

**DISK
INSIDE!**

#1 GUIDE TO THE ATARI ST **START**®

Volume 3, Number 3

October 1988

Canada \$19.95 • USA \$14.95



BRAIN POWER

Programming Under Pressure

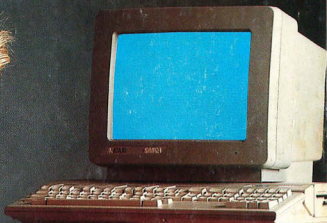
Tom Hudson Tells All!

ON DISK:

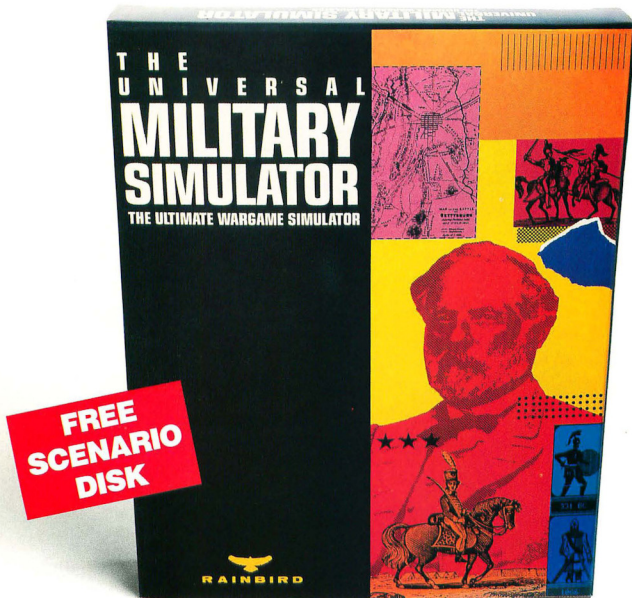
Language Tutor
ST Microscope
Brickworks

REVIEWED:

Desktop Publisher ST
BASICs, Cs
SMPTE Track
Softsynth



Enter a World of Battle Strategy You Never Dreamed Possible!



Re-enact ancient battles of Classic History. Make each conflict come to life on three-dimensional contoured landscapes. Do it all on the most sophisticated software imagined. This is it. The Universal Military Simulator.

Included are five pre-programmed historical battles: Gettysburg, Arbella, Hasting, Marston Moor and Waterloo. Each is programmed with the highest standard of accuracy and attention to detail. But that's not all...

You no longer have to settle for inferior graphics, or worse, no graphics at all.



Intergalactic
Development
Incorporated

HOW TO ORDER: Visit your software dealer, or call (800) 227-6900 from U.S. or Canada, for Visa, MasterCard, Amex or C.O.D. To order by mail, send check/money order: Rainbird, P.O. Box 9123, San Francisco, CA 94128. CA add 6% sales tax and TX add 7.1%. Shipping/handling is \$4.50. 2-3 weeks for delivery.

Each battle is depicted on a unique 3D grid system allowing you a view from almost any angle.

HOURS AND HOURS OF PLAY Five historical battles, plus the chance to create your own situations.

SPECTACULAR GRAPHICS Unique three dimensional grid landscape gives you a topographical battlefield.

LANDMARK TECHNOLOGY View a battle from any angle. Zoom in or spot check with an overhead glance.

TREMENDOUS FLEXIBILITY Design your own maps, orders of battles and objectives using a powerful built-in editor.

FREE! SCENARIO DISK ONE: THE AMERICAN CIVIL WAR (\$19.95 RETAIL VALUE) Rainbird Software would like to announce the Scenario Disk One: The American Civil War. It includes the Shiloh, Chattanooga and Antietam battles. Consumers who purchase The Universal Military Simulator can receive the Scenario Disk One: The American Civil War FREE! See your local dealer for store displays and details.

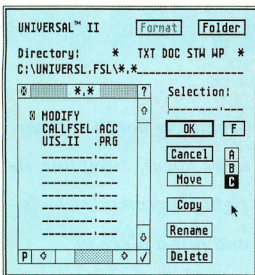
Offer expires December 30, 1988.



RAINBIRD

P.O. Box 2227 Menlo Park CA 94026 415/322-0900

AVAILABLE ON: IBM, CGA, Macintosh 512K, Commodore Amiga 512K, Atari ST 512K and Apple IIGX 549.95. Rainbird and Rainbird logo are trademarks of British Telecommunications plc. Macintosh is a trademark licensed to Apple Computer Inc. IBM, Commodore, Apple, and Atari are registered trademarks of International Business Machines Corp., Commodore Electronics Ltd., Apple Computer, Inc., and Atari Corp., respectively.



Universal Item Selector II

Oregon-based Application and Design Software is shipping its **Universal Item Selector II** (version 2.01), a unique tool for manipulating disk files and folders. When placed into an AUTO folder, the UIS II will function with any applications that use the standard GEM file selector. With UIS II you can rename, move, copy, delete and create folders, protect and format disks, and change and save drive paths. UIS II also will let you search for files (including wildcards), print directories, check file sizes and hold six extenders in memory. Universal Item Selector II, version 2.01, \$19.95. Applications and Design Software, 226 N.W. "F" Street, Grants Pass, OR 97526, (503) 476-0071.

CIRCLE 270 ON READER SERVICE CARD

More From Microdeal

From Microdeal comes the arcade game **Goldrunner II** and its companion **Scenery Disks**. Goldrunner II is the sequel to the original, smooth-scrolling shoot-em-up game. In Goldrunner II you must protect your defenseless planet from marauding robot fighters. The Scenery Disks let you change the standard game backgrounds—just insert the new disk into your ST drive instead of the regular data disk, and you'll find yourself flying over new terrain.

On a more down-to-earth note, **International Soccer** features flashy graphics and the following user-definable options: length of game, day or night play, team colors, team formations, wind and wet or dry conditions. You can also play against your ST or against a friend. Goldrunner II, \$39.95; Scenery Disks 1 and 2, \$14.95 each; International Soccer, \$39.95. All games require color monitor and joystick(s).

Microdeal, distributed by MichTron, Inc., 576 S. Telegraph, Pontiac, MI 48053, (313) 334-5700.

CIRCLE 226 ON READER SERVICE CARD

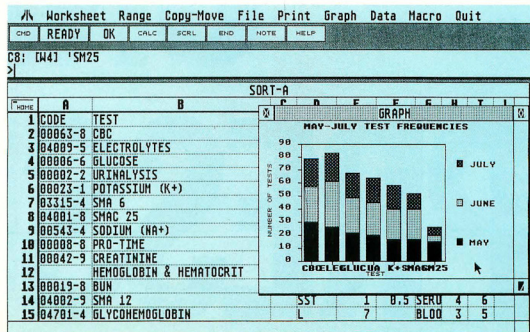
LDW'S New Spreadsheet

Logical Design Works, makers of the LDW BASIC Compiler 2.0 has just released **LDW Power**, an advanced spreadsheet that offers ST owners Lotus 1-2-3 compatibility. Transfer files back and forth between Lotus and Power; create presentation graphics and even print them sideways on your dot-matrix printer. LDW Power features almost 300 commands and over 80 functions, a macro recorder that lets you record

keystrokes and simultaneous operation of up to four workscreen windows (including a graph window). A review of this program is scheduled for an upcoming issue of START. LDW Power, \$149.95. Logical Design Works, Inc., 780 Montague Expressway, #403, San Jose, CA 95131, (408) 435-1445.

CIRCLE 228 ON READER SERVICE CARD

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



PROGRAMMING

Personal computer software doesn't grow on trees, nor does it spring fully formed from the forehead of Zeus. It comes from hard-working programmers such as Tom Hudson, author of DEGAS and CAD-3D. For Tom,

producing hot ST software takes talent, discipline, the right programming tools—and just a pinch of ‘Rambo’ music. Join him as he tells you about the joys—and the hardships—of independent software development.

by
Tom
Hudson

START
Contributing
Editor

UNDER

PRESSURE

LASER C

Zero to Sieve in 5 seconds!

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

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

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

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

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

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

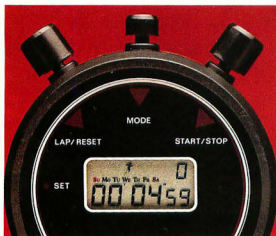
Introducing LaserDB—the powerful *source level debugger!* Now you can view your source code while it runs. Monitor C variables, set breakpoints with the mouse, and evaluate

C expressions interactively. Multiple windows and easy command structure make debugging fast and efficient.

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

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

—Wayne Holder,
President, FTL Games



	Laser C			Mark Williams C v3.0		
	Compile/Link	Run	Error	Compile/Link	Run	Error
Hello.c	2.43	—	—	15.98	—	—
Apskel.c	8.88	—	—	26.5	—	—
Sieve.c	4.59	2.45	—	23.9	2.77	—
AES	35.6	—	—	103	—	—
Savage	6.31	36.4	1.73 × 10 ⁻¹⁰	30.82	83.0	1.18 × 10 ⁻⁷

All times in seconds.

AES consists of nine source files totaling 1142 lines of code.

AES is built using Make.

Mark Williams C using RAM disk.

Megamax, Inc.
DEVELOPMENT SYSTEMS

Box 851521, Richardson, Texas 75085-1521
(214) 987-4931

© Megamax, Inc. 1988. Laser C and LaserDB sold separately. If you currently own Megamax C for the ST, update to Laser C for \$20. Call for details. (214) 987-4931. Now available through distributors. UNIX™ is a trademark of AT&T.

COMPILER:

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

EDITOR/SHELL:

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

UTILITIES:

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

LASER DB:

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



Mark Williams Raises C Programming To A New Level.

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

Now, on top of the world's best C compiler, Mark Williams brings you *csd*, the world's only source level debugger for the Atari ST!

With *csd*, you actually debug in C. Forget about trying to find bugs in clunky assembler and struggling with long dumps. *csd* gives you the interactive advantages of an interpreter plus the speed of a compiler. An indispensable companion for Mark Williams C.

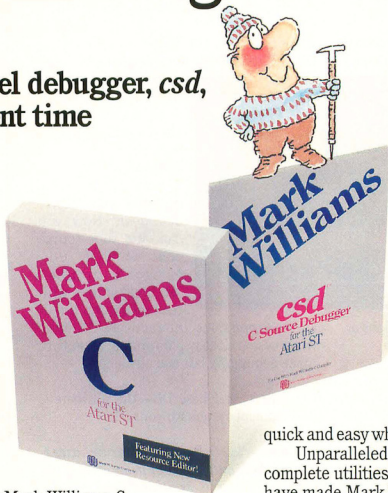
Reviewers have been raving about the IBM version of *csd* for years:

"csd is close to the ideal debugging environment... a definite aid to learning C and an indispensable tool for program development."

—William G. Wong, *BYTE*

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

—Jonathan Sachs, *Micro/Systems Journal*



WE'VE UPPED COMPILER PERFORMANCE, TOO!

Our new **Resource Editor** makes creating window driven interfaces with icons, alerts, pull down menus and dialogue boxes a snap. And its exclusive compiler/decompiler lets you directly access resources, making changes

quick and easy while simplifying project management.

Unparalleled compiler speed, fast, compact code, complete utilities and outstanding documentation have made Mark Williams C the preferred compiler for the Atari ST. Reviewers enthusiastically agree:

"Mark Williams C may be the best implementation of C on the Atari ST to date... not only for the experienced, professional developer, but also for the weekend programmer."

—George Miller, *COMPUTE!'S Atari ST Disk and Magazine*

"... the all-around best choice for serious software development on the ST."

—Douglas Weir, *Analog Computing*

COUNT ON AN UPSTANDING REPUTATION.

Mark Williams has been producing and improving quality programming tools since 1976. A good reason why the Mark Williams C compiler is the one chosen by Atari. And just one more reason you should choose Mark Williams, too.

SPECIAL UPDATE OFFER AVAILABLE NOW!

If you already own Mark Williams C, a special update offer is available for version 3.0 and *csd* by calling Mark Williams. If not, there's never been a better time to ask your Atari dealer about Mark Williams C and *csd*. Or you can order by calling 1-800-MWC-1700.

In Illinois, 1-312-689-2300



601 North Skokie Highway, Lake Bluff, Illinois 60044

© 1988 Mark Williams Company

CIRCLE 023 ON READER SERVICE CARD

FEATURES

Mark Williams C For the Atari ST

- ★ New! Resource Editor includes compiler/decompiler for direct access to resource text
- ★ New! Peephole optimization—faster compile times and faster code
 - Full access to AES/VDI libraries with complete documentation and examples
 - Source and object code for RAM disk cuts compile time in half
 - Integrated edit/compile cycle: editor automatically points to errors.
 - MicroEMACS full-screen editor with commented source code
 - Full K & R plus ANSI extensions
 - Microshell Command Processor, a powerful UNIX style shell
 - Complete symbolic debugger and assembler

NEW VERSION 3.0!

Powerful utilities: make, linker, archiver, egrep, sort, diff and more

Over 600 pages of documentation with more than 100 sample programs

New! *csd* C SOURCE DEBUGGER:

- Cuts development time in half!
- Debug in C source code not assembler
- Provides separate source, evaluation, program and history windows
- Ability to set trace points and monitor variables
- Can interactively evaluate any C expression
- Can execute any C function in your program
- Trace back function
- On-line help screens

MARK WILLIAMS C FOR THE ATARI ST: \$179.95

csd C SOURCE DEBUGGER: \$69.95*

60 DAY MONEY BACK GUARANTEE




*Introductory price—good through May 31, 1988

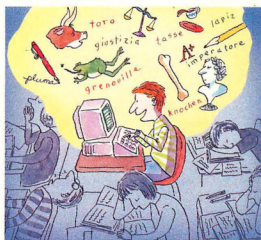
START ^{#1 GUIDE TO THE ATARI ST}

OCTOBER 1988

VOLUME 3, NUMBER 3

FEATURES

- 18 Programming Under Pressure** by Tom Hudson
Or, Kids, Don't Try This at Home!
- 25**  **The Vocabularian** by John B. Holder
Your Personal Language Tutor
- 36**  **ST Microscope** by Ron Shaefer, M.D. and Kathy Shaefer, M.D.
Your Window to the Small World
- 94**  **Brickworks** by Paul Pratt and Steve Everman
Exterminate or Be Exterminated!



Page 25





Page 53



Page 91


REVIEWS

- 28 Timeworks Desktop Publisher ST** by Jerry McBride
In a Word, Incredible!
- 41**  **BASICs for the ST Revisited** by David Plotkin
Updates, References and More!
- 57 SMPTE Track** by Jamie Krutz
Hybrid Arts' Professional Sequencer
- 71 The ECS MIDI Musicware Series** by Jim Pierson-Perry
ST Musical Education Software
- 78**  **ST C'S—A New Look** by Arick Anders
The Language of Preference for ST Development
- 87 Digidesign's Softsynth** by Jim Pierson-Perry
New Sounds To Draw On

 *Indicates programs included on START Disk.*

DEPARTMENTS

- Dialog Box** 8
- News, Notes and Quotes** 11
- Products Update** 15
Jon A. Bell
- Mac & PC on the ST** 33
Jim Pierson-Perry
- Clipboard** 40
Heidi Brumbaugh

- Getting Started** 47
Scot Tumlin
-  **Small Tools** 51
David Small and Dan Moore
- The Cyber Corner** 53
Andrew Reese
- Online With Start** 61
Gregg Pearlman
- Disk Instructions** 65

- Making Tracks With MIDI** 67
Mard Naman
-  **Programming In BASIC** 75
John L. Hutchinson
- START Spotlight** 83
Scot Tumlin, George Miller and Andrew Reese
- For The Fun of It** 91
David Plotkin
- Index To Advertisers** 96

START

PUBLISHER

James Capparell

ASSOCIATE PUBLISHER

John Taggart

EDITORIAL

Andrew Reese, Editor

Jan A. Bell, Associate Editor

Haidi Brumbaugh, Programs Editor

Gregg Pearlman, Assistant Editor

Caroly Cushman, Editorial Assistant

CREATIVE SERVICES

Matthew C. Mason, Director of Creative Services

Rick Binger, Art Director

Dwight Been, Associate Art Director

Kate Murphy, Ad Production Coordinator

Linda Tapscoff, Production Manager

Julianne Ososko, Colletter Printing Coordinator

Cover Photography: Fred Stimson

Cover Model: Christopher Kane, Grimmé

ADVERTISING SALES

Gail McCall, Advertising Sales Coordinator

Area Sales Representatives:

Western Region

Phoebe Thompson Associates, (408) 356-4994

Midwest Region

The Pettis Group, (312) 679-1100

Eastern Region

Garland Associates, (617) 749-5852

CIRCULATION

Manny Sawit, Director

Amber Lewis, Subscription Coordinator

Dennis Swan, Distribution Coordinator

ANTIC PUBLISHING, INC.

James Capparell, President; Donald F. Richard and Richard

D. Capparella, Board of Directors; Lee S. Isgur, Advisory Board;

John Cody, Controller; John Taggart, Associate Publisher

ADMINISTRATION

Evelyn Heinzman, Accounts Payable; Brenda Oliver-Owens,

Accounts Receivable; Fidez Bitoun, Accounts Receivables Supervisor

Ken Warner, Account Representative

START Subscription Customer Service: For subscription inquiries or changes of address, call (415) 372-6002 9 a.m. to 4:30 p.m. Pacific Time, or include an address label and write to START Subscriptions, P.O. Box 1569, Martinez, CA 94553.

General Offices, Catalog Customer Service, (415) 957-0886, 8 a.m. to 4 p.m. Pacific Time, START, 544 Second Street, San Francisco, CA 94107. Credit Card Subscriptions and Catalog Orders: (800) 234-7001.

SUBMISSION INFORMATION

START welcomes submissions. Please include both hard copy printouts of articles and program listings as well as disk files on ST compatible disks. Media will be returned if self-addressed, stamped mailer is supplied. START assumes no responsibility for unsolicited editorial material.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher. START is an independent periodical not affiliated in any way with Atari Corp. (ATARI is a trademark of the Atari Corp. All references to Atari products are trademarks and should be so noted. START is a trademark of Antic Publishing, Inc. An Information Technology Company. Copyright © 1988 by Antic Publishing. All Rights Reserved. Printed in USA.

October 1988, Volume 3 Number 3. START Magazine (ISSN #0089-6216), is published monthly by Antic Publishing, Inc., 544 Second St., San Francisco, CA 94107. Third Class postage paid at Waseca, Minnesota. Subscriptions: U.S. \$79.95 (12 issues with disk), Canada and Mexico \$87.95 (12 issues with disk), Other Foreign \$91.95 (12 issues with disk). POSTMASTER: Please send address changes to START Magazine, P.O. Box 1569, Martinez, CA 94553.

Editorial

It looks like a good fall. The memory chip shortage appears to be easing (at least for one-megabyte chips) and Atari has settled its lawsuit with Micron, once again buying some chips domestically. Atari remains very profitable, despite the weight of Federated losses and—stop the presses!—Atari will increase its allocation of STs for the U.S. this fall.

For START, this issue is a milestone: our first monthly issue. We want to thank all START's readers and subscribers again for making this possible. We'll try to live up to—or exceed—your expectations.

You may have noticed a new look in this issue and in START's Special Issue #4—Games and Entertainment. We hope you like it; we have a new graphic design team onboard since Marni Tapscoff, our previous Art Director, left START to have a baby (some loyalty!). We'll miss her, but we're fortunate to have two newcomers: Rick Binger, Art Director and Chris Mason, Director of Creative Services. Assisting them is Dwight Been, who's worked on START since our Winter 1986 issue as a freelance paste-up artist and as of our Winter 1987 issue has served as START's Production Manager. Thanks to the efforts of these experienced designers, you'll see more exciting, colorful new layouts in the months to come. A computer magazine shouldn't just read well, it should also look good!

In this issue we focus on **Brain Power**, yours and your computer's. *Directing* the ST's 68000 brain is the programmer's job, yet even programmers would agree that programming, particularly independent development, is an unusual profession. You may make millions—or zero. Who better than Tom Hudson to tell you the pitfalls and rewards of being an independent software developer? And if you're in the market for a new programming language (or an update), David Plotkin helps you choose a BASIC for your ST efforts and Arick Anders surveys the C's.

Or do you just want to improve your own brain? To help you, we've included on your START disk a fine educational program called *The Vocabularyian*. It's tailor-made to help anyone learn a foreign language—or any other subject. It's one of the best drill programs we've seen anywhere and we've included twenty lessons in Spanish vocabulary to get you started.

If your educational need is to visualize relationships among objects (to learn the parts of a blood cell, for example), then *ST Microscope* may be just your ticket. It's a unique computerized graphics microscope that you can customize with your own pictures to show just about anything that can be drawn. You'll find two starter sets of slides: a human neuron and a red blood cell at various levels of "magnification" to give you the idea (and maybe help you get an A on that biology test at the same time).

And, of course, we have our usual top-notch columns. You'll find tips on setting up pc-ditto, checking out your floppy disks, using the easiest and hardest online services, picking your next game, planning your next animation and the conclusion of our 3-part series on using resource files in GFA BASIC.

What can I say? That's an issue-and-a-half! I hope you enjoy this October issue. See you next month.



Andrew J. Reese

Editor

START, The #1 ST Monthly

For Atari, 1040, and Mega ST Computers:

New!

Includes
• A Money Back Guarantee
• Free Customer Technical Support

PUBLISH IT IN LESS THAN AN HOUR!

Introducing The...

TIMWORKS DESKTOP PUBLISHER ST™...

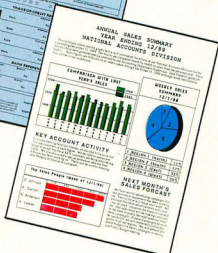
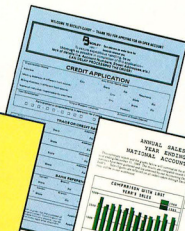
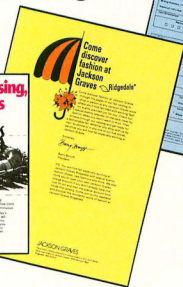
A full-featured, fully integrated desktop publishing powerhouse with word processing, page layout, typesetting, and graphics.

Even if you have no design skills or publishing experience, you can get results in less than an hour with THE TIMWORKS DESKTOP PUBLISHER ST!

For all its state-of-the-art ability, PUBLISHER ST is incredibly easy to learn—refreshingly so. PUBLISHER ST combines the familiar GEM User Interface, our Quick-Start Mini-Manual, a full complement of Help Screens, and the practical WYSIWYG (What-You-See-Is-What-You-Get) display—all designed to get you up and running in less than one hour!

SPECIAL FEATURES

- **GEM User Interface:** It's fast and easy. Pull-down menus, icons, scroll bars, and dialogue boxes help you learn and use the program quickly. Your display screen shows you exactly what your final product will look like when you print—What-You-See-Is-What-You-Get!
- **Flexible Page Layout:** Use your mouse to overlap, reposition, or resize your text columns & graphics. Change your layout or experiment—almost effortlessly!
- **Built-In Fonts:** Chose from thousands of possible type-style combinations! Opt for bold, italic, underlined, outlined, light, and superscript or subscript characters. Type sizes range from 7 to 96 point.
- **Premium Quality Printouts:** PUBLISHER ST uses a special high density printout format to give you superior quality printouts on your dot matrix or laser printer.
- **Built-In Word Processor:** All the features necessary for everyday word processing, plus most of the sophisticated features found in complete word processing programs.
- **Text Importing:** Load documents directly from WORD WRITER ST, FIRST WORD, and FIRST WORD PLUS; or from any standard ASCII file.



- **Built-In Graphic Toolbox:** Draw lines, boxes, circles, polygons, and more. Plus, choose from a wide variety of built-in line and fill patterns.
- **Graphics Importing:** Import graphics created with popular drawing programs—such as DEGAS, NEOCHROME, & EASY DRAW.* Crop & scale to fit your document.
- **Kerning & Leading:** Adjustable letter and word spacing add those professional "finishing touches" to your document.
- **Automatic Text Flow & Word Wrap:** Flows text around graphics; and from column to column on the same page, or carries it over to subsequent pages.

- **Multiple Page Views:** View, edit, and layout pages at actual, double or half-size. Or, reduce them so the entire page fills the screen.
- **Professionally Drawn Graphics:** Ready-to-use art makes your documents even more eye-catching.
- **Plus you get special time-saving features, sample documents & more!**

For Atari 520, 1040,
& Mega ST Computers*
Sug. Retail Price . . . \$129.95

Available at your local dealer—
or order direct from Timeworks.
Call 1-312-948-9202

TIMWORKS®

444 Lake Cook Rd., Deerfield, IL 60015
312-948-9200



(Documents do not print out in color)

© 1988 Timeworks, Inc. All Rights Reserved.
*Registered Trademarks of their respective companies.

The Birth of



A Partial List of Features

Fully interactive 2 dimensional & TRUE 3 dimensional capabilities
Multiple 3D views can be opened and modified at any time
A user can work in any combination of views with all views instantly updating at all times
Automatic generation of ANY orthographic view including user defined auxiliary views
Entities can be selectively hidden in any view allowing easy generation of true orthographically sound views
Extremely user friendly
Full GEM interface, pull down menus, mouse or keyboard commands, dialog boxes and more.
256 Layers can be activated individually or in groups
9 zoom modes allow magnification's of up to 1,000,000 times
The ability to overlay other programmes from within
DynaCADD

Dimensioning

Auto Dimensioning includes;
Mechanical and Architectural formats
Full 2D and 3D dimensioning is supported
Baseline, chaining, angular and linear dimensioning is supported
Automatic tolerancing in any of three different styles
Text orientation using any one of the three different systems (uni-directional, angled or aligned)

Commands

Sophisticated command nesting allows the following partial list of commands to be accessed at any time:
Zoom in or out
Zoom a window
Scroll or "Pan" the page
Center the page on a point
Multiple 3 Dimensional dynamic rotations at any angular increment
Rotate any 3 Dimensional view to a predefined co-ordinate plane
Zoom a 3 Dimensional view in or out...

Fonts

Full featured Vector Font Editor
Automatic proportional spacing can be activated or deactivated with the click of a mouse
Up to 16 extremely high resolution fonts can be active in any drawing with no need for repeated disk access

Insertion

Insert POINTS, LINES, CIRCLES, ARCS, FILLETS, ELLIPSES, ELLEPTICAL ARCS, TEXT, BOX, POLYGON, POLYFIGURE and SUBFIGURES using a wide variety of modifiers

a New Breed

Introducing DynaCADD... a Professional CADD Solution
at a Fraction of the Cost

DynaCADD is a 2D and true 3D Computer Aided Design and Drafting software solution that will turn your personal computer into a sophisticated and powerful CADD work station. With electrical, mechanical, architectural or civil applications DynaCADD provides a total design and drafting solution. DynaCADD revises, designs and details drawings in 2D or true 3D, reads and writes the industry standard

DXF file formats and provides compatibility with the new Desktop Publishing solution, Calamus. DynaCADD proves itself invaluable from conception to output by offering an alternative solution to expensive, difficult to use 2D and 3D CADD systems. DynaCADD brings mainframe CADD capabilities to the CADD Professional at a fraction of the cost.

DynaCADD
Computer Aided Design and Drafting

SPECIAL OFFER!!

For a limited time only
Save up to \$150.00 off our introductory price
Trade in your existing Atari ST CAD package and
receive up to \$150.00 in credit against the purchase
of DynaCADD

Call us for details

Information Commands

DynaCADD gives you the ability to:
Measure distances, angles and perimeters
Verify location and style
List database extents, drawing parameters...

Entity Transformation

Translation between 2D or 3D positions, circular arrays, mirror, linear arrays, stretch, sweep, rescale, project, revolve, trim and divide
3 Dimensional entity transformation of any view into 2 Dimensional entities
Select entities for transformation & editing using:
Digitize, Windows, Windows Out, View Windows or Last...
By entity color
By entity layer
By chaining with direction and much more

Plotter Output

Both HPGL and DM/PL and compatible plotters are supported
Plots can be generated at a constant 1:1 ratio or a drawing can be automatically scaled to any degree
Plotting extents can be defined using:
The drawing page
The current extents

A definable plotting window

The database extents
Plotter and printer output can be directed through the serial port, parallel port or to a disk file (ie; i/o redirection)

Printer Output

Laser Printers, draft and final mode
Epson and compatible printers are supported, both 8 and 24 pin
All drivers allow:
Quickplots, Final drafts utilizing the printers highest graphics mode, multi sheet prints, scaled and constant ratio prints

Data Transfer

DynaCADD reads and writes both DXF Entity and DXF Drawing Files
DEF File Format is included to insure upward compatibility to all versions on all micro computers
DynaCADD allows compatibility with the new Desktop Publishing solution, Calamus

System Requirements:

Atari 1040ST or Mega series, minimum 1 MByte of memory,
1 MByte disk drive and a Monochrome Monitor

Commitment to the Future

A modular design structure provides the basis for continued upward growth of the DynaCADD solution. A strong commitment to research and development and a world wide support mechanism combined with a young experienced dynamic programming team, are your insurance that the DynaCADD package will remain on the leading edge of CADD technology. Upgrade modules currently under development include surface design and image design, both with the same easy to use graphic interface of the DynaCADD base module.

To order and for more information please contact:

ISD Marketing, Inc. 2651 John Street, Unit #3, Markham, Ontario, Canada L3R 2W5

Tel: (416) 479-1880 Fax: (416) 479-1882

Dialog Box

Much More On Microsoft Write

I appreciated your review of Microsoft Write in the Summer 1988 issue of START, but I have to disagree with some of reviewer Ian Chadwick's conclusions.

I agree with Ian on the good points he noted. One other nice feature that I haven't seen in an ST word processor (short of WordPerfect) is the Replace option that will replace text in context! If the word being replaced begins with a capital letter, the replacement string will begin with a capital. If the same word is all caps elsewhere in the document, the replacement string will be caps also.

MW's lack of a spelling checker is unfortunate, but not insurmountable. I have yet to find a built-in spelling checker in a word processor to match Thunder! (from Electronic Arts). The Thunder! accessory works fine with MW, although the delay between backspaces needs to be set to 10 or thereabouts to adjust for MW's slow screen updates. The standalone Thunder! program can be used to check finished MW files but not to make corrections.

While MW doesn't allow you to append one document onto the end of another, there is nothing preventing me from doing this. As Ian notes in his review, it is very unlikely that a user will need all four document windows active at one time, so all you need to do is open a document in another window, select all or part of the text, use the CUT option and then paste it at the end (or anywhere else) in the first document. On the issue of MW's use of GDOS and fonts, I fail to see how the lack of graphics makes its implementation of

graphically printed fonts less useful. I have been using the graphically printed GDOS fonts on my older Epson-compatible printer with wonderful results; my NEC P6 printer does an even greater job. Of course, a laser printer will make best use of these fonts, but the dot matrix printouts aren't "mediocre." One other note about MW's use of GDOS: ASCII files may be loaded and saved by MW, but Ian failed to add that they will print properly as well. Unlike WordUp, which can print out non-graphically but without the proper page setup, MW will format documents for printing correctly for GDOS graphic printing and for normal non-graphic printing.

In calling MW a "semi-WYSIWYG" program, Ian is making the same proclamation about virtually all ST word processors, including Word Writer ST and 1st Word Plus. To me, MW comes the closest to true WYSIWYG word processing on the ST, maybe being exceeded by WordPerfect (which I don't have the budget to purchase—another plus for MW).

With MW's implementation of GDOS fonts, most of which are proportional, using column or character measurement would be meaningless, as would a column indicator. A capital "W" character takes up more horizontal space than five lowercase "i" characters. The ruler available in MW, along with the excellent tabbing features, allows for exact positioning for columnar material as well as filling in pre-designed forms. Additionally, with MW's mail merge feature, which allows for merging from data files and/or prompted input from

the user during printing, pre-designed forms become a breeze.

MW is an extremely hearty word processor with many features that simply aren't available in anything short of WordPerfect (and at a significantly lower cost). When asked, I often steer new ST owners to Timeworks' Word Writer ST because it comes complete with a spelling checker, thesaurus and outline processor (which Ian finds so indispensable), and it is a very capable consumer-level product. But for those whose demands exceed the limitations of Word Writer ST, but do not require the expense and complexity of WordPerfect, Microsoft Write will fill their needs admirably!

Jeffrey J. Williams
Arlington Heights, IL

Desk Accessory Questions, Parts One And Two

Two questions, please:

First, I've found the START Calculator (START Fall 1987) to be so helpful to me that I'm sorry to say or point out that it has a flaw (gasp!). Why can't you use it in low resolution?

Second, is there any way to override the standard six desk accessories available, enlarge the "Desk" menu and have more accessories available at any time?

David Boruch
West Mifflin, PA

I'm trying to make a startup disk with all of my accessories and utilities on it. However, when I put more than one program in an AUTO folder, my disk will not load. How can I fix this? Also, I read that the ST only allows for six ac- ▶



Aztec C's NEW Source Debugger Takes The Work Out Of Debugging!

Stop entering print statements and re-compiling over and over. Stop spending your time looking at assembly language and hex dumps. Stop agonizing over features you need but can't find... Start using Aztec C's NEW Source Debugger (SDB). It has all the features you expect and more!

SDB FEATURES

- Debug your code at the Source Level
- Set Breakpoints and Single Step by Source Line
- Access all Global and Local Variables by Name
- Evaluate and Print the Value of Any C Expression
- Displays all Structure Element Names and Values
- Assembly Language Debugger for intermixed routines
- Supports Atari debugger
- Supports the GEM, EDS and VDI resident libraries
- User Control of Color — background and text
- Separate Color Windows for Source, Data and Commands
- Supports 68010, 68020 and 68881 processors
- Re-usable command macros and procedures enables you to customize the debugging environment
- Debug desk accessories

And with Aztec C you get an optimized C compiler with selectable 68020 and 68881 support, the Gulam shell Command Processor including pipes, I/O redirection and more, an overlay linker, librarian, important UNIX utilities, and the clean, fast, compact code you need. Aztec C, the most advanced development system for the Atari ST!

SDB Special through December 31, 1988 60 Day Satisfaction Guaranteed

Source Debugger (Reg \$150)	ONLY \$ 75.
Aztec C68k/At-p Prof Sys (Reg \$199)	ONLY \$ 99.
<small>(Compiler, Assembler, Overlay Linker with Librarian, Unix and other libraries, utilities)</small>	
Aztec C68k/At-d Dev Sys (Reg \$299)	ONLY \$150.
<small>(Prof Sys plus Unix utilities make, diff, grep)</small>	
Library Source	ONLY \$300.
<small>Developer System with Source Debugger and</small>	
Library Source (Reg \$749)	ONLY \$399.

COD, VISA, MC, Wire (domestic & intl.) & terms

Take Advantage of the Introductory Special / Call Today

1-800-221-0440 (outside NJ)

201/542-2121
(NJ and Outside U.S.)

Telex: 4995812MANX
Fax: 201/542-8386

Aztec by **MANX**

1 Industrial Way, Eatontown, New Jersey 07724

cessories to be activated at one time. Is there any way to correct this? And if I put more than six accessories on my disk, will a problem occur?

Ari Cornman
Philadelphia, PA

First, the START Calculator will not run in low resolution simply because there is not enough room on a low resolution screen to fit all the buttons.

GEM imposes a maximum of six desk accessories (DA's), and any program that uses GEM (including the ST's Desktop) allows space on the Desk menu for only six. Theoretically, it's possible to load more than six DA's by writing a DA program to act as a shell; the shell program could load in many DA's at boot time. Then, when you select the shell accessory from the Desk menu it would bring up another menu that lets you pick which accessory to access. Again, such a program is possible (in fact, we had one submitted to our offices), but it could easily wreak havoc with your ST's memory.

Finally, we don't know of any such limit to the number of programs that you can run from an AUTO folder. However, programs in the AUTO folder run in the same order in which they were added (which is usually not the same order they appear in on the Desktop) and some programs must run before any other programs in order to work. Check the documentation of your programs to see if this is the case.

To rearrange the programs in the AUTO folder, copy out all the programs (either to the root directory of your boot disk or to another disk), delete all the programs in the AUTO folder and then copy the programs back, one at a time, in the order desired. You may need to experiment a little. If one particular program is hanging up your ST no matter where you put it, try making a new copy of it; if that doesn't work, contact the company that makes it and ask for assistance.

What About .IMG Files?

At the present I am struggling with understanding .IMG files. I don't understand how they are stored in 75, 150, 200 or 300 dots per inch (dpi). I would appreciate if you could explain how this is done. So far, I haven't been able to find this information in any ST books or magazines.

Gilbert A. Bush, M.D.
Alta Loma, CA

.IMG files use a GEM VDI bit image file format and are unique in that they can be larger than the size of the ST screen. They are popular with designers of image scanners, desktop publishing packages and some drawing programs (for example, Migraph's Easy Draw). .IMG files are only stored in

one resolution—the one they were created in. However, you will not be able to print out the image at a resolution higher than the capabilities of your output device (plotter, printer or whatever). For example, an image created at 300 dpi will be printed at a lower resolution if you are using a 150 dpi laser printer. On the other hand, an image created at 150 dpi will not be improved by printing it on a 300 dpi laser. GDOS (the Graphic Device Operating System—a part of GEM) controls output of .IMG files.

Dialog Box
START
544 Second Street
San Francisco, CA 94107
Or leave us a message on CompuServe
using the Antic Online Mailbox—just
log on and type GO ANTIC.

Alert Box

Unsafe at any speed!

It's hard to believe, but Dave Small was in error in his column in Special Issue Number 4. In checking with Atari, we learned that most Atari floppy disk drives do have speed adjustments. Only the Chinon drives that were used by Atari for a short period do not have such an adjustment. Atari's current drive source is Epson; their drives also have adjustments. However, Dave's advice still stands: START does not advise any owner to disassemble his or her ST drive to adjust the drive speed. This is a job better suited to an authorized Atari Service Center.

Creation! patch program

There is a slight problem with Creation! in the Summer 1988 issue that only affects the program under certain circumstances. If you have the pre-Mega TOS ROMs in your ST and want to save a fractal landscape as a

CAD-3D object, the alert box only offers 20x20 and 40x40 resolution. The 80x80 option is the default; if you press Return instead of choosing one of the options, your object will be saved in 80x80 resolution. This does not occur with the Mega ROMs.

Tom Hudson has written a patch program to correct this problem—it's on this issue's START disk as CREPAT.PRG. Creation! must be in the same directory and folder as CREPAT.PRG; run CREPAT.PRG and after a moment, you should see an alert box saying Creation! has been fixed. Once you have fixed Creation!, you will never have to run CREPAT.PRG again.

... And apologies to Tom for listing an incorrect price for his Antialiaser: it's a mere \$1995, including developer documentation. You can get it by sending check or money order to Tom Hudson, P.O. Box 3374, Shawnee, KS 66203.

News, Notes & Quotes

An Easing Of The Chip Shortage

Industry sources have reported that the DRAM (dynamic RAM) shortage is easing. Those are the memory chips that fill your ST or Mega and account for a good part of its price. While 256-Kbit chips are still in short supply (and this situation is expected to worsen), prices on 1-Mbit chips have already started to decline as 256-Kbit production lines are converted to the larger chips.

Merrill Lynch Research Capital Markets has estimated that worldwide production of 1-Mbit DRAMs will more than double over the next few months to approximately 35 million units per month in December, 1988. In contrast, 256-Kbit chips are being produced at 66 million units per month and this is expected to decline to about 50 million units. But spot prices of the 256-Kbit chips, the price that a company pays for immediate delivery, have still declined from their peak of \$10-12 for volume orders.

According to Dataquest, the latest DRAM prices at presstime show a range for 256-Kbit DRAMs of \$2.70 to \$4 if purchased directly from a semiconductor company, \$6 to \$9 if purchased from an authorized distributor and \$9.50 to \$15 if purchased on the "gray market." For 1-megabit DRAMs, the price ranges are: \$15 to \$18, \$20 to \$30 and \$35 to \$40, respectively.

Atari Wheels And Deals

Atari is making some sweet deals on ST and Mega packages. For instance, Atari is selling a Mega 4 with monochrome monitor, an SLM804 laser printer, a Megafile 10 20-Mb hard disk, Timeworks Desktop Publisher ST, VIP Professional and VT-100 Terminal Emulator for \$3995 (\$5615.70 suggested retail price). Other deals are a \$2995 Mega 2 package (with laser printer, VIP Professional, Microsoft Write and the Terminal Emulator) and a 520STFM monochrome system with the Arrakis Scholastic Series package, Missile Command, Battlezone, Atari Planetarium and Microsoft Write for \$699.

Atari also has announced a new joint promotion with Yamaha to be carried in the Lechmere chain in the East and the Federated chain in the West. For under \$1,000 suggested retail price, a buyer can purchase a 520STFM, Yamaha PSS-480 keyboard and Passport Mastertracks Jr. software. This system is billed as the "first under-\$1,000 home music system developed around the MIDI standard."

Paine Webber Bullish On Atari

In an investment advisory bulletin directed at the customers of brokerage house **Paine Webber**, Lee Isgur made a strong "buy" recommendation for Atari stock and revealed some details of Atari's upcoming products.

"We find it hard to conceive that the sheer momentum of revenues and operating profit will go unnoticed for very long. We recommend buying [Atari stock] now and think existing holders could double up," said Isgur. He also reported a 61% surge in profits from the computer division, but noted that DRAM price increases added about \$4.5 million to first quarter costs and that component shortages helped to curtail Atari sales.

Demand for Atari products (primarily computers), according to Isgur's estimates, exceeds supply by at least 50% and that computer and game revenues should hit \$550-700 million this year, up 50-100% from last year. Atari's goal, according to Isgur, is to have 50% of its computer sales come from the U.S. in 1990. While Isgur doubts this possibility, he does think it feasible in 1991.

On the product front, Isgur predicts a **laptop ST** with a built-in hard drive "this year" and a **\$199 68000-based game machine** in January, 1989. Because there have been no official product announcements by Atari of these products, the official Atari position as of this writing is "no comment."

Atari is only making a few thousand of its **PC clones** per month, but "later this year" Atari will start turning out its PC-5 model (80286 clone). ▶

Atari Games At CES

The Summer Consumer Electronics Show has traditionally been the occasion when manufacturers show their wares for the next Christmas season. It's not aimed at the business professional (as COMDEX is), but at the distributor and retailer looking for the hot product for under the Christmas tree. Atari made a strong appearance in June at this year's Chicago Summer CES, but not the way we would have expected.

The Atari pavilion was the first thing a visitor saw while riding down the escalator onto the main computer/electronics show floor. Dressed all in black like Johnny Cash, the pavilion was sponsored by the Electronic Entertainment Division of Atari—the video games division. While not as large as the 20,000-square-foot Nintendo arena, Atari had an active and well-attended area. But the only STs in evidence at the booth were several in a small area "grafted" onto the back and dedicated to MIDI.

But all over the show, STs were in



There were few STs in Atari's Summer CES pavilion and all of them were running MIDI software on the pavilion's "back porch."

Atari And Micron Settle

As we reported in Special Issue Number 3, Atari filed a lawsuit against Micron Technology, Inc. alleging a breach of an oral agreement for Micron to supply 256-Kbit DRAMs to Atari at \$3.75 each. Now, Atari and Micron have settled their lawsuit and Atari is once again buying chips from Micron, according to Neil Harris of Atari. Micron is one of the last two U.S. makers of such chips. Specific terms of the settlement were not disclosed.

Word Perfect Approaches Perfection

Since we last reported on WordPerfect for the ST in the Summer 1988 News, Notes & Quotes, WordPerfect Corp. has released a new version with many of the bugs fixed. This version, dated April 15, 1988, now performs as it should. Keyboard response is still slower than some word processors, but the major bugs with the installation and the speller have been fixed. The speller is now a joy to use, but the "freebie" conversion program still doesn't convert ST Writer files to WordPerfect format. WordPerfect has publicly reiterated their commitment to remain in the ST market and admitted they were premature in bringing out the first version of the software for the ST. Kudos to WP for their support of a fine product. *If you have a hot tip or an interesting product for the ST, we'd like to hear from you. Let us know at News, Notes, & Quotes, STARI, 544 Second Street, San Francisco, CA 94017.*

**ENCOUNTER HIGH
SPEED ACTION IN
AN INTELLIGENT
GAME OF TACTICAL
WARFARE.**

THE TIME: The 22nd Century.
THE PLACE: 64 islands in the
Southern Ocean.

THE PROBLEM: A worldwide en-
ergy crisis.

THE MISSION: Gain control of
the islands, set up centers to mine,
recycle and produce materials to
form a large network of power
plants.

JUST ONE MORE PROBLEM:
Enemy terrorists are destroying
the islands... one by one.

FAST-PACED ARCADE AC-

TION: You are in control of up to
4 aircraft and 4 amphibious vehi-
cles simultaneously. Capture en-
emy islands and destroy its
forces.

STRATEGIC TACTICAL WAR-

FARE: Conduct war maneuvers in
a huge territory that includes over
60 islands. Protect your ship with
defense drones and 360-degree
turret mounted laser cannon with
telephoto tracking.

SENSATIONAL GRAPHICS:

Three-dimensional solid filled
graphics, smooth scrolling, fabu-
lous sound and special effects.

ADDICTIVE, HOURS OF PLAY:

Your choice of action game or
strategy game, plus save-game op-
tion provides hours and hours of ex-
traordinary adventure!



CARRIER COMMAND



RAINBIRD

P.O. Box 2227,
Menlo Park, CA 94026,
415/322-0900

HOW TO ORDER: Visit your software dealer today, or call (800) 227-6900 from U.S. or Canada for Visa, MasterCard, Amex or C.O.D. To order by mail, send check/money order: Rainbird, P.O. Box 9123, San Francisco, CA 94126. CA add 6% sales tax and TX add 7.75%. Shipping/handling is \$4.50. 2-3 weeks for delivery.

AVAILABLE: IBM CGA/EGA/VGA \$39.95, Amiga and Atari 512K \$44.95, Macintosh 512K \$49.95, Commodore 64/128 coming soon.
Rainbird and Rainbird logo are trademarks of British Telecommunications plc. Macintosh is a trademark licensed to Apple Computer, Inc. IBM, Commodore and Atari are registered trademarks of International Business Machines Corp., Commodore Electronics Ltd., and Atari Corp., respectively.

Practical Solutions presents



VIDEOKEY™

RGB to Color Composite Converter
for the Atari ST®

602-884-9612

1930 E. Grant Rd., Tucson AZ 85719

 Practical
Solutions®

Products Update

Starglider II

Rainbird Software has just released **Starglider II**, the sequel to their bestselling ST game of 1986. Like the original, **Starglider II** features digitized sound effects, punchy music and smooth, vector-graphic-type animation. The new game lets you rescue colonies under alien attack, with multiple planet scenarios giving a unique feel to your missions. Rainbird is also re-releasing the original **Starglider** for only \$24.95. **Starglider II**, \$44.95. Rainbird Software, 3885 Bohannan Drive, Menlo Park, CA 94025, (415) 322-0412.

CIRCLE 225 ON READER SERVICE CARD

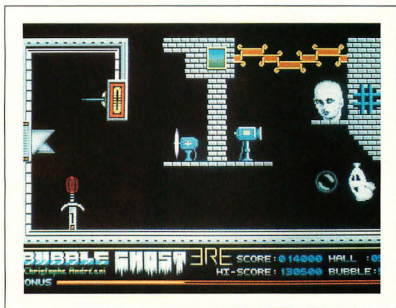
Kuma's Scientific ST

English computer software and hardware company Kuma has just released two ST products for scientific uses: **K-Scope** and **K-Spect**. **K-Scope** turns your ST into an audio-frequency oscilloscope; **K-Spect** turns your ST into a low-frequency, dual channel spectrum analyzer. Both products consist of interface boxes that plug into the cartridge port of your ST, along with GEM-based software for the data analysis. Prices were not available at presstime; for more information, contact **Kuma Computers Ltd.**, 12 Horseshoe Park, Pangbourne, Berkshire, RG8 7JW, England, telephone 07-357-4335.

Casper Is Phosphor

From Accolade Inc. comes **Bubble Ghost**, a cute, multi-level arcade game with a non-violent theme. In the game you are a ghost blowing a soap bubble through the maze-like rooms of a castle. You must maneuver the bubble through 35 different rooms, each filled with sharp-edged hazards more dangerous than the last. You'll blow out candles, dodge spinning fan blades and evade champing scissors in your perilous journey; secret passageways help you skip the more difficult levels. **Bubble Ghost**, \$34.95. Accolade, Inc., 550 Winchester Blvd., Suite 200, San Jose, CA 95128, (408) 985-1700.

CIRCLE 227 ON READER SERVICE CARD



Accolade's **Bubble Ghost**. In this light-hearted fantasy game you must blow a bubble through a dangerous maze of castle rooms.

Helpful Hints Book

Helpful Hints for the Atari ST or Mega User is a new book for both beginner and advanced ST users. The book contains useful tricks and tips and assumes the user has no prior familiarity with the ST. Author Bill Skurski has been an ST users group president for over two

years and has compiled a list of answers to the most-often asked ST questions; the book also includes tips on how to get the most out of popular ST programs such as **DEGAS Elite**, **1st Word** and **Publishing Partner**. **Helpful Hints**, \$16.95 plus \$3 shipping and handling. You can order it directly from **Bill Skurski Enterprises**, 10732 Lawler Street, Suite #1, Los Angeles, CA 90034.

CIRCLE 229 ON READER SERVICE CARD

START goes monthly this fall!

YOUR ULTIMATE ST SUPPORT

Push the limits of your ST.

Get the unbeatable combo
of *START* magazine &
disk—12 times a year!

Subscribe today and power up with
disks filled with word processors,
music and graphic software, super
utilities and games.

Learn about MIDI. Desktop publishing.
Business applications. Animation.
News of the ST scene. Top programs
by Tom Hudson, Dave Small and
other ST pioneers. Reviews of the
latest products. With the information-
packed magazine and the programs
on disk, you'll use your ST in ways
you never dreamed!

START really is the ultimate support
for you, the Atari ST user.

MONEY-BACK GUARANTEE

If, for any reason, you are not satisfied,
we'll send your money back on all
unserved issues in your subscription term.



Subscribe Today!

Call Toll Free

800-234-7001

(6am-6pm PST. Monday-Friday)

I remember being in eighth grade, browsing through books in the Pershing Junior High School library in Springfield, Missouri, and coming across the section of the stacks that held books on careers. Books with titles like "So You Want to be a Professional Baseball Player" and "So You Want to be a Brain Surgeon."

I never really read any of these books—I always had the idea the titles were almost sarcastic. You know, like the older sister or brother who was always ready with a nasty put-down: "So, Billy, you want to be a professional baseball player? Well, well, that's a *fine* career—lots of money if you make it to the major leagues, yessir! But did you know that most baseball careers last less than ten years? Or that one simple injury could end your career and you'd be lucky to end up as the bat-boy? Or that a catcher's knees can become arthritic after only five years? And don't forget that there will always be an endless supply of younger Billies to take your place if you slip a little? Gee, Billy—how about being an *accountant!*"

Actually, these books served an important function: they pointed out the good and bad points of various occupations, letting kids know that being a professional baseball player isn't the same as getting a game together on a vacant lot with the neighborhood kids.

Or, Kids, Don't Try This at Home!

Funny that there weren't any books entitled "So You Want to be an Independent Software Developer." There should be—there are a lot of misconceptions floating around about the independent software developer. Many people have asked me what it's like to be a self-employed programmer and if it's really possible to succeed on your own. I think it's time to talk about it.

So You Want To Be An Independent Software Developer?

