

ST LOG™

THE ATARI ST
OPERATOR'S
MAGAZINE

OCTOBER 1986

ISSUE 7

THIS ISSUE:

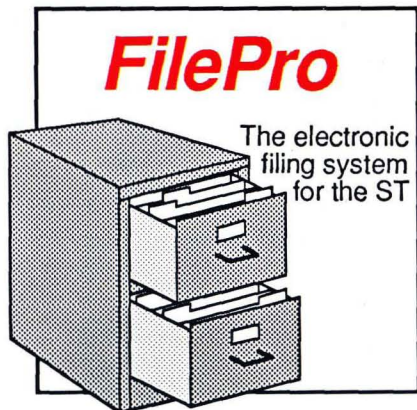
**A tutorial
on windows**

**Mark Skapinker's
Clock Boot**



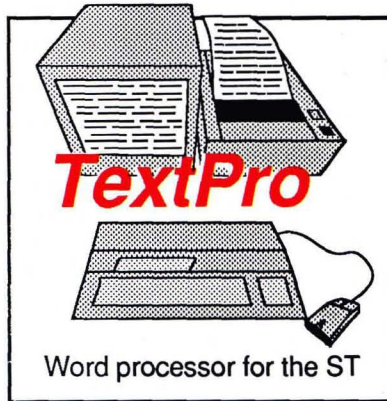
PROFESSIONAL DUCTIVITY

New **ST** software from a name you can count on...



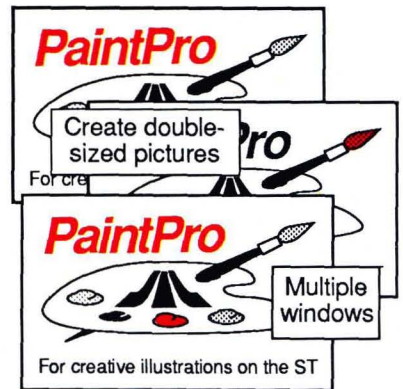
ST FilePro

A simple-to-use and versatile database manager. Features help screens; lightning-fast operation; tailorable display using multiple fonts; user-definable edit masks; capacity up to 64,000 records. Supports multiple files. RAM-disk support for 1040ST. Complete search, sort and file subsetting. Interfaces to TextPro. Easy printer control. **\$49.95**



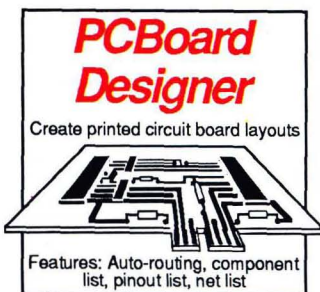
ST TextPro

Wordprocessor with professional features and easy-to-use! Full-screen editing with mouse or keyboard shortcuts. High speed input, scrolling and editing; sideways printing; multi-column output; flexible printer installation; automatic index and table of contents; up to 180 chars/line; 30 definable function keys; metafile output; much more. **\$49.95**



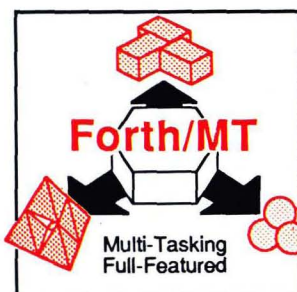
ST PaintPro

A GEM™ among ST drawing programs. Very friendly, but very powerful design and painting program. A *must* for everyone's artistic or graphics needs. Use up to **three** windows. You can even cut & paste between windows. Free-form sketching; lines, circles, ellipses, boxes, text, fill, copy, move, zoom, spray, paint, erase, undo, help. Double-sized picture format. **\$49.95**



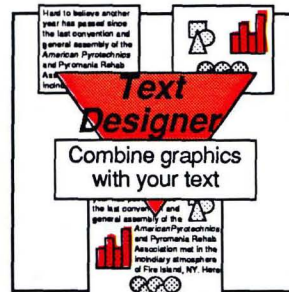
PCBoard Designer

Interactive, computer aided design package that automates layout of printed circuit boards. **Auto-routing**, 45° or 90° traces; two-sided boards; pin-to-pin, pin-to-BUS or BUS-to-BUS. Rubber-banding of components during placement. Outputs pinout, component and net list. **\$395.00**



ST Forth/MT

Powerful, multi-tasking Forth for the ST. A complete, 32-bit implementation based on Forth-83 standard. Development aids: full screen editor, monitor, macro assembler. 1500+ word library. TOS/LINEA commands. Floating point and complex arithmetic. Available Sept. '86. **\$49.95**



ST Text Designer

An ideal package for page layout on the ST. Accepts prepared text files from TextPro or other ASCII wordprocessors. Performs block operations—copy, move, columns. Merges bit-mapped graphics. Tools to add borders & separator lines, more. Available September '86. **\$49.95**



ST AssemPro

Professional developer's package includes editor, two-pass interactive assembler with error locator, online help including instruction address mode and GEM parameter information, monitor-debugger, disassembler and 68020 simulator, more. Available Sept. '86. **\$59.95**

ST and 1040ST are trademarks of Atari Corp.
GEM is a trademark of Digital Research Inc.

Abacus Software

P.O. Box 7219 Dept. NA Grand Rapids, MI 49510 - Telex 709-101 - Phone (616) 241-5510

Call now for the name of your nearest dealer. Or order directly from ABACUS with your MasterCard, VISA, or Amex card. Add \$4.00 per order for postage and handling. Foreign add \$10.00 per item. Other software and books coming soon. Call or write for your free catalog. Dealer inquiries welcome—over 1400 dealers nationwide.

CIRCLE #120 ON READER SERVICE CARD

FEATURES

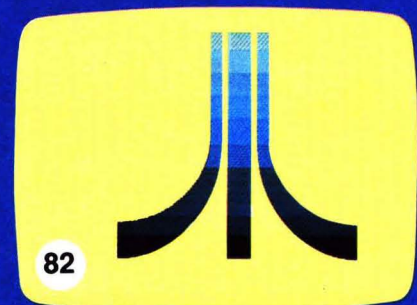
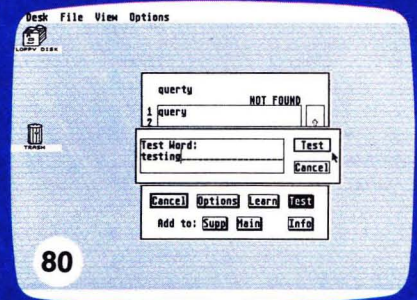
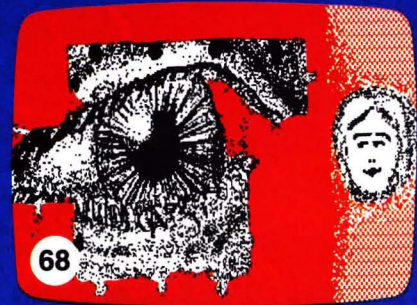
- Puzzle it out Douglas Weir 68ST
Doug explains how to use this multidimensional puzzle program from West Germany.
- BONUS—PROGRAM FOR DISK SUBSCRIBERS**
- Programming with GEM windows Douglas Weir 70ST
A deluxe shell program/tutorial which demonstrates how to create and use windows under GEM.
- Setting the clock on your ST Mark Skapinker 77ST
The author of this public domain program gives you the *hows* and *whys*.

REVIEWS

- Fast/BASIC-M Bruce D. Noonan, M.D. 53ST
(Philon, Inc.)
Similar to Microsoft BASIC and ST BASIC in syntax, but with the inclusion of a compiler.
- Thunder! Arthur Leyenberger 80ST
(Batteries Included)
Does this program continue to uphold Batteries Included's reputation for quality software?

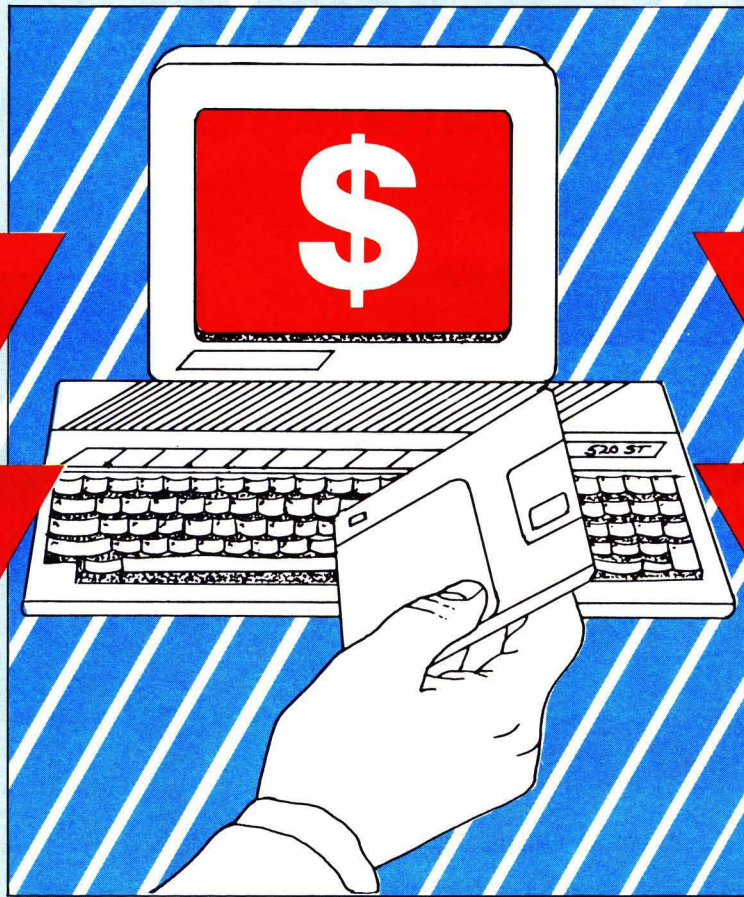
COLUMNS

- Ian's Quest Ian Chadwick 49ST
A look at software through the eyes of a program tester/reviewer.
- ST news 56ST
- C-manship Clayton Walnum 59ST
The topic this month: structures and their use.
- Atari ST best-sellers 82ST
- ST index to advertisers 86ST



We Challenge You!

