#1 Guide To Atari ST

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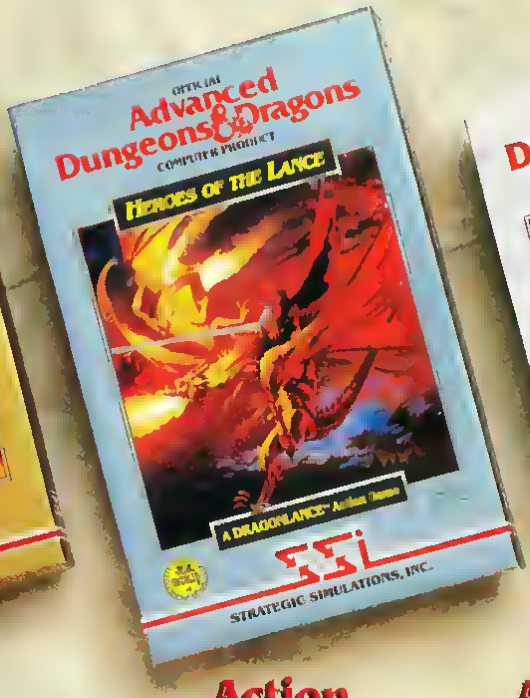

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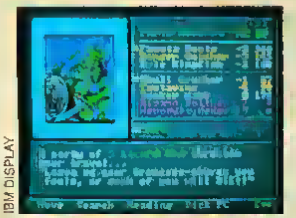

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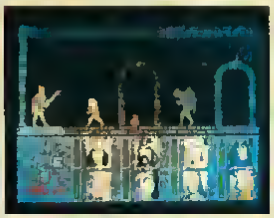

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Start Magazine May 1989

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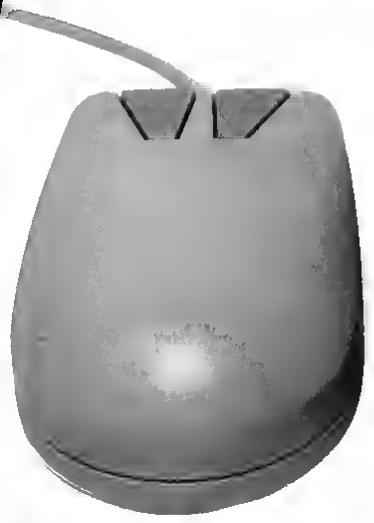
DECEMBER 1989 VOLUME 4, NUMBER 5



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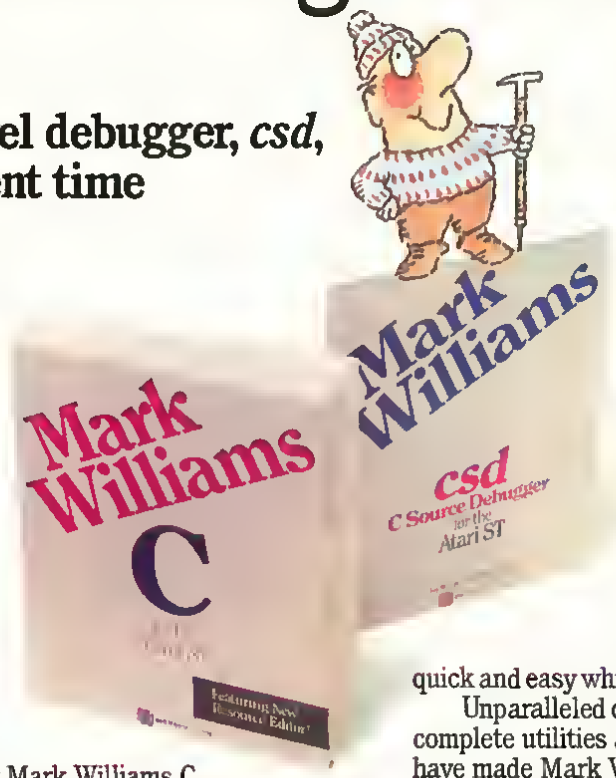
Mark Williams Raises C Programming To A New Level.

New source level debugger, *csd*, cuts development time in half!



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"This is a powerful and sophisticated debugger built on a well-designed, 'serious' compiler."
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FEATURES

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START
#1 GUIDE TO THE ATARI ST

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Editorial

How do you like the new START disk format? We're proud that we're now able to bring you more on a single START disk than you've ever received from any ST magazine before. But that's not all that's happening here.

This issue, we've reorganized START to make it even easier for you to find the programs, features and columns you're looking for. All features are now at the front of the magazine and the programs on your START disk are collected into a **special "On Disk" section** just after the Disk Instructions. We hope you'll like the new layout — let us know what you think.

If you like the new START double disk and easy Menu Program and enjoy the outstanding programs we bring you on every disk, why not **subscribe** to **START**? Not only will you save money every month, you'll also be sure to receive the Number One Magazine for the Atari ST — and for the Mega, TT, STACY and ATW!

This issue, we bring you a sneak preview of the new **Atari TT and STE** computers first shown in August in Dusseldorf, West Germany. The TT030 and its bigger sibling are the first Atari computers with the power of Motorola's 68030 microprocessor. Together with the evolutionary STE, the TTs form the heart of the Atari line for 1990 and beyond. Be sure to check out this article for the latest specs.

Ever used UNIX? No? Well, if you've heard of it or want to learn something about the operating system lurking in Atari's future, be sure to read **A Small Tour of UNIX** by START's inimitable Contributing Editor Dave Small, beginning in this issue.

Almost everyone wants to have the fastest machine on the block, whether it has four wheels or four megabytes. For our Feature Review this issue, we asked Dave Small to pit three new ST acclerator boards and two software accelerators against one another. We think you'll find the results useful and fascinating. They're in **The QueST for Speed**

On this issue's START disk, you'll find a fascinating mix of programs. For GFA programmers, we have **GFA Companion Version 2.03** that helps you create code-ready custom GEM dialog boxes. Yes, it's the original program previously sold by MichTron — worth the price of the magazine all by itself!

For the gamers, we have two solid programs: **ATTACK!** is Ron Schaefer's customizeable Defender-like game with smooth scrolling and lots of neat little touches. But if arcade isn't your thing, try the **Word Puzzle Designer** and create simple or complex word-finding puzzles in virtually any shape — and from your own word list.

There's always more in any issue of START than I can possibly talk about in the Editorial and this issue is no exception. Just take a close look at the Table of Contents and the Disk Contents ... and then plan on spending the next few hours with us!

ANDREW REESE
START Editor

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Dialog Box

Seeking the Seekshard

In the September 1989 issue, you included a very interesting adventure called Avecta I: Ebora. I have a problem with it To activate the teleport spell you must have in your possession a ''seekshard''. Where can I find a ''seekshard''? I have looked everywhere I can think of but yet I can't find one. Help!

Ronnie Harper
Oklahoma City, Oklahoma

If you give Wethwicker's All the World's Spells (which is hidden in the orcs' cavern) to Leveth he will give you a seekshard. You will receive a clue to Leveth's whereabouts if you are generous in your tip to the bartender at the Red Lion Inn.
—START Editor

No Exit, Stage Left

I'd like to compliment you on the fabulous delivery of Avecta I: Ebora. It's the best magazine game I've ever played. There is, however, a problem that I'm not sure is supposed to be there. The problem is that in the orc dungeon in the room where the ghosts appear saying, ''Our gold! You will not have it!'', the door I went in disappears and a new one appears on the left side of the screen. But when I try to exit the door on the left, it says that there is no exit where the door is. I can see the door on the screen and I can examine it, but I can't exit through it or rook/snoop it. I've tried thief, destroy, reveal, search, and prism on it without success. Is the disk defective or is this supposed to happen. If so, any suggestions?

Henry Chiu
Visalia, California

You can teleport out of this room if you have a seekshard; however, exploring this room is not necessary to winning the game—START Editor

Cyber Paint Music

I have a question about Cyber Paint 2.0. Can music and sound files be incorporated into it? Also, can Cyber Paint 2.0 animations be recorded to a VCR without buying anything additional like Cyber VCR?

Vic Wyant
Yorktown, IN

To add sound to your Cyber Paint animations, use Jim Kent's Audio Visual Sequencer (AVS) from the November 1988 issue of START. If you have a 520STFM model with an RF modulator that lets you use your computer with a TV, you can record this output onto a VCR; the better solution is to use Practical Solutions' Video Key that provides good quality composite video. If you have a Mega, JRI's GenLock is the best solution—but at the highest cost.
—START Editor

More Boxes

Just a brief note to let you know how much I appreciated the boxes (on program versions and how to upgrade) included in the article on programming languages in the August 1989 issue. This was very useful and I encourage you to do it in similar articles in the future.

Ruth Coy
Laurel, Maryland

Thanks. We'll try to include this information in all future overviews.
—START Editor ■

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

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

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#393/394 - PrintMaster Graphics
#395 - Desk Manager, Screensaver V2.0
RAM Disk, Disk Cache
#399 Degas Elite Printer Drivers
#400/800 - Disk Labeling Programs
#443 - Intersect RAM Baby
(RAM Disk/Print Spooler)
DCOPY do everything Utility Prg
#456 - Bolo Breakout Game
from Germany (Req 1 Meg RAM)
#468 - Accessory Ace V1.2 Mouse Speed
#475 - Werty's House of Horror
(Adult Game/Color Only)
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w/Digitized Voices
(Req 1 Meg RAM/DBL/Color Only)
#499 The Accessory V1.2
Multifunction Accessory
#500/600 - Publishing Partner Fonts
#509 Mark Johnson's Shareware
C Compiler (DBL)
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#512 - Dungeon Master Hints/Character
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#535 - Tree Chart Geneology Program
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#551 - Kid Shapes Ages 2-8 (Color Only)
#553 Kid Publisher Ages 4-12 (Color)
#555 - The Assistant Chef
Electronic Cookbook (Color Only)
#557 - Children's Programs (Color Only)
#564 - Cadenza Astrolocal V1.8 - Astrology
#567/728 Desk Accessories
#588 - Pac Man, Hangman and 5 others
(Color Only)
#590 Dungeon Master Utilities
#596 Pictionary Type Drawing Game
#599 - PageStream Fonts, Font Converter
#650 Text Output Accelerator
#651 - ST Virus Killer V2.1, Super Boot
#655 - **ST Writer V3.0** w/Spell V2.8
#667 - Benjamin's ABC's for Kids (DBL)
#679 - Disk Cataloger/Label Printer (DBL)
#688 - HP Laserjet/Deskjet Utilities
#689 Pictionary Type Game (Color Only)
#694 - Turtle Hard Disk Backup V3.0
#696/802 Hard Disk Utilities
#699 - Children's Programs Kid Color,
Kid Adder, Kid Story, Kid Sketch
#700 ST Xformer V2.4 - 8 Bit Emulator
#720 - Dungeon Master Maps Levels 8-14
#721 Drawing Programs
#723 Lottery Programs
#726 - Children's Programs Numerical Go
Around, The Wolf and 7 Kids Adv
#741 - Copystar V1.0, Address Book Base
#749 Barnimals Listen/Guessing game
#753 - Megatools V1.0 - Shareware Utilities
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#769 - Super Breakout (Mono Only)
#790 - Pentimo Strategy Game (Mono)
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#799 - PrintMaster/Plus Utilities
#801 - Mail/Envelope Labeling Programs
#803 - Desk Manager V2.5 Quick Menu
#807 - Quick ST V1.4, Turbo ST Demo
#810 - Sheet V2.5P S/W Spreadsheet
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News, Notes & Quotes

What's Happening in the Atari World

By Stephen Mortimer and the START Staff

Atari at SIGGRAPH

Atari Corp made a showing at the annual SIGGRAPH computer graphics convention this year in Boston, Massachusetts, held from July 31 to August 4. The conference drew over 30,000 people to view exhibits, attend conferences forums and courses and see the latest computer animations and artwork.

The Atari booth showed off two of the new Atari Transupter Workstations, which were running X-Windows under the Helios operating system. Frank Foster, Atari's director of Specialty Markets, explained that Atari hopes to do for parallel processing graphics workstations what the ST does for personal computers, that is, bring higher power for a lower price. The focus of the Atari SIGGRAPH appearance was to attract developers to the ATW, and Foster said the response had been good. Atari has already shipped about 300 units to developers, mostly in Europe. — Heidi Brumbaugh

What's Atari Up To?

Atari has made several major changes over the past summer, after a period of major product announcements and high expectations in the spring. As reported here last month, Atari hired the advertising agency of Chiat/Day/Mojo to help promote such new products as the STACY, Portfolio and the TT. Their subsidiary, Anderson and Lembke, will handle Atari Computer's products. Chiat/Day/Mojo formerly was employed by Apple Computer and produced some of the advertisements that introduced the Macintosh.

Atari recently began to sell the 520STFM through the discount Price Club chain as a short-term marketing test. Dubbed the 520 Game System, it includes a double-sided drive and a disk of public-domain games and will sell for $350. Atari's move to sell 520STs may be an indication that the four-year-old computer may be phased out to make room for new products such as the upcoming ST-based game machine and a low-end version of the enhanced STE that features an increased color palette and better sound. (See the feature story this month for more information.)

"Lynx" is the name for Atari's portable game system that was introduced at the June CES in Chicago, and it has created quite a stir in the industry. Some insiders think Lynx, originally dubbed the Portable Computer Entertainment System or PCES, is the product Atari needs to reclaim the video-game industry dominance it lost to Nintendo. Lynx has the advantage of having a color LCD screen instead of the Nintendo Game Boy's black-and-white screen.

Mike Dendo (Vice President Sales), Joe Mendolia (Vice President Marketing), and Chris Roberts (User-Group Coordinator) are no longer with Atari. Jim Fisher, a former employee of Federated, has assumed Mendolia's duties, while Fisher and Sig Hartmann have assumed some of Dendo's former responsibilities for the time being. No replacement has been found as of press time for Chris Roberts.

Recent activity in Atari's stock placed it near $10 per share in mid-August. The excitement on the American Stock Exchange surrounding Atari has been attributed to the imminent disposal of Atari's Federated division as well as takeover or merger talk on the street. Atari's Chief Financial Officer Greg Pratt absolutely denied that Atari was a takeover target, citing that the Tramiels own over 50 percent of Atari thereby effectively preventing a hostile takeover. However, Pratt allows that a merger is not quite as impossible as a takeover. Warner Communications, now part of Time-Warner, reportedly owns 25 percent of Atari stock and rumor has it that that block of stock may be sold in order to fund debt incurred by the recent merger of Time and Warner. ▶

News, Notes & Quotes

Upgrade for WordPerfect 4.1

As previously promised, WordPerfect Corporation is now shipping their long-awaited maintenance update of WordPerfect 4.1. This upgrade supports the ST's file-selector system, thus letting you use your own favorite file-selector, such as the START Selector or Universal Item Selector II, to access a file or macro. This update also offers the option to preview a document (with headers, endnotes, etc.) before printing it out. Registered owners can receive their maintenance upgrade by sending $17.50 to WordPerfect Atari Update, 1555 N. Technology Way, Orem, UT 84057, (800) 321-3271.

K-Spread 3 Version 3.5

Kuma Computers announces their updated version of K-Spread 3 (version 3.5). The major improvement to this popular spreadsheet program is the addition of an extensive range of macros, similar to the kind used in Excel. This upgrade is free to owners of the original version of K-Spread and can be obtained by returning the master disk to Kuma Computers. For more information, contact Kuma Computers, 12 Horseshoe Park, Pangbourne, Berkshire, RG8 7JW, England.

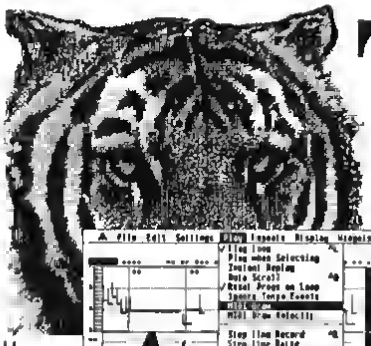
Alert Box

Boingo Blooper

In the article that accompanied Frank Cohen's program Boingo (START, October 1989), we failed to mention that the game will not run on 520STs. Our apologies for this oversight.

Bits not Bytes

In our Products Update section of the October 1989 issue, we erroneously stated that the Seymor/Radix VCR Hard-Drive Backup can transfer data at a rate of eight megabytes per minute. The correct rate is eight mega*bits* per minute.



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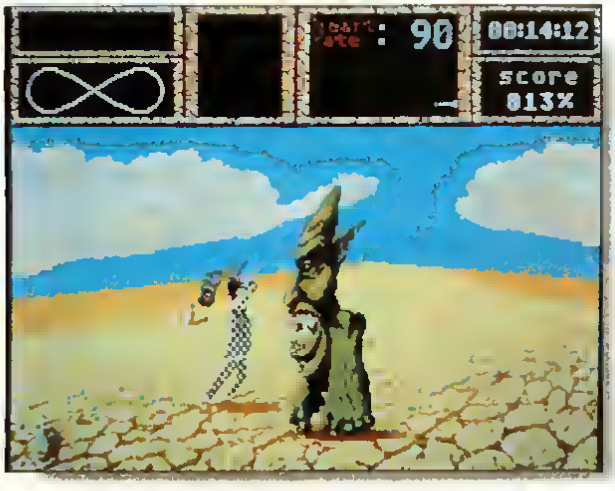
Products Update

New ST Software and Hardware

COMPILED BY MARTA DEIKE
START EDITORIAL COORDINATOR

New Games

Can you face the skeletons in your closet? Do you recover from Freudian slips? In **Weird Dreams**, Medalist International drops you into the subconscious mind of a hospital patient undergoing surgery. Your ability to confront the demons in the patient's mental underworld—psychopathic lawn mowers, little girls who aren't all sugar and spice—affects his health on the operating table. Interpretations of this game are welcome but, according to the authors, are entirely subjective (a sort of high-tech Rorschach test). Weird Dreams, $39.95. **Medalist International, 180 Lakefront Drive, Hunt Valley, MD 21030, (301) 771-1151.**



Welcome to the subconscious zone! A patient's life or death depends on your interpretation of his Weird Dreams.

Deliver papers to subscribers (and smash the windows of non-subscribers) in **Paperboy**, Mindscape's long-awaited ST adaptation of the arcade hit. Among other obstacles on your route, you'll face cars, bicycles, irate housewives, cats and lawnmowers. You can earn extra points on the "Paperboy Training Grounds," but be prepared for the unexpected. Paperboy, $49.95. **Mindscape, 3444 Dundee Road, Northbrook, IL 60062, (312) 480-7667.**

Accessories from MaxWell

MaxWell Computer Products introduces two new products for the ST, **GoGo>ST** and **MegSTender**. GoGo>ST is a quick-start tool, designed to make running a program fast and simple. With GoGo>ST, you can create a list of programs that automatically appear when you boot your computer, then all you have to do is select one and *go*! And GoGo>ST gives you full access to the ST's desktop functions, including desk accessories.

Also new from Maxwell is **MegSTender**, a keyboard extension cord for the Mega. Now you can move your keyboard around the room—great for MIDI applications and computer games. MegSTender comes in lengths of six, eight, 12 and 25 feet. GoGo>ST, $34.95; MegSTender, $16.95 to $24.95 (depending on length). **MaxWell Computer Products Unlimited, 507 W. Baseline, Lafayette, CO 80026, (303) 665-4849.**

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

THE FUTURE OF ATARI COMPUTING

TT and STE Unveiled in Germany

BY ANDREW REESE, START EDITOR

From the moment that Atari first showed the ST in 1985, the TT was a gleam in the designers' eyes. Finally, after more than a year of rumors and hopes, Atari showed the TT to the world in Dusseldorf, West Germany in August 1989. And as icing on the cake, they also showed the next generation ST: the STE. Want to know more? Read on . . .

When the ST was first introduced in 1985, Atari stole a march on the computing world, producing a ''next generation'' computer at an amazing price. Atari broke the price/performance barrier with the 1040ST being the first computer that cost less than one dollar for each kilobyte of memory. But microprocessor speed and power have increased so much over the last four years that an 8-MHz 68000 machine—even at an attractive price—seems a bit anemic.

ST stands for Sixteen/Thirty-two (16/32)—the Motorola 68000 is a 32-bit processor and communicates through a 16-bit bus. Motoroia's newer 68030 processor is also a 32-bit processor but it communicates through a *32*-bit bus. Moreover, the clock speed of the 68030 is a *minimum* of 16 MegaHertz. And the 68030 is at the heart of Atari's new TT computers, a prototype of which was shown at the Dusseldorf computer show last August.

But the ST is not dead—far from it, as a matter of fact. Atari has decided to update the venerable 68000 machine into the *STE* with the *E* standing for *Enhanced*. Also shown at Dusseldorf, the STE is the next generation ST. It uses TOS (version 1.6, of course) and adds several new hardware features, plus expanding the available palette from the ST's current 512 colors to 4,096.

The Siamese TT

There are actually *two* TT models. One is the TT030/2, as it is currently known. The TT030/2 is designed as an upwardly-compatible machine to the ST. It runs TOS programs right out of the box, if the software programmers followed Atari's programming standards. The TT030/2 starts with two megabytes of memory and a 16-MHz clock speed and is expandable internally to eight megabytes. With 4-Mbit DRAM chips instead of 1-Mbit, the TT's expansion capacity rises to a phenomenal *26 megabytes*!

The TT030/2 has room in the chassis for two rotating devices, such as one floppy disk and one hard drive. With a vast array of ports, including ACSI, SCSI and DMA ports, additional hard drives should be easy to add.

Other features include a built-in real-time clock, two 19.2-kb serial ports (expandable to four), stereo 8-bit PCM sound, MIDI in/out ports and a single VME-compatible Eurocard (A24, DI6) expansion slot.

The second TT configuration is another animal altogether. Originally called the TTX internally by Atari, it was designed to be a low-cost UNIX workstation. Since UNIX is such a memory hog, the TTX will come with a reported six megabytes of memory, a 100-plus-Mb hard drive and room for expansion. (*Editor's note:* If you aren't familiar with UNIX, the standard operating system for the "real world," see Dave Small's *A Small Tour of UNIX, Part I* in this issue.) At a price of, perhaps *one-third to one-half* the price of an equivalent Sun workstation, Atari could have a winner on its hands, depending upon its other specifications.