For a couple of years in the early 80's while computers were "hot" consumer items, we heard stories of kids who wrote one computer program and became millionaires. Or a guy who wrote one game, bought himself a Porsche and put himself through college with his royalties. "Gee," a lot of people thought, "the computer software industry is a big gold mine, just waiting for someone to

dig! I think I'll be a programmer!" You see ads with this logic on matchbook covers all the time.

However, when you heard about a person striking it rich in the computer software field, you heard about the few extremely successful (and extremely lucky) people who entered the market at the right time with the right product. But they also worked incredibly hard and had to rewrite the same program over and over for a number of computers.

The problem is that the gold mine that is the personal computer industry is pretty well "played out" right now. Sure, you hit a fairly strong vein from time to time (like the Atari ST market), but sooner or later it slows down again.

When I started writing software independently, a friend of mine who is a famous programmer for a major software publisher told me that he'd be watching how I did because he wanted to know if it was still possible for a person to make a living writing personal ▶





About The Photo

Yes, it's Tom Hudson doing what he does best—programming under pressure. The photo and swimming pool were provided by Dave Groves. And no, the ST and monitor weren't operational, and yes, if you try this with working equipment, you'll fry both your computer and yourself.

computer software independently. He was skeptical, and it made me nervous—and cautious.

The Down Side

When you have a nine-to-five job that pays you a regular paycheck every Friday, pays your health and dental insurance and gives you two weeks' paid vacation a year, it's a tough decision to leave it all for a career doing anything on your own. I don't care if it's free-lance basket-weaving; you find your stomach churning more often. You get nervous a lot.

I don't want to sound like one of those books in the school library, but if you're thinking of writing software independently, be sure of a couple of things.

Do you like programming? Well, you'd better. When I wrote CAD-3D, I was putting in 18-hour days, and the remaining six hours weren't all sleep, either—I was writing code and trying to figure out bugs in my dreams. I sat in front of the computer from 8:30 a.m. until after 2 a.m. (and even until after 5

a.m. some bad nights), stopping to eat only during compiles. I'd get up at 4 a.m. to test theories about eliminating a bug. Sound like fun? Uh huh. My friends thought I was going to blow a gasket. Things aren't that bad now, because I force myself to stop working at 6 p.m., just to prevent burnout. I like programming a lot, but under the kind of pressure put on by publishers, *anyone* could burn out.

You may even love programming, but make no mistake—free-lance programming is a job, just like ditch-digging or driving a truck. The only difference is in the tools you use to do the job. You have to put in the effort, a minimum of eight hours a day, five days a week. Sometimes you have to put in a lot more than that. It takes discipline to keep working inside on a nice spring day when you could be out at the local pool sipping a cold one while soaking up some rays. You just can't approach professional programming on a once-in-a-while basis, like getting together a sand-lot baseball game once a week; success in professional programming requires the same dedication as major

league baseball.

The trouble with free-lance work is that it's like a bad drug habit. As soon as you finish one project, you'd better get started on another, because programs have limited lifespans in the marketplace and most programmers are paid a fixed amount for each disk sold—a royalty—rather than a flat fee. If you want to write games, you're really in for some fun. Ordinarily, they have a life of just a few months before the sales slip off—in other words, *one quarterly royalty period*. Application programs are better, lasting over a year, or several years, if you're lucky. Their sales don't taper off as badly as games, which is one reason you don't see any ST games with my name on them.

Are you a nervous person? Do you have high blood pressure? Does your family have a history of ulcers? If you answered yes to any of these questions, think twice about independent software development. I'm not a nervous person, and I have low blood pressure. But I still get bothered every time I hear a rumor about how Atari's doing this or my software publishers are doing that. You start

to get superstitious and knock on wood a lot. You buy tarot cards. You talk to yourself a lot.

You especially start talking to yourself a lot when your compiler blows up and wipes out half your hard drive. You start pulling out your hair when you find your program stops working after a compile where you changed one line of code, and after three days of mind-numbing debugging and recoding, you find that the bug is in the compiler's linker. *Arrggghhh!*

The Up Side

Life as a software developer isn't all gloom and doom. In fact, it can be downright great at times—you just have to be realistic with your expectations.

The absolute best thing about independent software development is that you're your own boss. You can stay up as late as you want, watch David Letterman or whatever, sleep as late as you like and work the hours you want, as long as the work gets done. Most programmers I know don't get up until after 10 a.m.

Since you'll most likely be working out of your home or apartment, you can set up your office the way you want and the working conditions are up to you. Some summer afternoons, I switch on Cubs baseball games and have them on in the background. (Try that at Fruegle & Flerk Accounting.)

Something else that I can enjoy while programming at home is listening to music. My personal favorites: electronic music (Tangerine Dream, Kitaro, Vangelis) for ordinary programming—it sets up a great rhythm that seems to drive me along at a steady pace and doesn't get in the way of thinking. For the code where I know exactly what I need to write, and just need to get it into the machine, there's simply no substitute for Jerry Goldsmith's "Rambo II" soundtrack. I pop it in the CD player and it's heavy-duty coding time.

The trouble with free-lance work is that it's like a bad drug habit.

Getting Started

If you really enjoy programming and feel the software development game is for you, here are a few tips:

First, think about your first project thoroughly, and make sure there's a market for it. Have it well underway and have a signed contract with a reputable software publisher before leaving your old job. You don't want to be out on the street begging a publisher to take your new recipe filing system for the Coleco Adam or the Mattel Aquarius (gee, anybody remember *those* systems?)

Speaking of contracts, find a good contract lawyer who is knowledgeable in this field and talk to an experienced software developer. They know all the ins and outs of these legal nightmares and will be able to make suggestions for changes you'll want or need.

No matter how tempting they are, be careful about accepting advances against future royalties for your work. If you take a large advance, you might not see any royalties for six months or more. Take only the advance payments you *absolutely* need or you may find yourself pumping gas at the Turnpike Quick-Pump just to get by.

As soon as you have your first project completed, get to work on the second. You'll find that the software game is a never-ending series of projects and you can't afford to slow down until you have enough products on the market to provide a steady stream of income. I didn't slow down for over two years after writing DEGAS. I was very careful in how I spent money and until a year ago

I lived in a crummy apartment with a living-room ceiling that sagged like the back of a glue-factory horse. And it leaked.

This brings me to a couple of related points. First, it's a good idea to link up with a couple of different software publishers. This is a kind of safety net which will save you if one of them goes out of business. I never thought Batteries Included would buy the farm, but they did. I thanked my lucky stars I had another publisher, because even though my BI products were acquired by Electronic Arts, it was months before the sales restarted and royalties resumed. If BI had been my only publisher, I would have been flipping burgers at the local Jiffy Grease to make ends meet.

Another point here: *Never* give a publisher the "right of first refusal" to acquire your future products, no matter how well they treat you or how much they threaten you. Remember all those fairy tales you heard as a kid about the dummies who agree to give some gremlin their first-born child in return for a favor because it seemed like a good idea at the time? And when the kid's born the gremlin shows up and they don't want to give up the child? The same principle applies here.

Let's say you write a game for software company X, a great game marketing company, and give them the right of first refusal. In a stroke of genius, you then write the *ultimate* database manager. It's outside of company X's area of marketing expertise, but perfect for company Y. Unfortunately, company X has the dreaded right of first refusal and buys the program at your asking price. Sure enough, they market it miserably and you make around \$20 in royalties. Get the point? If a company is reputable and does a good job marketing your work, you'll want to work with them again, even without the right of first refusal. Keep your right to work for whomever you want. ►

And another point: *Never* sign a contract for a job unless you're ready to start on it the *next* day. Project time-tables can slip (and usually do), thanks to the horrible phenomenon known as the "creeping feature list."

It works this way. You're writing a program and several people are testing it. As they test it, they come up with ideas—lots of ideas—pages of ideas. The publisher sees some of these ideas and talks you into including them in the program, causing your schedule to slip little by little, until you're months behind. If you have another contract waiting, it has to be put off and the other publisher is upset. Take it from someone who knows—do it one contract at a time.

And for heaven's sake, don't expect to go out and buy a new Porsche when you get your first royalty check. The odds are that the check won't be that big anyway, particularly if you took an

advance at the start of the project. Be conservative and stick the dough in the bank. The days of Porsche-buying programmers who live in mansions are long gone, unless you're very, very lucky.

Another thing—keep it simple. If you can do the work yourself, do it. The work may be finished earlier with a partner, but partnership dilutes your royalties and complicates too many other things. And employees are *verboten* in my book. They really mess things up when you're trying to get started, adding worries about employment taxes, insurance and a hundred other problems. I look at it this way: If you want to be a programmer, *be* a programmer, not a personnel manager. Stick to what you do best.

Don't Try This At Home?

I've tried to point out the pluses and minuses of independent software development based on my three years of

experience in the area. Being self-employed in the personal computer software market isn't for everyone. My final recommendation to those who are self-motivated and have confidence in their abilities is a quote from a good friend who helped me decide:

"As long as you have a college degree to fall back on to get another position, you have nothing to lose in trying to become self-employed. The worst you can do is fail." ■

Tom Hudson is the author of DEGAS, DEGAS Elite, CAD-3D, Cyber Control, Cyber VCR, Cyber Sculpt and The Anti-liaser. He lives in a small comfortable house in Shawnee, Kansas and wants everyone to know that he is not a millionaire.

PART 4



"Find Red Square" Contest!

Find Red Square in Moscow and enter to win a real trip for two to Europe, courtesy of SubLOGIC and TWA! See the SubLOGIC Product Chart at your dealer or write SubLOGIC for complete details and contest rules.



"WESTERN EUROPEAN TOUR"

Scenery Disk is so beautiful to fly, you'll want to make it the centerpiece of your Scenery Disk collection! This is part four of a five-part guided tour from London to Red Square.

This month we continue our tour of Germany. Flying over Frankfurt at night can be a harrowing experience. Here we have a close encounter with a telecommunications tower.

Next stop, Stuttgart! We must approach the city carefully, avoiding the mountain ranges on both sides of our flight path.

Next month - on to Moscow!



subLOGIC
Corporation
501 Canyon Road
Champaign, IL 61820
(312) 299-8422 Telex: 200965
CIRCLE LINE: (312) 307-2993



DISCOUNT SOFTWARE

ABACUS SOFTWARE

Chartpak ST	.. \$ 34
Data Trieve	.. \$ 34
Fourth ST	.. \$ 34
P.C. Board Designer	.. \$136
ST AssemPro	.. \$ 40

ACADEMY

Typing Tutor/Word Instructors	.. \$ 23
-------------------------------	----------

ACCESS

Leader Board Golf	.. \$ 27
Tenth Frame	.. \$ 27

ACCOLADE

Bubble Ghost	.. \$ 23
Hard Ball	.. \$ 27
Pinball Wizard	.. \$ 23
Test Drive	.. \$ 27

ANTIC

Cyber Sculpt	CALL
Cyber Studio w/CAD-3D	.. \$ 60
Cyber Control 1.1	.. \$ 40
Cyber VCR	.. \$ 48
Flash	.. \$ 20
Macro Mouse	.. \$ 23
Cyber Paint 2.0	.. \$ 54
Base Two	.. \$ 40
Cartoon Design Disk	.. \$ 20
Phasar	.. \$ 60
Genesis	.. \$ 54
Spectrum 512	.. \$ 47
3-D Breakthru	.. \$ 27
3-D Architectural Design	.. \$ 20
3-D Developer	.. \$ 20
3-D Future Design	.. \$ 20
3-D Human Design	.. \$ 20
3-D Plotter & Printer	.. \$ 18
3-D Fonts 1 or 2	.. \$ 20
The Navigator	.. \$ 20
Stereotek 3-D System	.. \$119

AVANT GARDE

P.C. Ditto	CALL
------------	------

BAUDVILLE

Award Maker Plus	.. \$ 27
Video Vegas	.. \$ 23

BRODERBUND

Super Bike Challenger	.. \$ 14
-----------------------	----------

CENTRAL POINT

Copy II ST	.. \$ 26
------------	----------

DATA SOFT

Alternate Reality: City	.. \$ 26
Battle Droid	.. \$ 23
Global Commander	.. \$ 26
Hunt For Red October	.. \$ 32

ELECTRONIC ARTS

Aliens Fires	.. \$ 26
Bard's Tale	.. \$ 32
Chess Master 2000	.. \$ 29
Empire	.. \$ 32
Marble Madness	.. \$ 26

ACCESSORIES

Supra 20/30/60 Meg. Drives	CALL	Z-Time (520 ST)	.. \$39.95
IB 5 1/4" Drive	CALL	Z-Time (520 STFM/1040 ST)	.. \$49.95
Indus GTS 100	CALL	ST Series Mouse	.. \$49.95
Practical Solutions:		520 ST Power Supply	.. \$62.95
Video Key	.. \$ 99.00	Epyw 500 XJ Joystick	.. \$15.00
Mouse Master	.. \$ 35.00	Visco Rat Handic Joystick	.. \$19.00
Monitor Master	.. \$ 44.00	Mouse Three Way Joystick	.. \$22.50
Drive Master	.. \$ 44.00	Wigo Erico Stik Joystick	.. \$19.95
Terrific Corp.		Joystick "Blaster" Module w/Adjustable	.. \$ 49.95
E Z Ram II	.. \$109.00	Fire Rate Control	.. \$ 4.95

Mavis Beacon

Teaches Typing	.. \$ 32
Roadways	.. \$ 32
Scrabble	.. \$ 26
Scraples	.. \$ 26
Skyfox	.. \$ 14
Star Fleet I	.. \$ 37

EPYX

Death Sword	.. \$ 14
Dive Bomber	.. \$ 26
Impossible Mission	.. \$ 26
Metro Cross	.. \$ 16
Sub Battle Simulator	.. \$ 26
Temple of Aphasi Trilogly	.. \$ 14
Winter Games	.. \$ 14

FORESIGHT RESOURCES

Dratfix	.. \$135
Dratfix Data Plotter	.. \$ 34

FIREBIRD

Jinxter	.. \$ 26
Universal Military Simulator	.. \$ 33

FIRST BYTE

First Shapes	.. \$ 35
First Letters & Words	.. \$ 35
Kid Talk	.. \$ 35
Math Talk	.. \$ 35
Math Talk Fractions	.. \$ 35
Speller Bee	.. \$ 35

FTL

Dungeon Master	.. \$ 26
Olds	.. \$ 23
Sundog	.. \$ 26

ILIAD

Athens 2	.. \$ 65
Circuit Maker	.. \$ 54

INFOCOM

Beyond Zork	.. \$ 33
Leather Goddesses	.. \$ 33
Trinity	.. \$ 26
Zork Trilogy	.. \$ 33

INTRACORP

Bumper Sticker Maker	.. \$ 40
Business Card Maker	.. \$ 40
Vegas Gambler	.. \$ 34
Video Wizard	.. \$ 20
Murder on the Atlantic	.. \$ 26
Button & Badge Maker	.. \$ 40

LDW

Basic 2.0	.. \$ 60
Vegas Craps	.. \$ 24
Vegas Gambler	.. \$ 24

MARK WILLIAMS

Mark Williams "C"	.. \$129
csd C Source Debugger	.. \$ 49

MASTERTRONIC

Chopper-X	.. \$ 14
Ninja	.. \$ 14
Renegade	.. \$ 14

MICRO LEAGUE

Micro League Baseball	.. \$ 39
Gen. Manager/Owner	.. \$ 19
1986 or 1987 Team Disk	.. ea. \$ 14
WWF Wrestling	.. \$ 33

MICHTRON

GFA Basic:	.. \$ 40
Compiler	.. \$ 40
Interpreter	.. \$ 40
GFA Companion	.. \$ 34
GFA Object	.. \$ 54
GFA Draft Plus	.. \$109
GFA Vector	.. \$ 34
International Soccer	.. \$ 27
Leatherneck	.. \$ 27
Goldrunner 2	.. \$ 27
Scenerio #1	.. \$ 7
Scenerio #2	.. \$ 7

MICRO PROSE

F-15 Strike Eagle	.. \$ 26
Gunship	.. \$ 26
Silent Service	.. \$ 26

MINDSCAPE

Blockbuster	.. \$ 27
Gauntlet	.. \$ 34
Harrier Combat Simulator	.. \$ 35
Paperboy	.. \$ 35
Into the Eagle's Nest	.. \$ 27
International Soccer	.. \$ 27
Road Runner	.. \$ 34

NEUTRON

Fontz	.. \$ 23
Word Up	.. \$ 54

OMNITREND

Breach	.. \$ 26
Breach Scenario Disk	.. \$ 16
Universe II	.. \$ 34

ORIGIN SYSTEMS

Autoduel	.. \$ 34
Moebius	.. \$ 40
Cigre	.. \$ 20
Ultima III	.. \$ 25
Ultima IV	.. \$ 40

PSYGNOSIS

Barbarian	.. \$ 26
Deep Space	.. \$ 20
Terrorpods	.. \$ 26
Obliiterator	.. \$ 26

QUANTUM MICRO

BBS/ST	.. \$ 34
Desk Cart	.. \$ 69
Okimate 10/20 Printer	.. \$ 339
ST-Talk	.. \$ 14

SIERRA

King Quest 1, 2 or 3	.. ea. \$ 34
Leisure Suit Larry	.. \$ 26
Police Quest	.. \$ 34
Space Quest 1 or 2	.. \$ 34

DUST COVERS

520 ST Computer	.. \$ 8.00
520 STFM/1040 ST Computer	.. \$ 8.00
SF 543/314 Disk Drive	.. \$ 7.00
SC 1224 Monitor	.. \$10.00
SM 124 Monitor	.. \$10.00
Okimate 10/20 Printer	.. \$ 9.00
Star 10" Printers	.. \$ 9.00
Panasonic 10" Printer	.. \$ 9.00
Mouse House (Millie or Max)	.. \$ 4.95
Mouse Mat	.. \$ 6.50

SPRINGBOARD

Certificate Maker	.. \$ 26
C.M. Library Disk	.. \$ 20

SUBLOGIC

Flight Simulator II	.. \$ 35
Fl. Sim. Scenery Disks:	
Disk #7 Washington D.C.	.. \$ 18
Disk #11 Detroit/	
Great Lakes	.. \$ 18
Scenery West Europe	.. \$ 18
Scenery Japan	.. \$ 18

THREE SIXTY

Dark Castle	.. \$ 30
-------------	----------

TIMETWORKS

Data Manager ST	.. \$ 54
Partner ST	.. \$ 34
Swiftcalc ST	.. \$ 54
Word Writer ST	.. \$ 54
Desktop Publisher	.. \$ 89

SSI

Advanced Dungeons & Dragons:	
Heroes of the Lance	.. \$ 30
B-24	.. \$ 30
Twilight's Ransom	.. \$ 26
Warship	.. \$ 45
Stellar Crusade	.. \$ 39
Colonial Conquest	.. \$ 25
Phantasia 1, 2 or 3	.. ea. \$ 25
Questron 2	.. \$ 23
Rings of Zifin	.. \$ 25

UNICORN

Adv. of Sinbad	.. \$ 29
All About America	.. \$ 39
Animal Kingdom	.. \$ 23
Decimal Dungeon	.. \$ 23
Fraction Action	.. \$ 23
Magical Myths	.. \$ 29
Math Wizard	.. \$ 23
Read & Rhyme	.. \$ 23
Tales Arabian Nights	.. \$ 29

SIMON & SCHUSTER

Star Trek: The	
Rebel Universe	.. \$ 25

UNISON WORLD

Print Master Plus	.. \$ 26
Fonts & Borders	.. \$ 23
Art Gallery 1, 2 or 3	.. ea. \$ 20

VERSASOFT

dB Man 4.0	.. \$159
------------	----------

VIPT TECHNOLOGIES

ST Accounts 2.0	.. \$ 99
VIP Professional (GEM)	.. \$ 99

WORD PERFECT

Word Perfect (W.P.)	.. \$209
---------------------	----------

ALL TITLES ON DISK UNLESS MARKED (R) FOR ROM CARTRIDGE & (C) FOR CASSETTE TAPE

Order Line

WE CHECK FOR STOLEN CHARGE CARDS

Customer Service & Ohio Residents

1-800-282-0333

M-F 10 a.m.-8 p.m.; Sat. 10-3 ET

1-513-879-9699

ORDERS ONLY! Sales Personnel Do

11 S. Wright Avenue, Fairborn, OH 45324

Not Have Information on Previous Orders or Product Specs.

SOFTWARE ONLY - Prepaid orders over \$50 receive free shipping via UPS in continental U.S. Please add \$2 charge under \$50. HARDWARE and all orders requiring shipment via U.S. Post Office are subject to additional freight charges. Add \$5 for COD orders. Add \$2 charge under \$25. Ohio residents add 6% sales tax. Personal checks require a three-week waiting period. No waiting when paid by credit card, certified check or money order. All items subject to availability and price change. PLEASE CITE AD NUMBER WHEN ORDERING. ALL RETURNS MUST BE ACCOMPANIED BY AN AUTHORIZATION NUMBER.



ENHANCE YOUR ST.

Navarone Makes
It Easy with these
Great Tools at
Great Prices.

ST Video Digitizer

Digitize from any standard video source, (VCR, Video Camera, etc.) Save digitized pictures into NEO or DEGAS™ file formats. This is the fastest digitizer available for the ST™ or MEGA™. Capture single frames in less than a second.



The picture above was taken with the ST Video Digitizer and printed directly on a Linotronic 300™.

The ST Video Digitizer comes complete with cartridge, software and manual for only:

\$79.95

ST Scan Image Scanner

When your image is at stake, our image scanner can transfer your line art, photographs, logos and other graphics into your computer with resolutions up to 300 dots per inch with 32 shades of grey. And it scans in less than 15 seconds.



Navarone combines the Canon IX-12 or IX-12F™ Image Scanners with its own High Speed Interface that plugs into the cartridge port of the Atari ST™ or MEGA™. The ST SCAN Image Scanner program operates under GEM™ with simple click-on selections and is compatible with numerous graphic programs.

The ST SCAN Image Scanner comes complete with scanner (Sheetfed or Flatbed), interface, cable, software and manual for only:

(Sheetfed) (Flatbed)
\$1239. \$1779.

ST Sound Digitizer

Digitize real-world sounds from microphones, record player, tape recorders, etc., then play back with your MIDI keyboard. The ST Sound digitizer can be used to create music, edit short commercials, or use for voice mail. Very easy to use software with powerful editing and mixing features.

\$99.95

Timekeeper

This is our popular clock calendar plug-in cartridge. The timekeeper comes complete with removable long life lithium battery ready to use. Just plug it into the cartridge slot and set up either an Auto folder or Accessory program to automatically set Time and Date each time you turn on your ST.

\$29.95

To order, call toll free
1-800-624-6545
or in California
408-378-8177

or send M.O. plus shipping (call for rates) to Navarone Industries, 454 Kenneth Ave., Campbell, CA 95008. VISA, M.C., C.O.D. welcome. California residents add 7% sales tax.

 **Navarone
Industries**

The Vocabularian

by John B. Holder



Just in time for school, START brings you *The Vocabularian* to help you in your studies. Taking a Freshman Spanish class? A Spanish vocabulary library of 160 words is on your START disk! Use this state-of-the-art instructional program for at-home practice on just about any subject!

Add a great educational tool to your program library. File VOCAB.ARC on your START disk.

In the bad old days, the worst part of school was probably the endless grammar and vocabulary drills. Teachers and students hated them. Then along came the computer and at least the teacher was relieved of that

onerous burden. But as Computer-Aided Instruction (CAI) matured, computer drills became more effective and more pleasant—or at least less unpleasant.

With *The Vocabularian*, you can take advantage of the state of the art in CAI to learn foreign languages, geography, history or almost any other subject. You can make up a file of the vocabulary you have to learn, review it and then test yourself while the computer keeps

track of your score. Students and educators both can use *The Vocabularian* as a customized study aid; it will even print out a report card to record your speedy progress. Some of the program options are truly unique and enhance the learning process immensely.

To get you started, there's a large Spanish vocabulary library on your START disk, plus several other files that will give you a feel for the power of *Vocabularian*. ▶

Getting Started

The Vocabularian program and its associated files are on your START disk in the compressed file VOCAB.ARC. UnARC this file, following the Disk Instructions elsewhere in this issue. The Vocabularian is designed to run from a single drive or from within a single folder. The program recognizes drives A through F only and can be run in either medium or high resolution.

Step Inside The Mouse House

To run The Vocabularian, double-click on VOCAB.PRG. At the bottom of the main screen is a group of boxes called the Mouse House; clicking on these options gives you quick access to The Vocabularian's main features. The main screen also contains icons you can click on to set defaults and select various disk options. In this way, you can select most of the menu bar items by clicking somewhere on this screen.

Following is a list of The Vocabularian's commands with their alternate menu selections in parentheses. Because of the tremendous power of this program, we don't have space to detail all of the features at length. The Vocabularian is so user-friendly, however, that you should have no problems using all of the features to their fullest. The commands are explained in the context of a vocabulary test, but are obviously adaptable to other types of exams.

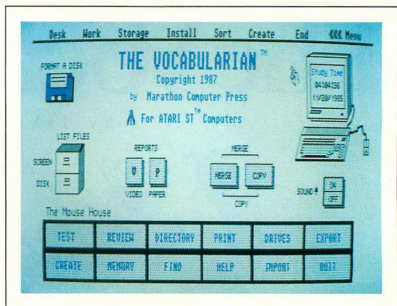
Desk

- Desk Accessory Switch—switches you to a menu bar with the desk accessories active. To return to the program, click a second time on the Desk Accessory Switch and then click on Off.

Work

- Take a Test (Mouse House button TEST)—tests you on .WDS files that were created by The Vocabularian. You can test yourself either on the

The Vocabularian, an excellent example of a Computer Aided Instruction program, lets you select options either from the standard drop-down menus or by clicking on the corresponding icons on the title screen.



words or their definitions and can set the order of the test to be from the start of the list to the end (forward), in reverse order or random. The Vocabularian is case-sensitive and requires that you enter the *exact* spelling of a word to score a correct answer. To finish a test, type /exit on the bottom line and press Return. You can have your report card sent either to the screen or the printer (depending on the default settings; see below). You also have the option of printing a study sheet of words missed. If you have a wide-carriage printer and want a printout of your report card, you will need to use the Control Panel's Install Printer option to set the pixels per line setting to 1280.

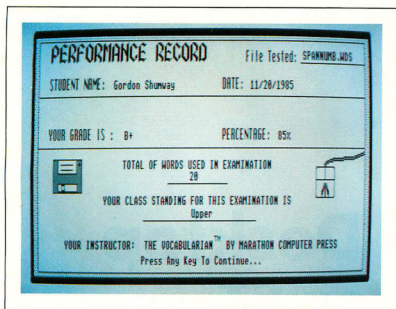
- Review a File (Mouse House button REVIEW)—flips through the words in one of your vocabulary files in a flash card fashion to study for a test. Pressing the left mouse button moves back through the words; the right mouse button advances to the next word. When you've reached the end of the file in either direction a deep buzzer will sound (if you have not turned off the sound effects). To exit, press the Escape key.
- Find a Word (Mouse House button FIND)—turns The Vocabularian into an electronic dictionary. You can

search for a word by either word or meaning.

- Print a File (Mouse House button PRINT)—prints out nicely formatted reports of your vocabulary files. You can pause at the end of each sheet of paper if you have to load each by hand. The printer defaults are set by clicking on Save Defaults under the Storage menu.
- File Directory (Mouse House button DIRECTORY)—The Vocabularian lets you keep an online file listing for use as a scratch pad. This is simply a quick reference card of up to 50 files that you wish to note for later reference. Files listed here are completely separate from those actually stored on diskette. If you are having trouble learning a .WDS file you can post its name here as a reminder. If a disk file is deleted, it is not automatically deleted from the Online File Directory. The online directory can be saved to disk for future reference.
- Help (Mouse House button HELP)—displays help screens explaining the major features. To exit press the Escape Key.

Storage

- Format a Disk (the floppy disk icon)—formats a floppy disk.
- Free Disk Space—reports how much room remains on your Floppy, RAM



The Vocabularyian report card. Having a printed record of your score will allow you to track your progress and pinpoint problem areas.

scratch pad.

- Set System Time (the ST screen icon)—lets you set the system time to keep track of your study time and date-stamp your files.

End

- Credits—shows you information about the program.
- End (Mouse House button QUIT)—exits the program.

Special Title Screen Options

When you click on the top drawer of the File Cabinet Icon a listing of files will be printed to the screen. If you click on the bottom drawer, the current listing of files is printed to disk as the file named DISK.INF.

If you wish to save a words (WDS) file in a special format for use in a database manager or other program, click on EXPORT in the Mouse House. This will print the file to disk with each word delimited (set apart from each other) by a special character. In the menu box, type in the delimiter you wish to use or Q to cancel. The first line in the resulting file will be the number of records in the file, and the last line will have the end of file marker "999/*Z." The maximum length of a word or its meaning is 40 characters and the maximum length of a type is 15.

Conclusion

I designed The Vocabularyian to follow CAI guidelines faithfully. I hope you have a satisfying learning experience with the program. The Atari ST is so user-friendly, the job was a joy and a wonderful way for me to become personally acquainted with the ST. ■

If you are as impressed with the user interface of The Vocabularyian as START was, you'll be interested to know that author John B. Holder is also the author of the GFA Companion, a menu and dialog box generator for GFA BASIC.

or Hard Disk.

- Change Drives (Mouse House button DRIVES)—changes the drive you are on to any legal drive between A and F.
- Delete Files—removes files either from your disk or from the online file directory. If you remove a file from your online directory, the actual file on disk will remain intact. However, if you remove a file from disk it will be gone forever.
- Save Defaults (icons on the screen let you set defaults for video or paper report cards or to toggle the sound on or off)—presents you with the program defaults which you may change with the indicated function keys. The screen is self-explanatory, except that if you choose to supply a new value for form feed, please refer to your printer manual. The program defaults are saved in the file DEFAULTINF; this file must be located in the same folder as VOCAB.PRG.

Install

- New Index—wipes clean the contents of your Online File Directory. It will clear out all of the names you have stored in the online file scratch pad, but it doesn't delete any files from disk.
- Copy Files (COPY icon)—copies a

file to a different directory or folder.

- Fix Files—gives you access to the WDS file editor. It opens a file and allows you to edit the words, types, or meanings.
- Add Words—opens an existing file and allows you to add more words. While adding the words you are kept informed of remaining free memory. It's a good idea to save files often while building them.

Sort

- Click on either Sort by Word or Sort by Meaning to rearrange a WDS file. You may then either print out the result or store it to disk.

File Creation

- Create (Mouse House button CREATE)—allows you to create a totally new WDS vocabulary file. It uses the same screen as Add Words and keeps track of how many words, types and definitions you have entered. Again, save your work frequently.
- Merge (the MERGE icon)—joins two files together if you want to build your vocabulary files a little at a time.
- Import a File (Mouse House button IMPORT)—adds file names to your online file directory scratch pad. This doesn't affect the status of actual files on disk, but is provided as a

Timeworks Desktop Publisher ST

In a Word, Incredible!

by Jerry McBride

As the editor of an ST club newsletter for two years, I've been anxiously awaiting a "second-generation" desktop publishing (DTP) program. My dream DTP program would support multi-page documents, import word processor files with all bold characters, underlining, etc. and import a wide range of graphics easily. Timeworks Desktop Publisher ST does these things extremely well and much, much more.

In a word, Publisher ST is incredible—it's extremely easy to use and very powerful. Publisher ST lets you import a "tagged" word processor file and produce a finished document instantly. I'm talking font sizes, headings, subheadings, bullets, the whole enchilada. And Publisher ST provides excellent dot matrix and laser printouts, as well as letter, legal, note card and landscape layouts.

Using Timeworks Publisher ST

When you run the installation program (and you must run it), Publisher ST cre-

ates working disks (or hard disk folders) specifically for your system. It's exceptionally easy to use and prompts you at every step. Once you tell Publisher ST your system configuration, it tailors the installation to fit. Your system configuration affects the number of font sizes available.

The Tool Box in the upper left-hand corner of the work screen has icons to switch among the four major modes of operation: Frame mode is used to set up frames to hold pictures or text, Paragraph mode lets you change the style of a single paragraph instantly, Text mode lets you modify or add text and Graphics mode has tools to draw lines, squares, circles, etc.

The Library window is under the Toolbox on the left side of the screen. Depending upon which mode you're in, the Library window will display the name of any text or graphic file you've loaded, paragraph styles or graphics tool icons.

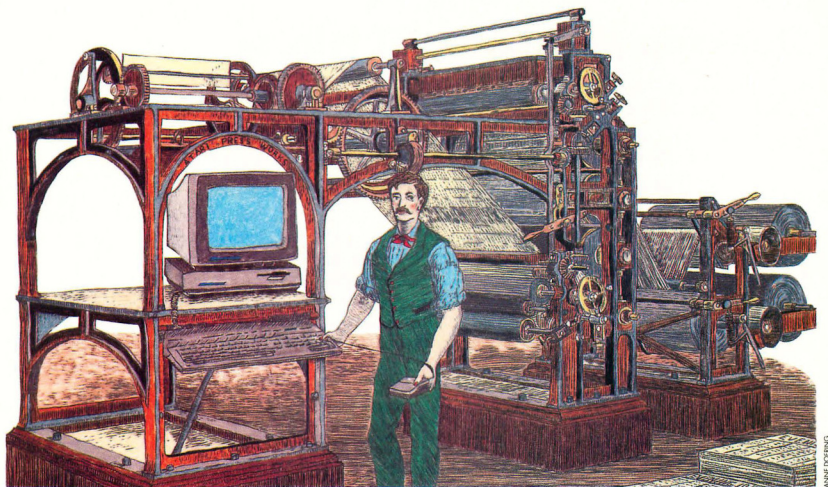
The Page Indicator is in the lower left

corner of the screen; here, you can click on the left arrow to go back one page or the right arrow to go forward one page. The dog-ear drawing of the icon tells you whether it's a left- or right-hand page.

You can save your page layout, master pages and user-defined paragraph styles in a "style sheet," and create different style sheets for various types of documents. When you're ready to create a new document, you just load the desired style sheet and you're ready to "fill in the blanks" with text and graphics.

Text Features

Publisher ST can accept 1st Word, 1st Word Plus, Word Writer ST and Word-Perfect ST files directly, retaining all formatting. You can even exchange files with its sister program, Timeworks' IBM Publisher; the files are 100 percent compatible. Existing text automatically flows around new text/graphic frames—and does this feature save time!



ANNE DÖRING

When you load a text file it's immediately stored in the Library and poured into any selected frame—and then will pour into subsequent frames. If no frame is selected, the file remains in the Library for later use, unless you choose to delete it. This is a very convenient way to create a document: you can delete text from your work area, but it will remain in the Library for placement elsewhere.

You can create specific combinations of paragraph format attributes and you can save different formats (bold, etc.), point size, justification, tab/indent and bullet style under a name of your choosing. When you want to change a paragraph, just click on the paragraph and then the new style. Zap! The change takes place instantly.

Any text paragraph can be "tagged" for style, font or size—even bullets—while still in your word processor. When imported, the paragraph will appear in the desired font size and format. What a time saver! (However, when you

place a tag at the beginning of a paragraph, make sure the previous paragraph has no trailing spaces or else the tag may not work.) Publisher ST does lose your document's tabs during import, but the tag feature can compensate for this by letting you define tabs and indents at the beginning of a paragraph.

Pictures And Graphics

As with text files, pictures are loaded into the Library as well as any selected frame. If you haven't selected a frame, most picture types will simply go into the Library until you need them. The only exception seems to be image files, which won't load unless you select a frame. Pictures become a permanent part of the document, which means you won't have to mess with any separate files. Cropping one picture from a group is easy and you can restore cropped pictures to their original aspect ratio instantly.

Publisher ST supports several graphic types, including DEGAS, NEO-

chrome, GEM Draw, Easy Draw and GEM Paint/Scanned (.IMG) files. (Sorry, TINY pics are not supported.) The built-in pixel editor lets you touch up your pictures at the last minute and you can crop an imported picture by selecting any portion of it.

Selecting the pencil icon selects the Graphics mode and brings up the drawing toolbox. The drawing tools are standard fare: circles, ellipses, free-hand lines, polylines, round- and sharp-cornered boxes. Standard GEM fill patterns are available (you cannot create your own) and you can make a frame and fill clear or opaque.

You can have a box drawn around the perimeter of a selected frame automatically; several line types are offered. But you can only draw within a frame, not on the bare work area. However, this problem is easily solved by making a huge full-page frame and placing separate text or picture frames inside it. ▶

Desktop Publisher ST Hints

by Stephen Mortimer
and the START Staff

- When you install Publisher, make sure your current ASSIGN.SYS file is in a safe place. Publisher creates its own ASSIGN.SYS file and overwrites any that it may find in the root directory of your installation disk, destroying your previous configuration. Similarly, any program that creates an ASSIGN.SYS file that you install *after* you have installed Publisher ST will overwrite Publisher ST's ASSIGN.SYS file and you will then have to re-install Publisher ST. You may want to create a folder of ASSIGN.SYS files with file names keyed to their associated programs, such as ASSIGN.TIM or ASSIGN.DEG. Then when you wish to run a particular program, you can exchange the locations of your current ASSIGN.SYS file and the appropriate ASSIGN.XXX file and run your new application. Don't forget to rename your new file from ASSIGN.XXX to ASSIGN.SYS.
- The undocumented hyphenation exception dictionary in the file PUBLISH.HYP is an ASCII file that may be edited with any word processor having a text (ASCII) output. To be safe, first make a copy of this file and change the name of the original to something like PUBLISH.BAK. Load the copy of the file into your word processor and insert your new words in proper alphabetical order. Place a hyphen wherever acceptable; you may want to consult a good dictionary for acceptable locations. Save this new file under the name PUBLISH.HYP and then test it by using your new words in Publisher ST. If everything works properly, you may delete the original .BAK file. Publisher ST will

now follow the rules you have prescribed and not apply its own general hyphenation algorithm.

- Timeworks' Publisher can use GDOS fonts other than its own. To do this, rewrite your ASSIGN.SYS file using a text editor or the Atari Install program. Re-boot your system with the new ASSIGN.SYS and run FONTWID.PRG, provided with Publisher ST. Publisher, which uses up to eight fonts, will now recognize the fonts specified in the ASSIGN.SYS. Fonts included with Publisher can be mixed with your own, if the corresponding screen and printer point sizes are correctly identified and installed in your new ASSIGN.SYS file. You must, however, include the Publisher ST Swiss font, as these fonts are necessary for screen displays and as the default font.
- If you have own a 520ST and have experienced difficulties while in text entry mode, Timeworks has a fix for you. The symptoms of this difficulty are that the program asks you repeatedly to "Insert the Overlay Disk," even though it's already in the drive. Then the program crashes with an internal system error message. This occurs because certain versions of the 520ST ROMs require 512 bytes of memory more than others. Solution: Call Timeworks Customer Support Help Line at (312) 948-9208. They will arrange with you to exchange your Version 1.10 for Version 1.11 at no charge. Remember, this only occurs in certain 520ST's and the only difference between the two versions is this obscure bug fix.

- The most common questions asked on Timeworks' Customer Support Help Line concern paragraph styles and style sheets. A *paragraph style* is a pre-defined combination of font, point size, bullets and justification. When you single-click on the Paragraph icon, Publisher ST will display its current Library of paragraph styles, either the default definitions or ones you may have created; if you wish to define others or change the default styles, a double-click on a paragraph style name (such as Body Text) will bring up a dialog box through which you can redefine any of the current style characteristics. You may use this new definition in place of the default style or give it a new name.
- Every paragraph of text has a paragraph style "tag" for the entire paragraph that can be changed in the Paragraph mode; if you wish to change the font, point size or style of part of a paragraph, *do not use the Paragraph mode*. Instead, while in the Text mode, highlight that part of the text you wish to change and choose its new style from the Fonts/Size or Style menu.
- A *style sheet* is a file that includes the page format, Master Page layout (including any text, frames or graphics on it) and your paragraph styles. Every document you save from Publisher ST saves its style sheet with it; when you load it in, its style sheet will replace your current one, so be sure to save your current document or style sheet before loading in a new one. ■

Other Features

There are almost too many features to discuss in a single review, but some of the features that were important to me are the following

Publisher ST is primarily mouse-driven, but Timeworks has provided keyboard equivalents for many functions, plus you can define the function keys for instant change of specific paragraph styles. Help is available merely by selecting Help from the menu bar, similar to Timeworks' other packages.

The main work area lets you view pages at half size, actual size, double size, size to fit (full page), or two pages at once. Although full page and two page displays allow you to see your document's overall layout, like all small-screen DTP programs, it's impossible to read small point size text when displayed at less than actual size.

Left, center, right and decimal tabs add great versatility to tabular text or financial reports and you can instantly place leader dots, making indexes and tables of contents a snap:

Multiphasic Variances in Doppler

Cycles..... 39, 57, 108
On the Author's Correctness of
Thought..... 5, 16
Fallacies of my Rivals..... 2, 61

You can make headers and footers different on left and right pages: if you set one up on a master page, it's placed on all document pages automatically. Page numbering is also automatic. On-screen precision rulers—very handy for laying out custom columns—show the exact position of the mouse pointer, and can display inches/tenths, inches/eighths, picas/points or centimeters.

Other features include snap-to-guides, left and right master pages, precision placement feature accurate to 1/100 of an inch, leading (line spacing), kerning (character spacing), six high-quality fonts and a set of bullets.

Finally, you can add a blank page be-

fore or after the current page and new pages automatically reflect layout information from the appropriate master page.

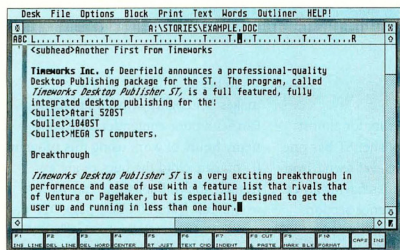
Printing

Publisher ST's dot-matrix print quality is very good. Floppy-based systems take about four minutes to load fonts and six-and-a-half minutes to print one page. Publisher ST, like Migraph's Easy Draw, uses the powerful but cumbersome GDOS printing utility. GDOS laser printer fonts consume large amounts of disk space. You need a hard disk to hold all the available Publisher ST font sizes; a floppy-based system just can't.

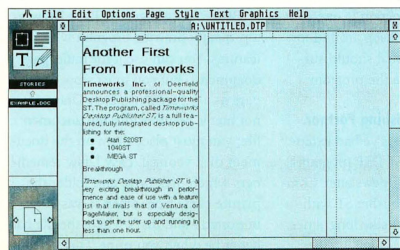
To support floppies, Publisher ST does two things: it reduces the number of available font sizes, creating the larger font sizes by mathematically enlarging

smaller ones. This makes large laser fonts jaggy on a floppy system. I'm not sure how much of a problem this presents: many ST users (like me) print documents at a local Atari "print shop." If the print shop has a hard drive, you're in business. For those of you who "roll your own"—is there anyone who owns a Mega 2 and a laser printer who couldn't scrape up \$550 for a hard disk?

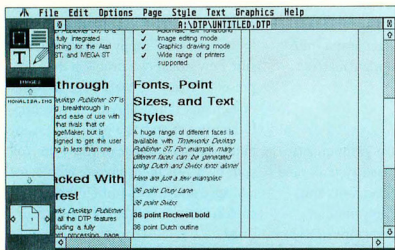
Another potential printing "problem" is a potential 1/4-inch error in horizontal or vertical page alignment on laser printouts due to differences between laser printers. However, Timeworks provides the file TESTCARD.DTP as an alignment test file. Print it out and if shows an alignment problem on your laser printer, change your master pages to compensate. ▶



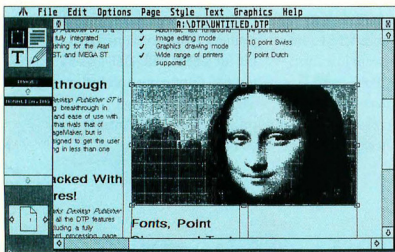
Timeworks Desktop Publishing ST. This screen shows a word processor file tagged with sub-headers and bullets.



This screen shows the result after the file is imported into the program.



This screen shows a Publisher ST page without a graphic.



This screen shows how the program flows your text when you import a picture.

The Manual

I've been a technical writer for almost six years now and Publisher ST has one of the best manuals I've ever seen. (Ironically, it's typeset.) Besides having an excellent tutorial and reference section, the manual contains sample document styles and a picture Library of the 200 clip art pictures provided. The manual comes in a small three-ring binder and slipcase; since this program is one you will definitely want to keep around for quite a while, the manual should survive as long as you use the program.

Easy Draw And Publishing Partner

Over the last two years, I've had extensive experience with ST DTP programs as editor of the ST-ACE newsletter. Comparing Timeworks' Publisher ST with these programs doesn't take long, since there are so few.

To begin, a history of fatal bugs makes SoftLogik's original Publishing Partner a poor contender. I have lost many hours of work using this program. If you can avoid the bugs or are extremely lucky, Publishing Partner is a useful, full-featured multi-page DTP program. (I'm interested in seeing how much SoftLogik has improved their product with the release of Publishing Partner Professional.)

Better yet is Migraph's Easy Draw, a top-quality drawing program with DTP features. You can use it for multi-page documents, but you must store each page as a separate file. Easy Draw does not merge pictures into the document file; you must place them on the document disk yourself. Easy Draw remembers which disk drive and folder the picture came from when it was imported—and that's where the file had better be when you print. That's great

for a hard disk, but not for floppies. Another problem is that all text in a given frame (text box) must have exactly the same format, font type and point size. If you want to boldface a word or enlarge a heading line, you have to create a separate text box for it.

As a full-featured DTP program though, Publisher ST is your best bet. It supports all Atari systems, although you need a hard disk to use all the available font sizes. Oddly, the program accesses the disk almost every time you change the mode of operation (say, from text mode to frame mode). This slows its operation a little, but is a minor inconvenience. The only software bug I know of occurs when you try to make more than one copy of the same page: Publisher ST only prints text on the first copy. Timeworks says that the bug will be fixed on the next major revision, however.

Overall, Publisher ST stands toe to toe with big-name DTP programs on other personal computers. I know many ST owners who've waited a long time for a real desktop publishing program. Timeworks Desktop Publisher ST is worth the wait. ■

Jerry McBride is a technical writer and newsletter editor for ST-ACE in Santa Rosa, CA.

Products Mentioned

Desktop Publisher ST, \$129.95. Timeworks, Inc., 444 Lake Cook Rd., Deerfield, IL 60015, (312) 948-9200, (800) 535-9497.

CIRCLE 220 ON READER SERVICE CARD

Easy Draw, \$99.95. Migraph Inc., 720 S. 33rd St., Suite 201, Federal Way, WA 98003, (206) 838-4677.

CIRCLE 221 ON READER SERVICE CARD

Publishing Partner, \$89.95, **Publishing Partner Professional**, \$199.95. SoftLogik Corp., P.O. Box 290071, St. Louis, MO 63129, (314) 894-8608.

CIRCLE 222 ON READER SERVICE CARD

Mac and PC On The ST

Setting Up pc-ditto

by Jim Pierson-Perry
START Contributing Editor

Welcome back to our column on running Macintosh and PC software on the ST. This issue we'll discuss how to set up Avant Garde System's IBM emulator program, pc-ditto. For this month's column, keep in mind that I'm basing my comments on version 3.01 of pc-ditto, the latest major revision as of press time. If you have a later version be sure to read any included document files to cover any significant changes.

In order to make optimal use of pc-ditto, you must tailor it to fit your particular system. There are three reasons for this: to meet the system requirements of certain software (e.g. it may expect a mouse driver or boot from a 5¼-inch disk drive), make use of additional hardware (hard disk) and to cater to user aesthetics (color schemes, key repeat rate). Most of these are taken care of by the PC_DMENUPRG program, included with pc-ditto.

Environmental Control

You can set and change the pc-ditto customizing options at any time by running PC_DMENUPRG. The program runs under GEM, not DOS, and is fully menu-driven with various context-sensitive help messages. (I'll refer in this column to "DOS" to include Microsoft

MS-DOS, IBM PC-DOS and the various DOS clones; where a specific version is required, I will specify it.) The options are grouped under sub-menus for disk, video, keyboard, colors and mouse—just click on the desired sub-menu button and all the related options are displayed (see Figure 1). After making any changes, either click on the Save Changes or Cancel Changes button to return to the main menu.

The Disk options determine the startup DOS disk drive, type of external drive, if a hard disk will be used and if non-GEM partitions will be accessed. You would typically want the DOS startup disk (A:) to be the ST drive A (first drive option). Some IBM programs, however, are copy protected on 5¼-inch floppy disks. In that case, an external 5¼-inch drive connected to the ST must act as the startup disk (second drive option). If you have a second floppy disk drive you must also specify the format (3½-inch or 5¼-inch) for pc-ditto to recognize it. (I'll discuss hard drives in a moment. For now, note that if you're going to use a hard drive, set the Hard Drive Attached option to Yes.) A final option lets you set if non-GEM hard drive partitions can be read. For normal PC emulation, these special for-

mats (such as Magic Sac) should be ignored.

The Video options select the IBM monitor type to emulate and compensate for Atari ST monitors not having the hardware for certain IBM monochrome monitor special effects. IBM programs may require a specific monitor type in order to run properly (consult the respective manual). All Atari monitors support both IBM color and monochrome displays through pc-ditto (color display on an Atari monochrome screen is done by shading). You can use reverse video on Atari monitors to represent text highlighting, blinking, underlining or any combination of the three.

The Keyboard options let you adjust key response to match your typing. Controls are provided for the number of repeat key strokes sent per second and the delay in seconds before they start after a key is held down. You can use the Colors options to change the display palette to match your taste, and can select 16 hues via RGB controls, similar to the GEM Control Panel. From these, the four colors used in 80-column text mode and two colors used in the medium/high resolution mode are selected.

The final sub-menu describes the ▶

Mouse options. Many, but not all, PC programs are able to use a mouse as a control device. The pc-ditto program supports two different implementations: a *serial* (compatible with the Microsoft mouse) and a *generic* mode. To use the Atari mouse as a Microsoft mouse (assuming the PC program you want to run supports it), you must select the

titions must be larger than 4.2 megabytes and less than 32 megabytes.

Since DOS can read standard GEM formatting, there's no need to reformat a hard drive for use with pc-ditto. The exception to that is when installing DOS to autoboot from partition C:. You can install DOS to autoboot from partition C:, even if that's also the GEM startup

ditto to activate the revised CONFIG.SYS file and your hard drive is ready for use.

You may elect to streamline operations and have DOS autoboot from the hard drive (partition C: only!). First, back up any existing programs in C: as the DOS installation process will clear the partition. Issue the FORMAT C:/S command from DOS then return to GEM and restore the original C: files. Depending on your particular hard drive, you may need to designate it for autobooting—just as if for GEM. For example, my Supra hard drive uses a utility program to do this. The next time you load pc-ditto, it will automatically boot from partition C:.

After you've used pc-ditto with a hard drive, you may wish to explore changing the Buffer specification in the DOS CONFIG.SYS file to improve performance speed. Appropriate values depend on your version of DOS and available memory. As a starting point, try values of 15 to 25 for a 520 ST and values of 25 to 35 for a 1040 ST.

Hello, I Must Be Going

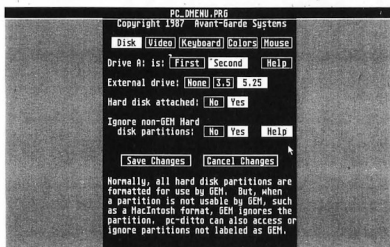
Closing this month on a personal note, this will be my last installment for this column. Starting next issue, David Plotkin will be taking over and I will move over to start a new column called "The ST/MIDI Connection." Dave is well-known throughout the Atari community and will be bringing his wealth of experience and new ideas to keep this column pushing ahead. Good luck to all of you with pc-ditto! ■

Jim Pierson-Perry is a research chemist and semi-professional musician who lives in Elkton, Maryland.