With our Atari ST programming contest



FIRST PRIZE
\$5,000

THIRD PRIZE
\$1000

SECOND PRIZE
\$2,500

3 HONORABLE MENTIONS
\$500 each

Take up the gauntlet! We're challenging ST programmers—give us your best. Original, exciting software for the ST is what we want, and your work could win \$5,000 for 1st prize. Winners will also get our normal royalty payment when their programs are published in **ST-Log**, the **ANALOG Computing** ST resource. If your program doesn't win, it could still earn you money. Normal publication fees will be paid for inclusion in **ST-Log**. Read the rules below and *meet our challenge!*

RULES AND REGULATIONS FOR THE ST-LOG ST PROGRAMMING CONTEST

1. All entries must be original creations and cannot be submitted, or be under consideration, anywhere else. This includes any other contests or competitions currently underway.

2. Feel free to submit as many entries as you like, as often as you like. The deadline for submissions to the contest is December 31, 1986. All entries must be in by that date to qualify for the contest judging (however, programs received after this date will be considered for regular **ST-Log** publication).

There is no limit to what types of programs we are looking for. Business or educational, graphics oriented or musically inclined, we want to see them all.

3. The entries can be in any programming language of your choice, on 3 1/2-inch single- or double-sided disk, with both run-time and source code. It's quality that counts, not format. If your program is in a compiled language, the compiled object or run-time code must be a free-standing program—one which can be run by someone without a copy of that language. This rule does not apply to programs written in ST BASIC and Logo, which come with the ST. Also, we need to be able to distribute the program legally, without licensing fees or obligation to the language's maker. Contact the manufacturer to

find out if the language you're using has distribution requirements.

4. Please make sure that all entries have accompanying documentation, and that all written materials pertaining to the entries (including articles) are submitted as standard double-spaced typewritten manuscript. Please try to make the text as informative as possible, as it pertains to the usage of the program. This accompanying piece could be in the vein of a "making of" the entry, and could include some of your personal programming hints, etc.

5. Any submissions that do not qualify for prizes will be returned only if you supply us with a stamped, self-addressed envelope or mailer. Please do not send originals of your program—make sure you keep a copy for your own use.

6. Contest judging will be done by the staff of **ST-Log**. The decision of the judges in all contest categories will be final. Contest winners will be announced in **ST-Log** during the first quarter of 1987.

7. This contest is void where prohibited by law. Full-time employees of ANALOG 400/800 Magazine Corp. are ineligible for this contest.

8. Send your entries to: **ST-Log**, c/o ANALOG 400/800 Magazine Corp., P.O. Box 23, Worcester, MA 01603.

Good luck!

ST-LOG
THE ATARI ST
OPERATOR'S
MAGAZINE



IAN'S QUEST

ST news and information

by Ian Chadwick

Let's talk about software development. Lots of software gets out into the market, but not a lot of it is top-notch stuff. This is particularly true when the hardware is new, like the ST. In the early stages, a lot of mediocre (or worse) programs hit the shelves. Why? In this column, I'm going to talk to the publishers about the process. A lot of you are new to the business and haven't really figured things out yet.

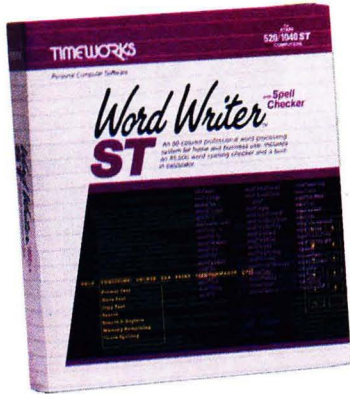
First, of course, is the learning curve. New hardware always has hidden "features," bugs, functions you don't discover until the system has been around long enough for developers to get into it seriously. Fair enough; software tends to become more sophisticated as programmers learn the inner workings and are able to apply both their knowledge and the knowledge other users uncover. A system as complex and demanding as the ST demands a longer learning curve than does a simpler system. We forgive a lack of sophistication in early programming efforts, with the understanding that better efforts will follow. I'll assume that your programmers are adequate in this respect.

A big problem lies in your publishing company's corporate structure itself. All too often, the programmers call all the shots; they are the developers, beta testers, marketing arm and head honchos. Unfortunately, while this looks good on their business cards, it makes for a narrow-looking company. And programmers are, too often, people without the skills or expertise to wear all those hats. Small companies which follow this model need to change their style. Either bring on board someone who knows business, or get outside help and consultation.

A basic developmental flowchart would be: publisher comes up with a product to sell; writes design specs; has a preliminary program written, along with a preliminary manual; has the product and manual evaluated by outsiders; has the program finished; goes through another testing cycle; rewrites and debugs; prepares final manual, disk and package; then places it in the distribution stream. Of course, there are a lot of other considerations—contracts with outside programmers, advertising and promotion, market research, project coordination, editing—all depending on the company involved. The weakest areas in this process are usually in market research, design specification compilation and evaluation.

IF YOU CAN FIND A BETTER PROGRAM WE'LL BUY IT FOR YOU!

Full GEM interfacing, convenient Quick Keys, and many other unique features of our own.



WORD WRITER ST with Spell Checker

A full-featured, professional word processing system for home and business use. You get:

- A Continuous Spell Checker that identifies misspelled words as you are typing your document.
- An additional 85,000 word, built-in Spell Checker that checks your entire document – at your command!
- On-Screen underlining, italics and boldface – as you write.
- An Outline Processor that quickly organizes notes, facts, and ideas in convenient outline format.
- Every other feature you'll need for everyday word processing, plus most of the features found in more expensive programs.

With Timeworks you get more than software. . .

You Get Our Customer Technical Support Team – free to all registered users.



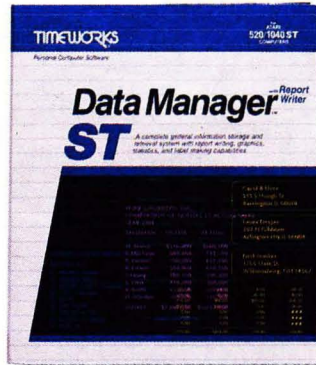
More power for your dollar

Timeworks, Inc. 444 Lake Cook Road, Deerfield, Illinois 60015
312-948-9200

© 1986 Timeworks, Inc. All rights reserved.

** Offer expires 90 days after date of original purchase.

*** Registered trademark of Atari Corp.



DATA MANAGER ST with Report Writer

A complete general information Storage and Retrieval System with report writing, business graphics, and label making capabilities. Plus, you get:

- Flexibility that allows you to modify your data base structure by changing the size or position of fields of information – at any time.
- A complete Report Writer that generates customized data reports. You specify the title, location, and sequence of each column.
- An extensive Business Graphics Package with pie charts, bar charts, line plots, point plots, hi-lo-close stock price plots, and more.
- A Label Maker that prints your important information onto all types of labels.

With Timeworks you get our Money Back Guarantee*

If you can find anything that works better for you – and it's available – we'll buy it for you. Details inside every Timeworks package.**

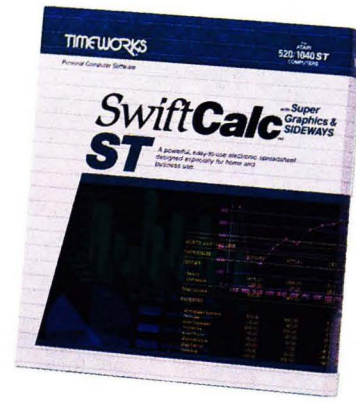
For the Atari 520/1040 Computers.***

Suggested Retail List Price:
\$89.95 each

Available now at your favorite dealer, or call Timeworks.

TO ORDER CALL:
1-800-535-9497

CIRCLE #121 ON READER SERVICE CARD



SWIFTCALC ST with Sideways

A state-of-the-art spreadsheet for home and business use. You get:

- 8192 rows and 256 columns provide up to 2,048,000 cells (locations) in which to place information.
- Super Graphics graphically display and print out business information using pie charts, bar charts, line plots, point plots, hi-lo-close stock price plots, and more.
- Windows allow you to work on two sections of your spreadsheet simultaneously.
- Sideways lets you print all columns on one continuous sheet . . . sideways.
- Help Screens, help you use the program – without referring to your manual.
- Formatting – Choice of five formats: Decimal (up to 9 places); Graphics; Exponential Notation; \$ Sign & Commas.

You Get Our Liberal Upgrade and Exchange Policy – Details are inside every Timeworks package.

These Programs
INTERFACE
with Each Other

First, I assume a company's research finds there is a need or a profitable market for a product. It goes without saying that some level of research is performed, or else you're talking Russian Roulette with your capital. Basic research involves a lot of foot and phone work; you call distributors and retailers first, asking them what's coming and what's been asked for. Read the trade journals and try to find trends or growth areas.

Check out the competition. See who has what out, what it does, and what's due in the next few months (or year). Read reviews to find the strong and weak points. Try to uncover sales figures to see if it's worthwhile and profitable (that's the magic word). Compare prices and see if there's enough margin to undersell or compete at the same price.

You can hire someone to do this for you, or you can have it all done in-house. But, whatever you do, make sure you know the market first. Find out why a product is demanded or is selling. Who is buying the machines? Will they also buy your program? At what price? Can you make money at that price? Will the program sell more machines or vice versa? Who will stock it? Sell it? Review it? Prepare a written analysis that tells whether or not there's a reason to go ahead and publish. This is done as standard practice in the book publishing industry; it fits the software business, as well.

Next, you write up the design specs for your product. Make sure you buy the competition's packages and see how they handle it. Try to find better, more elegant solutions or features. No, I don't recommend copying and plagiarism, but I do suggest you know what the other companies are doing, then aim at producing a better product with more features than what's currently on the market. The only way you'll know is to buy the competition and test it. Don't kid yourself: if you think other industries don't compare the competitor's products and try to outdo them, you're deluding yourself.

Design specs are *critical*. This is the working scaffold around which you'll build your product. Be as complete and detailed as possible. You may need to change the specs later; be prepared. Write up the essential features first, then potentially attractive features. This is where a lot of brainstorming is necessary. Don't attempt to do it alone; involve everyone in your office if you can. Never look down on ideas, no matter what their source.

With a basic design idea in mind, go outside the company. Ask the users and sellers what they want in a product of that type. Don't think you know it all. Ask the users. If your product is a professional one, ask the potential buyers what they want. Don't just program something and dump it on the market.

