a bit if you want to keep them running well and that may not be cheap.

I want to focus now on the instruments that were around before MIDI appeared and were later offered with MIDI retrofits. I'm referring to the Oberheim OBX and Sequential Prophet synths, which can be found for around \$1,000.

I have a real soft spot for synths with full-blown front panels featuring dozens of knobs and switches and wish this type of user interface would experience a renaissance ("Fat chance!" shout the critics). I wince whenever I hear of a Prophet 10 with built-in poly sequencers and MIDI selling for just \$500.

Samplers

As far as samplers go, the real bargains are in the used market. If you do buy a used sampler be sure it has an analog filter included. Analog filters help condition samples into more expressive

sound sources. Also, I've heard a lot of people say they'd rather wait for 16-bit samplers to come out in the \$1,000 range rather than buy anything currently available. They'll have a long wait because sample memory chips haven't dropped in price—they've risen.

The original Ensoniq Mirage is still worth a look. The new Mirage DSK retails at \$1,295, so the used price of old Mirages is very reasonable. The Mirage has the usual limitations of 8-bit samplers, but it is velocity-sensitive and has "quite a bit of MIDI." It's a beast to program, but the Mirage sample library is quite vast. Keep this one in mind.

**Before you blow
your cash on the
latest MIDI
equipment, ask
yourself if you really
need it *new*.**

The old Prophet 2000 sampler series still sound great. Though its manufacturer, Sequential, no longer exists, National Service Concepts is handling repairs and technical support. The Prophet 2000 series used to command professional prices upward of \$2,000, but you can now pick up one for next to nothing. I've heard of basic Prophet 2000's going for \$750, but if you see such a deal, make sure it has expanded memory (512K) and double-sided 3½-inch disk drives.

Quick-Disk Samplers

Think carefully about how much money you want to spend on a sampler that uses quick-disks to store samples. With quick-disks starting at around \$5 each, the cost of a large sample library

can be comparable to the cost of the instrument itself.

I find the Roland S10 to be an interesting sampling keyboard. The S10 is available for a steal these days since it has been outcast because it used quick-disks for sample storage. If you can tolerate using a costly disk format, then make sure you listen to this one.

Another keyboard that finds itself in the same boat as the S10 is the Akai X7000 and its rack counterpart, the S700. Both of these machines offer 12-bit sampling and have the support of sample editing software on the ST. These are all little brothers of the Akai S900 and the Roland S50 samplers and they feature similar sound quality with fewer control options.

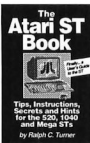
A sleeper in the quick-disk category is the Akai S612. This is a very simple 12-bit, six-voice sampler that suffered in the market due to its initial release without a disk drive. But by the time the "optional" disk drive appeared, Akai's competition had already begun to flood the market. The S612 is not without support, however and ST users will be pleased to know that DrumWare offers a S612 sample editor for the ST. The S612 can't multi-sample, but it gives a clean sound.

Wrap-Up

I hope this helps sort out some of the confusion around synths and samplers for ST-based MIDI systems. It's alarming to see how sophisticated synths have gotten and how some older units become classics while others become fossils. A good-sounding synth rarely becomes obsolete, but everything does have a place and time. Play your cards right and you could find yourself at the right place at the right time, playing a royal MIDI system without paying a king's ransom. ■

Rick Davies, former editor of Music Technology, is a writer, musician and consultant living in California's Santa Cruz mountains.

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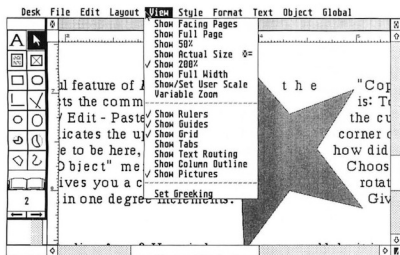
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PageStream

Powerful Mid-Level DTP Program from Soft-Logik

BY FRANK KLIEWER



An example of text runaround, shown in 200 percent-sized text. Like all other high-level desktop publishing programs, PageStream lets you set your screen display to suit your needs and wishes.

Would Soft-Logik's troubles never end? In the November 1988 issue of *START*, I sounded a disapproving note concerning its October release of a second-generation desktop-publishing program called *Publishing Partner Professional*. This was the long-awaited sequel to *Publishing Partner*, a real workhorse and the first DTP program for the ST.

Well, *Publishing Partner Professional* was dead on arrival, and Soft-Logik even admits the release was a marketing error prompted by a clamoring from loyal users for something to be shipped even if it didn't work. However, shortly after *Publishing Partner Professional* shipped, Soft-Logik was informed that its premier product's name was already being used

by Media Cybernetics, and so were forced to change it. Finally, much to their relief, Soft-Logik shipped *PageStream* just before Christmas 1988.

Since that time there has been a steady stream of new fonts, import modules and bug fixes that have resulted in a powerful, versatile program that my wife and I use on a daily basis for everything from personal letters to presentation layouts for our work and a monthly users-group newsletter. Going through the delivery pains with Soft-Logik on this baby was tough, but I'm glad we held in there—*PageStream* version 1.51 fills a needed gap in the DTP arena for the ST. Granted, there are less expensive packages available, but they're

also less powerful, and the high-end/high-priced programs usually require a Mega to run them properly. And to top it all off, *PageStream* is PostScript compatible!

There are Strengths

If features are what you're looking for, *PageStream*'s got plenty of them. One of its most useful is the ability to import object-oriented (.GEM) pictures, such as those created in *Migraph's Easy Draw*. While *PageStream* doesn't fully implement all of *Easy Draw*'s features, it will allow you to group and ungroup, as well as edit the object's shape. The output quality and fineness of detail that remains even after the object is greatly reduced is a vast improvement over the *DEGAS* and *NEOchrome* pixel-oriented formats to which you were limited in *Publishing Partner*. The redrawing time is a little slow. To speed things up a bit, turn off the *Show Picture* function in the *View* menu, then execute the screen redraw. (Editor's Note: *Version 1.52 of PageStream*, which is shipping at press time, reportedly speeds up both the import and redraw speeds by as much as 10 times.)

Text Runaround is a long sought-after feature that is well implemented in *PageStream*. This option allows you to ▶

place an object, like a picture, within a text column and have the text automatically wrap around it. You can define the exact size of the border you wish to have around the object and on which sides you want the text. In the case of an object-oriented picture you can get the text to hug tightly to an irregularly shaped object by running the text around all four sides and then ungrouping it.

Object rotation is another impressive feature in PageStream. This option lets you rotate, slant or twist an object any way you wish. My wife was pleased to discover that this includes text columns as well, since she does a lot of greeting cards. (In the past she had to run pages through twice to get part of the card upside down).

The new Alignment feature lets you line up objects horizontally or vertically in relation to each other as well as to the page itself. And it's now a snap to center objects on a page. Objects can be grouped and ungrouped so you can format your page quickly by dragging groups around together.

GEM is implemented in the document window area, so it's now possible to have multiple windows of text and graphics open at the same time. PageStream lets you move the toolbox around to more convenient screen locations and even cover it up by expanding your document size to cover the full screen.

I was thrilled to see that my Word-Perfect files converted to PageStream with all text-formatting intact (with Publishing Partner you had to import text in ASCII which resulted in a lot of extra work to reformat). Several import modules, which are small additional files, can be used to transfer other popular word-processing formats into PageStream in addition to those accessible in the old Publishing Partner. The new formats include DEGAS compressed, IMG, Word Writer, First Word and scanned IFF files. Also you can now ex-

port your work from PageStream to other word-processing programs as well.

And There are Weaknesses

The manual is undoubtedly the weakest part of the PageStream package. I found some glaring errors and omissions.

