START

#1 Guide To Atari ST

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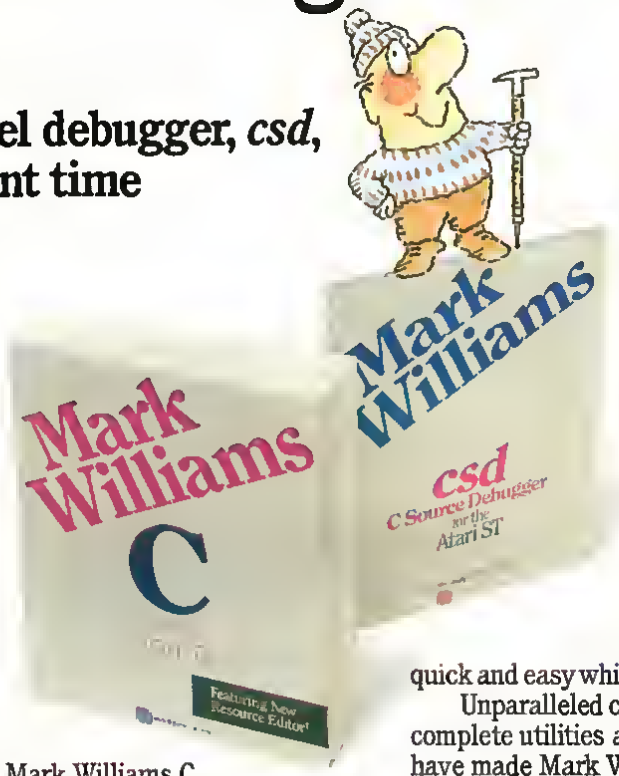

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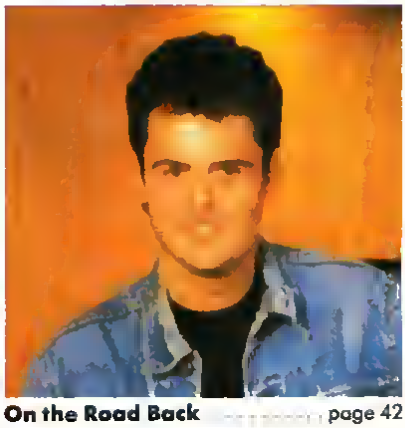
You're Clear for Takeoff! . . . . . Page 60

#1 Guide To Atari ST

START

NOVEMBER 1989 VOLUME 4, NUMBER 4

RezRender . . . . . page 30



On the Road Back . . . . . page 42

Features

22 THE TRANSPUTER CONNECTION: ATARI AND PERIHELION
by Marshal M. Rosenthal
An Exclusive Interview with Dr. Tim King

30 REZRENDER
by Richard Parker and Phillip Burgess
Ray Tracing and More on Your ST!

42 ON THE ROAD BACK
by Mard Naman
Donny Osmond and Atari

55 THE START DISK'S NEW LOOK
Double the Space!

57 JULIA
by Phil Comeau
"Buttonless" Drawing Program for the ST

60 FINAL APPROACH CONTROLLER
by Kevin Mason
Air Traffic Controller Simulation for the ST

Reviews

25 THREE FONT EDITORS FOR THE ST
by Dan Fruchey
Calamus's Font Editor, Neocept's Fontz!, MichTron's Hyperfont

53 MAVIS BEACON TEACHES TYPING
by David Plotkin
Learning to Type on the ST

79 TAMING THE TX81Z TONE GENERATOR
by Jim Pierson-Perry
A Patch-Editor Roundup

Departments

9 Editorial

11 Dialog Box

17 News, Notes and Quotes
Stephen Mortimer, Marshall M. Rosenthal

19 Products Update
Marta Deike

39 Mac & PC on the ST
Readability and Grammatik III Under pc-ditto

44 For the Fun of It
Battlehawks 1942, Combat Course, JUG

64 Disk Instructions

66 Disk Contents

71 The ST/MIDI Connection
Whole Lotta Shakin' Going On

75 Inside Atari
The Summer NAMM Show

85 Programming in True BASIC
Part III: Windows and Graphics

89 Business Applications
Desktop Publishing Typography

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START #1 GUIDE TO THE ATARI ST

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Credit Card Subscriptions and Catalog Orders: (800)234-7001
Subscription Customer Service: For change of address and inquiries, include subscription label and write to START Subscriptions, PO Box 3605, Escondido CA 92025 or call (800) 234-7001, 9 am to 4:30 pm Pacific Time

November 1989, Volume 4 Number 4. START Magazine (ISSN #0889-6216), is published monthly by Antic Publishing, Inc., 544 Second St., San Francisco, CA 94107. Third Class postage paid at Columbia, MO. Subscriptions: (for 12 issues with disk) $79.95 in U.S., $87.95 in Canada and Mexico, $93.95 for other foreign addresses. POSTMASTER: Please send address changes to START Magazine, PO Box 3605, Escondido, CA 92025

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Editorial

We at START are always looking at ways to give you the most for your money. Whether it's **exclusive interviews**, like those in this issue with Donny Osmond and Penhelion's Dr. Tim King, or great programs like RezRender, we're always after the best for you.

For more than a year, we've been exploring ways to **double the value** to you of our START disks. Finally, through the genius of David Small and Dan Moore, we've done it. Beginning with this issue, your START disk will have *two* sides full of programs, source code and demos. That's *double the value for no increase in price!*

And the best part of START's new disk format (named the **Heidi format** after Heidi Brumbaugh, START's Programs Editor) is that if you only have a single-sided drive, you will *still* be able to access one full side of our great programs, just as before. And if you have a double-sided drive (or have a friend who does), you can also access the second side of your START disk. With this format, *everybody wins!*

Plus, we asked Cyber Texture author David Ramsden to write a **new START Menu program** to make using START disks fun and easy. It features David's custom un-ARCing routines that are 40 percent faster than ARCXTTP and smooth, invisible handling of Heidi-formatted disks. And all you have to do is boot your START disk.

So what's on your START disk this month? Well, on Side One, you'll find **RezRender**, a pioneering rendering program for 3D objects. There's nothing else like it anywhere on the ST.

Then there's **Final Approach Controller** by Kevin Mason, a great and realistic simulation of an Air Traffic Controller's duties. It'll have you reaching for your Tums after just a few minutes.

And on **Side 2**, we have a special bonus: After years of being handled by Aegis Development, Jim Kent has placed his pioneering animation program, Aegis Animator, into the public domain. It's now called **Ani ST**, and it's on Side 2, complete with documentation and sample files.

Also on Side 2 is the **source code** for our remarkable Schedule Maker from last issue. A look at the source code to this professional-level program can be one of the best learning tools available. Our readers have always told us that the source code we publish is one of the most valuable parts of START. Now, with the Heidi format, we have the room for the source code from all of our programs, including the source code that wouldn't fit on past START disks.

Let us know what you think of our new START disk format and system. We hope you like it! ■

ANDREW REESE
START Editor

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Dialog Box

Letters From Our Readers

A Few Complaints

I have a few complaints concerning START First, why is there so much white space? If you compare your text format to, say, the ones used by *BYTE*, *Business Week*, or *Scientific American*, you'll notice immediately that there's a lot more spacing between the lines of text in your articles and around your titles In addition, you waste entire pages on meaningless pictures and large, blown up text excerpts

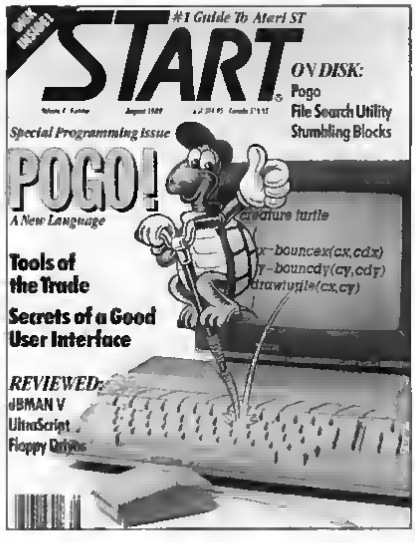
Secondly, your articles and reviews often lack any real depth and usually don't provide much technical information An example from the August 1989 issue is your Pogo article which devotes less than one third of a page to how the Pogo compiler actually operates, what kind of code it generates or how it might be improved Wasn't this supposed to be a "Special Programming" issue?

Bruce Graves
Chelmsford, MA

There are as many magazine designs as there are magazines, but there are some basic design principles here. In order to make magazines visually interesting and less difficult to read, all publishers—START included—use illustrations, subheads and white space to help break up large "gray" blocks of text. Both the leading (line spacing) and the ragged-right justification in START were conscious design choices to make START attractive and readable. We have dummied up pages here with full justification and less leading, but found that there was a surprisingly small gain in text lines per page and a notable loss in appearance and accessability.

The ST and Mega are versatile computers whose owners are of all levels of skill and technical sophistication. It's a daily challenge to strike that perfect balance in editorial content so that it is accessible to most of our readers, most of the time. We try to aim START primarily at intermediate users, but at the same time include a wide range of features designed for beginners or experts. We're constantly faced with editorial choices; for example, should we use, say, 10 percent of our editorial space for material that might be of interest or use to only one percent of our readers?

See Ray Mulford's letter below for another view.—START Editor



I Go Pogo

I've had my ST for about two years now, but I hadn't read an issue of START until I bought the August 1989 disk/magazine. Wow! I find it hard to believe that I managed this long without you guys I just had to write to tell you what a great product you have. It is a welcome change to read well-written (and typo-free) articles as well as intelligent, diversified reviews. And your broad base of advertisers leads me to believe that your excellence goes way back and will extend far into the future.

I would like to thank Jim Kent for giving us Pogo Until I began playing with Pogo, my programming experience consisted of dabbling with a limited knowledge of BASIC, taking a few Pascal courses in college and writing a few simple procedures in Logo for the high school geometry classes that I teach, But something about Pogo intrigued me and I started fiddling with it In about 12 hours I hacked out (a game called) Kamikaze Spaceships Now, I'll be the first to admit that it's a tired game with a tired premise and code that probably isn't the best, but, hey, it's far better than most of the other stuff I've done. I've enclosed a copy, hoping that if others see what a non-programmer can do, then programming will be seen as a pastime and not a chore.

Thank you again for a fantastic magazine.

Ray Mulford
Fresno, CA

Ray's game is a derivation of the classic Missile Command scenario and our first submission in Pogo. While its gameplay is not up to what we've published in START in more mature languages such as C or GFA BASIC, it's an interesting illustration of the power of Pogo Want to see it, readers? Oh, and thanks for the words of praise, Ray—START Editor

Test and Modify

I enjoyed the many useful suggestions in "Secrets of a Good User Interface" in the August 1989 issue. There was one very important piece of advice, however, that was overlooked by all three authors test and modify the interface based on actual experience. A sensible strategy is to write the initial version of the program with a relatively simple user interface, ▸

Dialog Box

but allocate development time for additions and improvements.

I would also like to comment on Tim Oren's concern about restricting menus to five to nine items. The limits to short-term memory occur when recalling items in a list after a brief exposure to that list. This is simply not the situation when using a menu. The user does not need to recall any items other than the one to be selected, and the menu does not disappear before the task is done. Obviously, short menus can be searched faster than long ones, but I would be very surprised if any study shows that menus become dramatically harder to use when they contain more than seven items.

Bob Korn
St. Paul, MN

A Hard Drive Misconception

There is a misconception that high-performance drives are limited to the IBM world. Wrong! A stock XT or AT can't handle the data rate achievable on an ST. For instance, in "Small Tools" of your July 1989 issue, it states that "No one is doing anything with ESDI in the ST world... restricted to IBM." Someone is.

Berkeley Microsystems has (and can configure) custom formatting software for ESDI drives. The folks at BMS were extremely helpful when I set up my 150Mb ESDI drive last Spring. Admittedly, a 150Mb drive is a bit spacious for typical users. Yet those in the market for "rolling their own" shouldn't be discouraged from investing in high-performance drives just because they only see slow 20-30Mb drives in stores and magazines. The ST is a performer—let it perform!

Robert Morris
Chico, CA

Berkeley Microsystems has been an ST stalwart since its earliest days. They were one of the first to offer "roll your own" hard drive kits and have an excellent reputation for quality products and support.—START Editor

Expansion Connector Forgotten?

START magazine is great and always informative. I think your monthly section on what's happening in the Atari world is great because it makes me feel that Atari hasn't just laid over and died on us loyal ST users.

Being that this could be Atari's year, with the release of the STACY laptop, the upgraded laser printer and the long awaited TT, I have one major question that I haven't heard addressed yet. On the first page of the Mega 2 owner's manual, it states that the Mega has "an internal expansion connector direct to the computer's main processing unit [which] allows for future expansion of the Mega ST's capabilities." Well, I've been to a few computer stores that didn't even know this. What's going on? To double-check this fact I opened up my Mega 2 and—lo and behold—there was this monster connector sticking right up saying "howdy!" Did Atari forget about this?

Jeffrey Woolsey
Sacramento, CA

Atari didn't forget about the connector, they're just not advertising what they know. In fact, the computer maker has produced a 68881 math coprocessor board for that internal port. A few third-party developers have found other uses for the special connector. Monitorm Corp. of Minnetonka, Minnesota uses it for their big Viking monitors and John Russell Innovations of Pittsburg, California uses it for Genlock. Contact these companies directly for more information.—START Editor

If Every ST Owner Would Just . . .

You still read a lot these days about software piracy, not just on the ST, but on many other systems as well. I think it's high time we Atari users change all this! How you ask? Simple—by purchasing software. What I'm suggesting is that we all go out and buy that program that we've put off buying for far too long. This way we can all do our part to combat software theft.

Regan Weed
Vernon, BC ■

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CIRCLE 042 ON READER SERVICE CARD

News, Notes & Quotes

What's Happening in the Atari World

by Stephen Mortimer, Marshall M. Rosenthal and the START Staff

Atari Advertising

According to sources at Atari Corp., the company has recently signed with two new ad agencies. Chiat/Day/Mojo of Los Angeles will handle advertising for the Entertainment Division and Stamford, Connecticut-based Anderson & Lemke will handle Computer Division ads. Both agencies will work from their San Francisco offices.

Both firms have excellent reputations and handle major accounts. Chiat/Day/Mojo's accounts have included Nissan, California Coolers, National Car Rental and Oracle, while Anderson & Lemke's clients have included Phillips Europe, OCE Worldwide, Burlington Air Express and Intel.

The total ad budget is reported to be in the neighborhood of $20 million with the lion's share going to the Computer Division. As of this writing, the media plan has not been set, but you'll probably have already seen new Atari ads by the time you read this.

Hacking to Disaster

by Marshal M. Rosenthal

A group of young men in West Germany recently paid a high price for their computer hacking. Hannover has long been the scene of some of the worst software piracy in Europe, but these men, aged 25 to 35, went quite a bit beyond piracy—they put their computer skills to work for the KGB, the USSR's state security and intelligence service.

The purpose of this hackers network was to acquire Western technology from military and civilian installations and then pass it on to the KGB operating out of East Germany. Through diligence, information supplied by U.S. intelligence sources and a bit of luck, the BFV (the German equivalent of our FBI) was able to tap into the network. West German Intelligence spread their net over 18 months and were finally able to grab all of the culprits.

The hackers claimed in their defense that they were the victims of blackmail and drug-induced coercion. In fact, they were paid a total of under $200,000 for their treason as well, but at the relatively paltry rate of about $2,000 per disk. Apparently, most of them found the excitement of their deeds as intoxicating as the financial rewards. They may have a long time to sober up, however, as they face long prison terms for their actions.

On a bizarre final note, the body of 24-year-old hacker Karl Kock was found in the woods near Hannover, apparently a victim of suicide by self-immolation. Though Kock had originally been a part of the hackers group—he supplied codewords for gaining entry into sensitive computer networks—the 24-year-old had turned informer to the BFV.

Spectre 2.0 Closer to Perfection

With Spectre GCR version 2.0, Gadgets by Small's Apple Macintosh emulator has reached the plug-and-play stage. It can read Mac disks directly and has improved in many other areas. Version 2.0 will also feature UltraScript support that, according to Gadgets owner Dave Small, brings it to the "pull down Print and it goes" stage. Negotiations are currently underway at press time to bring UltraScript support to Spectre.

Spectre GCR emulation is now that of a true Mac Plus rather than a Mac 512E. This means it should operate under System 7.0 when it's released by Apple next year. (System 7.0 is a revolutionary step for the Mac operating system, featuring non-PostScript outline fonts, increased printer support and a special language for communications between applications.) Small points out that floppy disk operation in Spectre GCR Mac mode is faster than it was with Spectre-formatted disks. Hard disks also operate faster and sound support has been solidified.

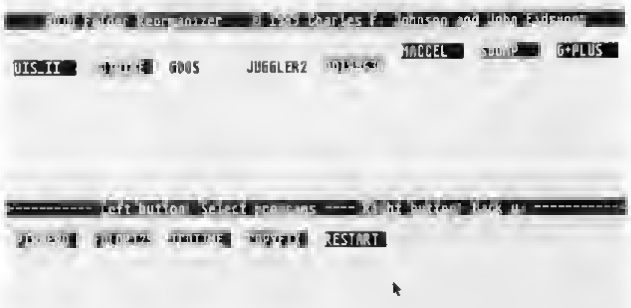
The Moniterm large-screen monitor is now supported by Spectre version 2.0. Lastly, it has been proven that Spectre GCR works with Atari's STACY laptop ST, meaning that a Mac laptop may soon be available—even if it's not from Apple!

For more information, contact Gadgets by Small at 40 West Littleton Blvd., #210-211, Littleton, CO 80120, (303) 791-6098.

News, Notes & Quotes

Fat Bits

• A total of five accelerator boards have been announced for the ST Early last year, Strange Systems was the first to announce an accelerator, but it has yet to appear JRI's JATO board is shipping CMI's accelerator with a math coprocessor and blitter socket is also shipping. Fast Technology's T16 and Datafree's board were not yet available at press time. It appears that a fierce competition is brewing in this high-speed market



One of the best of CodeHead's Utilities is the AUTO Folder Reorganizer by Charles F. Johnson and John Eidsvoog. It lets you change the order in which programs run in your AUTO folder, just the thing to let you solve those AUTO programs conflicts problems.

• On its way to the Dearborn, Michigan World of Atari show, the Atari STACY prototype was severely damaged. Atari called on Gadgets by Small's Dave and Sandy Small to resurrect the portable ST, using tape and glue. As a thanks to the Smalls, Atari let them display the STACY *with the Spectre* GCR Mac emulator.

• WordPerfect has reduced the list price of their popular word processor to $250. As of press time, however, the update announced in early summer had not yet been shipped.

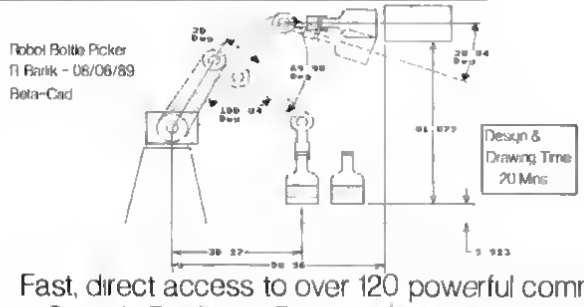
• Atari sponsored several small World of Atari shows for dealers and users. The shows were designed to increase dealer coverage for Atari in the Southeastern part of the United States. Several dealers have decided to carry the Atari line as a result of these shows.

• CodeHead Software has done it again with CodeHead Utilities. It contains many useful utilities and the most recent versions of Charles F. Johnson's shareware software with a retail price of $29.95.

• Atari hard-disk utilities (HDX) version 3.01 is now available and allow the creation of partitions up to one gigabyte in size. Check with Atari Customer Service for availability. ■

***Stephen Mortimer** is a contributing editor for START. He lives in Binghamton, New York. **Marshal M. Rosenthal** is a New York-based writer and photographer.*

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



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Products Update

New ST Software and Hardware

COMPILED BY MARTA DEIKE
START EDITORIAL COORDINATOR

New Games from Sierra On-Line

Sierra-Online is bringing back the action and excitement of role-playing games From the highest rampart of Camelot, to the Holy Land, across storm tossed seas, **Conquests of Camelot** will take you in search of the Holy Grail, a search determining your will, your faith and your physical prowess. Holding true to the mythical Celtic legend, all of your favorites are here with graphics and sound that bring new life to a tale often told: King Arthur, Gwenhyver, Sir Launcelot and Merlin, who knows all. Wield Excaliber, the sword of Kings, as you journey to find the lost Grail.

A magical adventure awaits you in Sierra On-Line's Hero's Quest. Requires a color system.

A magical land of good and evil awaits you high in the majestic Alps in Sierra's new fantasy/role-playing game **Hero's Quest**. In it, you must use magic and daring to outwit the brigands who have kidnapped the Baron's daughter. Save her and bring the hoodlums to justice and you'll earn the title "Hero" as one of your rewards—but that's just the beginning for you in Hero's Quest.

Computer owners the world over know Leisure Suit Larry, the lovable nerd and world-class lounge lizard created by designer Al Lowe. Now get ready for Larry's female counterpart, the promiscuous Passionate Patty! In **Leisure Suit Larry III**, players switch roles between Larry and Patty in a gender-bending adventure that is bound to cause controversy.

Conquests of Camelot, $59.95. Hero's Quest, $59.95. Leisure Suit Larry III, $59.95. **Sierra On-Line Inc., P.O. Box 485, Coarsegold, CA 93614, (209) 683-4468.**

Beat Box and Back Trak from Alpha Systems

Alpha Systems presents a whole new concept in digital sound with **Beat Box**, a polyphonic pattern builder, drum machine and song construction kit rolled into one! Beat Box makes it easy for anyone to create exciting, sophisticated beat patterns from ordinary digitized sound files. It lets you combine and arrange up to 30 different patterns to build a complete musical composition. Best of all, Beat Box plays in four voices through your monitor speaker or digitizer hardware. Beat Box fully supports Digisound ST, Digisound Professional, ST Replay and Navarone (Hippo) Sound Digitizers.

Alpha Systems' new **Back Trak** gives ST users more for less. Double-sided drives are now standard equipment on all STs, but software companies continue to churn out programs on single-sided disks. While this may be peachy for those who still own SS drives, for the rest of us it means wasting 50 percent of our disk's capacity. And with blank disks costing up to $5 each, you waste money every time you purchase or back up a software program. Back Trak lets you access the back side of these single-sided to double your storage capacity. Back Track lets you boot off the front or back side of the disk—and lets you select drive A or B as a boot drive.

Beat Box, $29.95, Back Trak, $29.95. **Alpha Systems, 1012 Skyland Drive, Macedonia, OH 44056, (216) 467-5665.**

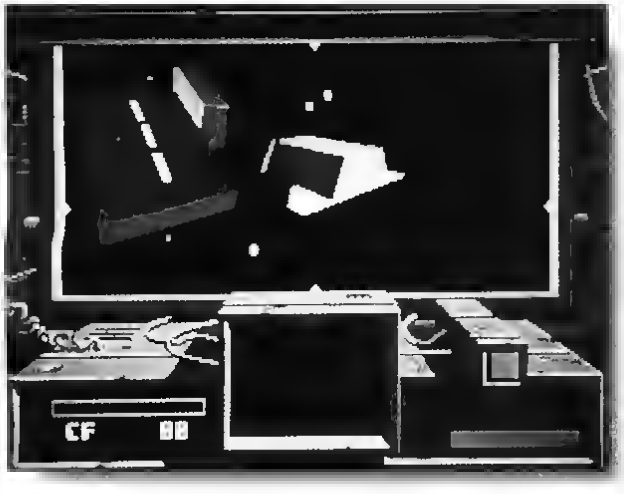
Products Update

Origin-al Simulations

For the "space flight experience of a lifetime" Origin introduces **Space Rogue**, a realistic 3D space-flight simulation that incorporates the principles of Newtonian physics. Players are immersed in a fierce struggle for galactic control in this one-of-a-kind adventure. Space Rogue orbits you into the history, culture and economics of the "far arm" of deep space.

Strive to design future's ultimate military cybertank in Origin's **Omega**, a strategic simulation program in which you are a cybernetic engineer for the Organization of Strategic Intelligence. Your mission is to integrate chassis components and create artificial intelligence in an attempt to build the world's supreme cybertank.

Space Rogue, $49.95. Omega, $49.95. **Origin, 136 Harvey Road, Building B, Londonderry, NH 03053, (603) 644-3360.**



Origin Systems gives you the "space flight experience of a lifetime" in Space Rogue, a realistic 3D space-flight simulation. Requires a color system.

GenWave/16: New Sound on the ST

A universal stereo waveform editor from Interval Music Systems is available for the first time on the ST! With **GenWave/16**, an update to the popular GenWave Waveform Editor, sound samples can be edited in either the frequency or time-domain through an extremely intuitive user interface.

Frequency editing functions include digital equalization, high-order sample rate conversion and pitch drawing. Time editing functions include visual looping, waveform drawing, mouse-drawn digital enveloping and stereo planning, waveform replication, gain normalization, phase inversion, mixing, cut-and-paste and five different cross-fade loop algorithms.

GenWave/16 will convert waveforms for porting to a Sequential Prophet VS. It is also 16-bit-file compatible with GenWave/12. GenWave, $349 (includes GenWave/16 and GenWave/12). **Interval Music Systems, 12077 Wilshire Blvd., #515, Los Angeles, CA 90025, (213) 478-3956.** ■

Text Editors for ST Programmers: EditST, Tempus II

Finally, one text editor that will transpose to *any* programming language. **EditST** is a powerful text editor specifically designed to turn raw source code into a professionally polished program in minutes. EditST may be operated as a stand-alone program or be executed from within many program environments. And you'll find your program time streamlined because EditST allows full use of all GEM features including the mouse, windows, pull-down menus, function keys and desk accessories. With EditST *you're* in command! EditST, (call for price). **DCS Enterprises, 5951 East 30th Street, Tucson, AZ 85711 (602) 571-0767.**

Tempus, the popular text editor formerly distributed by Eidersoft USA, has been upgraded and released by MichTron as **Tempus II**. The original version was particularly acclaimed for its speed and its sequel is even faster. Tempus II was designed as a program editor, but still includes a simple word-processing mode. Other important features in Tempus II are an UNDO command, a macro-recording facility, the ability to execute a program from within itself and an auto-save feature. Tempus II, $79.95. **MichTron, 576 South Telegraph, Pontiac, MI 48053, (313) 334-5700.**

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*

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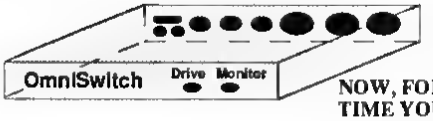

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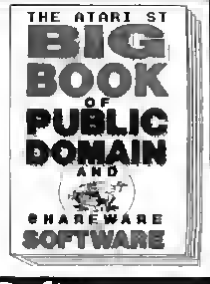

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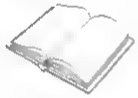

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The TRANSPUTER

Atari and Perihelion

An Exclusive Interview with Perihelion's Dr. Tim King

Dr. Tim King, president of Perihelion Software Ltd., is the creator of the Helios operating system for the Atari Transputer Workstation. He's also well-known for his work on ST BASIC and the AmigaDOS operating system.