For example, say you decide we need another word processor (we do, but I'll cover that in another column). Go to professional writers, or users who write several hours daily. Ask them what they need, if they want mouse or keyboard commands, or both. Do they need or want GEM? How many keystrokes will they accept to implement a command? Do they need to search and replace bare carriage returns, and do they need windows and buffers? How large a document do they plan to write? Do they use a hard disk or a spelling checker? Is ASCII file output needed? Find out what they're using now, and why they like or dislike it. Ask about printers, speed, fonts, and everything else you can think of. Put it all in writing.

This is a critical, often overlooked step. It pays to talk to users and find out what they're doing and what they need. It also pays to examine the best-sellers and the well-reviewed products from another hardware system. You can see what's worked there—and why. Many of the ideas and innovations can be carried over to the ST environment. Don't be afraid to incorporate a good idea into your product, as long as you write it yourself.

“Get the specs right first... by asking users what they need.”

An amazing amount of software hits the market without ever going through an elementary design stage. How often have you wondered, “Why doesn't it do this?” or thought, “It would be so much easier if it did it this way...” or “Why haven't they included this painfully obvious and necessary feature?” I haven't found much software that *doesn't* bring up these thoughts. That's why it's important to get the specs right first. And the only way you'll do so is by asking users what they need. Remember, in any other manufacturing or publication industry, fully developed and understood design specs are crucial.

Evaluation is the second part of this two-stage process. It's done after you've got some of the program written, enough to test it outside. This is also a key issue: go *outside*. People in the real world will find bugs and make programs crash in ways you never even considered. If you ask a person to press a numeric key, they'll press A, or a function key. They'll change disks when they shouldn't, choose the worst menu option, enter bad filenames, forget to turn on the printer, and everything else. And more. They'll also be able to find de-

sign flaws and make suggestions to improve them. Your programmers can't see this; they've worked with the program too closely. They wrote it; they know not to press A when 6 is expected.

Evaluation is a barometer for your product. Get professional users (I feel I must hammer that word home... *Don't* depend on your friends, your wife or hubbie, your mother, or your kids to test the product). Get someone who knows the field, uses similar products, needs the product or would use it if available—and who's dependable and willing to be critical. Pay them for their efforts, or promise them a finished copy. Mention them in the credits, but make it a business transaction. Demand a written report and feel free to ask for clarification or expansion on points you don't understand.

This is the make-it-or-break-it point. If your evaluators come back with a lot of criticisms, you'd better decide whether to redesign and rewrite, or to scrap the project altogether. I do this type of work for several companies, including Batteries Included and Antic. My reports are deadly; I'm very critical and tear the products to pieces. I test everything, then recommend which points *must* be changed to sell the product and which *should* be changed to improve it. I can't foresee or find every technical flaw, but I cover the user end completely. When these companies combine my reports with those from other sources, they have a good, detailed, critical analysis of the program. That's the base they need, to decide where to go next.

Of course, the needs and demands of a professional user are different from those of the casual user. I'm a professional writer: I spend eight to twelve hours every day (weekends, too) in front of one of my computers, writing. I need different, often more powerful or complex things in a word processor than does the person who writes a few articles or letters. I've used a dozen different computer systems and know what most major word processors can and can't do. But my evaluation of a word processor will take this into account.

If the program suits my needs, it will suit almost anyone in the business or professional market. This isn't true the other way around. If your testers are casual users, the result will be a program they can use, but it's unlikely they'll be able to see or appreciate what a regular or demanding user requires. Know your intended market.

By the same token, I would only use a project management program casually, so my report can only deal properly with the user interface and bugs. I couldn't tell whether or not the program design would best suit a professional project manager. I use spreadsheets regularly, so I can evaluate them, but I can't evaluate an accounting package as competently.

for and know the basics. Some should be technically oriented and some just competent users. By getting technical and non-technical (not casual) reviewers, your company gets a well-rounded perspective on the product. Generally, if your original design specs were properly developed, you won't face major rewrites or redesign at this stage.

If your evaluations come back negative, go back to square one. It's better to redesign and produce a good, finished product than produce a half-finished one. You'll only get bad reviews, customer dissatisfaction and a bad reputation with the latter. Think about the general reaction to **VIP Professional** when it arrived; it had many bugs and lacked the promised GEM interface. Most of the negative reaction could have been avoided by following a reasonable design/evaluation cycle, rather than rushing it out.

Don't confuse evaluation with testing. Testing is done on a "finished" product to iron out any last bugs, wrinkles or problems. It is not an invitation for design analysis. This can be done by competent, but not necessarily professional, users. It can be done in-house by people who are unfamiliar with the program, but you should send a few outside as well, to cover all bases. You can never test software too much.

Most of my criticisms of programs are due to weaknesses in these steps—or the lack of them, in some companies. No amount of professional programming expertise can make up for sloppy research or design. My own background includes both software and trade book editing for major publishing houses. Nothing got published without market research, financial analysis, and, where appropriate, design and evaluation.

There are other issues which can change the reaction to your products: packaging and documentation are two of the more important. Both must be professional and complete. Don't leave ad copy, jacket copy, or—especially—your manuals in the programmers' hands. Get them written by people who understand *English* and can write it adequately. Have all copy read by outsiders. Have them comment on it, along with the program. This goes for all text *within* the program as well: make sure it is fully proofed and edited. Don't let something like your up \$1 appear, when you're was intended (as appears in *Soft Logik's Electro Solitaire & 21*).

Get good package design—done by artists, not someone in the back room who took art one year in school. Make sure they understand that it has to sit on a store shelf, both face and spine out. Make sure they understand color, type and the need for a readable package. Above all, be professional in every stage, in every activity and every outlook. **A**

Ian Chadwick is author of Mapping the Atari and several software manuals. He worked in the publishing business on and off for fifteen years. He was also an itinerant fruit picker, short order cook, game store manager, magazine editor and journalist. He lives in Toronto with Susan, their six cats and one dog. He is currently writing a murder mystery and trying to teach his dog Pascal.

AnsiGraf

Ansi/Graphics Terminal Emulator for the Atari 520ST

- Ansi x3.64 emulation
- VT102 mode
- Tektronix 4014 emulation

AnsiGraf uses the interactive GEM interface. Separate text and graphics screens viewable concurrently, multiple text pages. Xmodem upload/download, text/graphics to printer or to disk, keyboard macros. Price: \$79.95

Grafikon, Ltd.
P.O. Box 446
College Park, Md. 20740
Phone: (301) 937 - 3394

CIRCLE #122 ON READER SERVICE CARD



LIONHEART

BUSINESS & STATISTICAL SOFTWARE

PC/MS-DOS (5¹/₄ & 3¹/₂), MACINTOSH, AM'GA
ATARI ST, C64/128, CP/M, APPLE DOS 3.3

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! Spreadsheet compatible.

- BUSINESS STATISTICS \$145
- EXPERIMENTAL STATISTICS 145
- MULTIVARIATE ANALYSIS 150
- EXPLORATORY DATA ANALYSIS 75
- STATISTICS FOR MARKETING 150
- QUALITY CONTROL & INDUSTRIAL EXPERIMENTS 145
- FORECASTING AND TIME-SERIES 145
- SALES AND MARKET FORECASTING 145
- DECISION ANALYSIS TECHNIQUES 110
- LINEAR & NON-LINEAR PROGRAMMING 95
- PERT & CRITICAL PATH TECHNIQUES 95
- OPTIMIZATION 110

VISA, MasterCard, AMEX, Check
P.O. Box 379, ALBURG, VT 05440
(514) 933-4918

CIRCLE #123 ON READER SERVICE CARD

WHAT IS ST-CHECK?

Most program listings in **ST-Log** are followed by a table of numbers appearing as DATA statements, called "ST CHECKSUM DATA." These numbers are to be used in conjunction with **ST-Check** (which appeared in **ANALOG Computing/ST-Log** issue 41).

ST-Check (written by Clayton Walnum) is designed to find and correct typing errors when readers are entering programs from the magazine. For those readers who would like copies of the article, you may send for back issue 41 (\$4.00).

ANALOG Computing/ST-Log
P.O. Box 625, Holmes, PA 19045

InSoft ST NETWORK Membership - \$50

Buy software and hardware at wholesale + 5% + S/H
Aug. - Sept. Member Specials (add 5% to all prices)

Atari Dev. Kit	\$205
Atari Hardware	
520ST Keyboard	340
" (1 MEG)	500
½ MEG Drive	120
B/W Monitor	150
20 MEG H.D.	625
Avatek 1200 Modem	81
Blank Discs - 3.5"	
Verbatim/10 SS DD	\$14
Brown/10 DS DD	20
Hippo EPROM Burner	99
Sound Digitizer	99
Video Digitizer	99
SLC Clock Card	34
Supra 1200ST Modem	125
Supra 20 MEG H.D.	625

***** SPECIAL TO NEW MEMBERS *****

When you sign up as a member in Aug.-Sept. with membership application you can buy software from the following publisher's at 45% off list:

Abacus, Activation, Antic, Batt. Inc., Beck., Dragon Group, Elect. Arts, Epyx, FTL, Haba, Hippo, M.O.U. Metacom., Michtron, Micro., Mirage, Migraph, O.S.S., Penguin, Phylon, PCA, Prospero, P.S., Psy., Quick., Regent, SLC, Syn, TDI, Unison, VIP, ect.

Add \$2 for S/H for each software item ordered. Add 5% to total.

For further information call (617) 739-9012

InSoft, Corp.
P.O. Box 180
Boston, MA 02123

CIRCLE #124 ON READER SERVICE CARD

Fast/BASIC-M Release 1.3

PHILON, INC.
641 Avenue of the Americas
New York, NY 10011
(212) 807-0303
ST Disk \$129.00

by Bruce D. Noonan, M.D.

Learning a new language on a computer is a major chore for some of us. Many of today's ST programmers learned on the 8-bit Ataris. We had Atari BASIC, Atari Microsoft BASIC, assembly and a few others to choose from. Now that the ST has arrived, we have ST BASIC, Logo, C, 68000 assembly, Pascal, Prolog and Modula-2, plus promises of COBOL, FORTRAN and several others. What a programmer wants in a chosen language is flexibility, ease of use and accuracy, as well as maximum access to the capabilities of his computer.

Philon has produced a product which takes source code written in BASIC and compiles it into machine language for optimum speed. We refer to programs thus created as "stand alone" programs, since they don't require the presence of a language "interpreter" in order to run.

Programs written in Atari's ST BASIC, on the other hand, require that BASIC be run first, with the user's program loaded in afterward. If you've dealt with many ST BASIC programs, you know how incredibly slowly they run. If you constantly move the mouse while an ST BASIC program is running, you can bring a running program to a virtual standstill.