For example, PageStream has a very handy feature that lets you take a polygon drawn with any number of sides, and then reshape it to fit your later requirements exactly. Now, according to the manual, on page 2.3-3 of Tutorial 2 you're directed to pull down the OBJECT menu and select RESHAPE in order to carry out this function. Don't bother, it's not there. You'll find it in the toolbox. It's the icon in the upper right-hand corner that shows a box with diagonal lines in the shape of an X.

Running a close second to the manual in the "PageStream Weaknesses" category is the Spell Checker. Until this feature is reworked, don't consider it a valuable part of the program—it's extremely slow, limited in the number of words it contains and prone to crash. You'll really need to do your spell-checking *before* you import text into PageStream.

There's one other shortcoming that I hope will be addressed in future PageStream enhancements. To scale grouped objects proportionally you must either eyeball the resizing or use the improved rulers as guides to make the change. It would be nice if you could use proportional sizing, as you can with bit-mapped and single objects.

An undocumented feature I should mention: I found that you're not limited to the standard fill patterns shown on the screen. Hit the Escape key to erase the current fill-type number and then type in a number with a percent (%) sign after it. Now you can define exactly what percent of fill you want. This is how to generate a relatively smooth blend of fill shading from one object to another. You can also create a custom

pattern. Drag your text icon over a block of text just as if you're going to change its attributes, and then select one of the fill patterns.

Wrap-up and Recommendations

PageStream has many more features to mention than space allows, such as a much improved variable zoom, some handy disk utilities and better printer drivers. Though the program will run on a 520ST with a color monitor, I wouldn't try anything too serious on less than a one-megabyte monochrome system.

As the desktop-publishing world evolves, support from software publishers is vital. This is one of the reasons why I feel good about PageStream. While there are a few remaining bugs in the program and some revisions needed to be made to the manual, Softlogik's track record indicates that they can overcome adversity and are dedicated to the Atari market. Their recent diversification of PageStream into other computer formats, as well as their inroads into the European market, has already helped Soft-Logik financially. Their future looks much brighter than it did at the beginning of this year.

Don't forget to mail in your registration cards. Soft-Logik is hinting at some pleasant surprises for PageStream owners in the months ahead, including a newsletter with helpful tips, updates and corrections to the manual. ■

With his wife Jennie, Frank Kliever has been the assistant editor for the San Leandro (California) Computer Club Journal for over two years. His review of Publishing Partner Professional appeared in the November 1988 issue of START.

PRODUCTS MENTIONED

PageStream, \$199.95.
Soft-Logik, 1131F S. Towne Square, St. Louis, MO 63123, (314) 894-8608.

CIRCLE 151 ON READER SERVICE CARD

Stupidity, Gold and Space

Once again START's editor makes time in his busy schedule to review the latest graphic adventure—this one from Lucasfilm. Also in this issue, we take a look at some impressive new arcade-style games from Magnetic Images and Epyx.

ZAK MC KRACKEN AND THE ALIEN MINDBENDERS

Reviewed by Andrew Reese

Zak McCracken and the Alien Mindbenders marks the happy return of Lucasfilm Games to the Atari market. Any long-time owner of an 8-bit Atari will remember Lucasfilm's last two Atari games with pleasure: *Rescue on Fractalus* and *Ballblazer*. They were marked by great graphics, imaginative scenarios and well-conceived gameplay. Zak McCracken certainly shares these qualities.

"Zak" is a graphic adventure, one of that intriguing genre of games made possible by high-powered computers like the ST. Pioneered by Sierra On-Line in their *King's Quest* games, graphic adventures let you control an animated onscreen protagonist (or in this case, four protagonists) through a colorful graphic world. Sierra's games require occasional keyboard text entry, while Lucasfilm has devised a system that can



In an early scene from Zak McCracken and the Alien Mindbenders, Zak dons his hat and nose-glasses, an essential disguise. Without them, of course, he can't pass for an alien phone company employee. (If you don't believe us, play the game!)

be played entirely with the mouse or just a few keys. It's an interesting concept that ensures that you won't have to struggle with a command parser that doesn't understand your vocabulary and thought processes. It is a bit cumbersome at times, however, and you can't use the keyboard to speed things up.

Silly Story, Great Graphics

The storyline is delightfully silly: Zak McCracken is a reporter for a sleazy tabloid, pounding out outlandish fictional "news" stories. Meanwhile, aliens have secretly invaded Earth and taken over

the telephone company. In order to reduce Earth's residents to docile stupidity, the aliens are bombarding Earthlings with a 60-cycle hum through the phone lines. It's up to Zak and three friends to foil this dastardly plot.

The graphics are satisfactory and use the ST's low-resolution palette well. (You can play Zak on a monochrome monitor, but it's dull, dull, dull.) Where the graphics sparkle is in the animation. Lucasfilm has created some delightful cut scenes (mini-movies) that are interspersed throughout the game and add to the enjoyment of the story. Also, in ▶

dividual characters are themselves well-animated and the animation window scrolls fairly smoothly when necessary (such as when Zak uses the restroom in the airplane—he needs his privacy!).

The screen in Zak McKracken is divided into five areas. At the top is a message line, where game messages and dialog appear. Below this is the animation window, where your characters move and interact with each other and with people, aliens and objects in each scene. Just below the animation window is the sentence line, where you create commands for your characters. Next down is the verb list and below that is a scrolling inventory list.

To enter a command, you move the cursor to a verb and click once, then to an object and, if the verb requires something else, to the inventory. For example, you might click on "Open", then on the mailbox in the animation window. The game will supply any necessary connecting words, in this case "with", signalling you to select an item in inventory, the key. Once you've created your command, a click on the sentence line or the final word in the command and your character will carry it out.

Red Herring and Goldfish

Overall, I enjoyed Zak. It's a long and involved game and I don't think I could have finished it without the hint book. (That may say more about my adventure game-playing ability than about the game.) I do have several complaints. First, the game is so large and so bizarre that objects have no obvious immediate purpose. Luckily, your inventory is unlimited, so you just have to pick up or buy everything you can. It's just that finding an appropriate use for it is not easy.

My second complaint is related to the first in some ways. I have become used to Sierra's scoring system. I was disconcerted in Zak to find that I could never tell whether an object I picked up

was one I needed or just a red herring. For example, you'll need to pick up your goldfish, Sushi, in order to get to Mars (I won't say why here—it's a long story). But other than the fact that you *can* pick her up, there's no clue that you should. I'd really like to see a point system so that you can track your progress.

This is a big, big game. It will take you all over the world and off the world as well, so don't count on solving this

Zak McKracken marks the happy return of Lucasfilm Games to Ataris.

game in one or two sittings. One aspect that I particularly enjoyed is that, unlike Sierra's linear "you must do this before you can do the next thing" games, Zak can be solved in a number of different ways. There are certain essential actions, but Lucasfilm has built in a number of alternatives to most others.

Read All About It!

Zak comes on three unprotected disks with a slender manual and a clue-filled copy of "The National Inquisitor." Copy protection is via a black-on-brown printed "exit visa" code chart that's not required at the start of the game, but pops up later on whenever you leave the U.S. It's a pretty good protection scheme that puts a minimal strain on the user.

I have to mention the hint book—it's superb. It includes a help list (color-coded so that you won't "accidentally" see any hints you don't want), a list of objects (including where to find them and how to use them), a travel guide, maps, maze solutions and one complete game solution in narrative

form. You can use any part or all of the hint book to solve Zak, but don't be too quick to use it. You can enjoy the wonderful world Lucasfilm has created more if you aren't too compulsive about winning quickly.

Because Zak is on unprotected disks, you can install the game on a hard disk to speed up file access. But this lack of physical copy protection means that you may also be tempted to make a quick copy for a friend. Don't do it! Not only are the National Inquisitor and the exit visa codes required to get very far into the game, but piracy was part of what drove Lucasfilm from the 8-bit Atari market in the first place.

If you want lots and lots of humor, animation, adventure and just plain fun, go out and buy Zak McKracken and the Alien Mindbenders.