Products Mentioned

pc-ditto, \$89.95 Avant Garde Systems, 381 San Pablo Drive, Jacksonville, FL 32225, (904) 221-2904.

CIRCLE 180 ON READER SERVICE CARD



The PC_DMENU program runs under GEM, not DOS, and is fully menu-driven with context-sensitive help messages.

serial option in this menu and run a driver program (PC_DMOUS.COM, supplied with pc-ditto) under MS-DOS prior to running the application. In generic mode, the mouse can send a series of arrow keystrokes corresponding to position changes and each button can be assigned to any of the PC keyboard keys (e.g. F1-F10, Page Down, Esc, etc.).

Hard Drive Help

Installing a hard drive to work with pc-ditto isn't difficult. The only drawback is that you must use DOS 3.0 or higher. Earlier versions did not work with a hard drive, and attempts to do so can corrupt your files. At this time, only IBM PC-DOS—no clones—can be installed to autoboot from a hard drive.

DOS is picky about how hard drives are set up. It expects that there will be one partition per hard drive. As most Atari hard drives use multiple partitions, a special driver comes with pc-ditto for accessing partitions beyond C:. The partition size is also regulated: par-

disk. Atari and IBM files can peacefully co-exist in the same partitions.

The first step in bringing up a hard drive is to run the PC_DMENU.PRG customization program. Click on the Disk sub-menu button and select Yes next to the Hard Drive Attached option. Unless you have a very good reason, leave the Ignore Non-GEM Hard Drive Partitions option set to Yes. Save the change and exit back to the Desktop. Next, check your version of DOS. If it's earlier than 3.0, buy yourself a copy of the current DOS 3.3—the early versions do not support hard drives and you risk corrupting your files if you try.

Unless your entire hard drive is configured as partition C:, you need to install the PC_DHDSYS device handler. To do this, boot pc-ditto and go into DOS, then type the command COPY CON+CONFIG.SYS and press Return. Type DEVICE=PC_DHDSYS (careful, spelling does count!) then press the Return key, followed by the F6 function key, then press Return again. Reboot pc-

The reviews are in . . .

"A Best Buy? I'm impressed"

David H. Ahl, Atari Explorer, Nov-Dec 1987

"If you've got an Atari, you probably need this program."

Jerry Pournell, Byte Magazine, October 1987

"pc-ditto is a winner."

Charlie Young, ST World, July 1987

"This is the product we have been looking for."

Donna Wesolowski, ST Informer, August 1987

"This truly incredible software emulator really works."

Mike Gibbons, Current Notes, September 1987

NOW! RUN THESE IBM PROGRAMS ON YOUR ATARI ST.

Lotus 1-2-3
Enable
Sidekick
Crosstalk IV
EasyCAD
GW Basic

Flight Simulator
Ability
Superkey
Carbon Copy
DAC Easy Accounting
Managing Your Money

Framework
DESQview
Norton Utilities
Chart-Master
BPI Accounting
Silvia Porter's

Symphony
Q&A
dBase II,III,III+
Print Shop
Turbo Pascal
pfs:Professional
File

And Hundreds More!

pc-ditto is a software-only utility which expands the power of your Atari ST to imitate an IBM PC XT. No extra hardware is required (an optional 5.25-inch drive may be required for 5.25-inch disks). All your IBM disks will work "out-of-the-box".

pc-ditto features include:

- o both the 520ST and the 1040ST supported
- o up to 703K usable memory (1040ST)
- o not copy-protected - installable on hard disk
- o imitates IBM monochrome and IBM color graphics adapters
- o access to hard disk, if hard disk used
- o optionally boots DOS from hard disk
- o parallel and serial ports fully supported
- o supports 3.5-inch 720K format and 360K single-sided formats
- o supports optional 5.25-inch 40-track drives

System requirements:

- o IBM PC-DOS or Compaq MS-DOS version 3.2 or above recommended
- o optional 5.25-inch drive is required to use 5.25-inch disks
- o 3.5-inch 720K DOS disks require a double-sided drive (Atari SF314 or equivalent)

See pc-ditto today at an Atari dealer near you,
or write for free information!

\$89.95

pc-ditto
by

Avant-Garde Systems
381 Pablo Point Drive
Jacksonville, Florida 32225
(904) 221-2904

Avant-Garde Systems, 381 Pablo Point Dr.
Jacksonville, Florida 32225 (904) 221-2904
Yes! Please send information on pc-ditto.
Name _____
Address _____
City _____ State _____ Zip _____

Zoom in on the unseen! Files MICRO1.ARC and MICRO2.ARC on your START disk.

The idea for ST Microscope came from a visit I had with Kim Bridges at the University of Hawaii. He told me of his plans to create a computer-simulated microscope as a teaching tool. This program would be able to teach his introductory plant biology students the fundamentals of microscopy. Through a grant from Hewlett-Packard, Dr. Bridges had available several of H-P's high-powered Bobcat work stations. But the idea intrigued my wife and me, so I decided to see what our ST could do. ST Microscope is the happy result.

microscope files from disk. Each slide requires a data file with the extender .LST and four low-resolution picture files, which can be in either compressed (.PCI) or uncompressed (.PII) DEGAS format. I recommend that you create a folder called SLIDES and copy all of the picture files to it. MICRO.PRG and MICRO.LST can be outside this folder. ST Microscope will first look in the SLIDES folder for MICRO.PCI, its workscreen picture; if it doesn't find it there it will look for it in the same directory as MICRO.PRG. If it still can't find it, a file selector box will appear and you can then specify its path. Wherever ST Microscope finds MICRO.PCI will be treated as the default directory for the slide files.

ST MICRO

ST Microscope simulates a real-world microscope—you can explore what's happening on the smaller side of life. Study the slides on your START disk of a neuron and a blood smear or create your own slides. ST Microscope works in low resolution only.

by Ron Shaefer, M.D.
and Kathy Shaefer, M.D.

Running The Program

The ST Microscope files are on your START disk compressed into two separate archive files. MICRO1.ARC contains the program, source code, title screen and neuron slide files. MICRO2.ARC contains the blood smear slide files. Un-ARC these files onto separate disks, following the Disk Instructions elsewhere in this issue. Delete ARCX1TP and MICRO1.ARC from the MICRO1 disk and then copy over the SMEAR files. When you're finished, set your ST to low resolution and double-click on MICRO.PRG. MICRO.LST is an ASCII listing of the program; to examine it, double-click on the file icon from the Desktop and then click on Show or Print. To load the file into GFA BASIC, run GFA and click on Merge, then select MICRO.LST.

ST Microscope reads simulated

Getting Started

To use the program double-click on MICRO.PRG in low resolution. Now load a slide file with an .LST extender by clicking on the LOAD button found in the lower right portion of the screen. Choose a file with the file selector and the slide files will load into memory. Welcome to the microscopic world!

What You See. . .

The screen is divided into four major sections. The upper left section is the enlarged microscopic image and the upper right contains the microscope controls. Text is displayed in the lower left section and the lower right section contains the main program controls.

The microscope controls consist of the Move Buttons, Magnification Buttons and the Position Indicator. The Move Buttons control which portion of

the slide is visible; this is analogous to adjusting the position of the slide under a microscope. Just click on the large arrow pointing in the direction that you want the *microscope* to move. The box in the middle of the arrows will center the image. These buttons will only work when they are highlighted in green—you can only move the slide around in magnifications between 250x and 1000x.

The Position Indicator shows a representation of the entire microscope slide and what portion of the slide you are looking at. A tone tells you when you reach the edge of a slide.

The Magnification Buttons (small up and down arrows) increase or decrease the magnification. The magnifications

file that's clipped and displayed in the microscope image area. If you click the left mouse button the coordinates of the mouse's pointer (MX,MY) and the Color Index Number of that position will be displayed. I'll explain what that means below.

The LOAD button allows you to select an index data file (with an .LST extender) for a set of slides. The program will then load the four picture files associated with the index data file; each picture shows a different magnification. For example, the slide set on your START disk called SMEAR consists of SMEAR.LST, SMEAR.P11 (the lowest magnification of the picture and a small picture that displays the position indicator), SMEAR_1.P11 (250x magnifica-

X Marks The Spot

When the mouse cursor is on the image area it will turn from a pointing finger into a thin crosshair. If you left-click while using a magnification greater than 5x, the program will print the name of the object under the crosshair along with several lines of information about that object.

How To Make Your Own Slides

Now, on to the creative process. You can create a slide of any topic—for yourself, your students or just for fun. The first step is to decide what your slide will look like. (We suggest going to the library and checking out a book on microscopy for some inspiration.) Now sit down with paper and pencil and sketch out what you would like your four picture files to look like. Load the sample files on your START disk into your paint program to examine their format. You may use any paint program that will save your pictures as DEGAS files.

When creating our slides we made extensive use of DEGAS Elite's block copying and sizing options. If you have access to a video digitizer or a printer scan digitizer you can speed this process up considerably. The magnification powers are somewhat arbitrary; don't feel you have to adhere to them exactly.

SCOPE

available are 5x, 250x, 500x, 1000x, 2000x, 4000x and 8000x. If you are at one of the extremes of magnification the appropriate arrow will turn red, indicating that you can't go any further. For magnifications over 1000x the computer pauses as it calculates the image. If you later return to the same magnification (without moving the slide) the computer will not need to redo the calculations.

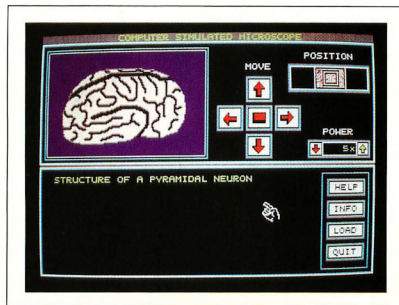
Program Options

The HELP button gives you basic instructions on how to use the program.

The INFO button is a programming tool that will be of great use if you're creating your own ST Microscope slides. When you click on INFO, the mouse turns to an open crosshair and tells you the X and Y coordinates (SX,SY) of the upper left corner of the DEGAS picture

tion), SMEAR_2.P11 (500x magnification) and SMEAR_3.P11 (1000x magnification). The ST will calculate higher magnifications.

The QUIT button ends the program.



ST Microscope representation of a neuron, magnification 5x. ST Microscope works with any .P11 or .PCI picture files. It could just as easily be used as an electronic telescope!

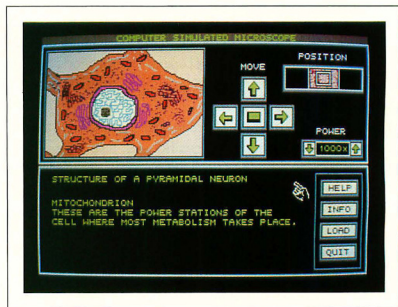
For example, the program should work equally as well as a simulated telescope with pictures of a galaxy magnified into a star field, then a solar system and finally into a single planet. Pictures may be saved in either normal or compressed DEGAS format. The file names, however, must be consistent; the lowest magnification picture must have a file name of no more than six characters (e.g. NEURON.P11); subsequent pictures in a set add an underscore and a number to the file name (e.g. NEURON_1.P11, NEURON_2.P11, etc.).

Each object you wish to identify in your slides must have a unique color index, since ST Microscope uses the color index to identify different objects. The 16 colors in low resolution on the Atari ST are each assigned a different color index numbered 0-15; 0 is reserved for the background color of black. You can use the other 15 distinct colors in your slides. Because ST Microscope uses the color index and not the shade of color to identify objects, two colors can be set to the exact same shade and still be distinguished from each other by the pro-

```
'5,BASOPHIL
'5,THE RAREST CLASS OF WHITE
BLOOD
'5,CELLS WITH DEEP BLUE
GRANULES
'6,
'6,
'6,
'7,BUR CELL OR ECHINOCYTE
'7,TYPE OF RED BLOOD CELL IF
FREQUENT
'7,CAN BE A SIGN OF KIDNEY
DISEASE
```

Figure 1: A portion of the SMEAR.LST file. Each line begins with an apostrophe and a comma, followed by the Color Index Number, another comma and the text for that object.

ST Microscope magnification of a neuron, magnification 1000x. You supply the pictures for magnifications of 5x, 250x, 500x and 1000x; your ST calculates the higher magnification images.



gram. For instance, in the human blood smear slide there are four reds in the palette of 15 colors, but only three different shades of red. Colors 7, 8 and 9 are different shades, but color 3 is the same shade as color 7. You can also have different color indexes represent the same object, for example, colors 3, 8 and 9 all represent a red blood cell.

You can create your own ST Microscope color index file with any word processor that has an ASCII (text) mode; alternately, you can create one using the GFA BASIC interpreter itself. For an example of how to set up a data file, examine SMEAR.LST and Figure 1, which shows a portion of that file. The first characters of each line must be a single quote and a comma (',') and the first line of the file is the slide title. Following are three lines of color information and text for each object on the slide corresponding to that color. These lines also start with a single quote and a comma, followed by the color index number (1-15), another comma and the text to be displayed when you select that object. Keep your text less than 40 characters long, so that it will fit in the text box properly.

The first 45 lines after the title (15 colors by 3 lines of text each) are the color index and text for the pictures representing magnifications of 250x and 500x. The next 45 lines use the

same format for the picture representing magnification of 1000x. Note: Each file must consist of exactly 91 lines—the title and two sets of 45 lines each of data. Because commas are used to separate the data, do not use them in your text or you will hopelessly confuse the program. If you don't want any text to be displayed with an object or if your text is less than three lines long, just put a period in place of the text '1,5,1.

Where To Get More Slides

We realize that the process of creating new slides is somewhat involved. We have created three slides—a human neuron, a human blood smear and a housefly. Due to space constraints only the first two of these are on your START disk, so we would like to offer our services as librarians and compile a collection of different ST Microscope slides. Send us a disk with your own slide pictures and data and a self-addressed, stamped disk mailer and we will send it back filled with the best slide pictures and data that we have received.

Please send your disks to: Schaefer Supergraphics, c/o Ron Schaefer M.D., 1201 Wilder Ave #1801, Honolulu, Hawaii 96822, phone (808) 523-3353. ■

Ron and Kathy Schaefer are M.D.'s specializing in internal medicine. They live and practice in Honolulu, HI.

Clipboard

Compiled by Heidi Brumbaugh
START Programs Editor

Three-character filename extenders often provide clues that identify the types of files on your disk. START has found a number of standard names—some mnemonic, some arcane, some just plain silly. Many of these extensions are holdovers from previous computer systems. Others were designed specifically for the ST, and some—those marked

with an asterisk—are acted on by the operating system in a special way. As a general rule, unless a file has a .PRG, .TOS, or .TTP extender, or has been installed from the Options menu of the Desktop, that file will be read as a text file from the ST Desktop and you will receive a "Show/Print/Cancel" box if you double-click on it.

This issue, we're devoting the Clipboard to some of the generic extenders we find common and useful to know. Next issue, we'll publish a detailed list of extenders used by the major commercial ST programs—so you'll know exactly what files are cluttering up your disks and why!

.ACC	Active desk accessory.*	.DFN	Resource companion file.	.O	Linkable object file.
.AC_ or .ACX	Inactive desk accessory.	.DOC	Text document.	.OVL	Overlay file.
.APP	GEM application (IBM).	.DUP	Backup file.	.PAR	Parameters file.
.ASC	ASCII file.	.FNT	Font file.	.PAS	Pascal source code.
.ASM	Assembler source code.	.GEM	GEM VDI graphics metafile.	.PRG	Executable GEM file.*
.BAK	Backup file.	.H	C include file.	.PRN	Printer definition.
.BAS	BASIC file.	.HLP	Help file.	.PRT	Printer definition.
.BAT	Batch file.	.IMG	GEM bit-image file.	.RSC	GEM resource file.
.BIN	Binary object file.	.INF	GEM information file (e.g., DESKTOPINF*).	.RSH	Resource source file.
.C	C source code.	.INP	LINK68 input file.	.S	AS68 assembler source file.
.CFG	Printer configuration file.	.LOG	LOGO file.	.SYM	Symbol table.
.CNF	Configuration file.	.LST	Output listing.	.SYS	System file.
.DAT	Data file.	.MAC	Macro.	.TOS	Executable TOS file.*
.DEF	Resource companion file.	.MAN	Manual.	.TTP	Executable TOS-takes-parameters file.*
.DIC	Dictionary file.			.TXT	ASCII or ST Writer file.

BASICs for the ST Revisited

Updates, References and More!

by Dave Plotkin

See these BASICs in action for yourself! The benchmarks for this article are in the file *BENCHBAS.ARC*.

In the Summer 1987 issue of START, I wrote a comparison of BASIC languages for the Atari ST. In the last year, there have been many significant developments in this language—the release of GFA BASIC probably being the most important. In the Summer 1988 issue START published a chart summarizing the features of the current BASICs on the market. This issue, I'll describe updates to the programs I reviewed last year, take a look at the new BASIC released and discuss support materials. It's not the purpose of this article to repeat the information presented in last summer's article; you'll find most of that information still accurate.

At the end of this article is a table that presents benchmark results on the BASICs we tested. These benchmarks are on your START disk in the file *BENCHBAS.ARC*. The purpose of the benchmarks is to test the speed of various functions important to BASIC programmers—string handling, writing to disk, calculations, calling subroutines

and looping. Since the benchmarks were written to have similar code, they should be used as indicators of a language's speed, rather than as an absolute measure of how fast the language can perform a function. In your own programs, you would use special functions unique to a particular language for optimization.

ST BASIC Version 2.0

ST BASIC is the language bundled with the ST by Atari. It has decent string handling capabilities, rudimentary graphics and sound, low-level GEM support, good loop structuring and debugging tools. Since its introduction in Version 1.0, it has had quite a bit of bad press because it uses a distracting number of windows and is quite slow. Now in Version 2.0, the notoriously inaccurate floating point math package has been considerably improved and many of the functions are faster (see the benchmarks). Unfortunately, some of the functions are a little slower. The cumbersome DEF SEG command has been replaced by multiple-byte PEEKs and POKEs.

Atari has corrected some of the bugs, but has introduced others. For example, there are no benchmarks listed for

string handling and writing to disk because ST BASIC stopped at line 770 with a "System Error #1" (this benchmark ran fine under Version 1.0). All attempts to edit line 770 resulted in a spectacular two-bomb crash to the Desktop. No other significant improvements have been made to the language and ST BASIC has fallen somewhat into disfavor among ST owners, even as a language for printed listings. As an added inconvenience, ST BASIC programs created with 1.0 will not always run under 2.0.

LDW BASIC Compiler Version 2.0

The LDW BASIC Compiler (LDW) includes a shell program, compiler, linker and necessary libraries. It started out with one function—to compile ST BASIC into standalone .PRG files. With Version 2.0, however, this function became just a small part of what LDW does. All the GEM bindings included with the original package still work, but about 50 new commands lift it head-and-shoulders above ST BASIC as far as GEM support is concerned. The shell program makes Version 2.0 easier to use than Version 1.0. It is fully menu-driven, uses two windows and lets you set and save options for compiling and storing ▶

files. There are a multitude of other options, including the ability to turn line numbers off and on, choose various error-checking protocols and either compile directly to binary code or create assembly source. Unfortunately, it's more difficult to set up batch files than it should be because the documentation for using them is poor.

New commands include support for menus, mouse position and button status, multiple windows and event messaging. Further, an event can trigger LDW to jump to a subroutine even while it is doing something else. Moving and resizing windows is handled automatically; LDW will tell you if a window needs to be redrawn and the REDRAW command lets you do it using the buffers which LDW maintains. You can call simulated dialog boxes and LDW will return the button selected or any text entered in a field. LDW now predefines the arrays required for using the GEM bindings so you don't have to PEEK and POKE the values. You can now use an ELSEIF/ELSE/ENDIF construction, as well as multi-byte PEEKs and POKEs. You can include another BASIC program in your current one and LDW has new functions for drawing filled shapes—but the manual's explanation of these is worthless.

The LDW manual is a disastrous collage of sections. Each new section details changes from the previous version; a separate index even details only the changes. The organization is poor; for example, the reference section for the new commands is located in the back and instructions on how to modify your batch files (which should be the first thing you do) are in Chapter 4. Further, the printed GEM bindings do not match the ones included on the disk. Overall, the manual needs a complete rewrite.

SQL

Regent Software has released LDW Structured Query Language (SQL) additions. SQL is the official American stan-

ST BASIC has fallen into disfavor even for printed listings.

dard database language approved by ANSI (American National Standards Institute). This package adds database commands such as CREATE, DELETE, SORT, etc., making it easier for people to design and program relational databases. The package comes with a 36-page manual, including a 15-page tutorial.

Softworks BASIC

SoftWorks BASIC compiles programs to an intermediate code called p-code. It compiles faster than LDW, but the code it generates does not run as fast and requires a runtime package.

SoftWorks is fairly complete—it's missing WHILE, CASE and procedures, but includes mapped variables, substring operators, memory-moving routines and up to seven dimensional arrays. There is no support for graphics, windows, alerts, menus or mouse usage and the GEM support is at a very low level—you can only call subroutines which have the same names as C calls. However, the documentation does not help you use these. Since our original BASIC comparison, the company has made no substantial changes to the package, but has raised the price from \$79.95 to \$295.95. Their explanation is that they are now gearing the product toward the vertical development market rather than toward consumers.

Fast ST BASIC

This BASIC has more commands than any of the others, including commands

for all GEM functions as well as for structured programming (procedures and functions), advanced loop and decisions (WHILE, CASE, REPEAT), system access, bit-blitting and double-precision variables. This BASIC is more sensitive to syntax errors than most—even a space in the wrong place can cause an error. A powerful editor allows up to 10 programs in memory at once.

The bugs I reported last summer have been cleaned up and all the keywords work. The language also manages to run all its demos without crashing. It is now available both in the original cartridge form and on disk; the manual is only sold with the disk version and you must be a registered owner to buy the cartridge. A runtime package is available (sold separately) so that you can distribute copies of your program to people who don't own the language. Eidersoft now supports the product and technical support has gone from non-existent to good.

GFA BASIC Version 2.0

GFA BASIC from MichiTron is a well-rounded BASIC that has become very popular, due both to its power and to MichiTron's excellent support. It includes a text editor with block operations and automatic indenting. Loop and decision commands (DO/LOOP, REPEAT/UNTIL, WHILE/WEND) make structured programming easy. GEM support includes menus, alert boxes, multiple windows and event detection, as well as graphics. GFA is very fast for many operations.

GFA BASIC Version 2.0 fixes some minor bugs and lets you use keywords in variables. The distribution disk now includes many more useful example programs.

About the manual: the original GFA BASIC manual was so poor, I took it upon myself to rewrite it for MichiTron. As the ST community has been kind enough to tell me, it's regarded as an improvement, although I think I could still

BASIC BENCHMARKS

Manufacturer	ST BASIC			LDW	SoftWorks	Fast ST BASIC	GFA BASIC		True BASIC
	Atari			Logical	SoftWorks	Computer	MichTron		True BASIC
	1.0	2.0	Mega 520 ¹	Design Wks	Limited	Concepts	2.0	3.0	
Time (in seconds):									
Value of Pi	4.20	3.08	2.58	1.02	2.70	1.10	.75	.36	.72
Sum of Sines	.30	.53	.43	.12	1.87	.12	.14	.16	.42
Sum/SqRoots	.25	.33	.28	.07	.98	.10	.10	.10	.40
Real Count	11.52	7.6	6.35	1.08	4.23	2.75	1.10	.47	1.04
Int. Count	9.55	5.7	4.73	.68	7.68 ²	2.00	.39	.24	.62
Gosub	1.85	1.3	1.12	.13	.55	.30	.21	.13	.24
String Hndlg	1.57	N/A	N/A	.27	1.28	.35	.34	2.3	.54
Disk Access	21.52	N/A	N/A	13.37	14.67	8.65	12.58	9.83	12.62
Compile/Link	---	---	---	9:08	0:15	---	---	---	3:90

¹ The benchmark results for ST BASIC 2.0 were different on the Mega and 520ST we tested them on, so both results are given here.

² Softworks Limited converts all integers back to floating point, so integer operations are slower.

improve its organization. I corrected many of the typos of the original and the program examples now run on both color and monochrome monitors. The manual also has additional information on using GEM.

GFA BASIC's popularity has generated a market for support products:

- MichTron has released the GFA Compiler, which is GEM-driven and very easy to use. As a result, ambitious programmers are now using GFA's inherent speed to write professional-quality programs.
- Regent Software's has an SQL add-on package (see LDW, above) for GFA BASIC.
- MichTron is distributing Marathon Computer Press's GFA Companion, also currently in Version 2.0. This package provides the tools to build standard GEM menus, bottom-up menus and break-away menus (which can appear anywhere on the screen), as well as several types of "pseudo" dialog boxes complete with text, buttons and editable

fields. The package will write the code for you, but cannot be used in programs for publication because the generated code is copyrighted. That may be just as well as the code is very inefficient. Certain aspects of the package are also not as flexible or friendly as they could be. For example, the routine to generate menus is TOS-based. It asks you a series of questions and if you make a mistake it's difficult to go back and edit your answers.

- MichTron has released GFA Vector, a tool for generating 3-D images which you can include in your own programs. It works well and provides many options for three-dimensional work that is otherwise impossible in GFA BASIC. The editor even lets people use images who have trouble visualizing 3-D objects.
- Several books on GFA have been released and more are on the way. These include the GFA BASIC Book (\$39.95 with disk), an intermediate guide which details such topics as

GEMDOS, BIOS, XBIOS, AES and resource construction. Its complete and detailed example of using multiple windows is very useful. Also by MichTron is the GFA BASIC Training Reboot Camp (\$19.95), a beginning tutorial book. It includes many more in-depth examples than the GFA BASIC manual and the sample programs use many of the BASIC commands.

GFA BASIC Programmers Reference Guide, Vol. 1 (\$29.95) is by George Miller, late of Compute!'s ST magazine. It is an advanced-level text (but still easy to read) with detailed information about graphics, animation, page flipping and sound. It also includes multiple appendices summarizing BIOS, XBIOS and GEMDOS functions. A second volume is planned. A Reference Card (\$4.95) summarizes all the GFA commands in one easy-to-use form.

And finally, Abacus's GFA BASIC Quick Reference Guide gives a short description of each command without programming examples. The triple in- ▶

dex (command, subject and alphabetical) is very useful.

GFA BASIC Version 3.0

MichTron's GFA BASIC Ver. 3.0 was not quite ready for distribution at press time, but George Miller, Director of Product Support at MichTron, was able to supply us with the benchmarks and a run-only package of version 3.0 to test them. This completely new implementation of the language will still run any 2.0 program, but adds more than 300 new commands. Features include Line A access, joystick input, object manipulation, the CASE command, bit manipulation, access to all AES functions (including dialog boxes) and changes to the editor to make it easier to use. The new version is also considerably faster. It is packaged with a Resource construction set and a compiler for Version 3.0 is currently under development.

True BASIC

True BASIC was released after we went to press with the original BASIC comparison. It is the brainchild of the inventors of BASIC, John Kemeny and Thomas Kurtz of Dartmouth. It is a massive and powerful language and is compiled to P-code, so that it is quite fast as well. The final code requires a runtime package if you don't own True BASIC.

The text editor is complete with menus and windows and is just short of a word processor. It uses block operations (cut and paste), Find and Replace, programmable function keys, script files and has the very best error messages I've ever seen. You can compile or run your program from the editor and there is also an immediate mode for debugging.

The BASIC language includes structured programming commands such as CASE, IF/THEN/ELSE and DO/LOOP. Line numbers are optional. You can include subroutines in programs or store them in external libraries so that differ-

Compiling ST BASIC programs is now just a small part of what LDW does.

ent applications can share them. No complex linking procedure is required; the libraries can be called simply by name. Programs are portable to the IBM PC, Amiga and Macintosh versions of True BASIC because it uses a graphics system which is independent of the machine. This takes a little getting used to, but is handy in the long run. You can even define your own coordinate limits and color palette. Graphics commands include BOX, CIRCLE, LINES and POINTS. Multiple windows (not GEM windows, but simply screen rectangles) can be handled automatically. Integer math is used whenever possible; there is no need to declare integer variables specifically. Floating point math is very accurate and matrix math operations are built-in.

Tracing and Cross-Referencing of variables is supported via DO files. Music is supported with the PLAY command, where you supply a string which contains notes of a tune. You can even play the tune in the background. Unfortunately, the archaic LET command for assigning variable values is required. Other features of True BASIC include program chaining, extensive math support (but not hyperbolic trig functions), sequential and random access files, dynamic resizable arrays, substring manipulation and sophisticated error handling.

True BASIC for the ST comes with two manuals—a generic manual which

is the same for any version and an ST supplement. Extra functions include more graphics, push-button menus, system functions (PEEK, POKE, access to GEMDOS, XBIOS, BIOS, AES and VDI). Access to system functions are by their number, much as with ST BASIC, and there is no documentation on what the various functions do.

True BASIC has released a series of libraries you can link with your programs. An advanced String library provides a large assortment of extra string functions, including pattern matching, scanning expressions, parsing, text manipulation, date and time routines and conversions from Arabic to Roman numerals. It also contains functions to detect the union, intersection and difference between strings. The Mathematician's Toolkit provides access to advanced math functions such as imaginary and complex operations, solutions to quadratic equations, hyperbolic trig functions and unlimited precision numbers. Sorting and Searching includes bubble sorts, heapsorts, quick sorts and selection sorts.

3-Dimensional Graphics includes perspective and parallel projections, plotting function in three dimensions, scaling and moving view. Finally, the Developer's Toolkit makes GEM functions available on a high level. GEM VDI graphics and attributes, menus (change, disable, check items) windows (set size, sliders, arrows, title, info line, switching, scrolling), sound library, events (mouse, key, window) and graphics (growbox, rubberbox, shrinkbox, etc.). The manual that comes with the Developer's Toolkit gives brief descriptions of how to use each function. While these are not exhaustive explanations, they are adequate to make use of the functions.

Come And Gone

A lot can happen in a year. DBASIC from DTack Grounded Systems was an extraordinarily fast language, which unfortunately used none of the tools

that make the ST such an attractive machine. It even required its own operating system. Distributed through a strange giveaway/pay scheme (the software was free but you had to buy the manual), the language was not profitable and DTrack Grounded is no more.

Editor's note: *We were unable to obtain a copy of CCL's Real BASIC Version 1.3 in time for this review. A review of this language (and GFA BASIC 3.0) will appear in an upcoming issue of START.* ■

Dave Plotkin is an engineer for Chevron U.S.A. and is a frequent contributor to START and Antic.

Products Mentioned

ST BASIC Ver. 2.0, shipped free with ST computers. Atari Corp., 1196 Borregas Ave., Sunnyvale, CA 94088, (408) 745-2000.

CIRCLE 200 ON READER SERVICE CARD

LDW BASIC Compiler Ver. 2.0, \$89.95 (upgrade from Ver. 1.0 or 1.1 is \$25 plus your original disk). Logical Design Works, 780 Montague Expwy., Suite 403, San Jose, CA 95131, (408) 435-1445.

CIRCLE 201 ON READER SERVICE CARD

SQL add-ons for GFA and LDW, \$30 each. Regent Software, P.O. Box 14628, Long Beach, CA 90803, (213) 439-9664.

CIRCLE 202 ON READER SERVICE CARD

Softworks BASIC, \$295. Softworks Limited, 607 W. Wellington, Chicago, IL 60657, (312) 975-4030.

CIRCLE 203 ON READER SERVICE CARD

Fast ST BASIC, \$89.95; (cartridge is additional \$59.95); runtime disk (\$19.95). Computer Concepts, distributed by Eidersoft USA, P.O. Box 288, Burgettstown, PA 15021, (800) 992-9198.

CIRCLE 204 ON READER SERVICE CARD

GFA BASIC Ver. 2.0, \$59.95; Ver. 3.0, \$99.95 or \$49.95 for the upgrade; **GFA Compiler**, \$59.95; **GFA Companion Ver. 2.0** (by Marathon Computer Press), \$49.95; **GFA Vector**, \$49.95; **GFA BASIC Book**, \$39.95 with disk; **GFA BASIC Training Reboot Camp**, \$19.95; **GFA BASIC Programmer's Reference Guide, Vol. 1**, \$29.95; **Reference Card**, \$4.95. MichIron, 576 S. Telegraph, Pontiac, MI 48053, (313) 334-5700.

CIRCLE 205 ON READER SERVICE CARD

GFA BASIC Quick Reference Guide, \$14.95. Abacus, 5370 52nd St. SE, Grand Rapids, MI 49508, (616) 698-0330.

CIRCLE 206 ON READER SERVICE CARD

True BASIC, \$99.95; libraries are \$69.95. True BASIC, 39 South Main St., Hanover, NH 03755, (603) 643-3882.

CIRCLE 207 ON READER SERVICE CARD

ProCopy ST BACKUP UTILITY

You can't backup your software because copy protection locks you out. **ProCopy** is the key!

- Protects against the accidental loss of expensive software
- Works with all Atari STs
- Copies both S/S & D/S disks
- Use with 1 or 2 disk drives
- Not copy protected
- **FREE** shipping and handling
- **TOLL-FREE** telephone number
- Updates are only \$12 with return
- Orders shipped same day
- Disk analyze function included

Dealer
Inquiries
Welcome

VISA  and C.O.D. orders
Call (800) 843-1223

\$34.95

Send check for \$34.95 (overseas add \$2.00 for air mail) to:

PROCO PRODUCTS

P.O. BOX 665, CHEPACHET, RHODE ISLAND 02814 USA
(401) 568-8459

Available
Internationally
in Europe
and
Australasia

THE MOVING FINGER CO.
Building 2
Shamrock Quay
Southampton, SO1-1QL
England
Tel. 0703-227274

TECH-SOFT
COMPUTER WHOLESALER
324 Stirling Highway
Claremont
Western Australia 6100
Tel. 09-385-1885

CIRCLE 033 ON READER SERVICE CARD

Public Domain Software

Over 550 Disks Available for the Atari ST
\$4.00 Each

Utilities, Games, Magic Sac, MIDI, Applications, Music
Publishing Partner Clip Art, Educational, Graphics
Same Day Shipping Telephone Support
Free Catalog Updates

Call Toll Free or Write for FREE Catalog
(800) 622-7942


Clip Master



10 Screens per disk
\$19.95 per disk
FREE Bonus Disk with Purchase

Disk 1: Animals, Christian, Folks, Food, Home, Music, Plants
Disk 2: Americana, Patriotic, US Map, Outlines of all 50 States
Disk 3: Arrows, Designs, Kid Stuff, Signs, Symbols, Christmas
Disk 4: Animals, School, Thanksgiving, Transportation & more

Clip Art for Desktop Publishing Programs

Supra 2400 Modem	Software		
 \$149.95	Turbo ST \$37.95	Call	Pub Partner Pro \$39.95
	Omniarc \$25.95	for	Publisher ST \$89.95
	Procopy \$24.95	Word Up	\$54.95
	Flash \$19.95	more	Fontz \$24.95



BRE Software
6210 N. First St, Suite 130
Fresno, CA 93710
(209) 432-2159 in CA



REVOLUTIONARY NEW PRODUCT

SWITCH BACK

REQUIRES at least 1 meg. of RAM

(or a MEGARAM or Polydisk Cartridge)

- Imagine Saving almost any game at any point, then being able to return them in many times as you like.
- Imagine the Ultimate Back-up Utility that actually UNPROTECTS programs as it copies them. Lets protected programs be stored as files, run from a hard disk or even be transmitted over a modem.
- Imagine saving three or more protected single sided disks on just one double sided disk.
- Imagine instantly switching back and forth between two different programs, games, utilities or business applications.

**Now Stop Imagining and get Switch/Back.
It can do all this and more.**

Switch/Back is a revolutionary new hardware and software package that lets you get more from your ST MUCH MORE.

Switch/Backs gaming features lets you instantly save most games then continue playing. If you get in trouble you can switch back to where you were as many times as you like.

BACK-UPS—Switch/Back can work with your favorite back-up program and allow you to save whole protected disks to files for archival purposes. It can also automatically unprotect a program and save it as standard file. This method works on hundreds of ST programs and it allows you to run the files directly. Its perfect for running protected programs off a hard disk. It creates standard IOS files, that can be stored together on disks or even transferred by modem.

SWAP — Switch back lets you load just about any two programs into your ST and switch instantly between them. It works with games, business programs, utilities, compilers, etc. Although only one program is running at a time, the other is available instantly, right where you left off.

The Switch/Back hardware plugs into your printer port for easy use (It has a pass through connection for your printer too.)

Switch/Back requires at least One Meg of memory
(Or a Polydisk or Megadisk)

ONLY \$69.95

ST Protection Techniques



Finally ST Copy protection techniques are revealed. This complete book and disk package details the state of the art in ST Protection methods and much, much more.

The Software included with the book provides many powerful features like the AUTOMATIC PROGRAM PROTECTOR. This easy to use Utility allows you to protect just about any ST program. You can choose a combination of protection methods like encryption, checking custom disk formats, password protection or a limited use option that makes the program self-destruct after running a preset number of times.

The book includes topics such as Threading, Logic Bombs, Hardware data keys, the legal aspects of piracy and software protection, Custom disk formats, Pirate Bulletin boards and much more.

In addition it contains reviews of the popular ST back-up programs and detailed explanations of ST disks and drives.

ST Protection Techniques (Book and disk package) **Only \$39.95**

COLOR COMPUTEREYES™

Incredible COLOR video digitizer. The first and only full color digitizer for the ST. • Uses standard video inputs like video camera, VCR, or video disk. • Works in all ST resolutions. Low res provides 16 shade black and white or full color pictures. • Pictures can be used with Beggs, Neochrome, Powerprint and others. • Automatic calibration of contrast, brightness and white balance. • Plugs into cartridge port for easy set-up. • Capture your picture or that of your favorite star. **Only \$199.95**
SPECIAL OFFER — Buy both ComputerEyes and Powerprint and SAVE 20.00 from the total.



BLOW YOURSELF UP

Imagine your picture on a 6 foot poster. Create a business graph that can cover a wall. Quality output for posters, t-shirts, news letters, and more.

POWERPRINT

Whether it's a photo digitized with ComputerEyes, a masterpiece created with Beggs, or the winning screen from your favorite game, POWERPRINT can print it with unequaled clarity and resolution. PowerPrint supports ALL ST resolutions. It prints multiple sizes up to **GIANT WALL SIZED POSTERS**. Print 16 shades for incredible detail. Print the whole screen or **ZOOM** in on just the part you want. POWERPRINT offers unique effects, including rotate, mirror and inverse options. Selective shading option allows you to print multi-color pictures on any printer by printing one color at a time (using color ribbons). Powerprint lets you capture and print almost any ST screen. Works with Star, NEC, Citich, Genprint, EPSON, XM8048 and compatible printers. **Only \$39.95**



DIGISOUND ST

High Quality sound digitizer for the ST. This powerful hardware and software package lets you sample real world sounds and play them back on any Atari ST. Add special effects like Echo, Reverse, looping, pitch manipulation, mixing and envelope control. Turns your Atari keyboard into a musical instrument to play songs with your digitized sounds (also works with any MIDI keyboard). Digisound makes it simple to add sound to your own program. Tool Unleash the incredible sounds in your ST with DIGISOUND. Supports sampling from 5 to 40kHz. DIGISOUND is the choice of the professionals. DIGISOUND was used to create the voice in Chessmaster 2000, and other commercial programs.

DIGISOUND ONLY \$89.95

DIGISOUND PROFESSIONAL

All the excellent features of DIGISOUND plus these great extras
LOGARITHMIC SAMPLING — Special hardware extends the sound quality far above the other ST sound digitizers. Logarithmic sampling and playback (external amplifiers only) greatly extends the dynamic range while reducing distortion and noise.

Internal Real Time Mixing — Input from a stereo and a microphone so you can sing over a tape. **\$149.95**

DIGIPLAYER The High powered digisound software can now be obtained by those who already own a digitizer for the ST. Compatible all cartridge based digitizers. Extend the power of your digitizer with Digiplayer.

Only \$49.95

The worlds most inexpensive clock cartridge. Finally its affordable to keep your time and date accurate 3 year battery included. **Only \$24.95**



MEGADISK

Ultra high speed solid state disk drive. • 500% Faster than a Hard Disk • Provides almost instant booting • Like a RAM disk that's always loaded with your favorite programs and ready to use • One megabyte of Solid State storage • Built in battery back-up in case of power failures

MEGADISK is actually one megabyte of RAM that simply plugs into your cartridge port. It acts as an added disk drive that's ultra fast and always ready for use. Like a Hard disk, MEGADISK won't lose its memory when your computer is turned off. It comes with its own power supply and battery back-up system so its independent of your computer.

Megadisk can be configured according to your needs. • Set it up as one large disk • Or as two 400K single sided disks and a 200K hardware print buffer • Or as two 400K single sided disks and a print buffer

Megadisk will work fine with your current system whether you have a hard disk and two drives or you're just getting started.

Megadisk is perfect for those who want the high speed of a hard disk for a lower price. Its even better for power users or software developers who may already own a hard disk and two drives but want extra speed and power. Megadisk can also emulate other cartridges for testing and back-up. In addition Megadisk can be used with Switch/Back to allow you to instantly jump between two full size one meg applications. **\$299.95**

Megadisk Clock Option — Adds a Clock/calendar card to your Megadisk cartridge. Contains replaceable Three year battery 29.95

Polydisk

Polydisk is a 512K version of a Megadisk. Polydisk gives you the same fast boot features, the high speed access, and the print spooler. Polydisk has a power supply (like Megadisk) but does not contain a battery back-up.

Note: Those with only 512K of main memory can use Switch/Back with a Polydisk. Just like those with One Meg.

Polydisk (512K Solid state drive) **Only \$199.95**

(Clock option card is also available for Polydisk \$29.95)

24 HOUR HOTLINE — VISA & MasterCard Welcome

216-374-7469

Customer Service line (216) 467-5665. Call or write for free catalog.



Order by phone or send check or money order to:
ALPHA SYSTEMS 1012 Skyland, Macedonia, OH 44066
Include \$3.00 ship. & hgt. (US & Canada). Ohio residents add 5% sales tax. Foreign orders add \$8.00

Getting Started

A Primer On Hard Drives, Part II

by Scot Tumlin

Last issue, we discussed hard drive basics and how to choose a hard drive for your ST system. In this issue, we'll explain how to install that hard drive and put it to work.

Getting It Going

Attaching a hard drive to your ST is simple—you simply plug the interface cable (included with the drive) into your ST's DMA port (identified with the icon shown in Figure 1) then plug the drive's power cord into a 110-volt outlet or power strip. The drive should be located in a dust-free area, preferably out of direct sunlight.

The next step is to prepare the hard drive to store data and open a communications link between it and your ST. All commercial ST hard drives include a start-up—or "boot"—program either on a floppy disk or already installed on the hard drive. If the latter, then your drive is said to be "self-booting."

When booting your ST system with a hard drive for the first time, first turn on all of the hardware except the computer and then insert the disk that came with your hard drive into Drive A. When first turned on, a hard drive makes an unusual sound as its internal cooling fan spins and the platter gets up to speed. (Some liken it to a refrigerator or

coffee percolator; to me, it sounds like the Tasmanian Devil from the Bugs Bunny cartoons.) Don't be alarmed—the sound will level off and you may then turn on your ST.

After a few moments the GEM Desktop will appear on your screen. At this point your ST can communicate with your hard drive, but you can't. You'll



Figure 1. This icon on the back of your ST or Mega identifies the DMA (Direct Memory Access) port. Your hard drive cable will plug in here.

probably see only the disk icons for the A and B drives, but none for the hard drive. Before you can use your hard drive, you have to format it (and partition it if you want to divide it up into separate sections).

Installation Programs

Every hard disk drive comes with its own formatting and partitioning program. The program for an Atari hard drive is named HDX.PRQ. (Editor's note:

As of press time, Atari has a revised installation program undergoing beta testing; it will probably have a different file name when released.) We'll use the Atari program as a model; although other programs will differ in details, the procedures are pretty much the same.

Formatting a hard drive means much the same as it does for a floppy drive—in simple terms, it organizes the magnetic surface into sections that the read/write heads can locate. A formatting program will be included with the floppy disk that comes with your hard drive—just follow the instructions and screen prompts that come with the drive. Once formatted, you can save and load files to and from your hard drive just as you would a floppy—but with much greater speed, of course.

After the drive is formatted, you have to decide if you want to partition it and if so, how. For example, you could divide your 20-megabyte hard drive into four separate five-megabyte storage areas, each with its own disk icon (C, D, E, F, for example). These electronic divisions of a single physical drive are called logical drives. To your ST's operating system, they appear to be four separate hard drives. This is useful for two reasons. First, searching for a single file ▶

through twenty megabytes of files in a single directory can be a chore. Second, it is useful to group applications and their associated files on a separate logical drive, such as word processing on drive C and graphics on drive D. Figure 2 shows one of the partitioning dialog boxes from the Atari installation program.

Follow the instructions for partitioning that came with your drive exactly and the program will make the appropriate magnetic divisions of your hard disk. Then you should use the installation program's Zero option (if it has one) to write zeroes into the hard disk's directories to clear out any garbage that may have snuck in during the earlier processes. (This can also be used to erase the directory of a partition later on without having to format the entire disk.)

Finally, the installation program will have a *Mark Bad* option that tests every sector of your newly formatted, partitioned and zeroed hard drive, just to make sure that everything's O.K. Any bad sectors the program finds will be marked as unavailable in the hard disk file allocation table and you will avoid writing good data to a bad sector later on.

Access From The Desktop

Once you've completed the installation program's procedures, you may think you are done, but you're not. In order for you to access your hard drive from

the Desktop, you will have to install a disk icon for each partition. Highlight either the A or B floppy disk icon by clicking on it once and then click on "Install Disk Drive" from the Options

Install will close the dialog box and a drive icon will appear on the Desktop representing one partition of your new hard drive. Now repeat this operation for each partition you created, changing

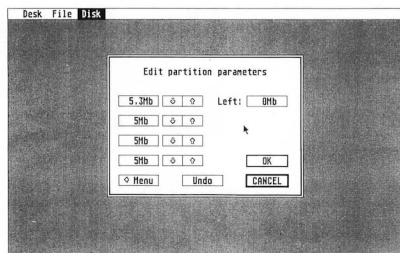


Figure 2. Partitioning your hard drive divides the single physical drive into two or more logical drives. Only your computer can tell they're there.

drop-down menu. A dialog box will appear requesting the identifier for the drive and the icon label. Enter any capital letter between C and P as an identifier. This will be the drive identifier you use in specifying a pathname (i.e. C:\filename). Don't use lowercase letters; a lowercase "c", for example, is the system identifier for the cartridge port.

The icon label is the line of text that will appear underneath the disk icon on the Desktop. Just type whatever words you want to use to identify this particular partition, such as "Hard Drive," "Work Disk" or whatever. Clicking on

the drive identifier to match the partition. Each of these hard drive icons can now be accessed just like your floppy disk icons.

Your last step is to save your Desktop. You may want to rearrange your new collection of icons and windows into a more logical or pleasing arrangement before saving the Desktop. Unless your hard drive is self-booting, you will need to insert your usual floppy boot disk in Drive A and make sure that Drive A's window is active (it has the shaded bar at the top). Go back to the Options menu and select Save Desktop. This will save your new set of icons in the file called "DESKTOP.INF" on your boot disk. If you don't save your Desktop with the hard drive icons, then the icons won't appear the next time you boot up your ST system and you'll have to install them all over again.

It is inconvenient to have to insert the same floppy disk to boot your computer every time; that's why self-booting programs were written. Depending on your make and type of hard drive, you may need to obtain another program from your dealer, the drive manufac-

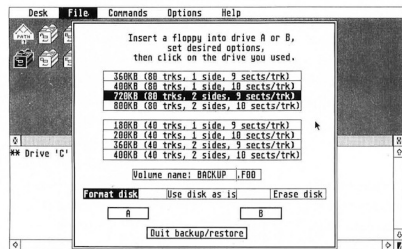


Figure 3. Periodically backing up your hard disk files is a necessity. It's not that hard disks fail that often—it's just that the results of a single failure can be catastrophic!

turer or from an online service. Some manufacturer's installation programs has this option as part of their installation program. If it's there, use it. To self-boot a hard drive using the (current) Atari software, you have to run an additional program that does not come with the drive. Ask your dealer for help.

Parking Your Heads (Huh?)

For hard drive owners, there are two utilities that are priceless: a head parking utility and a hard drive backup program. The first of these will come with the hard drive (called PARK.PRGM, SHIP.PRGM or a similar name) and the second might. Before you leave your dealer with your new hard drive, ask for a recommendation and take a good backup program home with you that day!

A head parking utility allows you to park—or move—your hard drive's heads off the magnetic platter to a safe loca-

tion. This prevents head crashes from moving your hard drive or even from bumping into your computer table. (Some hard drives are self-parking—they automatically park themselves whenever you shut off their power. Check your manual.)

You'll use a hard drive backup program to archive all the information you've saved on your hard drive by transferring it to floppy disks. Figure 3 shows a typical backup program dialog; this program is MichTron's Backup! It may take dozens of floppies to save all of your files, but weigh this inconvenience against the alternative—if your hard drive crashes, do you really want to lose 20 or more megabytes of important (and possibly irreplaceable) information? I thought not!

Conclusion

To sum up, a hard disk drive is an ex-

cellent hardware addition for your ST system. Although they may seem somewhat expensive (they start around \$600), once you buy one, you'll quickly become spoiled by their storage space, speed and convenience.

In fact, after using a hard drive for a few weeks, you'll wonder how you ever got along without it! ■

Scot Tumlin is in charge of Direct Mail Services and Software Technical Support for Antic Publishing.

Product Information

HDX.PRGM and **SHIP.PRGM**, free with purchase of an Atari hard drive.

Atari, Inc., 1196 Borregas Ave., Sunnyvale, CA 94088, (408) 745-2000.

CIRCLE 230 ON READER SERVICE CARD

Backup!, \$39.95. MichTron, Inc., 576 S. Telegraph, Pontiac, MI 48053, (313) 334-5700.

CIRCLE 231 ON READER SERVICE CARD



AUTHORIZED SERVICE CENTER FOR ALL ATARI PRODUCTS



MICROTYPE

A DIVISION OF MICRO PERIPHERALS, INC.