Fast/BASIC-M is close to Microsoft BASIC and ST BASIC in syntax. With the exception of a conspicuous absence of window, editing and debugging commands, it has commands and statements nearly identical to those of ST BASIC. Thus, you can write and debug your ST BASIC program prior to compiling it.

Most statements are compatible, such as those creating sequential files or random files by setting up fields. But you don't have the option of printing to a printer. What? LPRINT doesn't print to the printer? That's right, folks. The **Fast/BASIC** LPRINT function merely "prints" to a disk file.

When you want to print, the program first creates and prints formatted data to the print file called LINEPRINTER. You must then terminate the program and return to the GEM desktop to dump the file, by double clicking the LINEPRINTER icon and selecting "print" instead of "show." This is, in my opinion, a handicap for commercial applications where you need to enter data and get immediate hard copy.

Although **Fast/BASIC** lacks sound and graphics commands, just before press time Philon sent me a free update. It contains two functions: VDISYS and GEMSYS. By poking in the proper numbers to GEM arrays, you can utilize the graphics capabilities for which the ST is renowned.

To set up functions, you must also define two other functions, to translate **Fast/BASIC's** 32-bit integers to 16-bit words and back again, in order to access the GEM routines. The documentation covers this thoroughly and adequately, although, to a beginner, these routines may appear somewhat difficult to implement.

The language is versatile enough, however, to permit saving the arrays and setup procedures in a %INCLUDE file, so that they needn't be typed in for every program, and can be accessed by the compiler at compile time. Trying to use the GEMSYS function to access AES routines (such as dialog boxes) would be very tedious, indeed. Without the Resource Construction

Set in the Atari GEM Programmer's Kit, merely designing a dialog box would consume many hours and volumes of code. Setting up the TEDINFO and OBJECT structures (which contain data relative to strings, coordinates of dialog boxes and their whereabouts in memory) could be very frustrating. It would be helpful if Philon would define the structures and include them in the package, along with a "Resource Construction Set" to output BASIC code %INCLUDE files.

The language itself has some peculiarities. The rather unusual setup of GOTOXY followed by PRINT statements of ST BASIC is replaced with the more common PRINT AT command of Microsoft BASIC. But strangely, the y variable precedes the x variable (as in C)—meaning that, when you're porting over 8-bit Microsoft BASIC programs, you'll have to reverse the x and y variables in all the PRINT AT statements.

Another unusual aspect of this language is the lack of necessity for line numbers, except for use as labels in GOTO and GOSUB commands. Line numbers are left in merely as a convenience. You could label several statements with the same line number, and the program would execute without a hitch—provided the line number wasn't referenced as a label. The statements are simply executed in sequence. Thus, since the line number is ignored when editing, you must be careful to insert the statement in the correct position, or the program won't run properly.

Furthermore, there's no limit to the length of a statement line. By simply appending the underscore character at the end of a line (e.g., GOSUB_ RETURN), the line may continue on the next line in

NEWELL INDUSTRIES

256K XL

This 256K ram upgrade gives you compatibility with the 130XE, plus gives you an additional 128K of RAM for a total of 256K. With this upgrade you can run software designed for the 130XE including Basic XE, Disk operating systems, etc. Internal installation. Does not use expansion bus. Some soldering required. MYDOS and manual included with 256K upgrades. MYDOS lets you configure Ramdisk up to 192K, or 1522 sectors. Use Basic XE in extended mode, plus have 128K ramdisk, etc.

Don't confuse our upgrade with others you may have heard about. Ours supports Antic CPU control, so you don't have to worry about overwriting the screen when doing bank selecting. Some programs will not run properly if this is not controlled. Our upgrade also protects the main memory. During banked operations, you cannot accidentally access the main memory bank and wipe it out.

Installation available. Check with your dealer or contact Newell Industries for more details.

RAMROB XL/XE

Allows the use of three different operating systems. Comes with OSNXL OS that includes the FASTCHIP floating point routines, and OMNIMON XL machine language monitor. The OSNXL OS is compatible with the 400/800 OS.

The OMNIMON XL is a resident monitor with all the debugging tools needed for any application. Interrupt and examine any program (including cartridges) easily. Includes read/write to disk, binary load, directory, assembler, disassembler, single step execution, drive control, change registers, hex conversion/arithmetic, search/ display/ alter/ move/ relocate/ verify memory, hex or character format and more.

FASTCHIP

The FASTCHIP floating point routines can give you up to four times the speed of the original floating point routines. Atari basic uses these routines for almost every operation. Spreadsheets and other languages also use these routines. You can see the difference.

SCXH COPIER

This program was designed for use with Atari 130XE, and 256K 800XLs with the Newell Industries 256KXL ram upgrade. It should not be used with other computers unless they support this bank switching method. This program supports both single and double density disk drives up to 2880 sectors per disk. Copies a full disk in just one pass. Make multiple copies while reading the source disk once.

SBM ST

This system was designed to operate in a wholesale or retail environment. SBM ST is an inventory control, point of sale program that produces invoices, purchase orders, statements, mailing labels, quotes, sales and account reports, plus much more.

Inventory control:

Each inventory record consists of item number, part number, description, vendor number, quantity on hand, location, reorder point, quantity on order, cost, sale price, quantity sold, dollar amount sold, and product group.

Accounts control:

Account records consist of account number, name and address, terms, total purchased, total paid, last invoice date, and balance due.

General information:

Mailing labels may be printed for all or selected accounts and vendors. Purchase orders may be printed with automatic update of inventory records. Sales reports consist of daily, periodic, and annual. Tracking of up to 30 salespersons for figuring commissions, etc. Ten programmable tax rates, separated and recorded.

Capacities:

Parts (items) - 32,767 per inventory file, unlimited number of files.

Accounts - 32,767 per account file, unlimited number of files.

Vendors - 32,767 per vendor file, unlimited number of files.

Estimated capacity per media:

Single sided drive - 2000 records. Double sided drive - 4000 records. 20MB hard disk - 110,000 records.

HYDOS DOS

Compatible with 2.0S, but has the serious user in mind. Supports all 5 1/4 and 8 inch drives. Single and double sided and density. Also support for hard disk. Ramdisk support up to one megabyte.

OMNIVIEW

Now get 80 columns with your 600/800XL, 65/130XE. Compatible with LJK Products, BASIC, etc. Enter 80 column mode easily. Supports CPM on ATR 8000. Also comes with Fastchip floating point routines and easy access to additional ram. Also comes with omniviewer word processor and omniterm modem program.

For a complete list of products and prices, contact Newell Industries, 602 E. Highway 78, Wylie, TX. 75098. Phone 214-442-6612. Dealer and distributor inquiries welcome.

the editor. You cannot break up string constants, keywords, identifiers or statement numbers with an underscore, however, and some statements (such as compiler directives) must appear on their own line. Blank lines may be inserted in the program for legibility.

On the plus side... the program works flawlessly. Well, almost. One little thing not mentioned in the documentation is that another file, TERMCAP, must reside on the same disk as the compiled program, or it won't run. Philon says this will also be corrected, but meanwhile, whenever a program file is copied to another disk, remember to copy TERMCAP, as well.

Imagine my frustration when my program ran on the compilation disk, but not on a copy. I had to systematically delete or rename files, until I found the necessary accompanying file.

Fast/BASIC-M comes with a 240-page loose-leaf manual, including an index. For the most part, it's well written, and examples are helpful and instructive. It is not a BASIC tutorial, however, and assumes familiarity with BASIC programming techniques.

There are two types of floating-point formats, yielding either fourteen or sixteen digits of accuracy: BCD (Binary Coded Decimal) and IEEE (Institute of Electrical and Electronics Engineers). This level of precision exceeds that in the Alcyon C compiler, initially released by Digital Research in Atari's own programmer's kit (although Atari now has a double precision version, available as a \$20.00 upgrade). The manual goes into some detail describing the uses of each, and the programmer must decide which to use when compiling.

The package also includes five unprotected single-sided disks, one of which is the "Developer Disk Utilities" from the Atari developer's kit. This contains the Microemac Editor, the LINK68PRG and RELMOD.PRG, and command files.

The compilation instructions are quite detailed and complete, and, if carefully followed, result in a working program. Just be sure to check the notes on which files must be moved to which disks for BCD math. Having a hard drive or 1 meg of memory with a RAMdisk really saves time and wear on the floppy drives.

There are stern warnings on the back of the binder, telling the user not to make more than three copies of the program and/or its run-time library. Only your own use of a compiled program on a single computer system is authorized, without royalty payments to Philon.

Philon told me verbally that this limitation no longer exists, as policing thousands of users would clearly be unmanageable. Thus, license to use compiled programs commercially is *gratis*—a reasonable decision. After all, who would want to invest \$130.00 in a system capable of producing

commercial programs on a "power without the price" computer, to find the cost of each compiled program sold would have to be hiked \$15.00 or so to pay the royalty?

All in all, I'm pleased with the ease with which **Fast/BASIC-M** compiles and produces working programs. It would be helpful to have an RS232 interface, and again, Philon is working on an upgrade to include this. Their upgrades are to be available (cost not known) to all registered purchasers, as changes are finished.

Philon was responsive to my questions and appears dedicated to supporting its customers. If the lack of a printer interface is corrected—and an interface containing the AES supporting structures is added—this would become a terrific package. In its present state, however, I would have to rate **Fast/BASIC-M** a B. **A**

Dr. Noonan is an ophthalmic surgeon in Edmonds, Washington. He's been interested in computing since college, and has developed a program on the 8-bit Atari that magnifies text files on the screen, plotting the text in graphics modes 5 and 7, for low-vision patients.

If It's For The ST... And If It's Good... THEN WE HAVE IT!

We are your source for ST Computers, Hard Disks and the Best Software available for the ST! We evaluate and sell only the **BEST PRODUCTS** for the ST, and we support everything that we sell!

Call or circle our Reader Service Number on the Response Card to put your name on our mailing list. You will receive our **FREE ST BUYERS GUIDE & NEWSLETTER** with reviews, news and tips to get the most out of your ST!

Phone 1-800-782-7007 Toll Free
(In Oregon 479-9516)

SERIOUS SOFTWARE

VISA & MasterCard
gladly accepted.
837 NE 6th St.
Grants Pass, OR 97526

CIRCLE #126 ON READER SERVICE CARD

HOME AID ST Welcomes you to an organized household Only \$39.95

ADDRESS BOOK: Lets you record up to 100 names per file. Alphabetized search. Prints labels or complete address data in 3 type styles. Autodialer.