More Graphics and More Diskette Capacity

Both 68030 models will have the capability to expand the ST's graphics standards. The TT030/2 will run TOS programs in the familiar low, medium and high resolutions, but with the same expanded color palette available in the STE. While you can use an adjusted IBM VGA monitor with the TT030/2, it is said to perform better with a multisynch monitor. Atari plans to market its own compatible monitors.

The new graphics modes are set forth in the accompanying table. Most notable is that the resolution in monochrome has been *doubled*, from 640-by-480 pixels to *1,280-by-960* pixels, and that two new color modes have been added, one with 256 colors (selected from 4,096) on a 320-by-480 screen and the other a 16-color mode in the old monochrome resolution.

Atari may be following the IBM standard by adding high-density 3½-inch disk drives, although this has not been confirmed. TT drives would be able to read and write 1.44 megabytes per disk—double-sided, of course.

Sound, Music and Math

Both of the TTs and the STE sport new sound capabilities. Where the ST has a Yamaha YM2149 sound chip, the new machines have two 8-bit digital-to-analog sound convertors to provide realistic PCM stereo sound.

For those who need heavy-duty number crunching, the obvious answer is to add a 68881 or 68882 math coprocessor. Both of the 68030 machines have sockets for easy upgrade by simply plugging in the new chip. Word is that the workstation will have a 68881 or 68882 included in the purchase price. The STE will not have an 68881 socket.

Keyboards and Cases

The STE case will not be the same as the familiar 520/1040ST case (the need for stereo audio outputs alone will require different plastic). Atari was mum on whether the STE will be sold in a variation of the all-in-one case or will be in a CPU and detached keyboard configuration. The TT030/2, however, will be in a unique and striking new case, about the size of a Mega, but more rectangular. One of the best aspects of the TT030/2, however, will be that it will have the new high-quality Atari DIN-standard keyboard.

No one at Atari would commit on the record to a physical description of the TTX, but one description we heard was of a floor-sitting tower configuration like the ATW. Certainly, the larger system will require increased case size to contain up to six rotating devices, such as large hard disk drives, tape-backup units, optical drives, etc. Additionally, while the TT030/2 has only a single Eurocard-size VME expansion slot, the TTX is said to sport six slots for exceptional expandability. ▶

More STE Goodies

In addition to the increased palette and stereo sound, the new STE line will also have hardware for fine scrolling and ports for analog joysticks, light guns and paddles. For graphics buffs, the STE will also be "Genlock-ready," so that an external Genlock can be connected with no modifications.

Implications for the Future

With the release of the 1989 Atari line, we should see a new product alignment. The 1040STE shown in Dusseldorf will replace the 1040ST and, with additional STE models coming with up to four megabytes of memory, the Mega line seems in danger of extinction, especially since the TT030/2 can do everything the Mega 2 can do—and more.

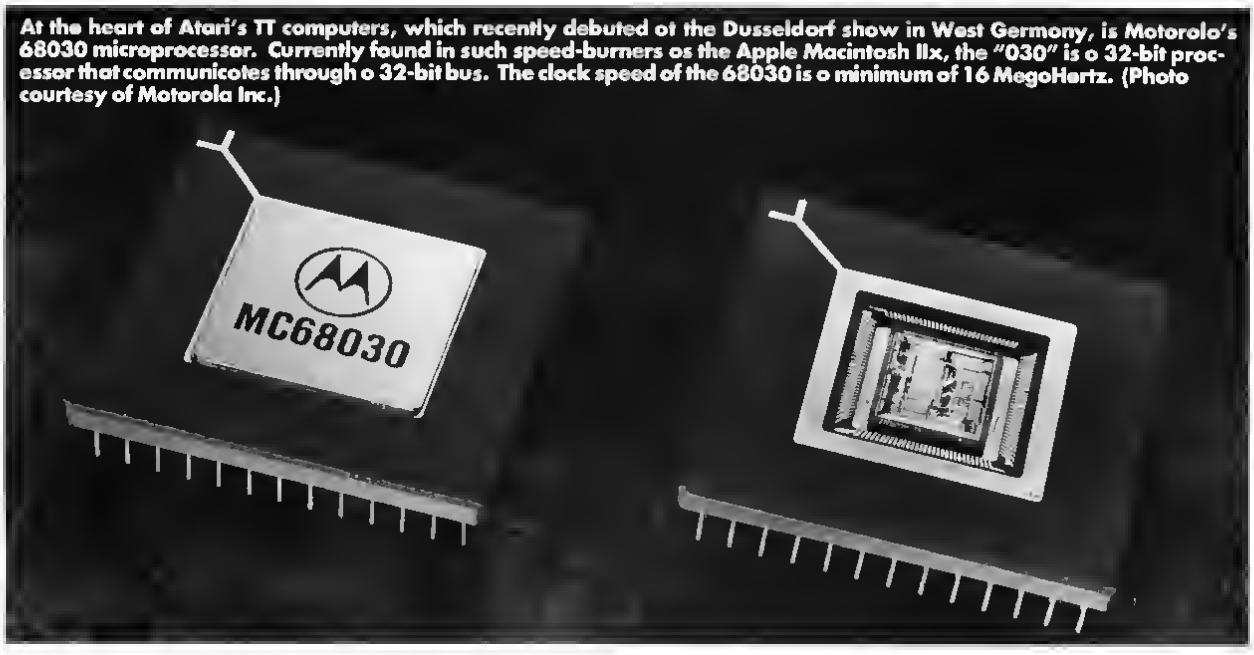
The 520ST has long been the entry-level computer for the ST line. The more sophisticated ST software available now makes such heavy demands on RAM that the 520ST is coming close to being too small (Can all you old 400/800 owners believe it? 512 kB of RAM is too small?) If Atari markets the long-rumored "ST game machine," i.e., 68000-powered keyboardless computer, whether ST-compatible or not, it could replace the 520ST, at least for gamers.

The TT's can be expanded to a phenomenal *26 megabytes*!

But the 520ST just may stay around. In some countries, the 520ST is the biggest-selling model, primarily because of price. If it continues in the United States, the new ST lineup will start with the 520ST and the 1040STE and extend to the TTX (and ATW). With the TT030/2, larger STEs and the STACY in the middle, Atari will have a powerful new line. And remember, the 68040 is compatible with the 68030.

Is this the end of "Power without the Price"? Well, it's not likely that the STE line will be much less expensive than the equivalent ST/Mega models, but those prices are still quite attractive. And if 1-Mb DRAM prices continue to decline, the ST/STE prices could drop, especially since RAM is the highest single cost component.

We've also heard amazing prices



At the heart of Atari's TT computers, which recently debuted at the Dusseldorf show in West Germany, is Motorola's 68030 microprocessor. Currently found in such speed-burners as the Apple Macintosh IIx, the "030" is a 32-bit processor that communicates through a 32-bit bus. The clock speed of the 68030 is a minimum of 16 MegaHertz. (Photo courtesy of Motorola Inc.)

for the TT030/2: *$1,495 or lower*—that's right, a 68030 machine for less than $1,500! That's a price that could cause competing 68030 computer makers to have nightmares. And the TTX? That's projected for less than three times the price of the TT030/2 with a high-capacity hard drive *and* an external Megafile 44 cartridge tape unit for quick backups and easily expandable storage.

Availability

Atari officials have sworn that the TT030/2 will be available in this country before the end of the year. Given the number of models that Atari is planning to introduce before 1990, this will take some doing. Cross your fingers—with a four-month production/shipping lead time, the TTs had better be on their way here now as I write this in September—or 1990 will arrive before the TT.

The STE is being introduced in Europe in September with sales in the U.S. to begin in October, according to Atari President Sam Tramiel. This seems a violation of the promise that Tramiel made several times to U.S. Atarians that new products would be introduced here first. But one senior Atari employee who declined to be quoted on the record argued forcefully that it would be foolish for the international company to forego income derived offshore, just because FCC certification procedures cause unnecessary delays. (Then again, if the products had been submitted to the FCC earlier, Atari could have kept Tramiel's promise.)

The Bottom Line

Overall, the new Atari line is a worthwhile revision. If you have an ST and need more speed and power for your TOS applications, the TT030/2 appears to be the way to go. If you've been shopping for a UNIX workstation, the TTX is an obvious choice. The STE sounds like a nice incremental improvement in the ST, but since it adds neither greater processing speed nor significantly expanded graphics capabilities, it's not a major enhancement. The new sound and graphics capabilities are nice, but current software will have to be rewritten to take advantage of them. Now, if Atari markets them aggressively, both in price and availability, they could gain a foothold. But the STE's success—indeed, the success of the entire new Atari line—depends more on advertising and dealer and product availability than on the product specifications themselves. ■

Colors

On-Screen	Palette	Resolution
16	512/4096	320 X 200
256	4096	320 X 480
4	512/4096	640 X 200
2	512	640 X 400
16	4096	640 X 480
Mono	—	1280 X 960

Graphics Modes for the new TT. Of most significance are the expansion of the base palette to 4,096 colors, the new VGA-like 256-color mode and the ultra-high resolution monochrome mode.

BY DAVID SMALL START CONTRIBUTING EDITOR

A SMALL TOUR OF UNIX

PART 1

First shown publicly in Dusseldorf in August 1989, Atari's new TT features some pretty hot hardware: a 16-MHz 68030 that runs about four times faster than an ST; higher resolution displays; lots of serial ports; works with lots of ST GEM programs . . . and UNIX compatibility. Wait, you say—UNIX? If you've read about UNIX, but never done much with it, let Dave Small take you on a tour of UNIX. In Part I, Dave covers basic UNIX system organization.

I wonder what UNIX is all about? I wonder what it's like?

A year or so ago I asked myself the same questions and ended up with a small UNIX machine to learn on. At this point, I'm reasonably UNIX literate. I can walk around inside a UNIX system and actually *use* it. I'm no UNIX guru, but that's

GEM and UNIX come at the same tasks from different directions.

good—because articles written by gurus invariably lose a beginner's perspective

I thought I'd tell you what I understand about UNIX and take you for a walk though UNIX. I'll orientate the discussion towards the ST, use ST-based examples wherever I can and try to stay away from guru-ese. I'll keep it as informal as possible.

MultiUser/MultiTasking

On the ST, you do one thing at a time. Only one user does it at a time, too. UNIX is totally different.

UNIX completely predates microcomputers, there wasn't even a 68000 when UNIX was first designed! Hence, UNIX is designed for those *BIG* computers—the ones that many terminals are connected to and many people are doing work on, all at the same time.

Thus, on a typical small UNIX system, you can plug in, say, five users—''Multi-User''— and they can each be working at the same time—''Multi-Tasking''. Each user ''thinks'' he has the machine to himself; the machine time-shares between users. (Cold Reality: The more users on a machine, the more it slows down.)

It's hard to find a generally known analogy for ST users for all this. Dave Beckemeyer's MT C-Shell for the ST is a very good UNIX ''workalike'' for the ST user. With it, I can plug a terminal or another ST into an ST running MT C-shell and be doing things (say, writing a BASIC program) on my terminal while another user, on the ST's keyboard, is doing something else (say, writing a letter in WordPerfect).

In UNIX, typically, each user plugs in through a serial port. It's a good thing the TT has four of them for multiple terminals to be added in. The ST only has one. (On expensive UNIX boxes, they sometimes use high speed links, such as Ethernet to hook UNIX boxes to UNIX boxes and to other users; the TT has Ethernet, too.)

User Nomes ond Directories

Of course, this multi-user stuff implies that each user has a name, so that the system can keep the users straight. So on a typical UNIX system, you have to ''log in'' to start a UNIX work session. Therefore, instead of just turning on your ST and getting going, you'd turn on the TT with UNIX and ''log in'' under a user name with your password. I use ''dsmall'' on my UNIX box.

The only good ST analogy for this is on a bulleun board or big network such as CompuServe or GEnie, where you have a user number/name and password, a separate place for your e-mail and sometimes for your files. The ST itself assumes it only has one user and thus never asks your name—and why should you need a password, anyway?

Since a UNIX system has multiple users, each one needs his own place to store files; otherwise, everyone's files would get mixed together. UNIX uses subdirectories (folders to us ST people) to handle separate filing areas. There can be subdirectories within subdirectories (folders within folders), just as with the ST and the way you name a file within a folder (the pathname) is remarkably like the ST.

Let's say we have a UNIX system with three users on it. We would have a place to keep users (a folder named ''usr'') and three sub-tolders in it, called, say, ''dsmall'', ''dwheeler'' and ''heidi''. I'd keep my files in ''/usr/dsmall'', Doug's files would be in ''/usr/dwheeler'' and Heidi's files in ''/usr/heidi''. This is called your ''home'' directory; if you type ''cd'' (change directory), you come back to here. On the ST, it would be ''C:\usr\dsmall'', ''C:\usr\dwheeler'' and ''C:\usr\heidi''. See *Figure 1*.

Note the difference in forward and back-slashes! This is one difference that is guaranteed to drive you nuts, UNIX uses forward slashes, while GEM uses backslashes. Switching back and forth from GEM to UNIX is *not* pleasant!

Drive Letters vs. Subdirectories

Also note there are no drive letters in UNIX. On the ST, we have A: and B: for floppies, and C: through P: for hard disks and RAM disks, in other words, we have multiple root directories, each on a separate disk drive. Your hard disk ''root'' or lowest directory on C: is ''C:\''; that's displayed whenever you first open the ''C:'' folder.

In ST terms, think of UNIX as only having one disk drive with the drive letter, say, C: for the hard disk, just being assumed. You can assume the hard disk part; UNIX is so huge that a hard disk is simply required.

The UNIX ''root'' directory is similarly named, ''/'' (remember, forget the drive letters; there's only one drive). All folders are built up from that one root directory, as though your ST only had one hard disk name, but no 16-megabyte limit on partitions. There's no limit on UNIX directory size.

But there's still no UNIX drive letters. So how do they handle ''removable storage,'' like floppies?

UNIX was designed *before 3½-inch floppy disks*! So floppy support ▶

was added later. The closest analogy to a floppy disk the designers could think of was a "removable disk pack," like the big 500-megabyte units on mainframes. Thus, to access a floppy, you have to insert the floppy disk, type in a UNIX command called MOUNT (just like operators MOUNT a disk pack), and when you're done, you have to de-MOUNT the "disk pack" floppy. (Sheesh!)

When you MOUNT a floppy disk, you attach it to a subdirectory or folder. For example, let's say you have a folder called "\floppya". When you request a directory on it normally, it's empty. Ah, but when you MOUNT a floppy, suddenly that floppy's data is available inside of the "/floppy" folder. In an ST, this would be just as if floppy A:'s data showed up inside of a "C:\floppy" folder whenever you put a disk in A:! And, of course, when you de-MOUNT "/floppya" from its floppy, it reads empty again.

So you see, GEM and UNIX come at the same tasks from different directions. In GEM, there are multiple directories, each one based on a different drive. In UNIX, there is only one main directory with different drives showing up as subdirectories, along with the "normal" other subdirectories on the main drive.

Each user "thinks" he has the machine to himself.

Owners and Permissions

Since there are named users with their own files, suddenly there are *owners* of files. Each person has exclusive rights to their files. Each file has *permissions* and an *owner*. You, as file owner, can select whether only you, your "group" (presumably, an immediate group of people with whom you work on a project) or anyone on the UNIX system can use your file. And that means either to execute it if it's a program, read it if it's data or write to it (and possibly destroy it). There's nothing like this on the ST, short of some custom password-protection program for a file, say, using ARC's encryption option.

Hence, unless Doug specifically lets me look at his files by granting me permission, I can't use them. And vice versa.

Again, the only analogy in the ST world is on a multi-user BBS or large network; other people can't read your private mail, unless you specifically let them.

Next Issue

That's enough for the first few steps on our UNIX tour. In the next issue, I'll introduce you to the guru named root and show you some of the uglier sights in UNIX ■

Contributing Editor Dave Small is one of a small circle of ST pioneers who have helped to make the ST popular. Dave has been a leader in the development of ST Macintosh emulators, culminating with the release of his latest triumph, Spectre GCR.

ST vs. UNIX PathNames

ST

Drive A:\

Drive B:\

Drive C:\AUTO\STUFF\BASIC (misc.folders)

UNIX

/(the root)

/AUTO/STUFF/BASIC	(misc.folders)
/FLOPPYA	Becomes contents of floppy A if A is MOUNTed!
/FLOPPYB	Becomes contents of floppy B if B is MOUNTed
/SR	

/USR/DSMALL	/USR/DWHEELER	/USR/HEIDI
Dove's Files	Doug's Files	Heidi's Files

Unlike the ST's GEM file management system, UNIX requires a more extensive system to manage and separate multiple users on a single system. The worst part of moving from one system to another is that UNIX uses a slash (/) where GEM uses a backslash (\)—a difference guaranteed to drive you crazy!

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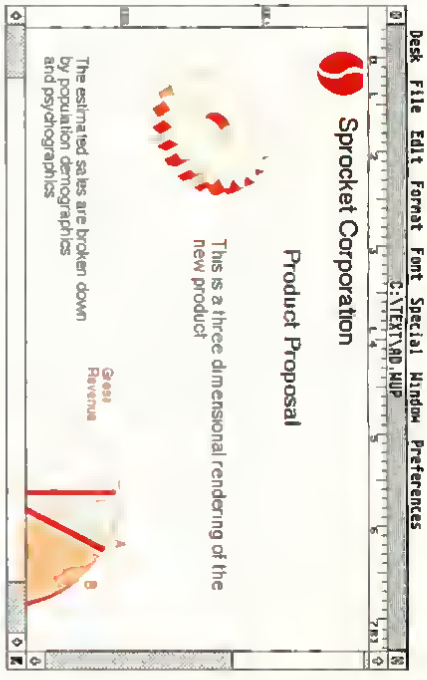

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BY DOUG WHEELER AND DAVID SMALL
START CONTRIBUTING EDITOR

The Quest for Speed

Accelerator Boards and Software for the ST

One of the hottest trends in the ST market today is speeding up your ST. There are many ways to do it: disk accelerators, ''software Blitters'' and ''16-MHz accelerators'' are available today and doubtlessly more products are on the way. Dave and Doug's overview is designed to tell you what these products do and how well they do it, so that you can decide if they're for you!

There are really two ways to speed up the ST. Either the software can be improved with better programming, so that the programs run faster, or the hardware can be sped up, giving the same result. (Of course, the ideal situation is that both of these occur, for the maximum speedup.)

One thing we can't do for you is to identify just where your ST is being slowed down the most, and where you can do the most to speed it up for the least money. This varies from program to program. For instance, if you use a lot of graphics and animation, you ought to focus your attention on speeding that subsystem up, with a Blitter or software Blitter. If the disk is slowing you down, you need to work on the disk system with a hard disk, Twister, cache or RAM Disk.

Accelerating some part of your ST that doesn't *need* acceleration is like adding (let's say) a bigger fuel pump to a car whose fuel pump is already just fine; it won't do you much good. So keep your particular system in mind as you read this article and where *you* could use the acceleration the most.

Ways to Speed Up the ST Without Replacing the 68000

It is possible to speed up your ST without replacing the 68000 through either software or hardware. Software-only acceleration offers some interesting alternatives and often at the best price possible: free! Many of the alternatives given here are available for the price of a phone call to a local BBS, are on a local user's group disk collection or in the massive BIX/Compuserve/GENie libraries. ▶

Now if the programs you use are rewritten to be more efficient and run more quickly, that'll help speed up your machine. CAD-3D version 2.0 was rewritten to be much faster than version 1.0, for example. Sometimes this happens in the next version of a program, sometimes not. Alas, you're not in control of this process.

However, the programs you use often rely on features of the ST's built-in operating system that you *can* speed up. Two that you can most often help are the disk system and graphics displays. Most ST programs rely on the ST's operating system to run the disk drives and the graphics and you can change these modules to your advantage; thus, most programs will show an improvement. Let's discuss disk drives first.

Disk Drive Accelerators

If you spend a lot of time waiting on disks, then a disk drive accelerator is probably for you. It is unlikely that speeding up the 68000 will matter if you're waiting on the disk; all that will happen is that you'll wait 16 million times per second instead of eight million times per second!

The way to judge this is by how much time you spend waiting for the disk to do something (load/save a program, get data, store data), be it a floppy or hard disk. If you spend most of your time "number crunching" (for instance, recalculating a spreadsheet), then a 68000 accelerator will do more for you; if you spend your time copying files, a disk accelerator will help more.

Twister

If you use floppy disks, the first and best accelerator is the Twister format, which debuted here in START several years ago. Twister changes the way data is laid out on the disk, letting the ST access it up to twice as quickly as the standard ST format. Twister proved so successful that Atari adopted it in the Mega ST machine's operating system (TOS 1.2), so you may already have it! If not, Twister format is available from START in back issues, as an option in the shareware "DoubleClick Format 3.01" program and as an option in NeoDesk.

If you're on a low budget and cannot afford a hard disk, we recommend Twister or one of its derivatives for speeding up your floppy disks. The ST features a fine floppy system, capable of the maximum possible speed that any manufacturer can get out of a floppy, *if* you use Twister format. All that's required to use it is to format disks in Twister format, after that, reading and writing to them accelerates, particularly on large files.

RAM Disks

Another alternative is a RAM Disk. This converts a section of your ST's memory to a pseudo-disk that is very, very fast. Of course, there are some trade-offs, you lose anything in that "disk" when you power off or crash and if you don't have much memory in your machine, you can't afford to give 400K to a RAM Disk. There are many RAM Disks available as either public domain or shareware, some of which are even Reset Proof (whose data will survive you pressing RESET, but not powering off).

If you're on a low budget and cannot afford a hard disk, we recommend Twister.

Cache Programs

A third way to accelerate disks is with a cache. A cache is a small, dedicated RAM Disk that remembers certain parts of a disk in memory, so that they don't have to be re-read; typically it remembers the directory area of the disk, plus the last few sectors read in. Strictly depending on the program, this can range from no-help to great acceleration. There are many cache programs in the public domain/shareware, and Atari even now has an official cache program.