P.O. BOX 369 • KETTERING, OHIO 54509




HARDWARE	ACCESSORIES	PRINTERS	MODEMS	SOFTWARE	OTHER
ST's Color or More	ST Dust Covers	PANASONIC: call for latest	RX-1000 NEW!	OLYMPIA: simply the best!	NO EXTRA CHARGES FOR CREDIT CARDS!
SH-204 20 Meg Hard Disk	Mouse Mat	1080	PowerType Daisy Wheel	NLD modes use 18 x 24 matrix!	• Do not bill until we ship •
SF-314	Power Strip w/ Surge	1091 160 cps	DLMPA: simply the best!	NP-30 130 CPS	• Minimum order \$15 • C.O.D. \$3.50 • SHIPPING: Hardware, minimum \$4. Software and most accessories, minimum \$3 • Overnight shipment available at extra charge • We ship to Alaska, Hawaii, Puerto Rico (UPS Blue Label Only), APO, and FPO • Canadian orders, actual shipping plus 5%, minimum \$5 • Ohio residents add 6% sales tax • Please allow 3 weeks for personal or company checks to clear • All defective products receive a return authorization number to be accepted for repair or replacement • No free trials or credits • Returns subject to 15% restocking charge • Due to changing market conditions, call for latest price and availability of product. FOR YOUR PROTECTION, WE CHECK ALL CREDIT CARD ORDERS FOR FRAUD.
Supta 20/30/60 meg	Deluxe Power Strip w/ Surge	1092 240 cps	NP-80 240 CPS changeable font cards	A Most Famous Voyaging	CIRCLE 071 ON READER SERVICE CARD
18.5" drive for ST	TERMINATOR Joystick	1524 24 w/ head	STAR: call for latest	Mid Cables 5'	
Nintendo Systems & Software CALL	EPXY 500 KJ Joystick	KK-P110 Ribbon (Blk)	RX-1000 NEW!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	WICO Bat Handle Joystick	KK-P Color Ribbons 11	PowerType Daisy Wheel	A Most Famous Voyaging	
	Printer Stand Heavy Duty	STAR: call for latest	DLMPA: simply the best!	Mid Cables 5'	
	Mail Labels 3.5x15/18-50 pk	RX-1000 NEW!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	PowerType Daisy Wheel	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Bureaucracy	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Bureaucracy	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Bureaucracy	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Bureaucracy	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Bureaucracy	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Bureaucracy	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Bureaucracy	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Bureaucracy	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Bureaucracy	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Bureaucracy	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Bureaucracy	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Bureaucracy	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	4 Bureaucracy	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	6 CAD 3-D/Cybermate	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Chromastar 2000	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	25 Auto Dual	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	24 Award Maker	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	11 Balloon	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	27 Barbanan WOW!	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	17 Bards Tale	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in the U.S.) (only a partial listing shown)	
	13 Base Two	DLMPA: simply the best!	DLMPA: simply the best!	SWI SOFTWARE (Largest Selection in	



Start Recording Music For A Song!

Master Tracks Jr.™ For the Mac, Atari ST, IBM PC and Apple IIGs

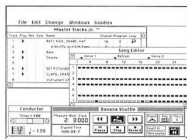
If you've got the desire to play, record or compose music—but fear the start-up costs will break the bank—take note. With Master Tracks Jr., an affordable, easy-to-use software sequencer, you can record and edit your music at home. Just hook up a MIDI* keyboard to your computer and you're ready to go. When you play a song, Master Tracks Jr. will record your performance and display it on the screen. Now, you're ready to create virtually endless variations of your song.

A Personal Recording Studio

Because Master Tracks Jr. combines professional recording features with easy operation, you're free to experiment and increase the complexity of your music. 64-track recording lets you record live, or enter songs note by note in step time. The transport controls work like a tape recorder. You can move through the song and record or play from any point, or punch-in to correct mistakes. Master Tracks Jr. also gives you independent track looping—and much more!

Unique Graphic Display for Easy Editing

The Song Editor graphically displays your music and lets you "build" songs. With editing commands



including cut, paste, mix and copy, you can visually edit the song and remove or insert time. The conductor track lets you change meter and tempos. Additional features make it easy to change key, add

expression or correct playing errors.

Passport to the Future

Master Tracks Jr. is compatible with an integrated series of products including Encore™ which prints your song files in standard music notation. When you're ready for more sequencing power and features, upgrade Master Tracks Jr. to Master Tracks Pro™. Because Master Tracks Jr. and Pro are MIDI file compatible, you can easily transfer all your sequences from one music program to another.

See Your Local Dealer. Or Call For Our Free Catalog!

PASSPORT®

(415) 726-0280 625 Miramontes St., Half Moon Bay, California 94019

*MIDI is Musical Instrument Digital Interface, an international standard for music communications.

Dave's Handy-Dandy Disk Certifier

by Dave Small with Dan Moore

Certify disk sectors lost from magnetism or mayonnaise with CERTIFY.ARC on your START disk.

No preamble—this month in “Small Tools,” we’re going to look at a simple little program that lets you make sure nothing nasty has happened to your ST floppy disks. Let’s get started!

Floppy Disk Certifier

This program isn’t particularly clever, just mighty useful. It reads an entire disk in, checking to make sure that none of the sectors on it have gone bad. It’s an easy way for you to check disks and make sure they’re still physically okay at the track/sector level.

There are several things that can go wrong on a disk. There’s the ever-popular *damage to the directory*, which happens a lot on the ST because of the 40-folder bug—very common on hard disk systems. (This is a bug in the ST’s operating system that causes your disk directories to go haywire any time you access more than 40 folders in a single session.) There’s nothing we can do about that one in this article. But there’s also the very trendy *sector damage*, where the magnetic fields on your disk

go bad in one spot and make a sector go bad; this is usually called a “CRC Error” (Cyclic Redundancy Checksum Error).

All sorts of things can cause this. A telephone ringing near a floppy is near certain doom for that floppy. Putting floppies near a monitor or power supply is as good as putting them in a microwave. It could also be a media fault, in which a small flake of the disk’s surface comes off.

I don’t want to make you paranoid, but the older ROM versions of the ST (the non-Mega ROMs) have a little bug: *They don’t always recognize a CRC error when they see it!* That’s right—this means you can have a bad diskette, and go merrily right on working with data that is almost certainly bad. Typically, one or two bytes per sector will be changed.

Since I do my taxes on a computer, this little detail gives me the cold sweats.

Using The Program

To use the Disk Certifier, boot in high or medium resolution. Un-ARC the file CERTIFY.ARC, following the Disk Instructions elsewhere in this issue. Double-click on CERTIFY.PRG; tell it which drive to check, and whether the disk is single or double sided.

The Certifier presents a display of 80 tracks in rows across the screen and 9

or 10 sectors per track down the screen. (If you select two sides, you’ll get two displays.) The Certifier reads disks in a track at a time; this is to speed up the reading process. If it finds an error, it goes back and reads the track one sector at a time.

What should you do if you find a bad sector?

First, examine the disk. Open the little window and spin the disk around using the center spindle on the back of the disk. Look for flecks, scouring or mayonnaise (my daughter Jennifer pulled that particular one—I kid you not). If the disk seems physically okay, then go copy everything off it—one rule about disks that are going bad is that they seem to get worse. (I don’t know why this is, but I’ve seen it happen many a time. If it’s marginal media to begin with, you’ve probably got other files gradually going bad. Scary, eh?)

However, if something is obviously wrong with the disk, *don’t put it back in your drive!* The read/write heads in your drive are easily scratched, and if that happens, your drive is totalled, kaput, worthless. This means hundreds of dollars to replace the drive. Compare that with a \$1.50 disk. . .

Even on pain of death, I won’t tell the story of cleaning mayonnaise off the ▶

...Turns Your Atari™ Into A Mac™



"The most exciting product of the [West Coast Computer] show..." - *Infoworld Magazine*

"Probably the most interesting product demonstrated..." - *Jerry Purnelle, Byte Magazine*

"Data Pacific attracted a lot of attention." - *San Francisco Chronicle*

"The best back of 1986." - *Bruce Webster, Byte Magazine*

The Magic Sac...starting at \$149.95 list price.

For further information contact:
or your local Atari dealer.

©1987, 88, Data Pacific Inc., all rights reserved.
Trademarks, and registered trademarks listed
are of the respective companies.

Data Pacific Inc.
609 East Speer Blvd.
Denver, Colorado 80203 USA
Telephone: (303) 733-8158
Telex: 880366 (DATAPACIFIC)



Data Pacific, Inc.

RUNS PAGEMAKER™



NEW for all Atari STs!

Darling, I never buy a gem of any kind until I'm certain that it's authentic. That's why I bought **Purebred**, the new GEM telecommunications package. I looked at those other so-called GEM terminal programs, but as soon as I went online, the GEM menu bar *disappeared!* Unlike **Purebred**, those flawed gems expected me to memorize whole lists of key-strokes, or to switch constantly between screens while online. I don't know about you, darling, but most of my time with communications software is spent online... so if you don't want your GEM to lose its sparkle while you're online, buy **Purebred** today -- it may cost a little more, but it's worth it, darling -- it's a GEM all the way through!

Purebred

The New Fully-GEM Telecommunications Package
by Computer Fenestrations out of Zaphodyne

The most accurate DEC VT100/VT102 terminal emulation available for the Atari ST, complete with a truly legible 132 column mode. Also available: full VT100/VT102 plus a very complete Tektronix 4014 emulation with local zoom mode, crosshair support, and device-independent GPOX screen dump to printer or metafile (add \$49.95).

Wide selection of file transfer protocols: XMODEM, including the CRC and 1K variants, true YMODEM (batch), and the lightning-fast ZMODEM; CompuServe B, with support for Quick-B downloads; complete Kermit server implementation.

Online viewing of CompuServe's RLE and GIF pictures with either monitor. Chat mode enables split screen to facilitate online conferencing.

Consistent GEM interface used throughout the program, with keystroke alternatives for all menu selections to aid the experienced user. Proprietary text routines and a large input buffer allow confident operation at speeds up to 19200 bps.

Built-in text editor, clipboard, and capture buffer. Comprehensive script language to allow you to automate your online sessions. Phone book saves commonly called phone numbers and associated configurations and scripts for instant recall. Address book retrieves user IDs by system.

Published by Computer Fenestrations, P.O. Box 151, Lake Meade, FL 32747-0151; phone (407)-322-3222. Available for \$99.95 at your local Atari dealer. Dealers, contact your usual distributor or call us direct.

heads of my 1040's internal drive with rubbing alcohol and Q-Tips. Never.

Okay, so you've copied the data off the disk. What now?

You can also team the Certifier with a sector editor. Since you'll see the track/sector that went bad, you can look over the sector, and perhaps fix whatever went wrong. Rewriting a disk sector that has a CRC error will fix the error, if it's fixable (a magnetic field going sour instead of a physical media problem). So if it's a word processor

The older ROMs don't always recognize a CRC error when they see it!

document, for example, and there's a typo where the sector failed, you can fix it. For instance, the desk accessory TinyTool, available on most online services and many ST BBSs, is able to edit raw sector data.

Finally, if you use the Disk Certifier with a file-oriented editor, such as the Byte Mechanic from Special Issue #4 of START, you can find out what file has been damaged, and go to a backup of it to get good data. This is especially helpful in the case of binary files or numeric data, where you can't tell what's gone bad.

Coming Attractions

Next issue's Small Tools will be dedicated to hard disks and the poor souls chained to them. Given the amount of trouble I've had with hard disks, expect a particularly full column! ■

Dave Small, formerly of Data Pacific, is the creator of the Magic Sac Macintosh emulator and the Translator One disk controller. Dan Moore is the author of PaperClip for the 8-bit Atari computers.

Planning Your Animation, Hollywood-Style

by Andrew Reese
START Editor

When I started writing this month's column about choosing and using different camera angles and cuts in ST animation, I realized there was a great deal of basic information that might not be available to you. So we'll put off our discussion of camera cuts in Cyber Control animation recording until later and focus on basic film, video and animation terms and concepts.

If you watch a movie, TV program or commercial, you'll see that the actors aren't the only things that move. The camera moves and its viewpoint changes, depending on what the director wants to show. The same thing can—and should—be done with your animation. But in order to be visually effective, you need to plan your animation carefully.

All commercial film, video or computer productions are planned in detail before production begins. When the cost of a day of shooting a film can easily exceed \$100,000, a director spends most of his or her time planning each shot and camera angle. Well, you're the director of your own animation, but luckily, a day at your ST doesn't take a penny from your pocket. But it does take time. Let's see how to save that time by planning ahead.



A "point-of-view" shot puts the viewer in the place of the camera and conveys some of the feelings that the actor is presumably feeling.

Storyboarding

Every director, you included, must have an idea what the finished production should look like before beginning. It's no good just to sit down with an animation program and hope for inspiration. Experimenting with an animation program, however, is different—you *have to*

play with it in order to understand its capabilities. Otherwise you may plan your animation around an effect your creative vision demands but that the program just can't deliver. So fool around; try out all of the program's controls and effects. You may discover something that will make your job eas- ▶

ier or inspire you to try a new approach. But you should always begin with a clear idea.

Next a director must shape the idea in the form of a series of pictures or sketches called a storyboard. A storyboard shows a sequence of key points in a scene or production. In an animation, it shows the *key frames*. The actors (our animation cels, objects, sprites, clips or blocks, depending on the program) are depicted in specific positions from the viewpoint of the camera, i.e. the viewer. In an animation system that does *tweening*—interpolation of an object's position or shape between key frames—the definition of these key frames is critical.

Many ST animation programs have some form of tweening. *MichiTron's Make It Move*, *Antic Software's Cyber Paint*, *Epyx's Film Director* and *Aegis Development's Animator ST* all tween cels, blocks, clips or sprites between positions on the screen or between different sizes or shapes. Tweening is essential to easy two-dimensional animation. Programs like *Antic Software's CAD-3D* and *Cyber Control*, however, use three-

A storyboard shows a sequence of key points in a scene or production.

dimensional objects and do not do tweening. Storyboarding is just as essential for CAD-3D animations, however, as it helps you define camera and object movement for later *Cyber Control* program development.

Storyboards can be any size that's convenient. Any good art supply store should sell a variety of different storyboard pads, complete with a TV-shaped mask and a place for notes, dialog or narration for each frame. If your local art supply doesn't carry them, contact *Valiant IMC* at the address and telephone number at the end of this article. They stock a number of storyboard

pads of different sizes and designs. I generally use a pad with 21 frames on a single 8½ by 11-inch sheet, as shown in *Figure 1*. Choose the size and style that fits your needs and your handwriting.

On your storyboard pad, sketch in the first position of the actors *from the viewpoint you want the audience to have*. You don't have to be a great artist; just make a sketch that you can understand. Next, sketch in the next key position of the actors and make a note on what has changed from the first frame, so that you can plan the movement or programming to accomplish it. Proceed key frame by key frame through the animation, ending with the final position of the actors. You now have a "script" that will help you structure your 3D program or 2D animation.

Camera Angles And Roller Coasters

Look at your storyboard. You've probably drawn your actors from different viewpoints during the animation. After all, a story told from a single fixed camera angle or viewpoint is inherently boring. The next time you watch TV, ignore the plot and action (it's easy, actually) and focus your attention on the way the cameras move and vary the size and location of what you see. Every scene has a "master shot" (also called an "establishing shot"). It's usually a wide shot that shows the actors in relation to their surroundings and gives you a point of reference to understand what's happening. Don't forget this concept in planning your animation.

But there are other camera shots that add visual interest to a scene, focus your attention where the director wants or put you in the place of one of the actors. (A camera shot can be thought of as a particular combination of camera position, angle, focus and field of view.) A good animator uses any technique that will assist him or her to tell the story.

For example, it's possible to show a complete roller coaster ride in a wide

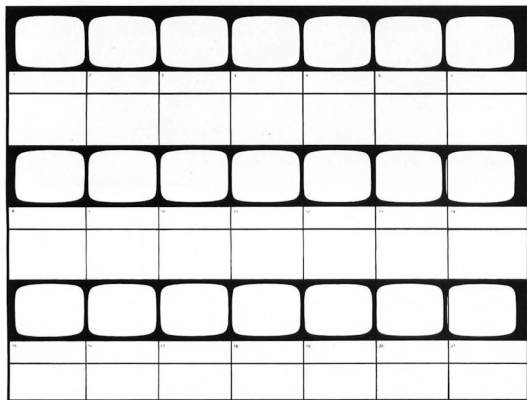


Figure 1. A 21-frame storyboard form such as this can be used to plan an animation and minimize the animator's time at the computer.

shot from the ground, but it totally lacks any visual punch. Directors, therefore, often place a camera in the roller coaster itself to give the viewer the visual impact of the ride as shown in the opening photo. This "point-of-view" shot puts the viewer in the place of the actor to share his or her experience. But how is the actor reacting to this wild ride? To show this, directors use a "reaction" shot, focusing on the wild-eyed expression of the actor as he or she plunges down the track.

These camera shots are valid, useful tools to tell a story, but using any one of them too long destroys the effectiveness of the story itself. So a director will mix them and add in a number of others as they may be needed. You, too, should vary your camera angles to tell your animation story.

Techniques

Animation is a laborious process at best. Changing camera angles or viewpoints in 2D animation requires an animator to create a new sequence for each portion of an animation shown from a different viewpoint. The actors will be seen from a different angle and so will the background. It takes a great deal of artistic ability to accomplish this in a coherent manner.

3D animation is different, however. Once you've defined an object (the hard part), it's relatively easy to change camera locations around that object or zoom in on one portion of it. This is the magic of modern computer animation—if you have a chance to see "Red's Dream," the award-winning animation by Pixar, you'll travel through a bicycle shop full of gorgeous 3D bicycles, made up of over 10,000 computer-generated polygons.

You can change camera angles in a 3D animation in two ways. First, you could record the animation several times, once from each camera angle during a separate run through the animation and then assemble it in a post-

The camera moves and its viewpoint changes, depending on what the director wants to show.

production animation package. This is the technique video and filmmakers use all the time; it puts the burden on the editor to assemble the footage correctly. Alternatively, you can record it *once* and cut between cameras, camera angles or locations *during the one recording*. If you've planned well, you should be able to accomplish your entire basic animation in one pass. This is the technique we'll focus on next column.

New Graphics Products

We're in luck, fellow graphics buffs! A number of new graphics products have hit the market or are in the pipeline as I am writing this. Epyx is releasing Art Director/Film Director in mid-summer, so it should be available by the time you read this. It's a unique addition to an ST animator's program library with capabilities found in no other product on the ST market. This package was originally set for release by Broderbund last year, but never made it. Now Epyx has picked it up, fixed some bugs and completely rewritten the documentation. It has such features as scratch-off (overlaid one picture over another and scratching off part of the front to reveal the back) and multiple sprite animation. Watch for a full review by Marcus Badgley of this package and version 2.0 of Cyber Paint in an upcoming issue of START.

The wait for high quality composite

video output is over. Practical Solutions, the folks who brought you the Monitor Master and Mouse Master, is shipping Video Key. We're looking forward to putting this long-awaited wonder through its paces for you; watch this space! And if you have been pouting because the Amiga has genlock capability and the ST doesn't, pout no more: JRI is releasing a superb, reasonably-priced genlock for the ST. (Genlock lets you overlay computer graphics onto a video image.) John Richardson, the genius behind JRI, will explain the intricacies of genlock in the next START and we'll have a review of his product as soon as we can squeeze it into these pages! ■

Products Mentioned

Animator ST, \$59.95. Aegis Development, 2115 Pico Blvd., Santa Monica, CA 90405, (213) 392-9972.

CIRCLE 250 ON READER SERVICE CARD

Cyber Studio, \$89.95, **Cyber Control**, \$69.95, **Cyber Paint**, \$79.95. The Catalog, 544 Second St., San Francisco, CA 94107, (800) 234-7001.

Make It Move, \$49.95. Michtron, Inc., 576 S. Telegraph, Pontiac, MI 48053, (313) 334-5700.

CIRCLE 248 ON READER SERVICE CARD

Video Key, \$119.95. Practical Solutions, 1930 E. Grant Road, Tucson, AZ 85719, (602) 884-9612.

CIRCLE 252 ON READER SERVICE CARD

Art Director/Film Director, \$79.95. Epyx, Inc., 600 Galveston Drive, Redwood City, CA 94063, (415) 366-0606.

CIRCLE 253 ON READER SERVICE CARD

JRI Genlock, tentative price at presstime \$400. John Russel Innovations, Inc., P.O. Box 5277, Pittsburgh, CA 94565.

CIRCLE 254 ON READER SERVICE CARD

Video Storyboard Pads, \$3.95 per 100 sheet pad. Valiant IMC, 195 Bonhomme Street, Box 488, Hackensack, NJ 07602, (800) 631-0867.

CIRCLE 255 ON READER SERVICE CARD

SOFTWARE DISCOUNTERS OF AMERICA

S.D. of A.

For Orders Only—1-800-225-7638
PA Orders—1-800-223-7784
Customer Service 412-361-5291

- Free shipping on orders over \$100 in continental USA
- No Surcharge for VISA/MasterCard
- Your card is not charged until we ship

EPYX

Shoot the tube while surfing at Santa Cruz, do hand plants skateboarding in Hollywood, & cruise Venice in roller skates.

California Games List \$49.95
Our Discount Price \$33



EPYX	Championship	\$33
Champ. Wrestling	\$14	
Death Sword	\$14	
Dive Bomber	Call	
Impossible Mission 2	\$24	
Metross	\$16	
Street Cat	\$16	
Sub Battle Simulator	\$24	
Temple Apath Trilogy	\$14	
Winter Games	\$14	
World Games	\$14	
FORESIGHT	Call	
Draxis	\$119	
FTL	Call	
Dungeon Master	\$25	
Dungeon Master II	\$9	
Olids	\$23	
GAMESTAR	Call	
GIF Champ. Football	\$25	
GRABIN	Call	
Neo Desk	\$19	
ILLAD	Call	
Athena 2	\$65	
INTEREST	Call	
Interlink	\$25	
Revolver	\$33	
ISD	Call	
Masterplan	\$59	
VIP	\$95	

MICROLEAGUE	Baseball 2	\$39
1987 Team Disk	\$33	
WWF Wrestling	\$33	
MICROPROSE	F-15	\$25
Gunship	\$33	
Silent Service	\$33	
MINDSCAPE	Balance of Power	\$33
Blockbuster	\$25	
Captain Blood	\$33	
De Ja Vu	\$33	
Garrett	\$33	
Harrier Combat Simulator	\$33	
Indiana Jones & GEMESTAR	Call	
The Temple of Doom	\$33	
Into the Eagle's Nest	\$24	
Paperboy	\$33	
Road Runner	\$33	
720	Call	
Shadowgate	\$33	
Superstar Ice	Call	
Hockey	\$33	
Unlimited	\$33	
MINDSCAPE	Professional	\$33
CINEMAWARE	Defender of the Crown	\$33
S.D.I.	\$33	

MINDSCAPE



This is the real thing. You're flying this mission solo into territory that's as hostile as it gets.

Harrier Combat Simulator List \$49.95
Our Discount Price \$33

SIERRA	Black Cauldron	\$25	
King's Quest 1, 2, or 3	\$33 Ea.		
Leviathan	\$25		
Mixed Up Mother Goose	\$19		
Police Quest	\$33		
Space Quest 1 or 2	\$33 Ea.		
SIMON & SCHUSTER	Star Trek: The Rebel Universe	\$25	
SOFT LOGIC	Font Disk 1 or 2	\$19 Ea.	
Partner Forms	\$19		
Professional Publishing Partner	\$59		
Professional Publishing Partner	\$129		
SOFTICE	Turbo ST	\$33	
SPRINGBOARD	Certificate Maker	\$25	
C.M. Library Disk	\$19		
SSI	Advanced Dungeons & Dragons: Heroes of the Lance	\$26	
Phantasia 1, 2, or 3	\$26 Ea.		
President Elect 1988	\$19		
Question 2	\$33		
Rings of Zilim	\$26		
Roadwar 2000	\$26		
Roadwar Europa	\$29		
Stellar Crusade	\$39		
War Game Const. Set	\$23		
Warship	\$39		
Wizard's Crown	\$26		
SUBLOGIC	Flight Simulator 2	\$33	
Scenery Disk	Call		
#7-Washington	\$19		
#11-Detroit	\$19		
THUNDER MOUNTAIN	Leviathan	\$9.88	
Tau Ceiti: The Lost Star Colony	\$9.88		
Top Gun	\$9.88		
Winter Challenge	\$9.88		
Wizball	\$9.88		
MARK WILLIAMS	TIMEWORKS	Desktop Publisher	\$87
D.P. Clip Art	Call		
Partner	\$33		
Swiftcalc/Widesway	\$49		
Writer	\$49		
C Source Debugger	\$49		
Mark Williams C	\$119		
LINSON WORLD	Art Gallery 1 or 2	\$19 Ea.	
Art Gallery: Fantasy	\$19		
Fonts & Borders	\$23		
Print Master Plus	\$25		
VERASOFT	Man 4.0	\$149	
WORD PERFECT	Word Perfect W.P.	\$199	
ACCESSORIES	CompuServe Starter Kit	\$19	
Disk Case (Holds 30)	\$6.88		
Disk Drive Cleaner	316.88		
18 Drive 2000	Good Deal		
Super 20 meg Drive	Call		
Wico Ross	\$12		
Wico Bat Handle	\$17		
Wico Ergostick	\$19		
Wico Three Way	\$19		

ACADEMY	Typing Tutor	\$23
ACCESS	Board Game w/Tours. Disk #1	\$16
Tenth Frame	\$25	
ACCOLADE	Bubble Ghost	\$23
Hardball	\$25	
Pinball Wizard	\$23	
Test Drive	\$25	
AGEIS	Animator	\$44
Art Pak #1	\$19	
ANTIC	Base Two	\$39
Cyber Paint 2.0	\$49	
Cyber Studio	\$59	
Flash	\$19	
Phasar 3.0	\$59	
Spectrum 512	\$44	
3 D Breakthru	\$25	
ARTWORK	Bridge 5.0	\$23
Centerfold Squares	Call	
Linkword French	\$19	
Linkword German	\$19	
Linkword Spanish	\$19	
Strip Poker	\$25	
Strip Poker Data Disk	\$14	
#4 female	\$25	
#5 female	\$14	
AVANT GARDIE	PC Ditto	Call
BATTERIES INCLUDED	D.E.G.A.S. Elite	\$39
Thunder: The Writers Assistant	\$25	
BAULDVILLE	Award Maker Plus	\$25
Video Vegas	\$23	
BRODERBUND	Super Bike Challenge	\$14
Typhoon Thompson	\$23	
CENTRAL POINT	Copy 2	\$23
DATA EAST	Speed Buggy	\$25
Alternate Reality: City	Battle Droidz	\$23
Cosmic Relief	\$23	
Global Comm	\$26	
Hunt for Red October	\$32	
ELECTRONIC ARTS	Alien Fires	\$26
Articflex	\$14	
Bard's Tale	\$32	
Chessmaster 2000	\$29	
Empire	\$32	
Global Cookbook	\$14	
Lords of Conquest	\$14	
Marble Madness	\$26	
Mavis Beacon Teaches Typing	\$29	
Music Const. Set	\$32	
Roadwar	\$21	
Rockford	\$21	
Scalable	\$26	
Scruples	\$26	
Skyfox	\$14	
Star Fleet 1	\$35	
Twilights Ransom	\$23	



The Ultimate Joystick!
500XJ Joystick
List \$19.95

Our Discount Price \$14

(for right-handed players only!)

LDW	Basic 2.0	\$59
Air Ball	\$23	
Club Backgammon	\$23	
Vegas Cards	\$23	
Vegas Gambler	\$23	
MASTERTRONIC	Chopper X	\$14
Ninja Mission	\$14	
MICHTRON	Autoduel	\$25
Moobius	\$25	
Ultima 3	\$25	
Ultima 4	\$25	
PROGRESSIVE	Superbase Professionals	\$189
QM1	Desk Cart	\$69
RAINBIRD	Carrier Command	\$29
Guild of Thieves	\$29	
Jinxer	\$25	
Starglider 2	\$29	
The Pawn	\$19	
Universal Military Simulator	\$33	
SCORPION	Foundations Waste	\$25

THUNDER MOUNTAIN

Bring home the excitement of world-class competition as you go for the gold in five challenging winter sports.
Winter Challenge List \$14.95
Our Discount Price \$9.88



Datatype®

As captain of Russia's newest state-of-the-art sub your goal is to cross the Atlantic and rendezvous with the American Navy.
Hunt for Red October List \$49.95
Our Discount Price \$32



P.O. BOX 11327—DEPT. ST—BLAWNOX, PA 15238

*Please Read The Following Order Terms & Conditions Carefully Before Placing Your Order: Orders with cashiers check or money order shipped immediately on in stock item! Personal & Company checks, allow 3 weeks clearing. No C.O.D.'s Shipping: Continental U.S.A.—Orders under \$100 add \$3; free shipping on orders over \$100. AK, HI, PO, Alaska add \$5 on all orders. Canada & Puerto Rico add \$10 on all orders. Sorry, no other International orders accepted! PA residents add 6% sales tax on the total amount of order including shipping charges. CUSTOMER SERVICE HOURS: Mon-Fri, 9 AM-5:30 PM Eastern Time. REASONS FOR CALLING: CUSTOMER SERVICE—412-361-5291 (15 status of order or back order (2) all merchandise purchased within 60 days from S.D. of A. is defective, please call for a return authorization number. We will not process a return without a return auth. If defective merchandise will be replaced with the same merchandise only. Other returns subject to a 20% restocking charge! After 60 days from your purchase date, please refer to the warranty included with the product purchased & return directly to the manufacturer. Customer service will not accept collect calls or calls on S.D. of A.'s 800# order line! Prices & availability are subject to change! New titles are arriving daily! Please call for more information. NEW, MORE CONVENIENT ORDER LINE HOURS: Mon-Thurs, 9:00 AM-7:00 PM Fri, 9:00 AM-5:30 PM Sat, 10:00 AM-4:00 PM Eastern Time.

SMPTE Track

Hybrid Arts Professional Sequencer

by Jamie Krutz

Years in the making, SMPTE Track, the new top of the line sequencing hardware/software double whammy from Hybrid Arts is a major achievement. It's packed with features and is one of the best sequencers I've seen on any personal computer.

Diving In

The first thing you notice about SMPTE Track is its fast, responsive feel. You can do most operations from the main screen with GEM drop-down menus and specialized screens appearing quickly when needed. In addition, you can use the mouse for almost every operation, although keyboard commands are also available.

On the main screen, tracks are shown on the left and tape deck-style controls are on the lower right (see Figure 1). To record a track, you click on the "play" button with the mouse (or touch the space bar) and play your MIDI keyboard in time with the built-in metronome. There's no "record" button because an extra buffer track is *always* in record mode. When you've performed something you like, pick a track and hit the "keep" button to store your performance there.

There are 60 tracks and you can

view any consecutive 20 at one time. Everything you'd want to see is displayed, including whether a track is muted, protected from accidental erasure, and/or assigned to a MIDI channel. Also shown for each track is memory use, how many notes are playing at a given instant and when the track has reached its end.

Each track can record all 16 MIDI channels at once, making it easy to transfer sequences from another sequencer. Tracks can be combined from several sequences into one sequence using the "import track" function. Patch change data can be recorded, controller information can be recorded or selectively filtered, and Hybrid Arts has said they will support system exclusive data in a future version.

Should 60 tracks not be enough, a "mix" command lets you bounce tracks together, and an "unmix" command lets you undo this if you change your mind. Remember, you are limited to MIDI's 16 channels—unless you have Hybrid's MIDIPlexer, an optional piece of hardware which gives you a total of 64 MIDI channels and another MIDI input!

Unmixing can also be done by pitch; useful for separating left and right hand piano parts or getting drums onto their

own tracks for flexible editing. Another feature, "Track Delays," allows you to move individual tracks forward or backward in time. This is great for getting percussion tracks to "feel right," and for accommodating synth patches with slow attack envelopes.

Chain Your Brain

Working with SMPTE Track is like working with a 60-track tape, which may seem powerful enough, but SMPTE Track doesn't stop there. At any time you can say, "from here to here on these tracks is a *section*, and I want to combine these sections in this order to make this *chain*." Different sections can share tracks and overlap time periods. Your "60 track tape" can be cut up into incredible mosaics, and yet the original is always there, undamaged, ready for more experimentation.

Once you make a chain, you can still use any number of free tracks to record more parts linearly along with the chain. You can even have several chains playing at once, all while multiple linear tracks are playing! This is extremely flexible and powerful. A "flatten chain" command allows you to record all the tracks in the various sections of any chain linearly onto one track. ▶

What SMPTE Is

SMPTE time code (often called "SMPTE"), was developed by the Society of Motion Picture and Television Engineers as a way to number each frame in video and film.

Using an included piece of external hardware, SMPTE Track reads and writes 30 frames per sec (fr/sec) and 30 fr/sec drop frame for NTSC video, 25 fr/sec for EBU time code (used in PAL and SECAM video) and 24 fr/sec for 35mm film. Thus it's compatible with standards in the U.S., Japan and many European and other countries. It even accesses "user bits," another set of SMPTE numbers often used to record the date or reel number onto every frame. It can also generate MIDI clock, MIDI song pointer and various FSK (frequency shift keying) signals, making it compatible with non-SMPTE gear.

The program's direct SMPTE support

should. If you're watching a video, you can play musical ideas as you watch. Rewind the tape and SMPTE Track will play them back against the picture just as you played them (with an accuracy of 1/96th of a beat).

How I Use It

When composing music for picture, I first get a time-coded video copy of the production. Using SMPTE Track's ability to regenerate identical time code, I record fresh, matching time code onto a multitrack recorder. After composing the basic MIDI tracks with the sequencer locked to the video, I lock the sequencer to the multitrack and add any non-MIDI instruments, sound effects, voiceovers and vocals I need. The accurate lockup also allows the same MIDI instruments to be used more than once in a sequence, by recording them in several passes to different tape tracks.

Hybrid is also considering supporting MTC. MTC's drawback is that it adds a constant overhead to the MIDI data stream.

Those Darn Mistakes

If you make a mistake while recording, SMPTE Track provides a lot of editing options.

You can tell your ST where a mistake begins and ends, have it start playing before the mistake and perform the part again. The sequencer will automatically "punch-in" your new performance, replacing the mistake.

Quantizing, humanizing, during, velocity adjust and transposing are all available. Quantizing moves every note to the nearest time value you select. It can move the entire note or just the attack. Humanizing is quantizing with a random element introduced. During makes all notes the same length. Velocity adjust lets you compress, expand, shift, or limit attack and/or release velocities or make them all the same.

Transposing moves the pitch of all tracks (with an optional exception for drums), and/or individual tracks.

All of these functions can be easily applied to a whole track or just to part of a track. When in doubt, try it! You won't hurt anything, since you can save all changed versions to other tracks.

List Editing

The built-in MIDI event list editor is handy for small changes. It arranges the MIDI event data into columns, and allows data to be added or changed with the mouse. However, it does not allow you to listen to sections of the sequence, though it does provide icons to trigger individual notes.

Graphic Editing

The graphic editor allows you to listen to selected parts of the sequence as you work, with one or all 16 channels sounding (Figure 2). It does not allow new data to be added, but it's a much

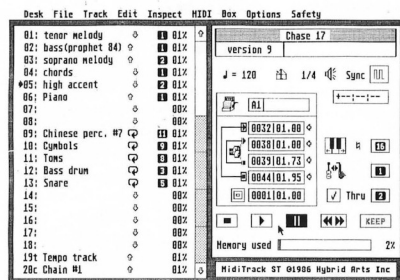


Figure 1: SMPTE Track's main screen. Tracks are shown on the left and tape deck-style controls are on the lower right.

makes it a professional tool for composing video and film soundtracks. SMPTE is also the best way to synchronize to any kind of tape deck, from a home cassette, video or 4-track deck to a mega-buck digital multitrack.

For any deck, once you've recorded SMPTE onto a spare audio track, you can wind the tape to any point and play it, and SMPTE Track will read the time code and begin to play exactly where it

The fact that SMPTE Track's SMPTE support is built in makes it much easier to use than sequencers that rely on MIDI Song Pointer and generic (but expensive) SMPTE to MIDI interfaces, and much more accurate than FSK (Frequency Shift Keying) systems (which put a pulse on the tape that's not numbered). The built-in SMPTE support makes the use of the new MIDI Time Code (MTC) unnecessary, although

easier way to make changes in existing data.

You can move notes in time using the mouse, and you can even *draw* controller information and velocity with the mouse! Want a crescendo? Draw it! Want a faster attack on that breath-controlled note; more vibrato in measure twenty; more aftertouch in the climax? You can draw the changes in seconds. Even release velocity and polyphonic aftertouch are supported.

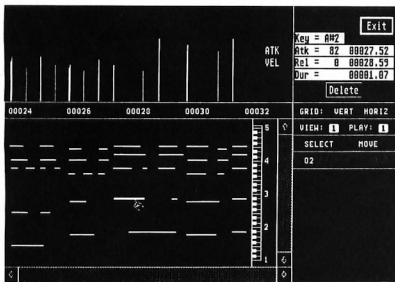


Figure 2: SMPTe Track's graphic editor allows you to listen to selected parts of the sequence as you work, with one or all 16 channels sounding.

regions could be set as easily as time regions can for other editing functions, and if pitch regions, once unmixed, weren't also still left on the original track. The section chaining can be a bit confusing to those first introduced to it.

You can back up SMPTe Track easily, although it won't work without the SMPTe box connected (both to the second mouse port and the serial port). This is an acceptable form of key protection, but there is no serial pass-

entry mode, you can format disks from within the program, and like many word processors, SMPTe Track can automatically keep the penultimate saved version of each sequence file on disk as a backup.

Other Options

An "Auto GenPatch" feature loads your synths with needed patches automatically each time you load a sequence, but you'll need Hybrid's "GenPatch" generic librarian software to save patch banks to disk from your synths.

"Hybri-Switch" is a program that toggles between SMPTe Track and other Hybrid programs (like EZ-Score Plus or DX Android). However you may need more than a megabyte to make this useful. EZ-Score Plus will change your sequence files into good-looking traditional music notation (with a three staff limit). Worth mentioning are the non-SMPTe version "SyncTrack" and the simplified "EZTrack Plus," both of which are file-compatible with SMPTe Track.

Utopia?

SMPTe Track isn't perfect—its biggest problem has been the time it took to arrive at the level of performance first promised "by March" at the January 1986 NAMM (National Association of Music Merchants) show. That was essentially moot with updates finally released this year. Hybrid promises new features will be added in future versions, though eventually those versions will require at least one megabyte of RAM.

Some small complaints: You must click the mouse button for each numeric increment change, which is annoying if you're clicking one by one through 127 velocity levels in the list editor. If you change a patch number in the list editor it will not remember the offset you've given it from the main screen. Unmix by pitch would be quicker and more convenient if pitch

through on the SMPTe box. The box is also a clumsy companion on stage.

It would be nice if graphic editing would allow the selection of multiple notes to move around together, rather than just one note at a time. As it stands, the only way to cut and paste multiple notes is with a separate "glue section" feature, which can be difficult to visualize without graphic representation. Also, although you can change a note's pitch in the graphic editing mode, you can't drag notes from one pitch to another.

Thoughtful Touches

SMPTe Track is full of nice touches. There are 27 registers for storing counter positions, tempos and mute combinations. You can route your controller keyboard to any MIDI channel and change synth patches from the computer screen. There is an easy step-

Conclusion

Stefan Daystrom, creator of the sequencer, and Joe Fitzpatrick, responsible for the SMPTe reader/generator, have done excellent work. SMPTe Track is a super product. ■

Jamie Krutz is a producer/director and composer for film and video productions. His 1040 ST has been one of his favorite tools since 1986.

Products Mentioned

SMPTe Track, \$575; MIDIplexer, \$299; GenPatch, \$150; Hybri-Switch, \$29; EZ-Score Plus, \$149.95; DX Android, 199.95; SyncTrack, \$375; EZ-Track Plus, \$65. Hybrid Arts, Inc., 11920 W. Olympic Blvd., Los Angeles, Ca 90064, 213/826-3777, Computer BBS: 213/826-4288.

CIRCLE 150 ON READER SERVICE CARD

THE INCREDIBLE BACK ISSUE SALE!

ANTIC Back Issues



HOW TO ORDER

Ordering individual magazines or disks is easy! AMS stands for Antic Magazine. ADS stands for Antic Disk. Follow these product codes with the month and year you want. For example, to order the March 1987 disk and magazine, write:

AMS0387
For Antic Magazine
March 1987

ADS0387
For Antic Magazine
March 1987

WHAT IS AVAILABLE

Individual back issue disks and magazines are available for July 1983 through the current issue. September 1984 magazine is sold out.

Individual Antic disks are \$5.95 each, Antic magazines are \$4.00 each. Remember to include shipping and handling charges (see below)

6 month back packs only \$20.00 each

Get a complete set - order both magazines and disks in our special BACK PACK SALE

DISKS

JULY THRU DECEMBER 1983 DBP8302	JULY THRU DECEMBER 1985 DBP8502
JANUARY THRU JUNE 1984 DBP8401	JANUARY THRU JUNE 1986 DBP8601
JULY THRU DECEMBER 1984 DBP8402	JULY THRU DECEMBER 1986 DBP8602
JANUARY THRU JUNE 1985 DBP8501	JANUARY THRU JUNE 1987 DBP8701

MAGAZINES

JULY THRU DECEMBER 1983 MBP8302	JULY THRU DECEMBER 1985 MBP8502
JANUARY THRU JUNE 1984 MBP8401	JANUARY THRU JUNE 1986 MBP8601
JULY THRU DECEMBER 1984 MBP8402	JULY THRU DECEMBER 1986 MBP8602
JANUARY THRU JUNE 1985 MBP8501	JANUARY THRU JUNE 1987 MBP8701

Available only in six month sets shown above.

START Back Issues



	MAGAZINES	DISKS
START #3 WINTER '86	SMS1286	SDS1286
START #4 SPRING '87	*SMS0387	SDS0387
START #5 SUMMER '87	SMS0687	SDS0687
START #6 FALL '87	SMS0987	SDS0987
START #7 WINTER '87	SMS1287	SDS1287
*SOLD OUT		

Start magazines are \$4.00 each. Start disks are \$10.95 each. Remember to include shipping and handling charges (see below)

SHIPPING AND HANDLING INFORMATION
Please include \$1.00 for each magazine ordered
Please include \$3.00 for 1-10 disks
\$6.00 for 10 or more disks

ST RESOURCE PROGRAMS (From Antic)

	ISSUE	DISK #
COMPENDIUM #1	8/85-1/86	SB0101
COMPENDIUM #2	2/86-5/86	SB0102
COMPENDIUM #3	6/86-9/86	SB0103
COMPENDIUM #4	10/86-2/87	SB0106
COMPENDIUM #5	3/87-7/87	SB0107

Compendium disks are \$10.95 each.

VISA AND MASTERCARD HOLDERS

CALL TOLL FREE 800-234-7001
OR SEND YOUR CHECK OR MONEY ORDER TO
ANTIC PUBLISHING
BACK ISSUES

544 SECOND STREET
SAN FRANCISCO, CA 94107

Please indicate by product code which issues you would like. California residents add 6½% sales tax.

Prodigy, Dialog and the Knowledge Index

by Gregg Pearlman

This month we take a look at two on-line services—one new and one old—that are worlds apart in approach. Prodigy is a new service for family use with heavy emphasis on graphics and easy menu operation, while Knowledge Index/Dialog is aimed at serious researchers, both scholastic and corporate.

Prodigy

Prodigy is from Trintex, a partnership of IBM and Sears, Roebuck and Co. It's an online service along the lines of CompuServe and GENie, but with a twist: it's graphics-oriented. When we first saw Prodigy demonstrated at the West Coast Computer Faire in April, 1988, it looked to be a service that would be excellent for many ST owners. Unfortunately, software for this extremely promising facility has been developed only for Apple and IBM computers, but not the ST—yet. So START editorial staffers harangued Prodigy's beleaguered booth-dogs to persuade the higher-ups at Trintex to develop software for the ST.

Then we thought of running Prodigy under pc-ditto, so we requested and received a 3½-inch IBM demo disk. But



Prodigy has an extremely user-friendly menu system with strong emphasis on graphics, but the price is having commercials on the screen.

because the weakest part of pc-ditto is the s-l-o-w speed of graphics handling, the demo just crawled along. However, the online demonstration (on an IBM) at Prodigy's booth was fascinating. The graphics aren't of Spectrum 512 caliber—it's an "Okay, now draw a house and fill in the colors" affair—but they're still impressive.

\$9.95 Per Month

What really makes Prodigy stand out is the price: \$9.95 total cost per month with no hourly charge. How can Trintex do this? The same way the networks can

show television programs free of charge: commercials. As you while away a happy hour online, you'll see advertisements from Prodigy's many sponsors scroll across the bottom of your screen.

Prodigy is now online for the IBM world and should be ready for Mac users next year. According to Prodigy Communications Manager Brian Ek, the ST hasn't been ruled out as a possible market, but the company simply must feed the bigger audiences first. If you want to have access to this unusual service, why not contact Trintex and tell them how you feel? Write to: Trintex, ▶

445 Hamilton Avenue, White Plains, NY 10601 or call them at (914) 993-8000.

And On The Other Hand

Dialog, the "world's largest online knowledgebank," began as a project commissioned by the Lockheed Missiles and Space Company in the early 1960s and was developed specifically as NASA's "recon database," according to marketing representative Kathy Mulvey. As a commercial service, it's been available since 1972. Overall, Dialog has roughly 80,000 customers in 80 countries. It's clearly not for the general user—largely because the general user can't pay Dialog's price for information (up to \$300 per hour). Rather, Dialog is geared toward a businessperson generating reports, or a serious researcher in a variety of fields, including business, law, medicine and technology. It's also useful to the very serious college (or graduate) student—with a healthy government grant or family trust fund.

Knowledge Index

Dialog's night service, Knowledge Index (KI), has been around since the early 1980s and it's far less expensive than Dialog: a \$35 startup fee and 40 cents per minute while searching, but this includes telecommunications charges. There is also a surcharge for accessing certain databases within KI that ranges from \$15 to \$300 per hour. But for this fee, you can access about 65 of Dialog's 300-plus databases.

Dialog has many educational uses. Educators can compile reading lists for their classes and students can research term papers or doctoral theses. College-bound students can research over 3,000 schools in the United States and Canada—or compile a list of prospective employers from thousands of company descriptions.

Professionals may make the best use of KI. Physicians can keep up with the latest research and have access to clinical studies on over 60,000 drugs. Over

Searching Through The Knowledge Index

Here's a portion of a typical search through Knowledge Index. As you'll see, I searched for articles on the DRAM shortage; what I typed online is in bold print with my comments in italics.

BEGIN COMP3

Now in COMPUTERS & ELECTRONICS (COMP) Section (COMP3) Database
MICROCOMPUTER INDEX—81-88/MAY
(COPR: 1988 DATABASE SERVICES INC.)

?FIND DRAM? AND SHORTAGE?

104 DRAM?
84 SHORTAGE?

These are the numbers of articles that my requested search has found.

S1 5 DRAM? AND SHORTAGE?

?DISPLAY S1/L/1-5

Display the "long form of the contents of the first search, first 3 entries.

Display 1/L/1

0164156 88MK03-202

DRAM chip famine is taking toll

Zengerle, Patricia

MIS Week, Mar 21 1988, v9 n12 p1, 41, 43, 3 Pages ISSN: 0199-8838

Languages: English

Document Type: Cover Story

Geographic Location: United States

Reports that the shortage of dynamic RAM chips is starting to push up the price of computer products, as well as threatening production. A number of companies are gearing up production of the chips, which should ease the shortage by the middle of 1988. Notes IBM Corp. manufactures most of its own DRAM chips. (if)

Descriptors: INTEGRATED CIRCUITS; RAM

Display 1/L/2

0164093 88IW03-201

Chip firms try to alleviate DRAM drought

Moran, Tom

InfoWorld, Mar 21 1988, v10 n12 p1, 6, 2 Pages ISSN: 0199-6649

Languages: English

Document Type: Cover Story

Geographic Location: United States

Sometimes Programming with ALICE Can be Dangerous

V1.5 Now
Shipping



ALICE: The Personal Pascal makes programming so much fun it will distract you from other things that might need your attention.

• 700 Help Screens

If that doesn't tell you that ALICE is the only system for learning to program, then wait until you see ALICE's syntax directed editor that prompts and makes it impossible for you to make most errors.

• Use GEM Now

Nobody's GEM support comes close. You can write a program with menus or overlapping windows in seconds, not hours.

• Kill Bugs Fast

Use ALICE's Pascal interpreter to debug interactively at the source code level. Breakpoints, single-step, variable tracing – it's all there.

• Have Fun

ALICE's interactive feedback and super features turn programming into the engrossing, enjoyable task it was meant to be. And if programming can't be fun, why bother?

"[ALICE] is all anyone could ask for. I would recommend [it] to anyone who is considering learning Pascal . . . or anyone who wishes to prototype small applications which deal closely with GEM." – ST Informer

"An excellent value." – Antic

"It is about as painless a method of learning Pascal as can be devised of Hypnosis. It works!" – Computer Shopper

"If you enjoy programming languages, this comes pretty darn close to being as much fun as a video game." – Computing Canada

ALICE

The Personal Pascal.

Only \$79.95. (Add \$20 for textbook)
Orders dial: 1-800-265-2782

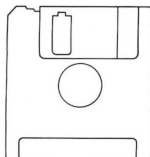
Trademarks: Atari ST, Atari, GEM, Digital Research, ALICE refers to ALICE: The Personal Pascal, a trademark of Looking Glass Software. ALICE is also available for the IBM PC to \$95.

Looking Glass Software

LOOKING GLASS SOFTWARE

124 King St. N. Waterloo, ON
N2J 2X8 Phone 519/884-7473

CIRCLE 009 ON READER SERVICE CARD



NO START DISK?

Every issue, START features great programs on disk. If you bought this issue of START without the disk, you're missing out!

CALL (800) 234-7001!

ON YOUR START DISK

GFA BASIC is quickly proving to be as useful as high-level languages – and we've got three programs on this issue's START disk to prove it. Two of these programs, Ron Schaefer's ST Microscope and John Holder's Vocabularyian, bring Computer Aided Instruction to your ST. The Vocabularyian is a flexible quiz program. You can enter your own review questions, test yourself, review a file, use the computer as an electronic dictionary and print out report cards to track your progress. File VOCAB.ARC; runs in medium or high resolution.

The ST Microscope is a more colorful educational tool. Study the electronic 'slides' on your START disk – a human neuron and a red blood cell – or create your own slide designs. File MICRO.ARC; runs in low resolution.

Our game for this issue was also written in GFA BASIC. Brickworks, by veteran programming team Paul Pratt and Steve Everman, is a ladders-and-levels game where you must rid the condemned brickworks of spiders and scorpions. Be careful – these critters bite! File BRICK.ARC; runs in low resolution.

Follow along as Dave Plotkin and Arick Anders help you choose which language package is best for you. Review the benchmarks we used to measure up the BASICS (BENCHBAS.ARC) and Cs (BENCH.ARC) on the market. And if you want to use resource files in your GFA BASIC programs, check out DIALOG.ARC and read John Hutchinson's BASIC column.

Finally, Dave Small strikes again with a great disk utility – this one will show you whether your disks have gone bad and if so, which sectors are damaged. File CERTIFY.ARC; runs in medium or high resolution.

Reports that Motorola and Texas Instruments are re-entering the DRAM market, in an effort to capitalize on the current shortage. National Semiconductor might also enter this field. (f)

Descriptors: RAM

Identifiers: Motorola; Texas Instruments; National Semiconductor

Display 1/1/3

0164054 88PK03-004

Memory-board prices surging in the wake of growing chip shortage

Siegmann, Ken; Burke, Steven

PC Week, Mar 01 1988, v5 n9 p1+, 2 Pages ISSN: 0740-1604

Languages: English

Document Type: Cover Story

Geographic Location: United States

Reports that the prices of memory and multifunction boards from several manufacturers are being raised due to 1M-bit and 256K-bit DRAM chip shortages. The manufacturers include Boca Research and IDEAssociates. Others such as Intel and AST Research are considering such an action.

Descriptors: EXPANSION BOARD; MEMORY; PRICE

Identifiers: Boca Research; IDEAssociates; Intel; AST Research

3,000 engineering and technical journals are available, as are over 720 law journals.