BUDGET: Track weekly, monthly, yearly expenses and income. Functions include Graphing, Recalculation (auto or manual), Copying (by individual item or whole fields). Use the mouse to move from one month to another.

APPOINTMENT CALENDAR: Select from any year (1752-?). Store and recall appointments easily. Print appointments out by day or week. Copy from one day to another. Search for any phrase. Appointment book uses a free-format so it can be used as a notepad, desk diary, etc. Stores 100 lines of information with 40 chars/line. Print out calendars by year or month. Customize your calendar by adding your own pictures. Calendar keeps current day/time and has on-screen real-time digital clock.

CALCULATOR: 19 functions with 10 memory locations. 'Paper Tape.'

SAVINGS and LOAN: A 'financial calculator' for asking 'What If' questions. Determine the interest you are paying or receiving.

HOME AID ST can be configured as desk accessories, as individual programs or as 1 main program. We let **YOU** choose what is best for **YOU!** Manual included.

Call (303) 472-6624
SRM Enterprises
P.O. Box 40
USAFA, CO 80840

Terms: VISA/MC/CHECK/MO/COD

** Dealer Inquiries Invited **

CIRCLE #127 ON READER SERVICE CARD

ST news!

A SHRINK IN A BOX

Dr. Xes is an advanced version of the old "artificial intelligence" program *Eliza*, which mimicks a psychotherapy session.

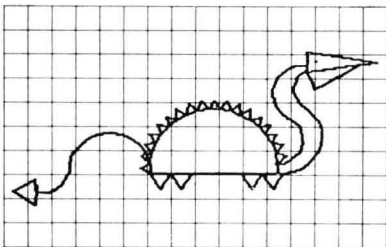
Taking advantage of the ST's memory and speed, **Dr. Xes** interacts with the user to the point where it's close to impossible to tell whether you're talking to man or machine. **Dr. Xes** lets you learn more about artificial intelligence, psychotherapy and yourself.

Selling for \$49.95. Rosetta Stone Software, 4000 MacArthur Blvd., Suite 3000, Newport Beach, CA 92663 — (714) 851-6464.

CIRCLE #177 ON READER SERVICE CARD

LOGOWORLDS

This spiral-bound book, meant for the elementary or middle school teacher who may be a computer novice, provides a practical perspective for bringing Logo into the classroom. Interested individuals will gain a better understanding of the language, enabling them to teach it to children or adults.



Each chapter contains a content section, in which Logo concepts with complete explanations and examples are given. The book has 301 pages written by Rachelle S. Heller, C. Diane Martin and June L. Wright.

Order via ISBN 0-88175-031-X. Priced at \$19.95, from Computer Science Press.

CIRCLE #179 ON READER SERVICE CARD

FULL-FEATURED COLOR WORD PROCESSOR

Colorwriter, a GEM-based word processor, lets you edit four documents simultaneously, using the ST's windowing. Color facilitates editing, highlighting, and text and cursor positioning. A user-modifiable menu permits printer control codes to be added or deleted, and there's also high-speed scrolling.

Colorwriter lists for \$69.95, from Shaner International, 453 Ravendale Drive, Mountain View, CA 94043 — (415) 964-2992.

CIRCLE #182 ON READER SERVICE CARD

68000 PRIMER

Howard W. Sams & Company has recently released the **68000 Primer**, a book written to introduce novice or experienced computer programmers to the instruction set and addressing modes common to the 68000 chip family (including the 68000, 68101 and 68020).

The **68000 Primer** features an introduction to the 68000 chips, plus information on: chip architecture, how to program in assembly language, how to use the 68000 fully, and how code mapping works.

Also covered: how to minimize file lockups, how to use various instructions and registers, and how these chips are used in multi-user systems. The 368-page book was written by Stan Kelly-Boote and Bob Fowler.

The **68000 Primer** sells for \$21.95. For more information, contact: Howard W. Sams & Co., 4300 W. 62nd Street, Indianapolis, IN 46268.

CIRCLE #178 ON READER SERVICE CARD



AC/FORTRAN

The only ANSI FORTRAN now out with a debugger, this one supports virtual arrays and overlays, and can download mainframe programs, with minimal modification.

AC/FORTRAN also provides several tools for large program development, and is source compatible with the similar compiler for the Amiga and Microsoft FORTRAN for the Mac (among others). Features 32-bit integer operations, dynamic linking, IEEE floating point numbers, and much more.

The price is \$199.00, from Absoft, 4268 N. Woodward, Royal Oak, MI 48072 — (313) 549-7111.

CIRCLE #180 ON READER SERVICE CARD

TELECOMMUNICATIONS MADE SIMPLE

I*S Talk is an advanced telecommunications package designed for ease of use and power. A 250K capture buffer, three levels of macros, auto-dialing and log-on sequences, an over 50,000-word built-in spelling checker and GEM compatibility are only a few of the features.

Use keyboard or mouse entry, or both. **I*S Talk** links with other software in the series (like **I*S Time and Billing**). For color or monochrome, **I*S Talk** needs TOS in ROM.

The cost is \$79.95, from Batteries Included, 30 Mural Street, Richmond Hill, Ontario, Canada L4B 1B5 — (416) 881-9941.

MIDI FOR MUSICIANS

This recently introduced oversized paperback is a comprehensive introduction to MIDI (Musical Instrument Digital Interface). As its title proclaims, it's aimed toward the musician whose needs are professional (or those who aspire to professionalism).

It doesn't matter what instrument you've chosen to concentrate on; you'll learn about the evolution of MIDI, how MIDI can solve musicians' problems, the MIDI language and MIDI applications. There are even directions for setting up and using your own MIDI-based recording studio. Presented in an easy-to-understand style, **MIDI for Musicians** also covers the currently available MIDI accessories and software.

The 105-page book is retailing now for \$14.95. Written by Craig Anderton, through Amsco Publications. You'll be able to order it from your local bookstore by giving them the ISBN number 0-8256-2214-X.

CIRCLE #183 ON READER SERVICE CARD



"EDITOR'S CHOICE!"

PC MAGAZINE

FOR
YOUR
IBM
ATARI ST
MACINTOSH
AMIGA

"... low price makes this capable package appropriate for professional and individual investors... GEM interface provides flexibility and easy communications... flexible reports and What-If analysis... the developers obviously consulted extensively with a stockbroker who knows his business." PC MAGAZINE

And we know our own business. Batteries Included has been providing excellent, useful and inexpensive software for over eight years, for all the major computer systems. In developing this superb investment management package we worked closely with Lee Isgur, First Vice-President of PaineWebber N.Y. and one of the world's leading financial analysts. **THE ISGUR PORTFOLIO SYSTEM** will give you all the answers you've been looking for.

"... actually three programs in one. Memo pad and calendar... portfolio management program... and telecommunications program... extremely easy to use... impressive extras." PERSONAL COMPUTING

Stocks, bonds, options, commodities, mutual funds — The Isgur Portfolio System (IPS) helps you manage any combination of portfolios more efficiently. Program functions are easily configured to your preferred way of working.

"... gives serious investors many of the technical analysis and reporting tools used by professionals. It can handle many investment portfolios simultaneously, consolidate multiple portfolios of foreign currency, and allow automatic updating of investments in different portfolios. A very good value." INFOWORLD

(F1)Desk (F6)General (F7)Prices (F8)Buy/Sell (F9)Review (F10)Replay

Name of Portfolio: J. Citizen Cdn
 Value of Securities: 83,050.00
 Net Cash/Margin: 3,500.31
 Net Value of Assets: \$86,550.31
 Commissions: 1,986.37
 Unrealized Gain(Loss): (\$5,787.50) 7%

Portfolios: 1 Selected 2 Current 3 All
 Change: 5 Values 6 %
 Purchases: 7 All 8 Short Term 9 Long Term 4 COMBINED

Annualized
 Suppose?
 Report

CURRENCY- Standard

Security	Purchase Date	Qty	Purchase Price	Current Price	Current Value	Gain (Loss)
AAPL	Sep 2/84	200	23	15	\$3,000.00	(34.78%)
BALLY	Jul 17/85	1000	18.25	16	\$16,000.00	(12.33%)
BALLY	Jul 17/85	200	18.375	16	\$3,200.00	(12.93%)
BMC	Oct 2/84	200	17	7	\$1,400.00	(58.82%)
CBS	Oct 2/84	100	87	118	\$11,800.00	35.63%
CBU	Aug 2/85	400	8.75	9	\$3,600.00	2.86%
GM	Oct 2/84	100	70	67	\$6,700.00	(4.29%)
IBM	Oct 2/84	100	123	124	\$12,400.00	0.81%
IBM	Nov 2/85	100	130	124	\$12,400.00	(4.62%)

IPS telecommunications module is pre-set to receive Dow Jones, Compuserve, The Source and InfoGlobe. IPS updates your portfolios automatically with the latest data. Then, makes use of powerful analytical features that show you the most profitable decisions.

- Display gains & losses on an annualized basis.
- Through "Suggest" mode, advises what to sell and when, for tax optimization while keeping your portfolio diversified.
- "Suppose," to assess possible price variations.
- All of this on the screen or as comprehensive printed reports.
- Multi-currency holdings.
- Totally automatic, single key telecommunications price updates from all major services.
- Timely alerts: calendar/memo function automatically advises you on short-term/long-term changes, option expirations, price alerts as well as your own personal reminders.

One of many screens available to show you where the profits are.

"... can benefit both individual investors and stockbrokers who manage medium-to-large portfolios." PC MAGAZINE.

"It is dangerous to look at any software package and say, 'This is the one,' but this one comes very close." COMPUTERIZED INVESTING.