BY MARSHAL M. ROSENTHAL

For two years now, Atari has been showing off its high-end transputer-based workstation. Now, as the ATW nears its U.S. release, START presents an exclusive interview with Dr. Tim King, president of Perihelion Software Ltd. and the creator of the ATW's operating system.

Three hours from London, England, in the township of Bath, is the home of Atari's Transputer Work Station (ATW), Perihelion Ltd. Dr. Tim King, the president of Perihelion, is as warm and friendly as the unusually sunny British summer afternoon on which we interviewed him. A talented programmer and designer, he is best known as the creative force behind ST BASIC and Amiga DOS for Metacomco. King's latest achievement is Helios, the Unix-like operating system mated to the Metacomco-designed ATW. But just what kind of computer is the ATW?

"A Transputer is an entire computer on a chip—running at 20 nanoseconds," explains King. "Trying to achieve greater speed in computing never seems to end—we keep trying to get closer to the speed of light. This results in more powerful computer systems running at greater speed. But the Transputer's extreme speed comes from its new and unique system. It's the way it processes information that's astounding. Let me show you what I mean." King leaps up from his desk, grabs a pen and starts scribbling on a wall board. "I always enjoy lecturing, you know," he says.

"Let's say you have 10 tasks to perform, X1 through X10," he begins. "The normal computer will take the first task, finish it and then start on the second. This goes on until the tenth task has been completed, the computer being 'locked' into handling this process from start to finish. It's a little like being forced to draw 10 buckets of water from a well, one by one until you're done. But the Transputer doesn't have to put up with that because it can do parallel processing. What happens here is that we're using

CONNECTION:

multiple computers, each handling a single task. This means that X1 is being worked on at the same time as X10. So all the buckets are being drawn simultaneously—the results being accomplished blindingly fast because it's all being done *at the same exact time*. This just wasn't possible before."

The Tortoise and the Hare

As an example, King offers a procedure that takes a 25mHz 80386 machine 3½ hours to perform. "Figure nine seconds for the ATW," he grins. "And don't confuse it with multitasking, because there you have one processor dividing its time between a number of tasks."

"Let's consider just what we have here," he says. "The Transputer is a RISC [Reduced Instruction Set Chip] operating at 50mHz and contains a floating-point arithmetic logic unit. There's 4K of RAM on the chip as well. The ATW accesses a 32-bit bus, has a special "Blossom" blitter chip and uses four megabytes of RAM, upgradable to 120 meg. There are also slots to accommodate special boards. It's a totally unique configuration that includes four operating communication engines, with the serial COM running at 20 megabits per second and video RAM taking up one megabyte.

"The ATW is linked to the 68000 microprocessor, so it doesn't have to be concerned with such chores as disk control, mouse or keyboard. This is all taken care of at the 68000 end, leaving the Transputer free to handle the heavy stuff." King points to the open guts of an ATW nearby. "Here's where it gets amazing," he says, pointing to the open slots inside the unit. "You can add processing boards with more Transputers for increased power. Each of these daughterboards has three Transputers on it, and the ATW can hold a total of four boards—which means 13 Transputers, all working at once at 10 MIPS [Million Instructions Per Second] and using some 16 megabytes of RAM. That gives you a total of one-fifth the power of a Cray supercomputer."

The ATW features a graphical interface not unlike the ST's, but each window has its own dynamic color map and its own palette.

Unix Plus

Lecture completed, King walks out of the office and over to one of the ATWs in the adjacent work area. "Our Helios operating system took two years to develop and is Unix-like," he says, "being command-line driven *and* having a mouse/graphical interface. It's highly compatible between computer systems, mainframes and Work Stations."

King inserts a 3½-inch disk and boots up the machine. The graphical Desktop appears, and for a moment it looks like a typical ST screen. But that illusion quickly dies as King brings up windows that appear with violent speed on screen—each window having its own dynamic color map and distinct palette. "Notice that you can move windows *under* each other as well as around," King says. "Plus you can see that the background can contain patterns—like the little 'Helios' wallpaper now up." King also calls to our attention that what we're looking at [on an analog RGB monitor costing some £2,000] is a 1,280-by-1,024-▸

"A Transputer is an entire computer on a chip—running at 20 nanoseconds."

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CIRCLE 025 ON READER SERVICE CARD

Perihelion president Dr. Tim King at the keyboard of Atari's top-end graphics workstation, the ATW.

pixel display in 16 colors; the famous Baboon face graphic never looked this good before. The other resolutions available through this system include 1,024-by-768 with 256 colors, and 16 *million* colors on a 512-by-512 screen.

"How about a real test of power?" King says mischievously. He brings up the Mandelbrot set, a mathematical model that graphically demonstrates a computer's processing speed. "We're going to do a nice one now that shouldn't take more than a day or so." King activates the program and all the Red LEDs in the ATW's processing boards light up, indicating that they're online. We don't wait a day, or an hour or even a minute. The image appears on screen in just under 27 seconds.

The Price of Power

We wonder what such computing power must cost—after all, a Cray costs millions of dollars. "Considering what you're getting, it's not bad at all," says King. He informs us that the basic ATW costs £5,000 (about $8,000)—with each daughterboard being £3,000 (about $5,000). The system that ran the Mandelbrot would cost nearly $80,000. King also notes that while the ATW is currently available in Europe, though in a heavily backordered state, Atari's marketing plans for the ATW in the States are not known at this time. (*Editor's Note*: Atari has announced plans to release the ATW in the U.S. in the fourth quarter of 1989.)

But the ATW's future applications are what interest us now. A flight simulator would be astounding on the ATW, even without any sound output. King mentions that one of the uses for high-speed workstations is in the medical field. "There are scanners that cover the entire human body a 'slice' at a time, then assemble it all as a 3D image that the physician can rotate and look at. But this takes time. With the ATW, you could do a scan and watch the body image *breathing*, because it would be in *real time*."

King's affection and admiration for the ATW is infectious. "I applaud Atari for having the vision to head into the next generation of computing power," he says. "Even though the 68000 is being put to good use, it's too commonplace now, quite old and a bit boring. The ATW represents a completely new and unique machine—one that pushes the limits farther than ever before—and one that will make its mark felt." ■

Marshal M. Rosenthal is an international writer and photographer whose work can be found in major publications in Europe and the United States. He lives in New York City.

Three Font Editors for the ST

BY DAN FRUCHEY

You've just bought UltraPublish 3.0, the brand new desktop publishing program that slices, dices, makes Julienne fries, and shreds mounds and mounds of coleslaw. It has every option you could ever wish for, but there's one catch. The program comes with only two different font families. You can only use those two styles in so many ways before things become boring. Worse, there aren't any other fonts available. Is there a solution? Read on, frustrated font fan.

Don't expect many new fonts from the publishers of your software. It's not that they don't want to offer you more options, it's simply that the time and effort expended creating a font for the commercial market usually doesn't justify the price people are willing to pay.

But what if you want additional fonts or need special symbols that aren't defined in the fonts you own? Several companies have recognized this need and produced font editors that fill the gap. Now you can create your own stylized fonts or edit existing ones.

Font Formats

When I was asked to compare the font editors for START, I should have realized the difficulties in doing so. It's easy to compare products that are similar in nature, but fonts are so product-dependent that making an exact comparison is difficult.

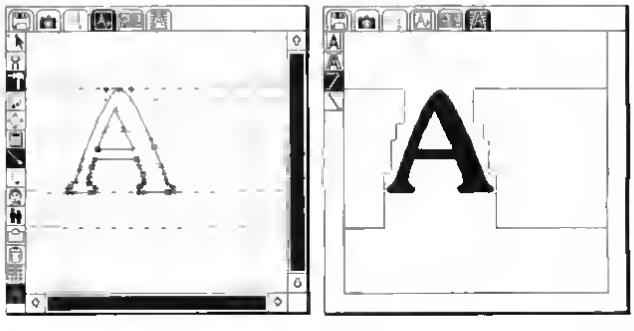
It's a little like comparing apples and oranges. Both are fruit and both have seeds but that's about as far as it goes. Fonts editors are similar: they're all editors and they create fonts, but beyond this the products are quite distinct. Each font editor is designed for a different font format and, if you own the associated products, you may have to buy more than one editor to meet your needs. Currently, there are two types of fonts: Outline (vector) and Bit-mapped (raster).

Outline Fonts

Outline fonts are created by aligning lines and curves and then joining them together to create a tracing of a character. The outlines can be filled, skewed, rotated, thickened and more, based on options defined later. The outlines can be resized almost endlessly and a font of almost any size can be generated.

Outline fonts are usually more versatile than bit-mapped fonts. They allow a greater range of character manipulations and consume less RAM and disk space. Unfortunately, they're not as precise as bit-mapped fonts, require more time to redraw on screen and can slow printing speeds dramatically on systems with minimal RAM.

Outline fonts are usually not as portable as bit-mapped fonts. Each product uses a slightly different format that won't let you use their fonts with any other product that incorporates outline fonts. PageStream, Calamus, Ultrascript and Deskset II all use outline fonts. Three of these companies purchase fonts from the same company (Compugraphics). Yet each time you buy a program that uses outline fonts you must repurchase these fonts in a slightly different format. ▶



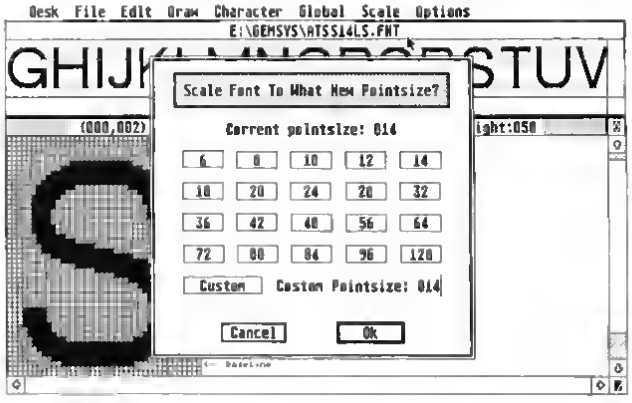
On the left, ISD's Calamus Font Editor drop-down accessory. The screen features an outline for the letter A from a Souvenir font. On the right, the same A, depicted in its final form while the kerning default is being adjusted on the letter.

Bit-Mapped Fonts

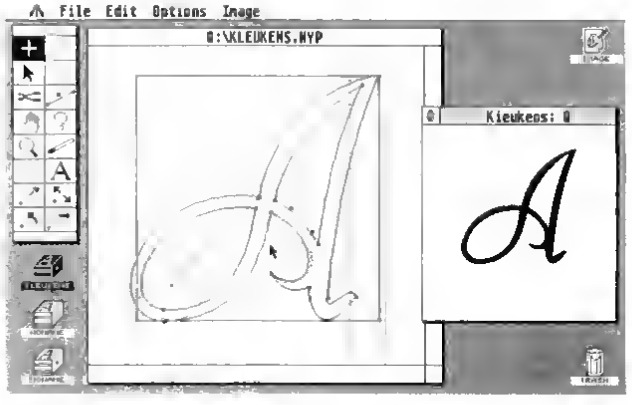
Bit-mapped fonts are composed of individual dots that are precisely placed to give each character clear definition. Individual dots can be used for flourishes and shading schemes that are impractical or impossible in outline fonts.

Printing speeds up when a program uses bit-mapped fonts. The characters are predefined in each size and style so the computer can copy existing characters without creating new ones from scratch. Programs that use bit-mapped fonts allow very rapid onscreen editing without the use of a separate editor or the constant redraws common in programs using outline fonts.

Bit-mapped fonts are extremely portable from program to program and system to system. Most ST programs that use bit-mapped fonts can use all the bit-mapped fonts available. The GDOS standard currently supported by Atari uses bit-mapped fonts. For users of 512K and one-meg systems, it's the only practical route for accessing fonts.



Fontzi allows automatic conversion to any point size desired, including many predefined sizes. Shown here is a Swiss font about to be converted to another size.



The unique Hyperfont "Desktop." The outline form for the letter A is depicted along with the actual results when the font is completed to the right of it.

The Calamus Font Editor is the only editor presented here that creates outline fonts.

The biggest drawback of bit-mapped fonts is size availability. Since each font is limited to a predefined size, you're also limited to certain types of applications. Most manufacturers of fonts limit their size selection to 8, 10, 12, 14, 18 and 24 point sizes. The fonts can't be rotated, filled or styled like outline fonts. If you need a rotated font, you have to *buy* a rotated font—which is virtually impossible to find.

Bit-mapped fonts, most of which follow the GDOS format established by Atari and DRI, are used by Easy Draw, Timeworks Publisher, Fleet Street Publisher, Microsoft Write, WordUp, DEGAS Elite and many other programs.

The Font Editors

Both outline and bit-mapped font editors are represented here. In addition, one of the editors creates bit-mapped fonts using a twist that brings the best of both worlds together. Listed below are overall summaries of each product with remarks about options that make a particular product unique or distinct.

A chart is also included that lists significant program options that are similar throughout all three products.

Colomus Font Editor

The Calamus Font Editor is the only one presented here that creates outline fonts. It's actually a desk accessory that you can use to make immediate changes to fonts while working within the Calamus desktop publishing program from ISD Marketing. The program interface is heavily icon-oriented, but that will be familiar ground to Calamus users—the icons are equivalent to those used in Calamus whenever possible. Usually font editors are produced by third party developers once the product is in great demand, but the early introduction of a font editor by ISD should help sell Calamus to many users.

The editor includes a utility to import pictures as templates that can be traced while creating fonts. For precision placement of lines and curves, the location of the cursor is displayed and updated constantly on screen. There's even a calculator that allows automatic and manual manipulation of characters for rotation, skewing, mirroring and other style changes.

Fontz!

Fontz! from Neocept has virtually become

Option Comparisons

	Fontz!	Hyperfont	Calamus Font Editor
Publisher	Neocept	MichTron	ISD Marketing
RAM requirements	512K	512K	512K
Resolutions	Med, Hi	Med, Hi	Hi
Documentation	Excellent	Good	Foir
Font Formats			
Imports	Amiga, Mac, Degas, Hippo	None	None
Exports	GDOS Paintworks	GDOS	Calamus
Uses	Bit-mapped	Outline	Outline
Generates	Bit-mapped	Bit mapped	Outline
Multi-level Zoom	Y	Y	Y
# Editing Windows	1	4	1
# Characters Shown at one time	Varies	1	24
# Characters Avail	256	256	256
Grids	N	Y	Y
Guide/Helplines	Y	Y	Y
Cut & Paste Mode	Y	Y	Y
Font Merging	N	Y	Y
Font Scaling	Auto w/cleanup	Auto	Auto
Adjustable Kerning	Y	N	Y
Rotate Character	Y	Y	Y
Flip Character	Y	N	Y
# of Fonts in package w/editor	18	3	28
Works With	All GDOS	All GDOS	Colamus Only
Price	$34.95	$49.95	$99.95

the standard for manipulation and importation of bit-mapped GDOS fonts. Last year several manufacturers were in the process of producing a bit-mapped font editor, but the completeness of Fontz! has made any similar product unnecessary.

Although Fontz! is easy to use, expect to spend many hours smoothing out lines and curves generated with this product. Each pixel must be placed in the right location or else characters will look lopsided or ungainly. Each time a new size is generated the characters must once again be smoothed to appear the best for that particular size and resolution.

To save your sanity I recommend purchasing this product along with Hyperfont. Create the fonts with Hyperfont and then perform minor changes and convert formats using Fontz!

The ability to import fonts from other systems makes Fontz! an invaluable addition for anyone who requires a wide range of fonts. In one day I was able to quadruple my font library by importing styles from other systems.

Hyperfont

Hyperfont, MichTron's addition to the market, is a unique blend that uses some of the best aspects of both outline and bit-mapped fonts.

Hyperfont creates bit-mapped GDOS fonts, but it uses a unique approach. When fonts are created, it's not necessary to follow the cumbersome dot-by-dot approach normally used for creating bit-mapped fonts. Instead, an outline is created similar to the type generated by the Calamus Font Editor. Once a font has been created, you indicate the size and device the font is intended for and Hyperfont generates a bit-mapped font for that specific need.

Hyperfont uses its own special Desktop (similar to the one used by GEM) ▶

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CAD 3D Design Disks & Font Disks (ea)	19.95	Guitaristics	52.95	MultiDesk	19.49
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Deep Space	19.95	KRoget	24.95	Prison	25.49
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		ProText	129.95	TV Sports Football	32.95
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CIRCLE 016 ON READER SERVICE CARD

You can open windows that contain fonts or an image file by double-clicking on icons. A trash can and a specialized file selector box are also present. Hyperfont's familiar operating environment makes it easy to use without constantly referring to the manual.

Like the Calamus font editor, Hyperfont imports pictures for use as tracing templates when creating fonts. One element that may limit the versatility of this program is it's inability to edit fonts it creates. Once a font is generated you need a GDOS font editor such as Fontz! to perform any additional detail work.

Final Thoughts

Perhaps you don't plan to create your own fonts, perhaps you're not sure use of a font editor will be productive. Let me make one final point, regardless of whether you use the editor, there is another positive aspect.

Each product comes with a variety of predefined fonts that you can use in your programs immediately. Each of the packages is well worth the purchase price simply for the fonts. If you use the editor, great; if not, you still haven't lost anything and even a single typeface can make a world of difference. ■

Dan Fruchey works as a paramedic in Santa Rosa, California and runs a small clip-art business on the side.

PRODUCTS MENTIONED

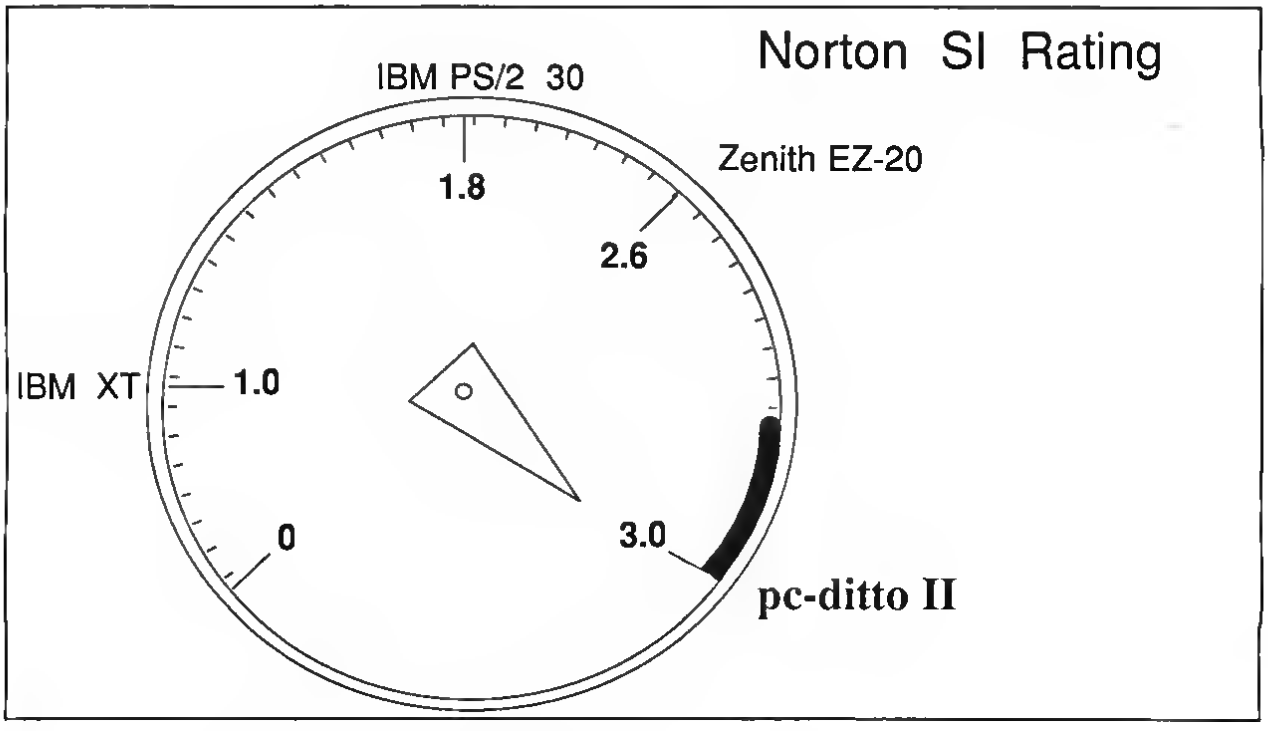
Colamus Font Editor, $99.95. ISD Marketing, Inc., 2651 John Street, Unit 3, Markham, Ontario, Canada L3R 2W5, (416) 479-1880.
CIRCLE 164 ON READER SERVICE CARD

Fontz!, $34.95. Neocept, 547-A Constitution Avenue, Camarillo, CA 93010, (805) 482-4446, (805) 482-0313 (technical support).
CIRCLE 165 ON READER SERVICE CARD

Hyperfont, $49.95. Michtron, Inc., 576 South Telegraph, Pontiac, Michigan 48053, (313) 334-5700.
CIRCLE 166 ON READER SERVICE CARD

pc-ditto II

By Avant-Garde Systems



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RezRender

Are you a Cyber fan? Have you spent hours creating animations in CAD-3D 2.0 wishing you had the advanced shading and rendering techniques from high-end graphics computers? Wish no more! RezRender is a powerful rendering package that adds Gouraud and Phong shading and ray tracing to CAD-3D objects! You won't believe your eyes! RezRender requires a color monitor and at least one megabyte of RAM to utilize all of its features.

RezRender will ray trace and cast shadows from one object onto another, onto itself or onto the checkerboard background. Images created in this manner are some of the most striking images available on the ST.

Ray Tracing and More on Your ST!

ON DISK

BY RICHARD PARKER AND PHILLIP BURGESS

You won't believe your eyes! The file REZRENDR.ARC is on Side 1 your START disk.

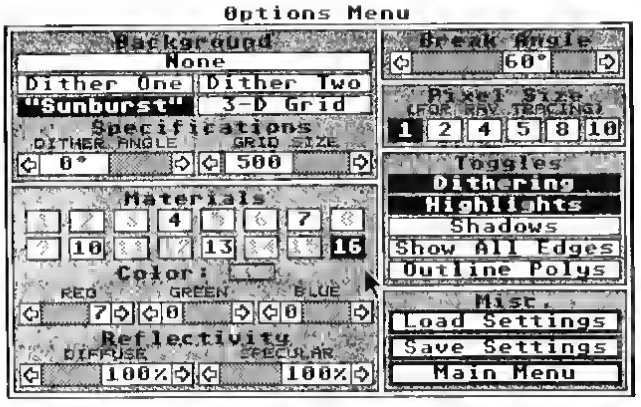
Although at one time, Antic Software's CAD-3D 2.0 was considered to have amazing shading capabilities, it is very dated by today's graphics standards. No longer are users content to produce animations that depict "faceted" spheres, cylinders and teapots. The age of realistic lighting and shading is upon us.

RezRender is a program that will take 3D objects built with CAD-3D 2.0 and give them accurate, smooth shading with highlights and shadows. Spheres will now look spherical, cylinders will look cylindrical and teapots will look teapotical? This process of generating realistic images is known as "rendering," hence the name RezRender.

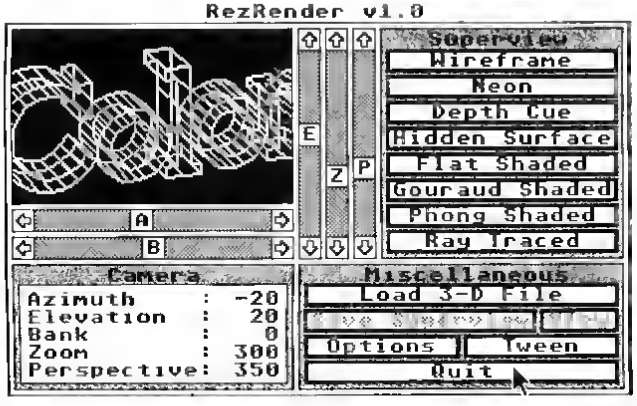
It is important to note that RezRender just renders—that's all. It is not an object generator and it does not interact with Cyber Control. RezRender is a completely stand-alone program that can be run without even owning CAD-3D 2.0. The only communication that it has with the other Cyber Studio programs is through the .3D2 object files generated by CAD-3D 2.0.

Getting Started

RezRender will run on any Atari ST or Mega computer with a color monitor. You'll also need a source of 3D objects, such as those created by CAD-3D 2.0 or Cyber Sculpt. RezRender will not read ▶



One of the most complex dialog boxes ever created in GEM, this is RezRender's Options Menu. Here, you can adjust object colors and materials, set the background and set a number of toggles that vary the image type.



RezRender's Main Menu. From here, you can load in objects, set the camera viewpoint and choose the rendering mode. Once an object's been rendered, you can save the image as a DEGAS .PI1 file.

CAD-3D 1.0 objects (.3D filename extender), but if you own CAD-3D 2.0, you can load objects created in the old format and resave them in the 2.0 format (.3D2 filename extender). To run RezRender, boot this month's START disk—the START menu runs automatically. At the main screen, click on Prepare, then select "\RezRender." The program will un-ARC directly onto the destination drive you specify. After the program un-ARCs, click on REZRENDR.PRG at the Desktop.

