

**DISK
INSIDE!**

#1 GUIDE TO THE ATARI ST **START**

ST Laptop Debuts



Volume 3, Number 7

February 1989

USA \$14.95 • Canada \$19.95

ST: SCIENCE AND THE FUTURE

ON DISK:

**VCR Organizer
Moon Calendar
Chess Double Header**



**Dolphin ST Fun!
Neil Harris Looks Ahead**

REVIEWED:

**Planetarium and Skyplot
Mirage Sample Editors
Spectre 128**



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News, Notes & Quotes

What's Happening in the Atari World

by Stephen Mortimer
and the START Staff

Falcon Flies!

By the time you read this, Spectrum Holobyte will have released **Falcon** in a superlative ST version. Tell your Mac and PC-using friends that they should take a look at your new super flight simulator. Falcon combines the features of the Mac version with the color and some of the advanced F16A avionics of the Falcon AT version. You can fly together with another pilot right next to your ST or in another city—even if they are flying PC or Mac Falcons! This is an absolutely spectacular program and we'll review it next issue.



Spectrum Holobyte's award-winning Falcon flight simulator has come to the ST.

Multi-Resolution Monitor

You need two monitors to display all three resolutions on your ST, right? Not necessarily, thanks to OmniMON and OmniSpect from Wuztek. OmniMON is a NEC Multisync, 12-inch, dark tint, non-glare, paper-white monochrome monitor. An adaptor box that comes with OmniMON allows you to switch from monochrome to color on the same monitor! In high resolution, OmniMON resembles the Atari SM124's monochrome screen. In low or medium resolution, OmniMON represents colors as true shades of gray, 16 in low resolution, four in medium.

OmniSpect is based on a color NEC Multisync monitor that displays all three ST resolutions in up to 512 colors. High-resolution picture quality with OmniSPECT isn't as crisp as a true monochrome monitor, but low- and medium-resolution displays are very similar to those of the Atari 5C1224 monitor. Both OmniMON and OmniSpect feature a tilt display.

According to Paul Wu of Wuztek, both monitors achieve their results in hardware logic only, so there should be no problems with software compatibility. OmniMON and OmniSPECT retail for \$2999.95 and \$499, respectively. For more information, contact Wuztek at 4521 Campus Drive, Suite 400, Irvine, CA 92715, (714) 733-0189.

Stereo ST!

Practical Solutions debuted Tweety Board at a recent Atari Fest in Glendale, California. Tweety Board is a solderless upgrade that enables any ST to produce stereo sound. A hardware adaptor with three RCA phono jacks connects to the RS-232 port on the ST; you can add two speakers for conventional stereo sound or three for full surround-sound capability. The adaptor also includes a pass-through that lets you connect other RS-232 devices to your ST. Tweety Board is expected to cost \$499.5. Contact Practical Solutions at 1930 East Grant Road, Tucson, AZ 85719, (602) 884-9612.

LASERC

Zero to Sieve in 5 seconds!

Because LaserC is fast. Really fast. Infact, so fast it can compile and link the popular sieve benchmark in 5 seconds! Spend more time programming and less time waiting on the compiler.

Whether you're an amateur or a professional, LaserC is the right C language development system for you. LaserC has everything you need to develop commercial grade applications or desk accessories for the ST.

LaserC is the *only* integrated C environment available for the ST. Program entry is a snap with the multi-window mouse and keyboard editor. Compile and execute your programs directly from the editor with a single keystroke!

Perform disk operations such as file copy, or run any program with just a few clicks of the

mouse—there's no need to leave the editor.

In addition to the large compliment of UNIX™ compatible library routines, LaserC allows complete access to the ST ROM routines—all documented in the 650 page manual.



Introducing LaserDB

—the powerful *source level debugger!* Now you can view your source code while it runs. Monitor C variables, set breakpoints with the mouse, and evaluate C expressions interactively. Multiple windows and easy command structure make debugging fast and efficient.

Get LaserC and LaserDB—the ultimate C development system for your ST.

"We converted Dungeon Master to Laser C and doubled or tripled our productivity. We now use Laser C exclusively for our ST Development."

—Wayne Holder,
President, FTL Games

COMPILER:

One-pass generating relocatable code. Absolute addressing of globals allows program's code and data to be as large as memory allows. Ultrafast linker accepts both Laser C and DRI format object files.

EDITOR/SHELL:

Integrated editor and development shell. Cut,copy, and paste between files. Pull-down menus and dialog boxes to control editor and run compiler. Fast scrolling and text entry—supports large files. Special window can be used as a command line interpreter. Built-in dynamic disk cache and facilities for RAM resident compiler and other Laser utilities.

UTILITIES:

Resource Construction Program, full-featured Make utility, linker, disassembler, archiver/librarian accept Laser C and DRI objects files.

LASER DB:

Source and assembly level debugger. Evaluate any C expression to print or set variables. Source and assembly mode allows interaction with compiler output. Disassemble or dump memory. Set breakpoints with the mouse on C lines or machine instructions. Watch C variables or machine registers. Multi-window user interface. Simple command structure.

	Laser C			Mark Williams C v3.0		
	Compile/Link	Run	Error	Compile/Link	Run	Error
Hello.c	2.43	—	—	15.96	—	—
Apskel.c	8.88	—	—	26.5	—	—
Sieve.c	4.59	2.45	—	23.9	2.77	—
AES	35.6	—	—	103	—	—
Savage	6.31	36.4	1.73 × 10 ⁻¹⁰	30.82	83.0	1.18 × 10 ⁻⁷

All times in seconds.
AES consists of nine source files totaling 1142 lines of code.
AES is built using Make.
Mark Williams C using RAM disk.

Megamax, Inc.

DEVELOPMENT SYSTEMS

Box 851521, Richardson, Texas 75085-1521
(214) 699-7400

©Megamax, Inc. 1988, LaserC and LaserDB sold separately.
If you currently own Megamax C for the ST, update to LaserC for \$20. Call for details. (214) 699-7400. Now available through distributors. UNIX™ is a trademark of AT&T.



Six Desk Accessories?

That's right. MultiDesk, a new program from CodeHead Software, lets you use more than six desk accessories at the same time. In its basic configuration, MultiDesk is a desk accessory that can load an infinite number of utilities contained within its structure. You can configure the program to load certain accessories automatically upon boot-up and to look for others stored in a folder. MultiDesk occupies only 25K of memory itself, but you must define a buffer in memory for the accessories. However,

in order to conserve memory, you can reduce the buffer to the size of the current accessories.

According to Johnson, CodeHead has tested MultiDesk with over 200 different desk accessories. Generally, if an accessory is incompatible with MultiDesk, it can be installed in one of the other five accessory slots. A PRG version of MultiDesk lets you load and operate desk accessories without allocating memory for them at boot-up.

MultiDesk retails for \$29.95. For more information, contact CodeHead Software at P.O. Box 4336, North Hollywood, CA 91607.

Sam Tramiel in Conference

On October 3, 1988 Atari Corporation president Sam Tramiel was the guest speaker at a formal conference on CompuServe. He made no major announcements, but he did say that Atari was working on a portable ST and hoped to show the 32-bit TT and new ST computers in early 1989. Regarding the shortage of STs in the United States, he stated that Atari had "just signed a major deal with a big DRAM supplier and the situation will get better, I hope, in early 1989."

ST Laptop Makes 1st U.S. Appearance

Atari's ST Laptop computer was unveiled to ST Developers at the Fall Computer Dealers Exposition (COMDEX) in Las Vegas, November 17, 1988. Originally slated to be displayed in the Gold Room as a part of the Atari exhibit, its U.S. debut was delayed until the Atari Developer's Party halfway through the show.

The ST Laptop, code-named STACEY after the custom screen driver chip designed by Atari, includes all of the features of a standard ST in a portable, battery-powered machine. It uses a backlit, supertwist LCD screen with 640 X 400 resolution, similar to the ST monochrome monitor. The Laptop will be equipped with one double-sided drive standard and have available either a second DS floppy or a 20-Megabyte hard drive.

The lightest ST will come equipped with serial, parallel, DMA, disk drive, MIDI and monitor ports just like its bigger brothers. In place of a mouse, the Laptop uses a miniature trackball in the right-front corner of the keyboard.

Although a working prototype of the Laptop was shown at COMDEX using a Mega motherboard, an actual production prototype was not available. According to Atari officials, it was in tooling during the period of the show. A foam plastic mock-up was shown, however, and gave observers a good idea of the "shape of things to come."

The Laptop is expected to make its debut on the market in the late first or early second quarter of 1989. While a price was not announced at COMDEX, rumor has it that the Laptop has a \$1500 target price. How much memory will be included in that price was also unclear, although the most likely figure seems to be one megabyte.



Daryl May is shown holding the foam mock-up of the ST Laptop at the Fall COMDEX Developer's Party. The keyboard in the mock-up is a standard ST keyboard with the keypad, function and cursor keys redesigned and reduced in size.

TD Helps Atari's MIDI Push

Tangerine Dream, the pioneer synth group profiled in the October 1988 issue of *START*, has been spending a great deal of time at Atari recently. Pictured with Frank Foster, Atari's Director of MIDI Marketing, is Paul Haslinger, one of the superlative keyboard artists using STs to create Tangerine Dream's unique music.



Tangerine Dream keyboardist Paul Haslinger and Atari music marketer Frank Foster.

"We're gratified that Atari cares enough about musicians to consult with them about the design of their computers," Haslinger said. "It's not often that hardware people will listen to musicians."

Atari is determined to make their new laptop ST the premiere MIDI performance machine and avoid the mistakes other computer makers have made. Listening to the consumer—the musician—is a big step toward making that happen.

Ferrari Leaves Atari

Joe Ferrari, long in charge of software development at Atari, has resigned from the company effective in early November 1988. Ferrari will be moving back to his home, Canada, to pursue a private software venture.

If you have a hot tip or interesting product news about the ST, let us know at News, Notes & Quotes, START Magazine, 544 Second Street, San Francisco, CA 94107.

Dot Dot Dot. . .

WordPerfect Corporation has decided to halt development of new products for the ST because of a depressed market in the United States; until the situation changes, there will be no new ST products from the company. Support for WordPerfect 4.1 will continue (the latest update was released August 1, 1988) and future updates to the product will still be available. This may include features that were planned for version 5.0, which has also been halted. . . . Version 2.0 of NeoDesk, Gribnif Software's replacement desktop, now has a master shell feature that allows NeoDesk to occupy as little as 24K while a program is being executed. Other major enhancements include the ability to display files as text instead of icons, a utility that analyzes system crashes and a move file feature. Gribnif Software, P.O. Box 350, Hadley, MA 01035. . . . Microtyme has released three volumes of IMG clip art and laser printer fonts. Called the Printer's Devil, each volume costs \$29.95. For more information, call Microtyme at (800) 255-5835 or write to P.O. Box 369, Kettering, OH 45409. . . . Soft-Logik Publishing has renamed its Publishing Partner Professional as Page Stream and Publishing Partner has become Page Stream Jr. . . . In an attempt to prevent possible foreign imitations of some of its products, Atari is suing Suncom, Inc. for illegally copying its "video game control unit," or joystick. Papers filed in a Federal District Court in San Jose allege that the Wheeling, Illinois-based company knowingly imported and distributed counterfeit Atari joysticks in the United States. Suncom claims no wrongdoing. ■

Atari Users Unite!

This year Atari users like you came together on GEnie™ to get their Atari questions answered by experts, their Atari games won, their Atari systems updated and their online Atari opinions confirmed, researched, and applauded **247,769 times.**



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*Basic rates and services in effect 9/88 apply in U.S. only. Non-prime time rates apply Mon.-Fri. 6PM-8AM local time and all day Sat., Sun., and next holidays. Subject to service availability. Some services offered on GEnie may include additional charges. *\$10 credit applies. Offer good for 30 days from sign-up.

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Capture any image sharp and clear with resolutions up 300 dots per inch and with 32 shades of grey.

Navarone's high speed interface.

Navarone combines the Canon IX-12 or IX-12FTM Image Scanners with its own High Speed Interface that plugs into the cartridge port of your Atari ST or MEGATM.



Sophisticated, but easy to use software, allows scanning in both line art and half tone mode. The *ST SCAN* program operates under GEMTM with easy to use click on menus. "Setting up and becoming familiar with the (*ST SCAN*) system is simplicity itself" (Frank Kofsky, ATARI EXPLORER).

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The *ST SCAN Image Scanner* comes complete with Canon Scanner (flatbed or sheetfed), high speed interface, cable, software and manual.

ST SCAN Flatbed	\$1779.00
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Products Update

New ST Software and Hardware

Compiled by Tom Byron
START Assistant Editor

Nickelodeon Five

A universal music program from Mars Merchandising plays song files created on five of the most popular music software packages. It's called **Nickelodeon Five** and it works on any ST color system, with or without an attached synthesizer. To complement the program, Mars is also releasing a library of song disks with over 4,000 classical, popular, ragtime and show tunes.

Nickelodeon Five, named after early American jukeboxes, plays Music Studio, Music Construction Set and EZ Track song files. It also plays AMS song files from Atari 8-bit computers and SID files from the Commodore 64 when both are ported over to 3½ inch floppies. Thousands of files are already available in this format. Nickelodeon Five (with 50 song files), \$1995. Mars Merchandising, 15W615 Diversey, Elmhurst, IL 60126, (312) 530-0988.

Megatouch

Regent Software's **Megatouch** firms up the keyboard on your 520ST or 1040ST to feel just like a Mega. "When the Mega began shipping last year, most ST users wanted its enhanced keyboard because it solved the 'mooshy' feeling of the ST's," reports Tom Mason, engineer of Megatouch. "That's why we developed Megatouch for the ST owner."

Megatouch takes less than 10 minutes to install. Megatouch, \$11.95. Regent Software, P.O. Box 14628, Long Beach, CA 90803-1208, (213) 439-9664.

New Games for the ST: Virus, Technocop, Off Shore Warrior

Games, games and more games! Three entertainment software publishers, Epyx, Rainbird and Titus, have each come out with games guaranteed to keep you busy for the next few months.

A creeping, poisonous menace is polluting the Earth. The Seeder slowly, silently spreads the spores. Now it's up to you to pilot your hoverplane as you try to destroy this creeping terror in **Virus**, the newest game from Rainbird. Scanners, laser cannons and homing missiles arm you for all-out combat in your deadly pursuit of these killer genes. **Virus**, \$2995, Rainbird Software, P.O. Box 2227, Menlo Park, CA 94026, (415) 322-0412.



In **Virus**, a new game from Rainbird Software, it's up to you to pilot your hoverplane as you seek to destroy the killer genes.

When foul felons threaten the city, the Enforcers, an elite police force, go into action in US Gold's **Technocop**. Armed with a computer wristwatch, criminal radar locator, snare net gun, .88 magnum and the V-Max—the most technologically advanced auto ever built—the Enforcers' mission (and yours) is to thwart the international crime family known simply as D.O.A.: Death on Arrival. **Technocop**, \$3995. Epyx, Inc., 600 Galveston Drive, P.O. Box 8020, Redwood City, CA 94063, (415) 366-0606.

In Titus Software's **Off Shore Warrior**, the extraterrestrial pacifists have taken control of economic, political and social life on Earth. War and violence are things of the past—even the major sports lack the action and aggression that every Earth inhabitant lusts for.

Continues on page 19

A ND NOW, A FEW WORDS FROM OUR SPONSORS...



You have become my favorite ST magazine by far. By and by, you are also the most expensive ST magazine I know of, a testimony to the fact that no one minds paying for high quality, an area where you excel.

- Christopher H., CO



I'm writing to express my appreciation of the BYTE MECHANIC program. It provided exactly the facilities I needed to convert a client's file for import into Publishing Partner.

-Martyn D., U.K.

PLC

Thank you very much for the program SCIPLLOT. That has to be one of the best programs I have received from an ST magazine ever.

- Ivan T., CA

NAVAL BATTLE

START's Version of a Classic Game

Bring the thrill and excitement of combat on the high seas to your ST in this special advertisement issue. START brings you a great collection of all-time classic games. Revisit them now by ship loads in your nearest - remote - store. You have to find out details of the ship in the vision. Challenge the computer or a friend to one of these brilliant tests. Naval BATTLE runs in color or monochrome.



In the last special issue #4, the NAVAL BATTLE was so addictive to play again and again, I personally congratulate J. Hutchinson for making the right stuff. It's a winner!

-Alistaire E., CA

Creation!

Build Mountains with START's Powerful Graphics Extension

Now you can build mountains and hills with the power of graphics extension and color. This feature is a great way to create a new world. You can build mountains and hills with the power of graphics extension and color. This feature is a great way to create a new world. You can build mountains and hills with the power of graphics extension and color. This feature is a great way to create a new world.

I especially enjoyed this last issue, with Tom Hudson's program CREATION! I have found that anything with Tom's name on it will be great.

-Mark L., OK

START

The START disks are loaded with great programs, and every month they get better. Subscribing to your magazine was the next best thing to buying my Mega 2 ST. As acting president of a users group, I tell my fellow ST users to subscribe to START.

Jonathan D., NY

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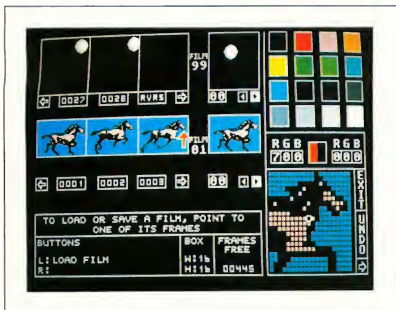
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New Games, continued

Amid the tedium, a sport evolves in which the participants pilot high-powered boats in a battle against their opponents and the natural elements. This is known as the Off Shore Warrior movement. Gigantic arenas are situated on some of the world's largest lakes, where the warriors fight to the death while trying to survive the dangers of rocks and waves. Will you be the new champion of the sport? It's time to find out! Off Shore Warrior, \$39.95. Titus Software, 20432 Corisco Street, Chatsworth, CA 91311, (818) 709-3693.



The Animatic Animation System from Kinetic Microsystems lets you create flicker-free sprites that animate at 0 to 60 frames per second. Films can be any size, from 8-by-8 pixels to 48-by-48 pixels, and you can load and edit NEOchrome and DEGAS images.

Animatic Animation System

Kinetic Microsystems announces the Animatic Animation System, a professional sprite design package for the ST. Features include a user-friendly interface employing icons and pop-up menus; full undo capability; easy editing with drawing tools—no clumsy grid interface; sprites that animate continuously as you edit, so you can see your changes as you make them; and the ability to edit up to 100 films at once.

Animatic lets you create flicker-free sprites that animate at 0 to 60 frames per second. Films can be any size, from 8-by-8 pixels to 48-by-48 pixels, and NEOchrome and DEGAS pictures can be

loaded into a separate "cut screen" and edited.

Animatic also includes the Sourcerer, which converts your animated shapes into source code that can be created for any programming language. Animatic Animation System, \$49.95. Kinetic Microsystems, 5640 Vantage Point Road, Columbia, MD 21044, (301) 964-3180.

Do you have a new ST product? If so, we'd like to hear about it. Please send your press releases and product photos to Product Update, START, 544 Second Street, San Francisco, CA 94107

Macro Assembler

Metacomco has just released a new version of Macro Assembler ver. 12.00. In addition to enhancements in the assembler itself, Metacomco has greatly improved the utilities provided with the software. One important addition to Macro Assembler is the fast, efficient Tempus editor, a new GEM-based text editor that lets you edit four documents at once. The Tempus editor was licensed from Creative Computer Design of Germany.

Macro Assembler ver. 12.00 also includes a new librarian, a linker that's at least five times faster than previous versions, a new RAM disk and enhancements to the resource construction editor and debugger Macro Assembler ver. 12.00, \$104. Metacomco, 26 Portland Square, Bristol BS2 8RZ, England.

SuperScore and Phantom SMPTE

Sonus Software's SuperScore 1.3 is a fully interactive scoring and sequencing program featuring QMagic, an intelligent quantize feature that eliminates the most common time-consuming tasks of editing a score after converting it from a sequence. Other features include the ability to quantize a select group of notes, highlighted playback and instant score edit update. SuperScore 1.3, \$299. Sonus Software, 21430 Strathern Street, Suite H, Canoga Park, CA 91304, (818) 702-0992.

Dr. T's Phantom SMPTE Synchronizer combines a Multi-Program Environment and hardware so you can read and write all industry-standard SMPTE time code formats, song painter-encoded FSK and standard pulse sync. Phantom SMPTE, \$250. Dr. T's Music Software, 220 Baylston Street, Suite 306, Chestnut Hill, MA 02167, (617) 244-6954. ■

Thanks For All The

Have you ever visited a zoo or aquarium and been concerned about the animals on display? Researchers at the California Academy of Sciences' Steinhart Aquarium in San Francisco are working on ways to make things a bit better for them—and an Atari ST is making the research possible.

by Rob Weinstein

Does the image of dolphins and computers together bring to your mind some science fiction tableau with visions of a futuristic human-dolphin society? Well, you're not alone. According to Steinhart Aquarium research assistant Eric Carlson, the combination of computers and the ocean's most intelligent inhabitants conjures up all sorts of wild images, both with the press and the public.

But the truth is that dolphins and an Atari 520ST are combining regularly in the pastoral setting of San Francisco's Golden Gate Park, and it is far from science fiction.

It is, in fact, a research project that has taken place regularly over the past three-and-a-half years, and which, except for the timely intervention of the Atari Corporation, MichIron, Inc. and START Magazine, would have been called to a premature end last summer.

What is actually going on, explains Carlson, is a "research project in environmental enhancement."

Relieving the Boredom of Captivity

Essentially, Carlson says, putting a wild animal in a small, featureless tank is akin to putting a person in a jail cell. While Carlson and other scientists agree that

the benefits of having animals accessible to the thousands of visitors are worth it, he is also aware of the limits the environment imposes on the captives.

These limits are particularly acute on dolphins, which are what scientists call a pelagic species. Pelagic means that dolphins generally live in the upper portion of deep water, an environment which is essentially devoid of dimension. There is a world without bottom, without sides. Even the surface, which would be a clear limit for other marine life, is an essential part of the oxygen-breathing dolphin's world.

In addition, dolphins travel in large groups, sometimes totaling 1,000 individuals or more. So their keepers, at least at the Steinhart Aquarium, are concerned that the animals don't get bored or suffer reactions to captivity which are too psychologically severe.

That was the reasoning which began the "environmental enhancement" project three-and-one-half years ago.

"We are looking at the effect on behavior of providing these animals with some control over their environment," explains Carlson. "Most captive wild animals are kept in such a way that the things they do have no effect on their day-to-day lives."