On the home (or business) front, computer users can find articles about hardware, software, peripherals and services. Other family members can find magazine articles on travel, entertainment and more.

Easy To Use? Not Quite

Aside from the surcharges for accessing individual databases within Dialog and KI, what might most discourage you most is that, according to Kathy Mulvey, neither service is remotely user-friendly. "In fact," she said, "When you log on, there's just a question mark for a prompt. The rest is up to you." While KI is easier than Dialog, it's still completely command-driven—there are no menus.

The KI manual comes in a three-ring binder and takes half a day to read. The Dialog manual comes in four binders

and may take you days to sort through it. (Dialog also has regular training sessions for users. If you phone the company's 24-hour customer service 800 number for assistance, the customer service representative will suggest strongly that you go through the training and read the manual thoroughly before asking any questions of them.)

No matter how unfriendly an online system is, it's always possible to master its command structure eventually. But because KI is Dialog's nighttime access service, there's another very real limitation on KI's use: its hours of access. It's only available Monday through Friday from 6 P.M. to 5 A.M. the next morning, from 6 P.M. Friday to midnight Saturday and from 3 P.M. Sunday to 5 A.M. Monday. All of these access hours are determined by your local time.

Take a look at the sidebar illustrating a typical search on the DRAM shortage. It may seem easy enough to use KI, but you really do have to keep the manual

nearby at all times. If you master KI or its parent, Dialog, you will have at your fingertips a huge library of data. Then all you have to do is find the money to pay for it. ■

Gregg Pearlman is Assistant Editor of Antic Magazine.

Services Mentioned

Prodigy. Trintex, 445 Hamilton Avenue, White Plains, NY 10601, (914) 993-8000, \$9.95 per month.

CIRCLE 170 ON READER SERVICE CARD

Knowledge Index. Dialog Information Services, Inc., 3460 Hillview Ave., Palo Alto, CA 94304, 800-3-DIALOG (800-334-2564), (415) 858-3785, \$35 start-up fee includes manual and two free hours, \$24 per hour online searching fee including all network telecommunication costs, additional charges for specific services.

CIRCLE 171 ON READER SERVICE CARD

Disk Instructions

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

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

Getting Started

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

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

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

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

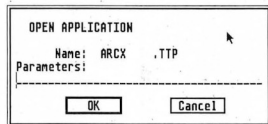
Now, put your START Backup disk in Drive A of your computer and double-click on the Drive A icon to see the disk's contents.

Un-ARCing the Files

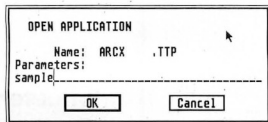
To use START's compressed disk files, please follow these steps:

1. Copy the ARCDed file you wish to use and the program ARCX.TTP from your START Backup disk onto your second blank formatted disk. When you're finished, label it *Un-ARC* disk.

2. Now you'll extract the compressed files from the ARC file you just copied. Insert your Un-ARC disk into Drive A and press the Escape key on your ST to see the disk directory. Double-click on ARCX.TTP. The following dialog box will appear:



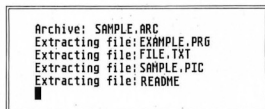
3. Type in the name of the ARC file you just copied over to your Un-ARC disk as shown in the example below and press Return. You do *not* have to type in the extender .ARC.



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

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

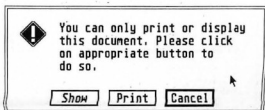
4. As the program runs, it will display the names of the individual files as it extracts them, similar to the example below.



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

To use any other archive files on your START disk, simply repeat the above procedures.

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



ALL ORDERS SHIP
IN ONE BUSINESS DAY!
(over 3.5" disks)



SAVE MONEY. GET QUALITY.

Diskettes

\$1.19 ea. 3.5" \$0.29 ea. 5.25"

100% Certified above American National Standards Institute (ANSI) specs for quality and value.

Price includes Sleeves, Labels & WP Tabs.

Money Back Guarantee.

3.5" DS 135TPI

\$1.19 ea. Qty 100
1.29 ea. Qty 75, 50
1.39 ea. Qty 25

5.25" DS DD Soft Sectored

\$0.29 ea Qty 100
Tyvek Sleeve, add 4¢
Prices subject to change

Free Delivery for \$100+ orders.
\$3.50 Others, MC, V or MO
Accepted. Ohio residents add
5.5% sales tax.

1-800-288-2887

8 AM-10 PM Mon-Fri EST
10 AM-6 PM Sat EST

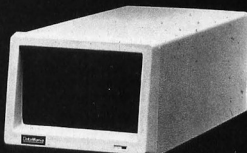
See us on CompuServe's
Electronic Mail-GO DM

Direct

M-I-C-R-O

1776 Dividend Drive
Columbus, OH 43228-9967
1-614-771-8771
FAX 1-614-771-8772

WHERE ELSE CAN YOU GET CAPACITY, PERFORMANCE, EXPANSION, AND RELIABILITY FOR THESE PRICES?



Capacity: From 20 to hundreds of megabytes.

Performance: From 12 to 65 milliseconds.

Expansion: SCSI expandable up to 7 drives.

Reliability: Field proven brand name components.

Our Prices: As low as half off competitors' prices.

Model	Description	Retail Price	Sale Price
HD-20	20mb, 40ms	\$749.95	\$689.00
HD-30	30mb, 40ms	\$849.95	\$729.00
HD-40	40mb, 40ms	\$999.95	\$849.00
HD-50	50mb, 40ms	\$1149.95	\$899.00
HD-60	60mb, 40ms	\$1249.95	\$1049.00

Special Introductory Offer

HD-60 only **\$995.00**

Good thru Sept. 30, 1988

Complete systems with software and warranty. We specialize in custom configurations. Larger capacities and faster access times available.



ST version includes date and time circuitry. Your choice of 5 case styles. We also sell HD components. Call for current prices and specifications.

DataMania

Hard Drive Systems by:

Streetsville Microsystems, Inc.

445 East Ohio Street, Suite 1809, Chicago, Illinois 60611
Voice: **312-923-0949** BBS: **312-923-1932**

Visa/MasterCard Accepted

CIRCLE 092 ON READER SERVICE CARD

PDOS[®] Realtime Operating System

A Realtime Multi tasking Multi user operating system

"PDOS is both easy to learn and easy to use - truly top-flight software. PDOS has a rich set of powerful system calls that make it easy to develop our real-time test program." -Lowell Miller, Hercules (last system for rocket motors)

PDOS Kernel & PDOS Basic \$99.95
PDOS C Language w/Assembler \$279.95
Pascal \$279.95
Absoft Fortran 77 \$499.95
And many other packages, most reasonably priced at \$99.95
Developers Kit¹ \$299.95

¹Kernel, Basic, Editor, Configurator, Assembler, Linker, PDOS Utilities)
BIOS sources purchased with the developer kit: \$99.95 (reg \$199.95)

iliad

Software, Inc.

Intelligent Software
for your Atari ST

495 West 920 North
Orem Utah, 84057
(801) 225-5751
Weekdays 10 am - 6 pm MST

Available from your local Atari dealer

Please add \$5.00 S&H for direct orders. Visa And MasterCard accepted.
Dealers, Iliad software may be purchased direct or through CSI or Triangle.

PDOS is a registered Trade mark of STREETSVILLE MICROSYSTEMS, INC. Atari is a registered trade mark of Atari Inc.

A Profile of Tangerine Dream

by Mard Naman

Twenty years is a long time, especially in the music world. How many bands that were playing in 1968 are still playing today? Score one for Tangerine Dream, the pioneering electronic music trio that celebrates its 20th birthday this year. And like a fine wine, the public's appreciation of this West German band seems only to increase with time.

Today, even people who have never heard of Tangerine Dream have probably heard their outstanding sound in many memorable film scores. From early films like *Sorcerer* and *Thief to Risky Business*, *Firestarter*, the award-winning *Shy People* and the just-released *Miracle Mile*, Tangerine Dream's sound seems tailor-made for the movies. Their music can be at once relaxing, otherworldly and totally absorbing. Listening to the interweaving textures and rhythms of a Tangerine Dream album can lift the spirit and energize the body.

As one of the very first bands to embrace electronic music and utilize its potential, the group remains on the cutting edge of technology. Today, the hypnotic, mesmerizing rhythms for which the group is famous are created in large part with the help of the Atari ST.

No Complaints

Edgar Froese is the band's founder and remains its only original member. He first decided to go with the ST because he didn't like the software that was available for the Macintosh. "We found we could do much better with Steinberg and C-Lab software, so we went with Atari," says Froese. He bought his first ST despite protests from other musicians. "Everyone said the Macintosh was the reliable unit. Everyone told us to stay away from Atari because they're unreliable and the hardware breaks down. But we've found the opposite to be true. We've worked with Atari systems for over three years with no problems. Any failures we've had have been human failures."

In fact, Froese likes Atari STs so much, the band now has 11 of them. "I could afford to hook up 11 Mac systems, but it would be stupid to do so when I can easily hook up 11 ST systems," he says.

The band will be using STs for the first time on the road during their U.S. concert tour this summer and fall. "We've got six Atari's for the tour," says Froese, "two for each of us." (Editor's note: *The cover of Tangerine Dream's latest*

album "LiveMiles" shows the group on stage. At the bottom left of the album cover is an ST next to some of the band's mixing equipment.)

Is It Live Or Tape?

Many people think of Tangerine Dream strictly as an electronic band, but in fact they play live instruments in concert as well. About 40% of what they play will be sequenced and the rest will be live. Froese will play electric guitar and acoustic piano, and fellow band member Paul Haslinger will also play electric guitar.

"Whatever we can play with six hands we'll play," says Froese. Everything else will be sequenced. "If you have a very complex composition, you can't play everything live," he notes. "You have to decide what's possible to play and what isn't. If a sequence runs four or five minutes, it would be absolutely stupid to start playing it with the left hand and trying to figure out what chord really fits in with your right hand. Therefore, all the more or less automatic stuff will be sequenced. The other important thing we want to change—the color of the sound—will be programmed so that at a certain time a program ▶

change will be activated and we can concentrate on the other work."

Techno-Sounds

When Froese started Tangerine Dream in 1968, he says he "had this crazy dream about using technology in the most advanced way possible. I'm still on that adventurous trip." Along with Keith Emerson and the Moody Blues, Tangerine Dream was among the first bands to use electronics. "At first we used the Moog synthesizer," says Froese. "We thought how wonderful it would be to store all these sounds—you couldn't store anything with the Moog, but you could create sounds never

technology for its own sake. As former band member Chris Franke says, "A lot of groups using electronics got into it because of a fascination with the technical equipment. We got into it the other way around. We were looking for specific experiences and electronic instruments were the only things around that could do the things we wanted to do."

Music To Go

... Which isn't to say the group isn't interested in the latest advances. Froese says the next big advance that excites him is the removable hard disk cartridge: "Up to 20 megabytes can be stored on a removable cartridge," says

"And that's one piece of advice I would give anyone just jumping into MIDI: The expensive equipment is not necessarily better if you know what you want to create. If you know how to compose and have a deep desire to create a certain type of music, you should go for the cheaper stuff, or something you can discard in six months and not worry about it. That's the way we work. We take our units as far as we can today. They may be out of the race tomorrow, but it doesn't matter because they didn't cost that much.

"The ST is a good example. We've never had any trouble with an Atari, but even if one breaks, I can easily get a new one. But if the Synclavier breaks, I'm in deep trouble—I might be out a quarter million dollars. So for the huge number of young people who just want to hear the sounds they've got in their heads, they should step into the ST. For them it's good to know they don't have to spend millions to create good songs and a good sound.

"I don't want to overwhelm Atari with compliments, but the only advice I would give people is, 'If you want to spend your money right, start with a normal ST. If you want to use sound data and song data at the same time, step into the Mega ST.' That's it."

The Bionic Band

Having 11 STs certainly helps Tangerine Dream create its original sounds quickly. The three members all work together. "We don't use a lot of switchers; we work parallel," says Froese. "One person will start printing sheet music. At the same time somebody else will be composing new sounds and loading it into the working memory. Someone else will start writing comments about it. We're a real human processing unit." Froese then notes that some of the band's STs are connected together so that "each unit can be transferred into another one by MIDI and by mixing consoles."



Tangerine Dream, the 20-year-old electronic band. Note the ST in the lower left of the photo.

heard before. Then the first memory systems came on the market, but you still couldn't link instruments together. That was the next big advance. When we first heard of MIDI we started jumping around in circles. We said, 'Okay, this is it!'

Tangerine Dream uses electronic equipment because they've found it's the best way to get the sound they want—they're not just using computer

Froese. "You can store all your sound and music data—whatever you compose can be stored on one cartridge, and you can put that in your pocket and take it on the road with you."

But Froese's love of the latest technology doesn't mean that he buys every high-priced piece of equipment that comes on the market—far from it. "We decided about four years ago to stop buying expensive equipment," he says.

Tangerine Dream uses mostly Steinberg software, primarily because in Germany Steinberg provides very strong support and because "the Main Page is just beautiful," says Froese. "It's just fabulous for us."

In explaining the type of sound Tangerine Dream strives for, Froese says, "The idea is not to use electronic machines to duplicate a flute or a violin—you could go out and buy the real thing for much less. What we do is use those instruments' characteristics and play in other registers, which gives us a violin or a flute that hasn't been heard before. When we want real, natural sounds, we ask friends and they easily deliver what we're asking for." Froese says he likes to create new sounds by "creating different layers and putting them on top of each other, then changing the envelope curves."

The Good Old Days

In the early years, Tangerine Dream was famous for improvising. But that's changed.

"Call those years the good old days," says Froese. "We can't improvise in the same way any more. The big change was in the late '70s when the hardware situation changed 100 percent. You have to have a more or less concrete picture of what you want to do. So we compose in a very old-fashioned way. We've switched from improvising in the area of melody lines and rhythm into improvising with sounds. So, for instance, if we've got a rhythm line stored as data, then we start playing around, changing the envelopes and the character of the sounds by adding or cutting a bit. We're trying to find the best color."

Froese says there is no set way the creative process works. "Once the data is stored, we just play around with it," he says. Or as Paul Haslinger puts it, "People think making electronic music is so serious. But we often love to just have fun. We love to act crazy, freak out and just fool around in the studio. And

Tangerine Dream's sound seems tailor-made for the movies.

the computers make it easy to do that. They are our instruments. We're not programmers; we're musicians and these are the instruments of our times."

Songwriting is often a collaborative process for Tangerine Dream. "Sometimes one of us has a concrete idea from the beginning and it sounds good and everyone agrees to it," says Froese. "Sometimes none of us is sure what to do but once the data is stored, we spend the rest of the day finding ways to make it sound more interesting."

The Wages Of Sync

Since they created the eerie, tension-filled soundtrack for William Friedkin's *Sorcerer* in 1976, Tangerine Dream has been in constant demand to do film soundtracks. For *Sorcerer*, they had the luxury of creating their music just from the script, and then the film was shot around their music. But that rarely happens. Most often they work from a "rough cut" of the film and sync their music to video using SMPTE time code. According to Froese, the kind of last-minute changes that soundtrack work requires wouldn't be possible without MIDI, because "with film people, everything has to be done in a day." But with the ST, it's easy to make changes to satisfy the director. "We run the original sound for the director and change whatever needs to be changed. It's very easy because everything is in sync and you just go through it and change sounds while he's looking at video.

"We've done film work with the Syn-

clavier, we've used every expensive system that exists. But the funny thing is—and no one wants to believe this—we always fall back on the little systems. Because we can change sounds and use so many different libraries from one moment to the next. It's easy because we have so many systems hooked up. That's why we use STs."

On The Road Again

But taking the computers on the road will be a big challenge. Even though they had five STs hooked up while recording their current "LiveMiles" album in East Berlin, they have never put a computer through the rigors of a long tour. As Froese says, "To set everything up in the studio is one thing—to bring computers on a bumpy road is another. The test is to keep the monitor working. The keyboard is fine. But if you shake the monitor for awhile, the graphics get a bit strange and you never know if it'll stay that way. But we had a German company build a flat screen for us—a travel unit."

Tangerine Dream will be crisscrossing the United States this summer and fall, starting August 25 in Chicago. It will be an unusual opportunity to see these true electronic music pioneers in concert—and with half-a-dozen STs. ■

Mard Naman is a freelance writer who specializes in personality profiles. His work first appeared in START Special Issue #2 (Graphics and Music).

Companies Mentioned

Steinberg Software, distributed by the Russ Jones Marketing Group, 17700 Raymer St., Suite 1001, Northridge, CA 91325, (818) 993-4091.

CIRCLE 215 ON READER SERVICE CARD

C-Lab Software, distributed by Digi-design, 1360 Willow Run, Suite 101, Menlo Park, CA 94025, (415) 327-8811.

CIRCLE 216 ON READER SERVICE CARD

ATARI ST PUBLIC DOMAIN Just \$3.25 per Disk

All of our approximately 400 quality Public Domain and Shareware disks for the Atari ST are just \$3.25 each - and this amazingly low price includes FREE SHIPPING in the U.S. and Canada! You can assume all disks are single sided (average of 260K per disk) and work with both color and mono 520 or 1040 ST's unless noted.

Join the more than 1000 satisfied ST owners who have turned to AccuSoft in just the last six months alone. You too can experience

Software Power Without the Price!

CAT Catalog disk - Just \$3. NEW INTERACTIVE VERSION! Have fun browsing all our PD disks, including many for PC Dito and the Magic See. Mention START magazine and we'll include a \$2 credit coupon along with your catalog disk good toward your next order.

- 108 Ramdisks and Print Spoolers (many types of each). Invaluable!
- 113 Desk Accessories #3 - Clocks, command line interpreter, calculator, more ...
- 134 ST Writer Elite 2.3 - Great word processor - optional GEM/mouse interface...
- 185 A great clone of the game Monopoly - you'll love the graphics. (COLOR)
- 198 Wheel-of-Fortune 2.0 Game - a favorite! Can make your own puzzles (COLOR).
- 139 Spacewar 3.0 - exciting action-packed arcade game for 2 players.
- 144 Great Chess game from Germany - challenging yet easy to use.
- 162 Stoneage Deluxe - A fantastic arcade game. (JOYSTICK, COLOR).
- 192 Picture Utilities #2 - Many programs. Convert pictures between resolutions, ...
- 214 Kids #3 - Several great kids programs, incl. a Concentration game (COLOR).
- 223 Speech #1 - The ST will speak (read aloud) your own text files! And more...
- 237 C Compiler - Fantastic - even has source code for a sample spreadsheet ...
- 255 Vitalize Spreadsheet clone. Also 100 business form letters.
- 294 DeskPac Plus - Powerful all-in-one desk accessory - notebook, phonebook, ...
- 301 Uniform 2.0 - The best ST modem program! Tons of features (GEM interface).
- 315 Two flexible database programs, a nice working PD spreadsheet, more ...
- 334 JILCAD 2D - Fully working CAD program! Powerful... (DBLMEG/MONO).
- 336 AIM 2.3 - Digital Image Processor - do amazing things with pictures! (1 MEG).
- 337 Cyberscape Animation - The BEST graphics demo (DBLMEG/COLOR).
- 369 Music Studio #6 - Many songs plus several PD song player programs.
- P01 Valuable hints, tips, and programs for PC Dito (ST format disk).

Pay by Check or Money Order (U.S. funds only). Fast FREE shipping!

AccuSoft Public Domain
P.O. Box 02214 • Columbus, OH 43202

APL.68000

\$99

A HIGHLY OPTIMIZED ASSEMBLER BASED APL INTERPRETER FOR FAST AND POWERFUL PROGRAMS. FEATURES A COMPLETE INTERFACE TO THE ATARI ST ENVIRONMENT WITH PULL-DOWN MENUS, DIALOG AND ALERT BOXES, AND GRAPHICS FACILITIES.

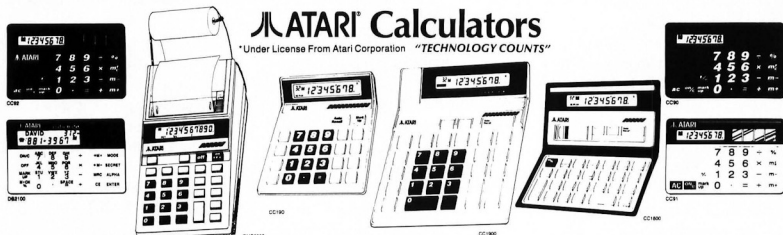
Order direct for \$99 + \$7 shipping, \$10 Canada.
VISA/MC/AMEX + 4% NJ res + 6% sales tax.

SPENCER ORGANIZATION, INC.

P.O. Box 248 Westwood, N.J. 07675

(201) 666-6011

CIRCLE 091 ON READER SERVICE CARD



Stock No.	Description	Unit	Quantity Ordered	Unit Cost	Total Cost
ATARI CALCULATORS					
CC192	32 Step Memory Calculator	Ea		8.95	
CC180	Compact Wallet Auto Recall Calculator w/Rubber Keyboard	Ea		11.95	
CC90R	Solar Powered Credit Card Calculator	Ea		5.95	
CC91R	Solar Powered Credit Card Calculator	Ea		5.95	
CC92	Solar Powered Credit Card Calculator	Ea		5.95	
CC90B	Solar Powered Credit Card Calculator	Ea		5.95	
CC91B	Solar Powered Credit Card Calculator	Ea		5.95	

Stock No.	Description	Unit	Quantity Ordered	Unit Cost	Total Cost	
ATARI CALCULATORS						
CC19G	Solar Powered Credit Card Calculator	Ea		5.95		
CC191	Compact Wallet Calculator—Battery Operated	Ea		7.95		
DMP2000	Handheld Printing Calculator—Battery Operated	Ea		24.95		
CC190	Junior Desk-Top Auto Recall Calculator—Battery Operated	Ea		9.95		
CC1900	Professional Desk-Top Auto Recall Calculator, Adjustable Display, Battery Operated	Ea		19.95		
DB2100	Data Bank Calculator/Telephone Numbers/Address/Calendar/Appointments	Ea		21.00		
ADD SHIPPING						5.00
TOTAL						

hartech USA LTD

Tel: 602 483-1991
8341 East Evans Road
Suite 106
Scottsdale, AZ 85260

FORWARD ALL ORDERS TO:

ALL STATEMENTS AND DESCRIPTIONS ON THIS PRICE LIST ARE BELIEVED TO BE CORRECT AT TIME OF PRINTING. MODEL AVAILABILITY AND PRICES ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

The ECS MIDI Musicware Series

ST Musical Education Software

by Jim Pierson-Perry

Although the ST MIDI market is presently focused on performance applications software (sequencers, patch editors, etc.), music educational products are just beginning to appear. The first offering is a series of 16 programs that teach a variety of subjects from note recognition to jazz harmonies. These come from Electronic Courseware Systems, Inc. (ECS) and are ST translations of music courses previously released for the Apple II and other computers.

The ECS Campus

ECS publishes educational and training software for all instructional levels from elementary school through college, as well as business and government uses; the courses can be set up for individual or classroom use. ECS offers over 300 courses, from language and math to fine arts and technology. Each is drafted by a qualified instructor then tested with students before being released.

Out of their existing 50-odd musical educational courses, ECS has released 16 for the ST, representing instructional levels from elementary to advanced. Most assume the user to be in at least mid-elementary school with some basic ability to read music at the note recog-

niton level. Since all share a similar format, I'll go over their common elements before touching on individual program features.

Common Ground

Unfortunately, the ECS programs share a commonality of flaws. They all come on separate single-sided copy-protected disks that you cannot back up or transfer to hard disk. This is doubly bad since all the programs write to disk at some point and thus do so on your master disk. Compounding the problem, ECS provides no documentation beyond a package blurb outlining content and loading instructions. Minimum system requirements are a 520 ST with color monitor; most of the programs also require a MIDI keyboard although a few allow operation with just the internal monitor speaker.

The biggest problem is that these programs appear to have been directly ported from the Apple II, and make no attempt to support GEM or the mouse. Some offer a help function that you call with the H key, ignoring the HELP key provided on the ST. Even more embarrassing, there is no way to exit the programs other than resetting your ST! The programs handle MIDI functions

reasonably well but they miss notes if you play too fast. This is particularly evident when playing scales and arpeggios but is not a problem for basic note recognition drills.

Oddly enough, half of the programs come configured for classroom use and require that you log in and provide a password before proceeding. This is ridiculous for home use and unfortunately you cannot bypass it. Auxiliary instructor software is included for administrative functions and monitoring student performance on these disks, along with instructions for its use.

Program content falls into one of two types: tutorials with quizzes or rote drills. In most instances, you can specify the difficulty level for the quizzes. Passing a quiz enters your name in a "Hall Of Fame," a fairly useless feature for such applications.

Course Selections

ECS has divided the courses into two sets of eight each representing beginning and intermediate levels. Beginning courses concentrate on note recognition and ear training while intermediate courses go into chord structures and fingering. Due to the similarities between the programs, many of my com- ▶

ments are generic.

Going beyond the frankly poor ST implementation, there is too much repetition of course content between programs. Keyboard Kapers, Keyboard Note Drill, Keyboard Namegame, Keyboard Speed Reading and Super Challenger are all basically the same exercise: keyboard note recognition. The same applies to the advanced chord theory courses as well as the fingering and arpeggios courses. In these cases, a single strong comprehensive program should have been delivered rather than the repetitive, watered-down current offerings.

A second and more annoying concern: there is often too little instruction provided, especially considering the program prices. Many of the beginning programs have no instruction whatsoever and are merely simple quizzes. Another example is the intermediate program Keyboard Fingering which gives no lessons—just a single help screen summary of information. This program is also restricted to cover only major, minor and harmonic minor scales for a single octave.

ECS provides two programs at the

Program content falls into two types: tutorials with quizzes or rote drills.

novice level. Early Music Skills lets you determine whether a note is drawn on a line or space and whether consecutive notes go up or down—that's all. Most 3-year olds can do that without MIDI or a computer. The other is Musical Stairs, which introduces the concept of note intervals. Unfortunately, it uses an atypical nomenclature that is not used in any other ECS course, let alone standard music, and it covers only whole note intervals.

On the positive side, several of the intermediate courses that cover chord theory have excellent integration of screen graphics, text tutorials and MIDI support. Chords are drawn on screen

and played at the same time via MIDI. These could be first-rate if the ST implementation were cleaned up.

Summary


The unfortunate bottom line is that I cannot recommend any of these programs in their present condition. Even the best of the lot are crippled by poor user interfaces and are overpriced for the amount of instructional content. There are also several ST public domain ear trainer programs far superior to these efforts.

ECS could make these programs much stronger without too much additional effort. They need to rework the programs' user interfaces to exploit the ST's features and should combine the repetitive lessons into separate powerful packages. They should also either get rid of the classroom log-in routine or make it a switchable option. Finally, I would urge ECS give up its copy protection entirely, or alter it to a key disk format so that owners could do some form of protective backup. With these changes, the ECS courseware would be worth a second look. ■

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

**Keyboard Chords
Tutorial**

**Chord quality can be identified
by sight or by sound.**



**Perfect 5th
Minor 3rd**

Minor triad

- Perfect fifth
- Minor third

Press RETURN

Although Electronic Courseware is to be commended for bringing educational music software to the ST, their programs' user interfaces should be reworked to take advantage of GEM.

Products Mentioned

Early Music Skills, Functional Harmony, Keyboard Tutor, Musical Stairs, Super Challenger, Keyboard Kapers, Keyboard Name Game, Keyboard Note Drill \$39.95 each; Keyboard Arpeggios, Keyboard Blues, Keyboard Chords, Keyboard Extended Jazz Harmonies, Keyboard Fingering, Keyboard Intervals, Keyboard Jazz Harmonies, Keyboard Speed Reading, \$79.95 each. Electronic Courseware Systems, Inc., 1210 Lancaster Drive, Champaign, IL 61821, (217) 359-7099
CIRCLE 151 ON READER SERVICE CARD

STPlus•STPlus•STPlus•STPlus

P.O. 1197, Berkeley, Ca. 94701

We all want the ST to grow, so let's BUY MORE SOFTWARE so the ST grows!
You'll find that STPlus cares about you and your ST more than anyone else that's why we put the ST in our name, through thick and thin we'll be here when you need us and we ship fast!

BUSINESS	GRAPHICS	CLIPART	GAMES	MUSIC
DBMan 4.0 175.00	Degas Elite 55.95	Warriors(720) 14.95	Gunship 35.00	Passport 35.00
Datamanager 56.00	CAD 3D 2.0 63.95	Outdoor(720) 14.95	Shadowgate 35.00	Master Tracks 280.00
Superbase 104.95	Cyber Paint 49.00	Buildings(720) 14.95	Uninvited 35.00	MasterTracks Jr. 104.95
Trimbase 69.95	Quantum 4096 27.95	Victorian(720) 14.95	Mouse Quest 14.00	Midsoft Studio 69.95
Zoomracks 2 84.95	Adv Art Studio 26.00	Etchings(720) 14.95	Blaygon 27.95	Hybrid Arts 499.95
Base 2 42.95	Spectrum 512 49.00	People (720k) 14.95	Sargon 27.95	Symc Track 299.95
The Informer 69.95	ExDraw&Superch 104.95	Religion(720) 14.95	Obliterator 27.95	EZ Track Plus 48.95
Wordperfect 189.95	Canon Scanner 104.00	Holidays(720) 14.95	Gauntlet 35.00	Midscore Plus call
1st Word Plus 64.95	Drafix 1 139.95	Ad Art (720k) 14.95	Dark Castle 27.95	EZ Score Plus 104.95
Word Up! 64.95	General Symbols 105.00	Vehicles(720) 14.95	F-15 Strike Eagle 27.95	DX-Android 139.95
Best Accounting 279.95	Elec. or Arch, Sym 105.00	Boats (720k) 14.95	Star Trek- Rebel U 35.00	CZ-Android 69.95
Equal Plus 139.95	Athena 2 69.95	Planes (720k) 14.95	Lock-On 27.95	Gen-Patch 104.95
Inventory Mgr. 69.95	Circui tMaker 55.95	All (9.2 meg) 99.95	Carrier Command 32.50	Dr. T's 199.95
Rollbase Plus 63.95				KCSequencer 289.95
Logistix Spread 104.95				KCS 16 w/PVG 56.00
Microlawyer 49.95				MIDI rec studio 75.95
Payroll Master 35.00				Copyist level 1 139.95
Construction EST. 94.95				Copyist level 2 299.95
Microsoft Write 35.00				
Datatrive 48.95				
STOneWrite 104.95				
VIP GEM 48.00				
DacEasy Payroll 52.00				
DacEasy Acctg 56.00				
WordWriter ST 56.00				
SwiftCalc 48.95				
EZ Calc by Royal 25.95				
Analyze Spread 99.95				
Final Word 140.00				
PublishingPartner 89.95				
T-works Publisher 48.95				
EZData Base 35.00				
Chart Pak 27.95				
Compute Roots 28.95				
Thunder NEW! 48.95				
Habawriter 2 35.00				
Text Pro 62.95				
Becker Text 59.95				
Expert Opinion AI 35.00				
Time Link 48.95				
Partner ST 35.00				
Labelmaster Elite 149.00				
ST Accounts 35.00				
The Juggler 35.00				
Max Pack 27.95				
Stuff 21.00				
Flash 15 27.95				
Omni Res 35.00				
Turbo ST-(blitter) 249.95				
Signum technical word processor 195.00				
SBT Dledger 195.00				
SBT DPayables 195.00				
SBT Divvoices 49.95				
SBT DMenu 27.95				
Neo Desk 69.95				
Sales Pro 39.95				
Mail Manager 35.00				
Mighty Mail 14.00				
First Word 1.6 14.00				

Just like you, we here at STPlus love the ST and know it's the most power for the price. To reward you loyal STUSERS starting with this ad we will give every one thousandth purchaser a hundred dollars credit, and the ten thousandth purchaser will get a 10 meg Supra floppy.

The ST's power is unrestrained with one of these-100 megs=\$1100 RULES: Have your customer number or credit card ready. Purchase as often as you like. We're your computer supermarket and we're ready to fulfill your dreams but we're not an information service. We ship right away and its your part to know what you want. Don't be cheap, at these prices you can splurge!

We're out there on the front lines making the ST happen for you. The ST is our specialty and thanks to your purchasing power there are about 2000 titles for the ST. I think STUSERS are the most loyal, and appreciative, supportive users there are. Remember: your software dollars make the STUSER BASE strong.

PROGRAMMING

48.95	GFA Basic	56.00
35.00	GFA Book	35.00
149.00	GFA Compiler	56.00
35.00	Mark Williams "C"	25.00
35.00	Laser "C"	159.95
27.95	Cambridge Lisp	139.95
21.00	RAID	27.95
27.95	Fast Editor	35.00
35.00	Alice Pascal	69.95
35.00	OSS Pascal	59.95
249.95	Fortran 77 GEM	139.95
	BCPL	104.95
195.00	Modula 2 dev. kit	104.95
195.00	Assempro	48.95
49.95	Fast Basic	56.95
27.95	True Basic	69.95

EDUCATIONAL

39.95	Arakis Series	14.00
35.00	Unicorn Series	27.35
14.00	True Basic Staff	69.95

Summer 520 STFM

Special
\$529 Mono
\$739 Color



Your Art Scanned
\$10 per page
75 to 300 dpi

GAMES

27.95	Tanglewood	35.00
35.00	Test Drive	35.00
32.95	Chessmaster2000	32.95
32.95	StarGlider&w&cl	32.95
35.00	Hunt for Red Oct	35.00
25.00	Police Quest	25.00
34.95	Aliants	34.95
35.00	Alien Fire	35.00
21.00	Santa Paravia	21.00
27.95	Lurking Horror	27.95
39.95	Star Fleet 1	39.95
39.95	Empire	39.95
39.95	Liesure Suit Larry	27.95
35.00	Gridiron	35.00
27.95	Dungeon Master	27.95
35.00	Flight Simulator	35.00
37.95	Trailblazer	37.95
48.95SPECIALS....	48.95
19.95	Jewel of Darkness	19.95
19.95	Silicon Dreams	19.95
48.95	Cardiac Arrest	48.95
19.95	Ball (neat,fast)	19.95
29.95	RanaRama(d&d)	29.95
29.95	Warlock'sQuest	29.95
29.95	The Flintstones	29.95
19.95	Trivial Pursuit	19.95
29.95	The Enforcer	29.95
29.95	Seconds Out	29.95
29.95	Scraples(board)	29.95
29.95	Livingstone	29.95
29.95	Battle Ships	29.95
29.95	Outrun(fast cars)	29.95
29.95	Crazy Cars	29.95
29.95	Tetris (from USSR)	29.95
29.95	Screaming Wings	29.95
29.95	Spotfire	29.95
29.95	Blue War	29.95
29.95	Star Quake	29.95
29.95	Enduro Racer	29.95
29.95	BMX Simulator	29.95
29.95	Arkanoids	29.95

The Best

European Games

Are you a gamer? How about joining our game of the month club? \$10 gets you the hottest new title at an extra 5% off & you can return it for 75% credit. Plus you'll be eligible each purchase to win a \$1000 or \$10,000. Call us and specify adventure or arcade. Get started this month with WIZBALL\$9.75

ONE NEW NUMBER

800-759-1110

Prices subject to change without notice.

We ship ANYWHERE! \$4.00 min S&H. No 1040's or Megas mail order. Hand delivery only, List plus \$100.

BRAIN STORM HARD DISK SYSTEMS

- 20, 30, 40, or 60 megabyte hard disk
- 5.25" 360k PC type or
- 3.5" 720k floppy disk
- Real time clock
- 1200 or 2400 bps modem
- Monitor A/B switch
- 4 AC outlets in back
- AC control in front
- Surge protector
- Cooling fan
- Cables included
- Software included

FROM
\$745.00



20 megabyte hard disk plus 5.25" or 3.5" floppy disk	-----\$745.00
30 megabyte hard disk plus 5.25" or 3.5" floppy disk	-----\$845.00
40 megabyte hard disk plus 5.25" or 3.5" floppy disk	-----\$995.00
60 megabyte hard disk plus 5.25" or 3.5" floppy disk	-----\$1145.00
1200 bps internal modem	-----\$95.00
2400 bps internal modem	-----\$185.00
Monitor A/B switch	-----\$65.00

VOID PRODUCTIONS

911 E. PIKE, SUITE 325, SEATTLE, WASHINGTON 98122

206-324-6809

VISA/MASTERCARD ORDERS WELCOME

OMNIREX

RUN LOW AND MEDIUM RESOLUTION PROGRAMS ON MONOCHROME
RUN HIGH RESOLUTION PROGRAMS ON COLOR MONITORS OR TV

The INDISPENSABLE UTILITY
FOR ALL ATARI ST OWNERS!

FOR MONOCHROME SYSTEMS!

Run the most popular COLOR-ONLY programs on your ATARI SM124 or SM125 monochrome monitor.

COLOR EMULATION FEATURES:

- 3 DISPLAY MODES: FULL SCREEN WITH 16 GREY SHADES, 1/2 SCREEN WITH 4 GREY SHADES, & A SPECIAL TURBO MODE THAT ACTUALLY RUNS MANY PROGRAMS FASTER ON THE MONOCHROME MONITOR THAN THEY DO ON A COLOR SYSTEM (DUE TO THE FASTER MONOCHROME VIDEO CLOCK!)

FOR COLOR SYSTEMS!

Run the most popular MONOCHROME-ONLY programs on your ATARI SC124 (and compatible) color monitor.

MONO EMULATION FEATURES:

- 3 DISPLAY EMULATION MODES, 640x400 (SCALED), 640x400 "DITHERED" AND A 640x200 DOUBLE-LENGTH SCREEN WITH THE REMARKABLE ABILITY TO SCROLL UP AND DOWN THE PAGE USING THE MOUSE!
- USER SELECTABLE MONOCHROME DISPLAY COLOR.

- AUTOMATIC STARTUP, EASILY INSTALLABLE ON YOUR OWN DISKS.
- SUPPORTS GEM & TOS (ETC.) PROGRAMS.
- WRITTEN IN 100% MACHINE LANGUAGE FOR OPTIMUM PERFORMANCE.
- COMPATIBLE WITH 520, 1040 and MEGA ST, INCLUDING NEW "BITTER" ROMS!
- NEW VERSION NOW COMPATIBLE WITH NORTH AMERICAN & GERMAN STs.

Works with virtually ALL programs, even copy-protected titles!
Discover for yourself why reviewers call Omnires "A MIRACLE!"

Only \$34.95

Price shown is in US\$. Canadian Price \$46.95. All orders add \$5 for shipping and handling. Payment by certified cheque, money order, VISA MASTERCARD and American Express. No personal cheques accepted.

HYPERTEK/SILICON SPRINGS DEVELOPMENT CORP

205-2571 Shughessy Street
Port Couillard, B.C. CANADA
V3C 3G3

Ph 604-942-4577
FAX 604-941-9358



For the Beginner:

Does NOT require MIDI, playback your music through the Atari internal sound chip.
Totally Mouse-Driven user interface
Mask the on-screen keyboard with 144 of the most used chord symbols.
The notes you record are instantly displayed on screen in traditional musical notation.
Supports chords up to 8 notes "deep".
The on-screen keyboard lights up as your music plays.
KEYS! comes with many preprogrammed music pieces.
Auto Composer creates themes and harmonies either from scratch, or from your music!

For the Professional:

Full MIDI support.
Notes, MIDI channel, duration, polyphony, and velocity recorded with mouse or a keyboard.
Compatible with Dr. T's KCS, MIDI Recording Studio (MRS), and Copyist programs.
Three modes of operation including Record, Audition, and Auto Composer.
Edit single events, move event ranges, copy ranges, and repeat with transpose.
Immediate musical notation displayed on the on-screen grand staff.
Functions on color or monochrome 520, 1040, or Mega ST computers.

Keys!

Dr. T's
MUSIC SOFTWARE



220 Boylston Street, Suite 306 * Chestnut Hill, MA 02167 * (617)-244-6954

Resourceful GFA BASIC, Part Three

by John L. Hutchinson

Add flair to your GFA programs using resource files. Sample file DIALOG.ARC on your START disk.

This is our third and final installment of START's series on using a resource construction set (RCS) to create true AES dialog boxes for use with GFA BASIC. Here I'll explain how to use the AES library procedures in a GFA BASIC program; an example program and its resource file are included on your START disk.

If you've been following along in our previous discussions; you should now have a better understanding of the structure of resources (Summer 1988 issue) and how to use an RCS (Special Issue #4). Now we'll explore a GFA BASIC program to implement the resource file we created last issue.

The AES Library Procedures

To incorporate your dialog box or any other resources in your programs, you need to use a number of AES library procedures. The following is a description of several standard AES library procedures as well as a few customized ones which are useful for the manage-

ment of dialog boxes. While it is not essential for you to know *how* each of these procedures work, it is important to know *what* they do. They must be merged with your GFA BASIC program if it is to use resource-generated dialog boxes.

Rsrc_load(Filename\$) This procedure must be called early in your program to load your resource file into your computer's memory.

Rsrc_gtree(Tree_number%, *Tree%) This procedure is a simpler form of **Rsrc_gaddr**, both of which return the memory address of the desired tree which will form your dialog box. You must supply the procedure **Tree_number%**, an integer variable which refers to the index number of the tree in your resource file. Remember that trees are numbered consecutively, beginning with 0, in order of their creation. The integer variable **Tree%** will store the memory address of your tree and will be returned by this procedure due to the addition of the asterisk (*).

Form_center(Tree%) If you want your dialog box centered on screen, calling this procedure sets up the proper parameters. **Tree%** is the tree memory address returned by the

Rsrc_gtree procedure.

Find_coords(Tree%) This is a handy procedure which minimizes repetition. Its purpose is to determine the value of the global variables **X%**, **Y%**, **B%** and **H%** which comprise the outside coordinates (clipping rectangle) of your dialog box.

Form_dial(F%,X1%,Y1%,B1%,H1%,X%,Y%,B%,H%) This is an optional procedure that creates special effects. **F%** may be either 0, 1, 2 or 3. The values 0 and 3 reserve and redraw screen memory, functions we can more easily perform in GFA BASIC with SGET and SPUT. If **F%** is 1, a grow-box effect is created when the dialog box is drawn on screen. Set to 2, a shrink-box effect is created in reverse fashion. The **Find_coords** procedure determines the **X%**, **Y%**, **B%** and **H%** variables. You must supply the values for the beginning coordinates, **X1%**, **Y1%**, **B1%** and **H1%**.

Objc_draw(Tree%,Start%,Depth%,X%,Y%,B%,H%) This procedure actually draws your dialog box objects on the screen. **Start%** is the integer value of the index of the starting tree. Set this variable to 0 for dialog box operations. **Depth%** is the levels of subordinate ob-

Example of GFA BASIC Programming Listing

```

' DIALOG.BAS
' by John Hutchinson
' Copyright 1988 Antic Publishing

' First load the resource file.
' Make sure this program, the
' resource file, and GFABASIC.PRG
' are all in the same directory;
' otherwise you will have to add
' the appropriate path name.
M1$="Resource file DEMO.RSC|"
M2$="          not found."
If Not Exist("DEMO.RSC")
  Alert 1,M1$+M2.1,"Abort",Button
Endif
@Rsrc_load("DEMO.RSC")
' Get the address of the tree of
' the box you want to display.
Tree_number% is the number of the
' tree in your RSC file (in this
' case it is 0 for our dialog box
' example). *Tree% will return
' from the procedure with the
' memory address of that tree.
Tree_number%=0
@Rsrc_gtree(0,*Tree%)
' If you want the box centered on
' the screen, make a call to
' Form_center.
@Form_center(Tree%)
' Use the Find_coords shortcut
' procedure to get the box's screen
' coordinates.
@Find_coords(Tree%)
' Make a REPEAT-UNTIL loop just
' for this demo.
Repeat
  ' Save the background screen in a
  ' temporary 32K string.
  Sget Temp$
  ' Reset the cursor to the
  ' beginning of our editable text,
  ' object index #2. This also
  ' erases any previous input in
  ' this text object.
  @Sstext(Tree%,2,"")
  ' Call this procedure for a grow
  ' box effect when the box is
  ' drawn.
  @Form_dial(1,10,10,0,0,X%,Y%,B%,H%)
  ' Now have the box drawn on the
  ' screen.
  @objc_draw(Tree%,0,8,X%,Y%,B%,H%)
  ' Turn control over to AES
  ' starting at 1st editable text,
  ' object index #2.
  Start_obj%=2
  @Form_do(Tree%,Start_obj%)
  ' Check to see which exit button
  ' was selected.
  ' In the case of this example, we
  ' only have one exit object (the
  ' OK button).
  EX%=Dpeek(Gintout)
  ' Deselect the OK button so it
  ' will be unselected next time
  ' box is drawn.
  @Sstate(Tree%,EX%,0)
  ' Restore the background screen.
  ' This is a lot faster than using
  ' event messages to redraw the
  ' screen.
  Sput Temp$
  ' Call this procedure for a
  ' shrink box effect when the box
  ' is exited.
  @Form_dial(2,0,0,0,0,X%,Y%,B%,H%)
  ' Find out what the user entered
  ' as editable text.
  ' *Text$ will return the user's
  ' input.
  @Gtext(Tree%,2,*Text$)
  ' Find out which radio button was
  ' selected.
  ' Button "ONE" is object index
  ' #3; button "TWO" is object
  ' index #4.
  @Gstate(Tree%,3,*Btn1%)
  @Gstate(Tree%,4,*Btn2%)
  If Btn1%=1
    Radio_btn=1
  Else
    If Btn2%=1
      Radio_btn=2
    Else
      Radio_btn=0
    Endif
  Endif
  ' Print the results to the
  ' screen for the demo.
  Print "You entered ";Text$
  Print "Radio button ";Radio_btn
  Print
  ' Deselect the radio buttons to
  ' prepare for next time box is
  ' called.
  @Sstate(Tree%,3,0)
  @Sstate(Tree%,4,0)
  ' Repeat the demo over and over
  ' until you enter a "Q" or "q"
  ' to quit.
  Print "Press 'Q' to quit."
  Repeat
    Key$=Inkey$
  Until Key$<>" "
  Until Key$="Q" Or Key$="q"
End
' *** AES LIBRARY PROCEDURES ***
' The AES library procedures on
' your START disk must be merged
' with your GFA BASIC program.

```

jects to draw; you should normally set this variable to 8. Again, **Find_coords** determines X%, Y%, B% and H%.

Form_do(Tree%,Start_obj%) This procedure passes control from your program to the AES to manage the user's interaction with the box. **Start_obj%** is the integer value of the object number of the first editable field in your dialog box; use 0 if your box contains no editable fields.

Gstate(Tree%,Object_number%,*State%) This procedure determines what state the user left the selectable object you give as **Tree%** and **Object_number%** after exiting your dialog box. The procedure will return **State%**, which will be 1 if the object was selected or 0 if the object was unselected.

Gtext(Tree%,Object_number%,*Text\$) This procedure determines what text the user entered in the editable text object you specify as **Tree%** and **Object_number%**. The procedure will return the user's input in the string variable, **Text\$**.

Sstate(Tree%,Object_number%,State%) Objects in resource trees do not automatically revert to their original state when the user exits the tree, so this procedure resets or changes the state of selectable objects. If **State%=1**, the object will become selected (darkened); if **State%=0**, the object becomes unselected. In some cases you might want the dialog box to reflect the user's previous input. If so, you don't need to call this procedure except to change the state of any exit buttons back to their original, unselected state.

Sxtext(Tree%,Object_number%,Text\$) Like **Sstate**, this procedure changes text or string objects in resource trees. If **Text\$** is longer than the text or string object was designed for, it will be truncated to fit. Due to a quirk in AES, this call must be used to initially store a null string ("") in any editable text fields that you want to be empty.

You do not need to know how AES works, only what these procedures do.

See For Yourself

The program listed in the sidebar to this article is on this issue's START disk. Note that this printed listing omits the actual AES procedures. To access the complete program, un-ARC the file **DIALOG.ARC** following the Disk Instructions elsewhere in this issue. This file contains **DEMORSC**, the resource file we created last issue, **DIALOG.PRG**, a program which uses the dialog box in that file and prints the user's input on the screen, and **DIALOG.LST**, an ASCII listing of that program. To load the program into GFA BASIC, run GFA and then click on Merge and select **DIALOG.LST**. By examining the code, you can see how easy it is to use resource-generated dialog boxes in your own GFA BASIC programs.

Final Tips, Hints And Suggestions

The Kuma K-Resource utility has a "compatibility" option that allows you to properly size resource trees for medium resolution even if all you have to work with is a monochrome monitor. Even so, it is often easier to create separate resource files for each resolution to be supported. Your program should first check the current resolution with an **Xbios(4)** routine and then **Gosub** to the appropriate **Rsrc_load** procedure.

Some RCS utilities limit resource files to a maximum of 32K (newer versions permit 64K resource files). Careful construction of dialog boxes to minimize the number of objects they contain can

help you stay clear of this limit. For example, use a single **BOXTEXT** object instead of a **TEXT** object within a separate **BOX** object.

If you are using a relatively large resource file with several trees, you may want to reserve some memory space for the RCS file to prevent it from being "trampled" by your GFA BASIC program. Use the GFA BASIC statement "Reserve Fre(0)-XXXX", where "XXXX" is the number of bytes to reserve. In the interpreted mode, GFA BASIC will not automatically release this memory for you; each time you run the application your available memory will be reduced unless you restore it using a modified Reserve statement such as "Reserve Fre(0)+XXXX-255". With the ST's huge memory, most programmers won't find this a problem, but you should be aware of it as a potential culprit in case your program suddenly crashes!

While this series has dealt solely with dialog boxes, remember that an RCS utility can also be used to create alert boxes, menus trees, free strings, bit images and icons. In some cases, GFA BASIC's built-in commands, such as the Alert and Menu statements, provide simpler solutions. More often than not, however, you will find that the power of a good RCS utility package will dramatically improve not only your program's appearance, but its ease of use as well. ■

John L. Hutchinson, currently on a two year tour of duty at the Australian Army War Games Center in Sydney, is the author of Naval Battle in Special Issue #4 of START.

Products Mentioned

GFA BASIC ver. 2.0, \$79.95. MichTron, 576 Telegraph, Pontiac, MI 48053, (313) 334-5700.

CIRCLE 175 ON READER SERVICE CARD

K-Resource, \$39.95. Kuma Computers Ltd., Pangbourne, Berkshire, England 07357-4335.

CIRCLE 176 ON READER SERVICE CARD

ON DISK!

ST C'S

A New Look

by
A r i c k
A n d e r s

The Language of Preference for ST Development

See for yourself how these C's stack up! File *BENCHC.ARC* on your *START* disk.

Opinions differ as to the relative merits of structured versus unstructured programming languages, but no one can deny that C has become one of the major development languages for microcomputers. In the Fall, 1986 issue of *START*, I took a look at the then-available C offerings for the ST. A lot has changed since then—for the better—and it's time to take a new look. There's no doubt that the C compiler market has some exciting packages to offer for the ST.

Since I first looked at C's two years ago, Antic Software has stopped distributing *GST C*, and Prospero Software, who picked up some *GST* products, plans to release their own C compiler in the near future. Manx has released an ST version of its compiler that veteran

Aztec developers will appreciate. *Megamax* did the impossible—they made their newest update (*Laser C*) even faster than before. *Metacom*'s *Lattice C* has added even more ANSI-compatible library functions to its already robust library.

Finally, Mark Williams, having pulled off quite a coup in the IBM market, is the first C compiler company to release a source-level debugger for its compiler. Atari is now distributing Mark Williams C as part of their Developer's Kit, but *Alcyon C* (now in version 4.0) is still available from them at a very moderate price.