Using RezRender

Upon booting RezRender, you will be in the Main Menu. There will only be two active buttons initially: Load 3D and Quit. Click on the Load 3D button. Using the standard GEM file selector (or any accessory file selector you may have installed), select one of the sample 3D object files included with the program on your START disk and click on the OK button. RezRender will load the object(s), optimize them by eliminating redundant lines and activate most of the remaining Main Menu buttons.

The successfully loaded object will appear in the black rectangle in the upper left area of the screen; this rectangle is called the Camera Viewport, and represents our current view of a virtual 3D-space simulated by the computer. There are five sliders around the Camera Viewport, which you can use to change your point of view. After adjusting the sliders to your liking, click in the Camera Viewport. You'll briefly see the message Projecting at the top of the screen, and then the the image in the Camera Viewport will be updated. Projecting means that RezRender is processing the 3D data to create the 2D viewport image.

The camera control sliders and their functions include:

Azimuth (A): This slider controls the horizontal (right/left) rotation of the camera around the center of the 3D universe. In CAD-3D 2.0, this function is called Horizontal, but being of the Science Nerd persuasion, we chose to use a more technically descriptive term.

Elevation (E): Known as Vertical in CAD 3D, this slider controls the vertical (up/down) rotation of the camera control around the center of the universe.

Bank (B): This controls the tilt of the camera, like a dog tilting its head when it hears something unusual.

Zoom (Z): The camera's magnification is changed with this slider. The larger the zoom value, the larger the 3D object will appear in the Camera Viewport.

Perspective (P): An object's "3D-ness" is set with this slider. Larger values here will result in objects looking more "massive." Carried to the extreme (999), this effect is similar to that produced by a fisheye camera lens.

Rendering

Once you're satisfied with the camera view, click on one of the Superview buttons along the right side of the screen. Each will generate a full-screen image in a particular rendering style or *mode*. If you're using a 520ST or have loaded an extremely complex object, some of the Superview buttons may be disabled. Each mode has its own particular memory requirements and will be deactivated if those requirements cannot be fulfilled. Similarly, each mode has its own preprocessing requirements (calculations that must be made before an image is drawn). As a rule, more realistic images take longer to create. RezRender will keep you updated on its progress by displaying pertinent messages with accompanying time bars at the top of the screen.

The available rendering modes include:

Wireframe: This is simply a full-screen image of the Camera Viewport. Only one preprocessing step—Projecting

– is necessary, so images are created quickly. Surfaces are not created, only edges, so that all of the lines in an object are visible at once.

Neon: This is a variation on the wireframe theme. The resulting image is made up of lines that glow, producing a neon sign effect. While not the most practical thing in the world, the results are usually interesting. No additional pre-processing is necessary, but the actual drawing of the image takes much longer than Wireframe mode.

Depth Cue: Another Wireframe mode, Depth Cue mode gives a somewhat better sense of depth by varying the color of the lines according to their relative distance from the camera. The closer a line is to the camera, the lighter in color it will appear. There are two additional pre-processing steps required for Depth Cue: Distancing, which calculates the brightness of each point based on its distance, and Depth Sorting, which makes sure that the object is drawn from back to front (lines nearer to the camera must be drawn on top of lines further away to give a convincing 3D effect).

Hidden Surface: This rendering mode will produce an image of the complete object, including its surfaces. The object will have a solid appearance, but will not be shaded. This mode does not require the Distancing operation, but introduces two new ones: Calculating Normals, which determines which direction a polygon is facing, and Backfacing, which eliminates polygons not visible from the camera position, thus speeding up the drawing of the image.

Flat Shaded: Flat Shading draws a faceted, solid object and shades it according to the light sources that were defined in CAD-3D 2.0. This mode is very similar to its CAD-3D 2.0 counterpart, but much more accurate; RezRender will display specular highlights (bright areas seen on a shiny object where light reflects almost directly into the camera) on the object's surface. RezRender also uses the technique known as Dithering (dot patterns that expand the range of apparent available color) to simulate hundreds of colors instead of just 16. Flat shading requires an additional pre-processing step: Illuminating, which assigns an appropriate color and brightness to each polygon.

Gouraud Shaded: CAD-3D 2.0's flat-shaded images always have the characteristic faceted appearance associated with microcomputer-generated images. The technique of Gouraud shading, named after its inventor, can create the illusion of smooth surfaces while still using the same polygonal data. This requires an additional pre-processing step, Smoothing. The Smoothing process is fairly time-consuming, but fortunately only needs to be done once for the first ▶

Tips on RezRender

By Andrew Reese, START Editor

RezRender is the most powerful 3D rendering program available on the ST, but in order to make the best use of it, you must keep its functions in mind. It is a *rendering* program – it doesn't create 3D objects, move them or adjust their illumination. You must use objects created in other programs, such as CAD-3D 2.0 or Cyber Sculpt, and the objects must be located where you want them, both in the 3D Universe and in relation to each other. Special lighting must also be accomplished in the object creation program.

If you need to move your objects in relation to one another, you will need to save the objects in each position (frame) and load each set into RezRender separately. If you're using Cyber Control to move your objects, there are two commands, SAVEGRP and SAVEALL, that will save the objects as .3D2 files to disk. (Refer to your Cyber Control manual for details on these commands.)

The use of SAVEGRP is illustrated in a simple Cyber Control program, REZDEMO.CTL, on your START disk as a part of the file REZRENDR.ARC. Follow the instructions for un-ARCing this file in the main article and then load REZDEMO.CTL into Cyber Control with CAD-3D 2.0 in memory. The program will generate fifteen frames of .3D2 files of a moving sphere.

Load each .3D2 file (BALL1.3D2 through BALL15.3D2) in turn into RezRender and render the sphere using whichever mode you prefer. After generating a rendered image, save it to disk as a Superview .PI1 file and load the next .3D2 file.

Now, using Cyber Paint, load each .PI1 file in turn into a separate frame and you will have a complete animation, which you can save out as a .SEQ file. (Alternatively, a slide show program can be used to show the frames in order, but at a greatly reduced speed, of course.)

You can also load a background picture with a compatible palette using the Load Under function in Cyber Paint and, finally, if you're ambitious, use Jim Kent's Audio-Video Sequencer (AVS) from the November 1989 issue of START to add sound effects or music!

Remember, RezRender uses the CAD-3D 2.0 Camera, called Camera 1 in Cyber Control. Don't use Camera 2 or 3 in your Cyber Control programs if you're going to use RezRender, since those cameras are only used to generate Superviews *within the CAD-3D 2.0 environment*. Saving an object file will save the object positions only, not the camera type or position.

Gouraud-shaded Superview and not again until another 3-D object is loaded

Phong Shaded This technique, also named after its inventor, uses a slightly different approach to solving the faceting problem The results are significantly more accurate than Gouraud shading, particularly the rendering of specular highlights and it actually requires a little less memory and pre-processing. But there's a catch Phong shading is *much* slower than Gouraud shading

Ray Traced Ray Tracing is the most realistic of the available rendering modes and, unfortunately, by far the slowest technique of all for generating realistic images Although Ray Tracing is often associated with mirrored spheres floating over a 3-D grid, creating these effects with only 16 colors is just not feasible. RezRender's Ray Tracing *will* flawlessly handle object intersections of *any* complexity, even those with which the simpler rendering modes may have difficulty The shading of Ray Traced images is also more accurate than Phong shading.

Ray Tracing requires a few additional pre-processing steps Ray Analysis, which analyzes the 3-D object(s) in memory to eliminate redundant calculations later on Bounding has to do with objects that cast shadows on each other (explained later), and Ray Backfacing, which like the Backfacing routine used in the other rendering modes, lets us ignore those polygons that cannot be seen Ray Analysis and Bounding are only performed during the generation of the first Ray Traced Superview

After the computer is done generating the Superview, press the right mouse button to return to the Main Menu If you want to abort RezRender's drawing process (even during drawing the Camera Viewport), press any key on the keyboard To abort a Superview, press any key then right-click

Once you have generated a Superview, the Save Superview and View buttons on the Main Menu will be enabled Click on Save Superview to save the most recently generated Superview as a DEGAS PI1 picture. Click on the View button to display the Superview screen, right-click to return to the Main Menu

Take a few moments now to play with the camera controls and rendering modes to get a thorough feel of the program before we continue on

The Options Menu

The options menu (which currently holds the record for being *the most crowded GEM dialog box ever conceived*) is divided into several distinct sections Backgrounds, Materials, Break Angle and Pixel Size Setting, Toggles and Miscellaneous. Before these topics can be effectively explained, it is first necessary to understand how RezRender handles color

The color scheme used by RezRender is radically different than that used by CAD-3D 2 0 In CAD-3D 2 0, the user must first build a color palette, and then assign these colors to the 3D objects RezRender, on the other hand, lets the user just specify the desired colors, and then automatically builds a custom palette that takes into account object complexity, coloration and lighting. This method provides for the best possible range of colors at all times

Why then do we use the word *Materials* on the menu rather than simply *Colors*? This is because in RezRender, we not only specify object colors, but some of their surface qualities as well. Varying the amount of diffuse reflectivity changes the overall brightness of an object's surface. Varying the specular reflectivity changes how shiny an object will appear For instance, a piece of white paper is light, but not shiny—it has high diffuse reflectivity but low specular reflectivity. A black bowling ball, in contrast, is dark but shiny—it has low diffuse reflectivity, but high specular reflectivity

The Materials editor is located in the lower-left corner of the Options Menu It consists of several buttons, each representing a material and sliders to control the color and reflectivity of the currently selected material You'll notice that, depending upon the CAD-3D objects loaded, different materials buttons are in use. When objects are created in CAD-3D, the user assigns them a color number for lightest color available within a color set RezRender uses this same color number to indicate a material number

If you have two materials which you want to have the same color but with different intensities (for instance, light blue and dark blue), rather than manually setting the RGB values for each material to the desired brightness, set both materials to the same bright shade of blue, but reduce the diffuse and specular reflectivity of the darker material RezRender will recognize the similarity in color between the two materials and make a much more effective use of the palette.

Set the pixel size to 1, begin generating your final image and go have lunch.

Since RezRender builds a custom palette for each Superview, we can't load in a background image, as can be done in CAD-3D 2 0. We have however, built in several fascinating predefined backgrounds which use the custom palette. The backgrounds will be drawn with the color and attributes of the currently selected material

The predefined backgrounds are

None The background is simply left ▶

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black. If you own Spectrum 512, you could load a picture as a background and then overlay a RezRender-generated image without background over it.

Dither 1: This will create a smooth gradation across the background from dark to light and at the angle set by the Dither Angle slider. An angle of 0 produces a gradation dark at the left and light at the right.

Dither 2: Somewhat like Dither 1, except that the color gradation goes from dark at one end, to light in the middle, and back to dark, again at the angle set by the Dither Angle slider.

Sunburst: Another color gradation, Sunburst works in concentric circles from dark at the outside of the screen to bright at its center.

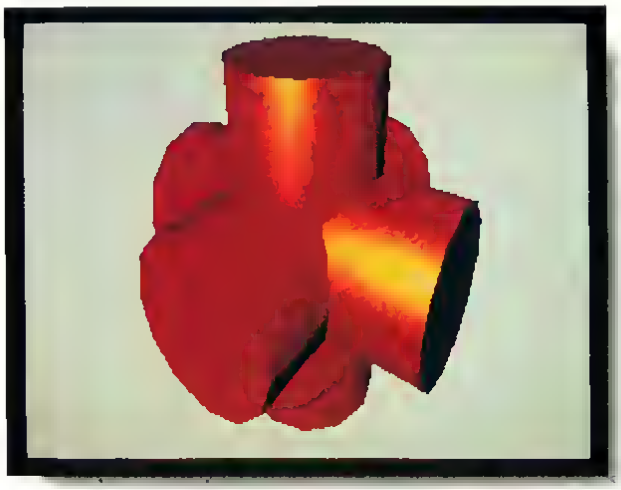
3-D Grid: This will generate an infinite 3D checkerboard under your object. The grid itself is Ray Traced and then the 3D object is overlaid using conventional techniques. The size of the squares can be changed with the Grid Size slider—its units are those used in the CAD-3D 2.0 universe.

At the middle-right of the screen are a series of toggles. These are simple on/off options.

The toggle options include:

Dithering: This toggles RezRender's dithering capability. Turning off dithering will speed up some rendering, but the results will usually be unspectacular. You may want to turn off dithering while trying out different views of an object, and then turn it back on when you're ready to create a final image.

Highlights: This will turn off specular reflection. Illumination will now be slightly faster, but image quality will suffer. Again, you have to balance image quality against your own patience. For flat-shaded images, you might want to turn highlights off, since this technique tends to exaggerate the faceted appearance. Highlights look wonderful with the other shaded rendering modes, however.



RezRender's Ray Tracing mode will not only do smooth shading, but also handle intersections of complex objects flawlessly.

With Cyber Sculpt, it's easy to generate 3D springs and with RezRender, you can smooth them out until they appear to be metallic.

Every material has surface characteristics that determine its appearance. Specularity refers to the shininess of an object, its ability to show highlights, while diffusion refers in general to the overall brightness of a surface. RezRender lets you determine values for these characteristics for any object.

Shadows: With this option, objects will cast shadows onto the 3D grid, if that background is enabled. In Ray Tracing mode, objects can also cast shadows onto each other, but be forewarned: ray tracing with shadows can literally take

hours, so use these capabilities together only if you really mean it.

Show All Edges: CAD-3D 2.0 files are made up entirely of triangles, but many of the edges are invisible, so some objects appear to be made up of four-sided (or more) polygons. This option will unhide all of these invisible edges.

Outline Polys: In Flat, Gouraud, and Phong shading modes, this will outline each polygon after it has been drawn, sort of the Darrel Anderson mode!

At the top-right of the screen is a slider labeled Break Angle. When creating smooth-shaded images, this lets you determine which edges will appear sharp and which will appear smooth. A break angle of 0 degrees will mean that all polygon edges will appear sharp; a break angle of 90 degrees will cause all polygon edges to appear smooth (as a result, even cubes will look roundish). If you change this value, RezRender must perform a new Smoothing pre-processing operation when generating any Gouraud, Phong, or Ray Traced Superview for the first time. However, the Smoothing operation will not have to be repeated unless you change the break angle again or load a new 3D file.

Just below the Break Angle slider are a series of buttons under the heading Pixel Size. These buttons let you change the resolution of the 3D grid and/or Ray Traced images. Since the 3D grid and Ray Tracing functions can both take some time, initially you may want to set the pixel size to a large value to generate draft views and, once you are satisfied, then set the pixel size down to 1, begin generating your final image and go have lunch.

Finally, in the lower right corner of the Options Menu, are the Misc. buttons. Save Settings will let you save *all* of your current settings including materials, toggles and sliders, even the camera view on the Main Menu. These settings files have the extender .RRS (RezRender Settings). Load Settings will let you load a settings file. However, if you previously saved a settings file with the same name as a 3-D object file (STUFF.3D2 and STUFF.RRS, for instance), the settings file will be loaded automatically when loading the corresponding 3-D object.

Animation

Well ... sort of. Most of us involved with the development of RezRender were frustrated by the fact that it wasn't easy to use for creating animations; our quick solution was to add a simple tweening animation capability.

If you click on the Tween button on the Main Menu, it will bring up the Tween Menu with two Camera Viewports, each with its own set of slider controls. RezRender lets you select a starting and ending view and then automatically generates the in-between frames. The small Camera Viewports work just like the Camera Viewport on the Main Menu. (These slider settings will also be saved in a settings file.)

You will notice that there is a Number of Frames slider in the lower right-hand corner of the Tween Menu. This slider allows you to select how many frames you would like for RezRender to create when tweening from Before to After. Please remember that although selecting a larger number of frames will create a smoother animation, each frame will take up 32K on your disk.

The buttons in the lower-left corner of the Tween Menu let you select which rendering mode to use when generating the frames. Like the Superview buttons on the Main Menu, some of these may be disabled depending on available memory.

The Preview button will generate a Superview consisting of a series of overlaid wireframe images to give you a rough idea of what the final animation will look like. Each frame is drawn in a gradually brightening shade of blue so that it is possible to distinguish between them. Sometimes, these previews in themselves make pretty neat pictures and you can return to the Main Menu and use the Save Superview option to save the preview image.

Clicking on the GO button will bring up a file selector that will ask you to select which path to save the animation in. Any filename entered will be ignored, only the path is needed. Unfortunately, as a last-minute addition, RezRender's tweening does not save frames as a Delta or Sequence animation file, but as a series of DEGAS pictures. These can, however, then be spliced together with an animation program such as Cyber Paint. If you have a double-sided floppy drive and a blank disk, you can easily generate over 20 frames, enough for a reasonably smooth animation sequence. The program will check the available disk space before generating the frames, so you won't be stuck with half of an animation.

What? No Source Code?

Not this time. In our haste to meet START's deadline, the source code is completely uncommented! Furthermore, with the incredible complexity of the various graphics algorithms involved, it *would* take more pages to explain them properly than START can devote in a single issue. (*Editor's Note*: We're happy to report that we have agreed with RezRender's authors for a series of columns covering 3D graphics programming on the ST. Look for it beginning in the next issue of START.) ■

Richard Parker and Phillip Burgess founded RezCo with one simple philosophy in mind: there's too much mediocre computer software in the world — but why?

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CIRCLE 057 ON READER SERVICE CARD

Readability and Grammatik III Under pc-ditto

BY DAVE EDWARDS

There are several grammar checkers available to help out the word-weary writer. Unfortunately, most of them run on the PC and clones—the poor ST user is left out in the cold. In fact, I purchased a PC clone just to use these programs. However, with pc-ditto from Avant-Garde Systems, ST users now can run many of these programs.

After writing a piece, first I check it for spelling and then I run it through Grammatik III from Reference Software. Grammatik III interprets a text file and assigns the part of speech to each word. Then it determines whether you have made any grammatical errors. Considering the complexity of the English language, this program does an amazing job. It's not designed to turn bad writing into good, but to help you become a better writer.

Naturally, the program runs very slowly under the current pc-ditto (but it's not *too* bad since it's a text-based process). Grammatik III uses standard pull-down menus that you select with a [Alternate]-key combination. However, it can only read WordPerfect and straight ASCII files. I use ST Writer and normally print my file to disk, which works fine. (Editor's note: *If you use ST Writer, Word Writer or 1st Word, you can convert them to WordPerfect format using WordPerfect's conversion utility or S.I.F.T., the START Instant File Translator, published in the May 1989 issue of START.*)

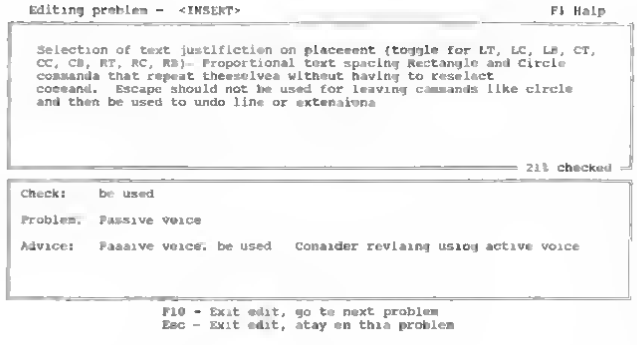

Figure 1. Grammatik iii uses severol word and phrase dictionories to determine your errors. Once it finds one, on edit windaw appeors showing the portion of the text in error, the errar type and a suggestian far correcting the problem.

Grammatik III uses several word and phrase dictionaries to determine your errors. Once it finds one, an edit window appears showing the portion of the text in error, the error type and a suggestion for correcting the problem (see *Figure 1*). You can make the change right in the editing window or you can flag the error to correct it later.

Once the entire document is checked, Grammatik III will give you a report (see *Figure 2*). The first section shows the readability indexes. These are standard values that give the grade level required to read your document. Grammatik III's manual has a complete explanation for each number. Also included are your sentence statistics and word count, which help you get your document to the desired length.

How Well Does It Work?

I've found that Grammatik III doesn't catch everything and sometimes flags errors that aren't really errors. The program doesn't correct problems for you—you must do that yourself. After using it for a while, I noticed that I kept getting dinged on passive voice—a common problem for writers. So instead of just correcting the problem every time, I dug out the grammar books and learned how to *prevent* the problem.

More importantly, I found that sometimes I'll mistype a word—which turns out to be another word, correctly typed ▶

Grammatik III will find many of these errors because the new words don't fit correctly

The program flags many errors such as verb agreement, punctuation and even capitalization problems. It also uses a phrase dictionary to flag words or expressions that are not proper. You'll see errors such as "Hackneyed, cliche or trite" or "Pretentious or overstated." Fixing these problems makes your text much easier to read and less cute or pompous, whatever the case may be.

One of my habits is that I use the word "that" when I don't need to. Using Grammatik's phrase editor, I added the word "that" to the phrase dictionary and asked to be prompted every time the word comes up. You can do this for any phrase or any phrase combined with other parts of speech. As Grammatik checks your document, it assigns parts of speech. You can list this interpretation if you like and see what the program has assigned to what. Using this information you can set up your own special cases to have flagged. It's complicated, but it helps tailor the program to your particular writing problems.

If writing is a big part of your life, then I suggest you buy this program and use it. Your teachers will love you, your bosses will love you, even your editors will love you.

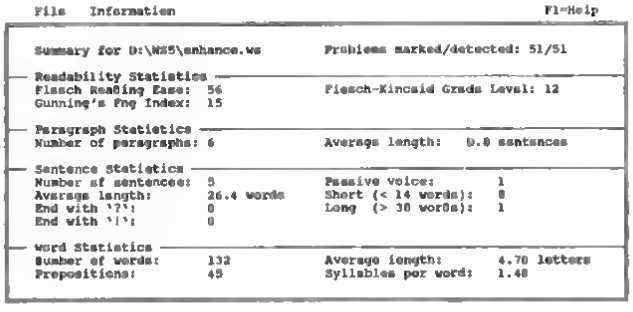

Figure 2. Once the entire document is checked, Grammatik III will give you a report. The first section shows the readability indexes. These are standard values that give the grade level required to read your document.

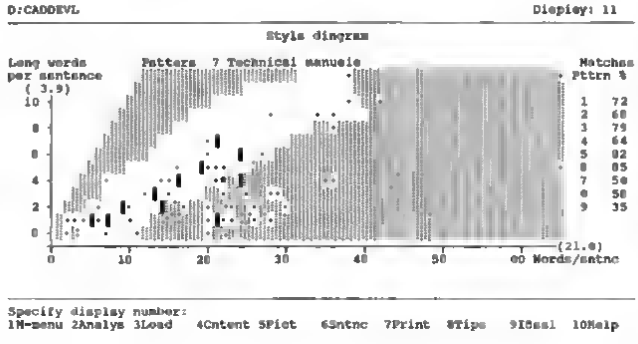

Figure 3. Readability determines how easy it is to read your document and flags any sentences that need to be simplified. Each sentence is represented as a dot or bar.

Readability

Readability from Scandinavia PC Systems takes the last section of Grammatik III and builds on it. The program determines how easy it is to read your document and flags any sentences that need to be simplified. It uses an analysis pattern type such as Children's Book, Technical Manual or even Bureaucratic. It then reads each sentence to determine how well it fits into the chosen pattern. This information is shown in over 20 charts (see *Figure 3*).

Each sentence is represented as a dot or bar. Sentences that fall into the clear area are suited for the type of document chosen. Those that fall in the gray area are outside that range. On the right of the chart are percentages telling you how close you are to the readability required. For pattern 7, Technical Manuals, this review is at 58 percent. However, it is 92 percent at pattern 5, Novels. This probably means that this particular piece is a little simple for a technical manual—not that that's bad; it just means that I could have used harder expressions and the readability would still be all right.

Readability is a little harder to explain and much more subjective to use. The program calculates "glue" words to "bricks." Glue words are the smaller words needed to hold a sentence together, whereas bricks hold the meaning of a sentence. It tells you if you're using overly long words too often. The program has several charts showing the readability level of each sentence and gives other percentages. It also makes suggestions when you fall out of your chosen range.

I found no problems running Readability under pc-ditto but, again, it was quite slow. I know things will change when pc-ditto II arrives, however.

Grammatik III and Readability are well worth investigating. They've helped me out of jams at deadline time—or when an editor needs an article "yesterday." I highly recommended both programs, but remember that they're *tools*—not easy ways out ■

Dave Edwards runs a CAD consulting service and has written several CAD-related articles. When he is not writing about CAD, you will find him doing VersaCAD training. He is also a MIDI consultant, professional drummer and managing editor of "The MIDI Insider, The MIDI Power User's Newsource."

PRODUCTS MENTIONED

Grammatik III, $99.
Reference Software Inc., 330 Townsend Street, Suite 123, San Francisco, CA 94107, (415) 541-0222.
CIRCLE 169 ON READER SERVICE CARD

Readability, $94.95
Scandinavian PC Systems, 51 Monroe Street, Suite 1101, Rockville, MD 20850, (301) 294-7450.
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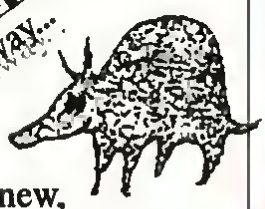

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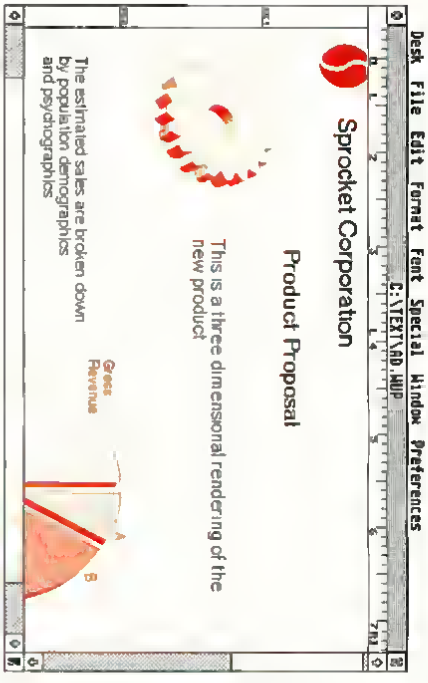

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ON

BY MARD NAMAN
START CONTRIBUTING EDITOR

THE ROAD BACK:

Atari and Donny Osmond

Donny Osmond and Atari have a lot in common. Both have suffered from image problems and both have had extreme peaks of success and valleys of failure. But now both are on their way back—and in a big way. START sent Mard Naman to interview Osmond at the Complex in Los Angeles, where Donny met STACY. It was love at first sight.