Fish

Calling All Humans!

The result is an underwater keyboard made of eight PVC pipes of progressive lengths, resembling a xylophone. These pipes hang into the water, providing the dolphins—or the harbor seals with which they share a tank—an eight-key keyboard. By pushing any one of the keys, the dolphins and seals can request that the researchers undertake specific actions, from providing fish or toys to petting them.

All of which worked fine until the summer of 1988, when the Commodore 64 which the project had been using since its inception, died.

That was when Atari, at the behest of START magazine, stepped in. "We heard about the problems they were having and called Neil Harris [then Atari's Director of Product Marketing] to see if some arrangements could be made," explains START Editor Andrew Reese.

The arrangements eventually consisted of the donation of a monochrome 520ST system by the Atari Corporation, GFA BASIC 2.0 with all of its supporting modules and manuals by MichIron, Inc. and programming assistance and other software by START Magazine.

"We feel very strongly about our role in the community," explained Atari

On the cover and in this photo are some of the stars of the Steinhart Aquarium's dolphin and seal display. The dolphins are not bottle-nose dolphins, like Flipper, but are of the California white-sided species.



SAL ZAVARITTI

Vice-President Sig Hartmann, when asked about the donation.

"In the past we have donated equipment to causes which we felt deserved it," he continued. "We donated a computer to a community crime prevention program in Los Angeles. We like to help people where we can."

Reese echoes these sentiments. "We felt this was an area where we could make a unique contribution. This is a program which is operated largely by volunteers on a very limited research budget, and we were delighted to be able to contribute to its continuation."

The First Two Letters in Steinhart are ST

But the donations do far more than continue the program, according to Carlson. Because of the capabilities of the Atari ST, the project now has an

even greater opportunity to study and interact with the dolphins.

"This gives us an efficient opportunity to record the behavior of these animals instantaneously," responded aquarium director John Macosker, when asked about the contribution, "and then sort, quantify and play back that behavior in ways which would have been impossible for a researcher using a pencil and a yellow pad 20 years ago."

And just exactly what is being sorted, quantified and played back? That explanation, as it comes from Carlson, is a little more complex.

Sessions with the dolphin keyboard device are held three times a week and last for approximately 25 minutes. During that time the pipes are placed in the water, and the keys are activated. The pipes are mounted on pivots and wired to microswitches activated by move- ▶

ment of the pipes.

When any of the animals in the tank (currently there are two California white-sided dolphins and two harbor seals) push a pipe, it is recorded on the Atari ST located in a blind-style hut on the roof of the building. Every activation records the day, time, and identity of the key pushed. Additionally, the key pressed is displayed on the screen, via a program Carlson wrote exclusively for this research. At the same time, another observer uses a bar code system to record the activity of each of the animals in the tank both before and after the pushing of the key.

Pushing the key also triggers the ST to generate a tone, not so the dolphins can play music, but so that these auditory-oriented creatures have an additional method to differentiate the keys.

Exercising Control

The underlying concept of the experiment is to provide the dolphins with some degree of control over their environment, some way of asking their keepers for a response. Each of the active keys, therefore—currently there are five—requires that a researcher, poised out of sight next to the tank, perform a specific action.

The dolphins or seals can request fish, a white ball, a large ring made of corrugated plastic pipe (which the dolphins like to rub against), a spray of water across the surface of the tank (which

the seals like to play in) or "tactile stimulation," in the form of either rubbing or petting.

"Each of these things is equally available to all of the animals," explains Carlson. "For example, if any animal pushes the right key, all of them get fish." With the exception of the fish, each of the other actions lasts a total of 30 seconds. The fish, of course, last until they are gone. The xylophone is disabled during the 30-second interval and no key can be pushed twice in succession.

In the future the three remaining keys will be activated and will provide additional auditory stimulus for the tank's residents. One key, when pressed, will provide 30 seconds of fast or active music, one key will provide slower more meditative music, and the final key will provide 30 seconds of marine mammal sounds, such as whale songs.

"We introduced the keys one at a time," explains Carlson. "We would activate a key and run sessions until we got a certain number of presses, a high enough percentage so that we were sure it was more than coincidence, and that the animals were taking a deliberate action."

Then additional keys were gradually introduced until the current level of five was reached.

"The first key was fish," says Carlson, "because in any wild animal food is such a strong selective force that we thought it might make them learn

faster." However, he points out, the fish was never provided as an actual part of the dolphins necessary diet. First, he says, the amount of fish provided during an interactive session was minute (about two pounds per session, compared to the approximately 20 pounds per day the dolphins normally eat), and the sessions were held without regard to the animals regular feeding schedule.

So, What Does a Dolphin Want?

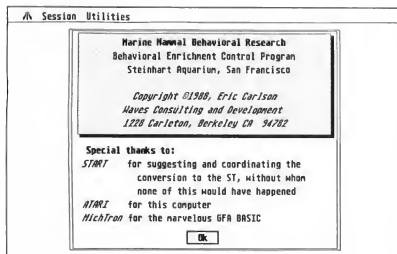
In fact, Carlson notes, the animals frequently request fish, even though they are not hungry. "They don't always eat the fish," he says. "Some of the time they will throw it around the tank and play with it, the same way as they would with the ball."

In addition to quantifying the keyboard activity, researchers are interested in the behavior of the tank's inhabitants throughout the session. Just what does Amphitrite do while Thetus is working the keyboard? And how do the harbor seals react to the entire process?

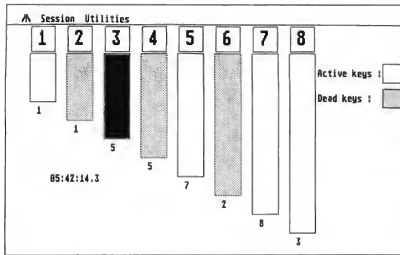
This research requires a system slightly more complicated than just the ST-xylophone combination. Initially, a researcher with a tape recorder was stationed at a viewing window and dictated a running monologue recording the behaviors of each of the animals throughout the session. But this method has been replaced by a much more efficient bar code reader system, in which a researcher with an electronic stylus records the animals' actions with a series of computerized bar codes, each representing an animal, a portion of the tank, and an action.

For example, while Thetus is pressing a key, Amphitrite may swim in a large circle with her belly up. The researcher scans the bar code for Amphitrite, the code for "swims fast", the code for "dorsal down," and finally the codes for each of six sections of the tank in the order in which she moves through them.

This is initially recorded on a small,



For a marine mammal researcher, Eric Carlson is a pretty darned good programmer. This is the title screen for his data collection program.



The unique software provides a visual record of the animals' keypresses and the elapsed time since the start of the session.

hand-held computer and then is transferred to the ST to be added to the database being compiled.

Surprising Results

And what conclusions have been reached through all this research?

Carlson is reluctant to say, largely because gathering the information has taken so much time that he has yet to compile it. "The ST is going to make a huge difference," he explains, "because once I write the software, I will be able to do the analysis right here on this machine. In the past I have had to take the information home and transfer it to a Macintosh."

Now that the data-gathering software is operating correctly, Carlson hopes to be able to begin work on the actual compilation and analysis.

Still, while he won't make any conclusions, he will tell some interesting "anecdotal" results.

For example, he was surprised to find that Thetus, the dolphin who currently interacts most with the keyboard, calls for the white ball even more often than for fish.

But the most surprising result emerged early in the experiment.

When the project initially began there were two dolphins and three harbor seals in the tank. Much to the researchers' astonishment, the role of communicator was quickly assumed by one of the seals, rather than by a dolphin, as had been expected. "Initially,

about 90 percent of the interaction was done with one harbor seal," says Carlson.

Although he is unwilling to make any conclusions about this result, he speculates that this may be the result of the harbor seal's familiarity with objects in its environment. "Since they live by the shore they are more used to coming across objects, such as rocks and piers," he said.

This situation changed, however, when the seal which had been doing the interaction was injured and had to be removed from the tank. "When she was removed from the tank," says Carlson, "one of the dolphins, Amphitrite, took over the interaction with virtually no reduction in efficiency."

Does this mean Amphitrite learned to operate the mechanism by merely watching the seal? Again, Carlson will not speculate on the workings of the dolphin mind. Still, the questions are raised. . .

High Tech, Low Tech Or. . .

Aside from these questions, both Atari

A thoughtful inclusion by Carlson is a simple screen of questions regarding the necessary pre-session equipment settings. This is intended to ensure that conditions are consistent throughout the experiment.

```
Did you check the xylophone? y
Speakers hooked up and in? y
Tape input level set at 187 y
Bkgnd amp volume set to 87 y
Bogen amp 'MASTER' volume set to 37 y
Bogen amp 'MIC 2' volume set to 187 y
Tape deck counter set to 87 y
```

Press the mouse button to begin the session. . .

and the aquarium point to one additional benefit being derived from the project, the educational opportunity for the research associates involved.

Initially organized by Cal Moskowitz, a professor at San Francisco State and a Fellow with the California Academy of Sciences, the project is operated on a day to day basis by Carlson and Victoria Case, who are both currently biology graduate students at San Francisco State University. In addition there are some seven or eight volunteers who are involved with the project on a regular basis.

The aquarium recognizes the educational opportunities, both for the dolphins and for the students. "Atari, MichTron and START have been very generous and we appreciate it," says Macosker. "They are contributing to some very important research, as well as important educational opportunities for these students.

"We appreciate this opportunity," he concludes "for high tech to examine lower tech. Or actually maybe we're examining even higher tech, since we can't really say where the dolphins are in relation to us. This project is showing us that we still need to determine what questions to ask them."

It is particularly gratifying to both Atari and START Magazine that an ST may play an important role in determining both the questions and their answers. ■

Rob Weinstein is a free-lance writer and the editor of a labor union newspaper in San Francisco.

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- * Compile the script and then run it at any speed
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ST Control language features FOR-NEXT loops, IF-THEN statements, logical operators, subroutines, floating-point arithmetic, multi-dimensional arrays, arbitrary expressions, trig functions and much more. There's also a Trace function for real-time debugging of scripts. ST Control works on any ST, color or monochrome.

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Mac and PC On The ST

A Closer Look at Spectre 128

by David Plotkin
START Contributing Editor

In our continuing coverage of Macintosh and PC emulators on the ST, this month we'll take a detailed look at Spectre 128 from Gadgets by Small. This remarkable product is a must-have for any ST owner who is serious about running modern Mac software. (Editor's Note: *Spectre 128 can use 128K Mac ROMs. For further information, refer to last month's column.*)

The first thing you'll notice about Spectre is that it is *small* (which has nothing to do with name of its author. . .). In fact, the slender cartridge shell is the same as the one used in Deskart. You can leave it plugged in all the time, since it is active only when you run the Spectre software.

Upon running the software, you'll become aware of the other important difference: all of the programs and utilities are built-in. You no longer need to run separate programs to configure, format disks, etc. Instead, a series of drop-down menus enables you to perform almost every task necessary. Some of the menu choices set up the configuration of Spectre; these choices can be saved in a file.

The Memory menu title screen lets you set the amount of memory that you want to use with Spectre. The software



The slender Spectre cartridge shell is the same as the one used in Deskart. You can leave it plugged in all the time, since it is active only when you run the Spectre software.

will default to the largest amount available in your machine. Memory amounts which are *not* available will be ghosted and you will be unable to select them. This illustrates another nice feature of Spectre: it's smart and can generally figure out which values can be used. Normally, you'd want to use all available

memory, but an exception would be if you wanted to use the Atari SLM804 Laser Printer. You must reserve one megabyte of memory for the printer, just as in ST mode. You can also enable a disk cache, so that the most commonly accessed portions of the current disk will be stored in memory, speeding up disk access. You can route printer output to either the serial or parallel port. Spectre's Hard Disk menu lets you enable a partition for Spectre access, boot from that partition and format it properly.

Interestingly, you can connect a standard Apple Mac hard drive to the ST through the SCSI port on an ST-compatible hard drive. You can also disable any SCSI device so that it won't be polled by Spectre—this can save time and provide flexibility.

When formatting a hard drive, Spectre figures out how many partitions are available. You can format your hard drives as either HFS (Hierarchical Filing System) or MFS (Multi-Finder System) and, as I said last month, Spectre now lets you boot directly from an HFS drive. Thus, hard drive setup is simplified considerably.

The Floppy Disk menu lets you format or duplicate floppy disks in two ▶

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- 144 Great Chess game from the 80's... (COLOR).
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Mac & PC on the ST

formats: Spectre (currently the same as Magic format) and Mac, which only works if you have the Translator One from Data Pacific. The "Duplicate Floppy" option lets you select the source and destination disks, their format and whether they are single- or double-sided. There's no utility to move ST files to Mac format disks and back, however; such a utility did come with the Magic Sac, but I could never get it to transfer ST files to the Mac successfully.

When you are ready to run Spectre's Mac emulator, just choose that option from the File menu or press Return. Soon you'll see a message telling you to insert the Spectre startup disk, which must contain the Mac System and Finder, usually located in a "System Folder." Unlike Magic Sac, however, you can use the current release of System and Finder, rather than being limited to System 5.4 and Finder 3.2. The latest version of System and Finder as of this writing are both 6.0. (Apple has finally assigned identical version numbers to them.)

In general, Spectre works quite well as a Mac emulator. Although this is its first release (version 1.5 as of this writing), it does not seem to have the sorts of problems that the early Magic Sac had. Obviously Dave Small learned a lot in the interim, and it shows. This first release of Spectre even supports color, although not very well. This is not Spectre's fault, however; the color screen just doesn't have the resolution to do the job properly. Sound is still not supported, and I suspect it may never be. Dave reports that it is possible to emulate the Mac's sound chip but that it ties up so much of the 68000's processing time that everything else (graphics, mouse, disk, etc.) pretty much comes to a halt. Still, with Dave Small it's never safe to say "never." We'll just have to wait and see.

Very few pieces of software which ran with Magic Sac do not run with Spectre—these are mostly the same

ones (such as MacWrite 2.2) that had to be revised when the new ROMs came out. In every case, newer versions that do run with Spectre are available.

Spectre's manual is remarkable, not only telling you how to use the product, but also giving some insight into the author as well. It includes periodic "breaks" to relate some humorous or horrifying anecdote. These breaks seem to occur just about when you might be getting a little bogged down or after a particularly technical section. Actually, none of the manual is terribly technical and all of it is very well-written and well-organized. The instructions are exceptionally precise and repeat warnings many times to make sure you pay attention. And because Dave Small understands how anxious you are to try out your new cartridge, there is a quick-start section so you can try it out right away. It is better, however, to read the rest of the manual at some point!

Overall, Spectre 128 is a good product because it works. Mac software runs well on the ST and as a result, you can use some extraordinary software not yet available in ST format, such as Hypercard—Spectre owners are already getting good use out of Hypercard on their STs.

Even Apple uses Spectre 128—it has unique program-monitoring capabilities that Apple uses to debug their own software. Not bad for a "Gadget!" ■

Contributing Editor David Plotkin is a chemical engineer for Chevron U.S.A.

PRODUCTS MENTIONED

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Spectre 128, \$179.95.
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CIRCLE 158 ON READER SERVICE CARD

Star Light, Star Bright

Atari Planetarium and Robtek Skyplot

by Jim Pierson-Perry

Twinkle, twinkle little star—how can I tell which one you are? At one time or another just about everyone has indulged in a bit of star gazing. Trying to make sense from patterns in the night sky has been one of my favorite preoccupations.

Atari Planetarium and Robtek Skyplot are two programs that bring the fascinating science of astronomy to your ST. While differing in style and depth of functions, they are both well suited for a wide range of practical and educational activities. Atari Planetarium is an upgrade of an earlier program for the Atari XL/XE computers. Skyplot, from Germany, was originally written in 1980 and has since been translated and expanded over several subsequent generations of computers.

Space: The Final Frontier

The primary function of these programs is to generate a screen display of the night sky for any observation point on Earth, at any date and time. The display contains visible stars, deep-space objects such as galaxies, star clusters and nebulas, planets from our own solar system, the moon and the sun. Constellations such as the Big Dipper or Orion are shown by connecting lines. By supplying your current

Skyplot screen taken in mid-passage from a simulation of the orbits of the inner Solar System planets.



date, time and geographical location, you can compare the display with the actual night sky and learn to recognize constellations and other landmarks of the heavens. (Editor's Note: *To do this, you'll probably need to set up your ST by the window. A more practical approach, however, might be to use a screen dump instead of the screen itself.*)

You can also use either program to track the movement of a celestial body and study interesting astronomical events such as eclipses, transits (where a planet passes in front of the sun), conjunctions (where two or more planets appear next

to each other in the sky) and more. Taken to extremes, you can watch the shapes of constellations change over time or the polestar change from Thuban (in ancient Egyptian times) to Polaris (today) and Gamma Cephei (around A.D. 4145).

Atari Planetarium

Planetarium runs on any ST or Mega in either low or high resolution. It is not copy-protected and can be installed on a hard drive. The program follows normal GEM protocols and is both mouse- and keyboard-driven. The accompanying manual is excellent, one of the best I've ▶

ever seen. It is well-written, logically organized and has numerous screen shots, illustrations, examples and information for self-study or classroom use.

Planetarium's main function is to calculate and display a star chart for any date and time from 9999 B.C. to A.D. 9999. By moving the mouse cursor over a map of the world, you can select an observation point. While the map is not accurate enough to obtain a precise location by mouse-clicking, you can get reasonably close and then use a screen icon to lock into the nearest minute of latitude and longitude. A table of geographic coordinates for over 150 cities and islands is given in the manual.

The star chart is drawn from a database of over 3,500 stars and 300 deep-space objects. Options include showing the connecting lines and three-letter names for constellations, symbols for the solar system planets and a grid of celestial coordinates. Planetarium shows the sun as a circle and the moon is shown with its current phase (eg. full moon, crescent, etc.). The display works best in color because the background tracks the time of day: black at night, lightening at dawn and bright blue during the day.

The normal display view mimics that of an observer looking out toward the horizon. An alternate view mode shows the sky as a typical astronomical chart, looking straight up to the celestial north pole.

Skyplot encompasses nearly 16,000 stars and 1,053 deep- space objects.

The view magnification can be varied by a factor of two over four levels—good for focusing on specific events such as a solar eclipse, where you can actually watch the moon's shadow pass over the sun.

Alongside the display chart is a control panel where you can change the date, time and viewing angle; the display is updated within seconds. Using the find menu, you can quickly locate the sun, moon, a planet or any of 88 constellations and have the display redrawn to be centered about it. Halley's comet can also be located, but only over the limited time window of its last approach during 1985-86.

The mouse pointer can provide two types of information. First, click the right button while positioned on a star or object to open a text window at the bottom of the screen. This window gives the star's name and description (if available). Click the left button on any position in

the display to show the star's corresponding azimuth and elevation in the control panel area.

The strongest feature of Planetarium is its ability to change the display to reflect the passing of time. The clock can move at real-time or up to 64 times faster, either forward or backward in time. This lets you set up conditions prior to an eclipse or other event, then watch it happen on the screen as it would be seen from Earth. This is an outstanding function for educational applications. The manual gives a number of astronomical events—historical and those yet to come—that can be studied via this simulation approach.

Skyplot

While Planetarium was created with the backing of Atari, Skyplot has been a labor of love by a single programmer and incorporates a number of advanced features for the astronomy hobbyist. It uses several data files to encompass nearly 16,000 stars and 1,053 deep-space objects. Because of this large database and the number of features, Skyplot requires at least one megabyte of memory. It runs in both medium and high resolution and is not copy-protected. The manual is very comprehensive with many examples, but has no screen shots or index.

The data is stored initially in three files: normal stars, alternate stars and deep-space objects. Be prepared for a long wait—about 20 minutes—the first time you load them; a program option subsequently lets you save the data in a single compressed file. After I installed the program and compressed data files on a hard drive, the load time was reduced to a mere 20 seconds! The original data files are in ASCII format and you can augment them, then resave them in the manageable compressed format.

There are three menu headings: Settings, Display and Search. An online Help function includes cross-references to the appropriate manual sections. Skyplot follows standard GEM protocol, but I found



Planetarium screen taken in mid-passage from a solar eclipse that occurred in 400 B.C., visible near Rome.



At left, a Planarium screen of the night sky view from Baltimore, MD on October 29, 1988. A gibbous moon is seen rising at the bottom of the screen.

actual spherical images (ranging from full disks to crescents) for more realism.

A great deal of information is available for many stars and objects. Click the right mouse button on an object to bring up a descriptive text box. If the object is a star from a constellation, the constellation connecting lines will be shown and you can remove them by clicking the mouse.

The Search command helps you locate stars and objects. It activates a dialog box where you can enter a text string with the full or partial name of the object. The success of the search depends on how closely you can match the name: "androm" was readily picked as the Andromeda galaxy, but no match was found for "little dip."

Where Skyplot really comes into its own is with its advanced features, such as a simulation of planetary movement in the solar system, either as an animation or by tracing the movements over a star chart. You can also generate a statistics summary of the star distribution, by magnitude, in the current display. Another feature produces a chart of visibility for all planets over the current year to predict the best observation periods. The rising and setting times can be computed for any object, including the maximum height of apparent rise and the time it occurs.

The occurrence of eclipses, transits and conjunctions of solar system ele- ▶

the mouse response to be somewhat sluggish.

The home screen lists the current display settings, which include observer geographical position, date/time, screen colors, type of star chart to create, classes of stars and objects to show. Observer site can be entered directly through a dialog box or by picking a position from a display of the Earth. That display can be rotated and zoomed in through several magnifications for reasonably accurate positioning. The time window is restricted to A.D. 1583 through 3000.

Several different star chart formats are supported. A 3D view can be drawn giving left- and right-eye views on the same screen, but this only works for those people who can cross their eyes properly. The program would achieve the 3D effect much better if it supported the Stereotek 3D glasses.

Display screens can be saved in DEGAS format and you can create and replay a series of screen shots with a companion program included on the disk to provide an animation sequence. The star charts displayed by Skyplot are static, so changes to the settings must be made on the home screen before you can update and redisplay the chart. There is no provision for synchronizing the display to time passage automatically.

Given the vast number of stars and objects in its databases, Skyplot can pro-

duce extremely dense charts. The charts can be thinned out by selecting only certain groups of stars or objects to display (e.g. stars only of visible constellations, planets, galaxies, globular nebulas, etc.). You can also superimpose a grid of celestial coordinates, limit the stars to display on the basis of the apparent magnitude and use the mouse to select a display area for zooming in.