To start, let's find out what we're getting for our C development dollar. All of the above companies include a symbolic debugger with their basic packages and all but *Lattice* can do in-line assembly. *Lattice*, Mark Williams and *Megamax* all include a resource construction editor as a part of their standard packages and they also support *Line A* calls directly from C. Only *Manx* does not

offer *makeR*, *diff* and an editor as part of its standard package (called the Professional System), but it does offer them as part of its Developer System.

Versions

For this article, I examined and tested *Manx Aztec Version 3.6*, *Laser C Version 1.0*, *Lattice C Version 3.04* and *Mark Williams C Version 3.0*. These were the latest versions available at press time. *Manx* and *Megamax* are also developing source-level debuggers that should be available by the time you read this review. (Editor's note: A review of the debuggers is scheduled for an upcoming issue of *START*.)

Programming Environments

Manx and Mark Williams offer traditional command-line shells, while *Lattice* and *Megamax* use graphics shells. The *Manx* package includes the *Gulam* shell, a snappy freeware piece included with the package. With a little bit of work, this shell could easily be the best

command line program, in part because of its fully editable command history, which lets you recall, edit and re-enter previous commands. Along with its command-line editing capability, Gulam offers many commands of the other command-line processors, but it has a different orientation. For example, as with the EMACS editor, you can redefine the key bindings. Gulam even has some primitive XMODEM capability. Interestingly enough, one of Gulam's intrinsic commands is *grep*, a command that Manx normally only distributes with its Developer System.

A standard, comfortable Unix-like shell is a significant part of Mark Williams's C's charm. Its commands are modeled after Berkeley Unix 4.2 and the Bourne shell. The only thing I absolutely do not like about it is the fact that I can't edit the command history. I can repeat commands and append or prepend to previous commands, but not edit. Even so, this is still the shell I use every day. (Executives want to point, managers want menus and programmers want a command line!) With all of the utilities that Mark Williams offers as part of their package, it wouldn't surprise me to see the Unix utility *awk* show up as part of their package.

For those who prefer graphics shells, Lattice includes Menu+, a handy graphics shell that lets you create and optimize your development environment. In fact, Menu+ is available as a separate package and can be customized to work with any language or development system you choose. Megamax's graphics shell offers the flexibility of Menu+ and is so intuitive and powerful that it makes traditional GEM applications seem cumbersome. You'll find yourself wondering why everyone doesn't do graphics shells this way. It's the best graphics shell I've seen.

Every shell but Lattice maintains a directory path cache in memory to speed file access, but Megamax blows the others away by maintaining an ac-

Executives want to point, managers want menus and programmers want a command line!

tual memory cache of any file loaded into memory. It seems to be even faster than Beckemeyer's dedicated cache.

The Editors

The Megamax editor is adequate for touch-ups, but it's not intended for actual development. It is intimately connected to the shell and serves primarily for fixing syntax errors after a compile. The package also includes a disassembler, an archiver, a full make utility, a resource construction set and several development utilities. The accompanying library is complete and includes standard utility routines for manipulating windows that should have been in the original Atari TOS operating system.

The Mark Williams package includes MicroEMACS 1.8, with source code. This is a very serviceable editor and EMACS editors are common on a wide variety of development systems.

The Manx editor, *z*, is a clone of the famous Unix editor *vi*, which operates much like the first editors to appear on the Atari 8-bit machines. Like all the early editors, it has a command mode and an insertion mode. If you are familiar with *vi*, you can sit down and begin work immediately. And Manx's manual is so good that I was almost convinced to go back to *vi*—the lack of a clear understanding of *vi*'s capabilities and the frustration with its manuals had

originally persuaded me to abandon it in favor of EMACS. It's not a WYSIWYG editor, but it's very useable, even for development. Unfortunately, it comes only with the Developer System.

The Lattice editor that comes with the system has been enhanced and has a GEM interface, as well as the previously available command capability. These commands include a full range of function and cursor movement capability. The editor is integrated with the shell and can be used for development.

The Manuals

Mark Williams and Megamax's manuals are the largest, the most complete and the easiest to read. The Mark Williams manual is like an encyclopedia; it takes some getting used to, but once you do, it is very flexible and easy to use. Both offer numerous programming examples in hard copy and soft copy. Lattice and Manx have some examples, but these seem more of a token gesture. Of the packages reviewed, only Manx fails to offer complete AES/VDI documentation.

Mark Williams also has the best table of contents, while Lattice's is barely acceptable. However, Lattice's *index* is the most complete I have ever seen in a computer manual. No other package I reviewed has an index that comes close. The content of Lattice's manual is good; each function is clearly documented and the concerns and cautions involved with each are clearly presented. Only Lattice included the warning about using "vqr_string" and "vsm_string" with AES (you can't, possibly due to a bug in the operating system). Megamax even dropped all references to these functions.

Both Manx and Lattice very carefully document any potential differences between their utilities and function calls and what you would expect on other systems. Since compatibility and portability are major reasons many developers standardize on these packages,

backward and cross-development are also covered.

Megamax has completely revised its documentation and, overall, I liked both the content and the layout of the Laser C manual better than any of the others. Beginning and experienced programmers can run GEM applications easily and quickly with this package.

Support

All of the companies offer online support: Manx, Megamax and Lattice have their own bulletin boards, while Lattice and Mark Williams have conferences on Bix. All but Lattice have technical phone line support, but only Mark Williams has a toll-free 800 number. Manx offers their library source code for \$300 and Megamax does so for \$50. Megamax also offers the source code to its free-program Megaroids for \$25.

Lattice C's compiler and linker still are the only fully ANSI-compatible system.

Features And Changes

Megamax Laser C

Laser C (formerly Megamax C) has changed the most since the last review. It's a different compiler package now. The graphics shell is a delight and the system works smoothly in both hard and floppy disk environments. Due to

the memory cache, compiles that take 35 seconds on the first pass take only two to seven seconds on subsequent passes. Linking is impacted even more.

Megamax has eliminated the 32K/64K limit on programs and data by using absolute code instead of PC-relative code. Explicit memory models are not supported. While absolute code takes longer to load and is slower than PC-relative code, it doesn't have PC-relative code's memory limitations.

The linker is now DRI-compatible and significantly faster. Unfortunately, it now links in whole files instead of just the needed functions. To support DRI compatibility, variable uniqueness has also been reduced from 32 characters to eight.

Megamax's \$20 upgrade fee covers both new manuals and new diskettes. For anyone who already owns an earlier version of Megamax, this is practically a steal.

Mark Williams C

Mark Williams C is an interesting package. It's the only one that offers an installation program; it works very well and is a model of how installations should be done. Mark Williams addresses the development speed difference by including a RAMdisk program in the package, complete with source code. (The benchmarks listed in the table were not performed with the RAMdisk.) With a RAMdisk to hold the temporary files, Mark Williams C speeds up considerably, although it's still not as fast as Laser C.

With the RAMdisk, the compiler and linker are reasonably quick. If you have the memory, you will definitely want to use this option. Like Manx and Lattice, Mark Williams uses the traditional four-pass compiler—a well-known, but relatively slow approach. There is a huge assortment of options for the compiler and linker. One useful option is to eliminate the code to manipulate command line arguments if you don't plan to use

HELLO.C COMPILE TIMES

	Compile	Link	Compile/Link	size
Lattice	:39	2:22	2:59	12850
Manx	1:32	:24	1:56	5547
Mark Williams	1:55	1:13	3:10	5630
Megamax	:02	:03	:04	10715

DHAMPSTONE BENCHMARKS COMPILE TIMES

	Compile	Link	Compile/Link	size
Lattice	2:37	3:08	5:45	22263
Manx	1:02	:38	1:40	11868
Mark Williams	1:55	1:13	3:10	13336
Megamax	:07	:03	:08	16445

DHAMPSTONE

	Char	Int	Fib ¹	Long	Double	Disk I/O
Lattice	7:40	3:05	1:95	:32	:38	11:78
Manx	7:93	2:03	1:68	:25	:43	11:08
Mark Williams	7:55	2:22	1:87	:28	:60	15:72
Megamax	7:35	2:03	1:78	:27	:50	18:68

¹ Fib: The Fibonacci recursion test.

them. Other options can add code to handle wildcard expansion and nested comments.

This system has a solid feel that the racier Laser C seems to lack. It seems to draw experienced programmers. I know many developers who first bought Megamax for its speed and then later migrated to Mark Williams C. I like the Mark Williams offering; it offers a lot to the Unix or DOS programmer looking for a familiar development environment.

Manx Aztec C

Despite its excellent Gulam command-line shell, Aztec C has two fatal flaws: it's far better at *allocating* memory than *freeing* it and I often ran out of room and had to reboot. Also—and this is partially Atari's fault—it's possible to save a file with the same file name as one already in the directory without deleting or overwriting the earlier version. This is extremely frustrating, to say the least.

Of the traditional four-pass compilers, Aztec C was the fastest—almost twice as fast as both Lattice C and Mark Williams C. In the Dhamptstone test, the code it produced outran every other compiler except in the character manipulation routines. One aspect of Manx's compiler that I really like is its memory modeling: by setting the appropriate switches, you can choose any of four memory models. This gives you the best of both worlds and you don't have to choose a particular memory model at the time you buy the compiler.

After Megamax, Manx's linker was far and away the fastest I tested. Its link times were a quarter of Lattice's and less than half of Mark Williams'. These times are more impressive because Manx also produced the smallest size code. Its major drawback is it cannot gracefully deal with a library forward reference.

The Developer System includes *z*, *make*, *grep*, *diff* and a really delightful utility called *c-tags*. While this package

The Mark Williams manual is like an encyclopedia.

is reasonably complete. I feel that it's overpriced for the additional capabilities it provides over the Professional System. What Manx is providing as an extra options package, the other compiler publishers are offering as part of their standard system.

One saving grace for Manx is that it has also been implemented on the Amiga, Macintosh, MS-DOS machines and Apple II family. Manx even sells a cross-development package for \$500. For developers interested in writing portable code, Manx may offer an advantage. The price for this advantage, however, is high.

Lattice C

The basic packaging of the Lattice compiler may not have changed much, but there have been some significant enhancements in addition to Menu+. The manual includes the new ANSI library extensions, so this package addresses one of the concerns often given about the Lattice development systems: they have historically used a non-standard library. The old Lattice library functions are still available, but so are the standard Unix and the ANSI functions.

The compiler and linker haven't changed much since the last review. They are still the only fully ANSI-compatible system. One of the ANSI features that only Lattice supports is function prototyping, which takes some getting used to, but it can really save you grief by catching some extremely subtle bugs at compile time.

Lattice indicates that they have sped

up their floating point library, and that portion of Lattice's Dhamptstone tests are better than any of the other packages tested.

Benchmarks

I did the benchmarks differently this time than when I first reviewed ST C programs. Each package had its own floppy disk containing the source code. This removed the effect of fragmentation when using a hard disk and let me keep the times and file sizes on each disk. Each compilation and execution was done at least twice in the environment that came with each system. This gave me the basic look and feel of each package's edit, compile, link and run cycle. Also, it reduced the times in Megamax's bench runs (which was a surprise).

Megamax's caching should be kept in mind when reviewing the compile times. The programs compiled were relatively small and much of the time for the other packages was spent just loading the compiler and linker into memory. If you would like to study the benchmarks I used, they are on your START disk in the archive file *BENCHC.ARC*; refer to the Disk Instructions located elsewhere in this issue if you are unsure how to un-ARC a file.

Conclusions

Mark Williams C will probably remain the package of choice for those who want to work with a command-line processor. It has the most complete, bug-free command shell available as part of a compiler package. It's also the only system with a source-level debugger. Its compile times need improvement, but the included RAMdisk helps.

Aztec C offers cross-developers a bridge to or from the ST market. Its most serious flaw is that Manx does not really seem to understand this market. At \$300 for the Developer System, \$200 for the Professional System and \$150 for

the source-level debugger, Manx will probably have a hard time attracting new developers. While Manx offers a very good compiler, the company is still charging too much for a package that offers too little. (Editor's Note: Manx currently has a limited-time half-price offer on their compiler packages, which expires September 30, 1988.)

Lattice C is a complete development package and offers the same capabilities as the other Cs covered here, but at a more economical cost. The ANSI compatibility offers a reasonable assurance that you can port your ANSI-compatible platforms to the Atari.

The Laser C package is unbelievable; it has an extremely innovative approach to compiler development. The techniques are the kind you'd normally expect to encounter in much more of an "ivory-tower" situation and the results are stunning. Right now the major weakness is in the actual code it produces. While it is competitive, it

doesn't really stand out; disk I/O is unusually slow and the code size is second only to Lattice C.

However, despite these concerns, 30-minute compile times just aren't as attractive as five-minute compile times. With the release of Laser C, Megamax is currently the C development compiler to beat in the ST marketplace. ■

Arick Anders remarked after finishing this article that programmers are among the luckiest professionals around: they get paid for doing their hobby!

Products Mentioned

Alycon C Version 4.0, \$20; Atari Developer's Kit (includes Mark Williams C and system documentation), \$300 or \$350 (price not set at press time). Atari Corp., 1196 Borregas Ave., Sunnyvale, CA 94088, (408) 745-2000.

Mark Williams C Version 3.0, \$179.95. 1430 W. Wrightwood Ave., Chicago, IL (312) 472-6659.

CIRCLE 236 ON READER SERVICE CARD
Laser C Version 1.0, \$199.95; updates, \$20 with original disk. Megamax, Inc., Box 851521, Richardson, TX 75085-1521, (214) 987-4931.

CIRCLE 237 ON READER SERVICE CARD
Aztec C Version 3.6—Professional System, \$199; Developer System, \$299. Aztec, 1 Industrial Way, Eatontown, NJ 07724, (800) 221-0440; 201-542-2121 in New Jersey. (Note: These products will be available for half-price until September 30, 1988.)

CIRCLE 238 ON READER SERVICE CARD
Lattice C Version 3.04, \$149.95. Metacomco; distributed by Lattice Inc., 2500 S. Highland Ave. #300, Lombard, IL 60148, (312) 916-1600.
CIRCLE 239 ON READER SERVICE CARD

AUTHORIZED ATARI ST/XL/XE

COMMODORE/AMIGA DEALERS

All Hardware/Software & Accessories

Plus IBM Compatibles & Equipment

BUY, SELL OR TRADE!!!

SUMMER SIZZLERS — 20% MORE FOR YOUR TRADE-IN!!!

New ATARI ST FM CPU

w/built in SF354 Disk Drive
with trade-in of 800XL, 1050 drive & color monitor.

Only
\$299

New ATARI 1040ST CPU

w/built in SF314 Disk Drive
with trade-in of 520ST CPU (TOS, RF) & SF354 drive.

Only
\$469

NEW ATARI XF551-360K DRIVE \$89

with trade-in of 1050 drive.

ST SF354 DRIVE Only \$99 (used)

NEW XE GAME SYSTEM W/GUN, JOYSTICKS, SOFTWARE Only \$75

with trade-in of 130XE computer.

NEW AMIGA 500 CPU \$69

with trade-in of Atari 1040ST computer system.

IBM COMPATIBLE

IBM XT Compatible — Color(CGA) or Mono graphics card, 4.77/10 MHz Turbo 8088, 640K RAM 0-wait, 360K drive, Printer/Modem/Mouse/Game ports, Clock/calendar. Only \$649*
*Options: Monochrome monitor \$79, CGA color monitor \$229, EGA color monitor \$439.

NEW PRODUCT PRICES

— ATARI ST —		— ATARI ST —	
520ST FM CPU	\$499	520ST Color Monitor	\$325
1-4MB EXP w/o RAM	\$149	Atari SF314 Drive	\$219
Supra 2400 Inc	\$159	RGB Color Monitor	\$279
XE Game System	\$149	— 400/800, XL/XE —	
1802C Color monitor	\$189	130XE Computer	\$149
Avatex 1200hc	\$99	1802C Color monitor	\$219
Happy Rev 7.1	\$99	Avatex 2400hc	\$179
ICD MI0 1 MEG	\$319	Supra 2400 Inc	\$179
Star NX-1000 Color	\$249	ICD MI0 1 MEG	\$319
Epyx 500X Joystick	\$19	Star NX-2400 (24 pin)	\$389
		Wico Black Max	\$11
		XF551-360K drive	\$179
		Magnavox 80 Mono	\$99
		Prac.Per 2400hc	\$179
		XM001 Modem	\$45
		256K 800 UG w/o RAM	\$79
		US Doubler	\$29
		MYDS 4.2A	\$25
		Star NX-1000 144cups	\$189
		KEP80 80 column UG	\$69
		Books/Software	Call

USED PRODUCT PRICES

SM124 Mono Monitor	\$125	SF354 Drive	\$99	130XE Computer	\$119
1200XL Computer	\$59	800XL Computer	\$69	400-16k Computer	\$29
Hayes Smartmodem	\$39	1050 drive	\$139	Atari 1027LQ Printer	\$79
Atari 1025 Printer	\$79	Okimate 10 w/P/IF	\$69	ATR-8000 64K, Slaves	\$189
Slave drives from	\$35	Atari RS0 interface	\$59	Commodore 1702 Mon	\$135
Koala Touch Tablet	\$29	Digitizer/recognition	\$59	Software/books from	\$1

Hundreds of new & used software & book titles for the ST/MEGA, 400/800, XL/XE, from \$1.00, call our computer with your modem 24 hours a day for free software quotes (303) 939-8174.

We buy/sell/trade new & used Commodore/Amiga, IBM compatibles, Atari/ST including hardware, software and accessories. All references to trade-ins assume equipment to be in good working condition. Shipping/handling will be added to all prices.

CUSTOMER SATISFACTION GUARANTEED with our exclusive 10 day return/refund policy.

2017 13th Street, Suite A
Boulder, CO 80302

Computer Repeats, Inc.

Orders/Questions: (303) 939-8144
Modem software quotes: (303) 939-8174

We Accept Master Card/VISA/American Express and C.O.D.

Authorized Dealers for
COMMODORE/AMIGA
and ATARI ST/XL/XE
Computers and Accessories.

NO ADDITIONAL CHARGE FOR
CREDIT CARDS OR C.O.D.'S!
Prices Shown Are Mail Order Only
WE CHECK FOR CREDIT CARD THEFT!

Obliterator, Universal Military Simulator and Prime Time

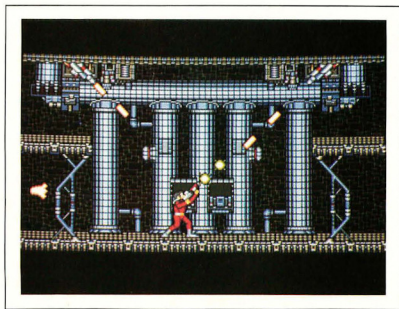
This issue's Spotlight focuses on battles—some fought in space, some in history, and some waged fiercely on the bloodiest ground of them all—the vast terrifying wasteland known as television!

OBLITERATOR

by Scot Timlin

You are Drak, the last of the Obliterators, an elite team of genetically enhanced fighting machines. Your mission is to infiltrate and disable an alien cruiser before it destroys the Earth. The fate of mankind rests on your shoulders!

Obliterator is the latest release from Psygnosis, the England-based software company responsible for Terrorpods, Barbarian, Deep Space and Arena. In Obliterator, your goal is to maneuver through several rooms in the alien ship, locate and remove five objects and get out. The first three objects control the ship's engines, shields and weapons systems; once they're gone, the systems shut down. The fourth object is a computer datapack containing important data about the aliens and their ship. (Your superiors need this information—



You're the Obliterator: a lean, mean, genetically enhanced fighting machine.

find it.) The last object gives you access to the shuttle.

Locating all five objects sets off a countdown sequence. If you plan on surviving, make sure you're on the shuttle before the counter reaches zero—because that's when an assault team from Earth attacks the alien ship.

At the bottom of your screen is a display of either several icons or your weapons. Pressing the spacebar toggles between them. Clicking on an icon will move Drak in that direction, but you can gain more control by placing the mouse pointer in the top half of the

screen. This method is also handy for firing a weapon at an odd angle.

Movement

Actually moving Drak through the game takes some getting used to. You can use a mouse, joystick or keyboard; I strongly recommend using the mouse. Controlling Drak or knowing what move to make at a given moment can be frustrating, though: I spent my first few hours of gameplay running into walls.

There is also a slight delay before an action is carried out. During combat, ▶

Drak will fall when hit by a missile. By the time he's back on his feet, another missile could knock him over again. Drak has a defensive shield that allows multiple hits, but after three or four, the shield offers little protection. The best way to avoid getting zapped is to pop into a room, scan for bad guys and leave. Then select a weapon, go back in,

the enemy gets off a shot, the missile should pass right by Drak. Some weapons are better against certain types of enemy targets—make sure you use the proper weapon for the proper threat. And finally, the manual says that you will enter towards the rear of the alien ship. Remember this—it becomes important later on.

anything away from the fun of playing the game. To this battle-hardened ST gamer, Obliterator is "the move."

UMS: THE UNIVERSAL MILITARY SIMULATOR

by George Miller

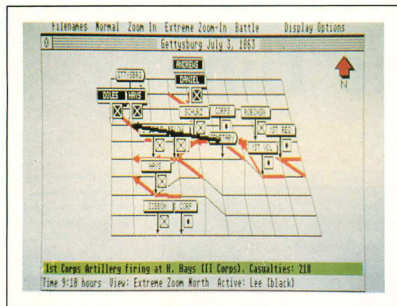
Rainbird's Universal Military Simulator (UMS) is a wargame that lets you recreate famous battles or create new ones. With it you can simulate a conflict between any two opposing forces in history—or fantasy—place them on any battlefield, and then control the action from any vantage point, zooming in on areas of interest to command the smallest unit.

UMS contains five battles, including those considered turning points in history—the Battle of Arbela between Alexander the Great and Darius III, the Battle of Hastings (which lead to the signing of the Magna Carta), the Battle of Waterloo and of Gettysburg.

Opening The Box

The UMS package contains one disk and two manuals: the User Instructions and the Scenario Handbook. The User Instructions contain detailed instructions for every mode of UMS. (However, at least one of the illustrations in the manual showed options that weren't available in the version I played.) The Scenario Manual includes a capsule summary of each scenario, providing historical background information on each clash. There's also a list of the Order of Battle and a brief outline of the strength of the opposing forces.

The UMS disk is unprotected so it's easy to backup or install the program on your hard disk. (The program asks for a specific word from the manual upon bootup—a reasonable means of protection.) The program supports two floppy disks and two hard drives, but caution: UMS may lock up your ST if you have any desk accessories installed,



With the Universal Military Simulator you can simulate a battle between any two opposing forces in history—or fantasy.

fire, then go into Defend mode, which prepares Drak for an incoming attack from one of the numerous creatures aboard the alien ship.

At one point, after I had entered an empty room, a hidden gun turret appeared suddenly and fired two shots at me. I selected a Defend move, and Drak executed a perfect tuck-and-roll just as the missiles screamed overhead. The moral of this story is, "It don't matter how ya play the game, just as long as ya look good whilst doing it!"

As you move Drak through the alien ship, you'll find different weapons—and ammunition. The need to find ammo adds realism to the game; there's nothing like running out of ammo as a large, nasty thing slithers toward you.

A few tips: Make a map of your surroundings, including what objects can be found where. After firing a weapon, go into Defend mode immediately—if

Booting Peeves

Obliterator comes on two disks. Cold-booting disk A starts the game. A series of screens appears, accompanied by some of the best music I've ever heard in an ST game. Eventually you're prompted to insert disk B. This procedure is fine on a one-drive computer system, but I was shocked to find that, on a two-drive system, I still had to swap disks. The program should have detected that two drives were installed and engaged drive B at the proper moment. I hope that future versions will fix this problem.

Still, Obliterator is a must-have for any arcade game library. Once you've mastered player movement, you'll appreciate the amount of control you'll have over Drak. The manual is clear and concise, with all functions and features explained in an easy-to-read format. I had a few minor gripes, but none took

even the Control Panel. Before booting UMS, remove all desk accessories and disable *everything* in your auto folder.

To Fight The Good Fight

UMS's opening menu selector screen lets you choose whether to run a previously created simulation, create a new scenario, design a new map, design a new army or quit. If you select "Run Simulation," you can then choose one of the included scenarios or read a different scenario from disk. It's easy to make selections, since UMS has full GEM support (as well as keyboard commands).

After you select a scenario, UMS initializes all variables and then displays the GEM Battlefield Window. Although UMS uses 3-D graphics, they aren't particularly impressive—wireframe grids for hills and valleys. However, the graphics are effective in representing the changes in terrain on the battlefield. Unfortunately, the programmers have chosen to show each unit as a flag containing the name of the unit with an arrow pointing to the occupied coordinates, rather than using traditional wargame simulation icons. With a large army it's difficult to really judge the composition of the battlefield. Even experienced wargamers will have difficulty adjusting to this view.

In defense of UMS, you can change perspectives and zoom in or out on areas of the battlefield, although it's difficult—and time-consuming—to get an overview of the battle to plot your next moves.

Next, you issue individual commands to each unit. You can't order a division or battalion to do something and expect all subordinate units to respond accordingly. Less experienced wargamers might break up a fighting unit by issuing orders that move an infantry brigade away from its supporting artillery units. It may help to use the "Print Map" option, which will let you keep track of where your units actually

are in relation to each other as you issue your orders, but the map is just a screen dump.

After sending your orders, you're ready to do battle, and you must choose the logic the computer will use during this phase—the ST can control all or some of the battle options of either (or both) sides. UMS uses rudimentary artificial intelligence to supervise the battle, although again, the zooming display mode complicates things. UMS displays information boxes that report losses for both sides at each point of conflict.

It's not possible to play a quick game because of the rather repetitive control structure. Fighting the Battle of Gettysburg took me nearly 48 hours at the computer; the real battle only took three days, with the most serious conflicts occurring during the daylight hours! UMS has a Save Game function—use it often.

poor; later I learned to do more research and plan everything carefully on paper before beginning to design with UMS.

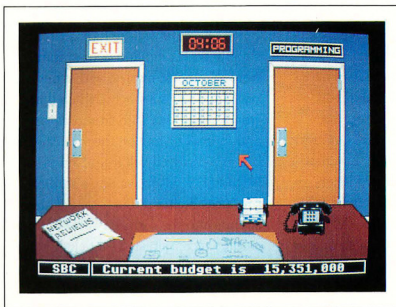
UMS: The Universal Military Simulator is for advanced wargamers looking for a new challenge. Although it's so complex that novices may be overwhelmed, experienced players will enjoy the level of control. If you're ready to create your own game and willing to deal with diversions from the traditional displays, give UMS a try.

PRIME TIME

by Andrew Reese

Just when you thought that everything that *could* be simulated on your ST had been, along comes Prime Time by First Row Software to change your mind.

Imagine yourself as a TV network programming executive competing for



Prime Time lets you recreate the triumphs and failures of a network television programming executive.

Napoleon Vs. Sherman?

Since you can use UMS to create real or fictional battles, playing "What if" is where really UMS shines. You can place any army (historical or fantasy) on any battlefield against any other army and see what happens. Creating your own scenario takes considerable time and planning, however. My early efforts were

ratings and ad revenues. Imagine yourself developing your own slate of top-notch teenage sitcoms packed with sex and violence. Will you win the battle of Sweeps Week—or lose your job? Tune in to Prime Time to find out!

Prime Time is a game for one to three players; if you play alone, your ST manages the competing networks. You

can name your network to please your fancy, but you start your season with a lineup of shows randomly determined by the computer. And these aren't just your average TV shows: they're all parodies of real shows, past and present, shows like "Piles of the Rich and Famous" and "The 'ay Team."

Dancin' With Santa

Each network begins the game with a \$15 million budget, but as in the real world, if you lose ratings, you lose ad revenues. On the other hand, if you do well in the ratings, your programming budget increases and you have more money to push (promote) shows, buy hot new shows or develop your own blockbusters. Every month you have the opportunity to bid on specials, everything from the Super Bowl to "Dancin' With Santa," but if you are short on cash, you may lose out in the bidding to your more prosperous competitors. The game ends after you have programmed one full season, September to July, with the winner being the player with the highest overall ratings.

As the season continues, you have five minutes to program the next month's line-up of shows. You can check the ratings, move shows around your schedule, shelve them, buy new shows from a number of producers, develop your own new shows, read the trade papers for trends, check your profit-and-loss statement, push one or more shows or dump any dogs. If you have trouble keeping track of your schedule, you can produce a hard copy with your printer. Your turn ends when you decide it's time to do lunch (really!).

Prime Time is a kick to play. The first few times you play, the shows and their TV Guide-style "blurbs" are fun to read. But if you tire of the canned shows, you can develop your own shows with names and plots even more ridiculous, just like those on TV every year.

Your turn ends when you decide it's time to do lunch (really!).

You can tailor each show you develop to the audience you think will carry the ratings. The variables at your command include length, type, target audience and the amount of sex and violence you want to include. It's hard to believe, but if one of your bizarre creations starts to move up in the charts, you actually feel a sense of triumph.

And Now A Word From The Screamer

Prime Time's graphics and sound make it a pleasure to play. From the rolling opening credits on, the look and feel is superb. You command your empire from an office complete with a deskpad you can draw on, a light switch that works, a Rolodex with studio names and more. Clicking on the wall calendar brings a digitized yell from Sam (The Screamer) Kinison; calling a studio produces digitized touch-tone dialing sounds and the digitized voice of the studio's receptionist. It's a delightfully complete production done with a wacky sense of humor.

The interface is also well done. You use the mouse for most operations, but can assign the mouse, keyboard or joystick to a player for use during the specials auctions. Moving shows around your schedule is done by entering the Programming Room (the door opens and closes realistically, again, with digitized sound) and grabbing film cans racked in airtime order. The right mouse button brings up a summary box of the show's status and the left grabs

the can. There's also a trashcan for your failures.

Prime Time's documentation is complete and has the same sense of humor as the game. There's a contract between you, Sweetie-Baby, and the Big TV Network, an Official Head Honcho Show Scheduling Kit and a TV Wise Guide Player's Manual that explains not only how to play, but also the ins and outs of ratings and programming strategies.

On the downside, there were too many typos in the manual and (occasionally) on the screen, and I was able to bomb the program once under circumstances I was unable to repeat—and I was leading in the ratings at the time, darn it!

But don't let these small complaints deter you from choosing Prime Time. Just make sure you have a color monitor and a good sense of humor. And by the way, if you buy all the specials you can afford and cater to teenagers, you should do fine. ■

Scot Tumlin is Direct Mail Sales Supervisor for Antic Publishing; George Miller is Director of Product Support for MichTron; Andrew Reese is Editor of START.

Products Mentioned

Obliterator, \$39.95. Psynosis, 1st Floor, Port of Liverpool Building, Pier Head, Liverpool L3 1BY, United Kingdom, 011-44-51-236-8818.

CIRCLE 215 ON READER SERVICE CARD

Universal Military Simulator, \$49.95. Rainbird Software, P.O. Box 2227, Menlo Park, CA 94026, (415) 322-0900.

CIRCLE 216 ON READER SERVICE CARD

Prime Time, \$39.95. First Row Software Publishing, Inc., 900 East 8th Avenue, Suite 300, King of Prussia, PA 19406, (215) 337-1500.

CIRCLE 217 ON READER SERVICE CARD

Digidesign's Softsynth

New Sounds To Draw On

by Jim Pierson-Perry

Samplers are incredibly versatile electronic music tools. Any sounds you can record (called samples) become new musical voices to play and control. That's also the catch to using samplers: although they have various built-in processing capabilities, it's up to you to feed in the starting sound, and your recording microphone and environment will strongly affect the quality of the samples.

What if you could get away from these "real world" limitations and have your ST create the samples? Imagine drawing the picture of a sound and having it synthesized mathematically and then sent to your sampler. You could create and experiment with well-known sound forms, such as strings or horns, or boldly go where no sound has gone before!

With Digidesign's Softsynth, you can do all that and more. Softsynth is an outstanding program, as much for its educational value as for its musical applications. Softsynth is a digital synthesizer simulator. It provides the tools for both additive and FM synthesis that let you build a sound from a series of individually sculpted pieces.

Although Softsynth creates samples, it is *not* a sample editor, an entirely

different type of program that operates on previously recorded samples and is instrument specific, much the same as synthesizer patch editors. Softsynth works with virtually all samplers in common use, including any that use the MIDI sample dump standard.

Follow The Sines

Before getting into Softsynth itself, let's go over a few basics of what sounds are and how we can create them. A sound is a pattern of vibrations, caused by movement of some source such as a plucked string. The pitch we hear for a sound is called its fundamental frequency and is expressed in Hertz (Hz); for example, middle A on the piano is 440 Hz.

Sound waves are complex beasts, made up of many different vibrations layered on top of the fundamental frequency. These additional vibrations give the sound its overall tonal color (timbre) and are called partials. Each partial has a frequency that is some multiple (ratio) of the fundamental frequency. Integral multiples make partials sound in tune while non-integral multiples add dissonant spice to the mix. Combinations of both are typical for musically interesting sounds.

Fortunately, complex sound waves can be broken down into a series of sine waves, each with a particular frequency and amplitude. Additive synthesis is the reverse of this process: a series of defined sine waves put together to create a complex sound. For each sine wave partial, you specify its starting frequency (as the ratio to the fundamental pitch), how its frequency changes with time (tuning contour) and how its loudness changes with time (amplitude envelope).

System Setup

Softsynth comes on a single program disk with a supplemental disk of 12 example sounds. The program is copy protected using the key-disk scheme. You can copy it to a hard drive but you must have the master disk in drive A when booting. Sending in your program registration card gets you a free backup disk, a greatly appreciated gesture. The manual is well written and comes with numerous illustrations.

Softsynth works with either a color or monochrome monitor and all ST models. You can do sound playback while editing (preview) through your monitor's internal speaker or a D/A (digital to analog) converter cartridge. ▶

Two such D/A cartridges are currently supported: ST Sound Digitizer (Navarone Industries, Inc.) and ST Replay (MichItron) although you cannot save sound files in either D/A cartridge file format.

While you can use Softsynth without MIDI to create and preview sounds, it's designed to send your creations directly into a MIDI sampler. Fifteen different samplers, including the MIDI sample dump standard, are supported.

Softsynth can handle up to 32 different partials—each with its own 40 stage amplitude envelope and 15 stage tuning contour. By comparison, the powerful Yamaha DX7 FM synthesizer uses only eight operators (the equivalents of partials), each with a four-stage amplitude envelope and four-stage tuning contour.

Getting Started

Softsynth uses five display screens: the main screen, individual partial editing, time slice editing, FM patching and Smartsynth parameters. When you start the program, you begin in the main

Current values for the fundamental frequency, sample rate and file length (number of samples) are shown next to the sound display and may be individually edited. A default sample rate is selected based on your choice of sampler instrument. The playing time of a created sound is a function of the sample rate and number of samples in the file.

Two other icons are present: one to enter time slice editing mode and the other to preview the sound. When you click on the preview icon, Softsynth numerically computes the sound and plays it through the ST monitor (or D/A cartridge). Repeat clicking will replay the sound immediately; resynthesis only occurs if you change any of the sound parameters.

To use the program with a sampler, you must select your specific instrument from the Sampler menu. All necessary MIDI data transfer information is built into the program; you just need to ensure the sampler is properly cabled to the ST. A section of the man-

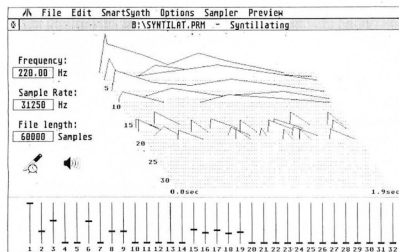
contain the actual synthesized sound data and can be sent only to samplers; you cannot open them within Softsynth for additional editing. Softsynth saves sample files to disk in a common 16-bit format used by Sound Designer (Digidesign's generic sample editing program). Softsynth also will handle automatically conversions from Sound Designer format to sampler specific formats.

Creating a Sound

You can either create a sound from scratch or build on a previously stored sound parameter file. In either case, you need to manipulate the individual partials to make the sound. Softsynth provides two modes to do this: partial editing and time slice editing. The first edits a single partial across the time axis while the latter edits all partials at a given instant in time.

Clicking on the partial number from the mixing bank display on the main screen activates the partial editing screen. From here, you can create and edit the amplitude envelope and tuning contour for the selected partial. Both are done using graphical editing with the mouse and the displays are large enough for easy editing with good accuracy. Other options include changing the ratio and waveform (choices are sine, square, triangle, pink noise and white noise). The preview icon can be used to hear the individual partial's sound. You can also use commands from the Edit menu to copy and paste parameters from the current partial to a range of destination partials, as well as setting all parameters to their default values. While few sounds would ever come near using all 32 available partials, these are useful for constructing chorusing, echo or other special effects.

Time slice editing uses the term "timbre event" to refer to the relative amplitudes of each partial at a specific instant in time. Within a single sound, there may be many timbre events as the tone changes with time. The time slice



Softsynth provides tools for both additive and FM synthesis that let you build a sound from a series of individually sculpted pieces.

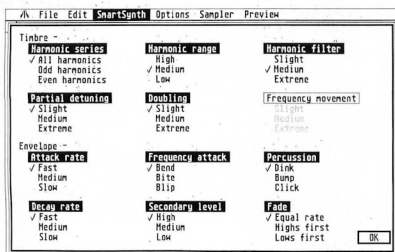
screen which features a 3D display of the current sound (partial number, amplitude and time). You can change this display to any of four viewing angles. Beneath this display is a bank of switches, one for each partial. These control the overall amplitude of each partial, similar to volume controls on a mixer.

ual provides details for the various samplers that are supported.

You can store sound data in either (or both) of two formats: a parameter file or a sample file. Parameter files contain program-specific information to create sounds and can be edited and re-saved at will. In contrast, sample files

edit screen shows a master envelope, a timbre event bar and a partials mixing icon. The envelope shows the overall sound amplitude as it changes over time and can be graphically edited using the mouse.

The timbre event bar is a series of numbered markers under the envelope



Although Softsynth creates samples, it is not a sample editor. The program works with virtually all samplers in common use, including any that use the MIDI sample dump standard.

The other major program feature is the Smartsynth option which can automatically create new sounds based on certain guidelines you specify. You can create either totally new sounds or variations on an existing sound. A setup menu is used to select which tone characteristics are to be altered and over what range they can vary. There are twelve different characteristics covering both tuning and amplitude elements that you can alter individually.

Summary

Softsynth for the ST is an excellent adaptation of the hit Macintosh MIDI program. Anyone with a sampler should consider buying it for its musical capabilities as well as the knowledge of sound theory to be gained from using it. This is also an excellent educational resource for music classes. And happily, my complaint about the MIDI Channel 1 restriction is soon to be corrected.

As an added attraction, the files created with Softsynth will be directly compatible with the Sound Designer sample editor program from Digidesign. It should be available by the time you read this. ■

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

that represent times where the sound tone changes. Clicking on any one of these markers causes the relative amplitudes of the partials at that time to be displayed in the mixer icon where they can be manipulated. New timbre events can be added by clicking in an open area in the timbre event bar and setting the partial mixer display. Existing timbre events can be moved or deleted.

To have Softsynth turn the sound parameters into a sample, you must select the synthesize command from the File menu. Synthesis can take from 10 to 30 seconds, depending on the complexity of your sound, then you can save the sample to disk and/or to your sampler. Make sure you've selected your sampler from the command menu before trying to send the sample data or you will get MIDI transmission errors.

All MIDI data is sent and received on Channel 1 exclusively, a silly restriction on an otherwise superb program. In addition, there is no provision for MIDI Thru and use of a master controller. A screen keyboard can be displayed that

lets you click on individual notes with the mouse which are played by the sampler (via MIDI Channel 1 only). Only MIDI note data is sent—you cannot send controller or velocity information, although a future version of Softsynth will allow you to specify the MIDI channel to use.

Going Beyond

Not content to provide just additive synthesis, Softsynth also contains program modules for FM synthesis and automatic sound creation (Smartsynth). FM synthesis lets you have a partial modulate one or more other partials, including itself. The concept is similar to that used by Yamaha synthesizers and diagrams are given in the manual showing how to simulate Yamaha DX7 FM algorithms.

The FM synthesis screen has two rows, each containing the numbers 1 to 32 which correspond to the partials. The top row represents the modulators; the bottom row are for the partials to be affected (carriers). Click on a number in the top row, a number in the bottom row and click on the SET button and you have created an FM patch. Modulators can be linked to multiple carriers. Typically in FM synthesis, you only hear the carrier partials. With Softsynth, you have the option of hearing only the carriers or the entire mix of carrier and modulator partials.

Products Mentioned

Softsynth (Ver. 2.1), \$295. Digidesign, Inc., 1360 Willow Road, Suite 101, Menlo Park, CA 94025, (415) 327-8811.

CIRCLE 153 ON READER SERVICE CARD

ST Sound Digitizer, \$99.95. Navarone Industries, Inc., 454 Kenneth Ave., Campbell, CA 95008, (408) 378-8177; (800) 624 6545.

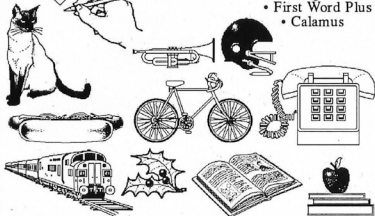
ST Replay, \$99.95. MichTron, 576 S. Telegraph, Pontiac, MI 48053, (313) 334-5700.

CIRCLE 155 ON READER SERVICE CARD

Magnetic Images™ CLIP ART!

Quality Images for use with:

- Supercharged EasyDraw
- Fleetstreet Publishers
- Publishing Partner
- First Word Plus
- Calamus



- Disk 1: Computer, Office, Music, School, Travel, Trans.
 Disk 2: Business, Sports, Animals, Party, Religious
 Disk 3: Food, Borders, Medicine, Old West, Newsletter
 Disk 4: Hands, Seasons, Pirates, Tools, Personal, America
 Disk 5: Theater, Corners, Zoo, Menu, Outdoor
 Disk 6: Adman's Special: Computer Products

\$19.95 (Add \$2.50 P & H per order)
 per disk

Magnetic Images Co.
 P.O. Box 17422, Phoenix, AZ 85011
 (602) 265-7849

(Formerly The Font Factory) Dealer inquiries welcome.

WHAT CAN CRICIT™ DO FOR YOUR BUSINESS?

CRICIT is an integrated **Cash Register & Inventory Control** package so complete that you can give your old cash register notice! CRICIT ties together many of the facets of running your business. **Here's what CRICIT can do for you:**

- Complete cash register functions
- Flexible inventory control for 65,500 products
- Daily, period and yearly reporting
- Price/product labels with optional bar code
- Coupon issue and redemption (fixed or % of sale)
- Customized receipts, coupons, inventory and reporting
- Ready-to-mail purchase orders with automatic re-order calculation
- Commission calculation for 15 sales clerks
- Mailing lists in list and label formats
- Lay-aways, auto-discounts, stock searches
- Between-store reporting via modem
- User-friendly error correction and training manual

\$219 U.S. / \$299 CDN

Demo disk is available for \$7 U.S. / \$9 CDN

Nice & Software, Inc.
 103 Queen Street S.
 Kitchener, Ontario
 Canada N2G 1W1
 (519) 744-7380

Visa & MasterCard

1040871 Monochrome

MONTH	YEAR	SALES	EXPENSES	NET	TOTAL	PERCENT	PERCENT
1	1987	100.00	20.00	80.00	100.00	100.00	100.00
2	1987	150.00	30.00	120.00	150.00	100.00	100.00
3	1987	200.00	40.00	160.00	200.00	100.00	100.00
4	1987	250.00	50.00	200.00	250.00	100.00	100.00
5	1987	300.00	60.00	240.00	300.00	100.00	100.00
6	1987	350.00	70.00	280.00	350.00	100.00	100.00
7	1987	400.00	80.00	320.00	400.00	100.00	100.00
8	1987	450.00	90.00	360.00	450.00	100.00	100.00
9	1987	500.00	100.00	400.00	500.00	100.00	100.00
10	1987	550.00	110.00	440.00	550.00	100.00	100.00
11	1987	600.00	120.00	480.00	600.00	100.00	100.00
12	1987	650.00	130.00	520.00	650.00	100.00	100.00
1	1988	700.00	140.00	560.00	700.00	100.00	100.00
2	1988	750.00	150.00	600.00	750.00	100.00	100.00
3	1988	800.00	160.00	640.00	800.00	100.00	100.00
4	1988	850.00	170.00	680.00	850.00	100.00	100.00
5	1988	900.00	180.00	720.00	900.00	100.00	100.00
6	1988	950.00	190.00	760.00	950.00	100.00	100.00
7	1988	1000.00	200.00	800.00	1000.00	100.00	100.00
8	1988	1050.00	210.00	840.00	1050.00	100.00	100.00
9	1988	1100.00	220.00	880.00	1100.00	100.00	100.00
10	1988	1150.00	230.00	920.00	1150.00	100.00	100.00
11	1988	1200.00	240.00	960.00	1200.00	100.00	100.00
12	1988	1250.00	250.00	1000.00	1250.00	100.00	100.00
1	1989	1300.00	260.00	1040.00	1300.00	100.00	100.00
2	1989	1350.00	270.00	1080.00	1350.00	100.00	100.00
3	1989	1400.00	280.00	1120.00	1400.00	100.00	100.00
4	1989	1450.00	290.00	1160.00	1450.00	100.00	100.00
5	1989	1500.00	300.00	1200.00	1500.00	100.00	100.00
6	1989	1550.00	310.00	1240.00	1550.00	100.00	100.00
7	1989	1600.00	320.00	1280.00	1600.00	100.00	100.00
8	1989	1650.00	330.00	1320.00	1650.00	100.00	100.00
9	1989	1700.00	340.00	1360.00	1700.00	100.00	100.00
10	1989	1750.00	350.00	1400.00	1750.00	100.00	100.00
11	1989	1800.00	360.00	1440.00	1800.00	100.00	100.00
12	1989	1850.00	370.00	1480.00	1850.00	100.00	100.00
1	1990	1900.00	380.00	1520.00	1900.00	100.00	100.00
2	1990	1950.00	390.00	1560.00	1950.00	100.00	100.00
3	1990	2000.00	400.00	1600.00	2000.00	100.00	100.00
4	1990	2050.00	410.00	1640.00	2050.00	100.00	100.00
5	1990	2100.00	420.00	1680.00	2100.00	100.00	100.00
6	1990	2150.00	430.00	1720.00	2150.00	100.00	100.00
7	1990	2200.00	440.00	1760.00	2200.00	100.00	100.00
8	1990	2250.00	450.00	1800.00	2250.00	100.00	100.00
9	1990	2300.00	460.00	1840.00	2300.00	100.00	100.00
10	1990	2350.00	470.00	1880.00	2350.00	100.00	100.00
11	1990	2400.00	480.00	1920.00	2400.00	100.00	100.00
12	1990	2450.00	490.00	1960.00	2450.00	100.00	100.00
1	1991	2500.00	500.00	2000.00	2500.00	100.00	100.00
2	1991	2550.00	510.00	2040.00	2550.00	100.00	100.00
3	1991	2600.00	520.00	2080.00	2600.00	100.00	100.00
4	1991	2650.00	530.00	2120.00	2650.00	100.00	100.00
5	1991	2700.00	540.00	2160.00	2700.00	100.00	100.00
6	1991	2750.00	550.00	2200.00	2750.00	100.00	100.00
7	1991	2800.00	560.00	2240.00	2800.00	100.00	100.00
8	1991	2850.00	570.00	2280.00	2850.00	100.00	100.00
9	1991	2900.00	580.00	2320.00	2900.00	100.00	100.00
10	1991	2950.00	590.00	2360.00	2950.00	100.00	100.00
11	1991	3000.00	600.00	2400.00	3000.00	100.00	100.00
12	1991	3050.00	610.00	2440.00	3050.00	100.00	100.00
1	1992	3100.00	620.00	2480.00	3100.00	100.00	100.00
2	1992	3150.00	630.00	2520.00	3150.00	100.00	100.00
3	1992	3200.00	640.00	2560.00	3200.00	100.00	100.00
4	1992	3250.00	650.00	2600.00	3250.00	100.00	100.00
5	1992	3300.00	660.00	2640.00	3300.00	100.00	100.00
6	1992	3350.00	670.00	2680.00	3350.00	100.00	100.00
7	1992	3400.00	680.00	2720.00	3400.00	100.00	100.00
8	1992	3450.00	690.00	2760.00	3450.00	100.00	100.00
9	1992	3500.00	700.00	2800.00	3500.00	100.00	100.00
10	1992	3550.00	710.00	2840.00	3550.00	100.00	100.00
11	1992	3600.00	720.00	2880.00	3600.00	100.00	100.00
12	1992	3650.00	730.00	2920.00	3650.00	100.00	100.00
1	1993	3700.00	740.00	2960.00	3700.00	100.00	100.00
2	1993	3750.00	750.00	3000.00	3750.00	100.00	100.00
3	1993	3800.00	760.00	3040.00	3800.00	100.00	100.00
4	1993	3850.00	770.00	3080.00	3850.00	100.00	100.00
5	1993	3900.00	780.00	3120.00	3900.00	100.00	100.00
6	1993	3950.00	790.00	3160.00	3950.00	100.00	100.00
7	1993	4000.00	800.00	3200.00	4000.00	100.00	100.00
8	1993	4050.00	810.00	3240.00	4050.00	100.00	100.00
9	1993	4100.00	820.00	3280.00	4100.00	100.00	100.00
10	1993	4150.00	830.00	3320.00	4150.00	100.00	100.00
11	1993	4200.00	840.00	3360.00	4200.00	100.00	100.00
12	1993	4250.00	850.00	3400.00	4250.00	100.00	100.00
1	1994	4300.00	860.00	3440.00	4300.00	100.00	100.00
2	1994	4350.00	870.00	3480.00	4350.00	100.00	100.00
3	1994	4400.00	880.00	3520.00	4400.00	100.00	100.00
4	1994	4450.00	890.00	3560.00	4450.00	100.00	100.00
5	1994	4500.00	900.00	3600.00	4500.00	100.00	100.00
6	1994	4550.00	910.00	3640.00	4550.00	100.00	100.00
7	1994	4600.00	920.00	3680.00	4600.00	100.00	100.00
8	1994	4650.00	930.00	3720.00	4650.00	100.00	100.00
9	1994	4700.00	940.00	3760.00	4700.00	100.00	100.00
10	1994	4750.00	950.00	3800.00	4750.00	100.00	100.00
11	1994	4800.00	960.00	3840.00	4800.00	100.00	100.00
12	1994	4850.00	970.00	3880.00	4850.00	100.00	100.00
1	1995	4900.00	980.00	3920.00	4900.00	100.00	100.00
2	1995	4950.00	990.00	3960.00	4950.00	100.00	100.00
3	1995	5000.00	1000.00	4000.00	5000.00	100.00	100.00
4	1995	5050.00	1010.00	4040.00	5050.00	100.00	100.00
5	1995	5100.00	1020.00	4080.00	5100.00	100.00	100.00
6	1995	5150.00	1030.00	4120.00	5150.00	100.00	100.00
7	1995	5200.00	1040.00	4160.00	5200.00	100.00	100.00
8	1995	5250.00	1050.00	4200.00	5250.00	100.00	100.00
9	1995	5300.00	1060.00	4240.00	5300.00	100.00	100.00
10	1995	5350.00	1070.00	4280.00	5350.00	100.00	100.00
11	1995	5400.00	1080.00	4320.00	5400.00	100.00	100.00
12	1995	5450.00	1090.00	4360.00	5450.00	100.00	100.00
1	1996	5500.00	1100.00	4400.00	5500.00	100.00	100.00
2	1996	5550.00	1110.00	4440.00	5550.00	100.00	100.00
3	1996	5600.00	1120.00	4480.00	5600.00	100.00	100.00
4	1996	5650.00	1130.00	4520.00	5650.00	100.00	100.00
5							

Three from Mindscape, Mouse Master and Quest For Clues

by David Plotkin

Computer role-playing games have been around for years. In these you assume the identity of one of the characters in the game, and unlike a book, what you do actually influences the outcome of the story. It's your intelligence and problem-solving ability that decides how—and if—you'll achieve the goal of the story.