Get A Hard Disk

I realize that hard disk doesn't fit under software accelerators, but it's a logical place to mention them, since we're talking about disks. A hard disk will greatly increase your disk speed. Some good news for you: hard disk prices are constantly dropping. We recommend comparing prices here in START, at your local dealers, and mail order for the best buy. We can strongly recommend, from personal experience, hard disk units from Berkeley Microsystems, ICD, and Supra (names are in alphabetical order), all three companies have been in the business a long time, have excellent support and good products. (There are other companies that make hard disks, which we simply haven't seen yet, for instance, the new removable hard disks may be the next wave in hard disks.)

We can also say that for nearly all ST users, a hard disk is the first *Best Buy* to speeding up your system overall and getting more out of your ST. We feel that even 16-MHz CPU accelerator companies would agree with us that your money is best spent first on a hard disk, then on their accelerator; hard disks typically are ten

times faster than floppies, accelerators typically 1.5 times faster than a regular ST. You can see where the big gain is to be made.

Don't underestimate the power of the ST; it is capable of scorching speed on hard disks. An ST hard disk, properly configured and with the right software, will outrun the hard disk of a 16-MHz Mac II!

If you do have a hard disk, though, and don't have the brand new TOS 1.4 ROMs in it, you'll find that as your hard disk fills up, it takes longer and longer to write to it. This is a bug in the ST's operating system, commonly called the FAT bug. There are three ways to fix it.

HARD DISKS: FIXING THE FAT BUG

Hard Disk Turbo Kit, FATSPEED, TOS 1.4

The first thing you can do to speed up a hard disk is to "defragment" the data on your hard disk. This moves portions of files together so that they can be accessed in the minimum time. Second, you can move the data on your hard disk so that new data is written towards the start of the hard disk, the Hard Disk Turbo Kit program (formerly TuneUp) from MichTron will do this quickly and easily. The next time you write, the difference may startle you; on a near-full 15 megabyte hard disk, disk-write times went from 45 seconds to *six seconds flat*!

Another alternative is the shareware FATSPEED.PRG program, which goes into your AUTO folder. This replaces the slow Atari FAT routine, and greatly accelerates writes to the hard disk. We strongly recommend this program to anyone with a hard disk and a version of TOS lower than 1.4.

TOS 1.4 has a rewritten FAT lookup routine that fixes this problem. (Don't use FATSPEED with TOS 1.4.)

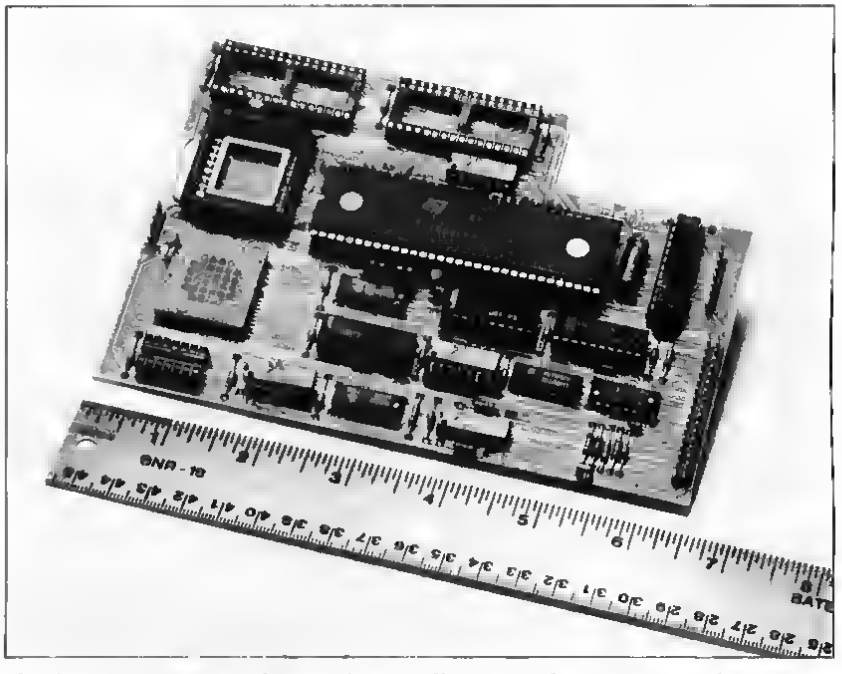
Until we installed TOS 1.4, we used both FATSPEED and MichTron's product regularly and can strongly recommend both. One note for Hard Disk Turbo Kit users: please don't use it on a full hard disk. Give it a megabyte or more of workspace.

Replace The Mechanism

Finally, if you have a slow hard disk (say, a 65-millisecond Seagate ST-225 that's in most Atari-built units), don't neglect the speed advantage of a faster hard disk (for instance, a 28-millisecond 40-megabyte ST-251) and of using an RLL hard disk unit. While this is on the upper end of ST users, as a general rule, as you accumulate more data on your hard disks, you have to move it around more often, the faster the hard disk, the better. Usually replacement is a simple matter of moving the cables from one unit to another and reformatting.

This pretty well covers accelerating one major subsystem of the Atari: disk storage. Next, let's cover accelerating the graphics subsystem.

As with all these sections, please keep your individual needs in mind. For example, a software graphics accelerator does us little good if we're not doing graphics! A large percentage of our time is spent waiting on the computer to assemble and link yet another revision to source code and there is no benefit to that process from a graphics accelerator; only a faster hard disk or faster CPU will help. Yet for those times we are editing code, having a faster display in the text-editor window is well worth it.



The CMI Processor Accelerator is actually more of an expansion board than just an accelerator. You can add a 68881 math Co-processor, a Blitter chip and replacement ROMs for fastROM access. Adding all of these chips runs the price up to over $500, but for particular applications, it may prove to be worthwhile. Without them, the performance improvement was approximately that of the J.A.T.O. Board.

Software Graphics Accelerators

There are two forms of graphics accelerators. One is software and the ▶

other is the Blitter chip. Let's take software first.

Whenever a program needs to show you something on the video screen, such as opening a window, it calls the Atari's built-in operating system, stored in permanent ROM (read-only-memory) chips inside the ST, to do this. The ROMs were written in a real hurry back in 1984/1985, are not optimally coded and have not been fixed. Thus, text isn't written to the screen as fast it could be, line-draws aren't as fast as possible, and so forth. (By the way, if you want to see truly amazing speed out of routines written for maximum performance, try the Tempus text editor; it is "what could have been" if the ROMs had been optimized.)

If you install a replacement for these graphics routines, you'll see great performance increases. For instance, when Showing a file to the screen, it can literally fly by too quickly to be read with a software accelerator. Word processor screens speed up, particularly in scrolling and animations speed up greatly.

There are two software graphics accelerators we are aware of. The first is TurboST, written by Wayne Buckholz, an assembly language wizard in Florida. It's sold by SoftTrek (see the end of the article for a list of prices and addresses for all these products). When we first met Wayne, he was demonstrating a small circle-drawing program that plotted 600 circles per second, at varying radiuses, we were amazed! Wayne's taken his graphics and assembly language skill and applied them to the ST with excellent results. The current version of TurboST is 1.6; it fixes some bugs in previous versions, plus accelerates more of the slow ST graphics routines.

The other is Quick ST, written by Darek Mihocka, who is otherwise famous for his Atari 800 emulator for the ST, another feat of assembly language wizardry and programming for speed. Darek's emulator approaches the absolute theoretical limits an emulator can achieve! Quick ST is shareware; this means you download it or get it from a BBS *for free*, then send money ($15) if you like it and use it. Incidentally, the source code for Quick ST is also available, this is a very generous move on Darek's part and gives neophyte assembly programmers some terrific examples of ultra-optimized code. There are many tricks to high speed coding that are best learned by example.

Both of these programs come as desk accessories; to install them, you just put the .ACC file on your startup disk, be it floppy or hard disk. That's all. The difference will show up immediately the next time you do something to the screen; windows seem to pop open and snap shut, text scrolls by very quickly and graphics operations really fly.

There is some debate currently about which of these is faster, but from a user's perspective, this is just a debate on if they're very good or very *very* good. Either way is good news for the user! We recommend trying both and sticking with the one you like.

We use TurboST on all of our machines.

TurboST is an amazing feat of programming on Wayne Buckholz' part.

Blitter Chip

When Atari released its Mega series of computers, it added a special chip whose only purpose was moving things around in memory very quickly: the Blitter chip. (Some say Blitter stands for Bit-Block-Transfer). In any event, if you're doing graphics animations, line drawing and so forth, the Blitter will definitely give you a speed advantage.

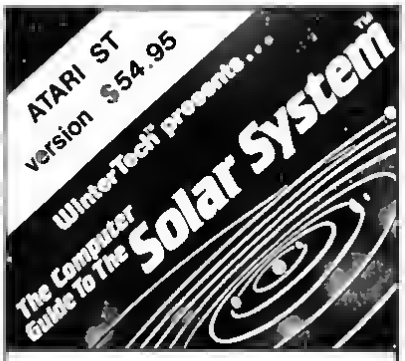
Atari long had announced that the Blitter would be available as an upgrade for 520/1040 owners. However, recently that promise was withdrawn; Atari said the conversion unit could not meet FCC specifications. There are now aftermarket manufacturers offering kits that let you put Atari's Blitter into an older 520/1040 machine.

If you have a Blitter, you will notice greater speed in such things as desktop operations (windows pop open and snap shut), text scrolling faster than you can read it, and so forth. When you have the Blitter turned on, Atari redirects graphics operations away from its old ROM graphics drivers to the Blitter, which does these operations in hardware.

However, the 68000 is a very, very fast processor. When properly programmed, it can outperform the Blitter in many operations! Hence, both Quick-ST and TurboST have published benchmarks which show them outperforming the hardware Blitter.

Before being convinced that the Blitter chip is the way to go, we strongly recommend going to a local store and trying TurboST version 1.6 against the Blitter. We did this comparison and found that TurboST is generally faster. Again, this is an amazing feat of programming on Wayne's part.

continues on page 37



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CIRCLE 016 ON READER SERVICE CARD

TAKING THE ST TO THE LIMIT

Elmtec
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M. ROSENTHAL

Want more speed? Is 6.125 MIPS enough? Hungry for color? Well, if 196,000 colors from a palette of 16,777,216 colors aren't enough for you, then turn the page. But if you're interested in how to make your ST perform like a graphics workstation, read on. The English lads from Elmtech are invading the U.S. with ParSec and the ST will never be the same!

In today's computer world, the ST's graphic abilities are far from astounding. At one time or another, it's been called the ''plain vanilla'' or ''basic'' 68000 machine. No matter that it's an amazing blend of power and low cost or that it performs feats equal to (and occasionally superior to) other 16-bit computers on the market, it's just that its maximum of 16 colors on screen from a palette of 512 seems a bit tame by today's standards. The ST seems to have been relegated to the graphics role of the ''second car'' for paint programs and the like. Until now, that is.

Enter the ParSec from Elmtech. To see it, I went to England's Alexandria Palace Convention Hall. There, among all the trappings of an Atari ST show, I found Elmtech Research Ltd.'s Director David Encill amidst a mob of ST devotees squeezed into his small booth. Everyone was watching STs displaying graphics that *just couldn't be*—without the ParSec Graphic Interface.

ParSec? What's a ParSec?

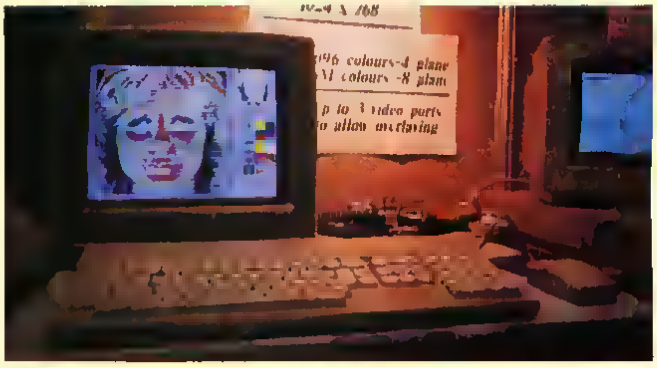
The ParSec Graphic Interface is physically about the same size as a 1040ST, configured into an aluminum rectangle that's 296 millimeters (11-5/8 inches) wide, 284 mm (11-3/16 inches) deep and 50 mm (two inches) high. It adds a second microprocessor and additional RAM to the ST and extends the graphics capabilities beyond anything dreamed of for the ST.

Listen to these specifications: A 32-bit microprocessor running at 50 MHz/6.125 MIPS (that's 6.125 *million* instructions per second), 768 kilobytes of on-board RAM and four color planes with 16 colors per line from 4,096 maximum colors onscreen. If you want more, the 8768 upgrade board increases this to over *196,000* colors onscreen from a palette of more than *16 million* colors.

ParSec plugs into the ST's cartridge port. Besides adding a video port, there's a standard RS232 port for hard copy output to XY plotters and laser, dot-matrix and color thermal transfer printers or input from graphic tablets and a mouse. There's also a SCSI port for CD ROMs and hard disks. The 8768 upgrade board also adds an additional connector for video (four and eight bit-plane outputs), plus space for up to 4 MB of additional RAM.

Goodbye, Atari Monitors

Getting this power onto a screen requires a multi-sync monitor; low resolution is 640 by 480 pixels and high is 1024 by 768, and all displays are double-buffered. Encill notes ▶



The ParSec Grophic Interfoce hos grophic power for beyond whot on Atori monitor con hondle. It requires o multisynch monitor with o horizontol scon frequency of ot leost 28.8 kHz for low reso- lution ond 46.08 kHz for high resolution. The ParSec boord itself is visible to the right of the monitor ond behind the ST.

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CIRCLE 051 ON READER SERVICE CARD

MASTERTRONIC

Similar to Atari's own ATW, the ParSec adds another microprocessor for sheer number-crunching power, while retaining an ST as the front-end. Ian Maw, technical director of Elmtech Research, Ltd., is shown holding a prototype ParSec board.

that any noninterlaced monitor with a horizontal scan frequency of at least 28.8 kHz for low resolution and 46.08 kHz for high will work, but recommends their own ELM MultiSync Plus, which allows programmable resolutions up to the 1024 by 768 maximum.

Technical director and product designer Ian Maw takes great pride in his accomplishment. "ParSec brings the kind of power and control that normally requires systems costing thousands of dollars," he says. "The ST is a fine machine, but with ParSec added, it flies into the world of graphic workstations."

Maw also notes that a GEM-to-ParSec conversion program offers the ability to run most Atari GEM-based programs without modification, while still taking advantage of the greater speed, superior resolution and increased color palette. "The trick [is] . . . that the ST works in conjunction with ParSec for familiarity and ease of use."

This enthusiasm is echoed by Paul Cowling, software designer for Elmtech. "We want to keep the options open. The Paint package supplied is very good. It can handle files in various formats, including IFF and those from the IBM and enables 16 colors on screen in 640 by 480 resolution. What we're excited about in our Paintbox Pixel+Art series are the possibilities for greatly enhanced features, such as oil, water color and chalk emulation."

The ST works in conjunction with ParSec for familiarity and ease of use.

Cowling reaffirms that the Paintbox art programs will use the ST to handle such functions as menus and sub-menus, freeing up the ParSec to handle large-scale image processing and the like. "The next generation Paintbox will continue all the standard graphic choices, such as line draw [with XOR and line-length tonal changes] and shapes [boxes, circles, regular polygon, ellipse and quadrilateral functions with full rotation in several axes, shearing and stretching]. Improvements will include file access functions for swapping palettes, merging and shrinking images, as well as being able to format and port images down to any host computer, but this relies on the host's compatibility with the SCSI port."

Cowling also points out that additional graphic functions will include variable airbrush with color flow parameters and image masking, plus palette color processing for limited color analysis, creating variable shading and stripping control. "The Paintbox will make the background of an image behave like a textured paper on command," he says, "and will include a full choice of functions for specific patterns and designs for the backdrops in the image."

Power Has a Price

Elmtech expects to sell the basic ParSec 4768 unit for approximately $1550 U.S., but no price has been set yet on the 8768 upgrade board. Also being planned are a Genlock for mixing and overlaying composite video and a digitizer for importing images to be manipulated by paint programs.

Of course, it all comes down to what you see on the screen, and that *is* impressive. Certainly not for everyone, the ParSec is for those wanting more graphic power, but still wishing to stay in the friendly environment of the Atari. As the Brits would say: "The ST and ParSec form a very good combination indeed." ■

Marshal M. Rosenthal is a New York-based writer and photographer who has been involved in the overseas electronic/computer industry since the early days of the "dreaded" VCS2600. He wrote about the ATW in the November issue of START.

PRODUCTS MENTIONED

ParSec Graphic interface, $1,550 (approximate price). Elmtech Research Ltd., 6 Witherford Way, Selly Oak, Birmingham, England B29 4AX, 011-0827-59566.
CIRCLE 154 ON READER SERVICE CARD

Disk Contents

Programs on Side 1 of your START disk

GFA Companion . . . . . pg. 52

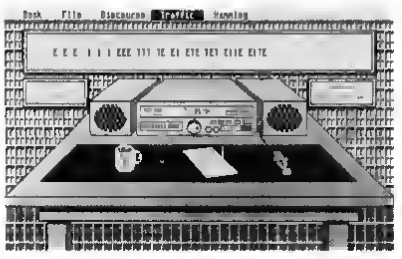
Now you can create custom dialog boxes and menus for GFA BASIC using **GFA Companion**, by John Holder of Marathon Computer Press. This product, which recently sold for $49.95, will give your programs that professional flair. GFA Companion is easy to use and generates source code so you can customize your user interface. File COMPAN.ARC, runs in medium or high resolution.

World Puzzle Designer . . . . . pg. 65

Create your own personalized word-search puzzles with **Word Puzzle Designer** by Earl Toman. You can enter and edit your own word lists and even use the on-screen editor to design your own patterns. The Word Puzzle Designer archive file also contains some sample files. File WORDPUZL.ARC, runs in medium or high resolutions.

Attack . . . . . pg. 60

Ron Schaefer's **ATTACK!** will really keep you moving! Fly your Attack Fighter through the desolate scenery of an alien landscape, destroying the enemy fighters as you negotiate Energy Towers for fuel and Charging Domes to increase your shield strength. This game is definitely a "keeper!" File ATTACK.ARC; runs in low resolution.



Dah-Ditter Code Lessons . . . . . pg. 73

Learn Morse code faster using this set of 14 **Dah-Ditter code lessons** by John Allen. These discourse files were specifically designed to teach you letters according to their sound and order of frequency. File LESSONS.ARC; requires Dah-Ditter from the February 1989 issue of START.

Side Two

Programs on Side 2 of your START disk

This month on the back side of your disk, START features **B/STAT**, a graphing and statistical analysis package by Bob Wilson. B/STAT is compatible with Lotus, Multiplan and .DIF spreadsheet formats, so you can analyze data created with other programs. Statistics functions include normality tests, descriptive statistics, correlation, ordinal tests, nominal tests, distributions, analysis of variance and more. If you like this shareware program the author requests a contribution of $30; B/STAT may be freely distributed

Note: B/STAT was written in GFA BASIC 3.0 and requires the GFA BASIC run-only program, which must be un-ARC'd separately from the front side of the disk. You must Prepare this file onto a double-sided disk, since BSTAT.GFA is over 400K in length. File BSTAT.ARC; B/STAT runs in medium and high resolution and requires a megabyte of memory.

START continues its commitment to bring you the full source code to feature programs from previous issues of START. This issue we present the complete Alcyon C **source code to Avecta I: Ebora**. Avecta, by Mark Swanson, is a complete graphics adventure game published in the September 1989 issue of START. (The executable code for Avecta and necessary data files are only available on that issue's disk.) See the README.DOC file in the Avecta Source archive file for compile instructions. File AVECTSRC.ARC; the game Avecta runs in low resolution

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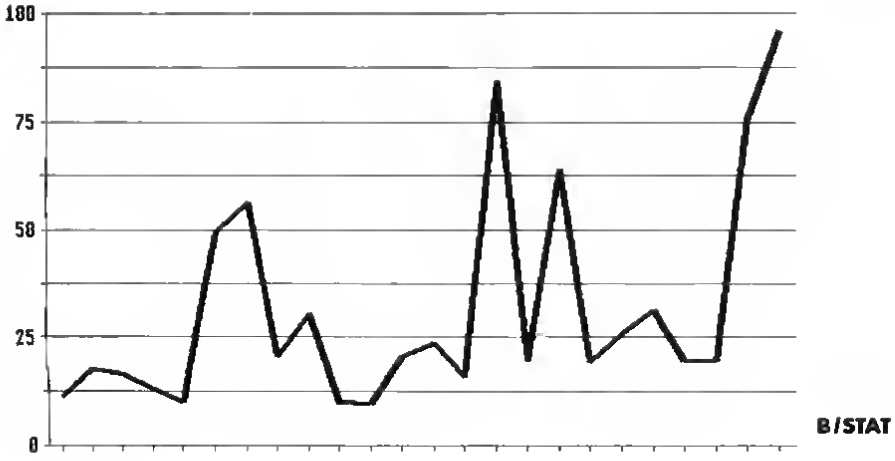

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CIRCLE 059 ON READER SERVICE CARD

continued from page 28

If you have a Mega, then you have a Blitter already. There's not really much advantage to you in installing TurboST, since you have its hardware equivalent already!

We have both Megas and STs. On the non-Megas, we use TurboST; on the Megas, we sometimes use the Blitter, sometimes use TurboST and have noticed no difference between the two high speed modes.

Replacing the 68000

So far, we've covered disk drive and graphics acceleration. Now, let's cover speeding up the very center of the system: the 68000. (Incidentally, we obtained all of these boards to test compatibility with Spectre 128; they all work.)

Now you have to keep things in perspective. While accelerating the 68000 is nice, the truth is that with our present products, you don't even get *twice* the normal speed out of them. Now if what you are doing needs all the CPU help it can get, then fine, go with a 16-MHz accelerator and you'll find yourself sped up around one-third with the fastest board listed here.