It's the first day of summer and singer Donny Osmond is feeling on top of the world. And well he should, because for the first time in longer than anyone can remember, he's on top of the charts. His song "Soldier of Love" has hit #1 in sales and #4 in airplay across the country. His new sound has drawn comparisons to Prince, Michael Jackson and George Michael. Not bad for a guy who was given up for musically dead 10 years ago.

Donny Osmond knows what it's like to fall from the pinnacle of success. And he knows how hard it is to climb back. As a child star, he had one smash single after another and a hit variety show with his sister Marie. But after the *Donny and Marie Show* went off the air in 1979, it was one long drought. No one would take him seriously as an artist. Songs like "Puppy Love" and "Go Away Little Girl" had branded him as hopelessly unhip, nauseatingly cute and a complete wimp. It didn't matter that the image didn't fit the man. The real Donny Osmond is thoughtful, charming and an unpretentious regular guy. But in a savage backlash to success, the artist who had 26 top-40 singles by 1979 couldn't get another record released in the United States for an entire decade.

Now all that's history. After enduring 10 years of Donny-bashing, Osmond is back with "Soldier of Love" and a hit album, "Donny Osmond," which he hopes will render at least three top-10 hits. Donny Osmond is being taken seriously. Finally.

No longer a boy but still boyishly handsome, the 31-year-old Osmond settles into a chair at the Complex recording studio in Los Angeles. He is here to talk about how far image can be from reality, to talk about his great enthusiam for the Atari ST and to see the incredible STACY laptop for the first time.

Like a trusted friend, the ST has been with Donny on his comeback trail. Donny used the ST on his new album, and he's using it today for both songwriting and recording. He picked the ST because of its great musical capabilities. But he feels a great affinity with Atari for another reason: both he and the computer have survived false public images to be redeemed in the end.

Parallel Images

Perhaps the most telling statement on Osmond's new album isn't in the music at all, but in the liner notes. "Perception vs. reality is deceiving!" writes Osmond. It's a statement he feels is as true for Atari as it is for him.

Osmond sees great parallels between his life and Atari's. "I'm just like Atari," he says. "I know what it's like to get over an image. If anybody knows what it's like, I do. It's the same with Atari. Nobody took them seriously. But the perception of Atari has been completely different from the reality of it. They're far ahead of everyone else, as far as I'm concerned. And the *price*—it's ridiculous!"

Not that long ago, many people didn't take the ST seriously as a music computer. The ST has always had great MIDI capabilities, but in the early days, top-flight studio musicians who worked with the ST would sometimes bring their STs to the studio with the logo taped over—they didn't want anyone to think they were making music with a "game computer." Other musicians would then simply see what the machine could

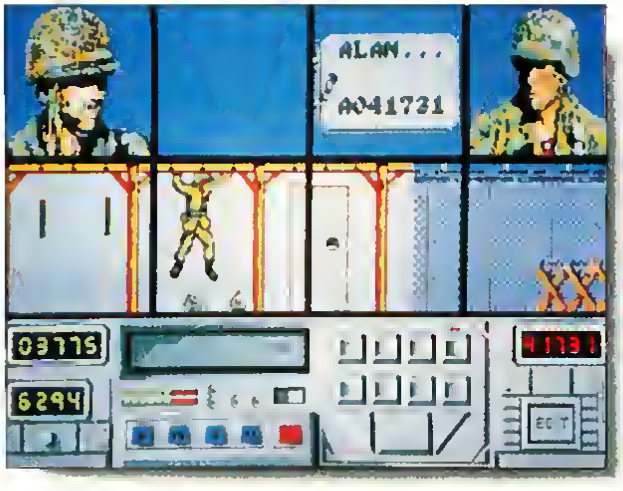
continues on page 92

For The Fun Of It

Battlehawks 1942, Combat Course, JUG

Are you prepared for combat? If you are, START Editor Andrew Reese will guide you through the WWII Pacific theater with Lucasfilm's Battlehawks 1942. If you aren't, Greg Perez will shape you up with his review of Mindscape's Combat Course, a rough-and-ready boot-camp simulation. After that, you may be prepared to take on a whole planet single-handedly as you follow Frank Nagy on a hero's quest in Microdeal's JUG. Good luck, soldier!

Lucasfilm Games adds another success to their line of innovative computer games. Battlehawks 1942 is one of the few flight simulators that lets you take either side—and in accurately re-created combat situations to boot. With spectacular graphics and effects, this is one game not to miss.



One of the many challenges that await you in Combat Course from Mindscape—Is this what boot camp is really like?

Battlehawks 1942

REVIEWED BY ANDREW REESE

What are you looking for in a flight simulator? 1980's speed and firepower? Or, perhaps, a step back to an earlier age of flight? If it's the latter you're looking for, then look no further than Lucasfilm's Battlehawks 1942.

Set in the Pacific Theater of Operations in 1942, Battlehawks 1942 puts you in the middle of four of the most crucial sea and air battles of World War II. You fly authentic aircraft of the era—Wildcats, Dauntlesses and Avengers on the U.S. side and Zeroes, Vals and Kates on the Japanese side. (Yes, in this simulation,

you can fly on either side.) And the missions are right out of the history books with authentic targets and scenarios

As with most flight simulators, you have a cockpit point-of-view, switchable with the keypad for a look around your plane. Your instruments are few: airspeed, altimeter, bank and pitch, fuel, rate-of-climb, RPM, compass and indicators for fuel and engine/airframe damage. You also have levers for landing gear, speed brakes (if equipped) and flaps and, if you are on a bomb or torpedo mission, a warhead indicator. This simplicity makes it both easier and harder to fly and fight: you have no complex avionics and electronic displays to master, but at the same time, there's no radar, autopilot or homing missiles to help you down your targets. This game is a pure flying experience.

Manual Ecstacy

If you're an aviation enthusiast at all, you'll want Battlehawks 1942 just for its extensive manual. It's 127 pages of history, tactics, theory and aviation lore and includes fold-out maps of the battles in which you can fly. It's truly a spectacular production and almost worth the price of the game by itself.

You'll also need the manual for the off-disk copy protection. You must match a Zero displayed at a particular angle on the screen to one of a number of drawings in the manual and then type in a keyword. I don't mind such copy protection if it means that the disks are unprotected (as here) and I can load the game onto my hard disk. A game this complex requires a lot of disk accesses and a hard drive eliminates disk swaps and long waits.

Battlehawks 1942 offers many variations in play. There are 10 different training missions for fighter interception and escort, dive bombing and torpedo bombing. Within the groups are increasingly difficult tasks with more and more opposition. Depending upon which side you wish to fly for, there are also 16 different missions drawn from the Battles of the Coral Sea, Midway, Eastern Solomons and Santa Cruz Islands. Add to this variety the ability to choose different aircraft, set their armor effectiveness, fuel capacity and ammo capacity, set your starting altitude and choose the caliber of your opposition pilots and you have an amazingly customizable game.

The Battlehawks 1942 manual is almost worth the price of the game by itself.

You start each mission at altitude and don't need to take off or land on a carrier (even if you would like to do so). The aircraft on the screen are solid-colored with authentic markings. You can, for example, distinguish a Val dive bomber from a Zero at some distance just by its distinctive coloring.

All the Bells and Whistles

The graphics throughout Battlehawks 1942 are superb. The planes take hits and catch fire, smoke or explode with the pilot bailing out in a parachute. (Don't try to gun down the vulnerable pilots; this particular bit of historical nastiness has been eliminated.) Debris falls into the sea with convincing splashes and you can track your torpedos by their bubble wakes. A bomb miss raises a convincing geyser of water. Flak from the ships explodes around you as soon as you're in range. In short, it's all there.

Lucasfilm also added a "gun camera" feature that lets you record part of your mission and play it back at any point. Moreover, you can move the camera's vantage point anywhere in the action and check your accuracy from close range. It's one of the game's most outstanding features.

Despite all of the great features of Battlehawks 1942, the one place it falls short is that it uses the mouse as a controller. Airplanes, especially WWII craft, need joysticks and the only consolation here is that Lucasfilm engineered the mouse interface quite well; in most situations it works acceptably. Also, when the screen is filled with planes, flak and machine gun fire, the game response gets a little sluggish. It's just the price you have to pay for running such a complex game on a 68000 processor.

You can't fly these planes like jets. There's no Stage 5 afterburner to pump out more thrust than weight and take you straight up at 700 knots. These babies will stall out any time you let the airspeed drop too far, an easy thing to do in combat. But the authenticity of the simulation gives you a good feel for the flying characteristics of each model of plane. You can really appreciate the advantage the Zero gave to the Japanese in the early years of the war.

There's lots more to say about a product this good, but you'll just have to go down to your local software dealer and try Battlehawks 1942 to appreciate all of its fine points.

COMBAT COURSE

REVIEWED BY GREG PEREZ

A few words from Lieutenant J.P. Wilcox:

"So, you guys think you're pretty hot stuff, getting accepted into Combat Course for Special Forces training, eh? Well, let me tell you, this has gotta be the worst bunch of recruits I've ever seen! I don't know what they were thinkin' when they OK'd your applications—I'll bet there isn't a single one of you who's got what it takes . . ."

If you've always wanted to know what goes on at boot camp, where men ▸

are men and slackers are dogmeat, Combat Course from Mindscape is worth a look. Yet despite its harsh introduction, Combat Course is actually mild in comparison to other games of this genre. After all, this game only details the training and physical tests that every soldier must go through, and doesn't really simulate all the heavy action one would face in a true combat situation.

Courses of Action

There are five different challenges that await you in Combat Course, each of which require different physical skills and a quick trigger finger. The basic test is the Physical, where you must traverse a rigorous obstacle course while maintaining a hectic pace to avoid the vicious dogs. The second is the Risk course, in which your ability to handle explosives and avoid booby traps will come into play. The Combat course requires you to face numerous opponents that will either attack you in hand-to-hand combat or try to get you with their M-16's. The fourth and fifth courses are grueling combinations of all the previous tests.

Action in Combat Course is controlled through the keyboard, mouse or joystick, or a combination of each. I found that the keyboard was the most responsive in the Combat test. The other courses are best handled with the joystick.

The main screen is divided into eight separate windows. four show your course and four show different scores and various displays. At the bottom of the screen is an eight-button control panel that you use to choose courses and view high scores. To the left of the control panel is a VCR panel. The VCR records all of your actions on the course and can be used as a guide to help your training.

All the action begins when you choose your course. The course is scrolled into view and shows you standing before your challenge. In the top right-hand corner of the screen is a picture of your drill instructor, who yells digitized voice commands at you. The left side of the screen displays a closeup of your soldier, and also the points you rack up as you complete obstacles in the course. If you happen to make mistakes during your training, this window will also show point deductions for your follies.

Despite its harsh introduction, Combat Course is actually mild.

The obstacles in the course range from a simple fuel cannister lying on the ground to Rex, the combat dog, who'll attack you if the proper evasive maneuvers aren't utilized. Your drill instructor will often command you to do 10 pushups on the course, or dive for cover from enemy air-raids. The digitized sounds in Combat Course, from the opening theme to the scratchy voice of the drill instructor, are very clean and well done and add to the excitement of your training.

A Serious Lack of Realism

There are certain features in Combat Course that seriously detract from the game's appeal. It's supposed to depict the realism and toughness of military training. However, I find blowing yourself up on land mines and getting back up to complete the course highly unrealistic. Call me a stickler for realism, but I'm disappointed in the way Combat Course handles a man's mortality. Oh sure, tripping in barbed wire wouldn't actually kill anyone, but I assume getting drilled with an M-16 several hundred times would drop any normal person (permanently, that is). Even if one were subjected to intense training and being force-fed rifle bullets for breakfast, he'd never be able to withstand the full force of three pounds of dynamite going off in his back pocket! (Yes, that's part of your training.) Fortunately or unfortunately, the programmers at Infogrames decided to leave the killing to the real military and keep the immortal soldier on the computer screen.

Though Combat Course offers many options in the way of playability, the choppy graphics and clumsy play system could leave some would-be-soldiers in the dust. If you personally find the courses offered in Combat Course too rigorous for your tastes, Mindscape has included an attractive course editor. This easy-to-use construction set lets you fill a course with as many traps, tricks and dogs as your heart desires!

JUG

REVIEWED BY FRANK WM. NAGY

If you're willing to merge your human mind with Titanium flexmetal, JUG could be for you. In this newest arcade-action game from Microdeal, you become JUG, an advanced interactive humanoid which is more than machine, but much more than human.

Your job is to save the planet Spiraeus. You must descend through layers of an underground labyrinth to find and excise a "tumor" from the dying computer brain which rules this planet. The virus, however, can't have you poking around so it has convinced the dying planet's immune system that you are the real enemy.

Gameplay

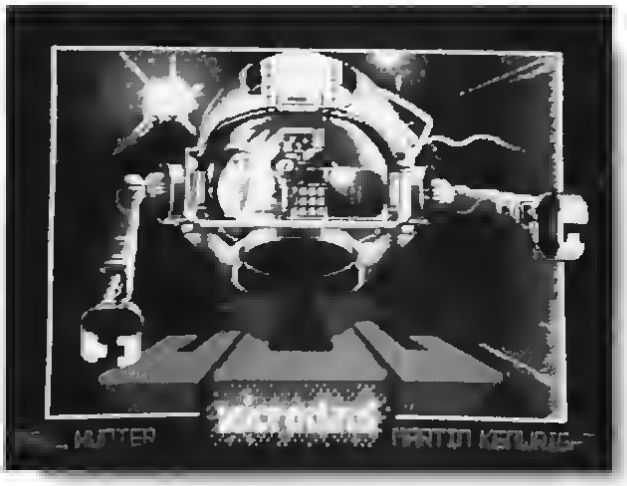
In JUG, everything from lowly insect runners to high-flight missiles go all out to attack you and defend their home. After you deal your destruction, plenty of other kamikaze reinforcements *stand* ready to take their place. But you have clever tricks of your own. You can transform into different shapes and reform instantly according to the need of the

moment. You are indeed a flexible hero. You can also protect yourself by firing your protectors or teleporting away from danger.

As you dissolve walls that stand in your way, you'll discover one uncharted chamber after another. Equipment and fuel vital to your survival have been transported to pickup points along your path. Use these resources for further strength and adaptability. If you can make your way through four four-sectored battlezones, you'll reach the heart of the planet. There you must match wits with the malevolent virus that's trying to kill the planet's brain and you.

Movement in JUG is controlled with the joystick. Spiraeus has very little gravity so movement is kind of tricky. With the joystick, you can move up, left and right. Press down to collect fuel, weapons, keys or any other needed provision. Surprisingly, you'll find it takes some power and effort to hop up or fly from side to side, and you'll always float back down to the ground. Whenever you downstick, you'll experience a metamorphosis. Your weaponry will also change to plasma fire, laser cannon or smart bombs.

Red blinking lights signify areas of radiation more than ready to drain your fuel. You can take quite a pounding, but damage is minimized when fuel reserves are kept up. Watch for that critical damage lamp; when it's lit, just 16 more hits ▶



JUG is Microdeal's latest arcade creation. In this graphically impressive adventure, you must save the planet Spiraeus from the grip of a fatal virus. Requires a color system.

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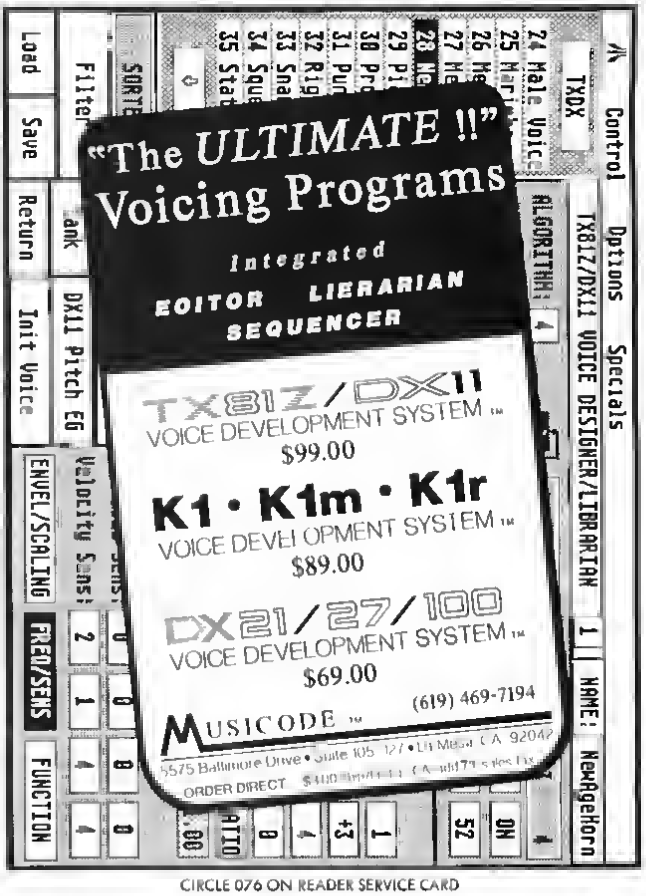

CIRCLE 076 ON READER SERVICE CARD

Twice the Space!

This issue your START disk is in the speciol new Heidi formot developed exclusively for START by Dove Smoll ond Dan Moore. Single-sided drive owners still get the some selection of greot ST progroms, utilities ond gomes. Double-sided drive owners will find Side 2 of your disk crom pocked with source code and demos. See our exponded Disk Contents to leorn whot's on the disk this issue.

will take you out—and believe me it doesn't take long to accumulate a terminal clobbering if you don't stay on your toes.

Stay on Your Toes

JUG is a graphically impressive game that is constantly coming at you—I have yet to see a dent made in the defenders! While the immune system's forces rejuvinate with a vengence, remember you have only three lives! Whatever progress you make against the defenders shows up only in points.

I like it when I can conquer an area and establish a retreat for myself. JUG doesn't give you that option—there's no truly safe spot outside the fray. However, I was able to recover some energy by teleporting back and forth between waves of attackers.

Good luck—if speed and adaptability are your strengths, you may be the hero of Spiraeus ■

Andrew Reese is the Editor of START Magazine and has been an aviation enthusiast for more than 30 years. Greg Perez attends East Lake High School in Oldmar, Florida. He wrote the review of Batman in the September 1989 issue. Frank Nagy is a freelance writer who lives in Lansing, Michigan. JUG is his first review for START.

PRODUCTS MENTIONED

Bottlehawks 1942, $44.95. Lucasfilm Games, P.O. Box 10307, San Rafael, CA 94912, (415) 662-1902.
CIRCLE 157 ON READER SERVICE CARD

Combat Course, $39.95. Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062, (312) 480-7667.
CIRCLE 182 ON READER SERVICE CARD

JUG, $39.95. Microdeal (MichTron), 576 S. Telegroph, Pontiac, MI 48053, (313) 334-8726.
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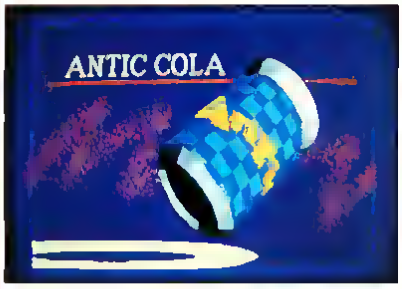

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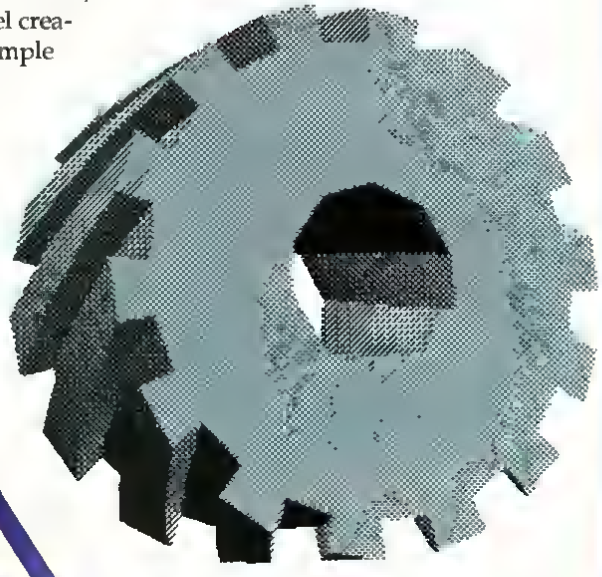

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Mavis Beacon Teaches Typing

REVIEWED BY DAVID PLOTKIN
START CONTRIBUTING EDITOR

As a new school year rears its ugly head, START feels that it's high time we reviewed Mavis Beacon Teaches Typing, still the best typing tutor available on the ST. The program combines graduated exercises with a game to encourage you to increase your typing speed.

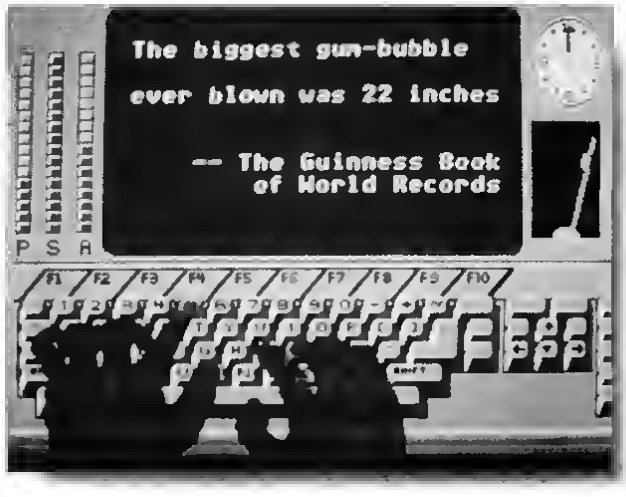
You don't run Mavis Beacon from the distribution disk. You must first install it to produce an "installed" data disk to which you can add users. One unique thing about Mavis Beacon Teaches Typing is that several people can use it and it tracks the progress and problems of each user. When you add a user, the program requests the user's name and age range (although the ranges seem strange: younger than 8, 8-14, or older than 14). This data is then used when producing progress charts.

Users are split into three categories: Beginner, Intermediate and Advanced. The lessons are built around a chalkboard, wherein the fictional Mavis suggests a lesson plan and tells you why. Then you can either proceed with that lesson or choose something else to do. The main screen shows the keyboard and a pair of "shadow" hands poised over the keys. As you type, the shadow fingers move and strike whichever keys *you* strike, and the keytops light up. Generally, however, the shadow hands aren't very useful, since you're too busy looking at what you are typing to see what the hands do anyway.

Lesson Plans

There are basically three types of lessons. Untimed tests put text on the screen for you to type, primarily emphasizing problem areas that have been identified (more on this in a moment). A cursor may or may not be visible to help you follow the text. The cursor helps you figure out when you've reached a space, although the program wants you to learn to type by "feel," not by sight. The tests beep at you and print your letters in red when you make an error.

Timed tests are similar, except that a score of your words per minute (wpm) typing rate and the number of errors are kept track of. The "raw" number of words per minute is adjusted down for the number of errors you make, giving you an "adjusted" wpm rate. An onscreen metronome keeps a beat consistent with your target typing rate. According to the manual, having this beat helps you speed up, but I tended to ignore it.



According to the outhar, Mavis Beacon Teaches Typing is the "best typing tutar ovoilable for the ST." This screen shows o Timed Test, just one of the program's many options. Requires o color system.

The third type of lesson is an arcade racing game in which the text area is replaced with a view out the windshield of a car. The graphics are good, with a realistic rendition of the road going by (there's even a city in the distance) and a rear view mirror showing where you've been. Periodically, a jet plane zooms across the ▶

COMING IN THE DECEMBER ISSUE!

In the December 1989 issue of **START**, we'll bring you up to date on some of the best new hardware add-ons and the latest from Atari on the TT and STE.

In The QueST for Speed, Alex Leavens tests three hardware and two software accelerators in the Grand Nationals of ST speed-up products. And the winner is: ... In the December issue of START!

Looking for the ultimate ST accessory? In December we also take a look at ParSec from England's Elmtech Research — 16,000,000 colors, 1024 X 1024 resolution and more. Join Marshall Rosenthal in the U.K. for the latest word on this amazing ST addition that's coming to the U.S. this year.

And on our new custom-formatted START disk, you'll find more of the kinds of software START is world famous for. We'll show you how to control your world from your keyboard or run a Laser Disk player with your ST. Design your own word puzzles, learn Morse Code with custom tutorials for START's Dah-Ditter and experiment with Artificial Intelligence with A I Doctor. It's all there — and more — in the December START.

And as a bonus to START disk owners, we're bringing you the best ST statistical package ever written, Bob Wilson's BSTAT 2.05. Plus we'll have an exclusive demonstration version of the hottest new game from the masters at Lucasfilm Games.

And as always, you'll find the special features, columns and programs you've come to expect from START.

More than just a magazine! START Magazine for December 1989!

screen, leaving text for you to type. The faster you type, the faster you go, and a "speedometer" records your wpm rate. There is also an "accuracy meter" to keep you honest. There is an opponent on the road, and if you don't type fast enough, he will pass you. But if you're a real speed demon, you can leave him in the dust.

Mavis Beacon Teaches Typing even lets you design your own lessons. You can select the type of lesson (including the race game). You can choose to emphasize speed or accuracy (or both), set the lesson length (in words or in time), set the metronome or pace car speed and the text format. This last lets you choose from a regular drill exercise, a "barrier drill" (only a few letters ahead of where you're typing are visible), pattern typing and transcription (typing from printed copy). There are also a variety of items in a main menu that let you customize your copy of the program, involving things like keyboard design (backspace on/off, or perhaps a Dvorak keyboard), setting the learning aids (such as the metronome) and calling for graphs of your progress. The graphs are impressive, tracking your proficiency in finding certain keys, your progress in typing speed and even a printed report card for boasting.

Mavis Beacon Teaches Typing even lets you design your own lessons.

Mavis Is Smart!