GOLD OF THE REALM

Reviewed by John S. Manor

In Gold of the Realm, a graphically appealing, easy-to-play arcade extravaganza, you assume the role of Nigel, an adventurer in search of a lost treasure of gold. There are three difficulty levels and up to four castles to explore, each of which has several floors that you reach by going up or down staircases. You must seek items such as keys to locked rooms (most of the rooms are locked), food (some of which is poisoned) and special items that will help you get past some obstacles. Bottles of pills—some of which are harmful—are scattered around the mazes. On the most difficult level, the item locations are random, giving you a different game each time you play.

Staying Alive

There are certain items that you *must* find, such as a candle for exploring dark areas of the castle, a container that lets you carry more than three things at once and a scroll that tells you what you are holding. (As you collect items, they appear in a window on the screen.

The name of your current item—the one you're holding or using—is above the window.)

You also have to keep Nigel healthy and well-fed. A bar at the bottom of the screen shows his level of energy or health. If it shrinks to nothing, he dies and the game is over.

Guards or monsters occupy many of the important rooms you explore. A swift hawk-type monster attacks you repeatedly until you leave his room. A mummy or a skeleton carrying a sword will attack you and, in the higher levels, chase you around the maze. The guards are excellent swordsmen who will cut you down quickly if they catch you. Archers sometimes appear on the wall of a castle to fire arrows at you. A ghost appears at regular intervals to steal whatever you're carrying in your hand at the time or to take some of your life energy. (Hint: to keep the ghost from getting my all-important keys or candle, I often hold a less important item, such as a bottle of pills. If the ghost comes, he gets my pills and not my key!) Most of the monsters (except for the ghost) are easy to evade, as long as you don't spend too much time in one room.

Keep a Map

Gold of the Realm is not a furious arcade-action game, but one of gradual exploration and discovery—an adventure game in the tradition of Temple of Apshai—so it's important to maintain a map. Your maps will cover many pages of a notebook; every floor of each castle needs its own map. Sometimes you must go up one staircase and down another to get at a key or other item. This makes you think in three dimensions when playing or mapping.

In addition to the stairs, there are gray transporter squares at various places in the maze that zap you back outside of the castle if you need a quick way out. I found some small wooden buildings on paths outside the castles that held important items such as the



In Gold of the Realm, the arcade adventure from Magnetic Images, there are three difficulty levels and up to four castles to explore, each of which has several floors that you reach by going up or down staircases.

candle. One held a poisoned apple that nearly killed Nigel. Then there's the maze of hedges that hides an object that you'll need for the hardest level.

The mazes contain some ingenious and nasty traps. I particularly liked the bridges over ravines and rooms with no floors. If you run blindly into these rooms, you'll fall down to the next level. You have to watch your step when exploring the realm.

Recommendation

The graphics in Gold of the Realm are sharp and colorful. The castle hallways and rooms scroll smoothly as Nigel explores them. Nigel and his monstrous foes are well-animated—he even looks stunned after a fall. The music that plays while a game is loading or saving adds to the wandering mood of the game.

Gold of the Realm comes on a single-sided disk with a glossy instruction manual that gives the simple rules for the game and some historical background on the lost treasure.

Though I prefer games with more action than there is in Gold of the Realm, I enjoyed exploring its intricate mazes. They're extensive and should be a real challenge to the stout-hearted computer adventurer for a long time.

SPACE STATION OBLIVION

Reviewed by Scot Tumlins

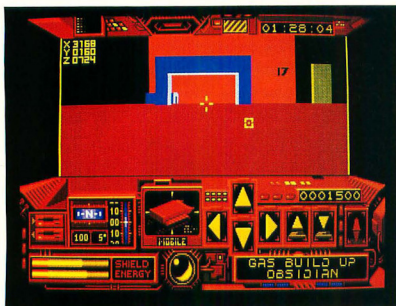
Mitral, the primary moon of the planet Evath, is about to explode. If it does, the force of the explosion will knock Evath out of its orbit and cause untold destruction of the planet's surface and people. Your mission is to prevent Mitral from blowing up. Thus goes the premise of Space Station Oblivion, Epyx' new action adventure. A color monitor is required.

Eighteen sectors (mining stations) were constructed on Mitral. After years of mining, large amounts of natural gases have been trapped underneath these sectors. From a first-person perspective, you must locate the proper site and set up a drilling rig to release the pressurized gas. Each of the 18 sectors must be drilled, and you have only four Mitral hours to complete the mission!

The Sectors

Each sector is unique in its defensive capabilities and supply of Rubicon crystals. These crystals are important—they provide energy for your Excavation Probe (see below). Fortunately you start the game in the Amethyst sector where the drilling spot is marked and crystals are plentiful.

Some of the sectors contain neutral areas (buildings and supply rooms) that ▶



Impressive graphics and slick arcade-like gameplay make Space Station Oblivion a quality entry into the ST game arena.

offer protection from enemy laser fire. Some of the neutral areas even contain crystals.

Four teleporters allow transportation between Amethyst, Emerald, Ruby and Beryl sectors. They're invisible until activated. When a teleporter is activated, a large "T" will appear. Drive the excavation probe into the "T" to transport to a different sector.

Each sector is defended by one or more of Mitral's automatic security systems. Laser beacons fire a deadly high-voltage laser beam. The cannon rotates around its tower stopping momentarily at North, South, East and West positions. To avoid fire, maneuver around the turret, but make sure to stay opposite the side the cannon faces. Ketar Skanners orbit certain sectors. They're well-armed, so don't try to destroy them. Mines are few and far between, just don't drive over one.

Some of the Mitral's defenses are controlled by switches that appear as colored objects. Fire at a switch to turn a defense off or cause a hidden door to appear that can take you to another sector.

The Excavation Probe and Reconnaissance Jet

Space Station Oblivion gives you two vehicles at your disposal: an Excavation Probe and a Reconnaissance Jet.

The probe needs a constant supply of crystals to maintain high energy and shield strength. Fire at a crystal to increase your energy or shield strength. Use the mouse to move the probe forward, backward or left and right. The probe can be elevated, lowered and tilted to see over and around objects. A step-size adjustment alters the distance traveled in one move, great for those quick dashes across open areas. An angle adjustment alters the angle of turn. Both of these features are the first I've seen in a computer game—nice touch!

For defense the probe comes standard with a quadruple dual-action laser cannon. In drive mode the cannon is centered—move the probe to adjust your aim. In attack mode, use the mouse to place the cannon sights on a target, then press either button to fire.

Once a drilling location has been selected, a drill rig must be teleported from Evath. You have 18 rigs and each must be placed correctly. Before the drilling process begins, you have the

option to cancel the rig and return it to Evath. The rigs bore through the surface with an extremely powerful laser. Once tapped, the gas is released in a safe, controlled manner.

The Reconnaissance Jet gives you a birds-eye view of Mitral. At the start of the game the location of the jet is unknown, but it's easy enough to find. The jet uses most of the probe's controls, the same laser cannon and also gains its power from the crystals. Movement is the same but with the addition of altitude. Unlike the probe, the jet can fly over a sector, but it cannot transport a drilling rig. Flying the jet takes some getting used to. The jet relies on the sector's surface for stability. Flying off a sector's edge can leave you stranded with nowhere to go—talk about the world being flat!

Wrap-Up

Space Station Oblivion is a nice game. It's not as quick as Starglider, but it takes more deductive effort to complete. To solve its puzzles requires unorthodox thinking. Any object can help solve the game, but some objects must be used in a certain way. Locating the drilling sites is hard enough, but getting the probe to the location (in one piece) is even harder. Don't worry—a load/save game option is included. As an aside: if you find Space Station Oblivion too difficult, there is a nifty hint book available from Epyx. Believe me, you'll find it to be a great help. ■

Andrew Reese is the Editor of START Magazine. John Manor has written extensively for Antic magazine, and this is his first review for START. Scot Tamlin is Systems Manager for Antic Software.