The zoom function is useful when depicting events such as eclipses or transits. Increasing the size of the sun to large scale lets you see the moon's shadow crossing it during an eclipse or Venus crossing in front of it in a transit. Planets are typically represented by their astronomical sign in the star displays; increasing the magnification lets them take on



Skyplot screen of the same sky. Contrast this with the similar view from Atari Planarium (above) to see the greater detail in Skyplot.

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Review Star Light, Star Bright

ments can be computed also, and the program is equally facile at generating star charts of the heavens from objects in space—ever wonder what the constellations would look like from Alpha Centauri?

Information on Halley's, Wilson's and Kohoutek comets is included so that they can be mapped and studied like planets or deep-space objects. One example simulation is for the 1908 approach of Halley's Comet past Earth. Movements of objects not specifically programmed into Skyplot, such as asteroids or other comets, can be computed and shown if information on the orbit characteristics is supplied. One such example is predefined in the program for the asteroid Ceres.

If You Have a Choice. . .

Although these two programs can do basically the same thing, there are a number of differences in implementation.

Atari Planetarium is better suited for the casual user and as an educational tool at the elementary through high school levels. It works with all ST models, has a superior interface (it can change setting parameters directly from the star chart display) and can lock the display to synchronize with passing time. My elementary school-age children were able to use the program easily and follow the examples in the manual to simulate solar eclipses and do other astronomical "experiments." My only real gripe is that Halley's comet is only included for the 1985-86 pass; this should be expanded to work over larger time periods.

On the other hand, serious hobbyists will want to use the advanced features found in Skyplot. Although the time window is much narrower, the range of observations is much broader (including star charts from the point of view of other worlds) with superior graphics, particularly at high magnification. The

drawbacks are the computer memory requirement and that the display cannot be synchronized to update with passing time. Animation can be done in a step-wise fashion or through a series of screen shots played back by an auxiliary program. This program also has educational value but is geared more toward the high school level. ■

Contributing Editor Jim Pierson-Perry is a research chemist and semiprofessional musician. He lives in Elkton, Maryland.

PRODUCTS MENTIONED

Atari Planetarium, \$39.95. Atari Corp., 1196 Barregas Avenue, Sunnyvale, CA 94086, (408) 745-2000.
CIRCLE 156 ON READER SERVICE CARD

Skyplot, \$99.95, Rabtek Ltd. (USA), 1983 San Luis Avenue, Suite 24 Mountain View, CA 94043, (415) 968-1345.
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Hard Disk Lore and First Aid Part III

by David Small

Once more into the breach. This issue, we'll look just a bit deeper into the ins and outs of disk handling.

GEMDOS and RWABS

When GEMDOS and the Atari ST were designed, it was decided that disk drive accesses of all kinds would go through one call, known as RWABS (pronounced, "rabs"). RWABS is short for "read-write absolute number of sectors." RWABS is thus a system subroutine available to any program for disk access.

When GEMDOS wants to read sectors in, it makes a call to RWABS; when it wants to write, it calls the same place. It's much like a GOSUB to a common routine that handles disk input and output.

Application programs, such as Flash, usually talk to the disk via GEMDOS because they're doing file-related things. Applications tell GEMDOS things like, "open this file and read 10,000 bytes from it." GEMDOS would handle the actual sector requests to do this (via the RWABS subroutine) and slice-and-dice the sectors into whatever is needed.

If you're using floppies, RWABS talks directly to the extended BIOS floppy handlers, FLOPRD and FLOPWR, to

```

; A not-complete, just-for-illustration-purposes RWABS Catcher.
; We grab all requests to drive C: and handle them ourselves.
;
;
;----- Grab RWABS. This is only done ONCE.
;
installrabs:
    move.l    rwballoc,saverwabs    ; save the old system RWABS pointer
    move.l    #myrwabs,rwballoc     ; install my RWABS hook into vector
    rts                                           ; all done.
;
;----- Run-time RWABS handler
; All rwbabs requests, this means, ANY floppy or hard disk or RAM disk
; requests, are forced to here:
;
myrwabs:
    move.w    6(a7),d0                ; get "device #" (drive letter) into d0
    cmp.w    #2,d0                   ; is it a request for drive 2? (C:?)
    bne      sysrwabs                ; nope, so go to system's rwbabs handler
;                                           ; that we saved when we installed this
;
mystuff:
    ;
    ; (code to handle the request myself)
    ;
    rts                                ; return to user after his r/q.
;
;----- Use old System RWABS hook
sysrwabs: move.l saverwabs,-(a7)     ; clever trick to jmp to
    rts                                ; contents of "saverwabs"

```

Figure 1. A RWABS interceptor might look like this.

handle the actual floppy work. You can find out more about FLOPRD and FLOPWR in the extended BIOS manual that is a part of the ST Developer's Kit. You'll also find the actual nit-picking RWABS parameters there (which is good, since I don't have room to cover them here).

A quick summary of the RWABS details is useful, however. To read sectors 50-89 off the first hard disk into location \$45678, you'd do:

```
rwabs (0,$00045678,40,50,2)
```

This means "Read 40 sectors, starting at number 50 (thus, 50-89), from ▶

device 2 (drive C:), into location \$45678."

How to Steal RWABS

Now, one handy thing about RWABS is that it may easily be "stolen." You direct the RWABS "hook" to your program and then intercept all RWABS requests; if you want to handle them, you do it directly. Those you don't want, you give back to the system by jumping to wherever the RWABS hook used to point.

Naturally, if you grab RWABS, you must do it with a terminate and stay resident program (TSR), which stays loaded in memory. (Otherwise, the next program you load will clear your program, leaving RWABS pointing into who-knows-what.) The classic example of this is a RAM disk; you set up your RAM disk driver to handle all requests to device #2 (drive C:), and pass any requests that aren't for #2 to the other RWABS drivers, say, floppy or hard disk.

If you write a RWABS interceptor, such as the example in Figure 1, then you are in control of all disk accesses on your machine—RAM disk, floppy disk, and hard disk. Thus, if a RWABS disk request is made for device #2, C:, the one we want to handle, we grab it away from the system and do it ourselves; if it's for the floppies (0-1) or hard disk (3-7), then we go back to the regular system RWABS handler and let the system worry about it.

Now, when your ST first starts up, it only knows about one sort of disk drive, the floppy disk. It doesn't really have much code in the onboard ROMs (programs prestored in the machine's chips) to worry about the hard disks or a RAM disk. The code from those must come from disk.

If you want to add a RAM disk, you must load that program from disk. You can either do it by hand, put it in the AUTO folder to be run automatically, or make it into a desk accessory which is loaded at startup time. All three options boil down to the same thing: they're

Any Program making any disk file request (open, read, write, close):

```

|
GEMDOS: Handles
all Disk "File" Requests (read/write/copy/delete/rename etc)
|
| RWABS call: all disk sector input-output requests
| Hard Disk RWABS handler: spliced into RWABS
| (handles some drive letters)
| RAM Disk RWABS handler: spliced into RWABS
| (typically handles one drive letter)
| System's very own floppy-only RWABS handler
| (handles A: / B: drives only)

```

Figure 2. This is a pretty broad overview of GEMDOS and RWABS.

programs loaded at system startup time that stay in the computer's memory as long as it's turned on. They all do the same thing: steal RWABS, direct it to your code first, then if your code doesn't want to handle the request, pass it back to the regular system floppy drivers. You can, therefore, daisy-chain many RWABS handlers (see Figure 2).

Hard Disks and RWABS

Now, what happens with the hard disk? How is it hooked into RWABS? Essentially, it's hooked in the same way as RAM disks.

The 1985 (first) pass of ST hard disks were "floppy bootable"; you couldn't start up—boot—directly from the hard disk. What you had instead was a floppy with an AUTO folder containing a "hard disk driver"; it was simply a RWABS handler. When run at startup from the AUTO folder, it would direct RWABS to a portion of itself and tell the ST to leave it in memory for good ("terminate and stay resident").

Then, if the TSR driver program saw an RWABS request it thought it should handle, it would do all sorts of things to the DMA controller chip to talk to the hard disk, send in the request, handle it, and return directly to the user without bothering the system RWABS any further.

This "hard disk driver" steals

RWABS away whenever it gets a request it thinks it ought to handle. On most ST hard disk systems, this means it kicks in for drive C: on up. If you've got a RAM disk installed as C:, then the hard disk handler worries about drives D: on up. The order that the RAM disk and hard disk installers are run will determine the drive letter.

How does the hard disk driver know which requests to handle? Or, translated into user-ese, to which drive letters does the hard disk respond? On start-up, the hard disk driver reads sector 0 of the hard disk, the partition sector. It finds out how many partitions there are and where on the hard disk they begin. Then, the hard disk driver remembers the following:

1. How many drive letters (devices) it has to handle. If we have four partitions, it knows to handle C:, D:, E: and F:. The handler is smart enough to ignore non-GEM (e.g., Magic Sac/Spectre) partitions; they are "skipped over" and no drive letter is assigned to them.
2. The offsets for each partition. For instance, assuming that the total number of sectors used by drives C:, D:, and E: total 30004, any RWABS request to drive F: has to have 30004 added to the "starting sector number" to offset it to the actual F: partition area of the hard disk. Thus, while you perhaps ask for

the tenth sector of drive F with your RWABS call, the hard disk driver returns you sector # (30004 + 10), or 30014.

If the hard disk driver cannot read the partition sector when it starts up (at system startup or any other time it is run), then it will not try to handle any hard disk requests ever. Even though the hard disk handler code might be installed in memory, it doesn't think a hard disk is connected and working, so it ignores all hard disk requests. This means you are doomed until you either reset the machine or re-run the hard disk handler with the hard disk working.

The Dread Power Strip Problem

The timing here is mighty important! Let's say you've plugged your hard disk and ST into a common power strip switch, which lots of people do. You then turn them both on with a single flick of the switch.

Your ST starts up instantly, but your hard disk does not. The hard disk has to spin up to 3,600 RPM, stabilize at that speed, move the head to track 0, and do all sorts of recalibration nonsense. A typical hard disk takes 10-30 seconds to get ready.

The ST will start up, briefly read the floppy disk, read in the hard disk driver from that floppy disk, and then try to read the hard disk's partition sector. (We're not covering autoboot yet). The hard drive will tell the ST that it isn't awake yet; the ST will get tired of waiting for it and report an error on reading the partition sector. The hard disk driver will then conclude that there's no hard disk hooked up and tell itself to ignore all hard disk requests. Thus, you'll have no access to the hard disk, which is embarrassing. (At this point, it's reset or cycle power time).

The hard disk *must* be spinning and ready before you power up the ST if you expect to read in the partition sector (and thus expect to be able to do anything to the hard disk).

An Added Layer Of Complexity: Some hard disk drive controllers (OK, OK, some Atari-only brand controllers) will "crash" if the ST is powered off.

This is because the ST "jiggles" the control lines to the hard disk as it is turning off and some hard disks can't handle that. The only way to fix this problem is to cycle the power to the hard disk.

This can lead to an incredibly irritating series of events:

1. You switch on both your ST and your hard disk.
2. Your ST can't instantly read the hard disk and reports "no hard disk connected." The hard disk eventually wakes up.
3. You then switch off your ST to cycle the power—to "try again."
4. Your hard disk locks up when the ST's power is cycled and goes to sleep for good.
5. Now you switch on your ST again; it still reports there's no hard disk connected, since now the hard disk has locked up.
6. You cycle your ST's power once again, but there's still no response.
7. (Usually) it's time for a call for help: "My hard disk is dead!"

For people with this type of hard disk, this means that any time you turn off your ST, you'll also have to turn off the hard disk, turn it back on and let it get up to speed and only then turn your ST back on. Whew!

Enough for now? Next month we'll be back for more! ■

David Small is the creator of the Magic Sac and Spectre 128 Macintosh emulators for the ST and a Contributing Editor of START Magazine.

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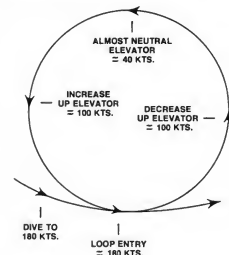
Flight notes

3B



✦ **Better Loops with Flight Simulator** - While several books have been written about aerobatic maneuvers with Flight Simulator, we get enough calls from frustrated computer pilots unable to perform a loop to warrant the following additional instructions. For those already successful at looping the aircraft, these instructions should help make your loops rounder and more satisfying.

After diving to the suggested looping airspeed (180 knots will do), add as much up elevator as possible without stalling the aircraft. As you pitch up and airspeed slows you will have to reduce some of this elevator pressure. Many people leave the elevator setting on high and become frustrated when the aircraft stalls before pointing straight up. In a perfectly round loop your elevator should be almost all the way back to neutral by the time you're upside down. Since airspeed is very slow at the top of the loop (and the portion of the circle traveled is small), your pitch attitude change should be gracefully slow as well. Start adding up elevator pressure again as airspeed increases. By the time you get to the bottom of the loop, the elevator setting should be where it was when you began the maneuver and your airspeed should be adequate to begin another loop.



In summary, up elevator setting varies throughout the loop. The faster your airspeed, the greater the up elevator pressure. Flight Simulator is the only simulation on the market that accurately portrays the flight characteristics of a light aircraft when performing this maneuver. In reality there's little room for error in the amount of up elevator you can use, and meeting the challenge of performing a perfectly round loop can be a very satisfying experience. You may even find yourself more knowledgeable about loops than many non-aerobatic pilots who fly real airplanes. Happy trails!

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Dah-Ditter

CQ CQ—are you interested in ham radio, but just don't think you can pass the Morse code test to get your license? Dab-Ditter was especially written to help the would-be ham pass the rigorous Morse code requirement. With Dab-Ditter and your ST you'll be on the air in no time! Runs on either color or monochrome systems.

by Sal Gutierrez

.....

 (Learn
 Morse code on your ST). File
 DAHDIT.ARC on your START disk!

Around the turn of the century, in the heyday of wire-line telegraphy, operators tapped out Morse-code messages on huge brass keys. If they banged the keys too hard, an extra dot or dash could garble the whole message being sent. As the story goes, operators who consistently transmitted garbled messages were derisively labeled as "hams," referring to their clumsy fingers.

The label stuck, but it quickly lost its original meaning as more and more amateurs embraced the new radio technology. Using mostly homemade gear, hams were the first to demonstrate the great possibilities of short radio waves, previously considered useless. Comparisons to today's computer hackers are inevitable.

If ham radio sounds interesting, there are a few things you should know before you get started. Amateur radio is strictly regulated by the Federal Communications Commission (FCC) and you must obtain a license from them before you can transmit *anything*.

To get a license, you have to pass an examination that tests your knowledge of radios, electronics, FCC regulations and Morse code. Amateur radio consists of five classes—Novice, Technician, General, Advanced and Extra-Class—and each class requires a separate exam. But the higher the class, the more frequencies are available to the ham.

Dah-Ditter and the Morse Code Requirement

Most would-be hams agree that the amateur radio license would be a lot easier to obtain without the stringent Morse code requirement. To advance through the classes, you must learn Morse at

speeds ranging from five words per minute for Novice and Technician, rising to 20 words per minute for Extra-Class. I developed Dah-Ditter specifically to teach the potential ham-radio operator Morse code. And even if you don't want to be a ham, you'll find the program's user interface friendly and straightforward.

There are many versions of Morse code, but Dah-Ditter teaches American Morse only. Check your local library for the different types of Morse code. To run the program, copy the files DAHDIT.ARC and ARCX.TTP onto a blank, formatted disk and un-ARC DAHDIT.ARC, following the Disk Instructions elsewhere in this issue. Double-click on DAHDIT.PRG. Dah-Ditter runs in either medium or high resolution.

Click by Click: The Drop-Down Menus
 When Dah-Ditter finishes booting, a DEGAS image of a ham station with

three message windows will appear on the screen with a menu bar above. The drop-down menus consist of Desk, File, Discourse, Traffic and Hamming. Click on Desk to get program and author info or to access any accessories from your Desktop.

Before you get heavily into the program, let's do a quick run-through to see what Dah-Ditter does. Under the File menu, click on Load Discourse. A file selector box will appear. Select the file INTRO.DIS. Now, under the Traffic menu, click on Receive Discourse. Following the "Get Ready!" prompt you'll hear a series of tones through your monitor speaker; if you don't hear them, you may have to adjust the volume. This is the Morse code "translation" of the text file you loaded. After the tones, the message will be printed on the screen in English. Press Return for another discourse or press Escape to explore other parts of Dah-Ditter.

The File Menu

A discourse is a message sent in Morse code. When you click on either Load Discourse or Save Discourse, a file selector box will appear. I've included some sample discourse files for you to load. Save all discourses with the extender .DIS.

The Discourse Menu

Click on Erase All to clear a discourse from the recording buffer. The buffer holds up to five messages. An alert box appears when the buffer is full.

The Build New option lets you type in any message you wish to hear in Morse code. Each message can be up to 60 characters long. After typing in your message, press Return. The message box will go blank and you can type in a new message if you wish. Press Escape to resume control with the mouse and capture the messages in the recording buffer.

Click on Edit Existing to change or correct any messages already in the

recording buffer. An alert box will appear if the buffer is empty. Press Return when you're finished editing, and press Escape to capture the message in the buffer.

The Traffic Menu

Select Receive Discourse to hear your message in Morse code. After the "Get Ready!" prompt, you'll hear the discourse transmitted at the word/character speed determined in the Set Parameters option. At the end of the reception the actual message will be displayed. When the buffer is empty, you'll see the words No More Traffic.

Random Groupings is like a test: 10 random five-character groups are transmitted at the speed selected in a range determined in the Set Parameters option. After reception, the characters actually received are displayed for comparison to what you copied.

Key Practice makes your mouse work something like the old paddle keys. Use the left mouse button for dots and the right mouse button for dashes. The character will appear on-screen as soon as you're finished tapping it out. Press Escape to end Key Practice.

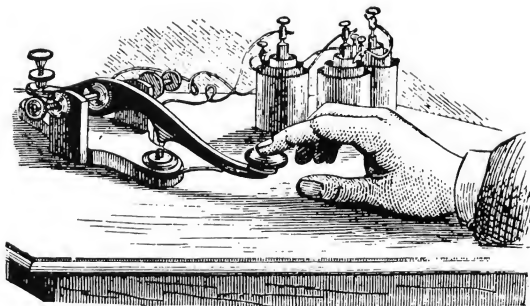
Roll Your Own

Click on Set Parameters to customize your drill by setting the speed of transmission, measured in words per minute. Under the heading Word Speed you can set the transmission speed for each word to between five words per minute and 25 words per minute. Under Character Speed you can set the transmission speed for each dot, dash and pause (each dash is three times the length of a dot or pause). Note that you must be in Customize mode to make use of any Character Speed setting.

On the Practice Input menu you can choose the type of character the computer will use in Random Groupings drills. You have a choice of Letters Only, Numbers Only, Symbols Only or a mixture of all three.

Under Code Output you can choose one of the two methods of learning Morse. Click on Pure Code to make all character and word speed equal. Pure Code is the way you'll be tested by the FCC. Click on Customize to set your own word and character speed.

Beneath the headings From and To you can set the range of letters/numbers/symbols that the com- ▶



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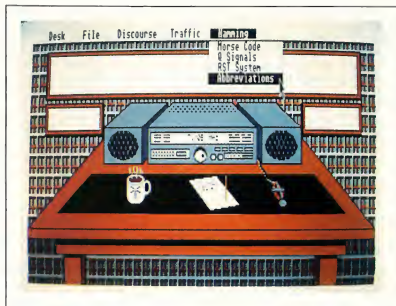
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Dah-Ditter

This DEGAS image of a ham radio station is the first thing you see when you boot up Dah-Ditter. From here you can access all the tools you'll need to learn Morse code and pass that part of the FCC requirement.



puter will use in Random Groupings drills.

Click on Abort to return all the parameters to their original settings or click on Done when you're finished setting your desired parameters.

Hamming It Up

Dah-Ditter wouldn't be complete without a library of basic ham terminology. More than just a specialized language, ham jargon was developed to make radio communication quicker and more efficient. The Hamming drop-down menu gives you access to several short lessons in Morse code and ham jargon. Each option is presented as a dialog box, accompanied by a short explanation of its use.

Click on Morse Code for a ready-reference chart that displays the American Morse code.

Q Signals are quick three-letter "words" that are used in place of often-used ham phrases. For example, if you want your contact to increase power you can simply tap out "QRO." Click on Q Signals to review the most commonly used of these signals.

Click on RST System to access signals that hams use to relay information about the quality of a contact's transmission. RST stands for Readability,

Strength and Tone. Each category is rated by a number system: Readability is rated from 1 (worst) to 5 (best); Strength and Tone are rated from 1 (worst) to 9 (best).

Tapping out a message in Morse code can often be tedious, particularly if you're new to the system. Click on Abbreviations for a list of the most commonly used words and phrases to streamline communications. For instance, you can tap out "CQ" instead of "Calling any station,"—very helpful knowledge in an emergency.

Wrap-up

With Dah-Ditter, it should be a breeze for anybody to pass the Morse code requirement for a ham radio license. All it takes is practice and the code will become second nature.

Ham radio is full of opportunities for computer enthusiasts who want to expand their horizons. Ham radio is also the realm of innovation and ingenuity for developing new concepts. So boot up, key up and get that license. And, by the way, 73's—that's ham code for "best regards." ■

Sal Gutierrez is a ham radio and computer enthusiast in Valdosta, Georgia. This is his first program published in START.

So You Wanna Make Music

by Rick Davies

From the moment electronics first entered the world of music production, producers and musicians have looked to technology to improve the quality of their music. Multitrack tape recording techniques revolutionized the way music was produced over the past 20-odd years and MIDI is the latest addition to the musician's and producer's bag of tricks.

MIDI and the ST

Anything you can imagine doing with a synthesizer by hand can probably be done via MIDI (Musical Instrument Digital Interface). For example, you can manually play middle C on a keyboard, adjust the volume knob to an agreeable level, and then release the key. On the other hand, if you want to do the same thing on another instrument at the far end of the room, but don't want to walk over and repeat your actions, you could connect the two instruments with a single MIDI cable and the results would be the same as if someone else were playing the other keyboard and mimicking your every move. It's a strange feeling, and it's addictive.

MIDI keyboards generally feature MIDI In, MIDI Out and sometimes MIDI Thru ports (yes, that's "Thru," not

"Through"). The MIDI ports are set up so that if you connected them incorrectly, nothing would blow up. For technophobes, this is reassuring because it means that you can experiment all you like without worrying about frying any components.

(Note: It is imperative that you use "MIDI spec" cables, especially if you own an Atari ST. Instead of having a MIDI Thru port, two unused pins from the ST's MIDI Out port are used as the

MIDI Thru port. But while this arrangement enables the ST to have a Thru port, it doesn't adhere to the official MIDI specification. If you accidentally use a cable with conductors wired to all five pins of the MIDI plug, your system might not function properly.)