But we'd like to caution you again that if your ST is slowed down by its disk drives, you need to handle that situation before accelerating the 68000 or you won't see much gain. Twister will double the speed of your floppies; a hard disk will go 10-30 times faster than floppies. Similarly, TurboST (or a blitter chip) will do a lot more for your graphics, dollar for dollar, than any 68000 accelerator; they'll go 5-30 times faster than the old ST graphics routines.

Here's a quick way to judge. We call it the ''toe tap'' test. Do you find yourself tapping your toes, waiting, on:

- A floppy disk to finish loading or saving programs/data? If you're a librarian for a computer club and copy disks a lot, you spend lots of time like this.
- A graphics animation to finish? (Other than number-crunching animations, like the Cyber series or ray-tracers.)
- The computer to get done calculating something and finish? A spreadsheet working away would be a fine example here.
- If the first, work on your disk system. If the second, work on your graphics system. If it's the third, add a CPU accelerator.

Now, assuming you need to accelerate the CPU itself, let's examine the 16-MHz accelerators on the market.

16-Mhz Accelerators

Do these accelerators run at 16 MHz? Well, no. They run at a mixture of eight and 16 MHz. Some average possibly 9 MHz; one averages possibly 12 MHz.

To explain how they run, we need to tell you what a ''MHz'' is (of course), and talk about machine cycles. We're deliberately keeping the theory short and in English here, so people who aren't into technotalk can still understand it.

The ST does everything in *machine cycles*: stashes one word of data somewhere, executes one part of a 68000 instruction, sends a certain number of dots to the video screen. The entire ST is designed around eight million cycles per second (cps), also called 8 MegaCycles. In commemoration of Hertz's work in electro magnetics, this electrical unit was renamed to the ''Hertz'', so today we speak of ''MegaHertz'', or ''MHz''; the ST is thus called an ''8-Mhz'' machine. This is the same ''Mhz'' you see in other computer's advertisements.

Eight million of these happen every second that your ST is powered on—quite some performance!

Usually, the most used thing in a computer is its internal read/write memory, and the ST is no exception. Only one thing can use memory at a time, *period*.

Video: The Biggest Memory Hog

The biggest user of memory is video, believe it or not. The ST handles video by remembering what's on the video screen in ''video memory.'' This is the same old read/write memory, just like any other, except that whatever is there is also displayed on the TV screen. This process happens over and over again, 60 or 70 times per second (depending on monitor type).

Generally, the biggest problem computer designers face is this video memory; for, once you start up a TV picture, you can't wait. You have to pump out the video signal very quickly according to the TV's needs. While the 68000 processor can easily wait, the video can't wait, so in other computer designs, the 68000 waits for memory while the video is active.

Now on an ordinary computer, since video has to have priority, this ▸

You'll wait 16 million times per second instead of eight million times per second!

would mean that the 68000, which is trying to use memory, has to wait while video happens. The ST's designers did a very clever trick to get around this.

First, they began with 16-Mhz read/write memory (RAM) chips As the number implies, these chips are capable of 16-million machine cycles per second. Then the designers devoted each even cycle to the video (at 8 mhz) and each odd cycle to the 68000 (at 8 mhz) back and forth. Hence, the 68000 and video share memory, yet don't trip over each other, nor is one forced to wait for the other.

This is one of the big reasons the ST is a low cost, high performance machine; the 68000 and video stay out of each other's way

Now, the question you're probably asking is, how can a 16-MHz accelerator work? Memory is half taken up by video, so the fastest the 68000 can get to memory is 8 MHz. And you're absolutely right; we're limited to 8 MHz.

Also, other chips that the 68000 periodically talks to, such as the video shifter, DMA Controller and whatnot are all limited to 8 MHz; try to run them faster, and they make mistakes. The entire ST was designed around 8 MHz, and the designers saw no point wasting money by making some parts able to run faster.

So What's a 16-Mhz Accelerator?

So what is it that the ''16 Mhz accelerator'' companies are selling?

Generally, they're selling the ability to take a 16-MHz 68000 and run it in the ST's 8-MHz environment. In a few situations, the 16-Mhz chip will be unleashed and be able to run full speed; you'll notice big acceleration then. But most of the time, the 68000 will be chained to 8 MHz, forced to slow down to live in the 8-MHz ST.

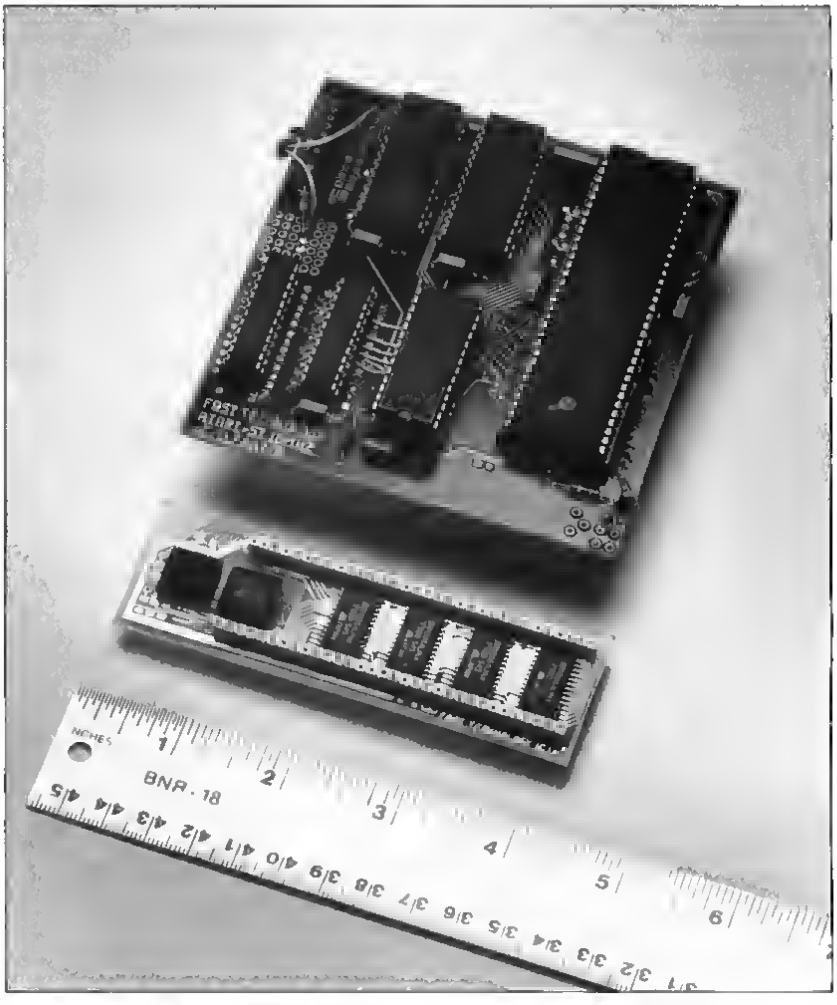
For instance, if the 16-MHz 68000 tries to go to memory at a time when video is using it, the 68000 ''wait states'', or temporarily stops. Next cycle, it tries again. Video will have freed memory, so the CPU can continue But the net result is you get 8-MHz performance.

The cold reality of all this is that two of the three ''16 MHz'' accelerators give you around 1/10th better performance (9-MHz ST) than a stock ST and the third gives you around 1/3 to 1/2 better performance (12 MHz), depending on what software you use.

Even getting these marginal performance improvements is a hardware engineering miracle; the people doing it are the equivalent of Wayne Buckholz or Darek Mihocka in hardware.

JRI's JATO Board

The first of the 16-MHz accelerators was the J.A T.O board from John Russell Innovations. We have to confess to some bias on our part with



At the top is a prototype of Fost Technology's Turbo16 board and below it is the production version. By using surface-mount technology, Fost was able to shrink the board so that it's very little larger than the 68000 socket—and most of the chips sit *under* the chip! The Turbo16 board proved to be the best performer of the three, but performance was highly application-dependent.

John: we know him personally and like him.

Now the technical terms here involve things like ''bus cycle'', ''data window'', ''chip select'', and ''wait state'', and are not understandable to anyone except a fresh Computer Sci graduate. So we'll translate to English; pardon if it's not technical enough. We honestly don't feel that passing along a great deal of technical talk will help you in your decision about purchasing these products; performance figures will.

John noticed some slop in the ST's timing—a way to sneak an added memory cycle to the CPU every now and then, when video wouldn't mind. It works primarily on RAM chips that are 120-nanosecond rated or faster, fortunately, the majority of 150 nanosecond RAMs on ST machines are pessimistically rated. So John whipped up a prototype board that gave the ST about a 12 percent speed increase (1/8th)

John was busy with other things; his 4096-color board and the Genlock. His friends asked him why he didn't market this accelerator board. He shrugged and said that well, the performance increase isn't awesome, but it isn't costly, either. So the unIt ended up being priced at $99, which is a very fair price.

Physically, the JATO board looks like a 68000 with a little daughter board glued on top. To install it, you unsolder and remove your 68000, then solder in a socket and plug in the JATO board. As a neat add-on, John added an LED and shut-off switch; the LED lights whenever the board is accelerating something.

Performance-wise, the JATO board gives you a barely visible increase in speed—1/10th, depending on what you're doing. However, balancing this is its low cost.

If you're on a budget, this is the obvious choice in CPU accelerators.

Creative Microsystems, Inc. Processor Accelerator Board

The next entry into the 16-MHz sweepstakes is the CMI board.

We don't know all the technical details of the CMI board; those are trade secrets and we wouldn't give them out if we'd designed it either! Apparently, they are not using the RAM-timing trick John Russell used; they are, however, getting a little more performance out of the ST ROMs than normal. (The ROMs hold GEM and other things.)

A quick way to judge whether you need an accelerator board is the ''toe tap'' test.

Installing the CMI board isn't too difficult. You can either remove your old 68000 or clip some of its leads and solder on top of it (harder, in our opinion), plus, you need to run three wires to your ST circuit board.

Once again, we see around a 1/10th performance increase. However, the price is a bit steeper than the John Russell board: $299. Now, of course, you'll say, wait a minute, that doesn't seem like much of a deal! Well, there's more to the story. The CMI board also gives you sockets to plug in various things to help your ST's performance. The board itself is physically much bigger than the other two to hold circuits to make these sockets work

When we talked with them, CMI's staff were honest about their board's acceleration performance: it wasn't great. What they emphasized were the expansion ports on their board; they consider it primarily an expansion board, not an accelerator board.

So if you purchase the CMI board by itself and add nothing to it, you're probably better off getting a JATO board; the performance increase will be about the same. However, the add-ons are interesting

Blitter. The CMI board lets 520 and 1040 owners plug in a Blitter chip. And since Atari won't market a Blitter add-on, at this time CMI is your only way to get a Blitter.

Before you go and buy one though, see the above discussion of Quick ST and TurboST, which outperform the Blitter — in software. Quick ST is free to try and TurboST doesn't cost much. Also, there is some question as to whether or not you can even purchase a Blitter from Atari. Some after-market sources have a few, but Atari is ultimately the source of these chips. If you do decide to go with the CMI board, be sure that you can get the Blitter first.

Naturally, if you install a CMI board with Blitter, you will get performance the same as a Mega with a Blitter; screen draws and animation will improve. You'll also get the 10% or so speed increase that the raw CMI board gives you. (We have to say ''or so'' because the speed increase occurs in some places and not in others, but it's a fair-enough average.)

fastROM expansion. FastROM expansion requires you to either copy the Atari ROMs to (expensive) big EPROMs and mount them on the CMI board's sockets or to bend up a couple of pins on each of the six ROMs in your system and run wires to them.

Here things get a little technical. Inside the Atari you have 192K of permanently stored program in read-only-memory (ROM). This is differ- ▶

ent from read-write memory (RAM), where programs load into off disk. ROM is there forever and contains GEM, drivers for things like serial ports and disks and so on

The idea behind fastROM is to run these ROM chips as quickly as possible Right now, they're run a bit more slowly than is necessary; if you can run them faster, you'll see more performance from your ST. Ah, but when? Whenever you're running from ROM rather than RAM So the question becomes, how often does a program run from ROM versus RAM?

Unless they're continually drawing things, programs do not continually use the ROMs, they only drop into it every now and then, such as when you pull down a menu, select a file name or open a window. Most mainline operations of a program are in main system RAM and are loaded off disk. Here, the ROM acceleration will not help

If you run a program that uses the ROMs heavily, then yes, you will see a considerable improvement The problem is that most programs don't use the ROMs this way; the ROMs are far too inefficiently coded to allow it. For example, if you're doing high speed animation, you don't call the ROM line-draw routines; you draw the lines into video memory yourself. Note that once again Quick-ST and TurboST enter the picture; they redirect the ROM drawing routines to better-written RAM routines, which would *not* be accelerated with fastROM.

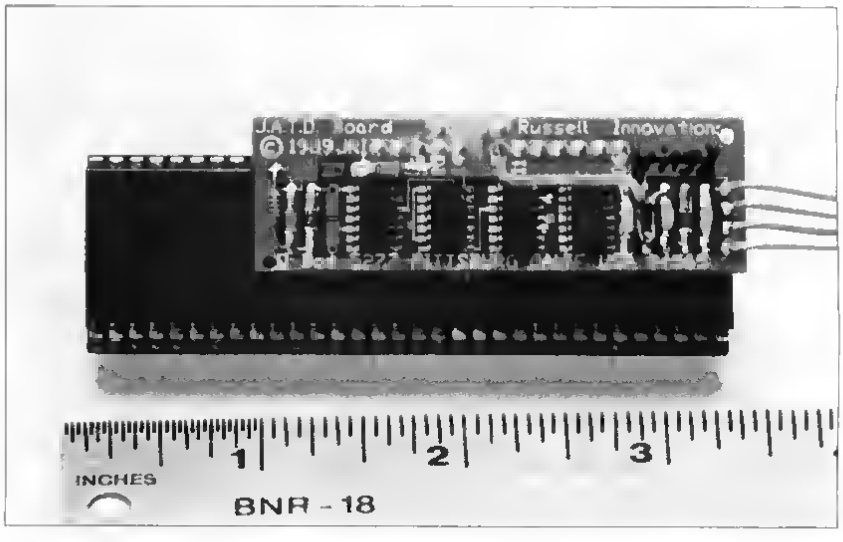
So we can positively say that the net result of fastROM is that "your mileage will vary." It is possible to write programs that will show both big speed increases and almost no speed increases from fastROM; you'll probably fall somewhere in the middle, depending on what you do. Your Desktop operations will probably speed up some; when you enter a program, you'll probably slow back down. Beyond that, we can't say for sure.

68881 Floating Point Co-processor. This requires that you purchase a 68881 FPU chip. The 68881 chip is a Co-processor; it works alongside the 68000 to do floating point math at very high speeds It far outruns the floating point math available for the 68000

The problem is that the ST hasn't really had 68881 facilities available for it and there are few STs with 68881s in them. Thus, very few programs have been written to take advantage of it. And here's the catch: unless the program is specifically coded to use the 68881, the 68881 doesn't accelerate *anything*. You get no speed increase at all.

The one commercial software package we know of that uses this chip is ISD's DynaCADD. There are a couple of public domain programs that also use this chip, such as ray tracers.

When using this chip, you'll note a big increase in floating point speed —10 to 30 times; the problem is in finding any software that will use it! Our opinion? By itself, the acceleration isn't worth the $299, especially with a $99 competitor doing just as well. If you want a Blitter badly, this is the way to get one; however, you will be equally served by software Blitters. The fastROM expansion is just too unpredictable for us to have any opinion on. On the 68881, if you're running DynaCADD or your software specifically says that it takes advantage of a 68881, then we'd seriously consider this option. If not, you will gain nothing and spend some serious money on the chip.



The diminutive J.A.T.O. Boord from John Russell Innovations attaches directly to the 16-MHz 68000 chip. Like the other two accelerators, the J.A.T.O. Boord requires you to unsolder your present 68000 and solder in a socket. While performance of the J.A.T.O. Boord was not the best tested, its price was by far the lowest. It's a good value.

FAST Technologies Turbo16

The third board to arrive at our lab was the $299 Turbo16. This is a board as small as the JATO board; all the chips fit underneath a 16-MHz 68000,

continues on page 45

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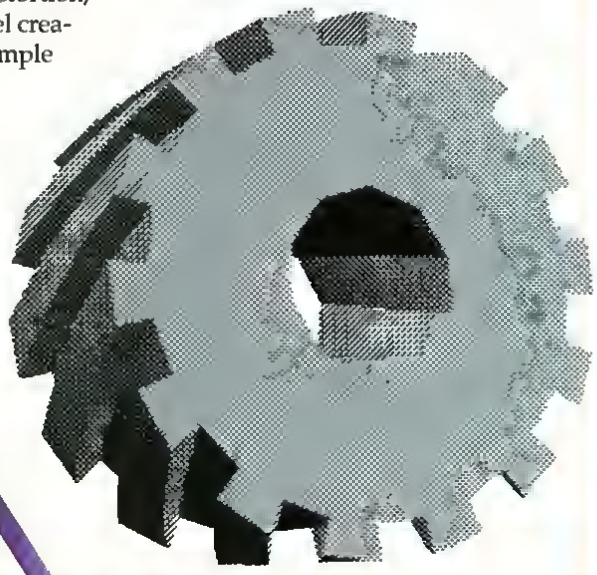

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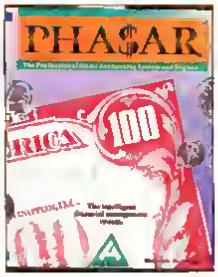

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surface-mounted. There's a number of chips all packed in there.

We weren't expecting much from the Turbo16, since the last board that size we'd seen was the modestly priced J.A.T.O. Installation involved a socket for the 68000 (again) and we ran the one lead required to a 16-MHz signal source as required (it's not a big deal).

Our first clue that we were wrong to prejudge the board was in opening and closing windows. They popped open and shut as though a Blitter were active or TurboST was loaded. (We then loaded TurboST on top of the Turbo16 and things became too fast to believe!)

A few benchmarks confirmed that there was between 30 and 50% speed improvement!

Nor was this a special-case speed improvement. Our normal uses of the ST is for ST programs (such as Tempus, Microsoft Write and Calamus) and in Spectre development, where we spend forever in assemblers and linkers. Tempus, which is already quick, became almost unusably too quick. Spectre assembly/link time dropped by a third. We even saw a 30% increase while in Mac mode under Spectre emulation!

In short, here was an accelerator that made a fairly big difference.

To this day, Turbo16 boards have lived in our STs; it looks like a permanent installation. We can give a no-problems report after two months of use. (One minor bug that affected Calamus and Tempus somewhat has since been fixed; our second unit shows this.)

The Turbo16 uses a new idea, a ''high speed memory cache''. Onboard the Turbo16 is 32K of high speed, static RAM chips. A cache works like this: whenever the CPU needs to read from memory, the Turbo16 first makes it ask the high speed cache if the cache has that memory value stored there. If so, the cache supplies it to the CPU and the CPU moves right along—at 16 Mhz—not bothering with ST memory and with the 8-MHz video speed limit. If the memory value is not there, the value is loaded from main memory at 8 MHz and also stored in the cache, for next time. Next time through, the CPU gets it at 16 MHz.

The idea is this: Most programs spend a lot of time in loops, doing calculations, screen memory moves or whatever. If the loop's instructions are in the cache, there is no need for the 68000 to slow down to 8 MHz; instead, it runs at 16 MHz the whole time. 32K of cache memory is enough to capture most big loops and give big performance.

Now, of course, your mileage will still vary. We can write programs that will deliberately upset the cache and then the performance of the Turbo16 will be ST-like. But in the real world, this doesn't seem to happen; most commercial software we run shows, on average, a 1/3 increase in speed.

We have had no compatibility problems with Turbo16 or with any of the boards, for that matter; the one small bug Turbo16 had with a couple of programs has since been fixed, and it wasn't serious.

Benchmarks

As a general rule, you should *always* take benchmarks, particularly those in ads, with several large grains of salt. A benchmark can be written for nearly all of these boards that will show large speed increases; the problem is that you don't run benchmarks on your ST all day.

We tried to pick a variety of software that would reflect what an average ST user does to give benchmark timings. We also tried to equalize ''everything else'', such as disk, Blitter and so forth during the benchmarks.

We then also ran the Quick ST Benchmarks. These test a variety of ST operations. However, Quick ST Benchmarks are sensitive to things like moving the mouse, so add another brick or so of salt to these results. We also don't have source code to find out exactly what a ''CPU Register'' test is.

In general, though, the tests reflect what you'd expect. Nevertheless, the three-grains-of-salt rules applies. Don't expect to get these numbers unless you're running on equipment identical to ours. Benchmarks have been the subject of endless debate in computer circles and we don't see any sign of it coming to an end this century.

You should always take benchmarks, particularly those in ads, with several large grains of salt.

68881 FPU: Expect a ten to thirty times increase in speed in whatever floating point operations you do. If you don't specifically call the 68881 in your code, expect *nothing*. Our test system consisted of a Mega ST4 with TOS 1.4, Mono Monitor and one double-sided floppy drive. The fast-ROM option of CM1 was *not* enabled and for the Quick ST Benchmark results shown in *Figure 1*, the Blitter was off. *Figure 2* shows the same benchmarks with the Blitter on and *Figure 3* shows results from some ''Real World'' tests ▶

Figure 1. Quick-ST Benchmarks—Blitter off

	8 MHz	CMI	JATO	T16
CPU Memory	100%	100%	100%	135%
CPU Register	100%	100%	100%	204%
CPU Divide	100%	182%	182%	203%
CPU Shifts	100%	179%	179%	207%
DMA Read	100%	181%	181%	181%
GEMDOS I/O	100%	100%	98%	100%
BIOS Text	100%	106%	121%	149%
BIOS String	100%	105%	118%	141%
BIOS Scroll	100%	100%	106%	113%
GEM Drow	100%	104%	116%	150%

Analysis: We see the T16 in general ahead on these benchmarks. Disk speed is unchanged (DMA Read / GEMDOS I/O); since that's dependent upon the disk, rather than the CPU, that's to be expected. The improvements in the BIOS (e.g., ROM) output tests reflect the expected 1/8th increase in the J.A.T.O. board from RAM timing change. They also reflect the Turbo16 cache improvements.