PRODUCTS MENTIONED

Zak McCracken and the Alien Mindbenders, \$44.95; **Hint Book**, \$7.95. Lucasfilm Games (distributed by Mediagenic), 3885 Bohannon Drive, Menlo Park, CA 94025, (415) 329-0800. CIRCLE 168 ON READER SERVICE CARD

Gold of the Realm, \$39.95. Magnetic Images, P.O. Box 17422, Phoenix, AZ 85011, (602) 265-7849. CIRCLE 169 ON READER SERVICE CARD

Space Station Oblivion, \$19.95; **Hint Book**, \$7.99. Epyx Software, P.O. Box 8020, 600 Galveston Drive, Redwood City, CA 94063, (415) 368-3200. CIRCLE 170 ON READER SERVICE CARD

Desktop Publishing Terminology

BY DAN FRUCHEY

From the Editor: *This month START introduces our new Desktop Publishing Column. Author Dan Fruchey has extensive experience in this realm—he wrote ST Applications' DTP column for a year, and for nearly three years he has produced monthly newsletters and brochures for the company he works for.*

Desktop publishing can be one of the most satisfying and productive tasks you can perform on your home computer. It can also be one of the most frustrating, time-consuming and hopeless tasks you will ever undertake.

You can create attractive, eye-catching documents that will match anything a layout specialist could produce—at a fraction of the cost—or you can create a piece of abstract garbage no one will ever read. What can you do to achieve better results? That's what this column is all about.

Speaking DTP

Just like computing itself, desktop publishing uses its own specialized vocabulary. The language used by desktop publishers is a form of pidgin computerese and publishing terminology rolled into one. Interpretation is sometimes confusing: what is a gutter and how does it

affect orphans and widows? What are vector and raster graphics? Is there a difference? Is a banner the same as a headline or a caption? The questions come faster than the answers.

Listed below are terms used by a variety of publishing programs including Calamus, PageStream, Timeworks Publisher, Fleet Street Publisher and Easy Draw. I've also included some common publishing terms that will make discussion of DTP easier and more informative.

These terms are specific to page layout and the options provided by your software. They don't address the subject of typography, which we'll examine later.

Append/Merge: Adding graphics, text or pages to a document without deleting graphics, text or pages currently in memory; a real time-saver when adding a standard file to something like a cover or advertisement.

Aspect Ratio: The height-to-width ratio of pixels in a picture. To obtain an accurate reproduction of a picture, the aspect ratio must be preserved proportionally.

Banner: A major headline; the title of a publication. Used most commonly in newspapers.

Block/Quad: A single word or line of

text that is to be set right, left or centered in a column or page. Usually used for headings or titles. A centered title would be referred to as "center-quadred" or "center-blocked."

Body Text/Body Copy: The main portion of text in a document, such as the columns of text in an article or the main portion of a letter.

Caption: The title or heading of a document. Also, a short explanation or description accompanying a picture.

Columns: Vertical strips containing text.

Copy: Text waiting to be placed in a document.

Crop: To cut off undesired portions of a picture.

Dummy: A preliminary page layout where components are placed in their approximate positions to obtain a rough idea of what the finished document will look like.

Frames: Boxes containing text or graphics. These are not borders. Frames are used to define working areas and resize objects once they have been imported or created. Frames are commonly surrounded by *handles* for sizing and stretching.

Fully Justified/Full Out: Text that stretches horizontally across a column ▶

Size: A program function that allows proportional adjustment to the shape of a frame. Especially important when using raster graphics so background patterns won't become distorted.

Desktop publishing can be satisfying and productive—or time-consuming and hopeless.

Stretch: A program function that allows non-proportional adjustment to the shape of a frame. Useful when increasing the length of a column for text routing.

Style Sheet/Master Page: A form of template that stores program options such as text style, grids, spacing and the locations of frames. Master pages can be copied automatically to subsequent pages. They are especially useful for standardized publications such as magazines and newsletters.

Subhead: A subordinate headline or title that explains or contrasts the headline. Subheads are also used as titles for subdivisions in a document.

Tag: A program option that lets you label or identify portions of text as they are loaded. A tagged document might load with all indented words in a differ-

ent font style, or all bold text in a different size.

Text Runaround: This option controls the flow of text around frames that overlap each other. Text can be moved to the right and/or left of graphics or other text automatically.

Title: A distinctive heading that indicates the contents of an article or document. Usually set in a larger type size with a distinctive style.

Vector/Object-Oriented Graphic: A picture composed of geometric lines and shapes. The graphic is endlessly resizable without loss of resolution as each adjustment in size causes a readjustment of the mathematical data needed to create all the other components in the graphic. Vector graphics are created by programs that save GEM metafiles, such as Easy Draw and Athena II.

Widow: A single short line of text isolated at the top or bottom of a page or column.

Whew!

I hope this brief (?) listing of publishing terms will make your job easier and help you create more effective documents. In the future we will use these definitions and concepts as we examine some "tricks of the trade" that will help make your documents stand out. ■

Dan Fruchey, formally the desktop publishing columnist for ST Applications, works as a paramedic in Santa Rosa, California and runs a small clip-art business on the side.

PRODUCTS MENTIONED

Calamus, \$299.95. ISD Marketing, Inc., 2651 John Street, Unit 3, Markham, Ontario, Canada L3R 2W5, (416) 479-1880.

CIRCLE 150 ON READER SERVICE CARD

PageStream, \$199.95. Schlegel Corp., P.O. Box 290077, St. Louis, MO 63129, (314) 894-8608.

CIRCLE 151 ON READER SERVICE CARD

Timeworks Desktop Publisher, \$129.95. Timeworks, 444 Lake Cook Road, Deerfield, IL 60015, (312) 948-9200.

CIRCLE 152 ON READER SERVICE CARD

Fleet Street Publisher, \$149.95. Michifon, 576 S. Telegraph, Pontiac, MI 48053, (313) 334-5700.

CIRCLE 153 ON READER SERVICE CARD

Easy Draw, \$99.95. Migraph, Inc., 200 S. 333 Suite #220, Federal Way, WA 98003, (206) 838-4677 for information or (800) 223-3729 for orders.

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START Spotlight

Turbo ST 1.4

BY ANDREW REESE
START EDITOR

Every once in a while, we come across a little utility that quickly becomes essential in the START offices. Turbo ST is just such a utility. It's not very large and is undetectable in many uses. But when you're scrolling through a long text file in STWriter Elite or waiting for a window update on the Desktop, you'll definitely notice—and appreciate—Turbo ST.

Turbo ST is the product of SofTrek of Winter Park, Florida. It does one thing and one thing only: speed up writing the ST's system fonts to the screen. These fonts are the ones used for text windows, such as in "Show as Text" disk directories on the Desktop, any file selector box and most word processors. Turbo ST is a relatively small desk accessory that installs on boot-up. It intercepts the system calls to the ST's ROM-based internal screen text and scrolling routines and redirects them to Turbo ST's much faster RAM-resident routines.

Speed! I Need Speed!

How much does Turbo ST speed up text? According to SofTrek's tests, as much as 607 percent in certain uses. That makes a big difference, but what makes Turbo ST

so valuable is that it speeds up every system font text redraw. That may seem like a little thing, but when you use an ST as much as we do at START (six to eight hours a day, every day), little things mean a lot!

If you haven't used Turbo ST, you're used to the ST's normal text speed and it probably won't seem slow. Now try Turbo ST. Within a very short time, you'll become accustomed to the noticeable speed-up in mundane operations. Remove it and you'll go crazy waiting just that unnecessary little bit longer!