This issue we'll look at three role-playing games from Mindscape and a piece of hardware to solve your mouse-and-joystick blues. We'll also look at a book to help you in your adventuring.

A Trio Of Role-Playing Games

Mindscape's three role-playing games are *Shadowgate*, *The Uninvited* and *Deja Vu*. Although their scenarios are completely different, their game mechanics are identical. All three games are heavily graphically oriented with no keyboard text entry. Your main screen consists of four resizable graphics and text windows. The center screen window shows what your character sees; double-clicking on most items visible in this window will give you a text description. Often what you see in this window is very important since not all visible objects are described in the text window. In *Deja Vu*, for example, the silhouette of a mysterious visitor can be seen in

your office, but is not mentioned in the text.

The main graphics window also contains command buttons—you give commands by clicking on one of these buttons and then on the object you want to affect in the main graphics window or in your inventory. An unusual feature of these games is that visible items are "live" — you can click on them, drag them to a new location (sometimes) or get a description by double-clicking.

Room and item text descriptions appear in the second window. The inventory window shows you whatever items you're carrying. Clicking on anything in this window will give you a description of the item. If an item can be opened—such as a wallet—you can click on it and then on the OPEN button. Another window will open to show the item's contents and you may transfer them to another item or location.

The last window is the Exits window, which shows all room exits as small colored squares. You can leave a room by double-clicking on an exit square to open a door and then click again to exit. This is very helpful, especially in making use of exits that are not visible in the main window.

Additionally, there are standard GEM

drop-down menus so that you can save any number of games, open a new game, begin a new game at any time or quit.

All three games are characterized by humorous responses in some situations. For example, in *Shadowgate*, looking at yourself in the mirror draws a comment that maybe all that easy living is beginning to tell on your frame! Brush a broom across the mirror and it will tell you that you can see yourself better.

The graphics of all three games are good, with animated sequences on many screens. Where they really excel, though, is their digitized sound. At one point in *Shadowgate* I opened a coffin and out leaped a bright red banshee, screaming with a blood-curdling yell. For the first time in my gaming career, I jumped clean out of my seat. Of course, the fact that my ST is hooked up to a stereo amplifier and external speakers might have something to do with it, but the sound is *really* good.

SHADOWGATE

Of the three, *Shadowgate* is the toughest to solve and play. In it, you must enter a dungeon and defeat an evil wizard. Besides dealing with fantasy hazards and some very nasty traps, you must constantly replenish your supply of torches, making sure to light a new torch before ▶

your old one goes out. (Stumbling around in the dark is instantly fatal.) In fact, Shadowgate is full of deathtraps and it's wise to keep lots of saved games, since you can get into situations where you are trapped because of a slip-up several moves back.

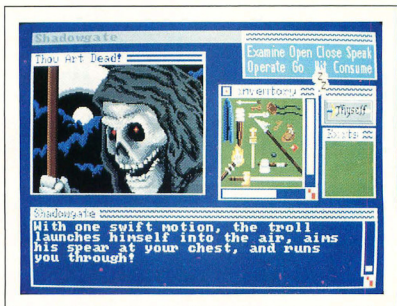
THE UNINVITED

The Uninvited, although menacing, isn't quite as tough to solve as Shadowgate. In this game, you and your brother are involved in a car crash and you lose consciousness. When you awake, your brother is missing and you find yourself outside a haunted mansion. (The car explodes into flame shortly after you crawl out of it—the program comments that this saves you the trouble of calling a tow truck!) Since you don't have anything better to do, you enter the mansion in search of your brother, who has been captured by evil spirits. Magic plays a fairly large part in this adventure, with talking busts, malevolent ghosts (be prepared to die. . .) and some offbeat humor (don't forget to pick up the can of "Ghost-be-gone").

DEJA VU

Deja Vu is the easiest of the three adventures and the one I recommend for beginners. In it, you wake up with amnesia, but all your possessions seem to indicate that you are a private eye and that you are being framed for murder. The object is to stay out of the hands of the police long enough to destroy false evidence and collect the real evidence you need to nail the real culprits. Aiding you in your quest is your revolver, although you can't use it indiscriminately. (Keep it handy though.)

As with the other games, humor abounds. There is a particularly funny (though grisly) sequence where I kept slugging a mugger and every time he made a later appearance he had more damage to his face. Deja Vu's graphics are particularly well, graphic—you seem to end up belting a lot of adversaries,



Shadowgate. For the first time in my gaming career, I jumped clean out of my seat—and this game was responsible.

which seems like a crude way to get things done. Unfortunately, I couldn't seem to get out of some situations any other way.

All three of these games are fun and challenging to play and they avoid the frustration of trying to figure out the right words to tell the computer to do what you want. The only complaint I have is that it's sometimes very difficult to use the mouse to click on items you want to use.

MOUSE MASTER

It's not a game, but if you're an inveterate gamer, you'll find Mouse Master invaluable. Mouse Master lets you to plug two joysticks and a mouse into your ST and switch between them. It's the perfect solution to games such as Robotron that require two joysticks and to others such as Major Motion that insist the joystick be plugged into port 0. Some ST games even require that you start them with the mouse plugged in, then unplug the mouse and plug the joystick in. It's a pain to do this repeatedly, especially on the 1040 ST.

Mouse Master is a small box (2 inches by 4 inches by 1¾ inches) with a switch on top, three joystick ports and a cable terminating in two plugs. Installing it couldn't be simpler: just plug the two plugs into your ST, then plug your mouse and two joysticks into the Mouse

Master. The rocker switch on top of the unit switches port 0 between mouse and joystick.

The only complaint I have about the Mouse Master is that the ports are upside down, requiring you to twist the joystick and mouse cables to plug them in. Also, the twin cables don't fit well into the groove on the underside of the 1040 keyboard designed to route the mouse/joystick cables out to its edge. But aside from these small complaints, the Mouse Master performs its task well and makes gaming with two joysticks much easier. Its long cable considerably extends the reach of your joysticks and mouse.

QUEST FOR CLUES

Starting with the original "Colossal Cave" adventure, players of computer adventure games have desperately sought help, hints and information to handle particularly difficult aspects. If you play these games, then you have undoubtedly encountered situations where a monster keeps killing off your carefully nurtured character, a door won't open, or a riddle totally stumps you. As Karl Malden says, "What will you do?"

Help is available from various sources. If you own a modem, you could call up a local bulletin board and leave a request for aid in the message

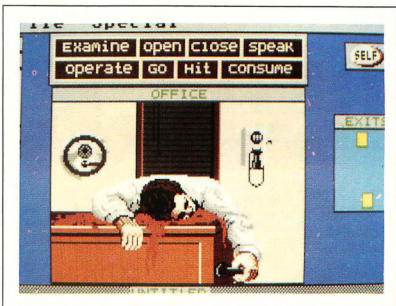
area. Or you might refer to the columns which have run in various periodicals and user group newsletters. (Current Notes, published in Sterling, Virginia, has an excellent hints column.) One problem is that sometimes the hints are cryptic and give too little information or give too much information and destroy the challenge of solving the puzzle. Some software companies also publish hint books for their own adventures.

"Quest for Clues" is another way to obtain help. This book, compiled through the not-inconsiderable efforts of a group of adventurers known as "The Questbusters Guild," offers help, hints and even complete maps for 50 games, including such classics as Bard's Tale, Borrowed Time, King's Quest III, Lurking Horror, Moonmist, The Pawn, Spell Breaker and Ultima IV.

The book starts out with a chapter on how the adventure game developed, starting with Crowther and Woods, proceeding through Scott Adams (Adventures), Richard Garriot (Lord British of Ultima fame), Infocom and Sir Tech (Wizardry). (This part alone is fascinating reading.) Then you'll find the meat of the book—the section on helping the stuck adventurer.

Several different types of help are available for the games covered. If the adventure has a complex world or maze, the book gives you a map with room

In Deja Vu you are a private eye (with amnesia) and discover that you are being framed for murder.



names and a special notation that indicates when you must obtain special objects before you can access a room. Not everything is shown on this map—only those locations necessary for solving the adventure. The map is necessarily cursory for huge worlds, such as Ultima IV. There are also general hints for character development and using special skills such as magic.

The next level of help is the "Walk-through." This section details what locations you need to visit in what order and what to do in each location. Some of the hints are coded (there's a decoding table in the back of the book) to keep you from inadvertently discovering clues you don't want. Depending on the complexity of the game, the walk-

through may include tables of information pertaining to a certain phase of the adventure.

Overall, "Quest for Clues" is quite helpful. The coding of the clues is annoying but is a necessary evil to avoid giving away too many clues at once. Often all you need is a slight push in the right direction. If you're stuck on any of the adventures this book covers, then this book is for you. ■

Dave Plotkin is a data analyst for Chevron U.S.A. and a frequent contributor to *START* and *Antic*.

Products Mentioned

Shadowgate, The Uninvited, Deja Vu,

\$49.95 each. Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062, (312) 480-7667.

CIRCLE 190 ON READER SERVICE CARD

Mouse Master, \$39.95. Practical Solutions, Inc., 1930 E. Grant Rd.,

Tucson, AZ 85716, (602) 884-9612.

CIRCLE 191 ON READER SERVICE CARD

Quest for Clues, \$24.99; \$4 shipping and handling. Edited by Shay Adams. Origin Systems Inc., 136 Harvey Road, Building B, Manchester, NH 03053, (603) 644-3360.

CIRCLE 192 ON READER SERVICE CARD



The Uninvited. In this game you enter a haunted mansion in search of your brother, who has been captured by evil spirits.

ON DISK!

BRICKWORKS

Exterminate, or Be Exterminated!

by Stephen Everman
and Paul Pratt

Battle spiders and scorpions! File BRICK.ARC on your START disk!

The Brickworks has stood abandoned for two generations, except by giant spiders and scorpions. Now the condemned building is about to become a yuppie boutique and these fierce arachnids must go. Since you drew the short straw, you've got to do the job alone, fighting for your very life with nothing but your own cunning for protection.

Brickworks is START's monster-filled arcade game where the object is to conquer as many screens as possible, amassing treasure and squashing spiders along the way! Un-ARC the file BRICK.ARC from your START disk following the Disk Instructions elsewhere in this issue. The only file you will need to play Brickworks is BRICK.PRG, although Brickworks will create a high score file on your disk called HI_SCORE.BRK. Brickworks runs in low resolution only.

Look And Feel, Ye Mighty And Despair

The Brickworks screen is made up of bricks, ladders and springs formed into

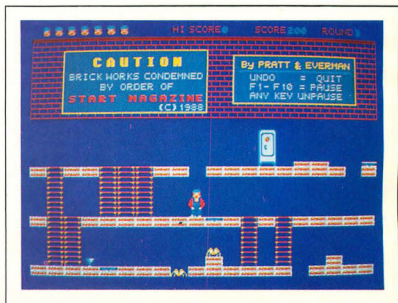
levels. There are two levels at the beginning of the game and they increase randomly to five every few rounds. The springs and bricks that make up the levels are all separate pieces that can be picked up and moved around, but you can only put them on another brick, another spring or in a hole. You can put them on a ladder, a prize (believe it or not, there *are* rewards in this game) or a stack of more than four bricks. To succeed at Brickworks you must survive the spiders' attacks and acquire points. You can accomplish both by making

traps and killing the creatures that fall into them.

To create a trap, move the bricks with your joystick until there's a hole in the floor. To do this, hold down the trigger and move the stick toward the brick you want to pick up, then place it where you want it. Keep moving the bricks until you've fashioned a hole. If the hole is above the ground level, you will be able to drop through it to the level below. Spiders, on the other hand, will always become trapped in holes.

Once a crawly thing has been drawn

Spiders and scorpions spell danger at the Brickworks!



into your trap, you can kill it by jumping up and down on it until it falls through. Climb up so that you are *above* it—not in its middle—and hold down the button while pulling the joystick up or down. But watch out: they only stay trapped so long before they crawl out most upset!

Singing For Your Supper

After you've vanquished a spider, a prize appears. Grab it and put it in the safe before another creature decides to eat it for dinner. You pick up prizes just as you pick up bricks; to put them in the safe, stand on either side of the safe, press the trigger and push the stick toward it. Once the prize is safely tucked away, its value is added to your score. For every five hundred points, you receive a bonus life.

The other way to get a bonus life is to pick up the golden key that appears randomly as a prize. If you can put the key into the safe without losing it to a creepy-crawly, you'll be awarded an extra life. A word of advice: if a key appears, drop everything and go for it. Those keys can often be the difference between embarrassment and a new high score.

You must kill off every creature in a round before advancing to the next round. The prizes become more valuable as you go along, but the next round is also harder with a greater number of creatures or, far worse, more intelligent creatures to evade.

Monsters Galore

There are four kinds of creatures, each increasingly smart and tough, from a harmless green spider that walks around aimlessly to a deadly purple scorpion that knows *exactly* where you are and how to get there. Do yourself a favor and study the way these creatures think, then use their own tricks against them.

There are 22 rounds in Brickworks, but if you survive them all, earlier rounds are repeated at random until

you quit or get killed. Then your score is compared to the existing high score and the higher of the two is saved to disk. If there isn't a HI_SCORE.BRK on the disk, the program will create one.

If you want to take a break, press any function key to pause the game. To resume, move the joystick or press any key *other* than a function key.

Strategy

You may be tempted to think of Brickworks as a game of speed and skill, but the major factor is strategy. The placement of holes and springs is of the utmost importance. Also, the faster you can move around the screen, the greater your advantage, so plan ahead. Take the extra second to move that spring into position or open up the floor so you have an extra exit in case of trouble. And never, never stand still! There is always work to be done to put yourself in a better strategic position.

If you somehow grow tired of playing Brickworks, you can quit by pressing Undo. But if you quit by just turning off your ST, the high score won't be saved to disk.

The source code is in the ASCII file BRICK.LST. Double-click on this file from the Desktop to Show or Print it. To load it in to GFA BASIC, run GFA, click on Merge and then select BRICK.LST. Please note: Brickworks was written in GFA BASIC and to get the maximum speed out of both the interpreted and compiled versions, we used two different sets of timer variables. If you want to run this program in the interpreter (GFA BASIC itself), please swap the two sets of timer variables located in the Equate procedure by putting a REM in front of one and removing the REM from in front of the other. ■

Stephen Everman and Paul Pratt are recent graduates of Hayward State University in Hayward, California and wrote "Slider" for START Special Issue #4.



LIONHEART

BUSINESS & STATISTICAL SOFTWARE

Explanatory books with professional compiled software; the new standard for statistical use. The influential Seybold Report on Professional Computing has this to say about Lionheart "...our sentimental favorite because of its pragmatic approach to the basic statistical concepts... The thinking is that the computer merely facilitates the calculations; the important thing is to be able to formulate a problem correctly and to determine what type of analysis will be most valuable. Let Lionheart help you get ahead of the competition!

• EXPERIMENTAL STATISTICS	\$145
• BUSINESS STATISTICS	145
• MARKETING STATISTICS	145
• QUALITY CONTROL	145
• BIOMETRICS	145
• ECONOMETRICS	145
• FORECASTING AND TIME-SERIES	145
• SALES AND MARKET FORECASTING	145
• PROJECT PLANNING	145
• DECISION ANALYSIS TECHNIQUES	145
• OPTIMIZATION	145
• LINEAR & NON-LINEAR PROGRAMMING	95
• MULTIVARIATE ANALYSIS	125
• REGRESSION	95

SEND FOR FREE BROCHURE

P.O. BOX 379, ALBURG, VT 05440
(514) 933-4918

Fame and Fortune!

Get Your Work Published in START!

The articles you read in START don't grow on trees—they're written by dedicated ST users like you!

We want articles of all kinds: programming tutorials (with accompanying software for our START disks), reviews, news, perspectives and tips on how to get the most out of the ST and Mega computers.

If you want to have your work read by over 75,000 ST owners and be well-paid for it, then submit your best efforts to us!

For a free copy of our author guidelines, write to:

Author Guidelines
START

544 Second Street
San Francisco, CA 94107

ADVERTISERS LIST

Be sure to mention START when contacting these advertisers—all of whom support the Atari ST Computer.

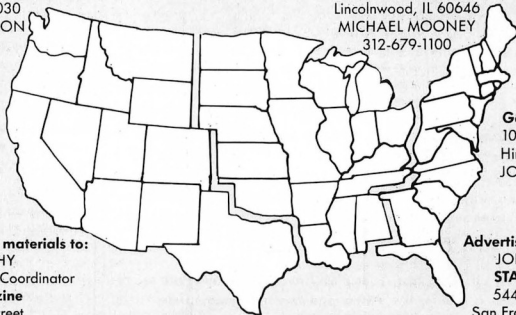
	READER SERVICE NO.	PAGE NO.		READER SERVICE NO.	PAGE NO.
ABBY'S DISCOUNT SOFTWARE	001	23	MANX	019	9
ACCUSOFT	002	70	MARK WILLIAMS COMPANY	023	2
ALPHA SYSTEMS	003	46	MEGAMAX	020	1
ANTIC SOFTWARE-CATALOG		32	MICHTRON	030	BC
AVANTE-GARDE SYSTEMS	006	35	MICROTYME	071	49
BRAD ROLTGEN ENTERPRISES	073	45	NAVARONE INDUSTRIES	022	24
BRAINSTORM	007	74	NICE SOFTWARE	031	90
COMPUSERVE	009	IBC	PASSPORT DESIGNS	038	50
COMPUTABILITY	005	39	PRACTICAL SOLUTIONS	058	14
COMPUTER REPEATS	026	82	PROCO PRODUCTS	033	45
DATA PACIFIC	008	52	RAINBIRD SOFTWARE	024	IFC, 13
DIRECT MICRO	012	66	SOFTWARE DISCOUNTERS OF AMERICA	042	56
DR. T'S MUSIC SOFTWARE	010	74	SPENCER ORGANIZATIONS, INC.	025	70
HARTECH USA LTD.	014	70	ST PLUS	039	73
HI-TECH ADVISERS	013	90	START		16
HYPERTEK	076	74	START—BACK ISSUES		60
ILIAD SOFTWARE	016	66	STREETERVILLE MICRO	027	66
ISD MARKETING	011	6,7	SUBLOGIC	040	22
LION HEART PRESS	015	95	TIMWORKS	028	5
LOOKING GLASS SOFTWARE	017	64	TRIO ENGINEERING	029	90
MAGNETIC IMAGES	018	90	ZAPHODYNE, INC.	030	52

This list is provided as a courtesy to our advertisers. START does not guarantee accuracy or completeness.

ADVERTISING SALES

Phoebe Thompson Associates
 15640 Gardenia Way
 Los Gatos, CA 95030
PHOEBE THOMPSON
 408-356-4994

The Pattis Group
 4761 W. Touhy Ave.
 Lincolnwood, IL 60646
MICHAEL MOONEY
 312-679-1100



Garland Associates
 10 Industrial Park Rd.
 Hingham, MA 02043
JOHN A. GARLAND
 617-749-5852

Address all advertising materials to:
KATE MURPHY
 Advertising Production Coordinator
START Magazine
 544 Second Street
 San Francisco, CA 94107

Advertising Sales Director
JOHN TAGGART
START Magazine
 544 Second Street
 San Francisco, CA 94107
 (415) 957-0886



**WELCOME TO COMPU SERVE.
THE LARGEST COMPUTER INFORMATION SERVICE IN THE UNIVERSE.
(AS FAR AS WE KNOW.)**

More people use CompuServe than any other online computer information service on Earth.

Over 380,000 members access hundreds of information, communications and entertainment services online.

Thousands with similar interests and special expertise converge regularly and exchange ideas on an ever-expanding list of special-interest Forums.

They have access to a combination of more financial information, a greater variety of shopping services, and deeper research resources than any other online computer service. Anywhere.

Of course, it's conceivable that there's a service like ours somewhere that could give you more for your money. But you may have to travel a few light-years to find it.

Instead, all you have to do is visit your nearest computer dealer today. To order CompuServe direct, or for more information, write: CompuServe, 5000 Arlington Centre Blvd., Columbus, Ohio 43220. Or call 800 848-8199. In Ohio and Canada, call 614 457-0802.

CompuServe®

AN H&R BLOCK COMPANY

GFA BASIC 3.0

the ultimate programming language just got better!

GFA BASIC 3.0 comes with over *three hundred* new commands, and offers an enormous increase in speed (40 to 60% faster for some programs). While others talk, GFA BASIC continues to deliver!

Even more important to the many thousands of current users of GFA BASIC, Version 3.0 remains compatible. You can still use all of the existing GFA BASIC program listings and reference books.

If you're tired of waiting for other languages to live up to their promises, come over to the one that offers automatic syntax checking, and an interactive programming environment that makes program development a snap. One of the more impressive new features is the ability to *hide* procedures. Once a procedure has been debugged, the programmer can conceal it. Only the procedure's name is shown in the listing. No longer will it be necessary to page through screen after screen of procedures.

Other important new functions are:

- > All AES functions have been implemented
- > Structured Programming



- > Line-A commands are now supported
- > Joystick commands
- > Case distinction (Select-case and Else-if)
- > Fast integer math operations

And much more!

Available for all Atari ST and Amiga computers with color or monochrome monitors \$99.95

GFA BASIC Programming Aids — No other BASIC is as well supported

Programming with GFA BASIC 3.0

Learn how to take advantage of the new power and structured programming commands in GFA BASIC 3.0. This intermediate programmers tutorial will guide you through the intricacies of this excellent programming language. Short example programs demonstrate the use of the new GFA BASIC 3.0 commands, while larger examples show you how to create complex programs. This book will enable you to begin creating the programs you've only dreamed about until now.

\$24.95

GFA BASIC Programmers Reference Guide, Volume I

This is the reference book that all intermediate and advanced programmers must have. It covers virtually every concept and command in the concentration you need. Many demonstration routines are included, suitable for use as procedures in your own programs. Whether looking to create sensational graphics and animation, or just having problems programming the RS-232 port, you'll find what you need and more in this impressive volume. For all GFA BASIC users.

\$29.95

GFA BASIC Training Reboot Camp

A brilliant beginners guide to the amazing world of GFA BASIC. This book will lead you effortlessly through the early steps necessary to make you a first class programmer. You'll even work with graphics and sound.

\$19.95

GFA BASIC Reference Card

The ultimate pocket guide to programming. Now every command is at your finger tips in this easy to follow card.

\$4.95



For more information
on these or other fine products
ask for our latest catalog!

576 S. Telegraph
Pontiac, MI 48053
(313) 334-5700

Dealer inquiries welcome.
Visa and Mastercard accepted.

THE CATALOG™

TIME PASS

The "Cyber" Line Goes Pro...



...with Cyber Paint Computer Animation!



Introducing...

Our Cover: At One-Pass Video, in San Francisco, the Cyber Desktop Video software rubs elbows with the likes of Ampex, Dubner and Wavefront. One-Pass Video is the largest video post-production and computer graphics facility in northern California. Their credits include TV commercials for Apple, Chevron, Purina, and Frito-Lay, plus MTV music videos, TV specials, and award-winning footage for the CBS Evening News.



Although the end resolution and limited colors of the Atari ST can't possibly compete with the Dubner or

the Wavefront, Cyber products offer a viable alternative to traditional storyboard techniques. Customers can quickly (and inexpensively) demonstrate graphics and animation concepts using CYBER STUDIO, CYBER PAINT, and SPECTRUM 512. These concepts are later converted to the larger machines. Plus, CYBER SCULPT is used to create the actual 3D models which are ported (via FLASH) to the One Pass Video supercomputer and rendered in 16 million colors.

The low-cost alternative of Cyber conceptualization is being discovered by other graphic-intensive businesses, such as Lucasfilm, Paramount Pictures, General Dynamics, Rockwell, Polaroid, and many university computer and film departments throughout the country.

Our Customer Service department fields hundreds of questions daily — many about our Cyber family of products. Those of you new to our product line [or those silently wondering] may find the following helpful:

WHAT DOES 'CYBER' MEAN?

When you see the word *Cyber* in front of any of our products, you know that product is somehow related to computer *animation*. (That's why SPECTRUM 512 doesn't include the word *Cyber*.) The root of the word *cyber* is to *pilot*. Cyber software is your pilot through a new universe: Cyberspace.

WHAT IS 'DESKTOP VIDEO'?

Well, desktop *publishing* is the application of low-cost micros in the professional publishing business. Desktop video is the next logical step: using the microcomputer to create professional, and economical, video displays.

MY GRAPHICS LOOK GREAT ON MY ST, WHY PUT THEM ON VIDEOTAPE?

For one thing, animations take memory. Record your animations onto videotape (using your VCR alone or with CYBER VCR), and you can get *hours* of graphics rather than minutes. Also, more people own VCR's than own ST's (over 40,000,000 versus under 200,000). Your completed videotape can be mailed to practically anyone; only an Atari owner can look at your disk.

WHAT DO I NEED TO PUT MY ATARI GRAPHICS ON VIDEOTAPE?

Video graphics are simply a recording of what is displayed on your monitor. However, the RGB output of your computer must be converted to an acceptable signal for your VCR. Many 520ST's have built-in RF modulators — plug a special monitor cable or Monitor Master into those 520's and you've got the composite

signal you'll need. But since most Atari's don't have composite output, an RGB-to-composite converter is required. Call Practical Solutions (602-884-9612) for all of the above. Or, you can use the JRI Genlock (415-458-9577) which lets you blend video images with computer images and produces a true RS-170 NTSC signal.

I WANT TO GET INTO DESKTOP VIDEO, BUT, RIGHT NOW, I CAN ONLY AFFORD ONE PROGRAM. WHICH PROGRAM SHOULD I GET FIRST?

Depends on your interest. If you like 3D graphics, begin with CYBER STUDIO and CYBER CONTROL. Anyone with a craving for animation should start with CYBER PAINT. And those who want the best art tools available will find them in SPECTRUM 512. The following chart will help:

Goal	Product
2D static or true color graphics	SPECTRUM 512
3D static graphics	CYBER STUDIO
3D animated graphics	CYBER STUDIO & CYBER CONTROL
2D & 3D, animated or static graphics	CYBER PAINT

DO YOU PUBLISH ANYTHING BESIDES GRAPHICS PRODUCTS?

Absolutely! Take a look at our products from page 12 on. We publish FLASH, the most popular terminal program on the ST, as well as several related telecommunications programs. (Be sure and check out SHADOW, our new multitasking file-transfer program.) Our educational software — such as GENESIS, the 3D Molecular Modeler, or MAPS AND LEGENDS — are sophisticated for a broad age range, yet extremely easy to use. According to our customers, PHASAR is the best home financial package for your ST, and be sure and read about our new MACRO MOUSE utility. We even offer the only collection of stereoscopic computer games.

ST Cyber Family

CYBER SCULPT™ The 3D Modeling Tool™

by Tom Hudson

STEREOTEX
CORPORATION

When Tom Hudson wrote CAD-3D 2.0 for the CYBER STUDIO (ST0236), memory limitations confined him to two basic object-modeling tools: Spin and Extrude. And, when combined with the ability to join objects, these tools offered (and still offer) variety and flexibility.

But Tom knew of more sophisticated object-modeling tools on high-end workstations — such as the Iris or Sun. He figured the best way to fit all those bells and whistles in one meg of ST RAM was to design a program that does just one thing — builds three-dimensional objects. And not just spun or extruded, but twisted, pushed, pulled, tweaked, and pummeled. The most fantastic shapes imaginable.

Skew, Twist, and Bend
Tom's new program is called CYBER SCULPT. It's mouse-controlled,

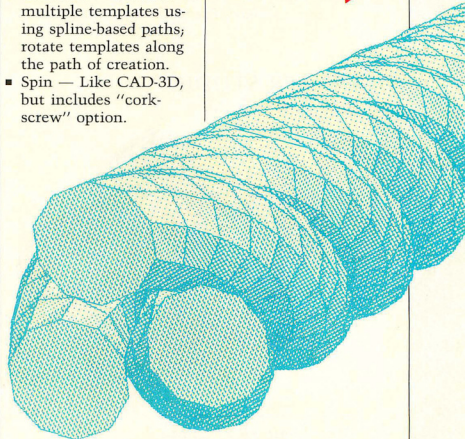
stand-alone, and a lot of fun to use. If CAD-3D object creation is like working with wood, CYBER SCULPT object creation is like working with clay. Don't like the shape of that object? Grab some vertices, and drag them into a better position. Or move a *magnet* over your object and watch the vertices stretch toward it. Skew, twist or bend objects into incredible shapes.

CYBER SCULPT includes cross-sectional modeling for shapes like boat hulls, or dimensional topography. And, for you engineers, we include optional manual data entry, and support for the more popular digitizing tablets.

Take a look at these features:

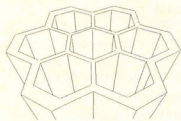
- Object Distortion — Skew (diagonal shear), bend (to any angle), and twist (along user-defined axis).
- Vertex Pulling — Distort by direct vertex manipulation.
- "Magnet" — Stretch selected vertices based on distance from magnet.

- Cross-sectional Model Creation — Connect multiple templates using spline-based paths; rotate templates along the path of creation.
- Spin — Like CAD-3D, but includes "cork-screw" option.



New!

- Complex Extrude — Single-template extrusion with optional end-capping, spline-controlled twist, and spline-controlled extrusion path.



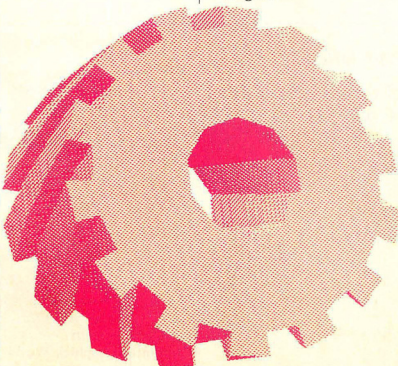
- Variable-magnification work window — see and manipulate entire model or just a small part.

- Face Beveling
- Manual Face Coloring — "Paint" object's faces with specific colors.
- 3D Mirroring — Create half the model, then mirror it to make the other half.
- 2D Template Toolkit:
 - Spline interpolation of points with user-defined smoothness.
 - Point mirroring, scaling, dragging, cloning.
 - n-face automatic polygon creation.
 - Arc generation.
- 3D primitives: Cubes, Prisms, Spheres, Hemispheres, Cones, Cylinders, Tubes, Discs.
- 2D/3D coordinate display.
- Raster tracing — convert 2D pictures into 3D objects.
- Isometric projection view window.

CYBER SCULPT
ST0255 Available in July
REQUIRES One-megabyte
RAM



All 50 states 6AM-6PM PACIFIC TIME
Monday-Friday MasterCard, VISA Only

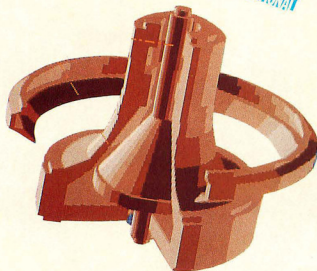


ST Cyber Family

"Attic's CAD-3D is one of the best programs I've seen for the Atari or anything else."

— Jerry Pournelle, Byte Magazine

THE CYBER STUDIO™ Featuring CAD-3D 2.0



Works with all ST paint programs, and the CYBER family.

Tom Hudson's STEREO CAD-3D 2.0

Hidden within your Atari ST is a professional 3D workstation. A 3D solid-modeling design system that is intuitive — yet powerful enough for professional artists, advertising agencies, or design firms.

Design and walk through your dream house with CAD-3D 2.0. Programmers use our system for dimensional tasks like flight-simulator scenic design; artists create accurate perspective foundations for their DEGAS or NeoChrome pictures; engineers find CAD-3D 2.0 the perfect sketchpad for conceptual design; and VCR owners use the CYBER STUDIO to create 3D titles and cartoons for home videos.

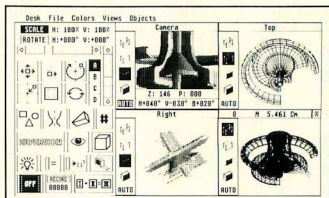
Plus, we made version 2.0 an open-architecture system, so that any programmer can easily write custom applications for CAD-3D 2.0 that run as desk accessories: motion control choreography (CYBER CONTROL), advanced rendering (ray tracing, texture mapping, finite element analysis, custom modeling tools... There's no limit. CAD-3D 2.0 will never become obsolete.

Let your creativity soar with all these new features:

- Icon control panel — fast, intuitive interface
- All new, DEGAS-style color design system permits custom-color lines, edges and backgrounds, plus multi-colored objects

- Real-time display mode for instant response (uses 3D math developed by Jez San for Starglider)
- Supports (optional) STEREOTEK 3D glasses (TH9020) for true 3D viewing

Mark Kimball's CYBERMATE™
The CAD-3D Animation/Editing language
CYBERMATE is a "post-production" animation editing language that gives you control over:



- Dimensioning (feet/inches or meters/centimeters)
- Graphic lighting control — drag 3 lights anywhere
- GDOS output supports laser and dot matrix printers
- User-selectable pivot points for articulated rotations
- Enhanced Spin, Extrude, and Join tools
- Load DEGAS pics into CAD-3D background
- Sequence looping, cuts, fades & dissolves
- Color cycling animation
- Sound effects (created with the G.I.S.T. editor, on pg. 22)
- Title generation and text display

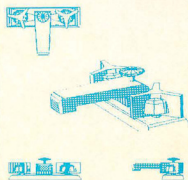
THE CYBER STUDIO STEREO CAD-3D 2.0 plus CYBERMATE (2-disk set)

ST0236 \$89.95
REQUIRES: one-megabyte RAM
Upgrade from CAD-3D 1.0 for only \$60 (plus original disk and \$5 shipping)

The Original...

Tom Hudson's CAD-3D™ 1.0

520ST-compatible



If you have 512K of RAM and are interested in computer graphics, many of the features of CAD-3D 2.0 are included in this original version—even a basic animation system.

CAD-3D 1.0
ST0214 ~~\$19.95~~
REQUIRES: 512K RAM
Now! \$29.95

"A remarkably powerful modeling system."
— Computer Graphics World

CYBER CONTROL™ 1.1

The CAD-3D Motion Control Language

by Tom Hudson



CYBER CONTROL is the CAD-3D Motion Control Language — a desk accessory programming language, with built-in GEM text editor. When you want to simulate a real event with articulated life-like animation, plug in to CYBER CONTROL.

CYBER CONTROL is an animation scripting language that locks in to CAD-3D 2.0, controls all of its functions, and magnifies its already powerful capabilities.

Whether you're a hobbyist or a scientist, you can create animated 3D models in a single afternoon. Simulate particle physics; 3D animation for entertainment or education; 3D financial analysis; animated, fully dimensional math models; event reconstruction of P.I. litigation, human factors engineering... you name it!

Now, you can write code to control any feature of CAD-3D 2.0—plus powerful features not in CAD-3D 2.0! But let's let Tom describe it:

As CAD-3D 2.0 grew into a powerful animation system, I realized that truly complex animations would require a scripting language for proper control. I purposely designed CYBER CONTROL as a BASIC-like language so anyone could pick it up quickly.



When activated in CAD-3D 2.0, CYBER CONTROL takes over full control of all functions, creating and manipulating objects, lights, and cameras (three different ones). Its primary use is as a cinematic motion-control script language, but its flexible nature makes it an ideal "front-end" for CAD-3D to let you write your own BASIC-like programs that use CAD-3D as a "graphic engine"!

Features include:

- Two new cameras! Now, move your camera anywhere in the CAD-3D universe — fly through your scenes!
- Real-time animation preview mode!
- Hierarchical Connectivity. Attach objects to each other for fluid, connected movement — walking skeletons, or hinged mechanisms.
- Smooth, 3D spline generation:
 - Move cameras along realistic flight paths
 - Apply natural movements to articulated models
 - Build new types of models (coils, fractals, etc.)
- Layer foreground and background images for cel animation.

Plus advanced power:

- FOR/NEXT for full Loop control, Conditional IF/THEN, GOSUB/RETURN.
- Labels instead of line numbers
- Numeric expression handling, floating point, logical AND and OR, parenthesized expressions, function library including sine, cosine, tangent, square root, and more!
- Up to 128 user-defined, alphanumeric variables, significant to 8 characters! Hardcopy Print statement for debugging.

I hope you enjoy CYBER CONTROL. Your ST can automatically create animations that would take you days to complete — in a matter of hours. Start the program and walk away, as your computer does all the work!

— Tom Hudson

CYBER CONTROL ST0250 \$59.95

REQUIRES: CYBER STUDIO (ST0236)

3D PLOTTER & PRINTER DRIVERS™

Supports Hewlett-Packard pen plotters (and compatibles); plus screen-dump drivers for Gemini/Star, Epson, Okidata, IBM, Color, NEC, Panasonic, C-Itoh dot-matrix printers.

PLOTTER DRIVERS ST0225 \$24.95

REQUIRES: CAD-3D 1.0, or CYBER STUDIO

The programmer's interface to CAD-3D! 3D DEVELOPER'S DISK

For CYBER STUDIO by Tom Hudson

Works with most popular ST C's plus assembly language

If you are a programmer with some experience in C, you can unlock the deepest secrets of Tom Hudson's code. He purposely left a special desk accessory "pipeline" to his program so CAD-3D would never become obsolete. Tom himself used this pipeline to create CYBER CONTROL, and now you can use it to create your own 3D programs.

In the 3D DEVELOPER'S DISK, Tom clearly explains to programmers and developers how to access the pipeline. Included on the disk are complete descriptions of the CAD-3D object-file formats, full-featured source and object code examples, as well as detailed instructions by Tom Hudson showing you how to hook into CAD-3D 2.0. Create your own 3D applications — with no knowledge of 3D math. (No licensing fee required.)

3D DEVELOPER'S DISK ST0244 \$29.95

REQUIRES: CYBER STUDIO (ST0236)



All 50 states 6AM-6PM PACIFIC TIME
Monday-Friday MasterCard, VISA Only

ST Cyber Family

Produce Your Own Cyber Video!

CYBER VCR™

The Video Connection

by Tom Hudson



Now that you've created your library of Cyber animations, it's time to tie the whole thing together — on videotape! CYBER VCR is a video sequencer that automatically links your Cyber animations into a professionally edited videotape up to four hours long. And the whole thing is mouse controlled, so it's a cinch to use. In fact, we'll describe it right here.

Plug the special umbilical cable (included with CYBER VCR) between a compatible Sony VCR (listed below) and the printer port of your Atari ST. Run CYBER VCR and a chart of columns and rows will appear. Click on any row, select your Cyber animation from the file selector—it's now listed on the screen chart.

Drag your titles into any order with the mouse — or clone them if you wish your animation to appear more than once. With any animation listed, you may set its start frame, stop frame, number of cycles and cycle mode (forward or ping pong), and playback speed.

Animations may be spliced seamlessly on tape because of Sony's flying erase head. Or, you may fade in or out from black or white — at variable rates. Or you can use one of the many custom graphic wipes from the library on your CYBER VCR disk. And if you can't find the wipe you want, create your own wipes with CYBER PAINT!

Only one more thing to do: click the Record button on the CYBER VCR screen, then sit back and relax. CYBER VCR will take over, controlling every function of the Sony recorder. All the buttons on the deck are duplicated on the CYBER VCR screen; it can even eject the cassette! In no time at all, a professionally edited videotape of computer graphics is ready to show to clients, friends, or family — and they won't need an ST to view it!

**CYBER VCR
ST0257 \$69.95**

REQUIRES: One-megabyte RAM; animations created by CYBER STUDIO or CYBER PAINT; one of the following Sony VCR models: Beta HF750 or HF1000; 8mm

EV8C8U; Camcorder CCD-V8, CCD-V8AFU, CCD-V9, CCD-V110. *Note: All future Sony models will include the necessary 5-pin remote jack required by CYBER VCR.*

ALSO REQUIRES: You must also have some way of sending a composite video signal into the "video in" port of the Sony VCR (either with a 520ST, Video Key, or Genlock).

JOIN THE CYBER FAMILY!

Don't forget to send in your warranty cards when you buy Cyber software. It's the only way to join our Cyber Family. Receive upgrade information, special offers, and our new **Cyber Newsletter**. It's all for you, but only if you become a registered owner of Cyber software.



All 50 states 6AM-6PM PACIFIC TIME
Monday-Friday MasterCard, VISA Only

3D-FONTS II™

by Doug Thomas



Spectacular new fonts plus a potpourri of 3D clip art. Includes 45 computer-style all-cap, 45 gothic upper/lower-case, 2-color gothic all-cap, and 2-color serif all-cap. These fonts are beautiful! Imagine the CYBER animation titles you can create with these. Packed disk also includes 19 multicolor decorative objects including face masks, corner pieces, stars, etc. Dress up your 3D world with this fabulous clip art.

**3D-FONTS II
ST0254 \$29.95**

REQUIRES: CAD-3D 1.0, or CYBER STUDIO

3D-FONTS I™

by Tom Hudson
Works with CAD-3D 1.0 and CYBER STUDIO



This first 3D FONT package contains over 250K of serif and sans-serif letters. Design your own 3D greeting cards, signs, logos, and letterheads. *Special Bonus Program:* Tom Hudson's color **SUPER EXTRUDER TOOL**, written by Tom to create these fonts. Design your own fonts, or create new kinds of complex, multicolored 3D objects (such as those seen in the 3D DESIGN DISKS) that can't be built with CAD-3D alone.

**3D-FONTS I
ST0224 \$29.95**

REQUIRES: CAD-3D 1.0, or CYBER STUDIO

3D DESIGN DISKS

FUTURE DESIGN DISK™

by Darrel Anderson



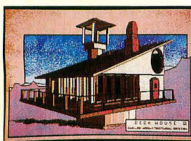
Get a fast start on your three-dimensional explorations with the CAD-3D FUTURE DESIGN DISK. Everything you need to create spacecraft, stations, bases, vehicles, robots and androids. Model your future then populate it with androids and CAD-People. Bring it to life with CYBER CONTROL; detail it with any popular paint program. Includes:

- Blueprints
 - Complete models
 - Component parts
 - Construction tips
- FUTURE DESIGN DISK ST0232 \$29.95**

REQUIRES: CAD-3D 1.0, or CYBER STUDIO

ARCHITECTURAL DESIGN DISK™

by Darrel Anderson



Create CAD-3D renderings of your Dream House or build an entire CAD-3D City from the ground up. Component parts including: Doors, Windows, Arches, Roofs, Walls, Stairways, and a wide variety of architectural accoutrements. Create your own CAD structures and populate them with HUMAN DESIGN figures.

Build "sets" for your animated Cybermovies. NOTE: The ARCHITECTURAL DESIGN DISK can be used to visualize and render real-world architecture. It is not intended for use as an architectural engineering tool. Includes:

- Blueprints
- Complete models
- Design tips

ARCHITECTURAL DESIGN DISK I ST0243 \$29.95

REQUIRES: CAD-3D 1.0, or CYBER STUDIO

HUMAN DESIGN DISK™

by Richard Berry



Populate the CAD-3D Universe. Bring to life your CAD-3D creations with the HUMAN DESIGN DISK. Amazingly accurate modular male and female skeletal anatomy forms are included. Detailed head and hands add realism. Modify your figures to create the infinite variety of the human form, pose your figures, detail the images with any popular paint program, or bring them to life with the CYBER CONTROL Animation System. Includes:

- Blueprints
- Tips on the dynamics of human anatomy.

HUMAN DESIGN DISK ST0242 \$29.95

REQUIRES: CAD-3D 1.0 or CYBER STUDIO

CARTOON DESIGN DISK™

by Maurice Molyneux and Andy Eddy



And now for something completely different — 3D cartoon characters! Plus, an entirely new approach in design disks. You get not only a collection of wonderful 3D comic characters, but specially designed CYBER CONTROL programs to animate them. You decide which way the heads turn, where the eyes look, how fast they move (or fly), then let CYBER CONTROL bring them to life — automatically. Disk includes: complete articulated characters, hierarchically designed for use with CYBER CONTROL; a library of "parts" to modify existing characters — or to build your own; detailed documentation describing how to use the many files on disk, how to modify your characters, character creation, animation techniques, and even how to videotape your animations.

CARTOON DESIGN DISK ST0256 \$29.95

REQUIRES: CYBER STUDIO (CYBER CONTROL for animations)

VIDEO TITLING DESIGN DISK™

by Andy Eddy and Maurice Molyneux



Add that professional touch to your videos with spectacular, animated titles. The VIDEO TITLING DESIGN DISK includes an entire 3D font, plus 3D objects designed specifically for titling effects. Custom, easy-to-use CYBER CONTROL programs let you animate your 3D titles, create credit sequences, etc. ADO f/x files are included to add complex ADO moves with CYBER PAINT. Plus, sample graphic files demonstrate advanced ADO techniques. Documentation includes all necessary instructions, plus a discussion of effective video planning and effects, a description of the equipment needed to tape your computer output, plus tips on getting professional results.

VIDEO TITLING DESIGN DISK ST0261 \$29.95

REQUIRES: CYBER STUDIO (CYBER CONTROL for animations; CYBER PAINT for ADO f/x)

ST Cyber Family

CYBER PAINT™ Version 2.0 Pro Animation Studio

by Jim Kent

New!

Three animation programs in one — a time-oriented paint program, a "cel" animation program, and a digital optical printer. If you were a professional video director and wanted a machine to do to video what CYBER PAINT does to Atari graphics, you'd have two choices — either an Abakus A62 DDR (digital disk recorder), or a Quantel Harry. Either cost approximately \$200,000.

Time Painting

CYBER PAINT has all the standard paint tools — Box, Brush, Rubber Line, Fill, etc. — then adds the *dimension of time*. For example, in the standard paint-program cut-and-paste operation, you cut your image out from one area of the screen then paste it to another. In CYBER PAINT, you cut your image out of frame #1, move it, then paste it over any range of frames. When you play your animation, the pasted image floats smoothly from the first position to the last.

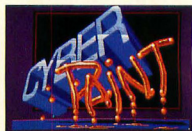
In a standard paint program, you load a single picture. Of course you can do this in CYBER PAINT — or you can load an entire 3D CYBER STUDIO animation, and touch it up with CYBER PAINT's time tools.

Cel Animation

Classic movie animations were painted, frame by frame, on celluloid — or "cels." CYBER PAINT



3 frames of CYBER STUDIO animation before CYBER PAINT



The same 3 frames after a CYBER PAINT touch-up



Works with all ST paint programs, plus CYBER STUDIO (ST0236).

All new! Version 2.0

Jim's added so many new features we haven't space to list them all. But here's a preview:

- All new Color menu:
 - Palette change per frame
 - Cut & Paste color range
- Color f/x menu:
 - Fade over time
 - Blend over time
 - Cycle over time
- Pixel f/x menu:
 - True antialias
 - Pixel shatter
 - Reduce to edges
 - Outline (neon effect)
- Separate many colors
- Automatic traveling mask — normal, inverse, XOR
- Splice Load & Reverse Save
- Paste Under
- Playback frame segment
- View frame in ADO

adds the power of the computer to this technique. The mouse-operated Frame Slider Bar instantly accesses any frame (cel). Auto-"bluing" prints a ghost image of your previous changes to subsequent frames, making registration of step-through animation a breeze.

CYBER PAINT's unique *compositing* system lets you overlay or underlay almost any type of graphics file — load a 200-frame 3D CYBER STUDIO animation, underlay a DEGAS background to frames #1 to #100, a NeoChrome picture to frames #101 to 200; overlay a converted Aegis Animator script to frames #26 to #115 ... The combinations are endless.

Digital Optical Printing

We've saved the best for last. You've seen this TV special effect on everything from rock videos to the evening news. Titles and images spin and glide around the screen like magic carpets. We call it ADO f/x (Antic Digital Omnimover effects).

Clip any part of your picture and you're ready to fly! Drag the Turn bar setting to 2 turns, then instantly preview the effect. Click to change the axis — or adjust all three axes; the clipped image now spins and twists in place. Even draw a curving path for the twisting, image to follow. CYBER PAINT is the fastest possible way to create professional looking animations.

CYBER PAINT

ST0251 \$79.95

(Upgrade \$25 plus original disk)

REQUIRES: One-megabyte RAM & color monitor

The New Standard in Paint Programs

SPECTRUM 512™

The Omni-color Paint Program

by Trio Engineering

It didn't take long. Since its premiere last October, SPECTRUM 512 has already become the paint program standard for the Atari ST. Easy to see why: 512 colors that you don't have to jump through hoops to use.

Just pick a color from the palette of 512, and draw with it — anywhere on screen. Or cut a block from any picture and paste it to any other picture; don't worry about matching palettes, all colors are available anytime!

Engineering at 617 964-1673 and ask about SPECTRUM 512 accessories, including DigiSpec, which creates full-color SPECTRUM 512 pictures using the ComputerEyes digitizer.)

SPECTRUM 512 is more than 24,389 colors. It's a collection of the most sophisticated graphic paint tools available on any microcomputer. When you own SPECTRUM 512, you own a professional system unlimited in its possibilities.



"Drops" by Richard Berry

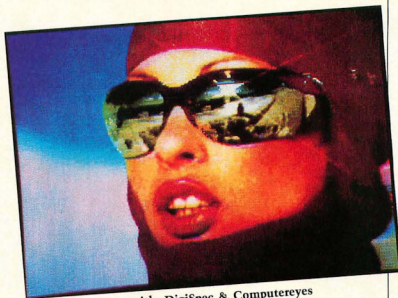
More colors means higher perceived resolution.

Anti-aliasing replaces ugly "staircase" lines with smooth, delicate curves. Multiple dithering combinations simulate a palette of 24,389 colors for creamy smooth gradient fills, or photo-realistic digitized color pictures — SPECTRUM 512 loads Amiga HAM pictures. [Call Trio

Here are just some of your tools!

Drawing:

- Freehand
- Rubber Line, French Curve, Polygon, Circle/Ellipse (all with no jaggies mode)
- Fill—patterned or solid
- Fill New—fill over any existing patterns or colors!



Digitized entirely with DigiSpec & Computereyes

- Patterns—20 predefined, 20 user-defined
- Brush
 - 38 shapes — solid or patterned
 - User-definable brushes
 - Auto-align patterns, or pixel offset for overlap
- Adjustable Airbrush
- Sophisticated color RGB search and replace, local/global

Anti-aliasing:

- Zag-Out anti-aliasing, or Blur defocusing
 - Full screen
 - Local box
 - Brush
- No Zag—Anti-aliasing and auto-curve for:
 - Lines
 - Polygons
 - Circles

- Add or subtract RGB values
- Add or subtract luminance
- All Color Edits global or local, one or more colors

- Magnify window, all tools active
- 12-screen scrollable cut & paste buffer (1-meg)
- Load CYBER, DEGAS, or NEO pictures
- Programmable slideshow program supports Spectrum 512 animation and Stereotek 3D glasses

SPECTRUM 512
ST0249 \$69.95

REQUIRES: Color monitor. 520ST's built before 12/85 may require \$30 MMU chip upgrade from auth. serv. center.