Figure 2. Quick-ST Benchmarks—Blitter on

	8 MHz	CMI	JATO	T16
CPU Memory	100%	100%	100%	135%
CPU Register	100%	100%	100%	204%
CPU Divide	100%	182%	182%	203%
CPU Shifts	100%	179%	179%	207%
DMA Read	181%	181%	181%	181%
GEMDOS I/O	100%	100%	100%	100%
BIOS Text	110%	115%	128%	155%
BIOS String	105%	110%	122%	144%
BIOS Scroll	132%	134%	137%	140%
GEM Drow	133%	137%	145%	190%

Analysis: Once again, the CMI places third, the J.A.T.O. second and the Turbo16 first, although in general all figures are improved. Note that if the CMI board with blitter was tested against another accelerator without blitter, the figures would be skewed.

Figure 3. ''Real World Tests—Blitter On

	8 MHz	CMI	J.A.T.O.	T16	Units
John Wolker	44.59	38.01	37.93	24.31	Sec (100 iterations)
Ray-trace		+17%	+18%	+83%	
HiSoft BASIC	1:37	1:33	1:33	1:03	Min (2403 lines @ 75K)
Compile		+4%	+4%	+54%	
MS Write Load 30K	9.35	9.31	9.26	8.96	Sec
		+.5%	+1%	+4%	
Search/rep.	1:19.7	1:15.9	1:15.8	0:58.6	Min (''e'' with ''xx'')
		+5%	+5%	+36%	
CAD-3D 2.01	6.55	5.89	5.64	4.14	Sec (drow Superview)
Stonehenge		+11%	+16%	+58%	
Torus	39.09	35.16	36.45	22.39	Sec (create)
		+11%	+7%	+75%	
Faucet	21.07	20.16	19.56	16.66	Sec (load and display)
		+5%	+8%	+26%	
ARC.TTP	1:43	1:42	1:41	1:10	Min (2 files @ 58K)
v.S.21b		+1%	+2%	+47%	
Calamus Print	1:01	0:57	0:57	0:35	Min
		+7%	+7%	+74%	
Average increase:		+7%	+8%	+48%	

Analysis: The ''real world'' results pretty clearly show the J.A.T.O. and CMI boards even in pure acceleration while the Turbo16 cache makes a big difference. Clearly Calamus, the ray-tracer, and CAD-3D 2.01 are using loops which fit within the 32K cache and thus remain in high speed memory. Operations which were slowed by the disk were slowed across all boards (MS-Write load, for instance), and in places the cache did not work that well (CAD-3D Faucet).

Conclusion

We recently decided to upgrade a group of STs, both Mega and non-Mega, to give the best performance; we were writing large programs and the performance was really becoming a problem. This article reflects the knowledge we gained doing that upgrade.

- To accelerate the disk system, we went to TOS 1.4. Before that, we used FATSPEED PRG to fix the FAT lookup problem in the earlier ROMs. We also put in fast hard disk mechanisms; anything below 28-millisecond seek rate is fine, and we strongly recommend RLL if you can get it at 1:1 interleave. (The OMTI 3527 controller is a real winner in the RLL competition; check with ICD for availability.)

- To accelerate graphics, we installed TurboST. While we tried Quick ST, it is just not quite as fast as TurboST, although both were very good. As it turned out, this was a good move; the Blitter chips on some of the Megas would not function with the Zax in-circuit emulator in the lab, so we had to leave the Blitters off.

- To accelerate the CPU, we installed the Turbo16 board from FAST Technologies for an average speed increase of approximately 1/3.

We don't expect to see faster Ataris until the TT becomes available or until someone makes a 68030 with RAM expansion card for the ST.

As you can see, the entire question of accelerating the ST is a complex one and there are many options. The options we selected turned out not to even be the most expensive and could have been less; if we'd been on more of a budget, we'd have used Quick ST, for example. The Turbo16 board is far less expensive than the CMI board with optional chips installed (around $549). If the accelerator had been a budget item, the $99 JATO board is the clear choice.

Hard disk prices vary so much and are dropping so fast that it's nearly pointless to recommend one; the price will have changed by the time this is printed. We'll only recommend a 1:1 interleave RLL unit. ■

Married to the fabulous Sandy Small, START Contributing Editor Dave Small is the sire of a wonderful family—and of Spectre 128 and GCR. Doug Wheeler works with Dave at Gadgets by Small. Doug is a GEnie Sysop and widely known for his GDOS expertise. This is his first appearance in START.

PRODUCTS MENTIONED

TurboST 1.6, $34.99
SofTrek, P.O. Box 5257, Winter Park, FLA 32793, (407) 657-4611
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Quick ST, $15. Darek Mihocka, Box 2624, Station B, Kitchener, Ontario N2H 6N2, Canada, (519) 747-9452 or on CompuServe as 73657, 2714, GEnie as DAREKM, Delphi as DAREKM and BIX as darekm.

JATO Board, $99.95
John Russell Innovations, P.O. Box 5277, Pittsburg, CA 94565, (415) 458-9577.
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Processor Accelerator Board, $299. Creative Microsystems, Inc., 19552 SW 90th Court, Tualatin, OR 97062, (503) 691-2552.
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Turbo16 Board, $299.
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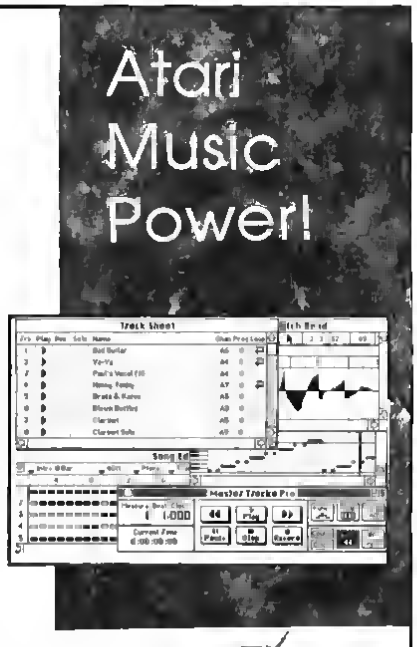

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Disk Instructions

Now Using Your START Disk is as easy as 1, 2, 3!

Running the START Menu Program

From a Floppy Disk: Put your START disk in drive A and turn on your computer. The START menu program will come up automatically.

From a Hard Disk: Boot your computer as you normally would. If you're using a color system, set the computer to medium resolution. Put your START disk into either drive A or B, and double-click on the drive's icon. After the disk's directory appears, double-click on START.PRG. Note: *Do not run the menu program from your hard drive!* Each issue's disk has its own START.INF file which must be in the same directory as START.PRG.

When the menu program first runs, it will ask you to describe your floppy disk drive configuration. It is very important that you enter this information correctly, as the program will use the information later to correctly back up and prepare your program disk. Click on Single or Double sided for both drives A and B; if you only have one drive, the Drive B buttons will be greyed out. If you are unsure whether your drives are single- or double-sided, click on Help.

What Then?

This is where accessing your START programs gets easy. Just follow these three steps:

Format Disk

1. Here, you can format a single- or a double-sided disk in either drive A or B. Click on the drive containing the disk to format, select Single or Double sided and then click on Format. Formatting a disk will delete that disk's contents. Do *not* format your START disk.

Backup START Disk

2. We recommend that you make an archive copy of your START disk, which is in the special Heidi format. If you have a single-sided drive you can back up Side 1 of your disk onto one single-sided disk. We also recommend that you borrow a friend's drive to back up Side 2 of the disk onto another single-sided disk. If you have a double-sided drive, you can back up the disk onto one double-sided, Heidi-format disk. The computer will rely on the system configuration information you entered earlier to tell you which disk needs to go in which drive.

Prepare Disk

3. This is the heart of the START menu program. The Prepare a Disk option brings up a window that lists the names of the programs, source files and demos on this issue's disk. The names of the programs will be given in full; you don't have to worry about the specific names of the archive files. If a program has accompanying source code on the back side of the disk, the entry will be listed separately. For example, one entry may be "Avecta I: Ebora" and an entry futher down would be "Source Code for Avecta I: Ebora."

Next, a dialog box will ask for the destination directory, and whether you wish to send the program files to a folder. The destination directory may be a floppy, hard drive or RAM disk. If you wish to put the files in a folder, the program will offer you a default folder name. Press (Return) to use this name or edit the path directly. If the folder does not already exist, the program will create it. If you select drive A or B as your destination drive, the program will ask you if you want to format the destination disk. The menu program will then un-ARC the files directly to the destination drive, and will minimize disk swapping by analyzing the drive configuration you specified earlier.

Bonus Options

Each month, your START disk menu program will include special bonus information ranging from the issue's disk contents and coming attractions to special subscription offers and the latest-breaking Atari news. Click on the various menu buttons and scroll through the main menu window to read this information.

And There You Have It

For more detailed instructions, click on the Help button. Click on Exit to return to the Desktop. And that's all there is to it — un-ARCing START programs was never easier!

Credits

Your START disk format and interface was developed by some of the most talented programmers in the ST world. Contributing Editor **David Ramsden** wrote the interface for the menu program and the custom un-ARCing routines that are as much as 40 percent faster than ARCX.TTP. Contributing Editor **Dave Small** and **Dan Moore** wrote the Heidi formatter that made the back side of the START disk accessible for the first time. **Charles Johnson** of Codehead software wrote a custom version of the STARTGEM program that lets the menu program run at boot time even though it's GEM-based.

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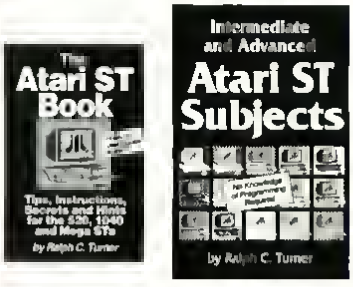

Ralph Turner's new book, Atari ST Subjects, covers hard drives, running IBM programs, disk structure and file recovery, connecting a 5 ¼ inch floppy drive, assembling your own hard drive system, sector and file editing, binary, hexadecimal and decimal codes, ASCII file problems, escape codes, miscellaneous tips, and much more. His Atari ST Book covers RAM disks, the AUTO folder, Desktop tricks, Installing an Application, adjusting the Control Panel's Palette Settings, Public Domain Software, Copying, Printers, Desk Accessories, Telecommunications, the Item Selector, and much more. Neither book requires a knowledge of programming. $16.95 each, plus $2.00 shipping each ($2.50 each to Canada). Check, Money Order, VISA or MasterCard. Index Legalis, P. O. Box 1822-48, Fairfield, IA 52556. (515) 472-2293

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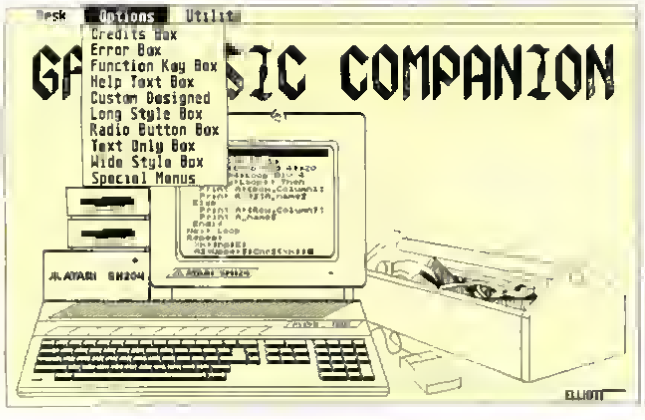
ON DISK

GFA companion

BY JOHN B. HOLDER

Design top-quality dialog boxes with COMPAN.ARC on Side 1 of your START disk.

In the past, designing a professional interface for your programs meant using a Resource Construction Set (RCS). Although these utilities make it easy to create dialog boxes and drop-down menus, integrating the resources into your BASIC program takes time and effort, especially since most RCSs on the ST are primarily geared toward C programmers. Now you can use GFA Companion to create the dialog boxes for you—*and it will automatically generate code you can merge directly into your GFA BASIC program.*



The GFA Companion, formerly a commercial product marketed by MichTron, lets you create customized dialog boxes and menu bars for your GFA BASIC programs. GFA Companion generates ASCII source code that you can merge directly into your program.

```
Sample Function Key Box

''Press Key Indicated To Toggle Values''

F1 = Option 1 is now off
F2 = Option 2 is now on
F3 = Option 3 is now off
F4 = Option 4 is now off
F5 = Option 5 is now on

Press the Spacebar to Exit
```

Create a function-key box for your program's users to set program parameters. The GFA Companion code draws the box and toggles the switches if the user presses a function key.

Features of GFA Companion include:

- Automatic generation of credit boxes, help screens, error boxes and function-key boxes.
- Automatic generation of custom dialog boxes with radio buttons and scroll bars.
- Automatic generation of ''Bottom Up'' menu bars or ''Detached'' menus that can appear anywhere on the screen.
- Fully commented GFA BASIC source code that you can merge directly into your program and begin to use immediately.

An Ideal Companion

To get started, boot your START disk; the START menu program runs automatically. Click on Prepare, then select GFA Companion. The program and associated data files will un-ARC

The GFA Companion, formerly a commercial product marketed by MichTron, is on your START disk this month. This powerful package lets you design sophisticated dialog boxes, text screens and menu bars—and creates code you can merge directly into your GFA BASIC programs. GFA Companion runs in medium or high resolution.

directly onto the destination drive you specify. Double-click on COMPAN2.PRG from a medium or high resolution Desktop; the files OVL010, OVL020, OVL030, GENCOLOR.RSC and GENMONO.RSC must be in the same directory as COMPAN2.PRG. GFA Companion was upgraded after its initial release; the newest version is 2.03. If you're running the program from a 520ST, you may need to disable your desk accessories and autorun programs in order to use GFA Companion.

GFA Companion is easy to use; in most cases you simply need to follow the program's prompts. When entering text, you can usually use the ST's [Alternate] and [Control] key combinations for special characters. Most of GFA Companion's menu options create a dialog box or menu bar. When you select one of these options, an alert box will ask if you really want to use that option; click on Yes to continue. At the end of each session, an alert box asks whether to Save or Abort your work; you must click on Save at this point if you want to save your work to disk.

GFA Companion uses the default file extension .LST. To use the listings in your program, run GFA BASIC, load your program, position your cursor at the end of the program and click on Merge from the menu at the top of the screen. Using the Item Selector box, click on the GFA Companion file to use. Each GFA Companion subroutine uses the same name as its filename. You must call the subroutine using either:

```
MYPROG.LST
  or
GOSUB MYPROG.LST
```

(In GFA BASIC 3.0 you can call a subroutine simply by using its name.)

Many subroutines will return a value in a global variable; if so, this will be completely documented so you can begin using the code immediately.

GFA Companion Menu Options

Desk

About Program: Program credits and version number

Options

Credits Box: Select this option and click on Yes to create a program-credits box. An outline of the box will appear on screen; at the prompt, enter the title. When you press [Return] to enter the line, an alert box will ask you whether the text style should be Normal, Bold or Italics. After you enter the title, you'll be prompted to enter 12 more lines of text. To enter a blank line, simply press [Return] at the prompt. The program will ask you to indicate the style for each line of text, and will center each line automatically. Enter *q or *Q at the prompt to abort.

Error Box: This option creates an alternative to the standard-form error-alert box used by GEM AES. Select this option and the error box will be displayed on screen; when you merge the code into your program and properly set an error trap this box will come up when there is an error and the routine will return the user's selection.

Function Key Box: Click here to define up to five function keys for keyboard input. You assign two strings to a function key; for example, "Insert Mode On" and "Insert Mode Off." When you finish assigning keys, save your work to disk. When you call the function-key procedure from inside your program, users can toggle options by pressing the appropriate key. To create a function-key box, select this option, then enter the title. The program will prompt you for five primary and secondary key definitions; enter "Quit" at the prompt to abort the process.

Help Text Box: This option lets you create multiple-page help screens. You can enter up to 500 lines of help with 42 characters on a line; each line is centered automatically. Type "Quit" at the prompt to save your help box. There are 12 lines of help on each page; when you save the listing the user will be able to scroll through the pages using the arrow keys.

Custom Designed: Select this op- ▶

tion to create customized dialog boxes; your dialog boxes can be as simple or as complicated as you wish. An alert box will ask whether to display resolution overlays; if you click on Yes, it will place a grid on the screen showing where the other resolutions would be in proportion to the current screen. The program will prompt you to draw the outside outline of the box. (After this, you'll be given an opportunity to Continue or Abort at each stage of the dialog-box creation process.) Continue in this manner to create three more boxes and an exit button inside the outline. (If you wish more or less than three boxes, you will need to modify the source-code listing that is generated by this option.) The program will ask if you wish to add a slider bar; if so, hold down the mouse button to position the slider and then release the button to set it in place.

The program will then ask if you wish to add text to your box. Text you type will appear at the mouse location. If you make a mistake, press the right mouse button to start over (the backspace and other editing keys do not work). Do not press [Return] to enter your text; move the mouse to position it and click the left mouse button. The text for the three selectable boxes will be inverted when the user clicks on this box, so if you enter the text outside of the box, be sure to modify the code so the text is visible at all times.

Long Style Box: This option creates a long information box that contains a title and up to 10 lines of test with 18 characters per line. Enter the box title (it will be centered and set in bold) and then the text, a line at a time, at the prompts.

Radio Button Box: You can create a dialog box containing two, three, five or seven radio buttons; click on Help after selecting this option for more information on the possible combinations. You can enter a title for this box and then the selections that will appear under each box. Each box is of a fixed size; the labels appear under or next to the box. When you have entered the labels, an alert box gives the choice of labeling the buttons with a letter, number or nothing in each box.

Text Only Box: Select this option to create a free-form text box. Select the size to be a ½ size box (16 lines by 40 characters) or ¾ (18 lines by 61 characters). Next, select whether to have the text ragged (as you type it) or centered in the box. Type in your text; if you want to abort enter *q or *Q.

Wide Style Box: This option creates a wide information box for a title and four lines of text with 70 characters per line. The text is not centered; it is positioned on the screen the way you type it.

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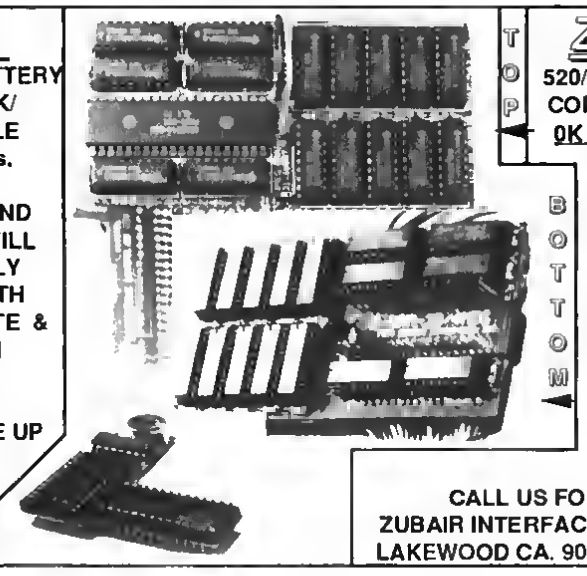

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Special Menus: When you select this option, a detached menu will appear on the screen with three selections: GEM Menus, Detached Menus and Bottom Up Menus. Click on the menu's close box to abort, or select one of the three options to create a menu. GFA Companion will load the overlay code segment containing the menu generator; if the overlay (OVL010, OVL020 or OVL030) is not present on disk the program will ask you to retry (enter a disk containing the overlay) or abort.

The following three options are the submenus to Special Menus:

GEM Menus: This option creates standard GEM-style menus. At the main screen, press [1] to generate a menu, [2] for help or [3] to return to GFA Companion's main menu. When you press [1], a prompt will ask how many items will be in the menu (12-65). The number of items include all titles and menu items, as well as overhead for the Desk menu and slots for six desk accessories. (*Editor's note:* refer to your GFA BASIC documentation, or the December 1988 "Programming in BASIC" column for details on the GFA BASIC menu structure and command syntax.)

At the next screen, you'll see the current number of items in the menu and the number of items left to go. The first entry in the menu bar array is Desk and is labeled entry 0, the first slot available to you is slot 10. At the prompt, enter the text for each item and press [Return]. Next, press [T] if you entered a menu title or [I] for a menu item. Enter *q or *Q at the item prompt to save or abort the current menu.

When you're finished entering the menu information, an alert box will ask if you want to Save, Abort or View the menu; if you click on View, the program will display the menu list's contents and then ask whether to Save or Abort the menu.

Detached Menus: After the title screen, select the size for your detached menu: Tiny, Medium, Large or X-Large. The only difference is the string length of the title and items; click on Help Me! to see the specific lengths. Select the number of items for the menu (from 2-12), then enter the title and the text for the items.

Bottom Up Menus: The titles of bottom up menus appear at the bottom of the screen; the menu's contents appear when the user clicks on the title. Other than that, these menus work the same way as GEM drop-down menus. In fact, GFA Companion's bottom up menus are compatible with GEM windows, so you can use both in the same program to increase menu choices. When you select the option to generate a bottom up menu, an alert box will ask you which resolutions your program sup- ▶

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ports. Low resolution can only have three titles, medium or high resolution can have six titles. Enter the number of titles to use, then type in the text for the titles. Next, enter the items for each title; you may have up to 15 items of 12 characters each above titles. To stop entering items for a title, press the [Tab] key and [Return]. To abort menu entry, press [Escape] and [Return].

Utility

Quit: Quits GFA Companion.

What Version?: Click here to see the current version number.

Change Drives: This option sets a new destination drive for listings.

Use Desk.Acc: Click here to switch to a screen where menu options are disabled but desk accessories are enabled (on the main screen, desk accessories are grayed out).

Turn on Menu: This option returns you to the main-menu screen from the desk-accesory menu screen.

Using Companion Code

GFA Companion uses a temporary storage buffer (TEMPUSE$) for the screen so screen redraws are performed automatically by any GFA Companion subroutine your program calls.