No Panacea

Turbo ST is not a cure-all for system slowdown, however. It doesn't work at all in applications that use bit-mapped fonts, such as desktop publishing programs, nor with programs such as WordPerfect that use their own routines. Earlier versions of Turbo ST also caused problems with such old standards as STWriter. The current version, 1.4, works with many more applications than before.

If you're prone to "desk accessory-itis," you may resent the fact that Turbo ST uses up one of the six precious slots al-

lotted for desk accessories. It was written as a desk accessory to let you remove and re-install it to avoid any conflicts with cantankerous applications. If you have an unexpanded 520ST, you may also resent the fact that Turbo ST takes up a bit of your relatively scarce memory. In tests I've run, Turbo ST requires 42,774 bytes of memory. Whether to use 42K of memory for Turbo ST is a choice each user must make, but with recent declines in RAM chip prices, you 520ST owners might want to consider a RAM upgrade.

By the way, if you really want to revel in speed, install Turbo ST and CodeHead Software's G+Plus with its speedy solid-line window redraw routine. You'll never go back again. ■

PRODUCTS MENTIONED

Turbo ST 1.4, \$49.95.
SofTrek, P.O. Box 5257,
Winter Park, FL 32793, (305)
657-4611.

G+Plus, \$34.95. Code-
head Software, P.O. Box
4336, North Hollywood, CA
91607, (213) 466-1868.

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ON DISK!

START ARCADE

3

Games in One

On this issue's disk, START presents a special treat: three fast-action arcade games wrapped up in one! In Cheese Munchers you must guard your cheese from pesky mice; in Immunity you have to save your patient's life by destroying the bad germs and protecting the good ones; and in Skeet you get to practice a little indoor sharp-shooting. A color monitor and a megabyte of memory are required.

Triple your pleasure, triple your fun. File ARCADE.ARC on your START Disk.

START Arcade gives you three games that test your hand/eye coordination to its fullest. Zap mice as they try to steal your cheese, blast germs as they invade your patient's body and shoot skeets as

they fly across the sky. All three games were written in GFA BASIC.

To get started, copy the files ARCADE.ARC and ARCXTTP onto a blank, formatted disk and un-ARC the file, following the Disk Instructions elsewhere in this issue. Set the computer to low resolution and double-click on ARCADE.PRG. You must have a megabyte

of memory to run START Arcade. The START Arcade menu lets you choose which game to play, either Cheese Munchers, Immunity or Skeet. When you're finished playing a game, you'll be returned to the START Arcade menu. Here you can either play the game again, play another game or quit the program and return to the Desktop.

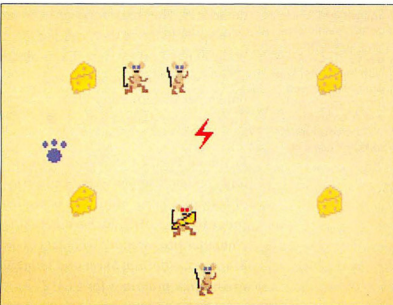
CHEESE MUNCHERS

by Raymond Pompon

The Cheese Munchers are ravenous, gluttonous and relentless! You're Greyham the Cat, and your job is to stop those monstrous mice from taking all the cheese. Unfortunately, as Greyham you're a rather lazy and cowardly cat, so you'd rather not confront the mice directly. Instead, you zap the Munchers with your Acme Neutron Mouse Zapper.

The Acme Neutron Mouse Zapper is a sophisticated anti-Muncher weapon. It will blast a Muncher, but will not harm the cheese that he's carrying. The Zapper must be reloaded each time it's fired. A red lightning bolt sits in the middle of the playfield. Use the ST mouse to grab the bolt by passing over it with your paw—there's certainly no kinship between the ST mouse and those cheese-snatching varmints. Your cursor will change to cross-hairs. All you need to do then is position the cross-hairs over some Munchers and click. If a Muncher is carrying a piece of cheese when you blast it, the cheese will fall down at that spot and stay put.

At first, the Munchers will creep meekly across the screen and snatch the cheese. However, as you blast more and more Munchers, the rest will descend as a horde, getting faster and cleverer as they get hungrier. The Munchers have an insatiable appetite;



In Cheese Munchers, you play a lazy cat assigned to guard the cheese from a house full of mice. Grab the Zap by passing over it, then squash the little critters.



The START Arcade is really three games in one. At the main menu, select the game you want to play. When you're done with that game, you'll return to this menu. Select Quit to return to the Desktop.

as soon as they drag a hunk of cheese home, they'll eat it and immediately come back for more.

Three difficulty levels can be chosen from Cheese Munchers' main menu. The default setting is Normal, and points are adjusted for different levels. The higher the level, the more points you'll earn. Your score and a remark on your gameplay will be displayed in an alert box at the end of the game.

Now, go get those Munchers!

SKEET

by Richard R. Betson

For those who like to shoot skeet but live in the city, relief can be found with

Skeet and your ST. Now you can enjoy the fun of blowing up little clay discs and not disturb the neighbors.

At the START Arcade main menu, click on Skeet to enter the game. Under the Game menu you can begin play or quit the game altogether. I developed Skeet to come as close to the real thing as possible. When shooting real skeet, you lead your target just a little before firing; my game is no different. In real skeet you yell "pull!" to let someone know you want the skeet launched; again, my game is no different.

The Options menu lets you adjust different aspects of the game. The first option adjusts your choke size. If you were using a real shotgun you could choose different sizes of chokes. Skeet also lets you choose your choke size: Open, Modified or Full. The wider or more open your choke is, the wider the spread of the shot will be. The narrower or more closed the choke is, the narrower or more confined the shot will be. Note: the narrower the choke, the higher the point value.

Under the Options menu, click on Speed to adjust the speed the skeet will travel. There are three settings: Novice (slow), Sharpshooter (medium) and Marksman (fast). The first two settings change the speed only. The third setting (Marksman) increases the speed and

makes the skeet smaller. The last two menus let you turn the sound on or off, or look at the last score recorded or the high score of the day. Good luck!

IMMUNITY

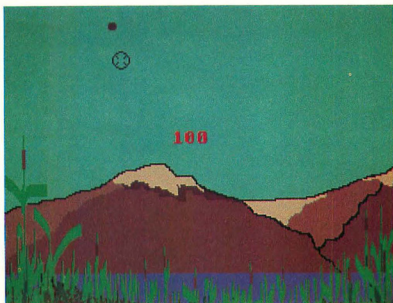
by Richard R. Betson

When I was a child my dad explained colds or flu this way: "Son, the good germs are fighting with the bad germs." This left me with the feeling that World War III was going on in my body. So, with this in mind I wrote Immunity.

At the START Arcade main menu, click on Immunity to enter the game. The "battlefield" is a board consisting of nine squares, set three across and three down. Popping into these squares are viruses (the bad germs) and red and white blood cells and bacteria (the good germs), which are constantly changing positions. With the latest technology in virus extermination, you're mission is to destroy all the bad germs.

Before you begin gameplay, choose the difficulty level from under the menu title LEVEL. Your choices are: Nurse (slow), Intern (fast) and Doctor (faster). You get extra points for starting at a higher level.

Gameplay is easy, but demanding. On the right side of the screen is a gauge that monitors your patient's life signs. The higher the gauge reads, the



Who needs the great outdoors, fresh air and exercise? Play Skeet for indoor target practice any time! As your skill increases, change the speed of the skeets or your choke size for a bigger challenge.

better your patient is doing.

Whenever you see a bad germ on the gameboard (characterized by a frowning face) move your mouse cursor to that square and click. If you're fast enough, you'll destroy that germ and it will be replaced by a dazed face. If you let too many viruses get through or zap too many blood cells or bacteria, your patient's status will drop and the game will end. Each time you complete a round, you move up to the next round, which is a little faster.