The most important thing about Mavis Beacon Teaches Typing, though, is that it's smart. As you begin the lessons, the program analyzes everything you do and the suggested lessons very quickly start closing in on problem areas. For example, my first lesson included a few symbol keys (the items above the number keys at the top of the keyboard). Right away, the program picked up on the fact that I had problems with these keys. Before long, it began providing lessons with *lots* of symbols. Interestingly, though, it didn't concentrate *only* on symbols, which would become frustrating quickly, but interspersed these lessons with the racing game and some other lessons that I could do really well on. Words of encouragement were also handed out lavishly (It felt good to be told I was doing well—even by a mere computer.) The built-in semblence of intelligence in this program is *very* effective.

On the Other Hand

There are some things I would change about this program. The installation program doesn't let you install it on a hard drive (despite what technical support said), and copying everything to your hard drive simply gets you a "demo" copy that doesn't do any lessons—it's just a waste of space. Software Toolworks should revise the program so you can run it from a hard drive. The other annoying thing about the program is that *I can outtype it!* As I type my lessons, the cursor falls behind, which means that I can type an incorrect letter and get well past it before I even realize it. This can be pretty confusing.

Finally, you're supposed to be able to set the length of a session, but although I set a length of 30 minutes, the program didn't warn me that the time was up—I finally quit after about 50 minutes.

Still, this is easily the best typing program I've ever seen for any computer, and if you want to learn to type or just polish your skills, I heartily recommend it. ■

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

PRODUCTS MENTIONED

Mavis Beacon Teaches Typing, $49.95. The Software Toolworks, 19080 Nordhoff Place, Chatsworth, CA 91311, (818) 885-9000.
CIRCLE 168 ON READER SERVICE CARD

The START Disk's New Look

Double the Space!

This month, START introduces a special new disk format developed exclusively for START by David Small and Dan Moore. It gives us twice the space on our monthly START disk, while preventing the problems that would show up if we used a regular double-sided disk. The new format is called Heidi format, named after START Programs Editor Heidi Brumbaugh.

Double-sided disks have a front side and a back side. Single-sided disks only have a front side. Both types use a single directory and File Allocation Table for all of the available space and, normally, double-sided disks can only be read by double-sided drives. This limitation has prevented START from publishing our disk in double-sided format, because we want all of our readers to have access to our great programs.

The Heidi Formatter solves this dilemma. Essentially, you can treat Heidi-formatted disks as two *separate* disks. One disk is on the front side of the Heidi disk (Side 1) and the other disk is on the back side (Side 2). You can't access them both at the same time (as you can with a normal double-sided disk); you must use the new START menu program to access files on the back side of your START disk.

This issue's START disk kicks off our new Heidi format, offering START readers twice the disk space. Our new START menu program by David Ramsden does away with the troublesome and difficult-to-use ARCXTTP. Now using your START disk is as easy as 1-2-3! See the new Disk Instructions in this issue for details.

Questions about the new START disk format:

Can I use the START disk with a single-sided drive?

Yes! If you have a single-sided drive, you will still have the same great pro- ▶

grams, tutorials and games we publish every issue.

How can I access the back side of the disk if I only have a single-sided drive?

START is recommending that ST owners with only single-sided drives take their START disk to a friend with a double-sided drive, a user group or an Atari dealer and copy the back side (Side 2) of your START disk onto a normally formatted single-sided disk.

Can I give copies of my START disk to friends?

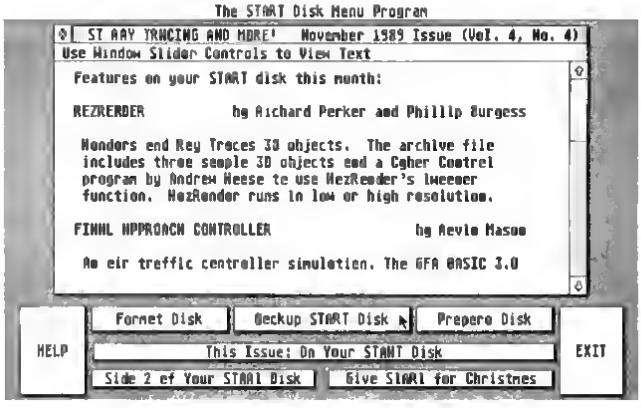
No, the contents of your START disk are still copyrighted and cannot be freely distributed, except for those programs which are specifically identified as freely distributable. Among other things, we do plan to offer public domain, shareware and manufacturer's demos on the back side of the disk which may be freely distributed.

Do I need to back up my START disk?

Yes, START still recommends users back up their disk for archive purposes. The new START menu program makes this easy, and keeps disk swapping to a minimum. You can back up your disk onto one or two single-sided disks, or onto one double-sided (Heidi format) disk.

Can I still use ARCX.TTP or Arcshell to un-ARC files on my START disk?

You can, but we are not recommending this. ARCXTTP will no longer be distributed on your disk. We are also not guaranteeing that future ARC files will be compatible with ARCXTTP, which cannot un-ARC files from the 5.21 version of ARC. If you choose to access the START disk without the menu program, you will not be able to access Side 2 of the disk.



The new START menu program by Contributing Editor David Ramsden makes using your START disk easier than ever. You can use this program to format disks, back up your START disk and prepare a disk containing a particular program or demo. See the Disk instructions in this issue for details.

START can now bring you double the programs each month on your START disk.

How do I run the new menu program?

Thanks to CodeHead Software's Charles Johnson, who has written a special version of STARTGEM for us, all you need to do to run the START menu program is put your START disk in drive A and boot your ST.

Can I run the menu program from my hard disk?

Because each issue's START disk will contain its own unique STARTINF file, you *must* run the menu program from the disk for that issue. Boot your hard drive, set the resolution to medium or high, open the START disk window onto the Desktop and double-click on START.PRG.

Will I miss out on START feature programs if I can't access the back side of the disk?

No. START's feature programs will be accessible to all our readers. We will be using the back side for demos, source code and public domain/shareware programs which we previously weren't able to offer.

LET US KNOW! START's editors want to hear your opinion on the new disk format and menu program, especially ways in which you'd like to see the back side of the disk used. Send your comments to START Dialog Box, 544 Second Street, San Francisco, CA 94107 ■

Is My Drive Single-Sided or Double-Sided?

Double-sided drives are: SF314 external, 1040ST, Mega or late 520STFM internal drives.

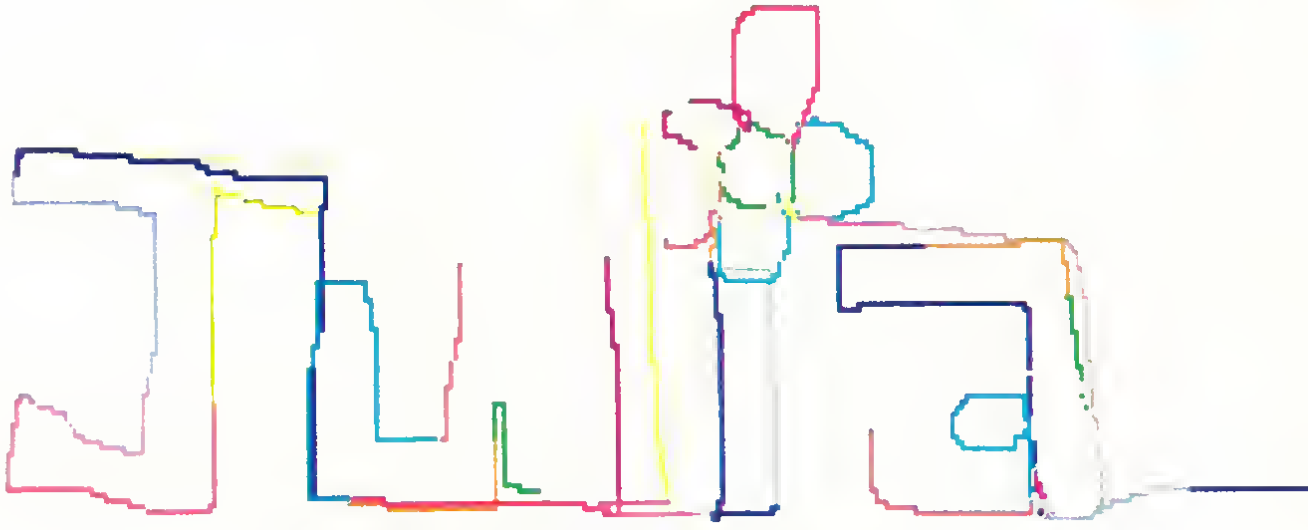
Most aftermarket drives are double-sided. (See manufacturer's documentation.)

Single-sided drives are: SF354 external and older 520STFM internal drives.

If TOS will let you format a disk double-sided, giving you 720K of space per disk, you have a double-sided drive. If you receive an error message when you try to do this, you have a single-sided drive. ■

ON DISK

BY PHIL COMEAU



"Buttonless" Drawing Program for the ST

A point progrom just for little kids! You'll find it in the file JULIA.ARC on Side 1 of your START disk.

Drawing programs for the ST like DEGAS Elite or NEOchrome share a common trait: you must hold down a mouse button in order to draw. But what if you're too small to keep the button down? With his young daughter as inspiration, Phil Comeau solved that problem in a fun and exciting way. His program Julia, on your START disk, runs in all three resolutions.

Julia is a "buttonless" drawing program written especially for very young children who haven't yet developed the strength to hold down the mouse button. I named it after my two-year-old daughter who is fascinated with my ST and loves to draw. Because of this, it would seem natural to let her fulfill her creative passions with a paint program like DEGAS. But though she's coordinated enough to move the mouse around, her little fingers lack the strength to press either of the mouse buttons. Enter Julia, the program.

Julia lets your children draw freehand, but doesn't require them to click the mouse buttons. An added feature in Julia lets children produce sounds as they move the mouse cursor back and forth and up and down. And because all those keys are so tempting to touch, a tone is also played when any key is pressed.

Getting Julia Started

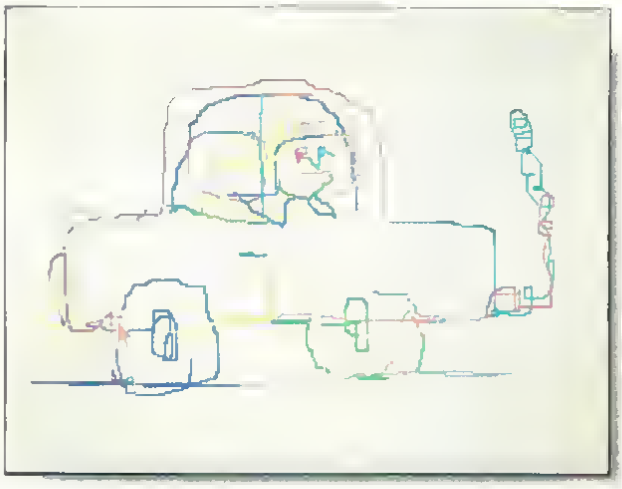
To run Julia, boot this month's START disk—the START menu program runs automatically. At the main screen click on Prepare, then select "Julia Buttonless Drawing Program." The program will un-ARC directly onto the destination drive you specify. At the Desktop, double-click on JULIA.PRG and start drawing. Press [Control]-[C] to quit the program and ▶

return to the Desktop. Julia was written in C and runs in all three resolutions.

Once Julia gets going, there's nothing else for you to do but have fun—no menus, windows, options, icons or dialog boxes to contend with. Move the mouse in any direction to draw a corresponding line on the screen. The color changes about once every second, cycling through all the colors in the ST's palette. Julia uses the current palette, so if your child wants new colors simply set them using the ST Control Panel before running Julia.

While you draw, you get to listen to some crazy sounds. The closer the mouse is to the center of the screen, the higher the pitch of the tone. You can also make sounds by pressing any key. Those tones are in C-Major so you can actually "play" your keyboard.

Press {Control-E} to erase the screen. Press {Control-P} to turn on or off a "Parent Mode" that lets you clear the screen by pressing the Spacebar. And press {Control-C} to exit Julia and return to the Desktop. Julia ignores mouse clicks.



Julia is a paint program developed especially for children under five years of age—all they have to do is move the mouse. But not only does Julia let children doodle to their heart's content, it also lets them generate sounds that range from the eerie to the whimsical.

Julia Wrap-Up

Julia is a great way to introduce very young children to the mysteries of computers. Children love to imitate, and using a parent's computer can help them feel responsible and grown up. Besides that, computers are fun ■

Phil Comeau lives in the Ottawa, Ontario area where he works as a software engineer. This is his first program for START.

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Final Approach Controller

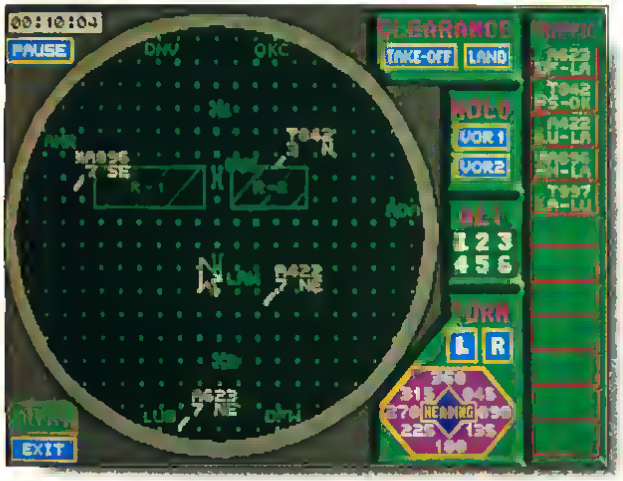
Prepare for takeoff with the file APPROACH.ARC on Side 1 of your START disk!

I'm one of those gamers who likes simulations better than text adventures and that's the main reason I wrote Final Approach Controller. It's a military Air Traffic Control simulation written in GFA BASIC 3.0 and utilizes DEGAS Elite, Cyber Sculpt, CAD 3-D 2.0 and the Animatic Animation System for the graphics design.

To run Final Approach Controller, boot this month's START disk; the START Menu runs automatically. At the main screen, click on Prepare, then select "Final Approach Controller." The program will un-ARC directly onto the destination disk you specify. To start the program, click on APPROACH.PRG at the Desktop.

Getting Started

Final Approach Controller begins with two dialog boxes. The first asks you to choose one of three skill levels according to the volume of traffic you're willing to handle. Depending on the level, aircraft will appear at the following time intervals when you enter the simulation. Student, every 150 seconds; Rookie, every 90 seconds; and Master, every 45 seconds.



Final Approach Controller's main screen: from here you must guide a total of 36 military planes and helicopters to safe landing and takeoffs. The program is set in Oklahoma's infamous "Tornado Alley," so watch out for sudden storms!

The second dialog box asks you for your preferred takeoff/landing orientation. Choose North for all your takeoffs and landings to face north, choose South for all your takeoffs and landings to face south.

There are total of 36 aircraft that will randomly appear in the final approach control area. Each aircraft is identified by a letter followed by a three-digit number. On the right side of the screen you'll see a list of all the aircraft in the immediate area. The aircraft ID number that is prefaced by an asterisk (*) is the plane or helicopter currently receiving your commands. To choose another, simply click on it with the left mouse button from the list of available aircraft.

The letters used to designate the three types of aircraft and their airspeeds are as follows:

USAF Jet Fighters: F–180 knots
USAF Jet Trainers: T–120 knots
Army Helicopters: A–90 knots

Interpreting the Radar Screen

On the Final Approach radar screen, target airports appear as text icons that contain information to assist the controller in managing traffic. The radar covers a circular area of approximately

ON DISK

Air Traffic Controller Simulation for the ST

BY KEVIN MASON

Let START put you in the hotseat of an Air Traffic Controller! Kevin Mason's Final Approach Controller will keep you on your toes as you guide a variety of military aircraft to safe takeoffs and landings. But be careful—this simulation requires quick thinking and a cool attitude, especially when the traffic gets thick. Final Approach Controller was written in GFA BASIC 3.0 and runs in low resolution only.

20 miles in diameter, overlaid with a grid divided into one-mile units. The six entry/exit fixes (positions) are marked around the rim of the screen as three-letter codes. The fixes are connected by airways, marked as lighter-colored grid marks.

Two airfields are centrally located and are marked by a three-letter code beside a runway icon. There are two diagonally hatched rectangles labeled as "R-1" and "R-2." These are restricted areas on the Fort Sill firing ranges that pilots must avoid, unless they want to catch an artillery shell in the belly of their aircraft.

The codes for the fixes and airfields are as follows:

DNV: Denver, CO, fix
OKC: Oklahoma City, OK, fix
ADA: Ada, OK, fix
DFW: Dallas/Fort Worth, TX, fix.
LUB: Lubbock, TX, fix.
AMR: Amarillo, TX, fix
LAW: Lawton Municipal Airport
FSI: Fort Sill Henry Post Airfield

A particular aircraft is displayed as a text icon on the radar screen. The first line of the icon is the aircraft identification; for example, "A638" for "Army 638", or "T400" for "Trainer 400." The second line of the icon is divided into the aircraft altitude and the heading. The altitude is represented on the left as a single number from 0 to 7, signifying 0 to 7,000 feet in intervals of 1,000 feet. The heading, the direction the aircraft is flying toward, is represented on the right by characters to differentiate the heading from the altitude. "N" is north, "NE" is northeast, etc. The third line of the icon is a slash mark "/" that points to the location of the aircraft on the radar screen.

The Control Panel

The Final Approach control panel around the radar screen is all mouse-controlled. There are no keyboard or joystick commands.

In the upper left corner of the radar screen, you'll find the TIME. Below that is a PAUSE button. If you pause the simulation, an alert box will ask if you want ▶

Final Approach Controller's Available Commands and What They Do

CLEARANCE—TAKEOFF

An active aircraft that is awaiting takeoff will depart the runway when you click on "TAKEOFF." The aircraft will depart in the heading that you selected at the beginning of the game (north or south). Initially the aircraft will climb to 1,000 feet altitude, unless you give the command for a higher altitude after issuing the takeoff command.

CLEARANCE—LAND

You can command an aircraft to "LAND" if it is aligned with the runway or turning to be aligned with the runway, traveling in the landing heading you selected at the beginning of the simulation (north or south), and is no more than 1,000 feet altitude when within one mile of the airfield. If you land at the wrong airfield, the aircraft will simply "touch and go" and depart the airfield.

HOLD—VOR1 or VOR2

The VOR is a radio navigational aid for the aircraft. These are marked on the radar screen at two traffic intersections as *1 and *2. You can command an aircraft to "HOLD" at a VOR1 or VOR2 if the aircraft is directly headed toward that VOR. When you issue the command, a small letter "v" will appear on the radar screen between the aircraft's altitude and heading readouts. The aircraft will hold at that VOR and simply make 360 degree circles with a radius of three miles, passing over the VOR at the completion of each circular turn. You can deactivate the VOR HOLD command by clicking on the holding aircraft's identification on the traffic list and then clicking the VOR button again. The small letter "v" will disappear and the aircraft must be given a new TURN and HEADING command.

ALTITUDE

To issue a new "ALTITUDE" command, click on a number, 1 through 6, in the altitude control panel. The aircraft will then climb or descend 1,000 feet for every one mile traveled until the assigned altitude is attained.

TURN—L or R

You can issue a command to turn left or right by clicking on the "L" or "R" buttons in the TURNS control panel. The turn command must be followed by a heading command for direction. The program will remember if you last clicked on left or right for each active aircraft, even if you issue several subsequent heading commands for that aircraft.

HEADING

After you select a turn direction, give the command for the new, desired heading of the aircraft. Your choices are 045 to 360. "Turn right, 090 degrees," means continue turning right until you are heading 90 degrees, or due east. "Turn left, 315 degrees," is a left turn to 315 degrees or northwest. The aircraft will change its heading 45 degrees for every mile traveled until the desired heading is attained. One-and-one-half miles is the smallest turn radius possible with this simulation. You may combine turns to headings with changes in altitude. ■

to study the score or radar screen while the game is paused. From either of these screens, click the mouse button to resume play. Below that is the ALERT box, which will turn red to warn you of dangerous situations. Click on EXIT in the lower left corner to return to the Desktop.

To the right of the radar screen is a panel labeled TRAFFIC that lists up to 12 active aircraft, though you'll usually have only two to six aircraft active at one time.

When an aircraft becomes active, you'll see its ID icon appear in the TRAFFIC panel. The first line of the icon is the aircraft identification. The second line shows a code for the arrival fix or takeoff airfield, separated by a dash (–) from a code for the departure fix or landing airfield. These codes correspond to the first two letters of the three-letter codes for each fix or airfield listed above.

The central control panel, to the immediate right of the radar screen, contains all of the final-approach controller commands. This panel is subdivided into five sections: CLEARANCES, HOLD, ALTITUDE, TURN and HEADING. See the sidebar for a detailed description of each command.

To control a specific aircraft, click on its aircraft ID text icon under the TRAFFIC panel. An asterisk (*) will then appear next to it to denote that it is the aircraft currently under your control. Now click on the command or series of commands you wish the plane or helicopter to follow.

Special Rules

Like any simulation, Final Approach Controller has some special rules that must be followed if you want all your aircraft to take off and land smooothly.

1. Aircraft will always enter the final approach control area at an altitude of 7,000 feet.

2. Aircraft must always exit a fix at an altitude of 6,000 feet.

3. Aircraft must always exit a fix aligned with the heading of the airway.

associated with that fix

4 Aircraft must always take off and land in the direction you selected at the beginning of the simulation

5. You are not authorized to direct aircraft over the restricted areas at any altitude.

6 You must keep traffic separated by a distance of three miles if they are at the same altitude to avoid a "near miss" conflict

7 You must keep traffic separated by 1,000 feet in altitude if they are within three miles of each other to avoid a collision

8 Do not fly into thunderstorms; avoid collisions

Scoring

The number of points awarded increases as the difficulty level increases Points are given for successful landings and proper departures at fixes, "handoffs" to other controllers Bonus points are given for handling all 36 aircraft without any errors. The number of errors, such as improper departures, landing in the wrong direction or straying out of the control area, are counted, leading to point deductions Each second over the restricted areas counts as one error Each second you are in a near-miss situation counts as one conflict error, which will also result in point deductions Losing an aircraft in a thunderstorm is disastrous for your score as well

The Weather

Southwestern Oklahoma, where the simulation is set, is in the heart of the infamous "Tornado Alley" More twisters drop out of the sky there than anywhere in the world Thunderstorms tend to appear suddenly over Childress, Texas, between Lubbock and Amarillo and march in a northeasterly direction Stay clear of these dangerous thunderstorms spawning tornadic winds, since their boiling, dynamic nature can destroy any aircraft

Parting Thanks

I would like to thank my friend Jerry Bethel for writing and compiling the machine language subroutines for me and giving pointers on finding crashes, and my friend John Crowley for playing the role of the frustrated novice player and ergonomic-controls design consultant

Finally, this program is dedicated to the real air traffic control specialists at the Army Radar Approach Control at Fort Sill, Oklahoma, who let me into their restricted world for dozens of hours as an observer

Now let's get that program booted up, and start managing aircraft traffic No smoking allowed! ■

Kevin Mason is a physician specializing in aerospace medicine and family practice in the US Army. He began hobby programming in 1980 on an Atari 800, which still runs next to his 1040ST. This is his first program for START.

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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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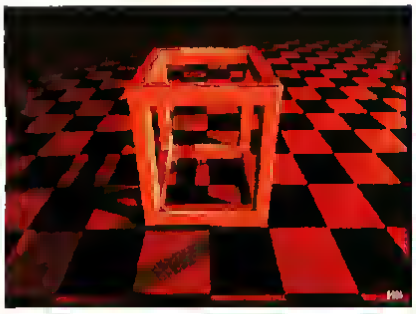
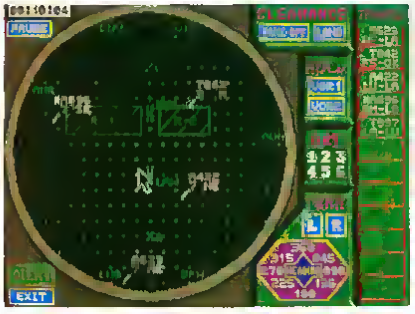
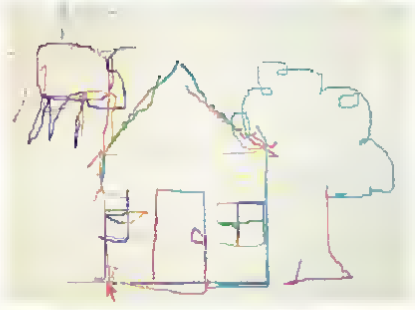


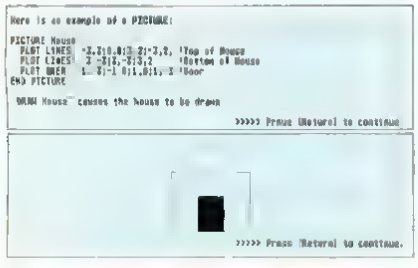
RezRender . . . . . page 30



Final Approach Controller . . page 60



Julia . . . . . page 57



Programming in True BASIC . page 85

Ray Trace Your World!

Programs on Side 1 of Your START Disk

Cyber Addicts, beware! A new realm of CAD-3D object manipulation awaits you! **RezRender**, by Richard Parker and Phillip Burgess, renders and ray traces 3D objects from CAD-3D, including Phong and Gouraud shading and super-dithering. Watch for future Cyber Corner installments as the authors of this impressive program explain how RezRender does its stuff. File REZRENDR.ARC; runs in low resolution.

If you'd rather play at simulations than battle aliens or lurk in dungeons, START's **Final Approach Controller** by Kevin Mason has you covered. As an air traffic controller, you must monitor your radar screen constantly, handle takeoffs, landings and through traffic while avoiding midair collisions and steering your targets away from storms. File APPROACH.ARC; runs in low resolution.

You're never too young to start computing, and now even toddlers and babies can enjoy the family ST with **Julia** , the buttonless drawing program by Phil Comeau. No menus, no icons — just move the mouse for fun graphics and sound. File JULIA.ARC; runs in any resolution.

Delmar Searls has outdone himself for this issue's "Programming in True BASIC" column. The **graphics demo** accompanying his article uses one window for graphics and one to describe exactly how the True BASIC code works. File GRAFDEMO.ARC; runs in any resolution.

Side Two

Programs on Side 2 of Your START Disk

With its debut of a double-sided disk, START reinforces its commitment to bring you top programs from the best programmers so that you can get the most out of your ST.