You can move Companion's boxes around the screen and still read and recover the user's interaction with the box. The commented source code tells you which variables to change; typically these variables are Lx (far left x coordinate), Rx (far right x coordinate), Ty (top y coordinate) and By (bottom y coordinate). If you have a slider, its coordinates are generally Slx, Srx, Sty and Sby.

Most of the code GFA Companion generates is resolution-independent. There are, however, a few exceptions, and if you want to modify your code to work with all resolutions the best track is to modify the "move point" variables listed above: Lx, Rx, Ty and By.

Closing Remorks

I truly hope that you enjoy this program package as much as I enjoyed putting it together for you. I also hope that you'll enjoy a lot of saved hours of work, and a more professional user interface for your programs as a result of this product. ■

John B. Holder heads Marathon Computer Press, recent developers of VDOS ProQueue, the alternate desktop (reviewed in the October 1989 issue of START). He also wrote the program Vocabularian in the October 1988 issue of START.

John can be reached at Marathon Computer Press, P.O. Box 68503, Virginia Beach, VA 23455-9433, (804) 460-5227.

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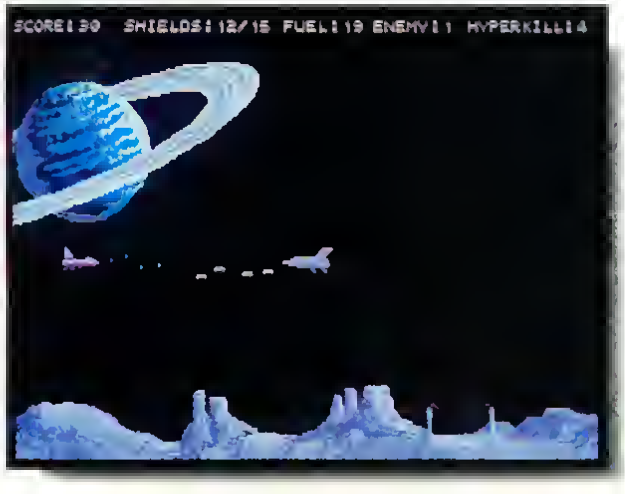
ON DISK

BY RON SCHAEFER, M.D.

ATTACK

Fast-Pased Shoot-em-up to Keep You on Your Toes

ATTACK! may remind you of the classic arcade game, Defender, but there's no one to rescue—you just have to stay alive and destroy anything that moves! It runs on a color monitor from low resolution and was written in GFA BASIC 3.0.



The bottle is on and the question is: How iong con you lost? ATTACKI was written In GFA BASIC 3.0 ond uses poge flipping for flicker-free onImotion. With greot grophics ond eosily modifiable code, you con customize ATTACKI to your heort's content (if you hove the GFA BASIC 3.0 Interpreter).

See if you con beot the top score in the file ATTACK.ARC on Side 1 of your START disk.

There are a few classic video game themes that never seem to grow old. Defender has been a stalwart of arcades and computer screens for almost a decade, but there are always ways to freshen up a classic and make it more playable than ever. ATTACK! is a refinement of the Defender theme that takes full advantage of the power of the ST and GFA BASIC 3.0.

Getting Started

To run ATTACK!, first boot this month's START disk; the START Menu runs automatically. At the main screen, click on Prepare, then select "ATTACK!" The program will un-ARC directly onto the destination disk you specify. At the Desktop, double-click on GFABASRO.PRG and select ATTACK GFA. The files ATTACK.DAT and ATAK_TIT.PC1

must be in the same directory as GFABASRO.PRG and ATTACK.GFA. At the title screen, press any key to start the game.

Fly and Fight

Fly your Attack Fighter with a joystick; just move it in the direction you want to fly. Press the fire button to launch a missile from the nose of your craft. If you find yourself hopelessly outnumbered, press the space bar to activate the ultimate weapon, Hyperkill. A Hyperkill will destroy all enemy fighters on the screen at that time, but try not to squander them, as you only have five. Press [Q] to quit the game or press [P] to pause it. The game continues until you're outnumbered and destroyed.

At the top of the screen you'll see your score, shield status, fuel remaining, number of enemy remaining in the current wave and the number of remaining Hyperkills.

If you're good enough to make one of the top scores, you'll be asked to enter your name. Type it in, then press Return and your score will be saved to disk in the file HISCORES.DAT. To play again from the High Scores screen, click on Again; click on the Quit button to quit the game and return to the Desktop.

Refueling and Replacing Shields

Life is not perfect as an ATTACK! pilot. Although you start out with fully charged shields (10/10), each collision with an enemy Fighter or the ground costs you two shield charges and each enemy missile costs one. When your shields are depleted, your Attack Fighter will blow up. Also, your Attack Fighter can carry only a limited amount of fuel. As you accelerate or decelerate, you'll use up fuel. The less fuel you have, the slower your fighter will fly.

As you fly across the surface of the planet you'll notice two man-made artifacts, the Energy Towers and Charging Domes. The Energy Towers have a beam of red electrical energy flickering between them and the Charging Domes have flickering lights at their peaks. To refuel your Attack Fighter, carefully lower it into the energy beam. You'll hear a beep as you are slowly refueled. Your shields can also be recharged by touching the top of one of the blue Charging Domes with the red spot at the tail of your Attack Fighter. Again, you'll hear a tone as your shields recharge. Remember, if your shields reach 0/10 your ship will explode and the game is over.

The first wave is easy: it has only one ship. As you destroy each wave, a new one will appear, each with more enemy fighters than the last. There are six types of enemy fighters, all different in their characteristics—but I'll let you sort them out for yourself!

I've spent quite a few hours playing ATTACK! I told my wife it was for debugging!

Beware the Blitter Chips!

Those of you with blitter chips will have to turn them off to play ATTACK!, unless your reflexes are much better than mine. Play speed with the blitter chip is about twice as fast, since ATTACK! is very graphics intensive, the blitter's specialty. If you want to use the blitter chip and you own GFA BASIC 3.0, you can go into the source code and modify the characteristics of the enemy fighters. Try slowing them down by about half.

I encourage those of you with GFA BASIC 3.0 to take a look at the source code. It's well-commented, so that you can learn how ATTACK! works. Also, I have made the factors controlling difficulty easy to modify. If you think that the game is too easy, you can speed up the enemy, give them more maneuverability and firepower or do the opposite for an easier game.

On a side note: I love GFA BASIC; I have done a great deal of programming in Version 2.0, but this is my first major program using 3.0. The 3.0 editor makes writing source code a pleasure, the new commands add more power and the new interpreter speeds the whole thing up. Version 3.0 is now available from Antic Software, and I'm anxiously awaiting the compiler. *(Editor's Note:* By the time you read this, the GFA BASIC 3.0 Compiler should be available from Antic Software.)

I hope you have as much fun playing ATTACK! as I had writing it—but I doubt it. Once you get into it, programming is much more fun and rewarding than playing games. (Not that I didn't have to spend quite a few hours playing ATTACK! just to make sure I got all the bugs out. At least, that's what I told my wife!) ■

Ron Schaefer is an M.D., board-certified in internal medicine. Ron is also the president of Schaefer Supergraphics, which markets medical software for the ST.

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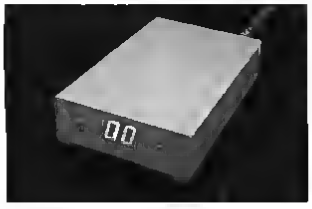

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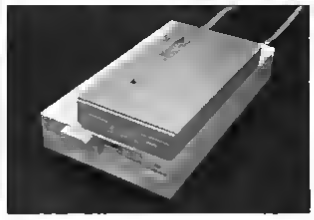

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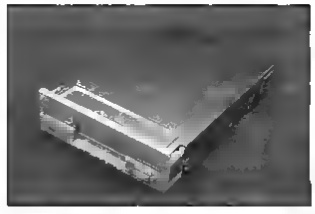

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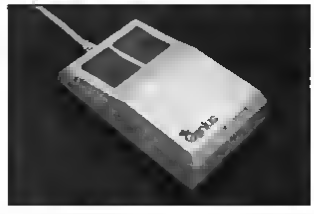

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BY EARL TOMAN

WORD PUZZLE DESIGNER

If you're a hidden-word puzzle fan, you'll find Earl Toman's Word Puzzle Designer especially appealing. With it, you can create puzzles in a variety of shapes and sizes with as many as 80 words automatically hidden—horizontally, vertically, diagonally, frontwards and backwards! Word Puzzle Designer was written in GFA BASIC 2.0 and runs on color and monochrome systems.

Puzzling patterns can be found in the file WORDPUZL.ARC on Side 1 of your START disk.

Hidden-word puzzles can be deceiving—on the surface, it seems all you have to do is find each of the words in the given list. But after a few tries, you give up on the first word and go on to the next—and the next. Pretty soon you're convinced that *none* of the words are in the puzzle, but you keep on trying anyway.

Word Puzzle Designer lets you create customized hidden-word puzzles in a variety of shapes and sizes. And once your puzzle is created, it can then be previewed on the screen and printed out. If you want, you can even print a solution.

To run Word Puzzle Designer, boot this month's START disk; the START menu runs automatically. At the main screen, click on Prepare, then select "Word Puzzle Designer." The program will un-ARC directly onto the destination drive you specify. At the Desktop, double-click on WORDPUZL.PRG and start creating your puzzle. Word Puzzle Designer was ▶

written in GFA BASIC 2.0 and runs in medium and high resolution.

Quick Overview

Let's make a puzzle right away to see how easy Word Puzzle Designer is to use. At the title screen, press any key to get started in the program.

Under Pattern on the menu bar, click on Create. You'll then be asked to type in the number of rows you want your puzzle's pattern to have and then the number of columns. After you answer these questions, a grid of pound signs (#) will appear with a dialog box.

Now click on OK and you're free to edit the grid to any shape you wish. Here Word Puzzle Designer becomes a kind of drawing program where you can create anything from a circle to a square—even a silhouette of the Enterprise from *Star Trek* (one of the sample patterns included with the program).

When you're finished creating your pattern, click on both mouse buttons at the same time. Now, under Wordlist on the menu bar, click on New Wordlist. The program will prompt you to type in your chosen words. Type in as many as you wish—the program accepts up to 80 words.

After you've typed in all your words, press [Return] at a blank line and click on Build Puzzle under Puzzle on the menu bar. You'll then be asked whether you want your puzzle printed out or displayed on the screen. Click on your choice and watch as your completed puzzle appears before your eyes. When you're through viewing the puzzle, click the mouse or press any key. An alert box will ask you if you want to print the hidden-word directory; if you answer Yes, the program will show a list of the words and their locations in the puzzle.

Word Puzzle Designer's Menu Bar

At the top of Word Puzzle Designer's main screen, you'll see a menu bar that contains five choices: Pattern, Wordlist, Options, Puzzle and Done.

Drop-Down Menus

Pattern

Create: Use this option to create a new pattern for a puzzle. You'll be prompted with questions of how

continues on page 68

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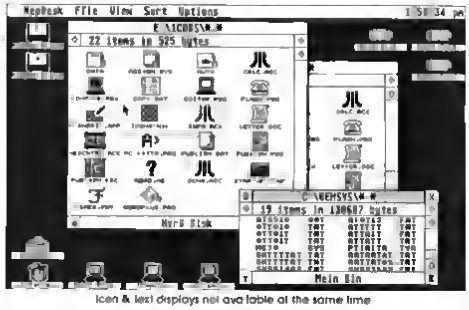

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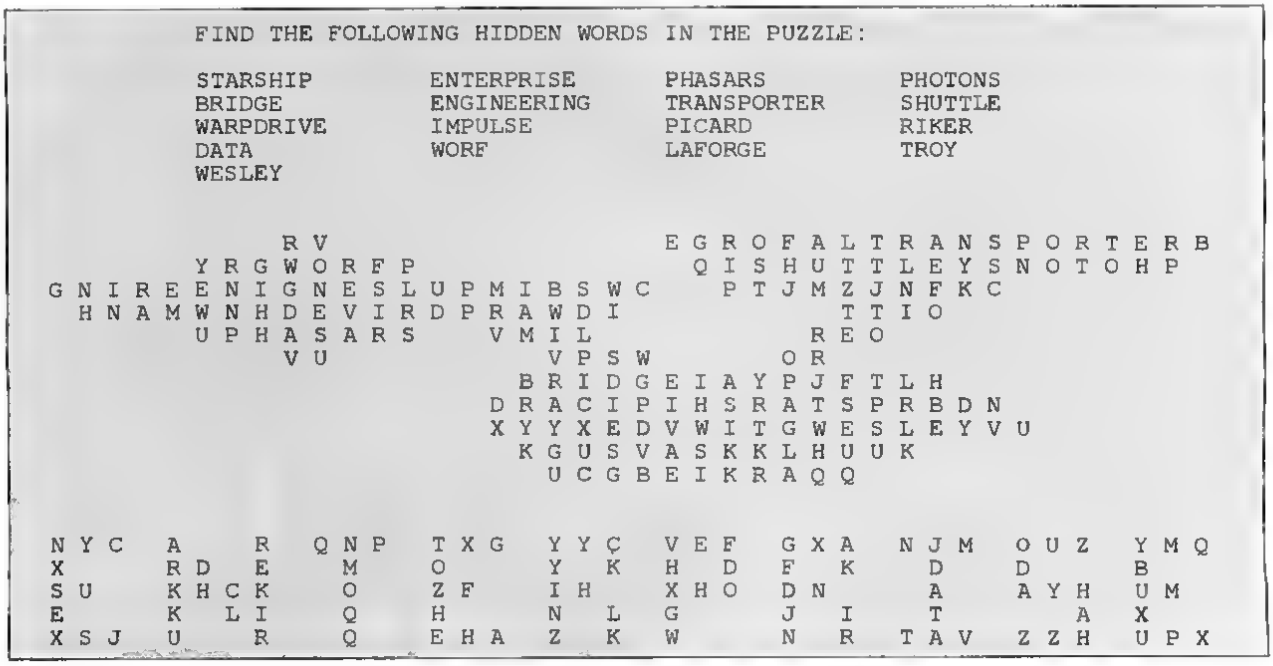

many rows and columns you want the puzzle to include. A rectangular pattern is then painted on the screen. A pound sign (#) indicates where letters will appear in the puzzle. You can use the mouse to erase or fill this design to make whatever puzzle shape you wish. Note that only every second column is used in the pattern. This is because a puzzle looks too compressed when letters are printed in each column.

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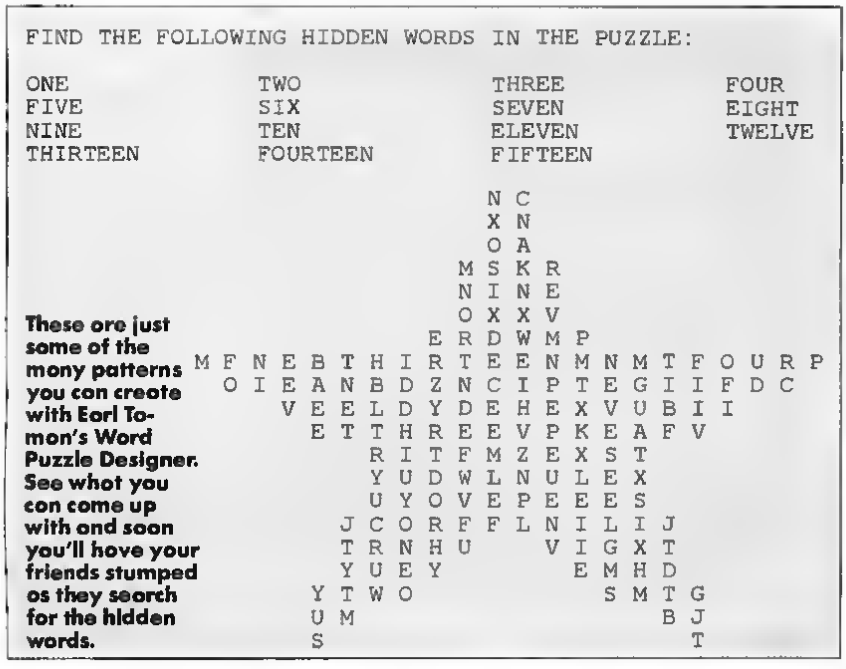

Edit: Click here to edit your existing pattern or one you've loaded. As in Create, use the mouse to modify the pattern as desired.

New: This option is nearly identical in function to the Create option, except that it clears the screen of the pattern you're currently working on and lets you start over again.

Print: Select this option to print a pattern. Note that this option prints out your pattern-grid only

Save: Click here to call up a file-selector box to save your pattern-grid to disk. Save your file with the extender .PAT (this is the default extender).

Load: Use this option to load a saved puzzle pattern from disk.

Wordlist

New Wordlist: Use this option to enter the list of words that will be hidden in the puzzle. You'll be prompted to type in each word. To end the list, press [Return] at a blank line. Although you can enter up to 80 words, you'll find a list of around 15 words to be more practical. Also, a word cannot be more than 15 letters. If you wish to redo your entire wordlist, simply choose this option again and your original list will be written ▶

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You're free to edit the grid to any shape you wish.

over.

Print Wordlist: When you select this option, you'll be asked whether you want the list printed to the screen or to the printer.

Add Words: Words you add are appended to the end of the existing wordlist.

Edit Wordlist: Use this option to edit a wordlist. Click here and you'll see the Main Menu screen replaced by the Edit Wordlist Menu. At the top of that screen you'll see your list of words. Right-click to delete the word (right-click again to undo).

To edit a word, left-click on it; it will then appear in the lower left-hand corner of the screen in the "Edit Word" field. Use normal keyboard editing functions to edit the word (i.e., arrow keys, [Delete], [Backspace], etc.).

When you finish editing a word, press [Return]. The edited word will be moved up into the appropriate spot in the displayed wordlist. To return to the main menu, click on "Back to Main Menu" at the menu bar.

Save Wordlist: Use this option to save a wordlist to disk. Save the list with the extender .WDS (this is the default extender).

Load Wordlist: Click here to load a saved wordlist from disk.

Options

Four Directions: This option limits the placement of hidden words in the puzzle to horizontal and vertical directions only (i.e., north, south, east and west). Choose this option to create simpler puzzles.

Eight Directions: This is the default option when you run the program. It places words in all eight directions: horizontally, vertically and diagonally, backwards and forwards.

Puzzle

Build Puzzle: This is the part of Word Puzzle Designer that makes it a puzzle *creator* as well. Click here to create your puzzle from the pattern and words you've chosen or loaded from disk.

Word Puzzle Designer builds the puzzle by placing the words from your list at random locations in the pattern. The remainder of the pattern is then filled with a random selection of letters. This completes the puzzle.

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you're asked to choose where you'd like it printed out: screen or printer. After the puzzle prints out, a dialog box will ask you if you want to print a hidden-word directory, which is essentially a solution to your puzzle.

Reprint Puzzle: This option lets you reprint a puzzle and its hidden-word directory—handy if you had it printed to the screen the first time and now want a hard copy, or if you simply need another copy.

Done

Quit. Click here to return to the Desktop.

Additional ''Build Puzzle'' Notes

If you try to use too many words in too small a pattern, Word Puzzle Designer may be unable to fit all of them into the pattern. The program will make a maximum of two passes. At the end of the second pass, any unused words will be discarded and the puzzle will be completed with a random-letter fill.

Since word location and direction are random, you may achieve better results if you build a puzzle again for a given pattern and word list. You may ''Build Puzzle'' as many times as you wish using the same pattern and wordlist. The program will come up with different results each time you build.

The hidden-words directory (puzzle solution) refers to pattern row and column numbers to identify where words are hidden. Depending on the pattern you create, the first row of letters printed on a puzzle may, or may not, be row one. In other words, if you blank row one in the pattern, the first row printed on the puzzle will be spaces. The first visible row of letters will actually be row two as far as the pattern is concerned. This also holds true for columns. If you find this confusing, reprint the pattern on your screen, and compare it to the printed puzzle and hidden-words directory taken off your printer.

Have fun creating your puzzles and don't forget to look at some of my sample patterns included on your START disk. Also, watch for more puzzle designers in future issues of START. ■

Earl Toman lives and works in Orleans, Ontario. This is his first program for START.

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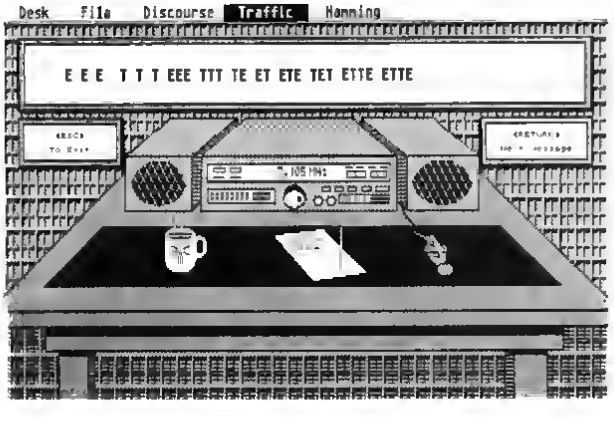
BY JOHN ALLEN

ON DISK

The Allen Method for Learning Morse Code

DAH-DITTER CODE LESSONS

In Dah-Ditter, from the February 1989 issue of START, Sal Gutierrez showed you how to use your ST to learn Morse Code. This month, John Allen takes that program a step further with 14 lessons to help you learn Morse quickly and easily. You'll need Dah-Ditter to run the tutorials on either a color or monochrome monitor.



All you need to reach the Novice cioss five-words-per-minute level is Dah-Ditter, John Allen's lessons ond a bit af practice. These iessons toke yau fram the shartest letters ta the langest and make learning Morse Code as easy as Dit-Dah-Doh-Dit, Dit-Dit, Diti

Learn Morse Code faster in the file LESSONS.ARC on Side 1 of your START disk.

When I received the issue of START that included Dah-Ditter, I used the program right away. Like Sal Gutierrez, I am an amateur radio enthusiast and had once thought of writing a similar program myself. I was pleased to see that someone did.