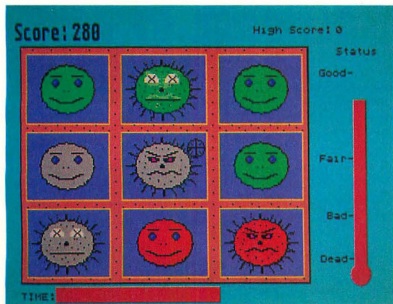
The Good Germs; the Bad Germs

Your red and white blood cells help carry oxygen and nutrients throughout

your body. If your body's own immune system started attacking these blood cells you probably wouldn't last that long. If you attack these same cells in Immunity you're patient won't last long either. The same principle goes for some bacteria. They're beneficial and should not be destroyed. You can identify the blood cells and bacteria by their smiling faces. If you do hit a blood cell or bacteria you'll see its expression change from happy to astonished.

In the real world, viruses are very tricky. They'll try to pass themselves off as a blood cell or bacterium. It's no different in Immunity. The viruses come in the same colors as the blood cells and bacteria, but you can tell who the viruses are by the expressions on their faces. They're spotted and covered with spiky hairs on their cell-like bodies—not a pretty sight. Exterminate as many viruses as you can, and remember that for every virus that gets through, your patient suffers. ■

Raymond Pompon studies computers and communications at the University of Hawaii. Cheese Munchers is his first program for START. Richard Betson is a computer programmer who lives in San Marcos, California. Skeet and Immunity are his first programs for START.



Squash the "bad germs" while protecting the "good germs" from viruses with Immunity! Your patient is depending on your hand-eye coordination . . . be careful not to kill any smiling faces!

HiSoft BASIC and HiSoft BASIC Professional

BY DAVID PLOTKIN
START CONTRIBUTING EDITOR

HiSoft Benchmarks Made Easy! File HISBENCH.ARC on your START Disk.

HiSoft BASIC and HiSoft BASIC Professional are a new pair of fast, compiled BASICs from MichTron, Inc. They support many of the ST's special features, but some knowledge of GEM is required to make full use of them. HiSoft BASIC Professional is, according to MichTron, the more advanced package, and this review will focus on it. At the end of this review, I will note those items which are different in HiSoft BASIC.

The Editor

HiSoft BASIC Professional provides a complete programming environment—everything from an editor to libraries of external functions. The editor is used for typing in your program text but, since its output is plain ASCII text, you can use any editor you want. You will, however, give up the interactive nature of the compiler if you don't use the HiSoft editor. The editor functions as a rudimentary word processor with pull-down menus and keyboard shortcuts for most commands. Besides being able

to enter, edit, load and save text, the editor includes such functions as search and replace and cut and paste. You can even cut and paste between files. Auto-indent is also supported, which makes it easier to follow any nested loops.

From the editor, you can compile your program to disk or compile it to memory and run it immediately. If you compile it to disk, the result is a stand-alone file which can be run by double-clicking on its icon or name from the Desktop.

Absolutely no syntax checking is done while entering a program in the editor, so errors only appear when you attempt to compile your program. When the compiler finds an error, it stops and displays an error message (some of which aren't especially helpful!). It then gives you the option of continuing with the compile. If you stop, the editor is reloaded and your program appears with the cursor on the offending line. You can then correct the error and attempt to recompile. If you continue the compile when an error is flagged, of course, the final product won't run, but any other errors in the program will be found and flagged.

Some of these other errors may not be errors at all, but a result of the compiler becoming confused by your earlier errors. Whichever method you choose, when you reload the editor, the cursor will once again be placed on the line containing the first error, and you can jump to each line containing an error and correct that line.

Features and More

HiSoft BASIC Professional is a fully-featured BASIC that includes many of the features that have come to be expected in modern BASICs. It supports integer, long integer, string and single- and double-precision floating point numbers. Arrays with dimensions limited only by available memory, and string arrays, are also part of the language. These arrays are dynamic—you can re-dimension them (with retention of data, if you want), and erase them, freeing up their memory for other uses. HiSoft BASIC Professional does not require line numbers, although they can be used to maintain compatibility with older BASICs. Labels are available to mark important locations in a program in lieu of line numbers or the two can ▶

The HiSoft BASIC Editor provides a word processor-like environment for typing in programs, but there is no syntax checking on text entry.

terms, line styles and end styles is not available except through the VDI library (see below), nor are polymarkers. POINT returns the color of the specified pixel, and single pixels can be turned on individually with the PSET and PRESET commands.

The mouse position, condition of both mouse buttons, the joystick position and the fire button condition can all be read, but the mouse must be turned off before the stick can be read. The mouse can be changed to one of the predefined shapes (hand, bee, arrow, etc.), but user-defined mouse shapes are not directly supported. Nor is there any direct support for menus, alert boxes or dialog boxes except through the AES libraries (see below). A set of commands which allow opening, closing and moving windows are provided, including commands to read and set the current information about the windows. All regular "gadgets" (close box, sliders, arrows, etc.) can be specified, but strangely, there isn't any direct way for the user to modify the window (such as clicking on the size box or moving sliders) without using the AES functions.

HiSoft BASIC Professional also doesn't support the ability to jump to a particular subroutine when an event (such as menu selection, mouse button, or key press) occurs, a la GFA BASIC's ON MENU.

File Handling and Libraries

HiSoft BASIC Professional handles both random access and sequential files. For random access files, all input and output to the disk must be in string format, but a full set of functions is provided to convert numbers to strings and back again. Direct access to memory (via forms of PEEK and POKE) is available, although protected memory can only be accessed via a clumsy DEF SEG statement coupled with PEEK and POKE. SOUND and WAVE commands are virtually identical to ST BASIC—and are

be combined.

HiSoft BASIC Professional supports FOR/NEXT statements (with an EXIT FOR option to jump out of the FOR loop), WHILE/WEND, DO/LOOP and REPEAT/END REPEAT. The DO/LOOP construct allows the modifiers WHILE and UNTIL at both ends of the loop. If used without modifiers, the DO/LOOP will execute indefinitely, unless an EXIT LOOP statement is encountered. The REPEAT/END REPEAT differs from the norm (REPEAT/UNTIL) since no exit condition can be specified except by using the EXIT option.

HiSoft BASIC Professional also supports powerful decision processes. Both single and multiple line IF statements can be used, along with ELSE, ELSE IF and END IF modifiers. SELECT CASE is also available, so that a series of results can be specified based on the value of a variable. An exact match to the variable, range of values, or a logic test (greater than, less than, etc.) can be used to specify which block of statements to execute. There is even a block which can be executed if none of the other conditions are met (ELSE).

Structured Programming

HiSoft BASIC Professional includes elements of structured programming. Subprograms are separate portions of the program with their own variables to which parameters can be passed either by value or by reference. If a parameter

is passed by reference, then the value of the actual variable used in the subprogram may be modified by the subprogram. Variables from the main program can only be used in the subprogram if they are declared as SHARED. Variables within a subprogram can be either LOCAL (initialized every time the subprogram is called) or STATIC (retain their value between calls to the subprogram).

Subprograms can call other subprograms and can even call themselves. A subprogram must be declared before it is used, either by placing the subprogram itself in the code before it is called, or by using the DECLARE statement to let the compiler know that the subprogram is going to be defined further along. Subprograms can be called either with the CALL command or just by stating their names as a command.

User-defined functions are quite similar to subprograms, except that they return a value and can be used in an equation, just like system functions such as SIN (sine) and COS (cosine). The value you want returned by the function is equated to the function name within the function definition. This is very powerful, because decisions can be made within the function code.

Graphics and Mouse Support

Graphic support includes lines, boxes, circles, filled shapes and flood fill, plus the ability to set the palette colors. Direct support of user-defined fill pat-

not explained very well in the manual.