Let's consider a very simple MIDI system consisting of an Atari ST and a single MIDI keyboard. Figure 1 shows how easy the basic connections are. The minimum requirements of the keyboard ▶

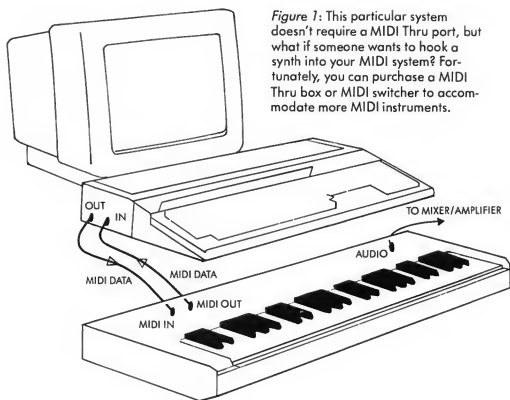


Figure 1: This particular system doesn't require a MIDI Thru port, but what if someone wants to hook a synth into your MIDI system? Fortunately, you can purchase a MIDI Thru box or MIDI switcher to accommodate more MIDI instruments.

are MIDI In and Out ports—sophisticated MIDI features are not essential. You can use an old second-hand synth (MIDI-equipped of course) that you might find in a pawn shop or garage sale, or you can use a brand new sampling keyboard. If it sounds good, use it. Let your budget be your guide.

Sequencing with the ST

There are dozens of versatile sequencer programs for the ST, and though they all differ in terms of sophistication, price and ease of use, the basic principles are the same.

A sequencer is the MIDI equivalent of a player piano, with a sequence corresponding to a piano roll. The difference is that a sequence is stored as MIDI data in computer memory, rather than as holes on a scroll of paper. A sequencer can record whatever you play on your keyboard, whereas a player piano requires specially-created scrolls for playback. Best of all, in a sequencing system, you're not restricted to piano sounds.

In the mid-'70s, sequencing became popular after such techno-pop bands as Tangerine Dream and Kraftwerk began experimenting with them. Sequencers were modules that fed a series of voltages into synthesizer modules to produce rhythmic sequences of notes.

When computers and MIDI entered the game, it became possible to fashion sequencer programs that were easy to understand and operate. Complete compositions could be recorded in several passes, part by part, by a single musician given the right combination of simulated instruments.

Sequencing programs let you record multiple parts on individual tracks, in several passes, one part at a time. Based on the basic MIDI system containing the components described above, a typical sequencing session would go something like this:

Start by recording the chord progression:

1. Select a track to record on.
2. Put the sequencer into record mode.
3. If the program can generate a metronome click, turn it on to keep a steady tempo.
4. Play the chord progression on the keyboard. For every note you play, the keyboard sends out MIDI data to the ST, which then records a list of the notes you played, when, how hard and how long they were played.
5. Stop recording.

Anything you do with a synthesizer by hand can probably be done via MIDI.

6. Play back the part you just recorded. The ST scans through the list of MIDI data it recorded, and sends the list (in MIDI form) via the MIDI Out port, and into the keyboard's MIDI input. The keyboard responds by playing back the chord progression.

While the chord progression plays back, you can play another part on the keyboard by hand. You can even try out a few bass lines on the keyboard until you come up with one to add to the existing sequence.

To overdub a bass line:

1. Make sure the chord progression track is enabled for playback.
2. Select an empty track for recording the bass line.
3. Put the ST into record mode.
4. As the sequencer plays the chord progression into the keyboard, play the bass line from the keyboard.
5. When you're finished overdubbing the bass line, stop recording and

play back the two tracks together. Now the ST is playing both the chord progression and bass line into the keyboard.

Almost every sequencer program has some way for you to follow each of these steps, and the controls may vary quite a bit. The main differences usually depend on the ways in which you can arrange the individual tracks for playback. These steps can be repeated as many times as you like, or as many times as the program allows. Sequencer programs usually provide between eight and 256 tracks.

So far, this process resembles tape recording. Unlike tape, however, raising the sequencer playback tempo speeds up the music but doesn't affect the pitch. This is because the sequence tempo merely determines the rate at which the lists of recorded notes are scanned through. The sounds themselves, which are produced by the keyboard, are not accelerated. For a similar reason, the sequencer has very limited control over the timbre of the keyboard.

If you were playing a piano patch on the keyboard while you recorded a sequence, but later changed over to a trumpet patch, you would hear the same notes as before, only this time they would be played by a trumpet rather than a piano. As you get more involved with sequencers, you discover how to control the sound selections for playback, as well as many other performance nuances, but we'll have to save that for a future article.

Saving Money with MIDI

One of the most popular ST MIDI applications is patch filing. (A patch is the definition of an instrumental sound.) Most keyboards contain between 32 and 1,000 sounds, but the number of sounds actually available can be far, far more. Arranging large numbers of sounds in a logical manner can be nearly impossible with some machines, but thanks to MIDI, the ST can shuffle

patches around with the graphic tools for which the ST has become so popular. Consider how much you might spend on RAM cartridges for one synthesizer: the advantages of spending \$50 to \$150 on a librarian program and some blank disks become quite clear. The software alternative may not fit in your shirt pocket like a RAM cart, but it's whole lot more flexible.

Another breed of program that complements Librarians is the patch editor. In the past five years, the trend among synthesizer manufacturers has been to cut costs by reducing front panel controls to a nearly absurd minimum. A patch editor program provides a "soft" front panel on the ST screen, so that you can examine any or all patch parameters at a glance and edit them with the mouse. As you add more MIDI instruments to your system, it becomes increasingly convenient to be able to access all patch parameters from one screen.

MIDI has worked its way into virtually every facet of music production, and though you may not be planning to do any heavy-duty production in your own home, the skills that you can develop with a small MIDI system will work to your advantage if you ever find yourself in the midst of a more complex system.

There's a lot more to MIDI than I've even hinted at in this article, but one basic thing that's common to all ST/MIDI applications is that the ST can act as MIDI co-pilot when you run out of hands to play or control your synthesizers. MIDI makes the Atari ST an open forum for anyone who has ever dreamed of creating music, but who has been unable to audition their ideas with live players. ■

A musician and MIDI consultant, Rick Davies is the former editor of Music Technology. He lives in the Santa Cruz mountains of California.

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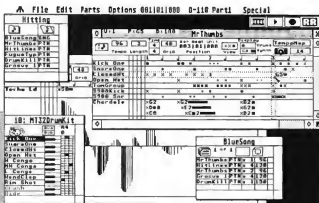
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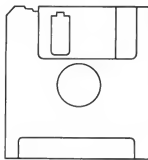
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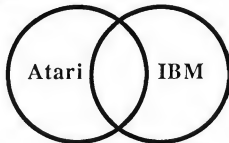
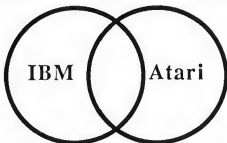
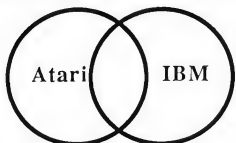
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ST:1999

by Neil Harris

Computers that understand the spoken word? Modems with baud rates above 64,000? Scanners that not only sense images but interpret them as well? Neil Harris, formerly Atari Computer's Director of Product Marketing, speculates where present computer technology will take us by the turn of the century—and beyond.

Outside the computer-using community, people have peculiar ideas about what computers are and what they can do. They picture computers as something out of science fiction, like HAL 9000, the brilliant but deranged system in *2001: A Space Odyssey*; or, more optimistically, the Enterprise computer in *Star Trek*.

I'm convinced that the computer industry is working toward the *Star Trek* concept of a computer—one that does what people think a computer ought to do: it listens to and understands the spoken word, obeys commands with unflinching dedication, accesses a seemingly infinite amount of information and controls real-world devices directly. This is the industry's ultimate goal, and one worth pursuing.

START offered me this opportunity to speculate on the direction home computers will take in the next decade. Not an easy task—who in 1979 would have guessed where we'd be now? Of course, I can't be 100 percent correct with my predictions but I do know that all the concepts discussed here are now under development. And given the ever-changing nature of the computer industry, some of these developments may be available sooner than anyone thinks.

Still the ST

The 1999 model of computer from Atari will still be called the ST, short for "16/32." But this signifies the number of processors, not the number of bits handled by a single processor: Thirty-two processor chips drive the input/output for speech recognition, simulated 3-D graphics and intelligent communications with other computers and computer-driven devices. The other 16 processors handle the internal computing tasks. Does this seem like a lot? Remember when people thought 64K of RAM was more than enough?

Processor chips are the brains inside computers. Every year they get faster, and innovations like RISC (Reduced Instruction Set Computer) architecture seem likely to continue this trend indefinitely.

Then the laws of physics intrude.

We are rapidly approaching the limit of how closely we can pack the electron channels inside a processor chip. If the chips shrink much more than current technology, thus packing these channels even more closely, the electrons will "jump the tracks" from circuit to circuit and the chips will be useless.

Another significant problem is the bottleneck between a processor and its memory. The "bus bandwidth," the speed at which data moves between the processor and RAM, is a serious limit to system performance. If the bus is not



KEVIN KHIN

fast enough the processor has to wait until the data arrives (known as a wait state). The efficient use of on-chip registers and memory cache can reduce this waiting time, but not infinitely.

Parallel processing can effectively bypass the present limits in both processor speed and bus bandwidth. Tasks are divided among several processors with separate memory for each, so that there can be multiple memory accesses at the same time.

By processing in parallel, computers can think very much like humans. You and I share the luxury of having minds that can process and control many bits of information simultaneously. Even with multi-tasking, however, today's computers can still do only one thing at a time. Such a quantum leap in processor power as is afforded by parallel processing will have dramatic effects on the capabilities of future systems.

Future Sights and Sounds: Simulations Systems

Computer animation is limited by the power of the processor. As video resolution improves, much more "horsepower" will be needed to make things happen on the screen. Custom chips can help with some kinds of operations but not for the most complex and interesting ones.

Tomorrow's computer will simulate all sorts of real-world sights and sounds. Imagine your monitor displaying the image of a person speaking perfect English, with lips precisely synchronized to the spoken words and all other motions amazingly realistic. It's not a far-fetched notion and it could happen soon.

But more important than talking (since today's computers can do that already even though they tend to sound like Irish-Martian hybrids), computers will understand spoken commands. ▶

What percentage of the population is really comfortable with a typewriter-style keyboard? The term user-friendly will take on a whole new meaning.

Quickened Communications

Electronic mail is one of the most appealing features in telecomputing. I can send you a letter and you'll receive it a moment later. But there's a catch: you have to be online with a service like CompuServe or GENie to collect your mail. If you're there when I send it, you get it then. If not, you get it when you decide to look. Clearly a system needs to be developed that will deliver your electronic mail regardless of whether or not you're present to receive it.

The answer is in the works in the form of the Integrated Services Digital Network (ISDN). The telephone companies have already begun to change over from their existing analog lines and switches to ISDN. Large corporations are also making the change and within the next 10 years you'll have ISDN service right in your home.

ISDN is an ideal answer to the telecommunications problem because it lets voice and digital data share the same lines—yet remain independent of each other. A typical modem operates at 1200 or 2400 baud. More costly models can handle 9600 and up to 19,200 baud. ISDN gives you a high-speed, 64,000-baud line along with a voice line and a slow-data line (equivalent to present modem speeds).

ISDN will break down the barriers between computers. At 64 kilobaud you'll be able to do things you can only dream of today, such as seeing real-time graphics between computers. And you won't have to go online with a bulletin board to collect your mail because ISDN hooks directly to your system, just like your present telephone line.

Databases: Dateline 1999

New storage devices available in the next few years will give us near-instant

I'm convinced that the computer industry is working toward the *Star Trek* concept of a computer.

access to huge volumes of data. Atari's CD-ROM, for instance, presently holds about 550 million bytes of information but it is likely that storage densities and access speeds will greatly improve in the next decade. Combine this with the kind of fast access to *outside* information that ISDN provides and the dream of a superintelligent computer becomes all the more real. What is not in your computer will be found in someone else's.

Of course, problems arise with this proliferation of information. Masses of data must be organized in order to extract meaning from it. Enter hypertext, a software technology now in its infancy. Hypertext is a way to build links between pieces of textual information. The data you use doesn't even have to reside inside your system—a hypertext link can point anywhere. This is a very efficient way to organize data on CD-ROM disks and it is absolutely essential as a means to organize information residing elsewhere on a network.

Data Entry Made Tolerable

One reason office computer systems are more common today than home computer systems is that businesses can hire people to handle the day-to-day chore of data input. Not so at home. My personal financial records are not on my computer because I refuse to type in all that information. I need technology to do this job for me.

Imagine an intelligent scanner, one

that not only senses an image but interprets it as well. Entering your check-book transactions into the system will be as simple as feeding paper into a photocopier is today. The scanner reads the data and your computer is smart enough to know what to do with it. In fact, this same device will also serve as a laser printer, copier and fax machine. Of all the predictions made in this article, this is the one which is likely to happen at the earliest time—the necessary technology is already available on the hardware side and is developing fast on the software side.

Home Computing Beyond The Year 2000

In the twenty-first century, the ST will listen as well as speak, read as well as write, send and receive information without close supervision and even reason, after a fashion. This is a tall order for today's engineers but clearly foreseeable using present and emerging technologies. That computer from *Star Trek* is not far from the home.

And beyond that? Drawing from science fiction as well as computer science, there are many possibilities. Imagine, as cyberpunk novelist William Gibson does, a world in which you just don't navigate through computer networks, you experience them as multi-sensory data as well. Imagine even further cellular computers evolving from DNA research or "biological modems" that can transmit data directly to the brain.

If it all sounds too far-fetched, remember: So was that computer on your desk not too long ago. ■

For several years, Neil Harris was the acknowledged "voice" of Atari Computers. His most recent position with Atari was Director of Product Marketing. In September 1988, however, he resigned from Atari to take the position of Manager, Product Marketing with General Electric Information Services (GENie) in Rockville, Maryland.

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THIS MONTH ON YOUR START DISK

This issue, take a look at some specific applications that show off your ST's computing power while stepping outside the mainstream of ST software.

Dah-Ditter, by Sal Gutierrez, will give you a boost if you're trying to learn Morse code. Even if you're not an amateur radio hobbyist, you'll find it challenging to study this form of communication. You might pick up some interesting trivia about the world of ham radio. File DAHDIT.ARC; runs in medium or high resolution.

VCR Organizer, by James Maki, helps you put your finger on exactly the movie you want to see. Not only will it print out labels for your tapes, it will cross-reference your film library by tape and movie so you'll always know exactly where to find the movie you need. File VCR_ORG.ARC; runs in medium or high resolution.

If you are into **Cyber Special Effects**, check out file CYBERCN.ARC. Jon Bell's spaceship animation in Cyber Corner this month is based on the low resolution DEGAS Elite picture in this file.

Moon Calendar, by Jeff Adkins, is a different kind of scientific application. Show on the screen or print out a monthly calendar of the phases of the moon—and plan those moonlit romantic evenings more accurately. File MOON.ARC; runs in medium or high resolution.

Finally, **START** takes a humorous look at "Artificial Stupidity". We feature two chess games this issue. Greg Knauss' **Killer Chess** lets you and a friend play a cutthroat game to see who can steal the other's king first—without taking turns! Jim Kent turns the tables slightly with his chess variant, **Kamikaze Chess**, in which the object of the game is to lose all your pieces. Files KILLER.ARC and KAMIKAZE.ARC; both games run in low or medium resolution. ■

NO START DISK?

START is a magazine with disk; if you bought the non-disk version then you're missing out on a dynamite disk that has two utilities, an exciting game, a collection of macros, a great educational program and—as an unbelievable bonus—GFA BASIC ver 2.0: a \$5995 value! Call toll-free (800) 234-7001 for your START disk or use the bound-in order form elsewhere in this issue. Only \$10.95! ■

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% of the total size of the original files.

In addition to the archive files, you'll find the program ARCXTTP, 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.

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."

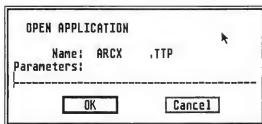
Now, put your START Backup disk in Drive A of your computer and double-click on the Drive A icon to see the disk's contents.

Un-ARCing the Files

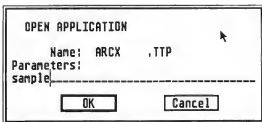
To use START's compressed disk files, please follow these steps:

1. Copy the ARCEd file you wish to use and the program ARCXTTP 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 and press the Escape key on your ST to see the disk directory. Double-click on ARCXTTP. The following dialog box will appear:



3. Type in the name of the ARC file you just copied over to your Un-ARC disk as shown in the example below and press Return. You do *not* have to type in the extender .ARC.



(Note: If ARCXTTP 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.)

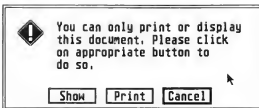
4. As the program runs, it will display the names of the individual files as it extracts them, similar to the example below.

```
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 ARCXTTP 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.

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 this 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) as shown in the example below.



Moon Calendar

by Jeff Adkins

Predict the next full moon with your ST! File MOON.ARC on your START disk.

The moon has always held a certain fascination for me. As a child gazing up at a full moon, I wondered if it really was made of cheese. And if I squinted hard enough, I swore I could see the mythical man overlooking his lunar domain.

As I grew older, my fascination with the moon only increased. Certain myths were shattered to be replaced by questions. Astronomy became a hobby I embraced with marked enthusiasm. Observing the moon is great fun, and that's why I developed Moon Calendar for the ST. With Moon Calendar you can generate a chart of the various phases of the moon for any year from 1985 on. The program was written in GFA BASIC 2.0 and runs in either medium or high resolution.

Running Moon Calendar

To run Moon Calendar, copy the files MOON.ARC and ARCKTTP onto a blank, formatted disk. Un-ARC MOON.ARC following the Disk Instructions elsewhere in this issue. Double-

Observing the moon has been one of humankind's most enduring passions. START helps you continue this tradition with its Moon Calendar, a simple but educational program that actually charts the various phases of the moon for any given year. Moon Calendar can run in either medium or high resolution.

click on MOON.PRG to start the program.

The first thing you see after starting the program is a text screen that asks you to type in a year (1985 or later). After you've typed in the desired year

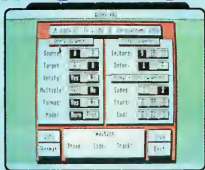
press Return.

The program will then automatically calculate the phases of the moon on each day of your chosen year. A frame will appear on the screen and then MOON.PRG will draw the moon's

Moon Calendar charts the phases of the moon for any year from 1985 on. Among its predictions for 1989: a new moon on Independence Day, Halloween and Christmas.



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Moon Calendar

phases. Note that for monochrome monitors MOON.PI3 must be in the same directory; for color monitors MOON.PI2 must be in the same directory. Easy!

Click on Print to do a screen dump of the image to your printer. Make sure your printer is turned on and ready. To compute the phases of a different year, click on New Year. Click on Quit to exit the program.

How the Calendar Calculates the Moon's Phases

The moon's phase-cycle (from full to new) occurs over a period of about 29-1/2 days. Moon Calendar starts from a set phase and time, in this case the new moon that occurred on December 31, 1984. It then adds the number of hours from that time to the year you selected. The phase for each day of the year is then determined by dividing the number of hours since the base phase (December 31, 1984) by the number of hours in a cycle of phases (calculated by multiplying 29-1/2 days by 24 hours in a day). The result is what you see on the screen.

Note: Moon Calendar calculates the moon's orbit as a circle; it is actually an ellipse. As a result, some deviation in phases may occur for dates beyond the year 2000. To do a quick fix, simply establish a new benchmark year every decade following the instructions contained in the REM statements.

Moon Calendar is a simple program that saves all you budding astronomers the time and energy it takes to dig through almanacs and complex charts just to find out when the next full moon will occur. Werewolves will find it especially helpful in planning their schedules for the coming years. ■

Jeff Adkins teaches high school astronomy and physics in Lexington, Kentucky. This is his first published program in START.

ATW, STOS and More

by Andre Willey

The annual Personal Computer Show is the largest and most important event on our home and small-business computer calendar here in England. This year, all the major U.K. and European manufacturers attended the show, held from September 14 to 18 at the Earl's Court exhibition center in London. True to form, Atari had the largest stand.

Perhaps "stand" is an understatement, *village* more aptly describes the 6,900-square-foot area enclosed by three huge canopies emblazoned with the Atari logo. As in previous years, Atari used part of its stand to show off its own British and American products and leased the remainder to various manufacturers and retailers of third-party software and hardware.

Atari's Transputer Workstation

Atari showed the latest Abaq hardware, which has been renamed the Atari Transputer Workstation (ATW)—apparently due to complaints from a Belgian company that already owns the name Abaq.

The ATW looks startling and seems bent on shaking the number-crunching and graphics markets to their foundations. Already British television companies have shown great interest in using



Atari's booth of the Personal Computer Show in London. On the shelf in the center is the new Atari Transputer Workstation (ATW).

the ATW for broadcast graphics. And the ATW's multi-transputer environment could make any workstation almost as powerful as a Cray.

The ATW is now available to software developers in very limited quantities (about 50 units worldwide—is that limited enough?). At the moment, most of these are located in and around Europe. Perihelion of Cambridge, England developed the machine and the Helios operating system software for

Atari. Perihelion hopes that Helios will become a standard for such multitasking transputer environments.

Housed in a plain gray and black box and connected to a Mega via the DMA port, the final ATW system will consist of a smart IBM-style casing, including a 3.5-inch disk drive, an external keyboard and a high-resolution color monitor. The user interface is very similar to the ST and all ST software will be compatible. The ATW will sell for a ▶

cool £3,000 to £4,000 (approximately \$5,250 to \$7,000) in the U.K.

The ATW's main processor is the Immos T800-20 transputer (the 68000 is really used only as an I/O device). Contained in a single package is a very powerful CPU that includes fast data and bit-graphic movement commands, four kilobytes of on-board high-speed RAM and a 64-bit floating-point math co-processor.

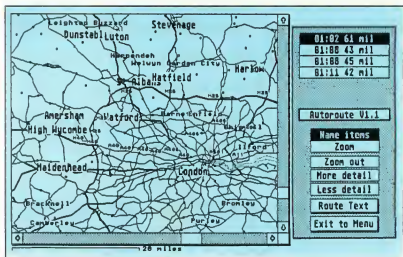
The T800 transputer has three significant advantages over processor chips like the 68000 used in an ST. First, since there are fewer fundamental instructions, the chip can operate the refined set much faster. Second, the inclusion of local RAM and the math co-processor allows the T800 to do most of its work without resorting to much slower bus communications with the outside world. Third, and perhaps most important, the T800 has been designed to communicate with other T800s via a high-speed 32-bit bus—enabling many transputers to work together to give almost unlimited potential speed. The ATW will be shipped with a single 20MHz T800 processor, but with sockets for another three.

But Can It Bounce the Ball?

It would seem that one essential item has been omitted from the ATW specification sheets, perhaps the most important piece of information you'll need before you purchase such an advanced piece of hardware. The processor speed, perhaps? Or maybe the memory capacity? Or what about the programming environment? No, something much more important: just how fast can the inevitable bouncing ball cavort around a high-resolution graphics display?

Any computer worth its salt, it seems, must be able to rotate and bounce a colored soccer ball around the screen to prove its worth. Of course, it takes all sorts to make a galaxy and as one youthful Amiga/ST programmer

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said, "I can make that sort of demo run much faster using machine code, you know." Yes, we knew—but then not only was the transputer working in color resolutions that the ST can only dream of, but if it were really let off its leash, the ball would probably move too fast for anyone to see.

Back to the Show

Meanwhile, other exciting things were happening at the PC show. STOS, Mandarin Software's new ST BASIC interpreter developed by Jawx International of Paris, was prominently displayed. Not only is this a full-featured and very fast implementation of BASIC, but it also has a whole range of high-speed graphics and sound routines. These include multicolor sprite definition and movement, music composition and playback and automatic pixel scrolling in any direction. All of this makes STOS the ideal language for would-be game programmers. The price hovers around a meager \$59.95. (Editor's note: STOS is currently available from Antic Software.)

The German company DMC showed yet another early version of its Calamus desktop publishing package, which looks very impressive indeed. Finally, someone is giving the ST DTP software to match the likes of Ventura and Aldus PageMaker. As of this writing, Calamus is slated for a late October 1988 release. Tentative U.S. prices are \$299.95 for Calamus and \$449.95 for Calamus Plus.

Calamus was among the many products demonstrated on the plethora of large Megavision screen monitors. These are monochrome monitors that apparently work by revectoring GEM output to an interface plugged into the cartridge or DMA port that gives you a fully functional 19-inch GEM screen with about four times the workable area of a normal monochrome monitor. Its software provides such special features as the ability to use the normal ST display with the large screen, either as a zoom window or running another program. Any GEM programs that behave themselves should work with these display systems, but it's always best to check that any necessary applications run correctly.

And speaking of monitors, Cardiff-based Eagle Business Computers previewed their interesting touch-controlled screen modification. This \$700 add-on fits over your standard monitor to let you control the mouse by pointing at the screen with your finger. All GEM functions are implemented. The system works using a resistive film basis, but the covering is so thin and transparent that you could easily mistake it for an anti-glare filter.

Mapping with Atari

British company NextBase showed its innovative new Autoroute map-and-route planning software. It provides a complete map of the UK, with all

towns, villages and major roadways listed. For example, if you want to travel from London to Liverpool, simply give the ST the two locations and let it do the work. Autoroute takes into account your preferences for major, minor or motorway driving, type of vehicle, places to visit en route and so forth. It can even give you the fastest or most economical routes as well as the total distance and estimated journey time. Autoroute presently only covers the UK but NextBase hopes to release European and American versions in the near future. Unless you travel a lot, you might find the price tag of \$260 a bit excessive.

And That's a Wrap

There just isn't enough space to cover everything at the great PC Show. Suffice it to say that there were plenty of colorful, noisy new games to choose from, plus some great new applications software including a very advanced Optical Character Recognition package and fiber-optic networking system that supports up to 26 linked STs. I'd say the show was a success.

On a closing note: I recently had the pleasure of attending one of Jean-Michel Jarre's amazing music and light extravaganzas, performed against the moody atmospheric backdrop of London's docklands. Glancing through the souvenir program I was pleased to note that even the great man of synthetic music himself is now using the ST during his performances, supplied by Atari France—who else? ■

Andre Willey is the Technical Editor for Atari User, the United Kingdom's leading publication devoted to Atari computers.

GFA BASIC 2.0: THE MANUAL!

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Clipboard

Compiled by Heidi Brumbaugh

Virus Update

In Special Issue Number Four of START, the Clipboard ran an item on how to protect your computer and disks against viruses. At that time, we knew of no confirmed viruses on the ST; since then we have seen an ST virus. Because viruses are a serious threat to Atari owners, we recommend you obtain a copy of the public domain program Virus Killer (VKiller) by George Woodside and use it to check all of your disks for viruses. VKiller will give you the option to stamp out any virus it finds.

If you don't have access to the online services, try your local user's group or a public domain disk distributor. Read the instructions and warnings carefully; misuse of this program can be dangerous.

Coincidence or Clever Planning?

If you look on any ASCII chart, you can see that the upper case characters and the lower case characters are 32 characters apart ($ASC('a') - ASC('A') = 32$). On further consulting the chart, you'll see that the space character has an ASCII value of 32. Coincidence? Not at all.

The binary value of 32 is 00100000. The binary value of A is 01000001; a is 01100001. To swap these two values, all you need to do is flip one bit. A GFA BASIC function to do this is:

```
DefFn Swap$(A$)=Chr$(32 Xor  
Asc(A$))
```

```
Call this function using Fn:  
A$=Fn Swap$(A$)
```

Similarly, assign the expression Chr(32 Or Asc(A$))$ to a function to convert a letter to lower case regardless of whether it was upper or lower case to

begin with. XOR the result with 32 to convert the character to upper case.

Where does the special value of the space come in? This is so you can perform a logical OR on a space without changing its value, useful when you are manipulating a string of words separated by spaces.

Backups in a Flash

If you have two hard drives and have access to a second ST, here's a quick way to transfer files between the two: Connect the two computers using a null modem cable and boot up Flash on both machines. Set each computer to the highest possible baud rate (19200). Set the same drive and directory path on both STs, and then use Flash's Ymodem batch transfer set to ".*". This will automatically transfer all contents of the folder on the computer set to "send" to the same folder on the computer set to "receive." Note: This will only work on version 1.6 of Flash; if you aren't sure how to access the Ymodem batch transfer option, read the disk-based documentation.

This makes it easy to use a second drive as a backup without having to go through any tedious (and time-consuming) floppy disk swaps.

Gamester Hints: "Virus" by Rainbird

Here's a tip on the new game Virus by Rainbird, thanks to Wolf Grifley in Antic's customer service department. When you're seeking the Cedar Ships, try reconfiguring the controls for "natural feel" at the beginning of the game. Also, look for your target using both sound and sight.

Give it some Slack

If your printer's tractor feed is jamming up after two or three pages, try tightening the left tractor wheel but leaving the right tractor wheel loose.

DEGAS on Megas

START recently received a phone call from a reader complaining that his new copy of DEGAS Elite wouldn't work on his Mega 4. He said when he called Electronic Arts they told him that they knew about the problem but weren't planning on publishing an update.

This phone call surprised us, primarily because DEGAS works on START's Mega 4 without a hitch. What we discovered, however, was that DEGAS will lock up when you run it if there are too many GDOS fonts installed. Try booting the computer without GDOS (rename it to GDOS.PR_ in the AUTO folder) and then make sure DEGAS works. Try GDOS again, this time editing the ASSIGN.SYS file down until it's small enough for DEGAS to run.

Desktop Cleanup

You can open a window on the Desktop to a nested directory, or folder, many levels down. Clicking on the close box in the upper left corner of the window or clicking on Close under the File menu will bring you to the next level up in the directory. However, to close the window completely without clicking through any number of directories, simply click on Close Window under the File menu. ■

Got an ST trick or tip to share? Send it to Clipboard, START Magazine, 544 Second St., San Francisco, CA 94107.

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Special Effects, Part I

by Jon A. Bell

Create your own stellar apocalypse! File CYBERCNR.ARC on your START disk!

I've been interested in special effects (FX) ever since I was a little kid. After years of experimentation in high school, I've continued to pursue my interest in FX—building models, doing still photography and studying how film FX are done. And with the Cyber family of software, I can recreate Hollywood-style FX on my ST, all from the comfort of my computer chair. You can too.

This is the first of three columns about how to use your ST to imitate or re-create cinematic special effects. All you'll need is your ST, this issue's START disk and Cyber Paint 1.0 or 2.0 from Antic Software.

Opticals and Rotoscoping

In film industry parlance, an "optical" (technically) is any FX shot that requires an optical printer. This device enables filmmakers to combine various pieces of film (*elements*) into a single composite. A spaceship battle from *Return of the Jedi*, for instance, might contain dozens of different elements—spaceships flying, planets, moons; a moving, swirling starfield for a background and a frosting of laser beams and engine glows.



This image is of the Narcissus shuttlecraft from the movies *Alien* and *Aliens*. We'll use this image as the basis for our special effects sequence, using Cyber Paint 1.0 or 2.0 to create the animation.

However, opticals typically connote *effects animation*. Animation effects include lightning bolts, laser beams and *Star Trek's* famous transporter.

Effects animation is created in much the same way as cartoon animation: a series of line drawings is made on transparent acetate cels, one for each frame of film. For a sequence of, say, an alien getting zapped by a laser beam, the footage of the actor portraying the alien will first be projected onto an animation stand. An effects animator will then draw *over* the sequence, using pencil or pen on tracing paper. On one sheet of paper, the animator will draw the laser beam reaching out to hit the

alien. When finished, the animator will advance the film to the next frame, replace the paper with a clean sheet, and draw another image, slightly different from the first. When the sequence is complete, he or she might add to the effect by drawing waves of energy washing over the alien after the beam has hit.

After the drawings are finished, other optical personnel shoot film negatives of the artwork. The negatives are placed onto another animation stand, backlit with colored gels and diffusion filters and then rephotographed. This element is then combined in the optical printer with the original footage of the alien and the FX sequence is finished. This pro- ▶

cess of tracing over live-action footage is called *rotoscoping*.

This issue, we're going to begin our own optical sequence.

Getting Started

For the effects we're going to do, you'll need a copy of Cyber Paint, either version 1.0 or 2.0. We'll load a DEGAS picture into Cyber Paint and then create a sequence of a photon torpedo hitting the prow of a spaceship with waves of energy wafting across it.

On this issue's START disk you'll find a 16-color DEGAS picture called SPACESHPPI1 in the file CYBERCNR.ARC. It's shown in *Figure 1*. The image is of the Narcissus shuttlecraft featured in *Alien* and *Aliens*, which I copied from an FX photo. Tom Hudson's Antialiaser accessory helped me create the background. (This picture also served as the basis for the demo for START's Audio Video Sequencer in the November 1988 issue.)

Let's get started. First, un-ARC the file CYBERCNR.ARC following the Disk Instructions elsewhere in this issue, then boot up Cyber Paint and load SPACESHPPI1. The picture will appear as frame one. Clip it by pressing the Tab key to store it in the Clip buffer, then press the Return key twice to copy the frame 20 times. Now you'll have 21 frames of the same image to work with.

Okay, now let's blow up the Narcissus.

Photon Torpedoes, Away!

Remember the opening of *Star Trek: The Motion Picture*, when the Klingon ships fire photon torpedoes into the Vger space cloud? The Apogee effects company created the torpedoes by mounting a chunk of crystal on a rotating lucite rod. By firing a laser up through the rod and filming it in a smoke-filled room, the FX men created a sparkling ball of energy with shafts of light spinning from it.

We're going to create a similar effect

You can recreate Hollywood-style FX on your ST.

in Cyber Paint. What we'll do is have a photon torpedo enter the frame from the lower left and hit the front of our ship.

Go over to the Color menu and select white (color 16) from the Color Palette. Move to the Modes menu, select Concentric, then select Lines from the Draw menu. This will give us the proper setting for our photon torpedoes.

Now, go to frame 2 (keep a clean frame at the beginning of the sequence) and place the cursor in the bottom-left corner of your screen. Hold down the left mouse button and draw, moving the cursor in and out in a circular sweep. It should look something like *Figure 2*.

Move to frame 3 and draw another torpedo to the right and up from the previous one, following an imaginary line from the "foreground" to the ship's bow "in the distance." Repeat this for the next four frames until the torpedo actually hits the ship. When you're finished, play the sequence a few times. It's interesting, but it needs more impact (pun intended).

For impact, we'll do a "nuke" effect. Go up to the Draw menu and select Circle. On the frame following the one where the torp touches the ship, place the mouse cursor where the torp hit in the previous frame and draw a solid white circle, about an inch in diameter. (Make sure Filled is highlighted in the Modes menu.) Go to the next frame and draw a three-inch-diameter circle and a five-inch circle on the frame after that. If

you play the sequence now, it should look pretty neat—a ball of energy impacting on the front of a spaceship.

But we want something that will really jolt you. Make sure you're in To Frame mode (an F should show in the far right bottom of the menu bar) and go to the frame after the five-inch ball of light. Clear that frame—make it black. Go to the next frame, and fill that frame completely with white. Now play the sequence. Startling, isn't it? The black frame lulls your eyes for a split-second, making the white flash even more dramatic.

Until Next Issue

We'll look at ways to visually enhance the impact of our torpedo on the Narcissus, but one final note: always take into consideration the physical conditions present within your sequence. In our nuke sequence, the Narcissus is obviously being illuminated by a harsh single light source off to its right. What should happen to the ship as a (presumably) brilliant ball of light approaches and hits it? Shouldn't that side of the ship start to brighten as the photon torpedo approaches?

I'll leave this graphics problem for you to solve. Next column, we'll talk about rotoscoping, miscellaneous lighting effects, Cyber Paint 2.0's Pixel FX menu and one of my favorite topics: traveling mattes and how to use them. ■

Jon Bell is the Editor of Oracle Magazine, but has long been a part of the ST community. Most recently, Jon was the Associate Editor of START.

PRODUCTS MENTIONED

The Antialiaser, \$19.95 plus \$2 shipping and handling. Tom Hudson, P.O. Box 3374, Shawnee-Mission, KS 66203.

Cyber Paint 2.0, \$79.95. Antic Software, 544 Second St., San Francisco, CA 94107. (800) 234-7001.

Dirty Dancing On The ST

by Mard Naman

One of the most memorable scenes in the film *Dirty Dancing* is also one of the most mesmerizing. On a hot summer night, Baby, a rich and naive guest at a mountain resort, wanders through the door of the employees' recreation hall and is stopped short. There before her is a room full of "dirty" dancers. It's the most sexually explicit dancing she's ever witnessed and she is both embarrassed and captivated by it. But by the end of the scene, Baby has joined in herself.

The key to the success of this scene is the music. The song that's playing is the classic *Do You Love Me*, recorded in 1962 by the Contours. No one back then could have possibly imagined it would be reincarnated with such success 25 years later.

The *Dirty Dancing* film and soundtrack were the sleeper hits of 1987. Even as late as the spring of 1988, the *Dirty Dancing* soundtrack continued to bump off its competition, including new releases by Bruce Springsteen and Michael Jackson. At one point, the original soundtrack album and the follow-up, *More Dirty Dancing*, were first and third on Billboard's Top 100. *Do You Love Me?* appears on *More Dirty Dancing* and sold over 300,000 copies as a single.



Patrick Swayze and Jennifer Grey in a scene from *Dirty Dancing*. Photo supplied by Vestron Pictures.

ST to the Rescue

The Atari ST's MIDI capabilities played a pivotal role in giving *Do You Love Me?* new life in the 1980s. When the producers wanted to release the song as an extended-play dance single, they were faced with a vexing problem: How do you stretch a 2½ minute song to six minutes? Berry Gordy, Motown founder and the song's author, turned to record-

producer and remix-wiz Brian Tankersley for the answer.

"This was originally a three-track recording," says Tankersley. "They [the producers of the film] wanted six minutes, but a three-track is difficult to stretch. Track One has everything, Track Two has guitars, hand claps and vocals. Track Three is the lead vocal. (Since) the drums, bass, voice, piano—everything—▶

is on Track One, you can't do edits."

Enter the ST. "Using my Atari ST and Hybrid Arts' SMPTE Track, I made a tempo map of the song. The Contours were definitely rushing and dragging, no doubt about it. They had about a 6-7 beat per minute variation over the course of the tune. It was "Hi-ho Silver away!" for the chorus and slam on the brakes for the verse!" laughs Tankersley. (Editor's Note: *Jamie Krutz reviewed SMPTE Track in the October 1988 issue of START.*)

But the ST was up to the task of mapping these extreme tempo changes. "I got it so tight that it would quantize," says Tankersley, "and just took off from there." He redid the drums, bass, keyboards and percussion. "Using samplers, triggering drums, I tried to stay true to the original sound to a degree, but have it fit more into an '80s dance groove at the same time."

Tankersley says his ST made the job possible. "If I was going to brag, I'd say I don't think anything but an ST with SMPTE Track would have done the job. I really don't. I was able to duplicate those tempo changes completely. I had 40 tempo changes in 2½ minutes, and had to use fractional tempos (fractions of beats), some of them radical and some mild. Not once in the two days in the studio did the ST fail to nail it and lock exactly, perfectly, the first time every time, even calculating all those tempo changes."

Adds Tankersley with genuine admiration for his ST, "Any other system would have taken a lot more time to lock up and would have done it a lot less accurately. I've never seen anything but the ST with SMPTE that always locks when you hit Play on the tape deck. You hit Play, it locks and it's tight."

No Gimmicks Please

Tankersley could have sampled the vocals and flown them in, but he chose not to do that. "Manipulating the vocals

**"I'm one of a new
breed of musicians—
I play the
computer."**

with samplers can get a little gimmicky," he explained. "Besides, I felt the Contours were singing better than people sing today—those vocal performances were done when people had to sing great all the way through the song. I didn't want to mess with the vocals and get gimmicky. I didn't want to be known as the guy who screwed up a great song."

No one would accuse him of that. Rather, he found the best of both worlds: the great vocals came straight from the 1960s, while MIDI brought the instrumental sounds into the 1980s, all the while remaining true to the original feel of the song.

Tankersley specializes in LP production of dance and groove-oriented pop music. He has worked with artists like Motown greats Smokey Robinson and The Temptations. "I do a lot of R & B, a lot of groove-oriented stuff where timing is important; timing is everything," says Tankersley. "Only the ST nails it every time."

Tankersley has a 24-track facility at his home. "Basically, my 1040 ST forms the heart of the system," he says. "I'm a total believer. My ST using Hybrid Arts software is bug-proof and incredibly accurate, timing-wise. What more could you ask for?"

Tankersley wouldn't use another computer. "I've checked everything—Amiga, IBM, Mac—and I haven't even considered switching. Price notwithstanding—and, of course, price is in the ST's favor—the ST is the best MIDI hardware. If there was something I thought was better, I'd buy it. Price wouldn't slow me down. I want the best, because I'm making my living using this machine."

Tankersley has one ST at the moment, "but I'm just about to add a second because there are too many pro-



Reworking the 1962 classic *Do You Love Me?* for the film *Dirty Dancing*, posed a unique challenge to Brian Tankersley and his ST. The question: "How do you stretch a 2½ minute song to six minutes?"

grams I want access to. Also, I'm running two different complementary sequencers, so I'll be bouncing back and forth via MIDI. I find with the 1040 and one megabyte I can utilize a 50-track sequencing program and GenPatch and have them both up on line at the same time."

As a recording engineer, Tankersley has seen his ST become more and more important in the studio. "Recently, I've been using the ST as a real-time replacement for tape machines. I'll hire someone to play keyboards, and they'll bring in their favorite MIDI controller—the DX-7, for example. I just hand them a cable to plug into the MIDI out. Then I engineer the session on the ST as though it were a tape machine. Originally the ST was an addendum to the tape machine. Now the tape machine is an addendum to the ST."

Playing the Computer

Tankersley classifies himself as essentially a technically-oriented person, but

How do you stretch a 2½ minute song to six minutes?

as he started working with his ST, he found a lot of his latent creativity bubbling to the surface. "The ST has caused me to do a lot more songwriting," boasts Tankersley. Indeed, his first ST-written song, *Higher*, was released last fall.

"I'm one of that new breed of musician," says Tankersley. "I play the computer. With my sequencer I have enough equipment so that I can hear the whole rhythm section, the whole drums, bass, keyboards, overdubs and percussion all in real-time. It's inspirational. When I have an idea I might

normally play on the piano, I play it on the sequencer and then I put a drum beat down and a bass line down. All of a sudden, I start making changes. It gets me going in different directions and it's a real interactive process with a lot of user-friendly feedback.

"My primary instrument is electric bass. The problem is that as a bass player, I'm not a proficient keyboardist. But with the ST and a good sequencing package, my mind is the only limit. The ST is able to compensate for my playing deficiencies. We've gotten to be very good friends. ■

Mard Naman is a freelance writer who specializes in personality profiles. He is a frequent contributor to STARTI.

PRODUCTS MENTIONED

SMPTÉ Track, \$575.
Hybrid Arts, Inc., 11920
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The ST/MIDI Connection

New Releases

by Jim Pierson-Perry

Patch editors for the popular Kawai K1 synthesizer are appearing right and left. The two newest are Synthview K1/K1m by Synergy Resources and K1 Editor/Librarian by Drumware. For its big brother, Dr. T offers the K5 Editor/Librarian in the Caged Artist series. The new S900 Pro Sample Editor is Dr. T's first dedicated sample editor for the ST. It has the added ability to convert an S900 sample loop into harmonic waveform data for the K5 or Prophet VS synthesizers.

Educational efforts got a boost this month. Three programs were released from Pocket Meadow Software focusing on note recognition and rhythm skills: Meadow Rhythms, Pocket Melodies and Note Pocket II. Another in this vein is Take Note, distributed by Thinkware, which works on ear training.

Player Software has released the first dedicated librarian program for the Alesis HR-16 drum machine. Get Zoned, also from Player, is a new breed of program which turns any keyboard synth into a master controller. You can specify note ranges to drive up to 16 slave synths, each on its own MIDI channel, with additional control for transposition, octaves, velocity, program change and controllers. This is a dynamite tool for live performance.



Frank Foster, Director of Music Markets for Atari, is the former president of Hybrid Arts.

Another hot item is the imminent release of the Lynex, distributed in the United States by the Russ Jones Marketing Group. It's a 16-bit stereo sampler that acts as a desk accessory. Its RAM (1Mb to 32 Mb) is self-contained and doesn't tie up the ST, so you can use it along with a sequencer. Other features include a 50 kHz sampling rate, eight or 16 voices, an eight-channel digital mixer with eight separate audio outs and sample editing software.

Sequences to Go

Even with a great sequencer program, it's hard work to record versions of popular songs that sound authentic.

This is particularly important for performing musicians who use their sequencers in place of a backup band. Several companies are capitalizing on this by offering pre-recorded songs for a variety of sequencers.

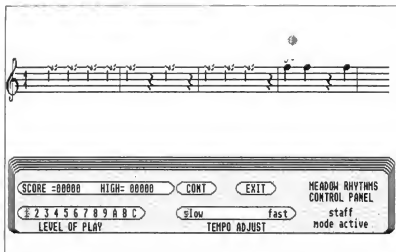
Golden MIDI Music and Software is one of the best of these companies, boasting over 130 songs in their library by artists ranging from The Police and INXS to the Glen Miller Orchestra and Sergio Mendes. The tracks are well-orchestrated and sound great. The company will customize the drum parts to fit your drum machine note assignments at no charge. Virtually every pro-level Atari sequencer is covered in its

native format. On the legal side, Golden MIDI has obtained a license for each song they offer and pay the appropriate royalties for their use.

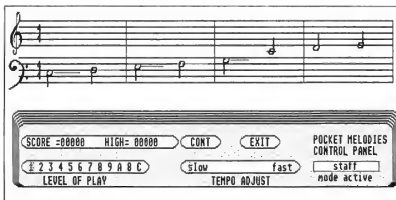
Trycho Tunes also offers songs for ST sequencers. They have over 300 songs available, mostly from pop and oldie categories. Sequences are supplied in MIDI-standard file format for use by Dr T, Passport, Sonus and Steinberg/Jones sequencers; Hybrid Arts is working on a MIDI file conversion program which may be ready by the time you read this. A demo cassette is available that shows off several songs in a live performance context. Other companies which provide ST-compatible song files are Tran Tracks and Future Music.

Atari and MIDI

Almost ready from Atari is a video on applications of STs and Megs for performing, composing and studio work featuring various celebrity musicians. A book on MIDI, musicians and the ST is ▶



Meadow Rhythms from Packet Meadow Software is a music education program that uses MIDI input to teach students note recognition.



Packet Melodies from Packet Meadow Software teaches rhythm while coordinating with the MIDI input.

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due out early next year. At the summer N.A.M.M. music show Atari announced a joint promotional campaign with Yamaha for a starter MIDI system consisting of a 520ST with monochrome monitor, PSS-480 keyboard and Master Tracks Jr. sequencer program. Aimed at the mass merchant market, the package retails for \$999.

Atari is taking its MIDI market quite seriously, to the point of recruiting Frank Foster from Hybrid Arts to head corporate MIDI-related activities. Atari has been active at national and international music shows and has also launched an aggressive advertising campaign in the trade magazines. The recent Tangerine Dream North American tour was sponsored solely by Atari, and more will follow next year. ■

Jim Pierson-Perry is a research chemist and semiprofessional musician living in Elkton, Maryland. He is also a contributing editor for START.

PRODUCTS MENTIONED

K1 Editor/Librarian, \$119. Drumware, 12077 Wilshire Blvd. #515, Los Angeles, CA 90025, (213) 478-3956.

CIRCLE 159 ON READER SERVICE CARD

K5 ST Editor, \$175; **\$900 Pro Sample Editor**, \$249. Dr. T's Music Software, 220 Baylston Street, Suite 306, Chestnut Hill, MA 02167, (617) 244-6954.

CIRCLE 155 ON READER SERVICE CARD

Song Files, \$59.95 per volume of 10. Future Music, P.O. Box 1090, 489 East Plumb Lane, P.O. Box 1090, Reno, NV 89504, (800) 367-6434.

CIRCLE 160 ON READER SERVICE CARD

Song Files, \$19.95 per sequence. Golden MIDI Music & Software, 1020 15th Street, Suite 29K, Denver, CO 80202, (303) 534-4055.

CIRCLE 160 ON READER SERVICE CARD

Master Tracks Jr., \$129.95. Passport Designs, Inc., 925 Miramantes Street, Half Moon Bay, CA 94019, (415) 756-0280.

CIRCLE 162 ON READER SERVICE CARD

HR-16 Librarian, \$29.95; **Get Zoned**, \$89.95. Player Software, 199 Narnh El Camino Real, Suite F323, Encinitas, CA 92024, (619) 753-1498.

CIRCLE 163 ON READER SERVICE CARD

Meadow Rhythms, **Notepocket II**, prices not available; **Pocket Melodies**, \$99.99. Packet Meadow Software, 1325 Imola Avenue West, Suite 123, Napa, CA 94559.