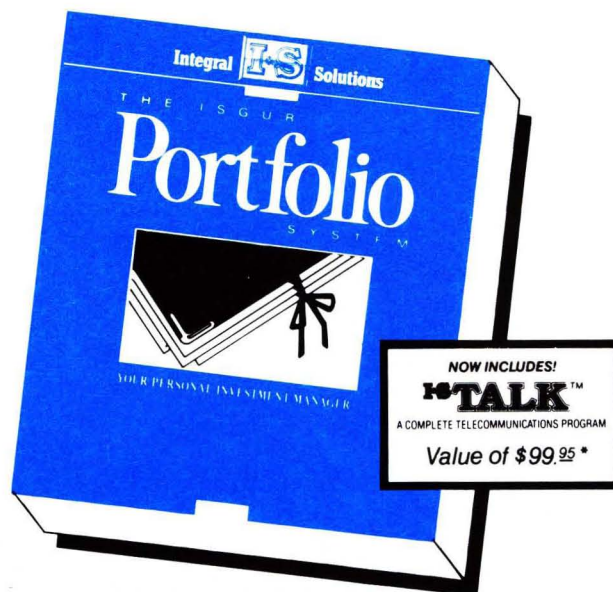
TOTAL INVESTMENT: \$249.95*

"a real value for the money" INFOWORLD

TRY OUT IPS FOR JUST \$7.95*

Comprehensive demo disk shows you every function. Detailed brochure explains it all. Call our toll-free number 1-800-387-5707.

OBTAIN THE ISGUR PORTFOLIO SYSTEM FROM YOUR LOCAL SOFTWARE SUPPLIER, OR DIRECTLY BY CALLING TOLL-FREE (CONTINENTAL U.S.): 1-800-387-5707
 Please have your VISA, MasterCard or American Express card number and expiry date ready when calling.



AN INTEGRAL **IS** SOLUTIONS PRODUCT FROM BATTERIES INCLUDED

0 Mural St., Richmond Hill, Ontario, Canada L4B 1B5 (416) 881-9941 • 17875 Sky Park North, Suite P, Irvine, California, USA 92714 TELEX: 509-139

The Isgur Portfolio System is available for:
 IBM PC and MS/DOS systems with graphics or color capability and minimum 512K RAM, Apple Macintosh, Atari ST, Commodore Amiga.

New enhanced version 1.05 now available! Update your program for only \$10.00* with the return of your original disks. Write to us for our full color catalog of software for IBM, Macintosh, Atari, ST, Apple, Commodore and Amiga systems.
 1986 Batteries Included. Apple, Atari, Commodore and IBM are registered trademarks respectively of Apple Computers Inc., Atari Inc., Commodore Business Machines Inc., and IBM Business Machines Inc.

*Suggested U.S. list price. All prices shown are in U.S. funds

LEADER BOARD™

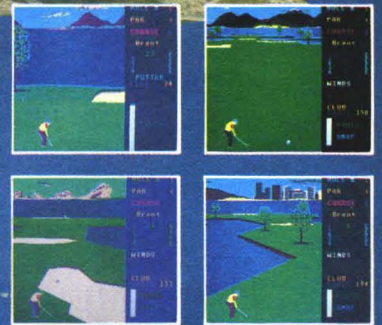
"Pro Golf Simulator"
By Bruce & Roger Carver

Access welcomes you to the exciting world of professional golf with **LEADER BOARD**. With amazingly realistic 3-D animation, golfers will face multiple 18-hole golf courses that demand strategy, total concentration and control to come in under par.

LEADER BOARD is the most realistic golf game available because it is actually a simulator that gives you a true perspective view of your golf game.

There are three levels of play so you can compete from amateur to touring professional. You'll get all the fun, aggravation and stimulation of true golf competition!

- Suggested Retail Price \$39.95
- 1 to 4 Players
- Choice of Club, Distance, Type of Shot (hook, slicer, putting) and More
- Realistic Sound
- Joystick Controlled
- Multiple 18-Hole Golf Courses
- Automatic Scoring
- Disk Commodore 64/Atari 800
Atari 520ST/Amiga
- Practice Driving Range



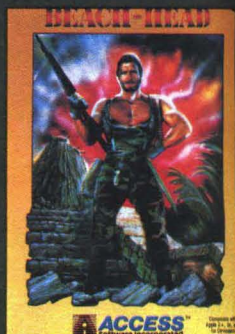
Enhanced
Graphics on the
Atari St and
Amiga version!

ACCESS™
Software Incorporated

For mall orders, enclose check or money order, plus \$1.00 shipping and handling, and specify machine version desired. Order by phone on VISA, MasterCard or C.O.D. by calling (801) 298-9077.

ACCESS SOFTWARE, INC. 2561 South 1560 West
Woods Cross, UT 84087

CIRCLE #129 ON READER SERVICE CARD



Also available for the Atari 800 Home Computer Series.
Suggested retail price: \$34.95

C-MANSHIP

by Clayton Walnum

Most of you, I hope, noticed the absence of this column last month. No, I didn't skip town. The summer CES reared its ugly (but interesting) head and gobbled up all my time. Add the fact that I had to finish programming last month's 8-bit feature game, **Moonlord**, and you'd be correct in envisioning your friendly author scurrying about like a squirrel desperately storing nuts for the winter even as the first flakes of snow drift from above. I still haven't got my breath back, and, as you can see by the length of this month's listing, I haven't begun to relax yet.

A week's trip to Chicago also gave the mailman a chance to play the trick he's so fond of. It took me a couple of days to locate my desk under the stack of submissions and letters threatening to overflow onto the floor. In that stack was a question from John Lambert.

I . . . noticed in your last article that the commands `open()`, and `write()` were used in the program. In both my developer's documentation and a book on C that I purchased, I did not notice any such command. There is, of course, `fopen()` and `fwrite()`, which I assume to be the same. What worries me is that there are other commands available that are not documented. . . is there any way to find all the commands available?

First of all, `fopen()` and `fwrite()` are not the same as `open()` and `write()`. The former are higher-level functions. When you open a file with `fopen()`, you have access to such functions as `fwrite()`, which allow *formatted* output, just like `printf()`. You can see these higher-level functions used in this month's sample program. Both `open()` and `write()` are low-level functions. If you look at their descriptions in your documentation, you'll see you have to do a lot of the work to get the output the way you want it. There's a good

discussion of I/O functions in chapters 7 and 8 of *The C Programming Language* by Kernighan and Ritchie, published by Prentice-Hall.

As for the documentation, the functions are all there if you look hard enough. For instance, you can find `open()` on page 2-39 of the developer's kit's C programming guide, or on page 10-17 of the **Megamax** documentation. When you're looking for a particular function, you may have to look in several places. There are the standard C functions, as well as all the routines for the AES, VDI, Bios, Xbios and GEM DOS. Nobody said programming an ST was going to be easy. When you jump into a new project, be prepared for a lot of manual hunting.

The tough stuff.

Our last journey took us through a strange, sometimes confusing region of C, pointers. It was our first confrontation with some of the more sophisticated citizens of that world. As we move deeper, we'll have to stay on our toes, checking every street and alley, lest that great mind befuddler confusion leap out and bring us down.

It all sounds a bit grim, but from this point on, alertness and perseverance will be your best friends. We'll get back to pointers again; you can be sure of that. Right now, let's check into a convenient way of organizing data, "structures."

Just your type.

Structures offer a way to keep related data items together, allowing easy access to each element. Database applications are a perfect example. Suppose you're the owner of a store and want to keep track of your receivables. You'll need to know, at a minimum, the customer's name, address and amount owed. It would be nice if there were an array type that could store both character strings and floating point numbers. Guess what? Structures to the rescue.

Setting up a structure is really defining a new data type,

// C-manship *continued*

one that's custom designed for your own use. Each "member" of the structure can be any data type you wish, even another structure. Let's set up a structure for our store's receivables:

```
struct account {
    char name[20];
    char address[36];
    char city[30];
    float balance;
};
```

The keyword `struct`, followed by the name `account`, tells the compiler we're going to set up our own data type, and that we're going to call this data type `account`. The structure's members are declared in the same way you'd declare conventional variables, though enclosed with C's ubiquitous braces. The structure declared above contains four members: a 20-element character array called `name`, a 36-element character array called `address`, a 30-element character array called `city`, and a floating-point variable called `balance`.

Now that we've declared our structure, we have a new data type at our disposal, but we still don't have a variable of that type we can use. Think about it for a minute. If we want an integer variable, we must declare it as type `int`. If we want a character variable, we must declare it as type `char`. So it follows that, if we want an account variable (the name we gave our new data type), we must declare it as type `account`:

```
struct account record;
```

We've just told the compiler we want a variable called `record` which is a structure of type `account`. That's all there is to it, almost.

Filling it in.

We've got our variable `record` all set up, but there's still one minor problem. It contains no data. As I'm sure you suspect, initializing a structure is going to be different from initializing the simpler data types. Well, yes. . . and no.

```
struct account record = {
    "Clay Walnut",
    "15 Notgonnagivemyaddress Ave.",
    "Atariland, MA 06116",
    155.97
};
```

The main difference between this initialization and that of other data types is that we don't have to include the element's name along with the data. We only have to fill in the information. The compiler knows the first element goes into the field called `name`, the second into the field called `address`, etc. We gave it that information when we defined the structure type `account`.

When initializing a structure, be sure to enclose the data in braces and separate each element with a comma.

Getting it out.

We now have our structure declared and initialized with data. Just as we need access to each element of an array, we need access to each member of a structure. How can we get at the data? We simply refer to the name of the structure and the name of the element within the structure, separating each with a period:

```
record.name
record.address
record.city
record.balance
```

The first example will give us the string *Clay Walnut*. We can manipulate this data the same way we would any string of characters. For example:

```
s = record.name;
```

will point the character pointer `s` to the string stored in the first member of the structure `record`.

The second and third examples are similar to the first.

The fourth example will give us the floating-point value of 155.97. We might want to use it in this way:

```
printf("Bal = %f\n", record.balance);
```

Layers upon layers.

I stated that the elements of a structure could be of any data type, including another structure. Let's take the structure we've created one step further. It might be nice to have the city, state and zip code in their own elements. We could, of course, just add a couple of members to our original structure. But what if we wanted, for the sake of clarity, to keep all the information within the member `city`? We'd do it like this:

```
struct where {
    char c[20];
    char s[21];
    char z[5];
};

struct account {
    char name[20];
    char address[36];
    struct where city;
    float balance;
};
```

```
struct account record;
```

Now take a deep breath, and we'll attempt to wade through this. Our structure `account` still contains the same information. The difference is that the member `city` is now a structure of type `where`, and `where` contains the members `c`, `s`, and `z`.

Got that? Try to imagine the structure `account` as a big box. Inside this box are three other boxes called `name`, `address`, `city`, and `balance`. Inside the `city` box are three even smaller boxes called `c`, `s`, and `z`.