To run any of the programs on Side 2 of this month's START disk, you'll need a double-sided disk drive. Then just follow the Disk Instructions on page 64.

Top ST programmer Jim Kent, best known for Antic Software's Cyber Paint, developed **Ani ST** (formerly Aegis Animator ST) a few years ago as a computer animation tool. When this program was first introduced, it was heralded by the ST community. Matt Loveless, in his review in the June 1987 issue of Antic, praised the Animator, stating that "full-scale high-level computer animation has finally arrived for the Atari." Ani ST lets you animate objects fast and easy by doing all the tweening (the in-between parts) for you. The ARC'ed file contains the program and documentation. Ani ST is shareware and can be freely distributed — the author asks for nothing more than a smile. Runs in low resolution only.

GET YOUR START DISK CALL 1 (800) 234-7001

Last issue we presented to you James Robinson's **Schedule Maker**, an outstanding time-management program that helps you keep track of your hectic schedule. Now, START makes Schedule Maker's source code available to all programmers and would-be programmers. The program is very large and was written in Alcyon C with some final touches done in Mark Williams C. Schedule Maker runs on both color and monochrome systems.

Also on Side 2 is CITYSCAP.SEQ, an animation created using RezRender's Tweening function. It's in the file CITYSCAP.ARC along with ANIMAT3.PRG, the Public Domain animation display program from Antic Software.

To produce **Cityscape**, we loaded the 3D file into RezRender, set the Tweening controls to move the camera nine degrees per frame and then used Phong shading to render each scene. After RezRender had worked its magic, we loaded the resulting .PI1 pictures into Cyber Paint, added a color border to adjust the filesize to the space available on the disk and saved the set of pictures as a .SEQ file. The result is an animation that shows off some of the shading and dithering abilities of RezRender. Requires a color monitor.

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3D Pool	29
Astaroth	25
Bermuda Project	25
Blo Challenge	32
Blasteroids (Wow)	25
Buffalo Bill's Rodeo	32
Chariots of Wrath	31
Cosmic Pirate	25
Dominator	25
Dragon Ninja	25
Eliminator	22
Emmanuelle	25
F40 Pursuit Simulator	29
Garfield: Winter's Tail	25
Gauntlet II	32
Giants (4 Games)	38
Gilbert	25
Guide to the Solar System	29
Hawkeye	25
Hellraiser	25
High Steel	26
Hole-In-One Mini Golf	18
Indy Jones Last Crusade-Action Game	26
Journey Centre Earth	25
Kult	31
Legend	25
Legend of DJEL	32
Licence to Kill (007)	25
Millenium	32
Murder in Venice	31
Nothor World	22
Newzealand Story	26
Operation Hormuz	25
Operation Neptune	31
Pac-Land	25
Pacmania (3D Pac-Man)	26
Personal Nightmare	38
Phobia	25
Populous	32
Powerdrome	25
Project Neptune	26
Pro-Soccer	26
Psycho	19
Purple Saturn Day	31
RVF Honda	25
Rambo III	19
Red Heat	26
Red Lightning	39
Rick Dangerous	32
RoboCop	25
Rocket Ranger	33
Roy of the Rovers	25
Savage	22
S.T.A.G.	32
Skweek	28
Sleeping God's Lie	32
Space Conquest	18
Superman	28
Stormtrooper	25
Story So Far (4 Games)	25
Thunderbirds	31
Timerunner	25
Time Scanner	25
Tom & Jerry	31
Triad (3 Games)	28
TV Sports. Football	32
Waterloo	31
Weird Dreams	31

BOOKS

ABACUS Books	
#0 Presenting the ST	15
#2 Internals	15
#3 GEM Prog. Ref.	15
#4 Machine Language	18
#5 Tricks & Tips	15
#12 3D Graphics	18
#13 Disk Drives	18
ATARI ST Book	14
ATARI ST Companion	14
Dungeon Master Guide	8
Elementary ATARI ST	16
GFA Basic Programmers Reference Vol. I	24
GFA Quick Reference	12
Helpful Hints for the ATARI ST or Mega User	14
MIDI for Musicians	14
Programming in C	17
Programming with GFA-Basic 3.0	22
Quest for Clues	18
ST Artist	18
ST BASIC Source Book	14
ST Reference #2 AES	16

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B.E.S.T. Business Mgmt.	184
Chartpak	31
Inventory Manager	52
Personal Finance Mgr.	32
Phasar 3.0	58
ST Accounts (GEM)	95

DATABASE

DB Man V	148
Data Manager ST	44
Intomer	84
Intomer Tnal Pack	13
Regent Base II	75
Suberbase Personal	44
Suberbase Pro. 3.0x	225

DESKTOP PUBLISHING

Calamus	174
Calamus Font Editor	64
Fleet Street 2.0	129
PageStream	115
Publisher ST	58
Design Ideas	15
Education Graphics	20
People, Places Things	20
Symbols & Slogans	20
UltraScript ST	159
Font Pack (PS35)	209

EDUCATIONAL

First Shapes	25
Fraction Action	24
Kidtalk	24
Kinderame	24
Magical Math I	19
Mathblaster!	28
Mathblaster Plus!	32
Mathtalk. Fractiona	24
Mavis Beacon Typing	32
Planetarium	33
ProSchool Kid Progs	28
Read & Ryme	24
Smooth Talker	29
Spelling Bee	18
Statistics I	19

GAMES

10th Frame Bowling	26
Airball	24
All Aboard!	16
Artura	27
Autoduel	24
Baal	18
Balance of Power 1990	32
Balistix	23
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Bards Tale	31
Battle Chess	32
Battle Tech	21
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Blood Money	CALL
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Breach	26
Bridge 5.0	22
Bubble Ghost	21
Captain Blood	31
Captain Fizz	21
Chessmaster 2000	28
Chrono Quest	32
Circus Games	28
Colossus Chess X	23
Combat Course	25
Craked	21
Dark Side	26
Death Bringer	25
Death Sword	19
Deep Space	19
Defender of the Crown	31
Demon's Winter	25
Dive Bomber	18
Dungeon Master	24
Dungeon Master 2	CALL
Elite	23
Empire	32
F40 Pursuit Simulator	29
Falcon	28
Mission Disk	18
Flight Simulator II	32
Scenery Disks	ea 21
F.O.F.T.	31
Foundations Waste	24
Gateway	28
Gladiator	25
Gold Rush	28
Goldrunner 2	25
Scenery Disks I-II	ea 8
Gone Fishin'	28
Gunship	31
Harrier Combat Simulator	32
Heroes of the Lance	26
High Roller	16
Hit's Disk Vol. 3 (4 Games)	33
Hostage Rescue Mission	28
Hunt for Red October	32
Hyperdome	21
I Ludicrus	22
Impossible Mission 2	27
Indy Jones-Temple Doom	32
International Soccer	25
Jet	34
Jinxter	25
Jupiter Probe	17
Karateka	21
Kings Quest I-IV	ea 31
Knickerbockers	12
Lancelot	28
Leaderboard Dual Pack	16
Leathernock	25
Leisure Suit Larry 1	25
Leisure Suit Larry II	32
Lock On	25
Lords of Conquest	13
Major Motion	25
ManHunter (N.Y.)	32
ManHunter 2 (S.F.)	32
Microleague Baseball II	38
Midi Maze	25
Missle Command	18
Moon Patrol	18
Night on the Town	22
Ninja Mission	14
Obliterator	25
Ogre	27
Oids	24
Orbiter	26
Platoon	25
Police Quest I-II	ea 32
Pool of Radiance	CALL
Prime Time	27
Prison	25
Quink	11
R-Type	24
Rastan	18
Road Runner	28
Roadwars	19
Robotron: 2084	18
Scrupies	25
Sex Vixens from Space	25
Shadowgate	31
Shared of Spring	27
Shuttleboard	18
Sinbad	24
Space Harrier	31
Space Quest I-II	ea 31
Space Quest III	37
STAC	44
STOS	39
STOS Compiler	25
Star Fleet 1	35
Starglider II	27
Superstar Ice Hockey	31
Talespin	31
Tanglewood	25
Test Drive	24
Test Drive II	CALL
Cars Disk	CALL
Scenery Disk	CALL
Tetris	25
The Games: Winter	28
Thunder Blade	32
Times of Lore	26
Total Eclipse	26
Typhoon Thompson	22
Uninvited	31
Universal Military Sim.	31
Vampires Empire	16
Vegas Craps	22
Vegas Gambler	22
Wargame Const. Set	22
Winter Challenge	10
Wizards Crown	25
World Games	12
World Karate Champ.	18
Zak McKracken	28
Zany Golf	26

GRAPHICS

Architectural Design Disk	18
Art Gallery 1, 2, 3	ea 16
Becker-Cad	256
Cad-3D 2.0	57
Cartoon Design Disk	16
Cyber Control	38
Cyber Paint 2.0	46
Cyber Print	32
Cyber Sculpt	53
Cyber Texture	32
Cyber VCR	45
DEGAS Elite	36
Drafix CAD	114
Draw-Art Professional	48
Dyna CADD	436
Easy Draw (Super)	95
Easy-Tools	32
First CADD	33
Fonts and Bordors	21
Future Design Disk	18
Genosis	48
Human Design Disk	16
IB Scan Pix #1-Religion	24
IB Scan Pix #2-Pets	24
IB Scan Pix #3-Holidays	24
Interior Design Disk	19
Maps & Ledgends	22
Datamaps Vol. 1	19
Master Cad	119
Microbot Design Disk	18
Neochrome	26
Print Master Plus	24
Scan-Art	32
Spectrum 512	41
Touch-Up	109
Video Titleing Disk	18

MIDI / MUSIC

Copyist I	66
Copyist II (Pro.)	158
Dr. Drums	18
Dr. Keys	18
EZ Score Plus	99
EZ Track Plus	43
Guitarstics	49
KCS 1.7 (Regular)	149
KCS Level II	219
Ludwig	66
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Master Traks Pro.	260
Midimax	32
Midi Recording Studio	36
MIDI Power Pack	109
Chord Master	44
Note Wizard	44
Scale Master	44
Midisoft Studio (Std)	66
Midisoft Studio (Adv)	99
Music Studio '88	39
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Take Note	52
Tune Smith	99
X-Or	199

MISC.

ANSI Term	18
Flash	18
Fontz!	22
Generation Gap (512k)	32
Generation Gap Plus	32
Great Chels Set (1-3)	39
HyperFont	32
Interlink	24
Michiron BBS 3.0	52
PC-Ditto 3.0	58
Shadow	18

PROGRAMMING

AssemPro	39
Cambridge Lisp	59
Devpac ST	66
Forth/MT	32
GFA-Basic 3.0	58
HiSoft Basic Professional	99
Laser C	119
Laser DB (Debugger)	53
Lattica C 3.04	109
Mark Williams C	114
C Source Debugger	39
Personal Pascal	66
Prospero C	129
Prospero Fortran	129
Prospero Pascal	98
R.A.I.D. (Debugging)	34

SPREADSHEET

LDW Power	88
Swift Calc ST	48

UTILITIES

CodeHead Utilities	19
G + Plus	21
Go Go	22
Hard Disk Accellerator	20
Hard Disk Backup	23
Hard Drive Turbo Kit	39
Juggler (New version)	32
Macro Mouse	25
Mirror Image	18
Multi Desk	21
NeoDesk 2	29
OmniRes	23
ProCopy	24
Revolver	31
Turbo Jet	26
Turbo ST	23
Universal Item Selector II	13
Utilities Plus	38
Virus Killer	26

WORD PROCESSING

First Word Plus	64
Microsoft Write	65
Tompus II	49
Word Perfect	139
Word-Up	47
Word Writer ST	48

CLOSE-OUT'S & SPECIALS!

(Quantities are limited on close-outs!)

220 ST	7
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Bizmarck	23
Black Cauldron	22
Blackjack	8
Border Pack (Easy Draw)	19
Brimstone	25
CZ Android	43
CZ Patch	54
Calendar	17
Chemistry I-II	ea 15
Clip Art #6	11
Colorwriter	3
Comerman	27
Cosmic Relief	21
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Cross Town Crazy 8	6
Db Calc II	3
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(CONT)

GFA-Artist	44
GFA-Companion	27
GFA-Draft	54
GFA-Object	44
GFA-RayTrace	50
GFA-Vector	33
Gridiron	9
H & D Base	56
Hacker II	9
Hippo Backgammon	22
Hippo Concept	49
Hippo Fonts I	30
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Home Casino Poker	18
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K-Switch	17
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Macro Desk	3
Mail Merge Data Base	14
Maniax	6
Mercenary	20
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Midway Battles	6
Mindwheel	25
Moon Mist	9
Music Construction Set	11
Music Mouse	40
N-Vision	21
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Nervana Quest 3&4	15
Oo-Topos	11
Paladin	21
Quest I	14
Pawn	25
Pinball Factory	20
Pinball Wizard	18
Power Assist	17
Powor Edit	17
Power Plan	44
ProShow +	15
Q-Ball	16
Quadralien	16
Quizam!	19
Regent Word II	38
Renegade (Outcast)	9
Roadwar 2000	23
Roadwar Europa	25
Santa Paravia	17
Seconds Out	12
Shanghai	20
Shuttle II	22
Space Station/Protector	3
Spell Breaker	27
Spitfire-40	18
ST Karate	3
ST-Key	3
ST Music Box	27
ST One Write	49
Star Quake	16
Star Ray	16
Sub-Battle Simulator	11
Super Huey	22
Swiftar	20
Time Link	27
Thunder	23
Time Blast	10
Trail Blazer	25
Transputer	18
Transylvania	11
Typesetter	22
Wanderer (3D Game!)	13
Word Master	27
World of Wine Sal	15
Champagene	6
Great Vintage Years	6
Virus	13
Your Financial Future	22
Zero Gravity	16
Zork I/ II	ea 25
Zynapso	18

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1060/91-1180/91 Colors	10
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WICO Bat Handle	18
WICO Ergostick	18

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ATARI 1040ST	10
ATARI SC1224	14
ATARI SM124	13
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STAR NX-1000	9
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Whole Lotta Shakin' Going On

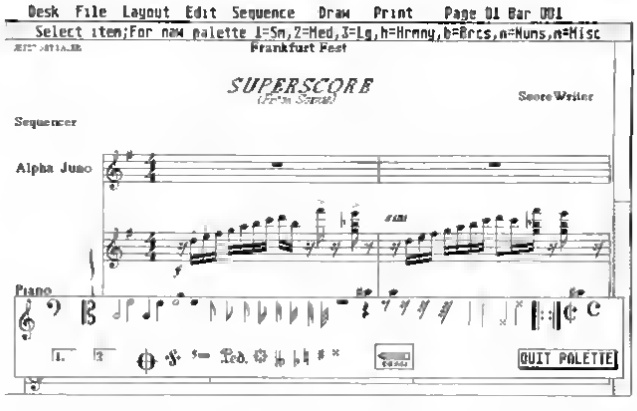
BY JIM PIERSON-PERRY
START MUSIC/MIDI EDITOR

The floodgates opened this month lots of new software, the ST prepares to take on IBM MIDI software (literally), multitasking arrives and a MIDI/BASIC language is launched

New and Notable

Let's start with a welcome for Sound Quest of Toronto. This premier Amiga MIDI software firm has brought its extensive line of patch editor programs (Master series) to the ST. Not content with simple porting, they rewrote parts of the ST operating system to improve performance. Standard features include mouse-controlled patch auditioning, graphical envelope editing and three types of random/controlled patch creation. The initial set of programs cover Yamaha DX/TX7, DX7II/TX802, DX11/TX81Z, FB01; Roland D50, D10/20/110, MT32, Oberheim Matrix 6/1000, Ensoniq SQ-80/ESQ1, Korg M1, Kawai K1 and Casio CZ series.

Big Noise Software is another newcomer to the ST MIDI ranks. Their first release is a patch editor/librarian for the Korg M1.



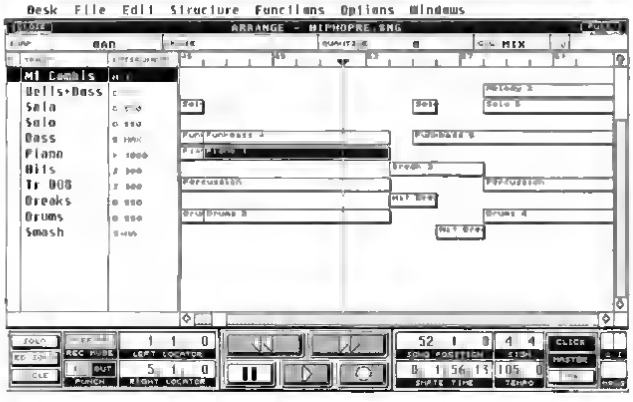
Score editing page from SuperScore, the combination sequencer/scoring program from Sonus. Changes made on the score are immediately reflected in the sequence data. Shown at the bottom is the palette for drawing musical symbols.

MusicSoft is expanding from their base of patch editor programs to offer Hit List. This acts as a cue sheet, working with standard MIDI file format files to aid in film scoring. Coming soon is a completely rewritten upgrade of MusicSoft's popular MIDI Drummer program, a universal drum sequencer. On the hardware side, they now offer MIDIMAN. About the size of a paperback, MIDIMAN is a MIDI data tape recorder interface that is capable of recording/playing virtually any MIDI data to a cassette tape. You could perfect your sequences, drum patterns and sysex data at home with your ST, then download them to MIDIMAN to take to gigs. Much easier than carting a computer system around!

The latest offering from Music Service Software is a dedicated librarian program for the Akai S700/X7000 sampler ▶

Author Dean Richard also provides the Data Dumpstor and the TR707 Dumpstor, two other good librarian programs.

Cubase (formerly Cubit) is now shipping from Steinberg/Jones. This is a "third generation" sequencer based on their new M-ROS MIDI multitasking operating system. It offers a host of new features such as controller chasing and remapping, simultaneous recording of up to four players on separate tracks, real-time simulation of delay and reverb effects, editing a score display while the sequencer is playing and a superb graphical environment. Also released is the first set of programs in the X-Syn modular patch editor series (previously available through Beam Team). Your initial purchase gives you the master controller program and two modules, where a module has the "brains" for a specific synthesizer. Inexpensive individual modules can be purchased as needed. They are loaded and unloaded from within the master controller letting you build a composite patch editor/librarian package tailored to your particular instrument setup. The initial set of modules available are for the Yamaha DX/TX7, DX21/27/100 and FB-01; Roland JX8P and MT32; Oberheim Matrix 6/1000 and Casio CZ.



The workscreen from Cubase, the new sequencer from Steinberg/Jones built around their M-ROS MIDI multitasking operating system. Note the dialog box from the Synthworks M1 patch editor program running simultaneously with the sequencer.

Staccato Notes

Pixel Publishing is now shipping version 2.20 of Super Librarian. This generic sysex librarian program comes configured for over 70 instruments and devices and is easily programmed to add configurations for new instruments. Included with it is Clickpad, a desk accessory which provides extensive support for SMPTE and cue sheet calculations, and a SMPTE tutorial guide.

Those looking for sophisticated MIDI data manipulations should check out version 2.0 of the Cartographer from Intelligent Music. This acts as a software emulator of the popular Mapper hardware unit from Axxess. It lets musicians create multiple keyboard split points, reassign controllers, trigger chords from single notes and many other forms of expressive real-time control of the MIDI data stream.

Version 1.4 of Sonus' SuperScore program has been released. Highlights of this upgrade are addition of new event editing capabilities, improved rhythmic analysis and beaming algorithms, an Undo command and use of Bezier curves to construct complex slurs. Owners of earlier versions can upgrade by sending in their program disks with a $15 handling fee.

Compu-Mates and Aegix, two early ST MIDI developers, are no longer in business.

1989 seems destined to go down as the year of multitasking for the ST.

IBM MIDI on the ST

The ST community has been eagerly awaiting the release of pc-ditto II from Avant-Garde. This hardware units plugs inside your ST or Mega and provides full IBM XT software compatibility at AT class speed. Going a major step further, a late summer software upgrade will allow pc-ditto II to emulate the Roland MPU-401 MIDI interface and run IBM MIDI software. The MPU-401 is the accepted MIDI interface standard in the IBM/clone world, so most existing software should be compatible. Other features of this upgrade are support for EGA video, extended memory (break the 640K barrier) and an Epson printer emulator for use with the Atari laser printer. Now if we could just get a version of pc-ditto II that fits inside STACY, we would have the perfect traveling studio for both ST and IBM environments.

Multi Multitasking

Perhaps 1989 is destined to go down as the year of multitasking for the ST. Already three developers have demonstrated the technology with MIDI software, and one is now shipping. The groundwork was laid by Dr. T with the MPE and Hybrid Arts with HybriSwitch. These systems provided a consistent data interchange environment between sequentially-run applications, similar to the Switcher program on the Macintosh.

The new offerings go beyond this to provide true multitasking, applications running simultaneously sharing resources and access to data. First out of the starting block was Steinberg/Jones with M-ROS (MIDI Realtime Operating System). This new operating system was two years in writing and is expected to be

ported to Mac and IBM environments Three MIDI programs now shipping that run under M-ROS are Cubase (sequencer, formerly Cubit), Mimix (automated mixing) and Synthworks M1 (patch editor) Plans are to upgrade all of the Synthworks patch editor programs to M-ROS compatibility, except those for the TX81Z/DX11 and MT32

Hot on the heels of M-ROS comes the RealTime Studio from Intelligent Music This music production environment is built around their RealTime sequencer, with two operating system enhancements providing GEM multitasking support: Multi-GEM and MIDI-GEM Multi-GEM provides the drivers that govern general multitasking between Atari application programs while MIDI-GEM coordinates the communications and scheduling functions specific to MIDI The RealTime sequencer has been shipping as a stand-alone program since earlier this year

The most recent entry, by only a few months, is Soft Link from C-Lab (distributed in the United States by Digidesign) This was demonstrated at this summer's NAMM show running C-Lab's Creator/Notator sequencer programs simultaneously with other GEM compatible programs

T-BASIC from Dr. T is a full-blown BASIC language with built-in extensions to handle MIDI and music functions.

What does this bode for the user, now looking at a future of multiple developer-specific implementations? Atari has recognized the need to standardize on a single approach to multitasking that all developers could exploit, much the same as the recently introduced MIDI Manager for Macintosh applications. The above systems are under active evaluation by Atari We can only hope for an early decision so a consolidation process can be started soon

Back to BASIC

Do any of these situations sound familiar? You really like your sequencer but there are some additional editing features you wish the programmer had included You have a great idea for a combination graphics/sound program but need more muscle than the ST internal synthesizer sounds and want to hook into MIDI sequences You have an interest in experimental music (e.g. fractals or Markov chains) that cannot be played from a keyboard but must be computer-generated These are just a few ideas that you now ▶

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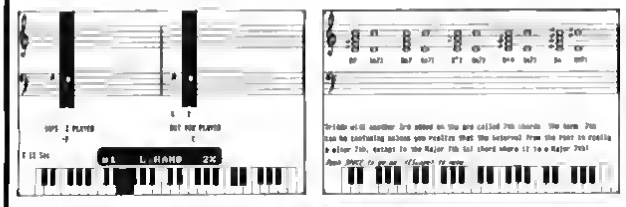

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can explore easily with T-BASIC from Dr T, a full-blown BASIC language with numerous built-in extensions to handle MIDI and music functions

The language is a superset of ST BASIC that has been tuned up to run fast enough for realtime graphics and music applications Provisions were made for structured programming, access to GEM functions (AES, XBIOS, etc) and all the hooks necessary to tie into Dr T's KCS sequencer T-BASIC can be run as a stand-alone application or as part of the KCS multiprogram environment.

T-BASIC runs on all ST/Mega models and comes with a tasty collection of starter programs and demos The doctor and crew plan to foster user interaction and support by maintaining a library of T-BASIC programs With the availability of Dr T's public domain MIDI file converter program, users of most other sequencers could import or export between their native format and the KCS format to use T-BASIC This is an exciting new tool for Atari MIDI/music explorations that should be well received by both hobbyist and professional users ■

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

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pc ditto II, $299. Avant-Gorde Systems, 381 Pablo Point Drive, Jacksonvilla, FL 32225, (904) 221-2904.
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M1 Patch Editor/ Librarian, $119.95. Big Noise Software, Inc., P.O. Box 23740, Jacksonvilla, FL 32241, (904) 730-0754.
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T-BASIC, $149. Dr. T's Music Software, 220 Boylston Street, Suite 306, Chestnut Hill, MA 02167, (617) 244-6954.
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Cortographer, $200; **Realtime**, $350. Intelligent Computer Music Systems, Inc., P.O. Box 8748, Albany, NY 12208, (518) 434-4110.
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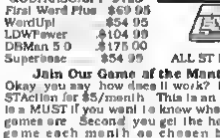

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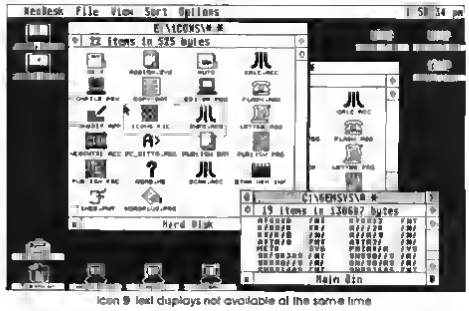

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Inside Atari

The Summer NAMM Show

BY FRANK FOSTER

Activity at Atari has reached an incredible level recently as a record number of new products are in final preparation for US distribution. After the Portfolio and PCES introductions garnered so much favorable press, by the time of the summer NAMM show, Atari seemed to be on a roll.

Of course, successful NAMM shows are no surprise to the Atari community, but reaction to STACY laptop was so positive that, even if the rest of the NAMM show was slow, Atari would have been successful. STACY is the epitome of what a music computer should be and the whole industry learned it at the NAMM show.

When Atari first showed the Hotz MIDI controller at the Winter NAMM show, it was demonstrated by such musicians as Mick Fleetwood, Mike Lawler (from Steve Winwood's band) and, of course, Jimmy Hotz. At that show, Atari wanted to let people play it themselves, so Jimmy gave continuous one-on-one demonstrations to music dealers, reporters and musicians. Once again, the reaction was overwhelming.