CIRCLE 164 ON READER SERVICE CARD

Lynx, price not available. Russ James Marketing Group, 17700 Roymer Street, Suite 1001, Northridge, CA 91325, (818) 993-4091.

CIRCLE 165 ON READER SERVICE CARD

Synthview K1, \$69.95. Synergy Resources, 754 North Baltan Avenue, Indianapolis, IN 46219, (317) 356-6946.

CIRCLE 166 ON READER SERVICE CARD

Take Note, \$79.95. Thinkware, Box 31613, San Francisco, CA 94131, (415) 665-0324.

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Song Files, \$20 per sequence. Tran Tracks, 133 West 72nd Street, Suite 601, New York, NY 10023, (212) 595-5956.

CIRCLE 168 ON READER SERVICE CARD

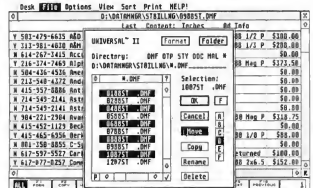
Sequences, \$17.95; **Backing Track Tapes**, \$19.95. Trycho Tunes, 2166 West Broadway #330, Anaheim, CA 92804, (714) 938-9616.

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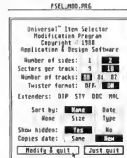
Shift/Click group operations are easy. Just hold down the shift key and select your files for any operation. You can also move up the folder tree by just clicking up the directory line. No more clicking out of each folder to go higher. Just select the superior folder and click on its name; it's that simple.

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Sample Editors For The Ensoniq Mirage

ST Sonic Editor, Soundworks Mirage and Sound Designer

by Jim Pierson-Perry
 START Contributing Editor

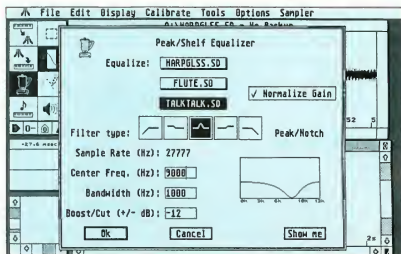
Samplers may qualify as the most versatile and complicated electronic musical instrument. They're the instrumental equivalent of playing a tape recorder. The sound you record (a sample) goes into a sampler to be processed to yield the final sound—and it may not sound anything like what you started with! Samplers give you the freedom to include any type of sound in your music, be it an animal noise, orchestra, choir, acoustical musical instrument or a car crash.

Enter the Mirage

The Ensoniq Mirage was the first affordable sampler for the home musician and hobbyist. It's an eight-voice polyphonic instrument, available as a keyboard or rack-mount unit. Samples are digitized to 8-bit resolution with a variable sampling rate of 10 to 33 kHz (up to 50 kHz with optional input sampling filter).

Internal memory is split into an upper and lower half, corresponding to a split keyboard. Each half holds one sound, consisting of eight wavesamples and four sets of program parameters. The wavesamples are the actual sample data and the program parameters control how the Mirage plays the raw sample data (e.g. amplitude envelopes, filter effects, modulation, etc.).

Digital equalization dialog box for Digidesign Sound Designer. This program's depth of specialized sample processing options sets it apart from other sample editors.



Each wavesample may be a separate sound so it's possible to have up to 16 different sounds in memory at a time—great for a full drum set. An advanced operating system (MASOS) is available to assist with sampling and sample data manipulation. Earlier this year, Ensoniq released their Performance Sampler (EPS), the next generation Mirage, which can read sound disks from the original Mirage.

Sample Editor Basics

Unlike a synthesizer, a sampler cannot make any sound on its own. Sampler editing programs are typically more complex than those for synthesizers as two editing levels are involved: instrument

parameters and the sample itself. Instrument parameters are equivalent to normal synthesizer patch parameters—amplitude and filter envelopes, modulation source and amount, detuning, etc. Examples of sample editing are cutting and pasting sounds together; reversing the sample (Beatles, anyone?), replicating parts of a sound (*m-m-m-Max Headroom*), deleting segments, creating fade in/out effects and applying digital equalization (boosting the treble, cutting the bass frequencies, etc.).

The most important sample editing operation is creating good loops. Normal sampler operation is to start at the beginning of the digitized sample data and play through to the end, *finis*. We may, however, want the sound to sustain at some ▶

point similar to holding down a piano pedal. This requires the sampler to replay a piece of the sample data over and over again (looping) until the sustain is released. The trick is finding a good sample segment to loop. If the start and end points do not match well, you'll hear pops, clicks and thumps. Good sample editor programs graphically display the data to help locate loop points and have several algorithms for automatically creating loops once you set a "ballpark" working region.

Three sample editor programs are available for the ST that work with the *Mirage*: Soundworks *Mirage* by Steinberg/Jones, ST Sonic Editor by Sonus and Sound Designer by Digidesign. A fourth, Oasis ST from Hybrid Arts, has been recently withdrawn from the market. The first two are dedicated to the *Mirage* and address both sample and program parameter editing. The third is solely a sample data editor that works with a number of samplers.

Soundworks *Mirage*

This program is part of the Soundworks series for popular samplers from Steinberg/Jones. Sound sample data files created by any of these programs are compatible with others in the series. It requires one megabyte of memory and runs in both color and monochrome. Soundworks uses a hardware key for copy protection; you can then back up the program and run it from a hard drive

The manual covers basic program operation and includes several useful examples, although it's short and filled with spelling errors. A desk accessory is included with the program to handle disk file operations: Get Info, Copy, Rename, Delete, Create Folder and Format Disk.

Separate display screens are used for the four main operations: program parameter editing, sample data editing, MASOS/sample data manipulations and a software synthesizer for creating new sound samples. Each screen is based on a background DEGAS picture. Desk accessories are available but not handled well. You must click on most several times before the accessory window opens, which leaves a "hole" in the screen background that is cleared only by moving to another screen. Several screens also have extraneous unlabeled or non-functional buttons that are not mentioned in the manual (e.g. System Reset, Copy Wavetable). There is no sound preview capability; all wavesamples must be transferred back to the *Mirage* to audition the edited results. Also lacking is any ability to play the *Mirage* from the program, almost a necessity when working with rack-mount units. All MIDI communication is fixed to channel 1.

The program parameter editor is complete and well implemented. All parameters are presented on one screen in logical groupings. You can change values with the mouse, but you can't type in values directly, often the most expedient

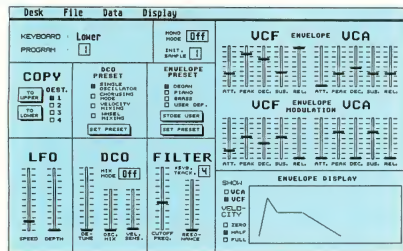
route. The program can display graphs of the amplitude or filter envelope settings but you cannot edit them graphically. Many parameters are set via sliders—easy to use but they don't provide a numerical value for their settings. All program parameter editing is done in real-time; you can copy parameters between programs.

Sample data is transferred as an entire sound or just a single wavesample and is shown graphically in a display window that you cannot size or move. The display resolution can be adjusted to show from 2 to 256 pages of sample memory by powers of 2 (2, 4, 8, etc.). The starting point of the display can be set to any point in the sample data using screen scroll buttons. Wavesample parameters (which you may edit) are displayed next to the sample plot. There is no way to clear the sample data buffer, so loading a short wavesample after previously loading a longer one will show residue from the former in the display.

Wavesample editing is restricted to changing amplitude values—no cut and paste, insert or delete operations are provided. Sample data amplitude editing can be done in three ways: cursor mode is the default and simply moves a line through the display window while showing the current position and amplitude; magnify mode shows a small rectangle that you can position within the display window and thus "blow up" the enclosed data for exact editing; line mode lets you draw a new contour shape for the sample data. When finished, the data amplitudes are recalculated to fit the contour.

Loop editing is virtually nonexistent. An end of loop marker can be toggled On/Off in the sample display and the loop parameter values can be numerically edited, but there is no provision for matching loop start and end segments nor are any automatic looping routines provided.

The only advanced editing operations are those provided by the *Mirage* MASOS. A screen is provided for setting up

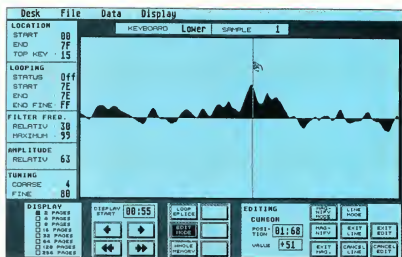


Program parameter editing screen for Soundworks *Mirage*. All program parameter editing is done in real-time; you can copy parameters between programs.

appropriate memory markers and selecting the MASOS commands. The operations are done by the Mirage and the wavesamples must be recalled to the ST to view the edited results. This screen is also used to set up the Mirage for user sampling.

A sophisticated module is provided for computer generation of wavesample data that simulates a four-oscillator analog synthesizer. Starting oscillator waveforms include triangle, sine, noise and square (with fixed or modulated pulse width and 4 types of modulation). A four stage envelope can be set for each oscillator. Both amplitude and frequency modulation of individual oscillators are supported. A library of 96 presets are included and you may store up to 96 more of your own design. Wavesamples generated this way can be viewed, edited and transferred to the Mirage the same way as normal samples.

Wavesample editing screen for Soundworks Mirage. Each wavesample may be used as a separate sound so it's possible to have 16 different sounds in memory at once.



ST Sonic Editor

This was the first Mirage sample editor released for the ST. It works with all ST models and monitors, and uses a hardware key protection scheme that lets you copy and install the program on a hard drive. The key goes into the cartridge slot, but it's a very touchy fit and often it took more than five attempts to seat it without bombing the program.

The working screen has a single display window for sample data that cannot

be moved or sized. Eight icons for common operations are provided: display zoom in/out, drawing tool, play sequencer and set loop start/end points. The manual covers all program operations but suffers from an extreme technical orientation, lack of appropriate screen shots and poor layout. A very good section on looping techniques is provided, but is also for the Mirage hacker, not a new user.

The Sonic Editor allows for editing of ▶

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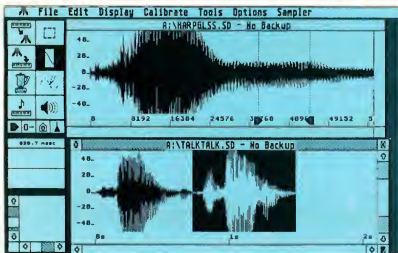


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selected Mirage program parameters, MASOS sample data operations, cut and paste editing, manual looping and rudimentary FM sample synthesis. There is no way to set overall Mirage configuration parameters such as MIDI channels (channel 1 is used) or to set up the Mirage for sampling. A sequencer is provided (notes only, no controllers) to play back short sequences while editing.

Wavesample data is transferred between the Mirage and ST through menu commands. A dialog box is called from the menu bar to select the specific sound (upper/lower), waveform and Mirage program to be transferred. Separate commands are used to transfer the wavesample and program parameters data. There is no sound preview capability; you must continually transfer the waveform data back to the Mirage to hear the results of your editing. Ten simple sound files are included on the program disk.

Mirage program parameters are edited numerically in either hex or decimal. Only amplitude or frequency envelope parameters can be edited, each in a separate dialog box. You cannot use the sequencer when a dialog box is active to audition editing effects. Oddly enough, the remainder of the Mirage program parameters such as LFO, detune, mix mode, etc. cannot be edited or viewed from the program. There is no provision for copying parameters between programs or sounds.

The main use for this program is to visualize the sample data, particularly for

Wavesample editing screen for Digidesign Sound Designer. Each sample is shown in its own GEM window that can be moved, resized, rescaled and scrolled at will.

the Mirage to see the results.

Two additional features are a waveform drawing tool and FM sample synthesis. The drawing tool is for smoothing loop points or editing out blips. The synthesis routine lets you create a sample simulating a one operator FM algorithm (1 carrier/1 modulator) for a desired number of sample points.

Sound Designer

This is a Mac port of the most popular sampler editor program currently available. The functions and interface design were faithfully preserved, plus we get color and a larger monitor screen!

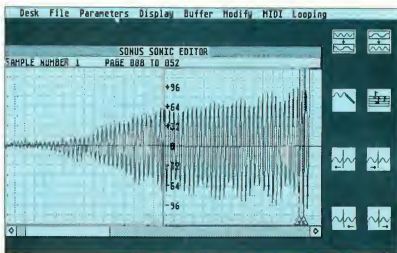
Sound Designer is a sample data editor that is not dedicated to the Mirage, but works with many sampler instruments (including the EPS from Ensoniq). It will not edit program parameters. Sample data files are created and stored in a common format regardless of the sampler instrument; a sound file originally sampled on an Akai S900 can be sent to a Mirage. This opens up a huge library of existing sample files on BBS (see the sidebar with this review). Sound files from Softsynth and Digidesign's companion sample creation program (reviewed in the October 1988 issue of START), are both compatible with Sound Designer.

The program can run on any model ST or Mega with either a monochrome or color monitor. Data manipulations are carried out using temporary disk files rather than risking memory limitations (sample data files are notoriously long).

creating loops. Resolution can be taken from an overview of the entire waveform currently in memory to a blowup of just 512 individual sample points. When the loop editor is activated, the display shifts to a split-screen arrangement with the loop start and end memory regions adjacent. Scroll arrows make it easy to move the loop points to try and find matching waveform regions. You must do all looping; the program merely shows data as a guide.

A cut and paste buffer is provided to take snippets from one sound and graft them onto another or for similar editing; the buffer contents cannot be displayed and you must keep close track of what is in it. You can perform MASOS functions from a dedicated dialog box or, in a few cases, from the menu bar. Using the menu bar, the display window automatically shows the results. Going through the dialog box, the work is done within the Mirage memory rather than the ST and you must retrieve the sample data from

Wavesample editing screen for the Sonus ST Sonic Editor. You must continually transfer the waveform data back to the Mirage to hear the results of your editing.



Although the program will work using a single-sided drive, you may need a double-sided drive for lengthy samples. For safety, sound files are automatically backed up on disk when you open them. A master disk copy protection scheme lets you copy and install the program on a hard drive. You get a free backup master disk when you send in your program registration card. The manual is very well written, contains a number of illustrative screen shots and is well laid out, although the program is so intuitive that you rarely need to read the manual!

One of the most useful program features is that sample data in memory can be previewed at any time through the ST monitor speaker. While not high fidelity, the sound quality is good enough for most editing needs. The preview quality can be improved by sending the sound to a stereo system via the Monitor Master or external D/A sound digitizer cartridges (ST Replay and ST Sound Digitizer are supported). A simple sequencer is also

provided to play notes on the Mirage from the ST, either real-time or a recorded pattern. This is quite useful with the rack-mount Mirage unit. All MIDI operations are restricted to channel 1.

Program functions can be broken into 3 main classes: basic editing, looping and digital signal processing. All feature excellent use of interactive graphics. Several icons and controls are located on the left side of the screen to handle data transfer between sampler and ST, play sequencer, sound preview, zoom, enter edit and processing modes, change display axes scales and draw waveforms. Most normal editing can be done without accessing the command menu.

Basic editing functions are view sample, cut and paste, insert, delete, reverse order and set to zero. These are performed on sample data in the active window. Up to three samples can be opened at the same time, along with a clipboard for temporary storage. Each sample is shown in its own GEM window that can

be moved, resized, rescaled and scrolled at will. An entire sample data set or just a segment can be edited by dragging the mouse through part of the display. Noise spikes can be cut out or initial sounds repeated for stutter effects with just seconds of work. A smoothing function can be set to work automatically during your editing to polish rough spots. The zoom function lets you magnify any sized part of the sample data, selected by drawing a box with the mouse. Double clicking on the zoom icon restores the default full view scale display. You can even activate an electronic pencil to draw sample data changes—sometimes useful to remove glitches or smooth previous editing effects.

A number of tools are provided to create good loops. Ballpark start and end loop markers can be set in the normal sample display window. More critical positioning is done in a dedicated loop window which shows sample data about both the start and end markers in a split ▶



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view. Scroll buttons can be used with the mouse to slide the loop pointers about and seek a good match. An automatic crossfade looping routine is provided with the signal processing options to handle more difficult samples.

What sets *Sound Designer* apart from other sample editors is its depth of specialized sample processing options. These include simulating the action of various equalization filters (low/high pass, notch and low/high shelving), normalizing the data amplitude for maximum signal strength, mixing and merging samples, crossfade looping and displaying an FFT plot of the sample (useful in choosing appropriate types of filters to apply). The processing is done within the *ST*, rather than going to *MASOS* on the *Mirage*. All options are clearly explained in the manual.

Summary

It is a sad but accurate statement that none of these programs meet all the desirable goals for a *Mirage* sample editor. Each has its own strong points, but none qualify across the board. So what is the best compromise?

Your best option is to go with *Sound Designer*. There is simply nothing in its class for fast, powerful editing and special effects. It is easy to use, makes excellent use of the *ST*'s capabilities and actually makes editing fun. It costs more up front but will more than make it up by saving you significant time and effort. Availability of numerous sample files on various BBS is just frosting on the cake. Program parameter editing must be done at the *Mirage*; *Sound Designer* was created for sample data only.

Coming in second is *ST Sonic Editor*. While it is far from being as intuitive or powerful as *Sound Designer*, it still packs the tools needed for basic editing and looping and will still save you some dollars. Be warned, this program is not well suited for novices and can cause a lot of frustration. The incomplete parameter editing capabilities will send you back to

Sound Designer Sample Files: Mac to ST

There are a large number of existing sample files on various BBS from *Sound Designer's* Macintosh incarnation, and with some simple touch-up editing, they work just fine for its *ST* version. There are two ways to do this. First, download the sample files from a BBS using a standard *ST* telecommunication program and save them to disk. Boot up the *Byte Mechanic* file editing program (from *START Special Issue #4*) and delete the first 128 bytes from the start of the sample file; then save the file. That's all—it gets even easier if you set up the trimming as a macro in *Byte Mechanic*.

The other approach requires the *Magic Sac* from *Data Pacific*. Download the sample files with a Macintosh telecommunication program using the *MacBinary* protocol. Use the *Data Pacific* program *Mover* to translate from *Mac* (or *Magic*) format to *ST*. These files can be used without trimming.

The advantage of going the *Magic Sac* route is that you may run into sample files that have been compressed via *Packit* or *Stuffit* (similar to *ARC* on the *ST*). These files must be decompressed with the appropriate *Mac* utility before translating to the *ST*. Often the BBS description will mention that the files have been compressed. You can also use the *Byte Mechanic* program to look at the start of the file in *ASCII* mode. If you see the notation "pit", it was probably compressed via *Packit*.

Using both of these methods I have obtained over 15 sample files that worked flawlessly with *Sound Designer* and my *Mirage*, including several huge ones that were initially compressed. The original samplers used to create these files included the *Emulator II*, *S900*, *Prophet 2002* and *DSS-1*. I downloaded them from *East Coast MIDI BBS*, (516) 928-4986 and *PAN* (voice), 215 584-0300. ■

the *Mirage* front panel and the lack of sound preview wastes time on *MIDI* transfers. It is best used by those with experience editing just from the *Mirage*.

In its present state, the *Soundworks Mirage* cannot be recommended. While the program parameter editing is good, the sample data editing and looping functions are insufficient. It also cannot be used on 520 *ST*s without memory upgrades. The good news is that a major upgrade, essentially a new program, will become available before the year's end and address the current shortcomings. It will sport a dedicated loop editing screen, work on any *MIDI* channel, be compatible with the *EPS* and much more. That will definitely be worth a return look and may provide real competition for *Sound Designer*. ■

Jim Pierson-Perry is a research chemist and semiprofessional musician. He lives in Elkton, Maryland.


PRODUCTS MENTIONED

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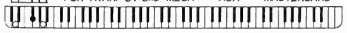
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11/11/88	11:45	10.00	CRICIT	1	10.00	10.00	0.00	0.00	10.00
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11/11/88	12:00	10.00	CRICIT	1	10.00	10.00	0.00	0.00	10.00
11/11/88	12:05	10.00	CRICIT	1	10.00	10.00	0.00	0.00	10.00
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Using True BASIC: An Overview

by Delmar Searls

Editor's Note: This issue, we'll turn away from GFA BASIC to look at True BASIC, written by the fathers of all BASICs. Over the next few issues, we'll continue to examine True BASIC, but never fear, we won't forget GFA BASIC!

In 1964, Dr. John Kemeny and Dr. Thomas Kurtz of Dartmouth College developed BASIC (Beginner's All-Purpose Symbolic Instruction Code) in an attempt to create a computer language that was easy to learn and easy to use. Today, it's the most widely used computer language.

Since 1964, BASIC has undergone a great many changes. Because it has been implemented on so many different computers, its characteristics vary from machine to machine and from interpreter to interpreter. BASIC has also been influenced by the growing emphasis in computer science on well-structured programming. As a result, many implementations, such as GFA BASIC 3.0, bear only a passing resemblance to BASIC as it was originally conceived. In order to bring their original BASIC up to date, Kemeny and Kurtz developed True BASIC.

Features of True BASIC