Now when we refer to the `city` member, we need to access the nested members `c`, `s`, and `z`. If you think about it for a minute, you might come up with the following:

```
record.city.c
record.city.s
record.city.z
```

And you'd be correct. In the first case, we're accessing `c`, which is a member of `city`, which is a member of `record`. In the second, we end up with `s`, which is a member of `city`, which is a member of `record`. I bet you can figure the third one out for yourself.

More layers!

I'm not through confusing you, yet. Just as you can have arrays of integers or arrays of characters, you can have arrays of structures. In fact, in the case of the database for our imaginary store, arrays of structures are a necessity.

VIP Professional™

Finally – A Business Program that Brings
Lotus 1-2-3® Functionality to Your *Atari ST*™!

VIP Professional is a state-of-the-art, integrated spreadsheet program which brings together a spreadsheet, a database and graphing capabilities. Professional was modeled after the powerful and best-selling Lotus 1-2-3® program which dominates the business world

Worksheet Magic

Nothing is left out of the workings of the worksheet. Ranges of cells can be named for convenience; column widths are variable; the screen can be split into two windows; titles can be frozen; contents of cells may be copied or moved; the worksheet may be altered as a whole or only partially; the list goes on and on. Perhaps most important, Professional can use and save Lotus 1-2-3 files for transfer between computers.

The worksheet includes over 45 special functions to simplify commonly used formulas, including powerful financial functions for the internal rate of return, present value, and future value. Of course Professional also has all mathematical, trigonometric, table, conditional and logical functions.

Database Power

The built-in database can handle up to 8192 records, with a possibility of up to 256 fields. The records can be searched, sorted and analyzed to find your best salesperson or your rarest stamp. Sorts can be done using multiple criteria, in ascending and descending order. And database functions can be used to do up to seven different kinds of statistical analyses of your database.

Graphs

The graphing capabilities of Professional are astounding. Not only are there six completely different types of graphs available, there are tens of ways to manipulate the data, titles, grids, colors, legends, keys, and scaling of the size of the graph.

Macros

Professional also includes sophisticated macro programming commands. With several special macro commands, the user can actually *program* Professional to be dedicated to a specific task such as accounting.

Just Minutes to Learn

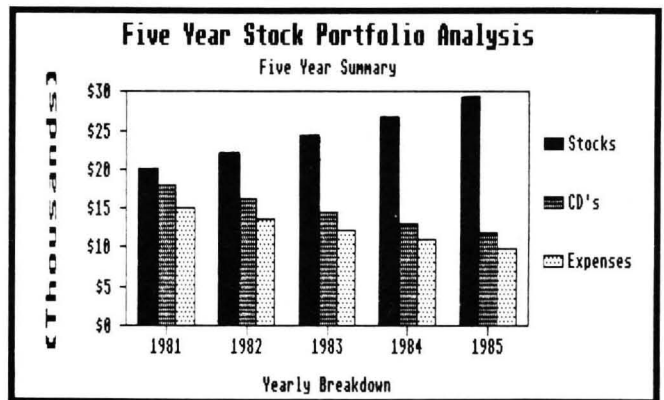
Professional is as easy to use as it is powerful. It comes with a user-sensitive tutorial for the newcomer. And help is built right into the program. With the handy tutorial, you will be able to create professional worksheets in just minutes.

Introducing Professional LITE™

For those of you who do not need the full power of Professional, we offer Professional LITE™. Though without the macros and the database features, and having a smaller sheet size (256 columns by 2048 rows, LITE still packs a powerful punch for only \$149.95!

	Mortgage	Car Payments	Education	Food	Insurance
1-85	\$500.00	\$200.00	\$300.00	\$250.00	\$150.00
2-85	\$502.50	\$201.00	\$301.50	\$251.25	\$150.75
3-85	\$505.01	\$202.00	\$303.01	\$252.51	\$151.50
4-85	\$507.54	\$203.02	\$304.52	\$253.77	\$152.26
5-85	\$510.08	\$204.03	\$306.05	\$255.04	\$153.02
6-85	\$512.63	\$205.05	\$307.58	\$256.31	\$153.79
7-85	\$515.19	\$206.08	\$309.11	\$257.59	\$154.56
8-85	\$517.76	\$207.11	\$310.66	\$258.88	\$155.33
9-85	\$520.35	\$208.14	\$312.21	\$260.18	\$156.11
10-85	\$522.96	\$209.18	\$313.77	\$261.48	\$156.89
11-85	\$525.57	\$210.23	\$315.34	\$262.79	\$157.67
12-85	\$528.20	\$211.28	\$316.92	\$264.10	\$158.46

Integrated Spreadsheet Power



Easy-to-Use Graphs

The Power of Professional

Only \$249.95

Or the Power of LITE

Only \$149.95

If your dealer is out of stock, order direct. Send your check or money order to the address below, together with \$3 for shipping and handling. In California add 6% sales tax. COD's and purchase orders not accepted. Personal checks will be held for three weeks to clear. All prices are subject to change without notice.



ISD™ MARKETING, INC.
20 Steelcase Rd., Unit 12
Markham, ONT
CANADA L3R 1B2
(416) 479-1880

SYSTEM REQUIREMENTS: Amiga with 512K; One disk drive; Monochrome or color monitor; Works with printers supported by the Workbench.

VIP Professional, Professional, Professional LITE and LITE are trademarks of VIP Technologies Corporation; 1-2-3 and Lotus 1-2-3 are registered trademarks of Lotus Development Corp.; Atari, ST, 520ST, and 1040ST are trademarks of Atari Corporation.

Copyright © 1986 by VIP Technologies Corporation

What good is a database with only one entry? We could leave things the way they are and load the records from disk one at a time, but that would be inefficient. Imagine trying to sort a database that way. Not me, buddy. I want them all in memory where I can play with them *fast*.

Arrays of structures aren't as scary as they sound. One small change to your structure variable declaration, and you've got it:

```
struct account record[100];
```

We now have room for one hundred records of type account.

Accessing each element of our structure array is just as simple:

```
record[index].name
record[index].address
record[index].city.c
record[index].city.s
record[index].city.z
record[index].balance
```

As we vary index from zero to the maximum number of elements in our array, we can access each member as shown above. We also retain control over arrays that make up some of the members of our structure. For instance, if we wanted the third letter in the character array name:

```
record[index].name[2]
```

An important point.

In the last column, we talked about pointers. Can we use pointers with structures? Sure can. The first step is to declare our pointer, a simple process:

```
struct account *sptr;
```

Now that we have our pointer, we must initialize it:

```
sptr = &record[0];
      or
sptr = record;
```

This assigns the address of the first byte of our array of structures to the pointer `sptr`. Suppose this address turned out to be 72000. Using what you've learned about pointers and structures, see if you can calculate the address we'd be pointing to if we added 1 to `sptr`.

The answer is 72096. How did you do? Remember that a pointer is kept well informed about the data type it's associated with, even if that data type is made up, as is a structure. `sptr` knows that there are 96 bytes in each of our array elements. We get this figure by adding together the length of each structure member:

name	30
address	35
c	20
s	2
z	5
balance	4

	96 bytes

Let's say that `x` is the length, in bytes, of the data type we're pointing to. Then, when we increment a pointer, we're asking it to point to a location in memory which is `x` bytes ahead of our current location. In the case of our array, we're pointing to the next element, `record[1]`, which begins at an address 96 bytes higher than our current address, or a final address of 72096.

Pointing to a member.

A pointer to the first member of a structure is only slightly useful. We need to get at the rest of the members, as well. As always, C is there with the answer. Assuming `sptr` equals `&record[0]`, then:

```
(*sptr).name equals record[0].name
(*sptr).city.c equals record[0].city.c
```

A more popular (and less cryptic) way of writing the above would be:

```
sptr->name equals record[0].name
sptr->city.c equals record[0].city.c
```

Either method is fine—and gives the same results.

Functions and structures.

The last thing we need to know in order to take full advantage of structures is how to pass them to functions. As has been evident throughout this article, structures aren't handled any differently, for the most part, than is any other data type. Nothing's going to change now.

The most obvious method of passing information from a structure to a function is by value:

```
t=add_em( record[index].balance,
          record[index+1].balance );
```

```
float add_em(x, y)
float x, y;
{
    return(x + y);
}
```

Here, two values from our array of structures are passed into the parameters `x` and `y`. The values are added, and the result returned to the calling function.

But what if we want to modify the contents of the structure directly? As in the past, we resort to pointers:

```
change_em(&record[1]);
```

```
change_em(sptr)
struct account *sptr;
{
    sptr->name = "Felix";
}
```

In the above example, we've passed the address of the second member of our array of structures to the function `change_em()`. This address is stored in the pointer `sptr`, where it's used to access the member name.

The listing.

This month's sample program is larger than anything we've done in the past. I got overzealous, but I wanted to put something moderately usable together. There are many things in the program we haven't covered, and I've run out of space (and then some). Next month, we'll clear up some of the leftover mysteries. At any rate, the program contains working examples of everything we've discussed here, as well as a lot of other little tidbits you can sort through.

What does it do? I thought you'd never ask. The program is a simple address database. You can enter addresses from the keyboard or disk, then print them to the screen—or to the printer in label format. As I said, it's simple. There's plenty of room for enhancements. A sorting feature could be added, or maybe a fancier input routine. To keep data from scrolling off the screen, labels are limited

to a maximum of eight. You could add some code that would wait for a keypress each time the screen fills, then increase the number of addresses in the database.

Due to the size of this program, I wasn't able to spend the time necessary to make it compatible with both the Megamax and Atari developer's kit compilers. I used Megamax (otherwise, I'd still be waiting for the first compile) to develop it, so you'll have to do a little fiddling to get it to work with the developer's package. I know the printer routines act strangely under Alcyon. It will compile cleanly, though, with either package.

That's it. Next month, we'll clean up loose ends and prepare for the exciting exploration of GEM itself. **A**

The author would like to thank Douglas Weir for his programming assistance.