In fact, reaction to the Hotz Box has been so positive that during Fleetwood Mac's production of a new album in Los Angeles, their producer *gave* them a room just to make sure that a Hotz Box was always available. A new housing design for the professional unit has just been completed by Ira Velinsky, the ST and STACY designer. Atari Manager of Product Engineering John Couch is overseeing the manufacturing, which is taking place in the U.S. Both Atari veteran Jose Valdez and new addition Scott Barrows are on the engineering team.

Summer NAMM in Chicago was widely viewed as the sleepiest one yet, with most exhibitors complaining about lack of attendance. Many of them indicated that they will cut back to one show per year. But for Atari, this NAMM was of pivotal importance because it set the basis for our continued dominance in the MIDI marketplace. Luckily for Atari, Apple Computers has been forced to postpone their multimillion dollar attack on the MIDI market because of their legal dispute with Apple Records. Of course, we can't expect that postponement to last.

For the moment at least, somebody up there likes us. According to *Keyboard* magazine's latest "Trends in Technology" poll of over 3,000 readers, those who bought a computer in the last two years responded as follows: Atari ST: 31%, IBM: 27%, Macintosh: 26%, C-64: 7% and Amiga: 5%.

Summit Meeting

Despite Atari's success in MIDI, there's still one area that has been bothering me for a long time: there are now at least five different and incompatible MIDI switching/multitasking systems on the ST. Even though this indicates that we have a diverse and talented group of ST MIDI developers, it's still not what Atari MIDI users need and deserve. At the Audio Engineering Society convention last year, Atari met with key developers to start a dialogue toward a switching standard. Last February, in Frankfurt, I met with personnel from C-Lab and Steinberg to see if the two biggest rivals in the market could agree on a standard.

We followed up on these efforts at NAMM with a large "summit conference" that included some of Atari's top executives, as well as the most influential MIDI developers in the industry. Representatives from Dr. T's, Steinberg, Hybrid Arts, C-Lab, Intelligent Music and Passport Designs were in attendance. While most of what was discussed in the meeting is still confidential, everyone agreed that there was a wonderful spirit of collaboration and open-mindedness that prevailed throughout the 4½-hour session. Finalization of an Atari MIDI-Tasking Standard has become such a priority that Leonard Tramiel, Atari's Vice President of Software R & D, is now personally advising on the project. ■

As Atari's Director of Specialty Markets, Frank Foster is responsible for MIDI and graphics products marketing in the U.S. This is his first article for START.

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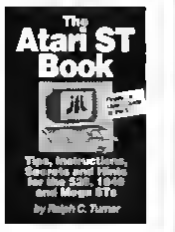

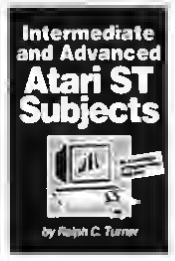

Ralph Turner's new book, *ST Subjects*, covers hard drives, running IBM programs, disk structure & file recovery, connecting $5\frac{1}{4}$" drives, assembling your own hard drive, sector & file editing, binary, hex & decimal codes, ASCII file problems, escape codes, miscellaneous tips, & much more. 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, Telecommunications, Copying, Printers, Desk Accessories, the Item Selector, & much more. Neither book requires a knowledge of programming. $16.95 each, plus $2.00 each, shipping ($2.50 each to Canada). Check, MO, VISA, MasterCard. Index Legalis, P.O. Bx 1822-47, Fairfield, IA 52556. (515) 472-2293.

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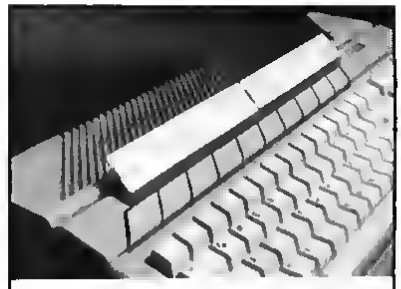

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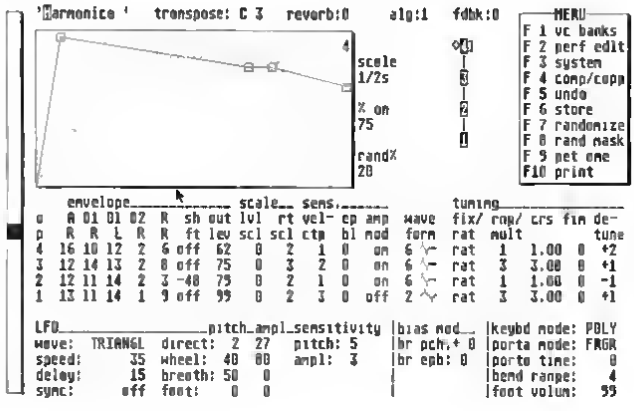
Taming the TX81Z Tone Generator

A Patch-Editor Roundup

BY JIM PIERSON-PERRY
START MUSIC/MIDI EDITOR



Shot of the voice editing screen from Dr. T's Four Op Deluxe. All patch parameters are displayed at once, along with graphical editing of the four operator envelopes.

The Yamaha TX81Z is a tone generator, a synthesizer without a keyboard. It provides excellent sounds with advanced MIDI capabilities and has been enthusiastically received by hobbyist and professional musicians. Based on four-operator FM synthesis, it plays up to eight independent voices simultaneously.

Programming the TX81Z involves creating individual sound patches as well as the overall voice setup (performance), specifying which patches to play, MIDI channel and note range for each voice, etc. The TX81Z also supports microtuning and three special effects: pan, delay and chord. (The DX11 is an upgrade of the TX81Z, adding a keyboard along with aftertouch, cartridge memory and other features.)

Several software developers offer patch editor/librarian programs for the TX81Z: Dr. T, Musicode, MusicSoft and Steinberg/Jones. Each addresses the same basic needs but takes a different approach.

FOUR OP DELUXE FROM DR. T's

Four Op Deluxe is from the acclaimed Caged Artist patch editor line, distributed by Dr. T's. It runs as a stand-alone application or under Dr. T's multiprogram environment. All ST/Mega models and monitors are supported. It uses key-disk copy protection and does not tolerate desk accessories or RAMdisks, locking up the computer if they are found. The manual is terse but sufficient to cover program operations. DX11 extensions to the TX81Z are not supported.

A series of workscreens, each for a particular task, takes you through all editing and librarian functions. You can customize the program for your particular synth and computer setup and the program automatically reads the synth memory banks if it is online when the program starts.

Each workscreen shows a menu of available operations and links to other workscreens. The menus change from one screen to another and you may not be able to go directly to a desired editing screen. This is awkward, but at worst requires only one intermediate step.

Playing the synthesizer with the mouse lets you audition your editing. The mouse's XY position controls pitch, velocity and modulation. You specify the modulation source that the mouse emulates (e.g., aftertouch, breath control) and can change it at any time. Used within the MPE, mouse play options extend to include playback of a sequence, an event range or from a cue point.

Voice and performance librarians hold four banks each. Voice banks are saved and loaded independently of per- ▸

formances and are fully compatible with those from Dr. T's DX21/27/100 patch-editor program (also supplied on the Four Op Deluxe disk). Copy, move and swap functions relocate individual voices or performances between any banks in memory.

Four Op Deluxe is a good choice, except for DX11 users.

Voice and performance editing is facile and intuitive. All parameters appear on a single screen. You have several ways to change parameter values: a screen slider, clicking on the parameter and dragging the mouse up or down, using the +/- keys or just typing the new value. Selecting a reference voice (or performance) from any bank in memory lets you do A/B comparisons with the edited version or serve as a source to copy parameters (as many as you like at once). Operator envelopes are shown both numerically and graphically and both forms can be edited. A randomizing function creates variations on a starting voice or performance. You control the amount of change and which parameters will be affected.

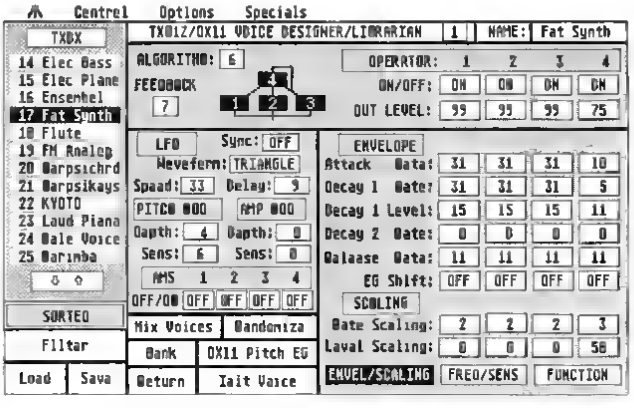
Separate editing screens are provided for the special effects (delay, pan and chord), microtuning and program change map. A copy octave function with built-in transposition facilitates creating custom full keyboard microtunings. The entire program change map is displayed on its edit screen, along with the associated index numbers. The data from each workscreens can be saved as independent files or sent/read by the synth at any time. All workscreens have a print option to produce a hard copy of the parameters and most operations are reversible with the UNDO command.

TX81Z/DX11 VDS FROM MUSICODE

The TX81Z/DX11 Voice Development System (VDS) is an excellent first offering from Musicode. It provides a full-featured librarian/patch editor with an integrated sequencer. All ST/Mega models and monitors are supported. The VDS runs under GEM with full access to desk accessories and RAM disks. The manual is very thorough and well organized, although it needs an index. A few program operations use somewhat esoteric key combinations that are only described in the manual. This was done deliberately for antipiracy reasons, as the program is not copy-protected.

In addition to standard voice and performance banks, the VDS provides a voice library that holds up to 300 individual voices (100 for performance libraries) which are stored and manipulated independently of banks. Library operations include alphabetic sorting and searches using wildcards. Banks can be dumped into a library or library contents extracted into banks.

Voice editing is integrated with the librarian; a screen button toggles between them. Voice parameters are divided among three submenus, grouped by function to reduce screen clutter. Selecting a voice for editing puts copies of it



First of three subscreens for voice editing from Musicode's Voice Development System for the TX81Z/DX11. Screen buttons provide quick access to other editing screens or librarian functions.

The user interface is well designed. Separate program operations have their own workscreens, all logically organized and visually appealing. The menu bar, and its command-key equivalents, provide access to any workscreen at all times. Press the return button to toggle between the current screen and the previous one accessed. The sequencer works in parallel with the editing system and command keys activate it at any time to audition your work. The ST numeric keypad operates as a control panel, moving the cursor between parameters and changing their values. These operations are duplicated with the mouse. Combinations of "power keys" (ALT, SHIFT, CTRL) provide editing enhancements for faster changes and initializing values.

in eight edit buffers. This lets you develop multiple editing ideas while keeping a reference copy of the original. Operator envelopes may be displayed but not graphically edited. The randomizing function creates multiple variations of a starting voice. Its complement is a mixing function that blends up to six different voices to create a new composite voice.

Performance editing is equally facile. Parameters are only displayed for assigned voices, both simplifying the screen and giving visual feedback on the performance setup. An autoload feature associates a voice bank, effects, microtuning and even sequence files with a particular performance. When the performance is selected, these files are automatically loaded into the VDS and sent to the synth.

Effects, program change map, synth

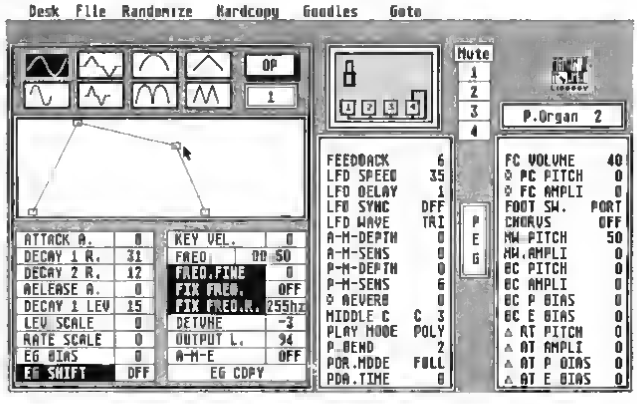
utilities and microtuning editing are handled with dedicated workscreens and saved to individual data files for maximum versatility. These settings are only read from the synth when the program starts. Entering any of these workscreens triggers the VDS to send the particular data (e.g. microtuning, chord effect tables) to the synth, overwriting current settings. This lets the VDS maintain control over the synth.

Instead of the typical "mouse play" to audition your editing, the VDS offers a full-fledged integrated sequencer. It is a single track, multichannel recorder that captures all MIDI data and runs at a respectable 240 ppqn resolution. You can overdub multiple recordings from different MIDI channels or redo the most recent take. Additional features include optional aftertouch filtering, real-time variable tempo control, count-in and the ability to drive a drum machine (sends MIDI Start/Stop/Clock). It uses the MIDI standard file level 0 format. The VDS will only play the synth through the sequencer; you will need a keyboard synth to generate MIDI data or you use an existing MIDI file, but a short test sequence should be included on the program disk.

4X4 FROM MUSICSOFT

4x4, from MusicSoft, handles the DX21/27/100 and DX11 in addition to the TX81Z. It supports all ST/Mega models and monitors using key-disk copy protection. It comes with a desk accessory for loading 4x4 voice banks and a MIDI data-view utility program. The manual needs substantial revision. several important features are either not covered or are described differently from actual program implementation.

Separate workscreens handle the li- ▶



Voice editing screen from MusicSoft's 4x4 program. It supports graphical editing of operator envelopes but only one operator can be displayed at a time.

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brarian and editing operations for voices, performances and effects. Links between them are poorly designed; only certain screens are connected—and not necessarily the most logical choices. Going from one operation to another may require several intermediate steps. There is no support for editing microtuning tables or synth master settings (e.g., MIDI transmit channel or pitch bend range). Menu bar selections are misleading. Voice bank transfers and hardcopy options are not accessible from the voice editor screen, although the menu bar shows them as active. Pressing the ST function keys lets you audit your editing by playing selected notes, a short sequence or going into "mouse play" mode.

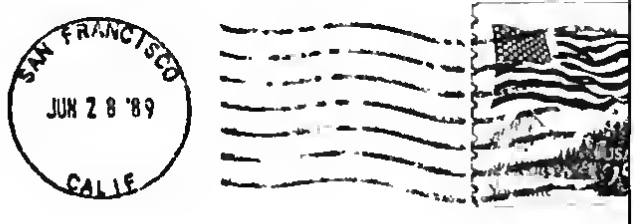
The voice librarian holds two banks. Voice banks downloaded from the synth always go into Bank A (undocumented). The copy function uses the mouse to drag voices from one location to another. The voice editing screen shows only one operator at a time. Envelope parameters appear both numerically and graphically. Graphical editing is supported but envelope parameters are not updated until you release the mouse button. Entire operator parameter sets can be copied from one to another. The program locks out features that your synth does not support.

The performance editor only shows parameters for one instrument at a time. This needlessly complicates creating multi-instrument performances, a key use of the TX81Z. Neither performance nor effects parameters can be printed. The program change table does not show index numbers for the entries, making it hard to keep track of your position. You can assign cartridge voices and performances as map entries even though they are only available on the DX11, not the TX81Z. In a final stroke of arrogance, 4X4 overwrites your synth greeting message with the software developer's name—and gives you no way to alter it.

SYNTHWORKS TX81Z FROM STEINBERG/JONES

Synthworks TX81Z (Version 2.0) is a member of the Synthworks patch editor/librarian series from Steinberg/Jones. It requires a minimum of one megabyte of memory to run and supports both monochrome and color monitors. A cartridge key provides copy protection. The manual is poor; many features are barely covered, are at odds with the program implementation or not even mentioned. The program disk comes with 17 banks of voices to get your collection started.

Program layout is good. It covers all aspects of synth editing for the TX81Z, DX11 and DX21/27/100 series. Command keys provide quick access to all work-screens and program operations. You can control up to four separate synths, easily transferring any voice, performance, effect or utility data between the synths, ST and disk. The printer is treated as a transfer destination enabling hard copy of any type of data. Clicking on a data



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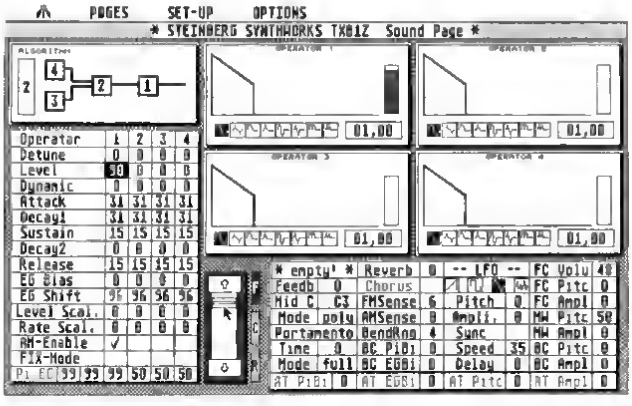
set within a synth area transfers the corresponding internal ST edit buffer to that synth—a quite useful feature not mentioned in the manual

Pressing the ST number keys plays different fixed pitches to audition your work, the ALT, SHIFT and CTRL keys vary the velocity. A screen keyboard display lets you play any notes with the mouse. The screen keyboard includes an integrated sequencer.

The voice librarian holds two banks per connected synth. Only one bank can be loaded from disk or synth, the other is a scratch pad for customizing voice banks or temporary storage. Librarian operations include copy, swap, delete and rename voices. The voice editing display shows all parameters on a single screen and supports graphical editing of operator envelopes. You can copy just the envelope or all associated parameters from one operator to another within a voice. Editing is totally mouse driven, values change as you click the mouse buttons or move a screen slider. Only one edit buffer is provided (per each connected synth) with no undo or compare functions. A randomization operation creates new voices from a starting voice, according to a user-definable mask.

The performance editor shows excellent design features. All parameters are available on a single screen. Graphic sliders set the high and low note limits for each instrument against a keyboard picture—very nice! Bar graphs indicate relative output levels for the instruments at a glance. Effects editing, microtuning and the program change map all work well and integrate smoothly with the rest of the program ▶



Synthworks TX81Z (Version 2.0) from Steinberg/Jones fully implements the ST's GEM interface. Of the four programs reviewed here, this is the only one that directly supports multiple online synths.

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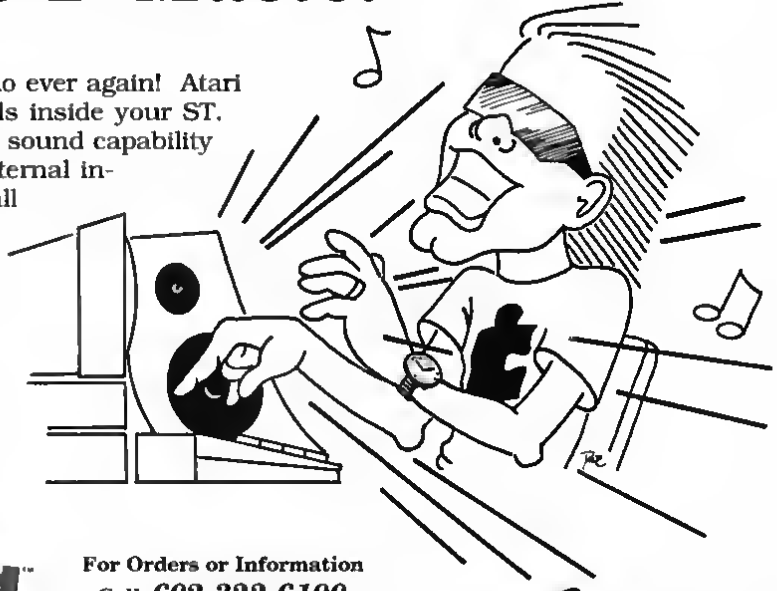

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Recommendations

So, what's the verdict? I cannot recommend 4x4. It seems to have been designed primarily as a voice editor, with support of other features added as an afterthought (or not at all, for microtuning and utility parameters). Editing a single operator at a time is inefficient and tiresome.

Synthworks TX81Z is very good, particularly for performance editing. It is also the only program of the lot that directly supports multiple online synths. Against that is its memory requirement, poor manual and high cost. It can be particularly recommended, however, for those with multiple TX81Z-compatible synths in their setups.

Four Op Deluxe is a good choice, except for DX11 users. My only criticisms are its inability to directly access all workscreens and the desk accessory/RAM disk incompatibilities. It offers the most versatile collection of ways to edit parameters plus compatibility with the MPE, a major factor for any Dr. T sequencer user.

My hands-down choice for best TX81Z patch editor is the VDS. It has everything you need to get the job done, put together with a careful eye to design features. The library data structure and built-in sequencer are additional sophisticated goodies, extra value to an already good product. Equally impressive in this market is the respect (and trust) the developer has shown for users by offering the program without copy protection.

A final note on patch-file compatibility. The Four Op Deluxe and VDS programs share an identical patch-file format. They can also use MIDIEX-format patch files, after trimming off the first six bytes. The 4x4 and Synthworks TX81Z programs use individualized formats that are not directly compatible with others. ■

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

PRODUCTS MENTIONED

Four Op Deluxe, version 2.0, $129. Dr. T's Music Software, 220 Boylston Street, Suite 306, Chestnut Hill, MA 02167, (617) 244-6954.
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TX81Z/DX11 Voice Development System, $99. Musicode, 5575 Baltimore Drive, Suite 105-127, La Mesa, CA 92042, (619) 469-7194.
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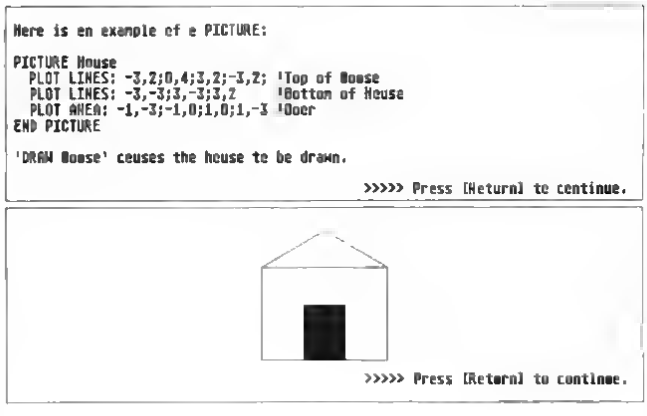
ON DISK

Part III: Windows and Graphics

BY DELMAR E. SEARLS

Enjoy a dynamite tutorial with GRAFDEMO.ARC on Side 1 of your START disk.

(*Editor's Note*. This issue START continues its series on True BASIC with a special on-disk tutorial of True BASIC's window and graphics functions. To run the demo, first boot this month's START disk. The new START menu program runs automatically. At the main screen, click on Prepare, then select "True BASIC Graphics Demo." The program will un-ARC directly onto the destination drive you specify. Read the column for an overview of True BASIC's graphics commands, then double-click on GRAFDEMO.PRG from medium or high resolution to run this demo. It describes these commands in more detail and shows them in action.)



The True BASIC Graphics Demo is a complete stand-alone tutorial. It not only shows you how a command is written, it also shows it in action! Even if you're not a programmer at heart, you'll enjoy running this demo. Who knows?, you may want to start in programming after watching this tutorial.

True BASIC Windows

True BASIC programs can run on a number of different machines, so its windows are not standard GEM windows. (There are ways to access GEM's windows and we'll look at them in a future article.) A window is a portion of the screen that is treated as if it were the display device. For example, scrolling text is confined within a window and graphics elements are restricted to the boundaries of the active window. Any portions of a graphic display beyond the boundaries are automatically clipped. The size and location of the window is determined by the programmer.

The location of ordinary text within a window is based on row and column position. Graphics elements (including text which is plotted rather than printed) are located on the basis of the window's coordinate system.

A window's coordinates range from zero to one both horizontally and vertically. The default window is known as window #0 and includes the entire screen area.

True BASIC makes use of channels (pathways) to disk files, the printer, and windows. Here is the statement used to open a window ▶

Open #<channel> Screen <left>, <right>,<bottom>,<top>

I'm using <> to enclose parameters that must be supplied by the programmer. For example,

Open #1: Screen 0,0.5,0,0.5

would create a window in the lower left corner of the screen exactly one-fourth the size of the default window.

The Clear statement clears the active window. The Set Window <xmin>, <xmax>,<ymin>,<ymax> statement lets you establish window coordinates for the active window.

To make a window active, use the statement Window #<channel>, where channel refers to an open window. The programmer is responsible for saving and restoring the contents of any window(s) that may be covered by the active window. This is easily done using the Box Keep statement discussed below. To close a window use the Close #<channel> statement.

Plot Statements

True BASIC's graphics statements can be grouped into several categories, the first of which includes the Plot statements:

Plot Points: <x1>,<y1>,<x2>,<y2>, ...

Plot Lines: <x1>,<y1>;<x2>,<y2>, ...

Plot Area: <x1>,<y1>;<x2>,<y2>, ...

In Plot Points, the points listed will be plotted. The coordinate pairs are separated by semicolons and you can list as many as you want.

Plot Lines will connect the points in dot-to-dot fashion. If the previous Plot Lines statement ended with a semicolon, a line will also be drawn from the last dot in the previous statement to the first dot in the current statement.

Plot Area will create a closed region by connecting the last point to the first. It will then fill in the region with the current foreground color. However, if the lines connecting the dots criss-cross, the fill comes out a bit differently than you might expect.

Plot Text, At <x>,<y>: <text expression> lets you plot text at coordinate x,y in the active window. The point determines the lower left corner of the text.

There are also three Plot statements that require a two-dimensional array as a parameter. The first dimension (the rows) corresponds to the number of points in the array. The second dimension (the columns) is always two (2). Column 1 corresponds to the x-coordinate and column 2 the y-coordinate. The statements are:

Mat Plot Points: <array name>
Mat Plot Lines: <array name>
Mat Plot Area: <array name>

and they perform the same functions as the regular Plot statements above. The only difference is that they will do so for all of the the points in the array parameter.

Picture This

A Picture is the graphical equivalent of a subroutine. Any of the Plot statements can be used in a Picture. To cause the Picture to be drawn, use the statement Draw <picture name>. What makes a Picture so special is that you can tell True BASIC to use scaling, shifting, rotation, shearing or any combination of these when drawing the Picture.

Plotted text is always the same size and printed horizontally, however. Only the position of the lower left corner is affected by the transformations.

Box Statements

The first four Box statements have a similar syntax.