HiSoft BASIC Professional includes libraries for directly calling BIOS, XBIOS, VDI and AES functions. In the case of VDI and AES functions, these tend to be simplified calls, since HiSoft BASIC Professional handles most references to "handles," freeing the programmer from worrying about such things. The VDI library includes the graphics functions, making it possible to do such things as define your own fill pattern or mouse shape (left out of "standard" HiSoft BASIC). You will need a good book on GEM, because the manual does not provide the "legal" values for the function parameters, and you are totally on your own when attempting to use the VDI block move operations such as `vro_cpyfm`.

The AES libraries include such functions as the rubber-band boxes (for moving and dragging rectangles) and all necessary functions for event polling (menus, messages, windows, keyboard, etc.), setting up and responding to menus, dialog boxes, and objects. The functions which return the list of rectangles for windows which need to be redrawn is also included. Again, a good tutorial book on GEM is required in order to use these items in your own programs.

Menus can be built from a string within HiSoft BASIC Professional, and installed using an AES library function call. Resource files, such as those created by WERCS, MichIron's new Resource Editor, can be loaded and used also. The full implementation of AES is important here, because HiSoft BASIC Professional provides no other way to get at many of the functions which make up a standard GEM program.

More on the Manual

The manual which accompanies the two HiSoft BASICs is very good. It opens with a tutorial, then provides an alphabetical listing of all commands. The appendices list the BIOS, XBIOS,

VDI and AES functions, although, as mentioned earlier, they do not provide enough information to fully use these functions. Also listed in the appendices are the error messages, compiler options and a long section on how to set up and use drop-down menus. Sample programs on the disk also provide useful information, although it is not really possible to make use of dialog boxes from the information provided. One minor problem with the manual is that the introductory tutorial uses an exceedingly complex example, the Towers of Hanoi problem.

HiSoft BASIC vs. GFA BASIC 2.0 and 3.0

One question that is bound to be asked is how HiSoft BASIC Professional stacks up against the reigning champion of BASICs, GFA BASIC. HiSoft BASIC Professional has many powerful commands and it is easier to use VDI and AES in HiSoft BASIC Professional than with GFA BASIC 2.0. This is because there is no need to worry about loading a multitude of parameters and using generic VDI and AES calls.

HiSoft BASIC Professional supports direct, simplified calls to the GEM functions. GFA BASIC 2.0 does support "interrupt" programming, however, vectoring program execution to the appropriate subroutine when menus are selected or the mouse button clicked, and providing a mechanism for receiving GEM messages directly from GFA BASIC. These operations are more difficult to do in HiSoft BASIC Professional, since you must use GEM functions (and understand how they work). HiSoft BASIC Professional also provides more powerful loop and decision functions.

GFA BASIC 3.0 adds many more commands and makes virtually all GEM functions available in simplified form from within the language, bringing it up to the level of HiSoft BASIC Professional in terms of GEM support, but also keeping the interrupt features. On the other ▶

HiSoft Benchmarks

Since HiSoft BASIC was not available at the time of START's BASIC overview in the October 1988 issue, here are the results of the same benchmarks we ran on the other BASICs for the ST at that time. The benchmark we ran is on your START disk in the archive file HISBENCH.ARC; un-ARC the file following the Disk Instructions elsewhere in this issue. The file HISBENCH.BAS is in ASCII format; the program HISBENCH.PRG can be run from the Desktop. (Editor's note: *This program can produce slight variations on other systems.*)

Time to calculate Pi: 15.6 jiffies
Sum of sines: -127175
Time to calculate sum of sines: 4.2 jiffies
Sum of square roots: 671.463
Time to calculate sum of square roots: 1.8 jiffies
Time to count to 5000 with floating point numbers: 27 jiffies
Time to count to 5000 with integer (max safety): 4.2 jiffies
Time to count to 5000 with integer (max speed *): 2.4 jiffies
Time to go to a Procedure 1,000 times: 3.3 jiffies
Time to do 512 string manipulations: 7.2 jiffies
Time to do disk access (drive A): 580 jiffies

*Only in counting with integers was there a significant difference between the compiler's "max safety" and "max speed" settings, so both of these results have been listed above.

hand, GFA BASIC 3.0 does not have a compiler as yet, and the current manual is unusable, although that is being fixed. Thus, if you require fairly straightforward access to GEM and compiled output, HiSoft BASIC Professional is the clear choice until a compiler arrives for GFA BASIC 3.0. When it does, either of these two languages will be a satisfactory choice for significant programming power.

HiSoft BASIC Professional costs twice as much as HiSoft BASIC. Strangely, there does not seem to be any significant difference between the two languages. According to George Miller, Product Director for MichTron, the two languages are different: HiSoft BASIC Professional supposedly supports more VDI and AES function than HiSoft BASIC, as well as having additional compiler options. However, a comparison of the compiler options showed that they were identical. Also, MichTron was unable to specify exactly which

commands were missing from HiSoft BASIC—apparently no one has ever compiled a list! A careful comparison of the two manuals and the quick reference cards provided show that with a single exception, every command is present in both languages, including GEM calls. That single exception is the VDI function for setting the shape of the mouse. This is not important because the equivalent AES function is available.

HiSoft BASIC Professional is capable of having external libraries added to it, while HiSoft BASIC is not, but this is of no interest to you unless you can use assembly language (the libraries must be written in assembly) and own or will buy DevPac ST, a development package from HiSoft. Also, HiSoft BASIC cannot be used to write Desk Accessories. Thus, unless you require assembly language access to HiSoft BASIC, or are well-enough versed in GEM to write Desk Accessories, the less expensive

package appears to be a much better buy.

Conclusion

The HiSoft BASICs are fast, efficient languages, graced with well-written manuals and are relatively easy to learn and use. They minimize the awkwardness of compiled languages, since the compiler is fast, although some error (syntax) checking in the editor would be nice. If you are willing to work with GEM and need a fast language, HiSoft BASIC could be an excellent choice. ■

David Plotkin is a chemical engineer with Chevron USA, a START Contributing Editor and our resident expert on BASICs.

PRODUCTS MENTIONED

HiSoft BASIC Professional \$159.95; **HiSoft BASIC**, \$79.95; **WERCS**, \$49.95. MichTron, Inc., 576 South Telegraph, Pontiac MI 48053, (313) 334-5700.
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And They're Off!

Horse Racing Simulations for the ST

Do you enjoy going to the tracks and betting on your favorite thoroughbred? Only if you win, right? START presents the following reviews of two horse-racing simulations that will only cost you the price of the software. Odds are that after a few simulations, you'll be handicapping your own horses.

A DAY AT THE RACES

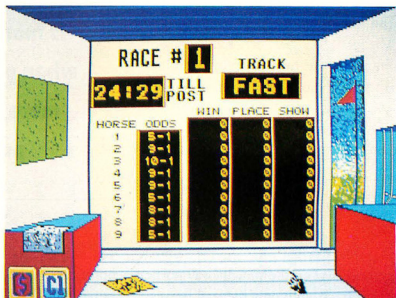
reviewed by Ken Warner

A Day At The Races by Team Software is a well-thought-out horse racing simulation/game that includes all of the standard handicapping aids, exotic wagers and pari-mutuel payoffs of the real race-track environment. Where the game differs from the real track, at least for the vast majority of us, is that it also lets you own and operate your own stable of horses, which greatly increases or decreases your bank account as the game progresses.

Choosing Parameters

Before you go to the races in "ADAR," as the manual calls it, you must first act as your own Racing Secretary and establish the parameters for the racing session. Your options include the number of races, track conditions, number of horses in each race, amount of each

Team Software's A Day At The Races includes a comprehensive horse race-track simulation, a database that tracks up to 500 horses, 50 jockeys and 15 players and a separate database that maintains past performances of the various horses.



purse and other details that make up the day's racing card. You can either let the computer set the options randomly or you can set them yourself. A small database of horses and jockeys is provided to fill the races. However, you may find it more entertaining to create your own database, with room for up to 500 horses and 50 jockeys. This database will then be updated after each race, to provide the players with statistics and standings on horses and jockeys alike.