But Something Was Missing

The one feature that was missing from an otherwise excellent program was an effective set of lessons. Morse code is designed so that frequent letters such as E and T are very short while less frequently used ones like Q, X, Y and Z are longer. Also, some letters are similar in sound and it's best to learn them separately to avoid confusion.

With this in mind, I set to work and came up with 14 lessons that teach Morse Code letters in the following order: ▸

E T A N I M S O R K D U H L C P W G F Y B J V Q X Z

Note that the letters are arranged in the order of length and complexity. Thus, the alphabet begins with the letter E (Dit in Morse) and progresses to Z (Dah Dah Dit Dit in Morse).

Each of the first 13 lessons consists of two new letters and words using the new and previously learned letters. In some lessons, letter groups with the two new letters are also included. Several of the later lessons have sentences using only the letters learned so far and the last lesson is five sentences to help you practice

Getting Started

To access the Dah-Ditter code lessons, first boot this month's START disk—the START menu runs automatically. At the main screen, click on Prepare, then select "Dah-Ditter Code Lessons." The lessons will unARC directly onto the destination drive you specify. Of course, you'll also need the Dah-Ditter program to run the lessons, which are .DIS files that can be loaded into Dah-Ditter by using the Load Discourse option from the File menu.

Slow and Steady

Take your time—it's normal to fly through the first few lessons, only to slow down and repeat later lessons several times before moving on. Unlike the letters that are arranged for speed, the digits are easy to learn in simple numerical order. Punctuation is also easy to learn once the letters and numbers have been mastered.

Have fun and remember that to achieve the Novice Class license you only need to read five words per minute.

Editor's Note: Be sure that you have fixed the small bug in the original Dah-Ditter before running these lessons. For full details on the bug fix, see Alert Box in the June 1989 issue. ■

In Morse code, frequent letters (such as E and T) are very short.

David Allen lives and works in Livermore, California. This is his first program for START.

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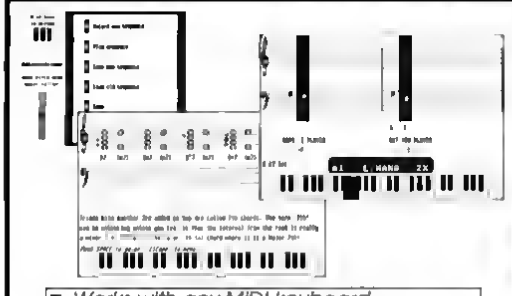

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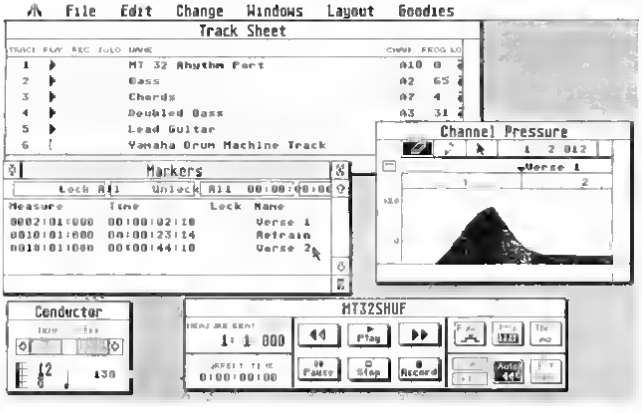
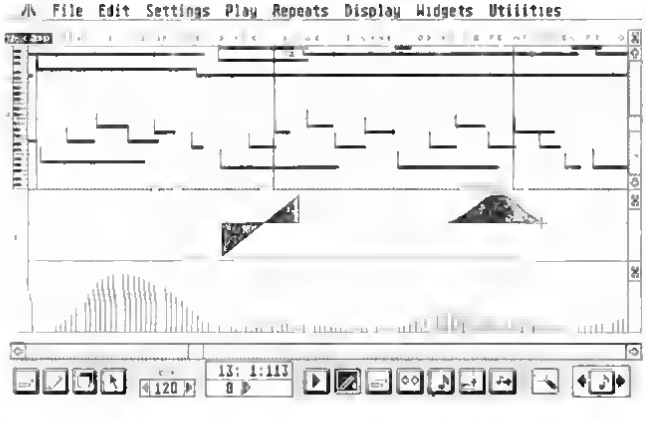
Moore Nights at the Roundtable (and Other MIDI News)

BY JIM PIERSON-PERRY



Warkscreen from TIGER, Dr. T's phenamenal new graphic editing pragram that warks with standard MIDI files as well as the KCS sequencer.



Typical screen from Master Tracks Pra ver 3.4, the pra level sequencer fram Passpart Designs. It sparts an extremely intuitive user interface and ane af the best GEM implementatians af any applicatian program for the ST/Mega.

As I write this month's column, the summer music show reports have just come out in the music trade magazines. Atari had a major presence with numerous software developers, plus their **STACY** laptop — named best computer of the show by *Keyboard* magazine

ST/MIDI Connection Goes On-Line

Yep, that's right, START's **"ST/MIDI Connection"** now has a home in the MIDI Roundtable on the GEnie bulletin-board system. The MIDI RT is run by Robert Moore, former head of Hybrid Arts and recently profiled in the April 1989 issue of START.

Moore manages many bulletin-board topic areas, addressing all aspects of music making and enjoyment from the pro to hobbyist levels. These range from lively discussions on software performance to practical hints for getting the most out of your musical instruments and even ▶

includes a section for want ads. Moore has been actively recruiting software and instrument developers and retailers to maintain topic areas. Among those currently on-line are Passport, Steinberg/Jones, Johnsware, E-mu and Everything Audio. The library also includes demos of commercial programs, patch and sample files, public-domain editors and utilities, text help files on MIDI and song files.

My hope is to encourage reader feedback on the types of MIDI/music features we present in START. What aspects do you like or dislike? What programs or ideas should we cover in months to come? It also will give me a place to provide timely information on new products. More globally, I hope to hear from users of various MIDI products for the ST — both good and bad experiences. This topic area could become a focus point for ST MIDI software in general.

To reach the MIDI Roundtable, just type "midi" from any main prompt on GEnie. Once at the RT, use menu option 1 to enter the bulletin board. The ST/MIDI Connection is Category 29. Stop by and visit — I'll be looking for you.

Keeping Up With the Steinberg/Jones's

There are several new developments from Steinberg/Jones. **Cubase** and **Avalon**, the first programs to run under the new M-ROS MIDI multitasking system, are now shipping. Cubase is a 64-track sequencer that picks up where the Pro 24 III leaves off. Virtually all edit commands work in real time as the music plays. It provides multiple methods to view/edit your music: track list, event list, piano-roll graphics and traditional score. A companion desk accessory, **Satellite**, comes with Cubase to send and receive patch banks from your instruments while the sequencer is running.

Avalon is a new generic sample-editor program that includes support for stereo samples and resynthesis and manages a network of up to 10 sampler instruments. You can take samples from one instrument, adjust them for playback speed and pitch, then send them to another sampler. A hardware D/A board is expected to ship in December that will accept stereo AES/EBU-format digital input (sample from a CD) and play back sound samples with 12-bit resolution. Support for the board is already built into Avalon. An earlier sampler-type project, the Lynex, has been cancelled.

If you want to run multiple Steinberg/Jones programs under M-ROS, you need to be able to install all the cartridge copy-protection keys. A solution is Steinberg/Jones' new MIDEX interface box which plugs

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Passport is shipping version 3.2 of Master Tracks Pro.

into the ST/Mega cartridge port and can hold up to three Steinberg/Jones keys plus one other of any type (Spectre 128 or GCR, for example). It also sports multiple MIDI In/Out ports.

C-Lab Happenings

Over at C-Lab, things have been busy as well. **Notator** version 2.1 is now shipping, and a free update is available to registered owners. One of Notator's many new features is support for the Atari laser printer. C-Lab's version of a multitasking system is called Soft Link and is expected to ship before the end of the year.

A particularly neat product from C-Lab is the new Human Touch interface which lets you drive sequencer tempo for Creator or Notator from an external audio source and all you have to do is make noise (snap your fingers, yell out a word — whatever!). On the "straight software" side, C-Lab's ***X*-Alyzer** has finally been released. Not only is this a good DX7II/TX802 patch editor, it also can derive a sound-sample file from the patch data to send to a sampler. These products are distributed in the United States by Digidesign.

Intelligent Choices

Remember MIDIDraw, the program that creates/performs music from pictures you've drawn? Well, Intelligent Music has just released MIDIDraw's big brother: Diablo. It's billed as a "performance controller" in which the mouse controls pitch and velocity while computer keys control other parameters (e.g., pitch bend, scales, etc.).

Due out in early 1990 is **MTA**, the MIDI Transit Authority (previously known as Cartographer version 2.0). This is a full software emulation of the Axcess Mapper hardware device; the earlier Cartographer program was a patch editor for the Mapper.

Multitasking at Intelligent Music takes the form of **ST RAM**, short for the ST Realtime Applications Manager. Currently configured as a desk accessory, ST RAM can run up to six GEM programs at the same time, whether you're using MIDI or not ▶

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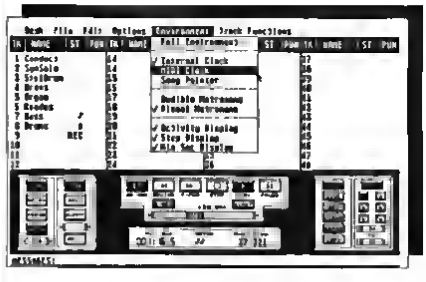

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House Calls

Another month, another crop of new titles from Dr. T — do these guys ever sleep?

Those of you who started with the text-only KCS won't believe your eyes when you see **TIGER**, possibly the most powerful graphical sequence editor available for any computer. It can display up to three tracks on screen at once, with multiple daughter windows per track of MIDI data. You can cut and paste controller envelopes, draw your own data — just about anything. TIGER will run under the MPE or can be used as a stand-alone editor with MIDI file-sequence data.

X-OR is now shipping. This is a generic patch editor program that lets you use one program to manage/edit your synthesizers rather than dealing with a number of instrument-specific programs. It comes initially configured for the Casio CZ-1/101; Ensoniq ESQ-1/SQ-80; Kawai KI; Korg M1; Oberheim Matrix 6/1000; Roland D10/20/110, D50/550, MT32 and GM70; Yamaha DX7(II) and TX81Z; Cooper MSB+; Digitech DSP 128 and ART Multiverb. More instrument configurations are in development and a configuration editor may be released at a later date for users to write their own. X-OR is fully compatible with patch bank files created by earlier Caged Artist editor programs. Nor is that line finished, as shown with the release of the **Proteus** patch editor.

Staccato Notes

In the "A rose by any other name ... " category, Drumware is now Interval Music Systems with the same management, address and telephone number. Their latest program is **Genwave/16**, an upgrade of their popular Genwave/12 generic sample-editing program. Genwave/16 handles mono and stereo samples, supporting both time- and frequency-based editing. Five looping algorithms are provided along with a host of digital signal processing options and intuitive mouse-based editing.

Passport is shipping version 3.4 of their popular **Master Tracks Pro** sequencer. Some of its new capabilities include controller chasing, sync to SMPTE and support for a hit list to cue musical events at defined times. If used with their companion MIDI Transport hardware interface, you can playback on up to 32 MIDI channels (16 each over two MIDI Outs) Master Tracks Pro is possibly the most ubiquitous sequencer on the MIDI market, with implementations for the Mac, Amiga, C1 and IBM and, of course, the ST. A scaled-down version, **Master Tracks Jr.**, is available for those who don't need all the pro level features.

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START Music/MIDI Editor Jim Pierson-Perry is a research chemist and semiprofessional musician. He lives in Elkton, Maryland.

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Proteus Patch Editor/ Librarian $129, TIGER, $149 X-OR $299 Dr. T's Music Software, 220 Boylston Street, Suite 306, Chestnut Hill, MA 02167, (617) 244-6954
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Jam Master, call for price Alpha Systems, 1012 Skyland Drive, Macedonia, OH 44056, (216) 467-5665
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Cartographer $100, Diablo, $150, MIDIDraw, $95, MTA version 2.0, $250 Intelligent Music, P O Box 8748, Albany, NY 12208, (518) 434-4110
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Genwave/16 call for price Interval Music Systems, 12077 Wilshire Blvd #515, Los Angeles, CA 90025, (213) 478-3956
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Master Tracks Pro version 3.4 $395, Master Tracks, Jr., $129.95; MIDI Transport, $395. Passport Designs, Inc., 625 Miramontes Street, Half Moon Bay, CA 94019, (415) 726-0280
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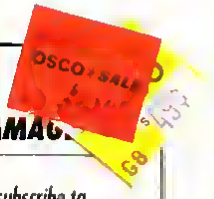

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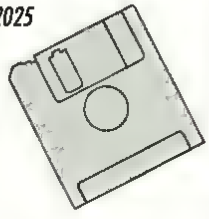

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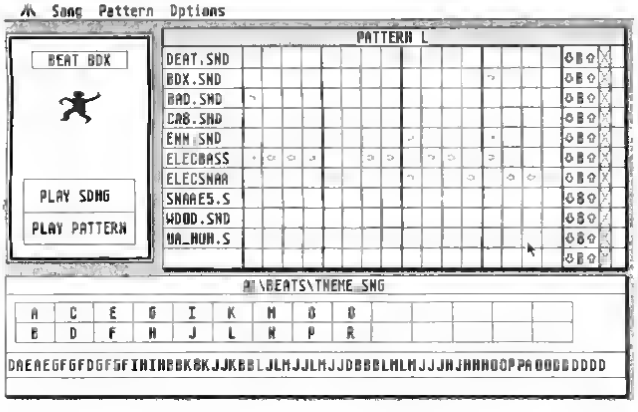
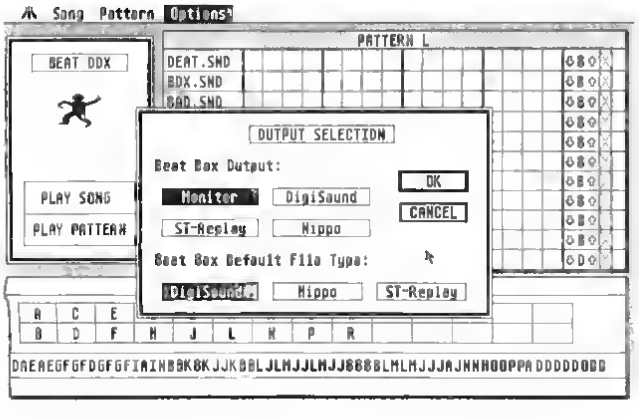
Alpha System's Beat Box

BY DAVE EDWARDS



Beat Box's main screen follows the layout used by many drum-machine programs—a grid of beats moving from left to right with the different sound choices along the left side. It's priced at $29.95, a steal for its performance level.

Beat Box uses the standard ''key word'' copy protection.



Beat Box supports all current commercial cartridges: Alpha System's own DigiSound, Michtron's St-Replay and the Novorone digitizer. Beat Box Sound output can be routed either to the monitor speaker or a sound digitizer cartridge.

I'm forever pushing a program to do more than its author ever intended and that's the case with Beat Box from Alpha Systems. On the surface the program is a simple sound sequencer, using sounds sampled into the ST. Sound files are loaded into memory and played using a set of ''patterns'' very much like a standard drum machine. What's amazing is that the program plays *four* sounds *simultaneously*.

First Impressions

The Beat Box package includes a program disk and one of the strangest manuals I've ever read (too much hip lingo for my tastes). When I first booted the program and heard the words ''Beat Box'' burst out of my monitor speaker, I knew I was in for some fun. Dutifully following the manual's recommendation, I loaded a demo song to hear what the program could produce. What a shock! Pouring out of the speaker came a very impressive sequence of samples that would do justice on anyone's recording. I could tell that during much of the tune four sounds were played at once—very impressive.

Beat Box Sound output can be routed either to the monitor speaker or a sound digitizer cartridge for im- ▶

proved fidelity. Beat Box supports all current commercial cartridges: Alpha System's own DigiSound, MichTron's ST-Replay and the Navarone digitizer. Even with all four sounds at once, playback sound quality is superb. Beat Box accepts sample data files in any of the preceding file formats as well (or you can use the Babel program from the July 1989 issue of START to convert sample files from other formats)

Once your sounds are loaded, it's time to work on your tune. The main screen follows the layout used by many drum-machine programs: a grid of beats moving from left to right with the different sound choices along the left side. Simply click on the sample name to hear what it sounds like

To build a pattern, move the cursor into the grid and click on one of the squares, corresponding to a sixteenth note.

I had a blast arranging different beats using the thirty or so samples that come with Beat Box. Since I do a lot of drum-machine programming, I knew exactly what to do. Novices may need a little time to get used to programming drum patterns in "step mode." The volume of each sound in the pattern can be changed by using the box with the arrows. Any sample can be deleted from memory or just muted. This last feature makes it easy to use the same pattern and just unmute parts as a tune builds. The tempo of the song or pattern can be set with the option of using 4/4 or 3/4 time.

Beat Box assigns letter names to each pattern and uses the box below the pattern grid to select which grid is currently active in the editing area. To add another pattern, just choose its letter name and start laying down the new beats. When all your patterns are written, you then arrange them into a play sequence to make a song.

Below the pattern letter grid is a line of text representing your song. Letters can be added, inserted or removed as easily as a word processor. When you click on "Play Song," Beat Box plays your patterns in the order listed. This is a limited but very straightforward approach.

A Few Gripes

As much as I like Beat Box, several

Beat Box plays *four* sounds *simultaneously*!

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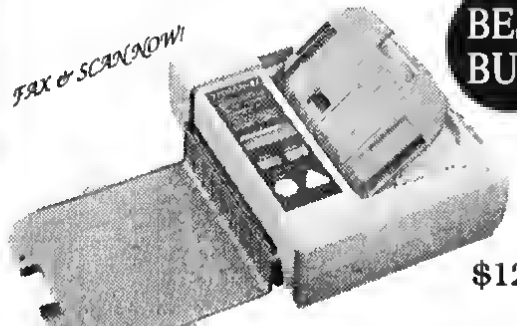

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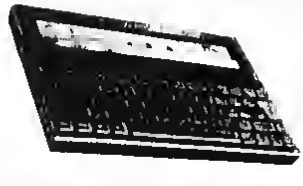

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Playback sound quality is superb.

things bother me about the program. First of all, Alpha Systems uses the standard "key word" copy protection, in which you must look up a word in the manual to get the program running. I consider this a nuisance and, for a program having only a 30-page manual, a big waste of time. But then again, I realize how pirate-conscious Atari software developers are and they no doubt see this form of copy protection as an unfortunate but necessary preventive measure

As to the program itself, I found that when you repeat sounds on the grid, they tend to overlap Retriggering a sample will not cut off the previous one However, samples are cut off at the end of a bar, which produces an annoying audible click from time to time—it would be better to have the samples play as long as possible rather than truncate them. Attempting to have more than four sounds play simultaneously produces an error flag at the offending grid location. If samples were cut off to prevent overlapping, this would happen less often.

Perhaps my biggest complaint about Beat Box is that for a program that simulates a drum machine, there are very few drum samples included and those consisted mostly of burps and electronic sounds I would have liked Beat Box to include the sounds of a complete drum kit, cymbals and all This would be much more in line with the program's basic premise.

Not a Toy

In their marketing strategy, Alpha Systems appears to think of Beat Box as a toy, an impression you get from the "cute" manual and lack of more professional features. Yet a toy it is not! I could think of a lot of ways this program could make it into professional studios if it had a few more features. The first thing I would like to see added is a MIDI clock so that sequences could be synched to other MIDI devices and a MIDI clock IN would be preferable. The program also should allow time signatures besides 4/4 and 3/4 and other note durations besides sixteenths Why not include a separate song edit screen? Patterns could then have longer names and, therefore, you could have more than 26 defined, including repeats, ritards and other musical dynamics.

For now, Beat Box is great for backup tapes for rappers and instrumentalists. It's also a great programmable metronome for budding superstars to practice their timings. For drummers who don't already have a drum machine, Beat Box is a must. Nothing is better than picking out a lick from a book and hearing it played by the machine. Even better, the tempo can be changed so that you can play along comfortably until you nail it at full speed.

For the price, Beat Box is a great value for both musicians and nonmusicians. And it has an even greater potential that I hope Alpha Systems will someday develop ■

***Dave Edwards is a MIDI consultant, professional drummer and managing editor of* The MIDI Insider, The MIDI Power User's Newsource**

PRODUCTS MENTIONED

Beat Box, $29 95. Alpha Systems, 1012 Skyland Drive, Macedonia, OH 44056, (216) 467-5665.
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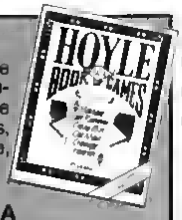

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DTP the Migraph Way

Touchup Revisited and the Hand Scanner

BY DANIEL FRUCHEY

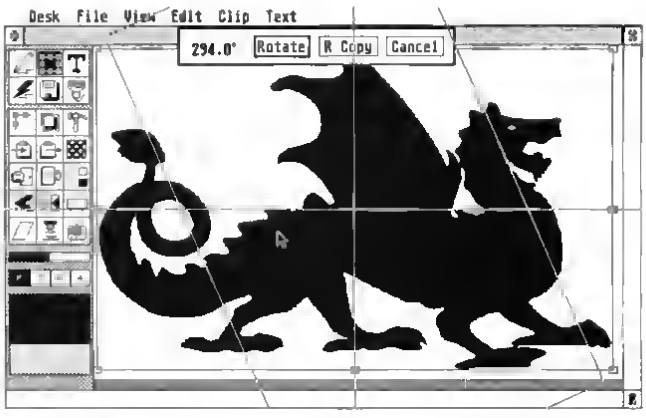
All too often we think of desktop publishing in a very narrow sense To most users, DTP means a "desktop publishing program " In fact, the field embraces a wide variety of software and hardware

Effective desktop publishing relies heavily on versatile layout-and-importation programs like Calamus, Fleet Street Publisher and PageStream But it relies just as heavily on effective word processors, paint, draw and CAD programs. Each of these products is designed for a very specific need and no single program currently available adequately meets all users' needs An all-in-one product that did meet all conceivable needs would be prohibitively expensive, both in dollars and memory, the modular approach lets you customize your software collection

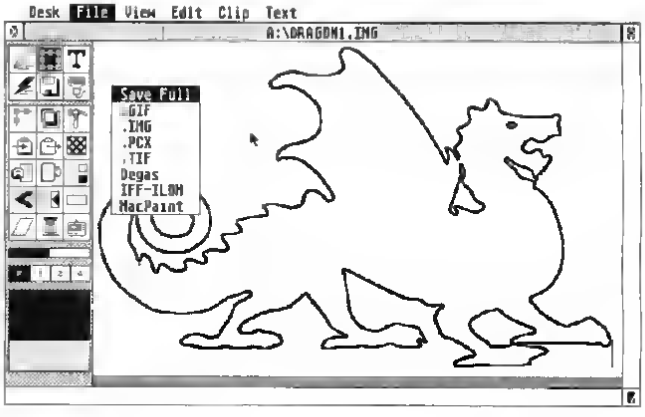
Provided it's used in conjunction with good support software, even a mediocre DTP program can match the quality and versatility of its high-end counterparts. This may sound like heresy to publishing purists, but ▶

it's true nonetheless.