True BASIC is available for the Atari ST, Amiga, Macintosh and IBM PC. Though to a great extent programs written on one machine will run on any of the others, each version of True BASIC includes certain features designed to take advantage of the specific hardware and operating system design of that computer. Programs using these special features must be modified before they will run on a different machine.

There are three main ways in which True BASIC differs from "standard"

BASIC (as we'll refer to it here): True BASIC includes new control structures, new statements and a new programming environment.

Control Structures

In any programming language, the control structures determine the order in which statements are executed. In standard BASIC the control structures are the For-Next loop, the If-Then-Else statement, the Gosub-Return subroutine call and the Goto statement. (Some newer versions of BASIC provide the While-Wend or Repeat-Until loop.) In addition to For-Next, True BASIC includes a versatile Do-Loop structure that can be used to write the two most common looping structures: Do-While (Figure 1) and Repeat-Until (Figure 2). You can also use the Do-Loop structure for more complicated loops (see Figures 3 and 4).

In standard BASIC, the If-Then-Else statement is limited in that only one statement can appear after the Then or Else. Some versions of BASIC permit multiple statements, but in many cases they must all be on the same line and separated by colons. In True BASIC, a ▶

Do While Condition Body of Loop Loop

Figure 1. In a Do-While loop a condition is tested before the body of the loop is executed. While the condition remains true, the program will stay in the loop. When the condition becomes false, the program will exit the loop.

Do Body of Loop Loop Until Condition

Figure 2. In a Do-Until loop a condition is tested following the execution of the body of the loop. If the condition is false, the loop is repeated. The program stays in the loop until the condition becomes true.

**Do While Condition1
Body of Loop
Loop Until Condition2**

Figure 3. In True BASIC you can put conditions at both ends of the loop. Here, the body of the loop will be executed if the first condition is true. Following the body of the loop (if it is executed) the second condition will be tested. If it is false, the program will go back up and test the first condition again.

block of statements can follow either the Then or the Else. True BASIC also includes If-Then-Elseif (Figure 5) and Select Case (Figure 6). The only provision for independent sections of a program (relatively speaking) in standard

**Do
First Part of Body
If Condition Then Exit Do
Second Part of Body
Loop**

Figure 4. In this loop, a condition is tested in the middle of the body of the loop. If the condition is true, the program immediately exits the loop and resumes execution of the first statement after the loop (i.e. after the BASIC keyword "Loop").

BASIC is the subroutine called by a Gosub and ending with a Return; in such a case, all the variables used in a subroutine are global. In True BASIC you may also use procedures and functions, either of which may be internal (using global variables) or external (using local variables). True BASIC also supports modules that let you create reusable units of code that you can incorporate into any program easily.

Statements

The original BASIC didn't need graphics or sound, since no provisions for graphics or sound existed on its host computer. But as better computers have been developed, new statements have been added to BASIC to take advantage of new graphics and sound capabilities. Unfortunately, all too often, the com-

mands differed from one machine to the next.

To solve this problem, the graphics and sound commands in True BASIC were made identical for all machines. With the graphics commands, you can draw points, lines, boxes and ellipses, you can color the interior of a closed figure, such as a box or ellipse and do 2D transformations, such as scaling, translation and rotation.

One nice feature of True BASIC is that the coordinate system is the same as that used in algebra: the horizontal axis runs from left to right and the vertical axis from bottom to top. (In most versions of BASIC, the vertical axis runs from top to bottom, with coordinate values increasing as you go down.

True BASIC also provides for windows whose size and location can be adjusted easily. While these windows are not as sophisticated as those created by GEM on the ST, they work the same way on all machines.

**If Condition1 Then
Block of Statements
Elseif Condition2 Then
Block of Statements
Elseif Condition 3 Then
Block of Statements
Else
Block of Statements
End If**

Figure 5. An Elseif structure chooses which statements to execute based on the results of a number of possible tests. The example indicates three conditions that are tested, but any number of tests can be included.

Programming Environment

Using True BASIC, you'll notice several changes in the way you write BASIC programs. The most obvious is the inclusion of a powerful editor which features find, find and replace and block movement commands. The editor is GEM-based and uses pull-down menus and optional mouse-controlled cursor positioning.

Another big change is that you no

longer need line numbers. This follows the trend seen in recent versions of BASIC. It's a welcome change for most programmers, although you may still use line numbers if you wish. In fact, the package includes one utility that numbers an unnumbered program and another that removes the line numbers

**Select Case Expression
Case Value1
Block of Statements
Case Value2 TO Value3
Block of Statements
Case Value4, Value5, Value6
Block of Statements
Case Is < 100
Block of Statements
Case Else
Block of Statements
End Select**

Figure 6. If there are several tests, all based on the same expression, you can use a Case structure. You can test for a single value (the first Case), a range of values (the second Case), a list of values (the third Case), or a relative value (the fourth Case). A Case Else allows you to indicate what action to take if all of the tests are false.

from a numbered program. (In order to use the Goto or Gosub statements, the program must be numbered, but the other more powerful control structures eliminate the need for Goto's and Gosub's.) In our next True BASIC column, we'll take a closer look at three of True BASIC's most significant features: procedures, functions and modules. ■

Delmar Searls is the author of Grapher in the Fall 1987 issue of START.

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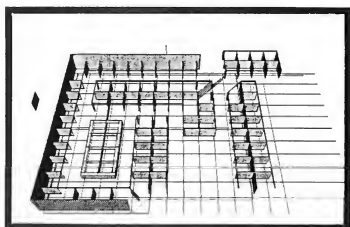
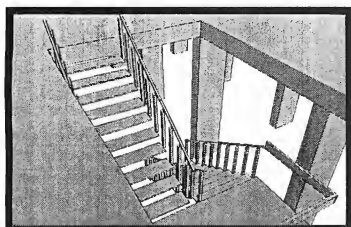
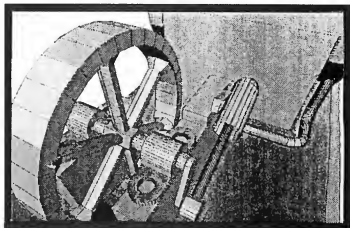
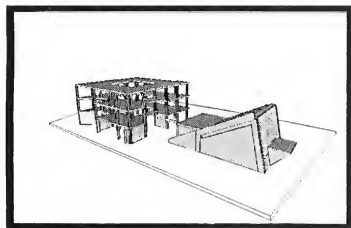
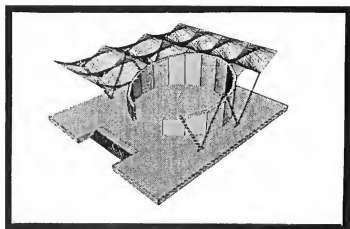
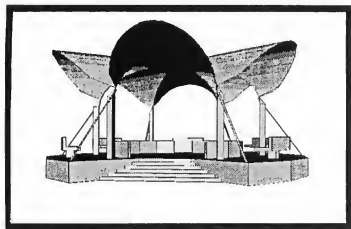
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Online With START

Finding Customer Support Online

by Gregg Pearlman
START Assistant Editor

It's 1 a.m. You've spent the last several hours alone with your ST, writing your screenplay. 1ST WordUpPerfectWriter Elite is your word processor of choice, but when you click on Save, your ST makes a coughing noise—just before the flames from your hard drive start licking at your monitor, accompanied by the inevitable, repeated form feeds from your printer. What will you do? What will you do?

And at one o'clock in the morning, what can you do? Well, as luck would have it, several manufacturers and software publishers have online support, either through commercial services such as CompuServe and GENie or through company bulletin board systems. These companies know that you're not likely to have problems with your home equipment during regular business hours—because you're at work too—so they make themselves available during the off-hours.

Forums, RTs and Bulletin Board Systems

The first place to look for online support is on a commercial service. The Atari Vendors Forum on CompuServe has software libraries for the following companies: ICD, Intersect Software,

MichTron, Drafix, QMI, Regent Software, Magic Sac, Atari Explorer, Avant-Garde, Navarone, PageStream/Publishing Partner, Practical Solutions and A.N.A.LOG./ST-Log. You can also communicate with such developers as START Contributing Editors Tom Hudson (DEGAS Elite, Cyber VCR) and Dave Small (Spectre 128).

To reach a vendor on CompuServe, type GO ATARIVEN at any "!" prompt. If you explore the message base, you might find that someone else has already asked a question pertaining to your problem and, if you're lucky, the vendor has already answered it. If you choose one of the software libraries, the vendor may have previously uploaded a program or documentation file that would take care of your problem.

GENie is the official online "home" of Atari Corp. In addition to its Atari 8-bit and ST areas, GENie has the following RoundTables (RTs): MichTron Products, Atari Developers, Data Pacific and Gadgets by Small. All four RTs feature bulletin boards, conference areas and software libraries. On GENie, type ATARI at any "?" prompt. Then choose the appropriate Atari RoundTable and visit either the bulletin board or software libraries.

The MichTron RT has demo software, support files, press releases, BBS software, GFA BASIC, GFA Draft and GFA CAD files, MIDI files and more. Data Pacific and Gadgets by Small both feature files in the areas of telecommunications, word processing, desktop publishing, utilities, graphics and HyperCard. Also present are some all-important help files.

You can find help in the Atari ST RoundTable, but you must be a registered developer to access the Atari Developers RT (and you must send a message to any Atari Corp. representative on GENie to request access).

BIX (BYTE Information eXchange) provides especially good product support for programmers, largely because many BIX users are Atari developers. Helpful Atari-related areas on BIX include Application, Documentation, Leisure, Utility and Word Processing. To get to the ST area, just type "atari.st" at any ":" prompt.

On BIX, Dave Small makes himself available once again—he obviously doesn't want to limit his help to CompuServe and GENie—as do the United States, United Kingdom and Benelux branches of Atari Corp. ▶

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Online With START

On Their Own

Many vendors, even some that already have special areas on CompuServe or GENie, have their own bulletin board systems, most notably Beckemeyer Development Tools, MichTron, ICD and Hybrid Arts. Atari itself has its own BBS also. (More accurately, it has five boards—actually, five phone lines, each of which connects to a different board.)

Even if the vendor you need to reach doesn't have its own BBS or a special section on a commercial service, it might have an online representative, especially in message base areas. For example, Antic Software representatives show up on CompuServe all the time, as do reps for Double Click Software, Practical Solutions, Navarone, Intersect Software and even Electronic Arts Customer Service. Sometimes these people are there just to see what people are saying about their products, but leave messages for them anyway, especially if you know that they check the message base often.

MIDI Help

The online service PAN, the Professional Artists' Network, has such illustrious members as Herbie Hancock, Jean-Michel Jarre, Branford Marsalis, Daryl Dragon and Jan Hammer (and

even Hitchhiker's Guide author Douglas Adams). However, you'll also find representatives of such companies as Akai, Kurzweil, Mark of the Unicorn, Digidesign, Dr. T's Music Software, Intelligent Music and Hybrid Arts. If they can't help you online, they may at least give you an idea of who to contact. And if you're still not getting anywhere, you can always leave a message for START MIDI veterans Jim Pierson-Perry and Rick Davies.

(Editor's Note: Be sure to check the next issue of START for a special PAN discount offer—only for START readers.)

You're Not Alone

No matter what pops, pings or devastating explosions your ST system has experienced during the wee hours of the morning, someone else has been there first. Most vendors that offer online support are very good about coming through, and it's not unusual for a company representative to go online at night or over the weekend just to see who has the newest problem.

So if part or all of your system goes "boom" when the rest of the world is asleep, it'll never hurt to seek online support—unless it's your modem that's causing the problems. ■

PRODUCTS MENTIONED

CompuServe, CompuServe, Inc., 5000 Arlington Centre Blvd., P.O. Box 20212, Columbus, OH 43220, (614) 457-0802, (800) 848-8190.

CIRCLE 170 ON READER SERVICE CARD

GENie, General Electric Network for Information Exchange, General Electric Information Services Co., 401 N. Washington Street, Rockville, MD 20850, (800) 638-9636.

CIRCLE 171 ON READER SERVICE CARD

Atari Corp., 1196 Borregos Avenue, Sunnyvale, CA 94086, (408) 745-2000 (voice); BBS numbers: (408) 745-5308, (408) 745-5970, (408) 745-2642, (408) 745-4758, (408) 745-5664.

CIRCLE 156 ON READER SERVICE CARD

Beckemeyer Development Tools, 478 Santa Clara Avenue, Oakland, CA 94610, (415) 452-1129 (voice); (415) 452-4792 (BBS).

CIRCLE 172 ON READER SERVICE CARD

Hybrid Arts, 11920 West Olympic Blvd., Los Angeles, CA 90064, (213) 826-3777 (voice); (213) 826-4288 (BBS).

CIRCLE 173 ON READER SERVICE CARD

ICD Inc., 1220 Rock Street, Rockford, IL 61101-1437, (815) 968-2228 (voice); (815) 968-2229 (BBS).

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MichTron, 576 South Telegraph, Pontiac, MI 48053, (313) 334-5700 (voice); (313) 332-5452 (BBS).

CIRCLE 175 ON READER SERVICE CARD

BIX (BYTE Information eXchange), 1 Phoenix Mill Lane, Peterborough, NH 03458, (800) 227-BYTE, (603) 924-7681 in New Hampshire (voice); available on Tymnet.

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3026

ON DISK!

KAMIKAZE CHESS



by Jim Kent and Heidi Brumbaugh

You can win for losing—file KAMIKAZE.ARC on your START disk!

Kamikaze Chess is a mirror-image chess game. It's played like standard chess, but with one important difference: in this case, the object of the game is to force your opponent to take all your pieces. If you win, you lose—and vice versa!

Kamikaze was written in Aztec C and assembly language. To play, copy the files KAMIKAZE.ARC and ARCX.TTP onto a blank, formatted disk and un-ARC the file, following the Disk Instructions elsewhere in this issue. Double-click on KAMIKAZE.PRG. At the opening screen, select either one or two players; if you play against the computer, it will have the white pieces and move first. Press Q at any point to quit the game and return to the main menu.

You can move your pieces using either the mouse or the arrow keys. When it is the computer's turn the cursor will be a busy bee; when it's your turn it will be a hand. Move the cursor into the square of the piece you wish to move and press the left mouse button. While still holding the mouse button down, move the pointer to the piece's

If you think chess is a staid old pastime, let START put some new life into the Game of Kings. Play Jim Kent's Kamikaze Chess against a friend or the computer, and see who can "win" by losing all their pieces. This game isn't as easy as it sounds and requires you to think on your feet. Runs in medium or low resolution on a color monitor.



new position and release the button. If you prefer to use the arrow keys, press any key (except Q) to highlight the last piece you moved. Then use the arrow keys to move the highlighted square to the piece you want to move and press Return. Now use the arrows to highlight the square to move to and press Return. Whichever method you use to move the pieces, you can take back your last move by pressing the Backspace key.

All legal chess moves are allowed in Kamikaze Chess, including castling and capturing pawns *en passant*. Castle by moving your king two spaces in the appropriate direction. If one of your pawns reaches your opponent's home row, it will automatically become a queen. If you need to brush up on legal



We consider Kamikaze Chess an experiment in artificial stupidity: the computer is programmed to try to win by losing all its pieces.

if you're in a position where you can take either a pawn or another piece, your best bet is generally to take the pawn and try to force the other piece into your home row. Toward the end of the game, pawns can be difficult to get rid of, so you will probably want to turn them into queens so they'll be more mobile. (Hint: you can usually get rid of a queen or a rook by putting your opponent in check twice in a row.)

chess moves, there are plenty of books at your local library or bookstore to get you started.

Inside the Castle

Kamikaze Chess has very few special rules, the main one being that if you are in a position where you can take one of your opponent's pieces, you *must* do so. If you are in a position to take more than one piece, you can choose which one to take—but you *must* take one. If you are in check, however, you must move out of check, and if you can do so by taking one of your opponent's pieces you must do that.

Like standard chess, you cannot move into check. However, this rule changes when the only piece you have left is your king. At that point your goal is to move *into* check to force your opponent to take your king. If this happens, you've won the game (by losing it).

The computer will check for legal moves and will also alert you to forced capture positions if you try to move a piece instead of capturing one. Also, you can't ignore a check if you have other pieces on the board. If both kings are the only two pieces on the board, make sure that you move *your* king into capturing range first. Then your opponent will have to take you—and lose.

Strategy

In Kamikaze Chess, the pieces that would normally be the most valuable to you can hurt you the most. For example, one rook on your seventh row can be forced to pick off most of your opponent's pawns if he or she manipulates the situation properly. Similarly, a queen on your opponent's home row may not last very long, but could be forced to take several major pieces before she gets captured.

Pawns can't do too much damage, so

Ready to Lose?

The computer will make a formidable enemy, so you may want to play a few games against it to get the feel of how the game works and what strategies to use. Kamikaze Chess makes a challenging diversion from most computer games. It's fun to play, requires skill and fast thinking, and best of all, unlike many computerized chess games, it actually gives you a good chance of beating the computer. ■

Jim Kent is the author of Cyber Paint from Antic Software and the Audio-Visual Sequencer from the November 1988 issue of START.



ILLUSTRATIONS BY ROBERT KOFCHEY

ON DISK!

KILLER CHESS

by Greg Knauss



The race is to the swift! KILLER.ARC is on your START disk. A color monitor is required.

Killer Chess incorporates most of the legal moves of the traditional game, with the usual demands of skill and strategy. But there's one big difference—in Killer Chess you don't take turns! With joystick in hand, each player works simultaneously to wipe out the opponent's pieces until either king is captured. It's a race against time where winning is determined not by how carefully you are but how fast you are.

To run Killer Chess, copy the files KILLER.ARC and ARCXTTP onto a blank, formatted disk. Un-ARC KILLER.ARC following the Disk Instructions elsewhere in this issue. Killer Chess will run in low or medium resolution. Double-click on KILLER.PRG to start the game. A few seconds later the title and game screen will appear. Two joysticks are required.

Playing Killer Chess

Press the spacebar to start the slaughter. With the joystick, move the square cursor to the piece you wish to move, then press the fire button to "grab" that piece.

Maybe you don't want to take up chess because you've heard it's boring. Or maybe you already play, but are tired of the long minutes you've spent waiting for your opponent's next move. Killer Chess pumps new life into an age-old game with fast and furious play that keeps you on your toes.



At the lower left of the screen, under the title, are two black boxes. When you grab a piece, it appears in its respective Hold box until you finish the move. Now, move the piece to the desired square and press the fire button again. If it's a legal move, you'll hear a bell. If it's not a legal move, you'll hear a dull thud. (Because of the fast-paced nature of Killer Chess, moves like castling and taking pawns en passant cannot be done.) To quit the game, press the spacebar.

Once gameplay has begun, watch out and just keep moving as fast as you can. If your opponent hesitates, you can probably get in three or four moves before he or she can recover. Since gameplay is so quick in Killer Chess you can win the whole game using

nothing but the queen. Of course, after a few games you'll find out there are many more ways to win. If you need help with basic chess moves, check your local library.

Killer Options

Killer Chess utilizes the first three Function keys to access features that make gameplay even more compelling.

Press F1 to change the board's traditional arrangement. This option gives you three alternate boards to choose from. Each time you press F1 you're given a different arrangement requiring a new strategy.

Press F2 to change Player One's pieces to a fantasy-adventure theme. In this option, rooks become wizards and pawns become trolls. Press F3 to do the same for Player Two. The sets can be used interchangeably. To return to the Desktop, press the Escape key.

Hey! It Uses Joysticks!

The 8-bit version of Killer Chess was written in ACTION!, the programming language distributed by ICD. To translate the game to the ST, I used GFA BASIC, which I found wonderful to work with. The transition was nearly effortless for both me and the game.

Of course, all was not a bed of roses. It took me only two weeks of on-again off-again work to finish the program, except for one thing: I didn't know how to read the joysticks! There the game sat, unchanged for over five months because I couldn't read the darn joysticks. I heard rumors of "packets" and other confusing things, but I never found the code I needed.

Then one day a member of my computer club handed me a public domain GFA BASIC game called Slalom Event. That game uses a joystick and it works! At last I found code that would work just as well in Killer Chess.

To use the joystick routine, I simply moved the section of code marked "joystick init routine" into the initializa-

tion code of the program. (I made one minor change in the routine that you can change back if you want: I put the joystick pointers into an array Joy(x). The code initially had them as Joy_0% and Joy_1%. If you keep them as an array, you'll have to DIM it at the beginning of your program.)

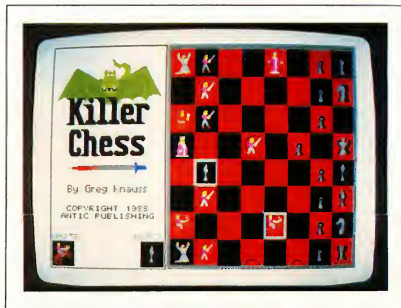
Then, anytime I needed a value for a joystick, I just typed Print PEEK(Joy(0)) or Print PEEK(Joy(1)). Pushing the stick up returned a 1, down a 2, left a 4 and right an 8. I found that instructions for diagonal movement added two of the values together, and pushing the trigger added 128 to the value. I've tested the routine on a Mega 2 and found that it works with its new version of TOS.

Wrap-Up

I think ST users will enjoy Killer Chess as much as 8-bit users do. It's a fast-action game that keeps the players light on their feet. As far as I know, this is the first direct translation of a magazine game for the 8-bit over to the ST, but I hope it's not the last. There are some great games on the older machines that magazines like Antic have published in the past. They could be even better on the ST. ■

START first-timer Greg Knauss lives in Palos Verdes California and has been a frequent contributor to Antic.

In Killer Chess each player works simultaneously to wipe out the opponent's pieces until either king is captured. It's a new twist on an age-old game.



ILLUSTRATIONS BY ROBERT KOPECKY

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Of Scruples, Hostile Aliens and Whirling Dervishes

This issue we review a computer version of a popular board game, an arcade shoot-em-up written especially for xenophobes and a game that takes you on a dizzying journey with a whirling dervish.

A QUESTION OF SCRUPLES: THE COMPUTER EDITION