Once you've selected the players for your day at the races you're ready to en-

ter the track and start playing the horses. Each player begins the meet with a \$1,000 bankroll that can be used to bet, buy horses through auction or claim a horse. This last option allows you to claim a horse at a set price before the race is run. The horse, with all ensuing stable expenses, becomes yours after the race, with any winnings from the race going to the previous owner.

After all players pay the \$3 entrance fee, they must use the standard handicapping tools to help them make their betting decisions before each race. These tools consist of the Racing Pro ▶

gram, which lists each race including horses, jockeys, weights and the "morning odds," the Racing Form with the past performances of each horse in detail and The Greek's Cheat Sheet with The Greek's "picks of the day." All of these options are accessible from the same screen that shows the tote board and the changing odds of each race.

If you've decided how you want to place your bets, simply click on the betting window. A second screen will prompt you for the name of the player betting, and allow you to place wagers in any amount on all the different types of bets available for that particular race. After verifying your bets, it's back to the track for the actual race.

The Race

The race takes place when the clock on the tote board runs down to post time (the amount of time can be set by the players) or when a player clicks on the flag outside the window of the clubhouse. At this time all wagering is halted and the race animation begins.

The animation itself is no great work of art with ADAR, but then again it doesn't have to be. Your view of the race is similar to what you would see from ground level on the straightaway portion of the track, with only the lead horses visible as the race progresses. A scrolling function lets you roll to the back of the pack if your horse is nowhere to be seen, and details elsewhere on the screen provide you with current positions by the horses numbers. And just as at the real track, a closing horse can nip yours at the wire, you can lose a photo finish or the inquiry sign may light up and your horse gets dropped out of the money due to your jockey's riding infraction—each and every one a horse player's nemesis!

At the conclusion of the race the results board is displayed, showing the official results and payoffs on all winning bets. Players who wish to verify winning tickets can click under the bars

of the ticket window on this screen to see which of their tickets paid off and which wagers were lost. Click anywhere else on the screen and you'll return to the Tote Board for the next race.

Wrap-Up and Recommendation

A Day At The Races is more exciting when played with more than one person. Aside from the obvious pleasure of watching your horse edge your opponent's at the wire, beating a competitor in a photo finish or stealing a come-from-behind victory, there is the strategy of claiming or buying particular

**A Day At The Races
is more exciting
when played with
more than one
person.**

horses to build your bankroll and beat your opponent. Since the owner of the horse gets a good share of the race purse, this strategy can be the most lucrative.

All of the handicapping information for each racing session can be printed out, but beware. Although it's a real convenience to have the Racing Program, Cheat Sheet and Jockey Standings printed out, the Racing Form details are too lengthy and difficult to decipher. If an experienced Racing Form "student" (like myself) can't read it, the beginner will be hopelessly confused.

But don't let this minor inconvenience scare you away. A Day At The Races is an absorbing simulation with its faithful and detailed recreation of horse-racing handicapping information. The attention to these details is fine enough that the game could easily be

used as a tutorial for anyone desiring to play the horses, but not quite ready to go to the track and risk their money. As for Team Software's claim that once you play you won't care if you ever go to the real track again, well, I'll still take the challenge and excitement, risks and rewards of the real racetrack over a game that merely requires me to "put my money where my mouse is"!

DAILY DOUBLE HORSE RACING

reviewed by Rick Teverbaugh

It's often been called the "Sport of Kings," yet for substantially less than a king's ransom, you can get a taste for the color and strategy of thoroughbred racing, even if the sound and the excitement are left on the real track. Daily Double Horse Racing from Artworx gives you all this and more.

There's a lot of variety in the Daily Double package. Each "day" there are 10 races, with six horses competing in each one. Since there are a total of 180 mounts that come with the game, simple arithmetic reveals that you'll use only a third of the horses in any one sitting. The game randomly chooses the length of races and the horses involved, but you can decide whether the races will be run on a dry or muddy track or a turf surface.

I've heard that Artworx ran about 400 races on the Daily Double track before they released it to the public. The results of those races are printed on a broadsheet racing form of sorts that comes packaged with the instructions for gameplay. You can use this form to research each horse's racing history. The game's instructions are mostly a rehash of real track-betting rules, and Daily Double provides most of the same betting options that you'll find at the track. These include win, place, show, daily double, exacta, quinella and parlay.

Place Your Bets, Please

Though it is very easy to place a bet in Daily Double, trying to figure out which

horse to wager on is another matter. With just a click of the mouse, the horses can be listed on the screen, but you'll get dizzy moving your head back and forth from the racing form to the computer screen as you search for each horse's racing history.

You can place up to 10 bets in each race and up to four people can play Daily Double at the same time. Each player starts with the same amount of money (player-selectable from \$100 to \$500). When you go to place your bet, you'll see a teller on the left side of the screen ready to take your money. On the right side of the screen are your menu options. These options let you do anything from viewing each horse in each race to placing the bets to setting the race in motion.

Out of the Gate!

Perhaps the race itself is Daily Double's weakest moment. The horses are drawn in fine detail and are colorful. But no matter whether the race is four or eight furlongs, each horse runs in a straight line. In other words, the No. 6 horse always stays on the outside closest to the screen. Since the TV camera's point of view is from just beyond the outside rail and moves with the lead horses, it gives the impression that the horses are on a drag strip rather than a circular or oval track. Thus post position has little impact on the outcome.

Even though there are several factors to consider before placing bets, such as the length of the race, track conditions, past histories and even the jockey (there are 12 in the game and their past records are also listed on the form), it would still take a real luckless individual to go home broke. On my first try I started with \$400 and ended up with \$840, and I live in a state that doesn't have thoroughbred tracks!

Problems, Problems

There is a conspicuous lack of realism in Daily Double Racing. In the races I've

Daily Double Horse Racing from Artworx. Though the game randomly chooses the length of races and the horses involved, you can decide whether the races will be run on a dry or muddy track, or a turf surface.



run there have been very few headlong dashes for the front. In general, the horse that is ahead at the halfway mark is the one that wins. I've also noticed that the favored horse tends to win.

It's easy to place a bet in Daily Double. Figuring out which horse to bet on is another matter altogether.

Even though this is realistic to a degree, it happens too often for my taste—there's no room for longshots.

Another disappointing feature was the fact that the horses' histories remain unchanged no matter how many races you run. The ones that are printed on the sheet are the ones you'll have forever. Since that information is available only on the included race form and not within the program, it isn't possible to update the horse's records with the races you run.

There is an option early in the game to use a data disk instead of the game disk to enter the data on the horses. Perhaps Artworx will use this to create a disk of real horses instead of another disk of fictional mounts.

Recommendation

Despite some areas that could stand improvement I found Daily Double Horse Racing enjoyable to play, especially with other people. In fact, I see it as more of a party game than a sports simulation, but I still like the intellectual challenge of studying the racing form and figuring out the right horse to bet on. ■

Ken Warner is an account representative for Antic Software and an experienced horse player. Rick Teverbaugh is a sportswriter and veteran game reviewer for several computer magazines.

PRODUCTS MENTIONED

A Day At The Races, \$39.95. Team Software, P.O. Box 7332, Washington, DC 20044, (703) 533-2132.
CIRCLE 179 ON READER SERVICE CARD

Daily Double Horse Racing, \$29.95. Artworx Software Company, Inc., 1844 Penfield Road, Penfield, NY 14526, (716) 385-6120.
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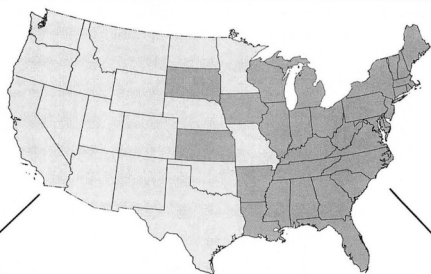
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