DEGAS™ Electronic Arts
NeoChrome™ Atari Corp.
ComputerEyes™ Digital Vision

Colors:

- Select colors from 512-color Main, or User-defined palettes
- Save and load custom palettes
- Auto-create color range
- Color cycle Brush or Airbrush
- Fantastic Color Edit mode includes:
 - Search and replace colors



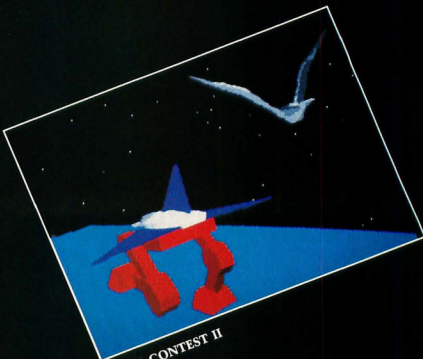
All 50 states 6AM-6PM PACIFIC TIME
Monday-Friday MasterCard, VISA Only

THE CYBER GALLERY

Since last October, when we released CYBER PAINT, CYBER CONTROL, and SPECTRUM 512, we've gotten a lot of requests for graphic demos. Here on these pages is the most bang we can muster for your demo buck.



HOLO CONTEST I



HOLO CONTEST II

CYBERMATION VIDEOTAPE

Here it is! The videotape that shows what can *really* be done with the Cyber family — and *how to do it*. Created by Tri-Vision, this tape contains our best demos to date, and a marvellous tutorial about how *all* of the Cyber products work. VHS and 8mm format — *don't miss it*.
VHS0002

CAD-3D COLLECTION I

Original collection of CAD-3D objects created by Tom Hudson.
(SS,M,..5)
PD9085

CYBERSCAPE SB0104

The original *tour de force* Cyber animation by Darrel Anderson. (DS,C,1)

CAD-3D COLLECTION II

Complex CAD-3D objects, featuring Space Shuttle, 2 fighters, Atari logo, etc.
(SS,M,..5)
PD9101

CAD-3D COLLECTION III

The latest complex CAD-3D objects, featuring trumpet, grand piano, bicycle, etc. Packed disk includes sample objects created with CYBER SCULPT. (SS,M,..5)
PD9103

CYBER DEMOS I

Features the Human Design Disk skeleton doing a back flip, plus more demos of CYBER CONTROL's capabilities.
(DS,C,1)
PD9104

CYBER DEMOS II

Amazing demo of *texture mapping*, plus examples of advanced CYBER PAINT techniques.
(DS,C,1)
PD9105

CYBER DEMOS III

Real-time sequences digitized with Supra View into Cyber Paint, plus many more Cyber animations. (DS,C,1)
PD9106

SPECTRUM 512 DIGIPIX

This packed disk contains our best collection of beautiful digitized Spectrum pics, including the woman in this issue's ad.
(SS,C,..5)
PD9107

SPECTRUM SLIDESHOW

The original slideshow disk, featuring Ellen and Laserbee by Darrel Anderson, and more! (SS,C,..5)
PD9100

SPECTRUM PORTFOLIO

Darrel Anderson and Richard Berry collaborate for a brilliant demonstration of Spectrum 512's fine art capabilities.
(SS,C,..5)
SB9108

STEREO STEELYBOINK

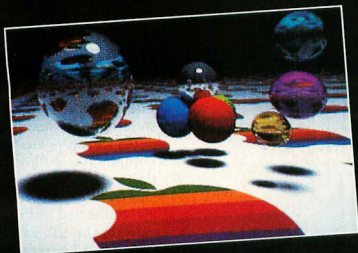
If you own a pair of Stereotek 3D glasses, you've got to see this demonstration of animated ray tracing on the ST by Tom Hudson. (DS,C,..5)
PD9098



CYBER DEMOS I



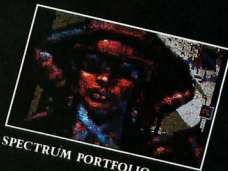
CYBER DEMOS II



SPECTRUM 512 DIGIPIX



SPECTRUM 512 DIGIPIX



SPECTRUM PORTFOLIO

"The (Cyber) system is a pioneering product... a turning point in the history of microcomputing."
— Dave Edwards
MicroCAD News

STEREO STARS/SLIDES

Float through stereo space with the Stereotek 3D glasses and this hypnotic starfield. Plus, over ten full-stereo slide pictures. (DS,C,.5) PD9099

HOLO CONTEST I

One of our favorite entries in the CYBER CONTROL Hologram contest: the dark peace of an ancient temple is broken by the majestic visit of an advanced race! Contest winner, Dann Parks of KTEH TV (San Jose, CA) demonstrates how to simulate realistic object dynamics with a simple, six-line CYBER CONTROL subroutine. The

.CTL code is included with the animation. Watch out Steven Spielberg! (DS,C,1) PD9109

HOLO CONTEST II

Soaring bird to roaring spaceship, while mechanical walker treads nearby. For FLYNIGHT.SEQ, contest winners Paul Dana and Robert Mills have actually created a desk accessory that creates moving starfields for CYBER CONTROL animations automatically. If you own CYBER CONTROL, you have got to have this disk! Also includes hierarchical motion examples. (DS,C,1) PD9120

HOLO CONTEST III

A flat plain becomes a living, breathing mountainous region in CREATION.SEQ. Contest winner Dan Reifsnnyder wrote a topographic contour-mapping program that turns DEGAS Elite/CYBER PAINT pictures into 3D contour-map object files that you can load into CAD-3D. Program plus animation included on disk. (DS,C,1) PD9121

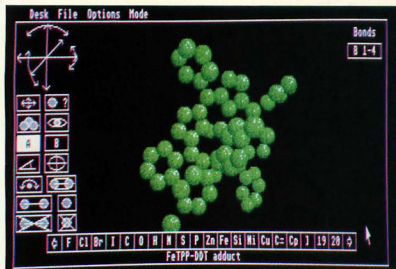
NOTE: All products on this page are in the public domain and may be freely distributed. All disks are \$12.00; CYBER VIDEOTAPE is \$24.95. All programs are self running, with the exception of the three CAD-3D COLLECTION disks, which require CYBER STUDIO or CAD-3D 1.0. Note also the requirements for each product before ordering:
SS = single sided disk,
DS = double sided disk,
C = Color,
M = Mono or Color,
1 = 1 megabyte RAM,
.5 = 1/2 megabyte RAM.



GENESIS™

The 3D Molecular Modeler

by Scott Legrand



The atoms of life... carbon... nitrogen... hydrogen... oxygen... phosphorus...

This is the stuff we're made of. But until now, only research scientists in large universities could actually *image* the building blocks of matter.

Imagine creating the basic elements yourself, then watching as they come to life. And with a pair of STEREOTEK glasses, this miraculous process unfolds in 3D stereoscopic depth.

Using GENESIS and your mouse, you can:

- load and display amino acids, hydrocarbons, and sugars
- create your own molecules onscreen
- output your molecules as CAD-3D objects, or as DEGAS/NeoChrome pictures
- Explore X-ray Crystallography

Rotate 3D molecules on any axis — X, Y, or Z, using real-time control. In *stereo*, hexagonal carbon rings and delicate fingers of hydrogen burst right out of your monitor.

With two molecules on-screen, you may create your own rules for molecular bonding, then animate the chemical reaction between them.

GENESIS offers the same type of iconic control panel and intuitive human interface pioneered on the Atari ST with CYBER STUDIO (ST0236).

Three different display modes for every imaging need:

- 1) STEREOTEK LCS glasses
- 2) Red/blue anaglyphic glasses
- 3) No-glasses (monoscopic)

And with data provided on the program disk, you can create virtually any known molecule using the on-line periodic table of elements.

GENESIS
ST0239 \$79.95

REQUIRES: One-megabyte RAM

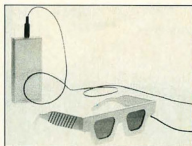
True stereoscopic 3D graphics for your Atari ST

STEREOTEK™ 3D GLASSES

By LC Technologies

Put on the STEREOTEK glasses and jump into a new universe. Discover a magical world that you always knew existed. That *extra* dimension — *depth*. Now you can add depth to your computer graphics with STEREOTEK Liquid Crystal glasses. Solid, realistic 3D images you want to reach out and touch. Your STEREOTEK depth-view system includes:

- One pair electronic Liquid Crystal Shutter glasses with six-foot cable (can be comfortably worn over eyeglasses)



- ST cartridge interface unit — supports six sets of glasses (additional glasses optional)
- DEGAS Elite Stereo Desk Accessory
- Stereo CAD-3D animation and stereo slide show by Tom Hudson
- For programmers: Complete developer's instructions plus source



All 50 states 6AM-6PM PACIFIC TIME
Monday-Friday MasterCard, VISA Only



code for adding stereo to your own programs (C or GFA BASIC)



The secret to full-color stereo images on a computer screen is electronic Liquid Crystal Shutter (LCS) glasses. Two optical shutters in eyeglass frames are connected electronically to the ST. Every time the ST screen refreshes (60Hz/color, 70Hz/mono) one shutter closes and the other opens. The monitor displays alternating right and left eye views synchronized with the shutters. The alternating views appear faster than the eye can see, and your brain translates the normally flat monitor image into one of startlingly realistic depth.

STEREOTEK 3D SYSTEM
TH9020 \$149.95

ADD-ON GLASSES
ONLY

TH9021 \$99.95

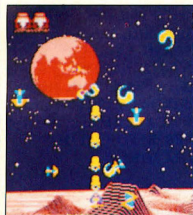
Satisfaction guaranteed or your Money Back! (during 30-day warranty period)

LC Technologies is a venture of Tektronix, Inc.

**A new perspective in
Arcade Action!
SHOOT THE
MOON™**

3D Alien Invaders

by Mountain Fresh
Software



SHOOT THE MOON is a colorful, high-speed shoot-em-up in the classic arcade tradition, with fabulous animation, and one big difference — *stereo*. The floating aliens menace you from multi-depth levels as you maneuver your ship beneath them, find the right depth level, and pulverize them.

And, for those who want their traditional arcade games to remain completely traditional, you can play SHOOT THE MOON in 2D without the glasses. The game play is just different enough to make it a whole new challenge. Master the double-dimension version before moving on to the STEREOOTEK universe, or, if you already have STEREOOTEK glasses, master both versions — if you can!

SHOOT THE MOON
ST0252 \$39.95

REQUIRES: Color Monitor

**LCS
WANDERER™**

**Deep space has never
been so real!**

by Pyramide Software

The first ST game designed for full-depth stereo. Written in France, but set in outer space, this stunning arcade adventure transports you through galactic Space sectors, Black holes, and Limbo. Startlingly realistic, stereo point-of-view animation puts you in the cockpit as you swoop and dive through star fields while dodging enemy aircraft.



LCS WANDERER is really several games in one. Journey from dogfights in the space sectors, to interstellar poker strategies; from Battlezone-style planetary sectors, to the stereo tunnel of the black holes.

The liquid crystal clarity of the STEREOOTEK glasses transforms LCS WANDERER into a multi-colored micro universe within your monitor. Includes a completely redesigned solid-surface cockpit, full color displays, and reduced eye fatigue compared to the original red/blue version.

LCS WANDERER
ST0238 \$39.95

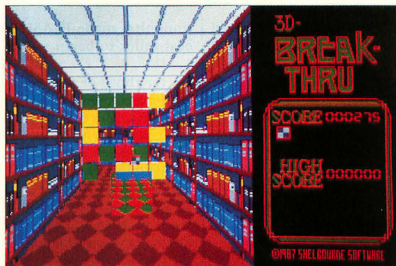
REQUIRES: Color monitor
and STEREOOTEK Glasses
Battlezone™ Atari Corp.

**The latest STEREO
game is here!**

3D BREAK-THRU™

Point-of-View Handball

by Shelbourne Software



Trapped! Hopelessly trapped in yet another ghostly corridor of this haunted three-dimensional labyrinth. And *there*, way down there at the far end of the hallway — the dreaded tri-level, multi-color, phasic-vulnerable brick wall that seals my doom!

But wait — can it be? YES! Gliding directly toward me (in full stereoscopic depth), the friendly form of a brindle-bagshaw bent-english Brick Buster. If I can but deflect it with my personal, porous polypaddle & Missile Mit (which I have nicknamed Phyllis), Brick Buster will rebound down the corridor and bust one brick (for the wall is, as previously mentioned, phasic-vulnerable).

Okay, stereo fans, it's the latest real-time dimensional challenge for the optically adventurous. Hook up your STEREOOTEK glasses and bust out of this multi-level, point-of-view game. At the far end of each corridor is a brick wall sealing off

your escape. You stand at the near end controlling a translucent paddle which reflects balls back toward the wall. Break all the bricks in the multi-layered wall to reach the next corridor.

Enhanced by rich graphics, the stereoscopic depth illusion works beautifully in 3D BREAK-THRU, especially when the next room begins to appear beyond the holes in the wall! As you reach the more complex levels some of those things floating at you aren't so friendly anymore! Defend yourself by firing off bits of your paddle, but with every shot, your paddle shrinks in size!

And 3D BREAK-THRU also works in monoscopic mode. So if you want to check the game out but don't yet have the glasses, don't let a lack of liquid crystal prevent you from wandering these haunted corridors.

3D BREAK-THRU
ST0253 \$39.95

REQUIRES: Color Monitor

BYTE picks FLASH — Top Atari terminal program!

FLASH 1.6™

The Most Popular ST Terminal Program

by Joe Chiazzese and Alan Page

Thank you FLASH owners! There are more than 25,000 people who have made FLASH the most popular terminal program for the Atari ST. We'd like to take this opportunity to thank you for your positive word-of-mouth. We're very proud of FLASH and, naturally, happy that so many of you feel the same way.

Since FLASH was introduced, we've added more and more features. In fact, the *new* features have been described so thoroughly in recent Catalogs, we've forgotten to mention the original func-

tions that made FLASH a best-seller to begin with.

So, for those of you who do not yet own FLASH, here's a collection of its most popular features. (If we miss a few, would you veteran FLASH owners drop us a line and tell us what we left out? We'll be sure and put it in the next Catalog.)

- Flip instantly between online screen and capture buffer with a single mouse click.
- Giant capture buffer automatically adjusts to available RAM — entire session automatically placed in word processor.

FREE! Try FLASH now and get \$15.00 of CompuServe access time. This effectively brings the price of FLASH down to \$14.95! And new FLASH owners join the GENie network free. No registration fee. How can you lose?

- Built-in GEM word processor includes:
 - Adjustable word wrap
 - Mouse controlled
 - Block Cut & Paste
 - Reformat text blocks
 - Automatic Search
 - File merge
 - Buffer or text-block output to disk,

"FLASH is my #1 choice on the Atari ST."
— Ron Luks, Founder of CompuServe's SIG* Atari and Atari Developer's Forum.

printer, or RS232 port
— High-speed window scroll

- Create custom "script" files for unlimited power and flexibility. (Over 90 commands; a full programming environment.)
- Twenty programmable function keys, which may be linked to disk script files.
- Typeahead buffer lets you scroll thru previous lines and resend them.
- Command line alternative to mouse control — includes history buffer.
- Two clocks: Real-time and Elapsed time.
- Bullet-proof file transfers at speeds up to 19,200 baud. Protocols include:
 - Xmodem (CRC & checksum)
 - Ymodem batch
 - B/B + Protocol (CompuServe)
 - ASCII and DC2/DC4
- Mainframe terminal emulation includes:
 - DEC VT100 w/character graphics (and VT52)
 - Vidtex color graphics (CompuServe)
- Supports 110 baud for Telecom Devices for the Deaf.
- Ability to run other ST programs from inside FLASH.
- Custom translation tables automatically filter incoming or outgoing characters.
- Built-in ARC commands.

"FLASH is the fastest, most complete, most reliable terminal program I've used..."
— M. Ratcliff, ANALOG Magazine

Ask Anyone

So if you don't own FLASH, you should. As we've said before: If you're looking for an ST terminal program, ask any online veteran about FLASH. They'll be glad to tell you. And we wouldn't say that if we weren't sure of the response.

FLASH 1.6 ST0220 \$29.95

(Free update with original disk and \$5.00 shipping. BUT SEE SHADOW OFFER BEFORE YOU DECIDE.)

FLASH OWNERS: BUY SHADOW & GET FLASH 1.6 FREE!

FLASH version 1.6 includes built-in SHADOW access (see SHADOW description, opposite page). This means that FLASH calls SHADOW directly with no need for the SHADOW desk accessory (though you still need the SHADOW program).

The SHADOW disk includes a "patch" program which automatically updates FLASH v. 1.51/52 to 1.6.

Add it up: A FLASH upgrade is free with your original disk plus \$5 shipping. SHADOW includes \$15 free CompuServe time. The FLASH 1.51/52 owner who orders SHADOW saves \$20 and effectively gets SHADOW for \$9.95. That's only \$4.95 more than you'd pay for us to ship the FLASH update by itself.

FLASH COMMAND CARDS

FLASH-CARDS
TH9025 \$7.95



**Soup up your
modem...in
software!**

**QUICKTRAN™
The Modem
Accelerator**

by Adrian Jovanovich
Works with FLASH, or
by itself.

Your 1200-baud modem can now transfer files at over 2000 baud... 2400 baud now flies at 4000 baud... The telephone company can't stop you. It's totally legal!

QUICKTRAN comes to you as two disks, each with an identical desk accessory. One QUICKTRAN accessory shrinks the file you're sending — in real time, using better compression than ARC.TTP. The second accessory — on the receiving end — expands the file to it's original size as it's coming in over the phone lines. Why spend hundreds on a faster modem when you can transfer files in almost half the time with QUICKTRAN?
**QUICKTRAN
(2-disk set)
ST0247 \$34.95**

**BBS and Kermit
Accessory for Flash!
REMOTE
CONTROL
ACCESSORY &
KERMIT
PROTOCOL™**

by Joe Chiazzese and
Alan Page

Instant Kermit protocol within Flash with this custom desk accessory. Plus Remote Control accessory turns Flash into a mini-BBS.

**REMOTE/KERMIT
ST0226 \$24.95**

REQUIRES: FLASH ST0220

Be in two places at once.

SHADOW

The Multitasking File Transfer Answer

by Double Click Software

Here's a background file transfer program that works. We've run SHADOW past our online experts and consulted with FLASH author, Alan Page as well. They all gave it high marks. It's a smooth, solid piece of programming that does its job while staying modestly in the background. No more waiting for file transfers.

SHADOW gives you transparent background file transfers with any GEM terminal program. While you are in the process of downloading or uploading files from an online service or a BBS, you can exit to the desktop and run any program you wish. Here's your opportunity to get that correspondence done — or play that favorite game. Once the transfer has begun, you can do anything but turn

off the AC power switch. While in other programs, a block countdown is displayed in the corner of the screen; an optional bell alerts you of its completion. SHADOW is elegant.

Let's say you use FLASH. Wouldn't it be nice to browse through the capture buffer — or do some editing while waiting for that file to download? Now you can. You can even load files into the capture buffer, save them to disk, or print out blocks — your I/O is completely free.

SHADOW works with X-Modem (checksum, CRC, or IK CRC), Y-Modem batch, CompuServe's B-Protocol, B+Protocol, and ASCII. To make background file transfers 100 percent secure, SHADOW even survives system resets! Did a program crash on you in the middle of an important download? No problem. Press the reset button and watch the download continue. You can even switch resolutions or change monitors during a transfer. SHADOW is robust.

**Works with every GEM
terminal program.**

A desk accessory is built into SHADOW for easy access to a background autodialer and a VT52 terminal for standalone operation. And for you programmers, we've included sample source code and all the information you need to access SHADOW's routines from your own programs.
**SHADOW
ST0259 \$29.95**

**FLASH
OWNERS:
BUY SHADOW
& GET FLASH
1.6 FREE!**

Each SHADOW disk includes a "patch" program which automatically updates FLASH v. 1.51/52 to 1.6. FLASH version 1.6 includes built-in SHADOW access so that FLASH calls SHADOW directly with no need for the SHADOW desk accessory (you still need the SHADOW AUTO program). Check out the arithmetic on the FLASH page, opposite. It's a big savings.



All US states 6AM-6PM PACIFIC TIME
Monday-Friday MasterCard, VISA Only

PHASAR 3.0™

Professional Home Accounting System and Register

by Marksman Technology

PHASAR, the friendly, GEM-based, single-entry accounting system has just gotten friendlier. Marksman Technology listened to your suggestions, and the result is now available — Version 3.0.

Just some of the new features include:

- Batch-print window addresses on checks
- Custom-define screen colors
- Fiscal year accounting
- Sort by name as well as amount
- Enhanced calculator: parenthetical expressions/5-level memory buffer
- Recall most-recent transactions
- Abort account reconciliation anytime
- Improved Tax program doubles as report writer
- Coded and recompiled to save on disk space

Standard features include:

General Features

- 130 expense/income categories
- 40 accounts (VISA, checking, etc.)
- Up to 500 transactions per month
- Custom check printing
- A.I. parser predicts input, minimizes typing
- Instant context-sensitive help
- Relational design integrates financial data

Transactions

- Automatic transfers between accounts
- Split-category transactions
- Create transaction macros for repetitive entries

- Point-and-type spreadsheet-style relational summary update

Financial Analysis

- Easy budget setup and maintenance
- Analyze loan/savings plan
- Display multiple loans simultaneously for easy comparison

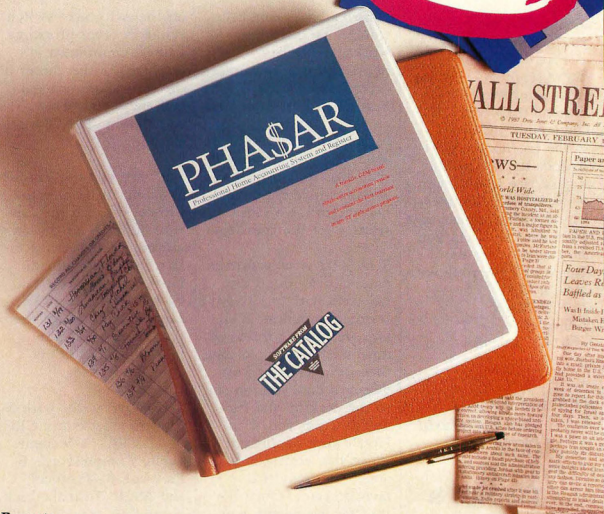
Reconciliation

- Confirm transactions with a single keystroke
- Display outstanding transactions for any account

IBM and Amiga users say: "The first home accounting package I have found in five years that is actually usable." — Mark Baldwin, Littleton, CO

"I am enjoying your tutorial almost as much as I admire the power and versatility of the software itself." — Joe Joyce, Huntington, VT

**NEW!
VERSION
3.0!**



Reports

- Clearly formatted printed reports include:
 - Account Summaries
 - Category Summaries
 - Net Worth Statement
 - Tax Calculations
- Display or print total income/expenses, monthly or year-to-date
- Sort categories in any order
- Built in data graphing

Date/Address Organizer

- Store up to 250 names, addresses and phone numbers
- Integrated scheduler stores special occasions
- Display calendar with highlighted special occasions
- Optional auto-alert reminds you of important events

Tax

- Design your own tax forms—never out of date
- Calculate tax liability in less than one minute
- Project tax liability at any time

**PHASAR
ST0237 \$89.95**
(Upgrade \$20 with original main program disk.)

EVERYONE'S A WINNER!

You win when you buy Catalog Software. It's easy. Just remember to send in your warranty cards. As a registered owner you will:

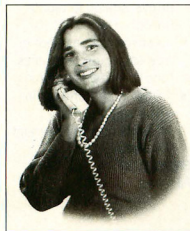
- Automatically receive news of product upgrades.
- Be among the first to hear of new releases.
- Get in on special offers available to registered owners only.
- Receive free technical support.*

PLUS:

By sending in your warranty card, you are automatically entered in the Catalog's "Warranted-to-Win" drawing. You could win a \$25.00 Catalog gift certificate. Be a winner! Send in your warranty cards!

* You pay applicable toll charges.

HOW TO ORDER



At publication time, the Cyber family of 3D CAD and animation software is being used by:

European Space Agency (ESA) — Satellite deployment simulation

Rockwell Space Systems — Space Station division

General Dynamics, Ft. Worth — Human factors design

NASA, Ames Research Center — Human factors design

Yale University — Dept. of Physiology exchange program with Shanghai University, China

Forensic Computer Graphics — Accident reconstruction

Industrial Light and Magic — Computer displays for Disney rides

One Pass Video — Animated storyboards for quick concept design

3DV, SF — Low-cost 3D modelling tools for their Iris workstations

REZ-N8, LA — 3D modelling for animations rendered on supercomputers for broadcast TV

General Motors — Project Trilby division

KTEH, San Jose — On-air station i.d. spots

Polaroid Holography Lab, Cambridge — Hologram generation

And by over 10,000 Atari ST users for just plain FUN!

If you're using any of our software for interesting applications, please drop us a line.

ORDER BY MAIL

1. We fill orders of \$20.00 or more.
2. Use the order form found inside the catalog. If you do not have one, please:
 - a. Clearly print your name, address and telephone number.
 - b. List quantity, item number, name of item, price of item, and total.
 - c. Add correct shipping and handling amount. (see below).
 - d. Enclose check, money order or credit card information. We accept Visa and MasterCard only, include account number and expiration date.
 - e. California residents must add 6.5% sales tax on merchandise total (shipping and handling are not taxed).
3. No C.O.D.'s. Do not send cash.
4. Overseas Customers, order by Visa, Mastercard, check or international Money Order in U.S. funds, drawn on a U.S. bank only. No wire transfers. \$40.00 minimum.

ORDER BY TELEPHONE

CALL 800-234-7001 our operators are here to serve you 6 am to 6 pm Pacific Time, Monday through Friday.

SHIPPING AND HANDLING CHARGES

	U.S./Canada	Foreign
Software		
Up to \$50.00	\$ 3.00	\$10.00
\$50.01-100.00	\$ 6.00	\$20.00
\$100.01-\$150.00	\$ 9.00	\$25.00
\$150.01 and over	\$12.00	\$35.00
Magazines	\$ 1.00 each	\$ 5.00 each
Books	\$ 3.00 each	\$10.00 each

Prices and availability subject to change without notice



All 50 states 6AM-6PM PACIFIC TIME
Monday-Friday MasterCard, VISA Only

PICTURE PLUS 3.0 and LISTER PLUS 1.5

Non-Standard Magic!

by *Chet Walters*

This 2-disk set gives you complete command of your dot matrix printer!

PICTURE PLUS works with nearly any DOS, even with RAMdisks. Lets you translate pictures between Micro-illustrator, SuperSketch, Paint, Fun With Art, B/Graph, Movie Maker, Micropainter, Atari Light Pen, Atari Touch Tablet, Koala Pad, LOGO, Computer Eyes, DrawIt, RAMbrandt (when converted), Graphics 7, 7+, 8, 9, 10, 11, and 15.

Work with all or part of the picture. Merge two pictures, reverse a picture left to right, turn it upside down, move it any direction, make a negative, change colors. Add text anywhere, in any color(s), any font(s), in 6 sizes.

Print screens in four sizes from 3" x 4" to 8" x 14". Supports Epson, Gemini, Prowriter, Okidata, color IDS, color Mannesman Tally and compatibles. Custom printer installation handles most others.

LISTER PLUS prints anything exactly as it appears on your screen.

PICTURE/LISTER

AP0179 \$19.95

REQUIRES: Atari BASIC
Optional: Dot Matrix Graphics Printer

ENVISION

by *Darrel Schebek*

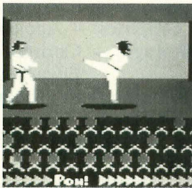
ENVISION gives you full control over your Atari 8-bit's 6 text modes. Create multi-screen, 8-way scrolling pictures and build effortless animations of up to 128 frames. Print out pictures or do fancy typesetting. Convert microscreens to character

graphics indistinguishable from the original. Produce BASIC and Assembler SOURCE CODE. Do all this and more with ENVISION.

ENVISION

AP0185 \$19.95

REQUIRES: Joystick
OPTIONAL: BASIC, MAC/65, SynAssembler, Epson-compatible printer



CHOP SUEY

by *English Software UK*

One of our most popular games ever. You'll thrill to this action-packed martial-arts simulation.

CHOP SUEY

AP0162 \$15.95

REQUIRES: Joystick



Mercator Projection



Rotating Globe

EARTH VIEWS

by *R.G. Wilson*

A world atlas, a globe, and a game, all in one! Many different maps and views of the world, plus an adventure game. Educational and fun!

EARTH VIEWS

AP0141 \$19.95

REQUIRES: Joystick

DEEP BLUE C COMPILER

by *John Palevich*

MATHLIB

by *Frank Paris*

Teach your computer the language of the ST. DEEP BLUE C is faster & more powerful than BASIC, and C is one of the most transportable languages. Pointers, recursive functions, and high-level control structures make complete software systems easy to design, implement and maintain.

MATHLIB is a complete library of math functions for DEEP BLUE C. 32 functions provide access to Floating Point & Trig operations. *Get both disks for the price of one!*

DEEP BLUE C

COMPILER-MATHLIB

AP0188 \$19.95

REQUIRES: Text Editor like WORD MAGIC



ORBIT-A TRIP TO THE MOON

by *John D. Reagh*

Boot Up & Blast Off on a trip to the moon! Enter low altitude lunar orbit, detach landing module & descend to the moon's surface. Fuel consumption & other details add realism to this challenging simulation.

ORBIT-A TRIP TO THE MOON

AP0168 \$15.95

REQUIRES: 48K RAM, Joystick



BASIC VIEW

by *Softview Concepts*

This is a utility all BASIC programmers will want. Written entirely in machine language, the BASIC VIEW window shows the actual execution of your program code while the program is running. See which line of code is affecting the program while it actually happens.

Features include:

- Joystick control
- Current line highlight during program execution
- Adjustable program speed
- Shows updated contents of variables while program executes
- Stop, skip to any line, then restart your program at any point
- Menu shows all variables, arrays, strings in alphabetical order
- Examine dimensional array, structures, elements and memory locations
- "Find" command for instant search of any variable or array element by name

BASIC VIEW

AP0192 \$19.95

BACKTALK 1.2

by Steve Ahlstrom, Dan Moore and Dan Curtis

This is the only program-able 8-bit modem software available. BACKTALK is easy to use. "Script" files can run automatically—you won't have to download anything yourself. Three protocols: Xmodem (with or without CRC), Amodem and Xon/Xoff. Supports 300, 1200, and 2400 baud modems, ASCII/ATASCII translation, full and half duplex. Supports Hayes-compatible and Atari 1030/XM301 modems, or load your own modem handlers. 130XE users can download files to RAMdisk.

BALKTALK
AP0154 \$19.95

THE ENHANCEMENT DISKS (A 2-disk Set)

by Robert Wilson

Here are four packed disk sides of super utilities and programs for use with B/GRAPH, the most powerful Atari 8-bit business graphics software ever. You can use many of the features on THE ENHANCEMENT DISKS without owning B/GRAPH, but they are primarily for use with B/GRAPH. THE ENHANCEMENT DISKS' many features include:

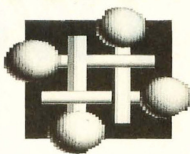
- Bubble charts
- Opposed bar charts
- Segmented horizontal bar charts
- Loan amortization schedules
- Instant switching of plotted variables

THE ENHANCEMENT DISKS support Atari 1020, Radio Shack CGP115 and Mannesmann Tolly Pixy plotters for clear presentation. Plotter features include:

- Exploded pie charts
- Floating bar charts
- Plotting of algebraic expressions
- 17 factors per graph with overlays
- Left and right side scaling

THE ENHANCEMENT DISKS plus B/GRAPH gives you a set comparable to business presentation systems worth hundreds of dollars on other computer systems.

AP0190 \$19.95
REQUIRES: Atari BASIC
RECOMMENDED: B/GRAPH
B/GRAPH™ Batteries Included

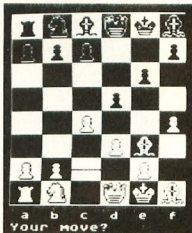


SOLID OBJECT MODULE

by Bard Ermentrout

Easily create 3-D objects with RAMbrandt. 8 different primitives: Sphere, Torus, Cylinder, etc. Combine primitives to make complex structures. Then flip into RAMbrandt to complete your picture. This module will not rotate objects, but it will do just about everything else: 4, 8 or 16 level grayscales, backlighting, point source lighting, clipping window lets you use parts of objects, undo command, and many more. If you use RAMbrandt, you need SOLID OBJECT MODULE.

SOLID OBJECT MODULE
AP0182 \$15.95
REQUIRES: 48K RAM,
RAMbrandt



COLOSSUS CHESS 3.0

by Martin Bryant, English Software UK

The ultimate computer chess—for all levels of players. Let's you watch & learn while COLOSSUS CHESS consider thousands of moves. Many simulation modes, adjustable playing speed and style.

COLOSSUS CHESS 3.0
AP0161 \$15.95
REQUIRES: 48K RAM

CHAMELEON CRT TERMINAL EMULATOR

Version 4.03

Written in machine language by John Palevich

Turn your Atari into one of five popular terminal types: Glass TTY, ADM-3A, DEC VT-52, IBM 3101, ASCII, plus a test terminal. Supports tab, backspace, line feed (on/off), form feed, bell signal, speeds up to 9600 bps, wide screen 80 and 132 column emulation, and more! Flexible enough for use with UNIX operating systems. You can customize all terminal parameters to log on to non-standard systems like MCI MAIL. Supports file transfers and features on all Atari 850-interface, 835, 1030 and XM301. Kermit and Xmodem file transfer capability.

CHAMELEON
AP0113 \$19.95
REQUIRES: 48K RAM

INTERLISP / 65

by Special Systems Software

Get the most out of your Atari's graphics and sound capabilities with INTERLISP/65. INTERLISP/65 is a subset of the standard "INTERLISP" dialect of LISP, the symbolic language of Artificial Intelligence. INTERLISP/65 features over 70 predefined functions, including a special graphics buffer initialization sequence, and the TRACE utility for detailed debugging. Additional features include eight digit, floating point arithmetic, PEEK, POKE, XIO for access to monitor and hardware functions, STICK and STRIG for game controller input, and example LISP programs.

INTERLISP/65
AP0191 \$19.95



All 50 states 6AM-6PM PACIFIC TIME
Monday-Friday MasterCard, VISA Only

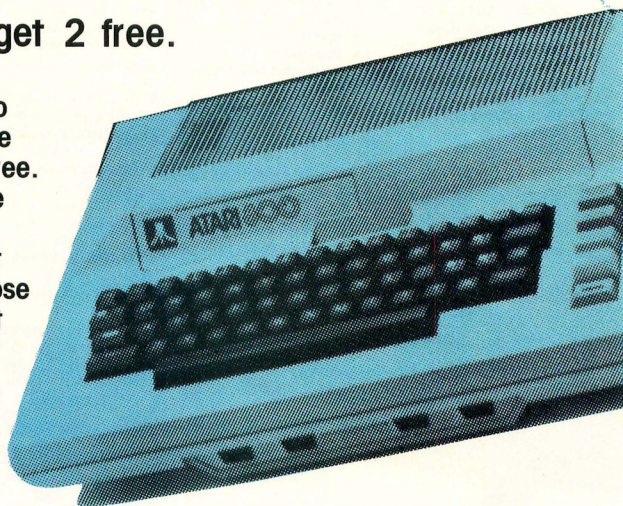
BUY TWO GET ONE FREE!



Or buy 4 and get 2 free.

In fact for every two products you buy we will send you one free. Here is all you have to do.

Select any two 8-bit products. Then choose a third 8-bit product for free.



This offer good on Catalog products for the 8-bit machines only.

Offer good through Sept. 30th 1988.



RAMbrandt Atari Design Studio *by Bard Ermentrout*

The ultimate point software... for under \$20.00! It took our technical staff three hours to step through each feature.

Use the built-in programmer's toolkit to enhance your own programs or picture files. Or just doodle with RAMbrandt for the fun of it.

Here are some highlights

from RAMbrandt's long list of features:

- Works with joystick, Koala Pad or Atari Touch Tablet, or both joystick and graphics tablet.
- 128 colors on-screen at once in any mode with easy one-key access to Display List interrupts. Works in all modes.
- Animation mode (capture up to 32 frames and flip through them at any speed — preview Moviemaker ideas instantly).
- 130XE RAMdisk support! Store up to eight different pictures in RAM at once and flip through them instantly. Cut and paste between pictures.
- Save and Load pictures in formats compatible with Moviemaker, Microillustrator and Micropainter.

RAMbrandt
AP0157 \$19.95
REQUIRES: 48K RAM, One Joystick and/or Koala Pad or Touch Tablet

ST Sound Tools

Why reinvent the wheel?

G.I.S.T.TM

G.I. Sound Tool

by Lee Actor &
Gary Levenberg
for Synthetic Software

You're a programmer and you want to add sophisticated sound to your program — without slowing it down. What do you do? Depends on how much time you want to spend.

You could knock out a few all-nighters and end up with a stomach full of junk food, a caffeine headache, and your own massive personal code that sounds for all the

world like the Merry Chipmunks playing table tennis.

Why reinvent the wheel? Lee Actor and Gary Levenberg have already written the code for you. They've squeezed every possibility from the ST's sound chip, then added a GEM-easy interface so you can quickly create your own sounds and save time, money, and frustration. Want a sound? Simple: create it in G.I.S.T., save it as compressed, memory-efficient data, link their driver with your code and call the sounds. Completely interrupt driven, it won't affect the speed of your program.

And you don't have to know sound to create sounds with G.I.S.T. We've put a whole library of sounds on the disk, and the G.I.S.T. interface is so friendly, a few moments of experimentation and you'll have a whole new library of sounds. But for those who *do* know sound, here are some of the things G.I.S.T. offers:

- Volume ADSR to shape attack, decay, sustain, release
- Volume LFO for Tremolo effects and AM (Amplitude Modulation)
- Frequency ADSR—

frequency shifts up to +/- 3 octaves!

- Frequency LFO for Vibrato effects and FM (Frequency Modulation)
- LFO delay lets you add effects at any point in the sound
- MIDI-compatible! Use your keyboard to play the GI chip
- Three sound windows may be open at once

Works with GFA BASIC, Personal Pascal, most C Compilers, CYBERMATE in the CYBER STUDIO, and Dr. T's MIDI Recording Studio.

G.I.S.T.
ST0233 \$34.95
GFA BASICTM Michtron
Personal PascalTM O.S.S.

Bargains

*****SPECIAL OFFER !!!**
BUY A-CALC PRIME
AND A-CHART TO-
GETHER AND PAY ONE
LOW, LOW PRICE!
ORDER BB9022 A-CALC
PRIME AND A-CHART.
PAY ONLY \$49.95!***

A-CALC PRIME

by KUMA
Now get the easiest-to-use spreadsheet ever at a rock bottom price. Don't wait any longer. Get A-CALC PRIME now at this incredible price.
BB9020 WAS ... \$59.95
NOW ONLY ... \$39.95

A-CHART

by KUMA
Use A-CHART to automatically turn your A-CALC PRIME spreadsheets into beautiful graphs that are DEGAS compatible.
BB9021 WAS ... \$39.95
NOW ONLY ... \$19.95

CRYSTAL

by Jim Thompson
CRYSTAL gives you the power of MS-DOS while retaining the look and feel of GEM with the eight icons the Digital Research forgot.

BB9019 WAS ... \$24.95
NOW ONLY ... \$19.95

A-RAM

by KUMA
Power, speed, flexibility, and, the best print spooler you've ever seen makes A-RAM the RAM disk for you.

BB9017 WAS ... \$19.95
NOW ONLY ... \$12.95

STAR STRUCK — THE ASTROLOGER

by Harry Koons
Follow your lucky stars with this GEM-based pro-

gram that instantly creates charts using formulas for the nine most popular historical house systems.

BB9014 WAS ... \$24.95
NOW ONLY ... \$19.95

A-SEKA

by KUMA
At last an Assembler, Editor, and Monitor/Debugger combo at a price you can afford. A-SEKA is the machine language assembler for programmers looking for ultra-fast response time.

BB9018 WAS ... \$34.95
NOW ONLY ... \$19.95

C.O.L.R. OBJECT EDITOR

by The Rugby Circle
Use C.O.L.R. OBJECT EDITOR to create sprites and bit-mapped game ob-

jects using your original art or low-res picture from any ST paint program.
BB9016 WAS ... \$19.95
NOW ONLY ... \$12.95

RED ALERT

by Stanley Crane
Don't miss this opportunity to pick your own Ground Zero with RED ALERT, the game that's the perfect blend of strategy and arcade action.
BB9015 WAS ... \$24.95
NOW ONLY ... \$15.95



All 50 states 6AM-6PM PACIFIC TIME
Monday-Friday MasterCard, VISA Only

ST Desktop Tools

P.I.E.™

Professional Icon Editor

by Alex Leavens

Customize Your Desktop Icons! Redesign your Trash Can to look like a paper shredder.

P.I.E. is the *Professional Icon Editor* — for programmers as well as desktop artists. Author, Alex Leavens has added icon code generation so you can now design icons for your own programs. And while he was at it, he added a bunch of graphics improvements to delight the artist in you.

New features include:

- Generates Resource Construction Set code for icon images, P.I.E. can be used from within the Resource Construction Set to create and edit icons for the resources you're currently working on!
- Improved Editing Features:
 - Faster Print and Line Modes
 - New Image Cut & Paste Functions
 - Selectable Fill Patterns
 - Horizontal and Vertical Image Flip
 - Multiple Sub-function Menus added
 - Nine-level Bi-directional Undo buffer
- In-program Desktop Icon Preview mode
- Improved Keyboard Resource

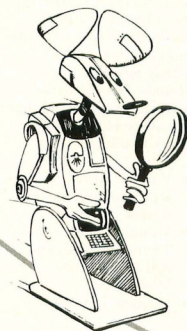
P.I.E.
ST0248 \$29.95

MACRO MOUSE™

The Mouse Recorder

by Charles Johnson

New!



Imagine turning on your computer, then sitting back and watching the mouse cursor glide across the desktop, load CAD-3D, and create its own space ship! And you only touched the power switch. It's as if a ghost were operating your ST!

MACRO MOUSE records all mouse movements, button clicks, and keyboard presses, then plays them back in real time. Up to four recordings can be held in memory, or you may save your macros to disk to play later — or link several together and play them sequentially.

It's easy to use. Set MACRO MOUSE on Record and use your computer. MACRO MOUSE automatically records each step. Avoid boring, repetitive operations — let MACRO MOUSE do it for you. Create spreadsheet macros, or automate your favorite telecom program. Special freeze feature lets you insert instructional text at any point for demos. No GEM program required.

Features include:

- Auto-run macro at power-up.
- Endless loop playback with protected keyboard for demos.
- Text-message with timed display or keypress exit.

- Set "loop points" anywhere.
- Pause & restart playbacks with a keypress.
- Load DEGAS fonts for custom display.
- Chain macros.

Bonus Utilities!

Order MACRO MOUSE now, and receive these two bonus programs: SUPER SELECTOR replaces the dismal GEM file selector. It sits in the AUTO folder and works with any program that calls the standard GEM file selector. Change drives with one click, file sizes plus free disk space displayed, plus much more. Once you've used it, you'll never go back!

ALTHELP is a collection of handy utilities accessed by the [Alt][Help] key.

Not a desk accessory, ALTHELP is accessible anytime from TOS as well as GEM programs. Includes:

- Adjust color registers & instantly switch to one of 10 custom palettes anytime.
- Set keyboard sound, and repeat & delay rates.
- Set disk write-verify on/off.
- Display free RAM.
- 4-function, 32-bit dec/hex calculator.
- Cold or warm reset from keyboard.
- Custom screen printing routines.
- Machine language: takes only 10K.
- Much more...

MACRO MOUSE
ST0260 \$34.95

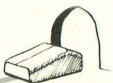
EVERYONE'S A WINNER!

Just remember to send in your warranty cards.

- Automatically receive news of product upgrades.
- Be among the first to hear of new releases.
- Get in on special offers available to registered owners only.



All 50 states 6AM-6PM PACIFIC TIME
Monday-Friday MasterCard, VISA Only

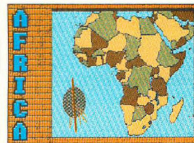


*The world on a disk.
Your eye in the sky.*

MAPS AND LEGENDS™

The Cartographer STEREO Version

by Harry Koons and David Chenette



Float over any spot on earth, from any altitude — in stereoscopic depth, if you wish! MAPS AND LEGENDS has become our most consistently selling product. And no wonder! As the word-of-mouth spreads, people naturally want to experience this fascinating and educational program.

MAPS AND LEGENDS accurately plots Earth land masses on your Atari screen using one of eleven map perspectives including: Orthographic, Foucault, Mercator, Flamstead, Cylindrical, 3D Globe and more. Adjust latitude, longitude, and altitude to place yourself over your home town — or over exotic faraway lands!

Custom Overlay function lets you design your own maps, or use the DATAMAP disks (this page) and load pre-designed overlays. Save multiple map views as CYBER PAINT animations!

MAPS AND LEGENDS 3.0
ST0202 \$34.95
(upgrade is \$15)

REQUIRES: StereoTek Glasses for stereoscopic effect

LET'S GET TECHNICAL

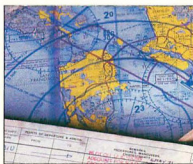
Packed with features, including: Stereo Compatibility, Built-in 9000-Coordinate Database, 11 Different Map Perspectives, Plotting from any altitude, Works in all 3 screen modes, Built-in Paint System (and compatible with CYBER PAINT, DEGAS and NEO), Multi-font Labeller, Custom Overlay Plotter (create your own maps—build your own map databases), Auto-locate Mode (reads coordinates, distance and bearing from maps) and so many more that we don't have room to list them all.

The professional flight planner has just gotten better!

THE NAVIGATOR 2.0™

by Scott D. Stephenson

Works with MAPS AND LEGENDS



When author (and navigator) Scott Stephenson wrote the professional, automated flight planner, THE NAVIGATOR, he requested suggestions for improvements to the program. Result: Big response from pilots all over the world! So okay, here it is. Version 2.0 of THE NAVIGATOR. With so many new features we had to add a second disk! Just a few of the many

improvements include:

- Greatly expanded ICAO databases (2000+ waypoints in US)
- Built-in Navigation Toolkit for database modification
- Quick-access, onscreen 'Micro Menu'
- Increased printout options
- Route 'Flip,' 'Return,' 'Move row'
- Expanded to 60 rows
- Equal Time Points
- Estimated time of arrival
- User preferences file
- R/DME up to 999NM
- Improved scrolling
- Faster calculation
- A-P drive paths
- On-line Morse code table

And much, much more, as you'll discover.

Private pilots, military pilots, navigators (ocean-going as well as air), and commercial operators can use this amazing program to create accurate, detailed flight plans. Amateurs, arm-chair flyers, teachers and students of navigational theory can discover how the professional navigator plans his flight, compensates for wind direction, establishes waypoints, and calculates times and distances. THE NAVIGATOR comes complete with European ICAO, Asian ICAO, and US ICAO databases, and includes a special MAPS AND LEGENDS overlay function to create custom, graphic map overlays.

THE NAVIGATOR
ST0245 \$49.95
(Upgrade to 2-disk set only \$15. Please include original disk.)

Datamap Collections

DATAMAPS II™ Rivers & Highways

by David Murray **New!**

New DATAMAP overlay files create the world's rivers, the great highways, plus the Great Wall of China, the Alaskan Pipeline, the Trans Siberian Railroad, and The Orient Express! A fraction of the rivers contained on this disk include North American: Yukon, Saskatchewan, Mississippi, Platte; South American: Amazon (plus tributaries), Plata, Magdalena; Europe: Volga, Danube, Rhine; Africa: Nile, Congo, Orange; Asia: Ganges, Irrawaddy, Yangtze, Huang-Ho. Some of the highways: US Interstates, Pan American, Trans Amazon, and many more.

DATAMAPS II
ST0258 \$24.95

REQUIRES: MAPS AND LEGENDS 2.0 or greater

DATAMAPS I™ Boundaries of the World

This original DATAMAP collection contains overlay files to create National Political Boundaries: Europe, Latin America, S. America, Asia, Africa, Provincial Boundaries: Australia, Canada, China, U.S.S.R., plus bonus Historical maps.

DATAMAPS I
ST0227 \$24.95

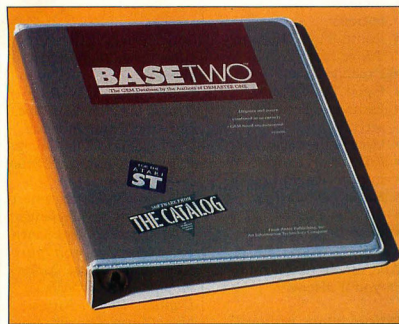
REQUIRES: MAPS AND LEGENDS 2.0 or greater

BASE TWO™

The GEM Database by the Authors of DBMASTER ONE

The next step in databases!

by Dan Matejka and Stanley Crane



It's no fun re-learning your database commands every time you boot it up. And those simplistic "filecard" databases just don't have the power to do the job. Or, maybe you've just created your custom database, entered 5,000 records, and now you want to print a report... good luck. You need a degree in programming just to get some decently formatted hard copy.

Dan Matejka and Stanley Crane have eight combined years of experience writing databases on computers ranging from the IBM PC to the Apple Macintosh. And their databases range in complexity from the extremely powerful and complex IBM PC DB MASTER to the familiar, introductory

DB MASTER ONE on the Atari ST. They've watched the ST database market grow—and they've spotted a gap: until now, ST databases have been either too simple, or too complex. Until now, ST owners were limited to easy-to-use, inflexible "mailing lists," or involved, programmable "throw-backs" to the CP/M or MS-DOS world. Until now, there was no intuitive, yet powerful database featuring an adaptable report generator. *Until now.*

BASE-TWO fills the gap. Entirely GEM-operated, DB MASTER ONE owners will find it familiar, yet far more powerful. Look over some of the features and see if it solves your problem:

INSTANTANEOUS SORTING!

size	number records	sort time
512K	5,000	5.1 sec
1 Meg	10,000	9.7 sec
2 Meg	20,000	19.2 sec
4 Meg	50,000	46.1 sec

Using a sample eight-field mailing list.

- Variable field types:
 - Implicit (default)
 - Alpha
 - Numeric
 - Date (calculable)
 - Formula
 - Formula fields automatically calculate results from several fields in same record
 - Adjustable numeric decimal placement
 - Re-edit database at any time without losing data
 - User-definable .DIF file creation for software compatibility
 - DB MASTER ONE conversion program
 - On-line Help screens
 - Optional mouse or keyboard control
 - 64 character label length
 - 100 fields per record
 - Multi-level Search and Sort
 - Totally RAM-based for instant action
 - Format disks from within program
- Optional, automatic date, time and page numbering
 - Print reports to screen, printer, or ASCII disk file for word-processor editing
 - Optional subtotal printout
 - Adjust number of records per page
 - Double-line report headers
 - Place "comment" text anywhere
 - Customize with printer control codes
 - "Soft" field borders for outfield truncation
 - Single-sheet or continuous feed option
 - Store 10 custom reports for each file
 - Up to 100 unique fields per report

BASE TWO
ST0246 \$59.95

DB MASTER ONE is a registered trademark of DB MASTER Associates.

The intuitive BASE-TWO Report generator includes:

- Multi-line field word-wrap, screen and printer
- Completely adjustable label or column-format report



All 50 states 6AM-6PM PACIFIC TIME
Monday-Friday MasterCard, VISA Only