Reviewed by Gregg Pearlman

The Milton-Bradley board game "A Question of Scruples" can end friendships, ruin marriages and strain family relationships—it can be nastier and hurt more feelings than "The Newlywed Game." (No wonder it's so popular.) But that element isn't present in A Question of Scruples: The Computer Edition by Electronic Arts, because you can't hurt your ST's feelings.

In the computer version of Scruples, you adopt a persona and rate it from -8 to 8 in areas such as personal integrity, honesty, greed and shyness. You can play against as many as nine opponents, computer and human. And not only is each computer player unique, but his or her personal characteristics differ from game to game—depending on their "moods." Characters range from policemen to punkers to nuns to just "average Joes."

The characteristics you've entered are



In A Question of Scruples: The Computer Edition, the computer players' faces change constantly—and some of their expressions make them look downright deranged.

displayed graphically as a histogram. At the end of the game, they're displayed again, along with an overlaying histogram of your "true" characteristics, as determined by your actual answers in the game. Sometimes the two histograms will be virtually identical; other times there will be great disparity. For instance, you might have told the computer at the start of the game that you're loaded with integrity, whereas your answers might show that you don't have an ounce. Other players' histograms are displayed before the game starts, but you only get a three-

second glimpse of them, which gives you an (extremely limited) idea of the kinds of people you're dealing with. Based on a computer player's appearance, the game decides just how much merit he or she has as a person and determines characteristics accordingly.

A side note: Interestingly enough, a complete louse has a fairly good chance of winning—a character I called "Mutant" rated extremely low in all favorable qualities, such as personal integrity, and extremely high in unfavorable ones, such as greed; he won consistently. ▶

Playing the Game

In both the board game and the computer game, each player receives a certain number of dilemma cards and one answer card. The dilemma cards pose moral questions along the lines of, "You try to phone a friend at 1 a.m. and dial another friend by mistake. Do you identify yourself?" or "You've driven into a parked car; do you leave a note?" Your answer card will say YES, NO or DEPENDS. If, for instance, your answer card says YES, your job is to determine which of your opponents will give a "yes" answer to one of your questions. If you're right, you take a new answer card. If you're wrong, you take an answer card and a new dilemma card. The object is to get rid of all your dilemma cards.

It's not enough to give a yes, no or depends answer; you must justify it. If one of your opponents thinks you're full of hooey, he or she can challenge you by saying what they think your answer really is. Then all players vote on which of you they believe. The loser must take a dilemma card from the winner.

Many of the questions are fairly harmless (Would you give up your seat on the bus to an elderly person? If your neighbors' dog ate some rat poison in your backyard, would you tell them?), while others can make or break a relationship (If you had an out-of-town extramarital fling, would you tell your spouse? You find your spouse's personal address book; do you glance through it?).

Actual gameplay is fairly simple. Scruples requires a mouse. Click on your answer card to find out what it says, then click on the question you want to ask an opponent. Next, click on the character that you want to answer the question. If you don't believe his or her answer, click on YES to challenge it. Otherwise, click on NO. Simple enough.

The Fun Stuff

Computer Scruples can be a very funny game and among its most humorous elements is the variety of facial expressions

your opponents display. As the game progresses, these players alternately smile, frown, wink, look around, yawn, or gape in surprise. One of the most common sequences shows a mouth saying "Ah. Ooh. Oh." The scruffier the character, the more manic he or she tends to look.

This game was programmed by Leisure Genius of London and a certain British flavor of the game comes through. For instance, the policeman wears a constable's bell helmet. Also, British expressions show up, such as "fancy," as in "I fancy a

**Scruples can
be nastier and hurt
more feelings
than "The
Newlywed Game."**

nice piece of fish," and "our" words, such as flavour, colour, favour, etc.

The documentation tells you all you need to know. In fact, since I already knew how to play the board game, I hardly needed to use the computer docs. The booklet is only 16 pages, but it's full of illustrations and it's mapped out clearly.

Problems

Computer Scruples is not without its quirks. It takes an annoying amount of time between stages of a turn. It also tends to use some questions more than once during the same game, especially if there are no human players. And after you choose players, the game won't let you "unchoose" any unwanted character. Nor will it let you play more than two games with the same group of computer players. (This is probably a bug in the

game; there's no alert box that pops up and says "You can't play anymore with these characters.") Finally, there's no option to quit the game entirely—you must shut off your system and reboot.

A Scrupulous Recommendation

A Question of Scruples: The Computer Edition is a good game that can become nasty at times. It is, I'm sorry to say, kind of a dumb implementation of the board version—but probably the only one possible. I think it's fair to conclude that A Question of Scruples simply doesn't lend itself to a computer atmosphere. Human personalities are complex and not easily quantified, so it's hard to believe in these fictitious computer characters.

On the other hand, Computer Scruples is still a fun game, at least for a while. When I played with three other people here at SIART, they seemed to find it intriguing, but after the second or third round of questions, they'd seen enough.

A Question of Scruples: The Computer Edition isn't the party game it would like to be. It's a decent one-player game and creating the characters is fun—it's a blast to watch their unusual facial expressions. But given the choice between this version and the board game, I'd have go with the board game.

BETTER DEAD THAN ALIEN

Reviewed by Scot Tumlin

Remember the first really good coin-operated video games like Asteroids, Space Invaders and Galaxian? Do you ever miss them? If so, pick up a copy of Better Dead Than Alien, the first ST release from Discovery Software. All three games have been combined in one often humorous package, complete with digitized sounds of applause—or derisive laughter.

As Brad Zoom, alien-blaster extraordinaire, your goal is to destroy wave after wave of continuously advancing alien invaders until either they're all gone or you're all dead! With stunning graphics,



Better Dead Than Alien (BDTA) will take you back to the days when alien-bashing and asteroid-smashing were all the rage.

Unavoidable Comparisons

The first few waves of BDIA start much the same way Space Invaders did: column after column of aliens move across the screen, while inching closer and closer to where you are at the bottom of the screen. But unlike the Atari arcade classic, BDIA allows your mouse-controlled spacecraft more freedom of movement, so you can move it up and down as well as sideways.

Like Galaxian, BDIA has aliens that make random strafing runs toward you and your ship. Each wave is composed of a different alien lifeform. As the waves progress they become more difficult. One wave displays a huge alien advancing on your ship. It takes a lot of shots to bring this puppy down.

Every other wave or so, a screen appears that will remind you of the famous arcade game Asteroids. Huge space boulders careen back and forth across the screen and you must skillfully dodge and blast them before they smash your ship. Once hit, an asteroid will break up into smaller asteroids, making survival even more difficult. I found that the best strategy is to destroy one asteroid at a time.

In Better Dead Than Alien, Space Invaders, Galaxians and Asteroids are combined into one sophisticated game—which has a lot more humor than you'd expect in a space shoot-em-up.

package also includes a Brad Zoom comic book adventure.

BDIA is easy to learn and fun to play. If you want to bring the good old days of the arcade to your Atari ST, pick up a copy of Better Dead Than Alien. And remember, the only good alien is a dead alien!

DIZZY WIZARD

Reviewed by David Plotkin

Dizzy Wizard is a game that has you guiding a whirling dervish through narrow paths, over obstacles and across gaping chasms. Developed for at least one megabyte of RAM and requiring a color monitor, Dizzy Wizard has a superior control system that demands quick reflexes and well-honed skill. But it's also terribly flawed (as many European imports are) by poor instructions and frustrating scenarios.

Controlling the Dervish

The object of Dizzy Wizard is to maneuver the dervish (a spirit) from a high plateau to the bottom of the level, where he can find and seize a fire. Afterwards, you must guide him back to where he started. Each level consists of hills, pathways, bridges, elevators and conveyor belts—and plenty of obstacles. You can use either the joystick, mouse or keyboard to guide the dervish. Go with the mouse.

The control system is outstanding; in fact, it's everything Marble Madness for the ST *should* have been. The control system is very intuitive and responds exactly the way you'd expect. The dervish keeps up with your mouse movements, in terms of both speed and direction.

The Obstacles

As you negotiate the dervish down the levels and back up again, you'll encounter a variety of items, some helpful, some harmful. Dice will appear from time to time, and running over them earns points. And accumulating points is important, because there's a minimum score ▶

The number of waves in BDIA is a secret the game's programmers would rather keep to themselves. I still don't know how many there are but I suspect it's well into the double digits. Waves are often given bizarre names, like Soprano or Jabberwocky. It's up to you to find them all.

The Energy Cylinders

All the aliens have red eyes. During each wave a bell will sound at random intervals and one of the aliens' eyes will turn green. If you shoot that particular alien and catch the cylinder it drops, you gain more power for your ship. A gauge on the lower right of the screen monitors your fuel consumption.

Often, energy is not the only reward for catching the cylinders. To the right of the game screen are icons that represent various weapons; one of these gives your ship rapid-fire capability, while another lets you fire single laser bolts powerful enough to destroy an entire column of aliens. Whichever icon is flashing when you catch the energy cylinder indicates which weapon you receive.

Manual and Wrap-up

The documentation for Better Dead Than Alien is scant at best. Fortunately, once you boot the game you'll have little problem figuring out what to do. The software

For the Fun of It

you must attain before you can move to the next level, even if you return the fire to the top. If you don't meet the minimum score, you'll have to do the whole level over again.

Each level has a time limit and if you don't complete the level within that limit, the game ends. You can have up to three dervishes going at once, with the computer controlling any one of them. But watch out: the other dervishes can get in your way too.

Great Graphics, But. . .

The graphics and sound in *Dizzy Wizard* are excellent and, as I've said, the control

found that games from Europe seem to have been designed by people who feel that the way to increase the time spent on a game is to make the game very difficult and tell you little or nothing about how to play it. Thus, you have to experiment and get killed off many, many times before you figure out how to get past even one obstacle.

For example, when you pick up the fire and start back up to the top of a level, the fire will suddenly detach itself from the dervish for no apparent reason and just sit there. It turns out that you can't pick it up again until you find more dice and accumulate more points. Clearly

top of the level with the fire. Swelling with pride, you're ready to move on to the next level—but just how do you do that? The documentation doesn't tell you, so you're left to wander around until time runs out. This is totally unacceptable. Having played hundreds of computer games, I've rarely come across documentation as inadequate as *Dizzy Wizard*'s.

Nevertheless. . .

Once you get past the problems, *Dizzy Wizard* is a pretty good game overall. But you'll need the patience of Buddha to tackle a game with documentation this inadequate. In other words, *Dizzy Wizard* is not for someone who isn't very tolerant. With excellent graphics and sound and a superb control system, this game is probably fun to play—if you can figure out how to play it. ■

Gregg Pearlman is an Assistant Editor for START. Scot Tumlin is Direct Mail Sales and Support Supervisor for Antic Software. David Plotkin is a chemical engineer for Chevron USA, and a Contributing Editor for START.



Will *Dizzy Wizard*'s outstanding graphics, sound and control system make up for its abysmal documentation? You make the call.

system is wonderful. Unfortunately, all this is wasted on a game that is excessively frustrating in many ways.

The frustrations begin with the loading process. *Dizzy Wizard* is heavily copy-protected, not only on the disk but also on a card with a grid of letters and numbers on it. The program will ask you for the symbol at the intersection of a particular row and column. Not only had you better take care not to lose the card, but you must have a ruler handy to figure out which symbol to enter. Be careful, because the instructions are confusing as to which symbol to key in.

The documentation is very brief. I've

something like this needs to be documented, but you're left on your own to find it out.

More Frustrations

While you're moving on to the next level a screen of blocks will appear suddenly and nothing you do can remove it. Then it'll disappear just as suddenly as it appeared. Since there's a picture of this screen on the game package, I must conclude that it's not a computer glitch. However, I still haven't figured out what it means or why it appears.


The supreme frustration in *Dizzy Wizard* comes when you return to the

PRODUCTS MENTIONED

A Question of Scruples: The Computer Edition, \$39.95, Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404, (415) 571-7171.
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Better Dead Than Alien, \$34.95, Electro Software, Imported by Discovery Software International, 163 Conduit Street, Annapolis, MD 21401, (301) 268-9877.
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Dizzy Wizard, \$24.95, Diamond Games, distributed by Robtek, Ltd., 1983 San Luis Ave., Suite 24, Mountain View, CA 94043, (415) 968-1345.
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VCR ORGANIZER

by James W. Maki

Get those videotapes organized! File VCR.ARC on your START disk.

If you have a sizeable collection of VCR tapes, I'm sure you've run into the situation where you have a tape with something recorded on it, but you don't know what it is—or you want to find a particular program without reading the label of every single tape. VCR Organizer is the answer.

With VCR Organizer, your tape library will become the envy of the neighborhood. The program will generate a label for each of your video cassettes and an alphabetized listing of all of your movies, TV shows, specials and sports events. It keeps track of movies (or other recordings) by cross-referencing the movie title with the tape number, so that you can instantly find a particular movie or check the contents of a tape.

VCR Organizer will run on a color or monochrome 520ST system with one single-sided floppy disk drive. To run VCR Organizer, first copy the files ARCX.TTP and VCR_ORG.ARC onto a blank, formatted disk and un-Arc the file following the Disk Instructions elsewhere in this issue. Double-click on the icon named VCR_ORG.PRG to start up the program.

VCR Organizer was written in Personal Pascal. The source code is on ►

You have a Video Cassette Recorder and an enormous stack of tapes with everything on them from Bambi to Masterpiece Theater to Hogan's Heroes. But you just can't seem to find the one tape that the kids want to watch. Let START's VCR Organizer come to your aid!



ELLEN SAAGER

your START disk for your examination.

Main Screen

The main screen of VCR Organizer consists of a card file icon with letters A through Z, plus *, a window for the movie title, and a window containing the tape numbers of entered tapes. The menu bar has the titles *File* and *Record*.

Under *File* are the selections *Enter Data*, *Print Contents*, *Print Cards* and *Exit Program*. *Enter Data* opens the Movie Input Window so that you can type in the movie names and tape counter readings. *Print Cards* prints up to three titles, in ascending tape number, on a 1-by-3-inch mailing label. *Print Contents* prints an alphabetized list of movies to standard 8½-by-11 paper and *Exit Program* closes all windows and files and returns you to the GEM Desktop.

Choices on the *Record* drop-down menu relate to the manipulation of individual records; *Save*, *Save/Exit*, *Clear*, *Exit* and *Delete*. Select *Save* to save the current record and clear the input screen so you can enter the next new record. *Save/Exit* saves the record (like *Save*) and closes the input window. *Clear* resets the current window, clearing all of the input fields. *Exit* closes the window without saving the record, and *Delete* removes the current record from the database.

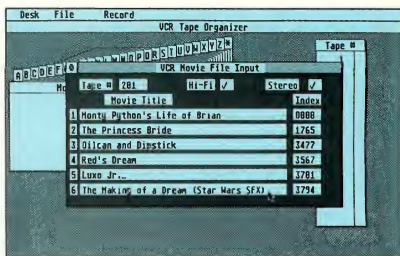
Cursor Commands

The up and down cursor arrows move the cursor up or down a field. Tab and Return will also advance the cursor to the next field. Esc erases all input in the current field.

Tape Information Entry

To enter new tapes into the database, select *Enter Movies* from the *File* drop-down menu. You will see a new window with the heading "VCR Movie File Input." The first field is for the Tape Number. You can enter any number between 0 and 9999. (Of course, you should assign a unique number to each

If you don't know which video cassette a particular movie is on, VCR Organizer lets you search *all* of your tapes by title and tape number—and finds the right tape.



tape.) If you enter a non-numeric character, the program defaults to zero.

Click the left mouse button on the Hi-Fi or Stereo box if either is appropriate. This places a check mark in that box. Clicking on the box a second time erases the check mark.

The next 12 fields are for entry of up to six events per tape. The first field is for the movie title and the field on the right is for the tape counter index number from your VCR. This makes it easier to find each program later.

When you're done entering information for that tape, select *Save* from the *Record* drop-down menu. Alternatively, you can select *Save/Exit* or click on the window close box to save your newly entered data and close the window. To clear all of the fields, select *Clear*. If you select *Exit*, all of the data you entered for that tape will be cleared and the window will be closed.

Retrieving Tape Information

To find the contents of a particular tape, select the tape number from the list in the tape number window to the right of the main screen. Tape numbers are listed in ascending order; you can use the window's vertical slider and up and down arrows to view other portions of the list. Click on the number of the tape you want to examine. The VCR Movie File Input window will then open and display the contents of that tape. The contents can then be printed, edited, deleted or even left unchanged.

To find a specific movie, click on the letter corresponding to the first letter of the title from the card file icon (keep in mind that the program ignores "The" and "A" as the first word in a title when alphabetizing). A list of movie titles will appear in the movie title window. Use the vertical slider and up and down arrows to view all of the titles. If you then click on the name of the movie, the VCR Movie File Input window will open and display the information about the tape that it's on.

Print Cards

If an individual tape record is displayed, selecting *Print Cards* will print a single record label. If no record is displayed, the entire database will be printed.

Print Contents

This selection will print an alphabetized list of all the movies in the database. Each page will consist of a heading approximately 56 movie titles and the page number. It is compatible with any printer.

Now Go To Work!

VCR Organizer will store up to 1,000 movie entries with up to six per tape. I'm sure that you'll find it easy to use and helpful in organizing your own special tape library. ■

James Maki is a full-time freelance writer and programmer who has been using Atari computers since 1982.

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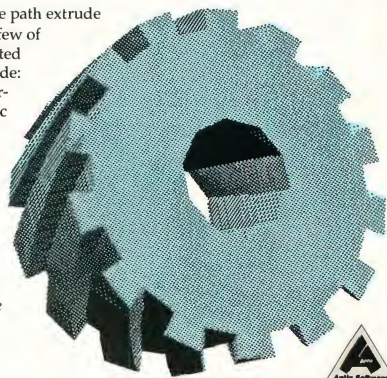
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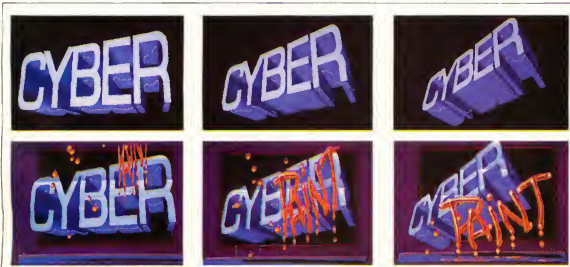
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3D Fonts II[™]

by *Doug Thomas* ©1987
Requires: CAD-3D 1.0 or CYBER STUDIO
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Cartoon Design[™]

by *Maurice Molyneaux and Andy Eddy* ©1987
Requires: CYBER STUDIO, CYBER CONTROL™ recommended



Architectural Design[™]

by *Darrel Anderson* ©1986
Requires: CAD-3D 1.0 or CYBER STUDIO
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Human Design[™]

by *Richard Berry* ©1986
Requires: CAD-3D 1.0 or CYBER STUDIO
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STO256

Video Titling Design[™]

by *Maurice Molyneaux and Andy Eddy* ©1987
Requires: CYBER STUDIO, CYBER CONTROL™ recommended; CYBER PAINT™ for special f/x
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Future Design Disk[™]

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Requires: CAD-3D 1.0 or CYBER STUDIO
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THE MICROBOT DESIGN

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Requires: CYBER STUDIO
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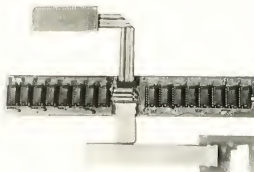
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ST Telecommunications

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by *Double Click Software*

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Action Adventure
in Deep Space

by Steve Crow and Bubble Bus

New!

Test your knowledge of Einsteinian Physics to repair the very fabric of our universe! Your mission: replace the nine core elements in the rogue planet before the entire cosmos is destroyed. But wait, it's not gonna be that easy. . . .

If the bugs don't kill you, the quake sure will. This is a new planet, and BIG! Fresh from that black hole. It's unstable and ready



to blow! To make matters worse, you don't know where the planet's core is located, or what the nine elements are. And there's these things floating around that suck the energy right out of you when they pass by, not to mention those whirly-slicer doobads with blades, and weird artifacts everywhere. You could get stuck wandering around the alien-infested caverns for years without finding your way

out, if you should live that long (but you won't).

Features include:

- Fast action arcade-style play
- 500 action-packed screens
- 30 on-screen colors
- Save scores to disk
- Four different musical scores available
- Beautiful animations

Requires: Color system and joystick
STO403 \$29.95

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by Bay Cities Software

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ALL ABOARD! comes with several pre-designed track layouts, plus trains and detailed scenery for



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