One of the goals of this column is to focus on individual support products that will help increase the power and versatility of desktop publishing software, while examining ways to use these additional products effectively. With this in mind, we'll now take a close look at Migraph's Touch-Up, a multi-resolution paint program, and examine some of the functions that make it uniquely suited to the desktop publisher's needs. We'll then move onto Migraph's new hand scanner, an example of DTP hardware at its best.



This dragan image was imparted ta Tauch-Up with Migraph's Hand Scanner. It's shawn here in Tauch-Up's ratatian made. TauchUp has ane of the slickest user interfaces in the ST market.



The sample dragan graphic after scanning, but before cleanup with Tauch-Up. The full editing pracess taak abaut an haur and the results were superb.

Zooming In

I don't intend to review Touch-Up here; I already did that in the June 1989 issue of START. But just in case you missed it, here's a brief synopsis of Touch-Up's capabilities.

Touch-Up is a paint program that runs in all resolutions. Although it only manipulates monochrome images it will load color pictures and convert the colors to user-definable grey scales. Pictures may be imported from virtually any ST format (and many non-ST formats), edited and then saved in any other format desired. Pictures can also be created and edited using a wide variety of brushes, lines, geometric shapes and fill patterns. Touch-Up includes 12 resizable vector fonts that allow an extensive range of manipulation capabilities. Text strings are saved as graphics which can then be processed to give your documents a unique appeal.

Graphics can be rotated, flipped, mirrored, copied, slanted, masked, outlined and cleaned up automatically. Multiple zoom levels, a resizable working area, a defineable clipboard and one of the slickest GEM interfaces available anywhere all give Touch-Up great power and flexibility.

For the desktop publisher there's nothing in Touch-Up's class. The program is designed for serious desktop publishing and graphic design work, not doodling.

But That's Not All!

Since my review of Touch-Up, Migraph has released version 1.5 which includes many significant new options including automatic bolding, rotation of graphics in 0.1-degree increments with a defineable rotation axis, a locator for close-up work, importation of Tiny (.TNY) format pictures, exportation of pictures in .GIF format and hard-drive caching of graphics (the only limit to a graphic's size is the amount of room available on your hard disk!). Touch-Up now supports Migraph's new hand scanner (more on this later).

A big change with the new version of Touch-Up is one that I am happy to see — Migraph removed the Product Security Key. With the previous version, it was necessary to install a hardware device in the printer port in order to run the program. But many users complained about the cumbersome device and many potential users chose not to buy the program simply because of the Security Key. Just remember: Migraph removed the Key but not the copyright, so don't pirate their software!

Why Touch-Up?

There's only one universal bit-image picture format used in Atari desktop publishing: Image (.IMG). The pictures conserve disk space and RAM, allowing more graphics per project, are resolution independent

and guarantee the best picture quality possible, regardless of the resolution used. Also, they're not limited to a single screen of useable data like NEOchrome or DEGAS pictures.

Once you own a collection of high-quality .IMG graphics, another problem presents itself. Many publishing programs can't flip, rotate or edit .IMG graphics. The only solution is to buy a paint program that will manipulate images before you load them into a DTP program and the only one that manipulates .IMG graphics is Touch-Up.

I don't mean to imply that Touch-Up should be used just because it's the only paint program that manipulates .IMG graphics. It's designed with serious users in mind and the results are extremely pleasing.

The majority of pictures used in publishing are scanned from photos or design collections and Touch-Up is especially suited to this type of work. Pictures can be automatically processed using a variety of special effects that can change one picture into a dozen. Clean-up of pictures with jagged edges is simple when they're outlined using Touch-Up's Bezier curve technology or B-Spline lines. Touch-Up can automatically process scanned pictures to remove stray pixels picked up accidentally in the conversion process and you can edit text for logos and letterheads.

A single session with Touch-Up will justify its purchase.

All DTP programs allow importation of pictures but none of them allow exportation in a format usable by other programs. With Touch-Up you can save your pictures in formats that are usable by any program and still be able to edit the pictures later.

Text Processing

Touch-Up excels at processing graphic text for titles and headers. An average title can be revised to take on new meaning and provide an eye-catching "hook" to draw a reader's attention. Touch-Up uses vector fonts that can be manipulated in ways that a layout program simply can't handle. Letters can be edited for a variety of special effects, such as masking. Individual graphics can be used to replace letters and create many pleasing effects.

Migraph's Hand Scanner

Touch-Up will run as a stand-alone program or you can purchase it along with Migraph's Hand Scanner. Although Migraph first announced that the scanner would be available with a "Lite" version of TouchUp, ▶

A further development

Prospero Pascal and Fortran for GEM have long been established as standard programming environments for professional developers using the ST. Prospero C is also gaining wide acceptance as the first ANSI conforming C compiler for the ST.

Building upon the experience that we have acquired and the feedback we have received from our users, we have launched the Prospero Developers Toolkit for those who wish to extract the most from their ST. The features of the Toolkit are:-

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The Prospero Developers Toolkit costs just $US 96. For further details of this or other Prospero products, phone or write to the address below.

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LANGUAGES FOR MICROCOMPUTER PROFESSIONALS

they've since changed their plans and if you buy TouchUp with the scanner, you'll receive the full version.

The scanner plugs into the ST's cartridge port and passes data directly into Touch-Up. Controls on the scanner allow photographs or line art to be scanned at 100, 200, 300 or 400 dots per inch. Additional hardware and software controls let you define the contrast of graphics and the size of the area you wish to scan.

The device includes a viewing area to help align graphics while scanning. A light on the side of the scanner lets you know if the scanner is being passed across a picture at the correct speed and indicates when the process is completed.

I have used virtually every type of scanner available and I found Migraph's model easy to use with extremely high output quality. Results were comparable to the sheet-fed and flatbed scanners I am more familiar with, but scanning was much quicker with the hand unit. Although the actual area scanned is only about 4 inches wide, you can make several passes for full-page graphics and merge the pieces within Touch-Up. Once I set the controls to my preferences, work was quick and easy. It took me only 15 minutes to learn how to use the scanner.

Some Final Thoughts

For any business doing desktop publishing on an ST, a single session with Touch-Up will justify its purchase. Your current paint program may be adequate to your needs, but Touch-Up will save time and free you to work on other customer's projects.

If you're a serious home user, you'll find that Touch-Up provides greater control than any other program over the many aspects of designing and editing graphics and graphic text. Your projects will become much more enjoyable and you'll find that you can take on a greater variety.

If you're in the market for a scanner, you probably fall in the majority of ST owners who can't readily afford a full-sized scanner. Migraph's is an ideal alternative and costs about the same as a major piece of software. Believe me, it's a worthwhile addition to any ST publishing system ■

Dan Fruchey is a regular contributor to START. He works as a paramedic in Santa Rosa, California and runs a small clip-art and desktop publishing business on the side.

PRODUCTS MENTIONED

Touch-Up $179.95, with scanner, $499. **Hand Scanner** $314. Migraph, Inc., 200 S. 33rd Street, Suite 220, Federal Way, WA 98003 (206) 838-4677

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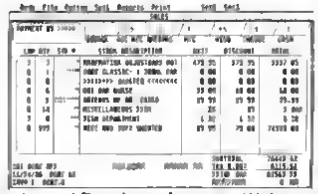

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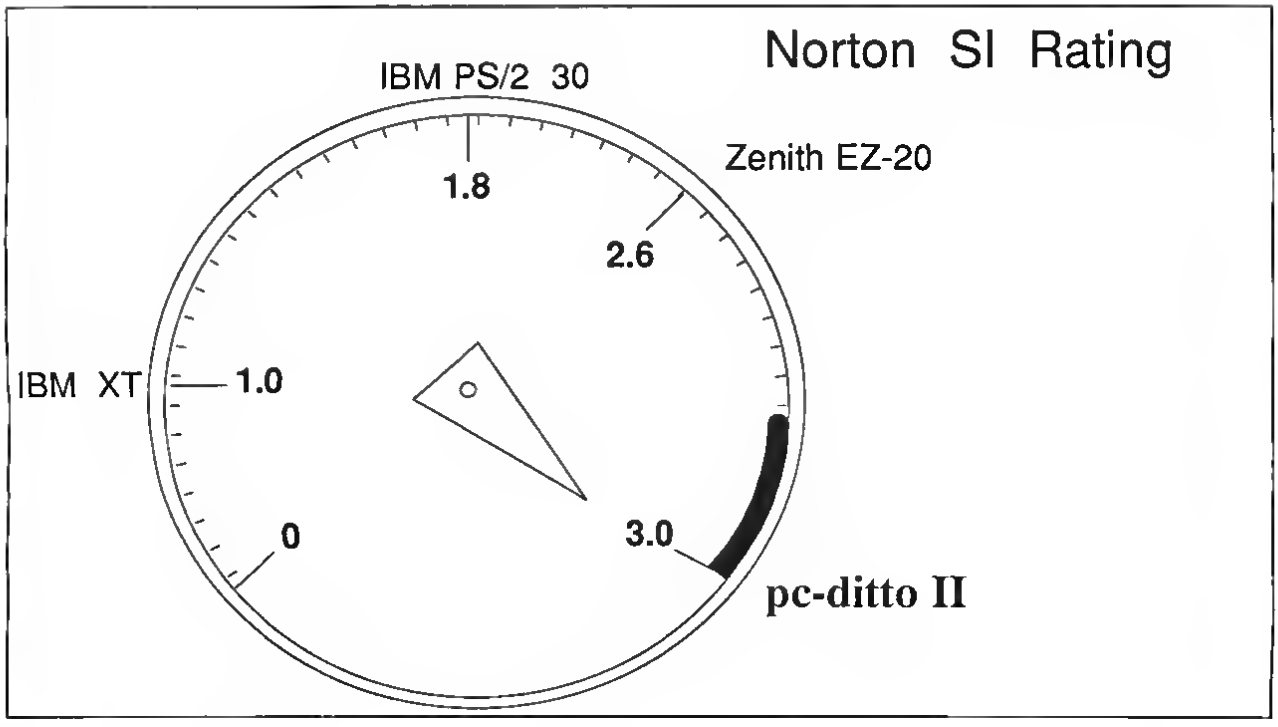

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Of Mice and STs

New Mice from Practical Solutions, Best and Datel

BY STEPHEN MORTIMER

The Cordless Mouse from Practical Solutions: infrared technology is what lets the mouse go ''tail-less.''

The Genius Mouse from Datel, has large buttons that offer a softer response than the Atari mouse.

For most ST owners, the mouse is just one of those components that they take for granted. It came with the computer, it's there and it always works. But now that early STs are getting on in years, some owners are finding that their mice are getting a bit crotchety. Other owners just want a better—or different feeling—mouse.

Until recently, the only solution to a dead or glitchy mouse has been to replace it with another from Atari, a $25 proposition. Now you have a choice: Datel and Best have two new direct replacement ST mice and Practical Solutions has announced a radically different mouse, one without a tail. If you need or want a new mouse, read on

CORDLESS MOUSE FROM PRACTICAL SOLUTIONS

Once again, Practical Solutions has created a useful hardware add-on to add to its already impressive product line This time, it's a cordless mouse Dubbed, appropriately, the Cordless Mouse, it utilizes infrared technology for wirefree operation.

A small receiver unit on a cable plugs into the ST's mouse port and receives commands from the Cord- ▶

less Mouse. While you must maintain a clear line of sight between the receiver and the light-emitting diode (LED) on the Mouse's nose, it is useable at an angle of up to 45 degrees and up to 5½ feet away.

Smooth Operation

The ergonomically designed Cordless Mouse is very comfortable to use. The two buttons on top of the unit use high-quality switches with excellent tactile response. They're much more responsive than the stock ST mouse.

Movement is very smooth. The Cordless Mouse uses a smaller ball than its Atari counterpart and, like Atari's, it's removable for easy maintenance. Teflon™ pads on the bottom of the unit also contribute to its slick operation. In fact, it's so fluid that it takes a little time to get used to after using an Atari mouse.

Practical Solutions' Mouse also increased the resolution to 200 cpi (counts per inch), which contributes to faster mouse operation. (Software-based "mouse accelerators" provide similar results.) You only have to move the Cordless Mouse half as far as an Atari mouse for the same cursor movement. This is especially

Ergonomically designed, the Best Mouse fits snugly in the palm of the hand—a comfortable alternative to the ST's stock unit.

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nice if your desk space is limited.

You can adjust the Cordless Mouse's speed to the application. If you hold the side button in while moving the mouse slowly, the cursor will move slowly; it's great for pixel-by-pixel editing in a paint program, for example. For faster movement, say, for moving from one side of a Moniterm 20-inch monitor to the other, you just hold the side button in and move the mouse more rapidly. In effect, the Cordless Mouse has three operating speeds: slow, normal and fast.

Datel supplies a six-foot-long cord with its mouse—a godsend for left-handers.

Two AAA batteries (not included) power the Cordless Mouse. Practical Solutions estimates that battery life will be about 125 hours in continuous use. For the average ST user, this should be almost three months! The Mouse also has two battery-saving "sleep" modes. After a few minutes, the Mouse will automatically go into its first sleep mode; just move the mouse to "wake" it. After 10 minutes of inactivity, the Mouse will shut itself off; you just press the side button to turn it back on.

No More "Down in Front!"

After using the Cordless Mouse for some time now, I've had no problems with it. The obnoxious but necessary cable of the "normal" mouse is just *gone* and no mouse accelerators are needed. The fact that you can use the mouse at some distance from the computer means that for anyone who uses an ST for demonstrations can now move far enough back to stay out of the way of the monitor screen!

The Cordless Mouse I reviewed was a pre-production unit. It's scheduled for release in late 1989, so it should be available by the time you read this. Practical Solutions caps its product with a full one-year warranty and stocks all parts. They have gained an excellent reputation for their ST hardware and the Cordless Mouse will only add to it. I highly recommend this product.

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Practical Solution's Cordless Mouse utilizes infrared technology.

Bringing You the "Best"

The Best mouse has an ergonomic, bulbous shape that fits comfortably in the palm of the hand. Though it operates smoothly on a mouse pad, Best suggests you use the unit on a harder surface because it has only three teflon feet and tends to dig into soft mouse pads. The mouse's two narrow, soft buttons have reassuring tactile feedback and are very responsive. A five-foot-long cord is supplied with the Best mouse.

A general problem with mechanical mice is removing the dirt that accumulates on the mouse's ball rollers. By the time you read this, Best says that Teflon (TM) rollers will be standard to make them easier to clean. Best provides a 90-day warranty and stocks all parts.

The Datel Genius

Datel's mouse, called the Genius, has a slightly boxy design with large, square buttons on top and Teflon (TM) feet. The large, soft buttons are pleasant to use and much more responsive than those on Atari's mouse, but I found that the cursor tends to make sudden jerky jumps, particularly when the mouse was moved fairly quickly. Datel supplies a six-foot-long cable—a godsend for left-handed ST users. Like the Best mouse, it also has a 90-day warranty

Final Thoughts

Both mice are claimed to have a 200-cpi resolution. In actual use, their operation turns out to be quite different. The Best mouse moves the cursor exactly like the Atari mouse; on the other hand, the Genius mouse needs only half the distance to accomplish the same operation, making software mouse accelerators unnecessary. After using both mice for some time, I found the shape of the Best mouse to be very comfortable, while the Genius mouse did not fit my hand quite as well and became tiring after several hours of use.

Overall, I would rate the Best mouse slightly better than the Genius mouse. This is a personal preference and your own preferences may differ. If you can, try them both out before you make your choice. ■

Stephen Mortimer is a Contributing Editor for START and authors "News, Notes & Quotes" on a regular basis.

PRODUCTS MENTIONED

Atari STM-1 Mouse, $25.00 exchange or $49.95 without exchange. Atari Corp., 1196 Borregas Ave., Sunnyvale, CA 94086, (408) 745-5759.
CIRCLE 171 ON READER SERVICE CARD

Best Mouse, $49.95. Best Electronics, 2021 The Alameda, Suite 290, San Jose, CA 95126, (408) 243-6950.
CIRCLE 172 ON READER SERVICE CARD

Genius Mouse, $44.99. Datel Computers, 3430 E. Tropicana, #67, Las Vegas, NV 89121, (800) 782-9110.
CIRCLE 173 ON READER SERVICE CARD

Cordless Mouse, $129.95. Practical Solutions, 1135 North Jones Blvd., Tucson, Arizona 85716, (602) 322-6100.
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Clipboard

Tips and Tricks for the ST Owner

by Heidi Brumbaugh
START Programs Editor

Current Directory Notes

START Selector diehards take note: here's a tip that will only work with the START Selector and not with the GEM item selector or UIS II. When you click on a drive letter in the START Selector, you will go directly to the current directory on that drive. One way to set the current directory is to open a window of the directory on the Desktop. For example, if you open a window for D:\TEXT\LETTERS and run a word processor from drive C, when you bring up the START Selector to load a file and click on the drive D button the TEXT\LETTERS\ subdirectory will be the default. This saves you the trouble of plowing through folders to get to the file you want. To switch back and forth between subdirectories on different drives, open a window for each subdirectory on the Desktop before running the application.

Dig them Curves

Flash! GFA BASIC 3.0 has a new command that lets you create Bezier curves. The syntax for the new command is:

CURVE x0,y0,x1,y1,x2,y2,x3,y3

A Bezier curve is drawn from (x0,y0) to (x3,y3). The curve is tangent to the line segment (x0,y0)-(x1,y1) at (x0,y0) and is tangent to the segment (x3,y3)-(x2,y2) at (x3,y3). CURVE is only available in versions 3.07 and later.

Autorun GEM Programs

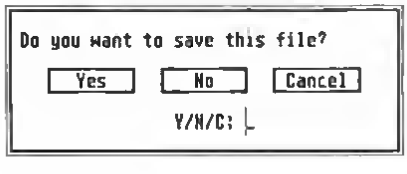
The rumors are true: you *can* run a GEM program at boot time under the new TOS 1.4 ROMs. However, putting the program in the AUTO folder won't work; you have to use a special installation process. At the Desktop, click on the program once to highlight it, then click on Install Application under the Options menu. Next to "Boot Status," click on "Auto," then save the Desktop. One of the advantages of this is that the GEM program doesn't have to take up space on the boot disk, another advantage is that you don't have to have TOS 1.4 to set up an autobooting TOS 1.4 disk. Simply insert the following line to any DESKTOP.INF file.

=Z 01 A:\PROGNAME.PRG*

Insert the line between the line beginning =d and the line beginning =E.

Text Input for Dialog Boxes

I spotted the dialog box shown below in True BASIC and just had to pass on this great interface idea. Each of the buttons—Yes, No and Cancel—are standard selectable exit buttons that the user can select with the mouse. The last line is an editable field with a template for one character of text entry. The user can enter a letter, for example Y for the Yes button, and press [Return] to select an option. To use this technique add a formatted text object (FTEXT) to the dialog box and assign it the attributes editable and default. When the user presses [Return], AES will return control of the program to you. If the user has pressed an invalid letter, simply put the dialog box back on the screen so the user can try again.



Stumper

If you're stumped for a solution to Stumbling Blocks from the August 1989 issue, or are beginning to wonder if the puzzle even *has* a solution, take a good look at the game's title screen. The slanted puzzle design may throw you off, and the screen is only visible for a few seconds, but author Mark Annetts used a completed version of the 5-by-12 puzzle for this design. Do a screen dump to get a better look. Sneaky, Mark, very sneaky . . . ■

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

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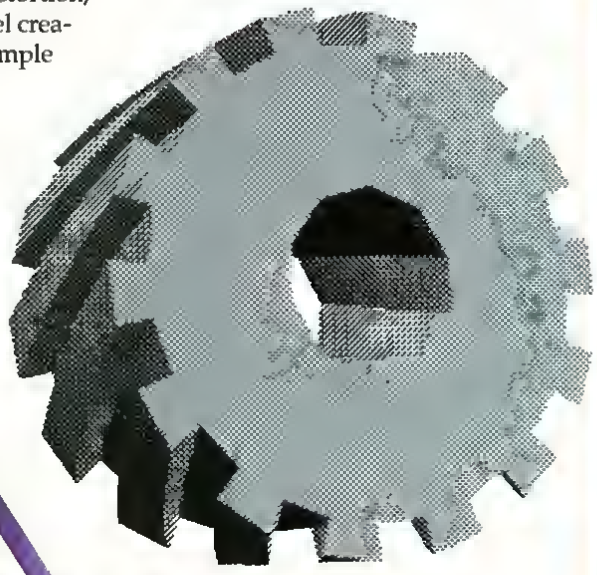

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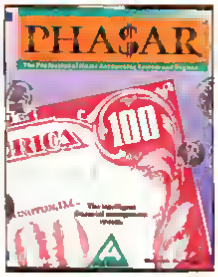

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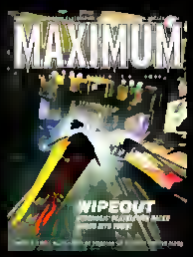

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