Box Lines <xmin>,<xmax>,<ymin>, <ymax>
Box Ellipse <xmin>,<xmax>, <ymin>,<ymax>
Box Area <xmin>,<xmax>,<ymin>, <ymax>
Box Clear <xmin>,<xmax>,<ymin>, <ymax>

The parameters are expressed in window coordinates and define a box shaped region. Box Lines draws the border of the box. Box Ellipse draws an ellipse inside the box. Box Area fills the box with the foreground color. Box Clear fills the box with the background color. These are significantly faster than Plot statements.

There are two statements that let you save and recover portions of the display.

Box Keep <xmin>,<xmax>,<ymin>, <ymax> In <string variable>

To save a portion (or all) of a window, identify the corners of the box and use the Box Keep statement. To recover what you've saved use

Box Show <string variable> At <xmin>, <ymin>

where xmin and ymin determine the lower left corner of the box and the string variable is the same one used in the Keep statement. These two statements can be used to generate simple animation or to facilitate window management.

Get it Right

There are two Get statements:

Get Point: <x>,<y>
Get Mouse: <x>,<y>,<state>

The first waits until you click the left button and then returns the location (in window coordinates) of the mouse cursor. The second statement immediately returns the position of the mouse and the state of the left button (no button, button pressed down but not yet released, button just now pressed down and button released).

Graphics Libraries

In addition to the statements discussed above, True BASIC (Version 2.0) includes three libraries of graphics-related routines. These routines are written in True BASIC and can be used in your programs. At the beginning of your program you have to list the names of the libraries that will be used in a LIBRARY statement. From then on, you can use them just as you would any routines you might write yourself.

True BASIC (Version 2.0) includes three libraries of graphics routines.

The GRAPHLIB library includes subroutines to print an arc of a circle, to draw coordinate axes, to draw bars (for bar charts), to plot a function (you declare the function as part of your program), to draw a box around the active window and to draw an n-sided polygon inside a box.

The ARC library includes Picture definitions that draw arcs, sectors, wedges (filled sectors), and disks (filled ellipses) in a box. Relplot includes routines that perform relative plotting instead of absolute plotting. For example, instead of plotting a line to a specific point you plot a line to point that is five units up and 20 units to the right of the last point.

True BASIC also sells additional graphics libraries. One has three-dimensional routines and others are available for business graphics and scientific graphics. (Not every library is available for every machine.) ■

Delmar Searls lives in Wilmore, Kentucky and was the author of Grapher in the Fall 1987 issue of START.

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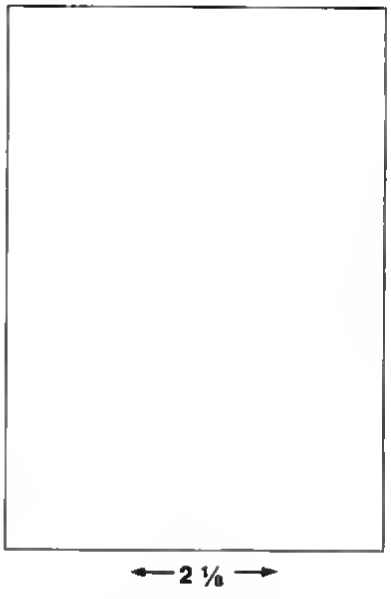

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Desktop Publishing Typography

BY DAN FRUCHEY

The most common subject debated among desktop publishers is typography, the arrangement of text on a page. Which text families should you use? How many fonts? Typography is so basic to desktop publishing that we sometimes overlook it in favor of discussions on graphics and the merits of publishing programs.

Any publishing program can be used effectively if you understand some of the basic concepts of typography. The fact that your software can import 11 picture formats and rotate graphics won't necessarily give your documents a finished look. Some of the most readable documents I have seen used few graphics or none. The key to producing an effective document is the effective use of type.

Before we go anywhere with this idea let's define some basic terms and concepts necessary for any desktop publisher. A specific size and design of text is referred to as a **Font**. A group of fonts that use the same design but come in different sizes are referred to as a **Typeface** (or just **face**). When a group of similar faces are gathered together they are referred to as a Family. Thus, 10-point Bold Bodoni text would be a font, Bold Bodoni would be a face, and Bodoni would be the family to which bold and all the other variations belong.

Bauer Bodoni
Bauer Bodoni Italic
Bauer Bodoni Bold
Bauer Bodoni Bold Italic
Bauer Bodoni Black

The Bauer Bodoni family. A specific size and design of text is referred to as a *Font*. A group of fonts that use the same design but come in different sizes are referred to as a *Typeface*. When a group of similar faces are gathered together they are referred to as a *Family*.

When you buy an outline font (used by Calamus, PageStream and UltraScript) your are actually buying a face. The face can be scaled to any font size you desire. If you are buying bit-mapped fonts for programs such as Timeworks Publisher and Easy Draw, you're buying true fonts with predefined sizes.

How do you measure fonts? I'm glad you asked! The alphanumeric characters of a font are measured vertically using the point system. A point is roughly equivalent to 1/72-inch. If you are uncertain about the size of a font, measure an uppercase "E" to determine the correct size of the character set. Be warned, though: sometimes the font size described by the software won't equal the actual font size printed. If you're serious about publishing, consider buying a font template from an art supply store and verifying the size of your text.

Selecting Fonts

The most commonly used font sizes include 8, 10, 12, 14 and 18 points. An 8-point font is used for footnotes, super- ▶

and subscript characters and those little legal notices printed on software warranties; 10-point text is used for the body of a document, 12-point text is normally used for subheadings or body text in publications intended for young or elderly readers who might have trouble discerning letter forms; 14- and 18-point fonts should be used for headings, captions and banners.

Now that you know a little about evaluating text sizes, fonts, faces and families, you need to select text designs that will convey your message in the best manner. Start by choosing a family for the body text of documents; it should be clear and easy to read. Letters should have clean lines and curves without a lot of decorative flourishes that might slow reading or make character identification difficult.

All type styles follow two basic forms. Serif and Sans-Serif (or, those with serifs and those without). The serifed families are the oldest and most popular, having been in use since the early days of the Roman Empire. The letters contain cross-strokes on the ends of letters. These cross-strokes act as guidelines for the eye and reading becomes easier with less fatigue. Common serifed fonts include Times-Roman (Dutch), Bodoni and Century Schoolbook. Sans-Serif fonts, based on some of the Humanistic designs developed in Germany and Switzerland in the 19th century, are also popular but less widely used. The letters are clean and easy to read but they lack the eye-following cross-strokes used in serifed designs. Still, they are popular for the variation they provide from the "standard" serifed text styles. Common Sans-Serif designs include Helvetica (Swiss), Avant Garde and Triumvirate.

When in doubt, stick to ragged-right.

Other fonts you might use regularly are known as Display faces—stylistic designs that evoke a particular mood, theme or period. Normally these styles should only be used for titles and headings (14-point or larger). If you drop below a 14-point size the text becomes difficult to read because of extra flourishes and unusual letter shapes. All of the Display faces are great "attention grabbers" but using more than a few words will defeat their purpose. Examples of Display faces include Old English, Chancery and Isabella.

Whenever you use any font, keep changes to a minimum. Items you wish to highlight may actually become de-emphasized if you change font families too often. Many experts recommend no more than two or three changes in a document. One of the easiest ways to separate the new user from a veteran is

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to note how often fonts are changed The new user often will take advantage of every font available as often as possible on the same page, usually creating a collage of conflicting design ideas

Adding Emphasis

Use text-style changes sparingly If every other word is emphasized in italics, the eye-drawing capabilities of the style are diminished or lost When you do wish to emphasize a word you'll find that bold usually stands out better than italics

Titles, captions and headings can be stressed if you use a font from a different family An article on Great Britain's history becomes more noteworthy when the headings are set with an Old English font A report on monasteries might become more intriguing with titles set in an Uncial style, etc

You can drag a reader's attention to an article by using some standard devices that use text effectively Write the first three or four words of the first sentence in an article in capital letters, or set the first word in a larger font size or use a different font family Just remember —the trick is not to overdo it

Standardizing

Define a standard text format you wish to use before getting started and then maintain that format throughout the document Select a family and font size for body text, choose the number of columns you plan on using, the number of carriage returns between subheadings and body text, the font size for headings, etc It's a good idea to keep a reference page that defines your format, especially if you're creating periodicals such as newsletters

We are all creatures of habit A format that changes from page to page is unnerving and irritating When you buy START, you subconciously expect certain things from each issue The name of the magazine will be in the same place on the cover, mastheads and editorials will be in the same places each issue, etc When things change radically from page to page or issue to issue, readers lose interest no matter how good the publication

Readability or Style?

You have a message you want to share. Give it the best chance possible by increasing readability whenever possible.

In newspapers and magazines, lines of text normally contain fewer than 14 words If the eye has to travel too far, reading becomes a chore Most magazines and newsletters use two or three columns of text per page to stay within this limit

Two justification themes rule: ragged-right and justified Justified text looks good because of the even width of columns and margins However, the wide, uneven spacing generated between some words tends to slow reading speeds, and the occasional single word sprawled margin-to-margin across a column looks terrible Ragged right, also known as left-justified, makes reading faster and easier because of the even spacing between words When in doubt, stick to ragged-right.

Sometimes a page of text appears dark and difficult to read The problem? The lines of text are set too close together Adjust the leading (line spacing) to let in a little more light Generally, the amount of leading between lines of text is equal to 20% of a font's point size. Thus, a document using 10-point text needs at least two points of leading between each line of text.

Closing Thoughts

Whatever you do with your fonts, remember readability rules! These are satisfactory guidelines followed by many successful publications but they hardly begin to touch what is possible with text Try adopting a few of these ideas to improve the appearance and readability of your documents ■

Dan Fruchey works as a paramedic in Santa Rosa, California and runs a small clip-art business on the side.

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continued from page 43

do without being prejudiced against it. After they were impressed with the ST's capabilities, the ST's owner would pull off the tape, and the other musicians would be shocked.

In the parallel universe that Donny Osmond inhabits, he actually considered changing his name for the release of this album so that people would listen to it without prejudging it. He decided to stick with his name, but when the single "Soldier of Love" was released, many stations were so afraid of the name Donny Osmond that they began playing the song without revealing who the artist was. Listeners tried to guess. Very few could identify Osmond, but the song became a top request across the country. Then the singer was identified as Donny Osmond, and people were shocked.

Osmond now realizes that image can change with hard work and perseverance. "It's such a hard climb and then Boom! Suddenly it snowballs, it's downhill. Thank God that's happened for me. And it's happening for Atari. Once you re-establish the credibility of your name, then everyone will grasp it."

Donny Loves STACY

Osmond has come to the Complex studio eager to meet STACY, the ST laptop, for the first time. The STACY has all the MIDI capabilities of the ST, and it also has the expansion port of the Mega series. As Frank Foster, Atari's Director of Specialty Markets, shows off STACY's features, Donny makes no attempt to hide his enthusiasm. It is love at first sight. "That's what I want. That's what I'm after!" Donny repeatedly exclaims. And when he hears STACY's price, he expresses disbelief. "You're *kidding*. Fantastic!"

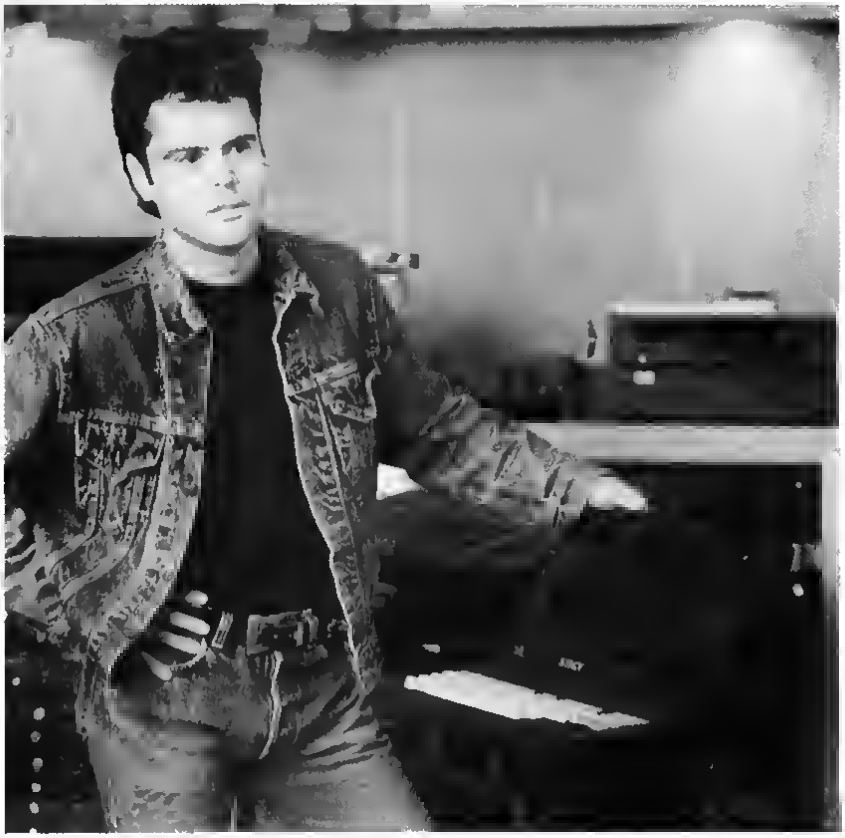
Donny says he will get STACY immediately and take it on the road with him. "With the kind of traveling I'm doing now, everyday it's a different city," he says. "It's frustrating because I can't carry my ST on the plane because it's too big, obviously."

Osmond, who co-wrote five of the songs on the new album, has been songwriting even more lately. And with STACY's great portability and MIDI features, he will now be able to compose on the run. "I've got to be able to create wherever I can—in a motel room, on the airplane, wherever. On an airplane, for example, I could be writing a melody line, running a sequence, and I could double-check it on my STACY."

He could indeed do that. Since he uses SMPTE Track, he could use software programs like Music Studio or E-Z Score Plus, which go through either the sound port or the MIDI port. That way he could play it back without having to take a sound module with him on the plane.

"There's another reason I want STACY," Donny continues. "I'm visiting a lot of radio stations and a lot of them are doing listener appreciation parties, where they invite artists to come in and do gigs. I can't stand track gigs—singing live to a tape. But sometimes I have to because there's no other way to recreate the sound without bringing a band. The problem is the bottom line—we can't afford to bring a band for these little parties. But if I have a STACY with a sound module, I can do everything live."

It won't take long for Donny to get used to STACY, because he's already so familiar with the ST. Why did he go with the ST in the first place? "The main reason I went with Atari versus the Mac or anything else was the capabilities of the ST." Another reason was that Peter Gabriel used Atari. Gabriel and Osmond



Danny met STACY—and it was love at first sight. "That's what I want," he said. "That's what I'm after!" And when he heard STACY's price, he expressed disbelief. "You're *kidding*. Fantastic!"

Atari is definitely back, and in a big way, with the Hotz Instrument and the STACY laptop computer. Donny Osmond (left) and Jimmy Hotz are shown at the Complex, a Los Angeles recording studio.

met at a UNICEF benefit, and Gabriel invited Donny to his studio in England to record and meet the man who would produce his hit, "Soldier of Love". And when Osmond recorded at another studio in London, the studio also had an Atari system. One of the engineers there showed Donny its capabilities.

Donny took to composing on the ST right away. The next single from his album—he didn't want to reveal the name of this song yet—was written by Donny on the ST. "It was one of the first songs I composed on the ST," says Osmond proudly.

Osmond also programmed the drums on a song called "My Secret Touch," but not without resistance. Some of the engineers didn't believe he could do it on the ST. "The track was great. We had live drums and sequenced drums, but we needed a little extra kick, a different snare. But everyone was a little leery and they wanted to do it on their equipment," Osmond remembers. The engineers wanted to use the Roland synchronizer they were familiar with. Donny wanted to use his ST and do it himself. The engineers still weren't convinced. "So I let them do what they wanted, and on the sly I brought my ST into the studio and relaid all the drums with the ST, synching up to SMPTE code," laughs Osmond. "I programmed the drums when they weren't watching!"

Once everyone heard the results, they knew Osmond had been right. "Everyone was afraid to make the change to new technology, but when you dive into it, it's so much easier," says Osmond.

Osmond is not afraid of new technology. He embraces it. Having the ST has helped Donny be more creative as a songwriter. "I'm a total klutz when it comes to playing real drums. If I sat down and tried to get into a groove on the set, I'd be totally intimidated and I couldn't create. But I can program drums. The same thing goes with my playing. I'm not the most accomplished musician in the world."

He says that's why he uses a recorder and the ST for songwriting. "When I get an idea, I sing it into the recorder, then go to the ST. That way I get the feel of song from the recorder, rather than try to get the feel dependent on my musicianship."

Before he got his ST, any writing he did was just with a piano and a little recorder. "The problem with doing it that way is you can't mix it up—take sections of a song and move them all over the place," he says. "The nice thing about the ST is you're always recording and you're always experimenting. You can loop, and you can do real time with the loop."

When it comes to songwriting, what Donny likes most about the ST is it allows him to just keep playing and be as creative as he wants to be. "Thinking back, I remember just sitting in my room working with the ST and letting it roll. Whenever I had an idea I just went to the keyboard, did whatever I wanted to and then forgot about it. I just kept going and came up with something else. I'd just set up a simple groove and start playing around with that feel. Then I'd play back any section I wanted, place it in the loop and flatten the chain." ▶

Osmond is especially impressed with the graphic editing capability of the ST, where he can edit off the screen. "It can be an hour's worth of stuff," he says. "You look at the whole thing and pick out where you want to be, then go right to it and bring it back to wherever you want to bring it. You don't have to worry about staying within a little pattern, which drives me crazy when I work with people using computers—they rely on patterns too much. They say, 'No, we've got to stay within this structure.' That absolutely inhibits creativity. That's why I like the constant recording feature of the ST."

As a songwriter, Osmond is also excited about the new Hotz Instrument that Atari is producing and marketing. "It's great," says Osmond. "I've seen what it can do. You don't have to be an extremely accomplished musician to go for it. You can get immediate satisfaction from it. I view the Hotz Instrument with the same philosophy I view the ST, which is that you don't have to be creative *right now*. You just sit back and it's recording all the time, and whenever you feel like it, you go for it."

Donny Live

Even though his album was released last spring, Osmond has waited to tour until this fall. Why is he waiting? "If there's anything I've learned from the past, it's not to over-hype; you don't over-publicize. You can gain a lot of longevity by not over-saturating and over-hyping.

"Another big reason I've waited to tour is that I don't want people to expect the old music. I want them to be very familiar with where my head's at musically and lyrically and nothing else."

Keeping with this philosophy of not over-hyping, Osmond is going to play mostly small clubs. "I don't want to pack ten thousand seats. I want to put on very, very intimate shows, where people can get into it musically."

Osmond wants his concerts to have a very "live" feel, not just a recreation of the studio sound. He plans to take the ST and STACY with him on tour. "Through the registers in the SMPTE Track program, I want to be able to set up some loops, so if we get in a situation where it's feeling good and we want to jam, I hit the register and just keep going with

Donny Osmond knows what it's like to fall from the pinnacle of success.

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it until I hit another register, and Bam! I'm back into the end of it." He also plans to use the ST for vocal enhancements "I'll have my musicians singing, but I'll use it for reinforcement on the backups, because I don't want to take a bunch of singers with me."

In the near future, Osmond plans to get into a Hybrid Arts ADAP system. For the second single from his album, "Sacred Emotion," Osmond complained that he had to go into an expensive studio and do a lot of digital editing on the song for a radio edit. "It could have been done on ADAP very easily," he says. "But I didn't have the system."

He also plans to sample sounds with STACY and the ST. "Sampling is going to be more important than anyone ever realized, because you create so many real sounds from it. That's why I like Peter Gabriel's sounds—they're not all synthesized. He's gone to Africa to sample all these strange instruments and then mixed them with other instruments to get different sounds. What I want to do is take my voice and mix it with other different sounds, then change it, alter it, put it on the graphics and come up with something totally new."

He also wants to start sending sounds and sequences via modem. His co-writers live in New York. He's on the West Coast. Right now the only way they write together is over the phone. "It's so frustrating to do it over the phone. My co-writers come up with an idea, play it over the phone, then I try to recreate what they just played. It's impossible."

A modem in his ST is the answer. "I could be co-writing a song with them and they could send me the sheet prints, the sounds, everything, just dump it into my ST. And I've got exactly what they've got, even if they've laid a vocal down."

The Family that Plays Together

Donny is the most high-tech member of the Osmond clan, but the next generation isn't that far behind. Donny's three boys, ages 4, 8 and 9, are budding young musicians. And Donny has already turned them on to the ST. "My boys have played around with my ST," he says. "They're in this piano class where they learn a different little piano piece every week. They wanted to program one of the songs. So one boy played the drums, another played the bass and my wife played the chords. They produced this little tape off the ST for their teacher."

Donny also sings the praises of Atari to his siblings. Donny's brother Alan, with seven sons in the music business, is starting to get familiar with all the gear that's available. His sister Marie has an Atari system through her producer husband. "I got him converted to Atari," says Donny. "I showed him what it does and he said, 'I've got to have one of these things'." ■

Mard Naman is a freelance magazine and television writer and a Contributing Editor of START.

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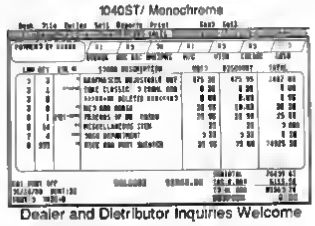

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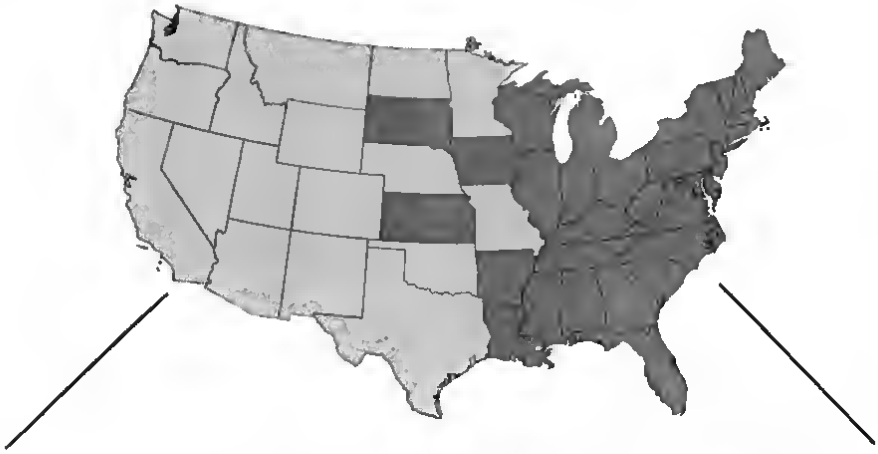

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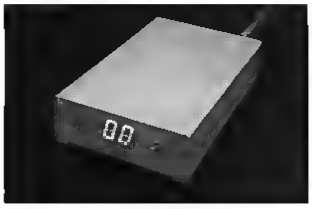

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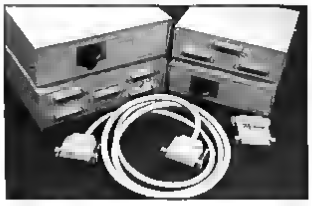

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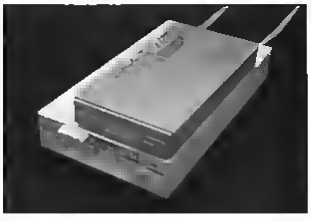

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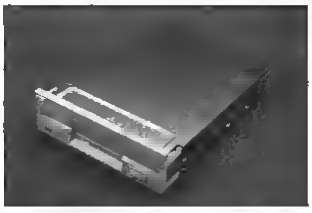

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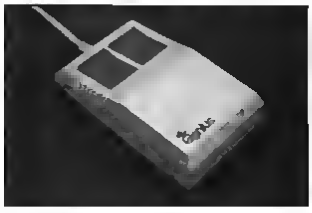

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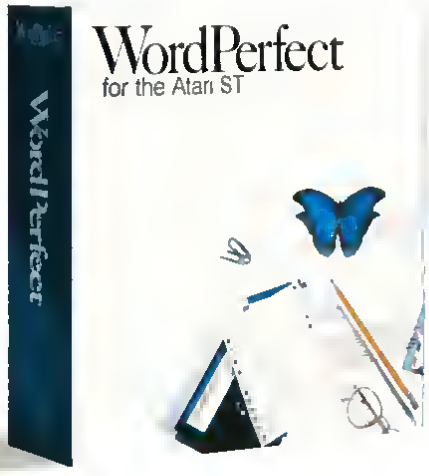

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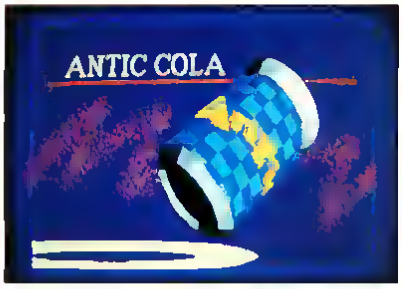

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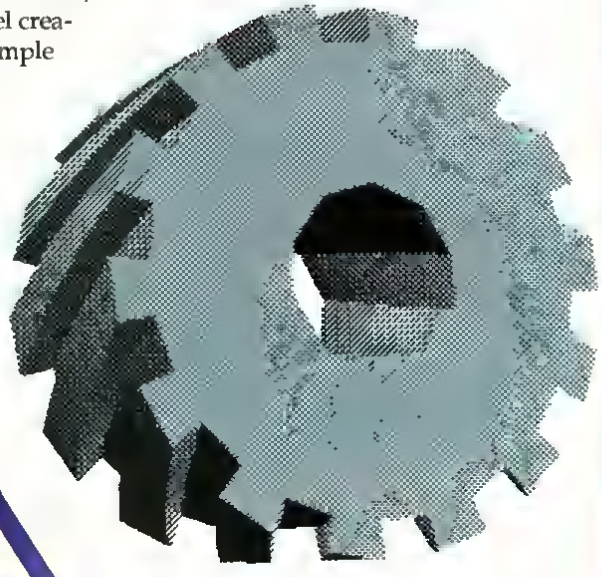

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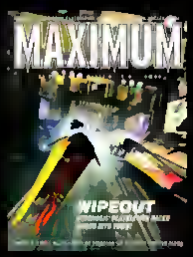

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