Listing 1.
C listing.

```

/*****
/* C-manship listing 1, St-Log #7 */
/* Developed with Megamax-C */
*****/
#include <stdio.h>
#include <osbind.h>

#define RETURN 13
#define BACKSPACE 8
#define MAX 8
#define PRINTER_OFF 0
#define NOFILE ((FILE *)0)

FILE *fopen();
FILE *fclose();

int work_in[11];
int work_out[57];
int handle;

int contrl[12];
int intin[128];
int ptsin[128];
int intout[128];
int ptsout[128];

struct name {
    char fname[11];
    char lname[11];
};
struct rec {
    struct name names;
    char street[30];
    char city[30];
};

main()
{
    int num_recs, load;
    struct rec address[MAX];

    open_vwork();
    num_recs = load_file(address, &load);
    output(address, num_recs);
    if (load=='N' || load=='n')
        save_file(address, num_recs);
    printf("press key\n");
    Cconin();
    v_clsuvw(handle);
}

open_vwork()
{
    int i;
    for (i=0; i<10; work_in[i++] = 1);
    work_in[10] = 2;
    v_opnuwk(work_in, &handle, work_out);
}

```

Don't be Puzzled

REGENT BASE:

A Relational GEM Database

Solve your business and personal needs with our easy to use database. Regent Base makes full use of the GEM system so using any of the available templates is as easy as dragging the Mouse and pressing a few keys. Included with Regent Base are two templates: A Mailing List Manager and A Checkbook Manager. Other templates available include: Accounts Receivable, Payables, General Ledger, Customer Billing, and Invoicing. Many other templates are also available. Regent Base supports over fifteen printers and even "mail-merges" with Regent Word II.

REGENT WORD II:

GEM Word Processor with Spelling Checker

Power through any word processing needs with Regent Word II. Regent Word II makes full use of the GEM system, so editing is powerful and easy! As text is typed Regent Word II reformats the document on the screen to show exactly what will be printed. Bold, Superscripted, Subscripted, Italic and Underlined text are displayed while editing. A 30,000 word Spelling Checker is built in. Insert or delete words — up to 100,000 — in Regent Word II's spelling dictionary with the click of a mouse button! Regent Word II "mail-merges" with Regent Base for instant form letters. On-line Help Menus and over fifteen printer drivers are built in.

The Perfect Match for the Atari ST



REGENT SOFTWARE

7131 Owensmouth, Suite 45A
Canoga Park, CA 91303
(818) 882-2800

CIRCLE #130 ON READER SERVICE CARD

// C-manship *continued*

```
    }
load_file(recp, load)
struct rec *recp;
int *load;
{
    int num_recs;

    Cconws("Load file? ");
    while ((*load=Cconin)!='Y' && *load!='y' && *load!='N' && *load!='n');
    printf("\n\n");
    if (*load == 'N' || *load == 'n')
        num_recs = get_records(recp);
    else
        num_recs = disk_file(recp);
    return(num_recs);
}

get_records(recp)
struct rec *recp;
{
    int ans, i;

    ans = 'y';
    i = -1;
    while ((ans=='Y' || ans=='y') && i+1<MAX) {
        ++i;
        Cconws("FIRST NAME: ");
        get_str(recp->names.fname, 10);
        Cconws("\n LAST NAME: ");
        get_str(recp->names.lname, 10);
        Cconws("\n   STREET: ");
        get_str(recp->street, 29);
        Cconws("\n         CITY: ");
        get_str(recp->city, 29);
        Cconws("\n\nAnother (y/n)? ");
        ans = Cconin();
        printf("\n\n");
        ++recp;
    }
    return(i+1);
}

disk_file(recp)
struct rec *recp;
{
    FILE *p_file;
    char filename[15];
    int num_recs, x;

    p_file = NOFILE;
    while (p_file == NOFILE) {
        Cconws("Filename: ");
        get_str(filename, 14);
        printf("\n\n");
        p_file = fopen(filename, "r");
        if (p_file == NOFILE)
            printf("No such file!\n\n");
    }
    fscanf(p_file, "%d", &num_recs);
    for (x=0; x<num_recs; ++x) {
        fscanf(p_file, "%s", recp->names.fname);
        fscanf(p_file, "%s", recp->names.lname);
        fscanf(p_file, "%s", recp->street);
        fscanf(p_file, "%s", recp->city);
        ++recp;
    }
    return(num_recs);
}

output(recp, num_recs)
struct rec *recp;
int num_recs;
{
    int status, device;

    status = PRINTER_OFF;
    while (status==PRINTER_OFF) {
        Cconws("Print to screen or printer (s/p)? ");
        device = Cconin();
        printf("\n\n");
        if (device == 'p' || device == 'P')
            status = printer(recp, num_recs);
        else {

```

```

        screen(recp, num_recs);
        status = -1;
    }
}

save_file(recp, num_recs)
struct rec *recp;
int num_recs;
{
    FILE *p_file;
    char r, x;
    char filename[15];

    Cconws("Save file? ");
    while ((r=Cconin())!='Y' && r!='y' && r!='N' && r!='n');
    printf("\n\n");
    if (r == 'Y' || r == 'y') {
        p_file = NOFILE;
        while (p_file == NOFILE) {
            Cconws("Filename: ");
            get_str(filename, 14);
            printf("\n\n");
            if ((p_file=fopen(filename, "r")) == NOFILE)
                p_file = fopen(filename, "w");
            else {
                p_file = NOFILE;
                Cconws("File already exists. Delete it? ");
                if ((r=Cconin()) == 'Y' || r == 'y')
                    p_file = fopen(filename, "w");
                printf("\n\n");
            }
        }
        fprintf(p_file, "%d\n", num_recs);
        for (x=0; x<num_recs; ++x) {
            fprintf(p_file, "%s\n", recp->names.fname);
            fprintf(p_file, "%s\n", recp->names.lname);
            fprintf(p_file, "%s\n", recp->street);
            fprintf(p_file, "%s\n", recp->city);
            ++recp;
        }
        fclose(p_file);
    }
}

screen(recp, num_recs)
struct rec *recp;
int num_recs;
{
    int x;
    v_enter_cur(handle);
    for (x=0; x<num_recs-1; ++x) {
        pos_cur(x,0);
        printf("Record #%d\n", x+1);
        pos_cur(x,1);
        printf("%s %s\n", recp->names.fname, recp->names.lname);
        pos_cur(x,2);
        printf("%s\n", recp->street);
        pos_cur(x,3);
        printf("%s\n\n", recp->city);
        ++recp;
    }
}

printer(recp, num_recs)
struct rec *recp;
int num_recs;
{
    int x, status;
    FILE *p_file;

    status = Cprnout(0);
    if (status == PRINTER_OFF) {
        printf("Turn on printer!\n");
        return(status);
    }
    p_file = fopen("LST:", "w");
    p_file->_fd = 3;
    for (x=0; x<num_recs; ++x) {
        fprintf(p_file, "%s %s\n", recp->names.fname, recp->names.lname);
        fprintf(p_file, "%s\n", recp->street);
        fprintf(p_file, "%s\n", recp->city);
        fprintf(p_file, "\n\n\n");
    }
}

```

// C-manship *continued*

```

    ++recp;
}
fclose(p_file);
unlink("LST1");
return(status);
}

pos_cur(i,1)
int i,1)
{
    int x, y;
    if ((i+1)*2 == 0)
        x = 50;
    else
        x = 10;
    y = ((i/2)*5)+4+1;
    vs_curaddress(handle,y,x);
}

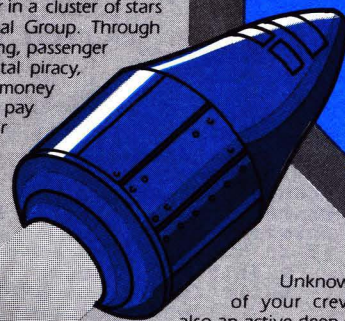
int get_str(s, mx)
char s[];
int mx;
{
    int p, code;
    p = 0;
    code = cconin();
    while (code != RETURN && p <= mx-1) {
        if (code != BACKSPACE) {
            s[p++] = code;
        }
        else if (p > 0) {
            s[--p] = '\0';
            putchar(BACKSPACE);
            putchar(' ');
            putchar(BACKSPACE);
        }
        code = cconin();
        s[p] = '\0';
    }
    if (p == mx)
        printf("\r\n");
}

```

OMNITREND'S UNIVERSE II

ENTER A NEW WORLD of unprecedented depth and excitement with Omnitrend's Universe II. It's quite unlike any game you've ever seen before, combining the thrill of role playing with the depth of story possible only in text adventures.

You are a free trader in a cluster of stars known as the Local Group. Through sharp trading, mining, passenger transport, and orbital piracy, you'll try to earn money to fuel your ship, pay your crew, repair parts, acquire advanced technology, and perhaps buy a new spacecraft.



Unknown to most of your crew, you are also an active deep-cover agent for one of the governments in the Local Group. As the interstellar situation worsens, you'll be called upon to carry out covert operations deep within enemy territory.

Universe II is available for the Atari ST, Apple II, Macintosh, and IBM computers. Price: \$69.95. Also from Omnitrend: Universe I for the Atari XLIXE, Apple II, and IBM computers. Price \$59.95.

To order: contact your local dealer or call Omnitrend at (203) 658-6917
P.O. Box 3, West Simsbury, CT 06092



CIRCLE #131 ON READER SERVICE CARD

DISCOVERY AN INTERACTIVE EDUCATIONAL SPACE ADVENTURE

You're in control of all the robots, computers, and intergalactic characters on the spaceship **Discovery**. Through the mastering of mathematical and spelling challenges you explore and repair the inner workings of your powerful and complex craft. Set your blast-off at grade levels 1 through 7 for math challenges, or grade levels 1 through 10 for a spell-bound adventure.

Aboard the **Discovery** you're engulfed with the full potential of your Atari ST*. Exploding graphics, bizarre sound effects, special music and robots that talk back to you as you guide your vessel toward new learning adventures.



*Available in spelling or math versions. **Discovery** from **Microillusions** maintains high intensity interest for both youngsters and teens through increasing levels of complexity.

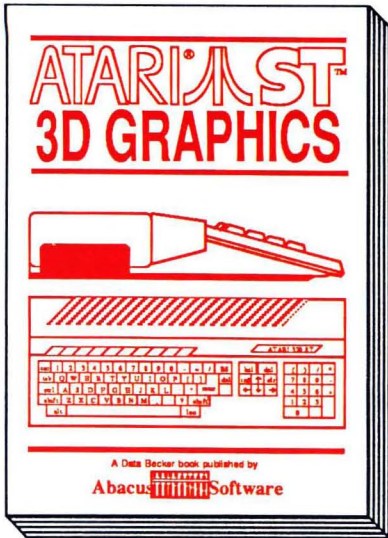
microillusions

*Atari ST is a trademark of Atari Corp.

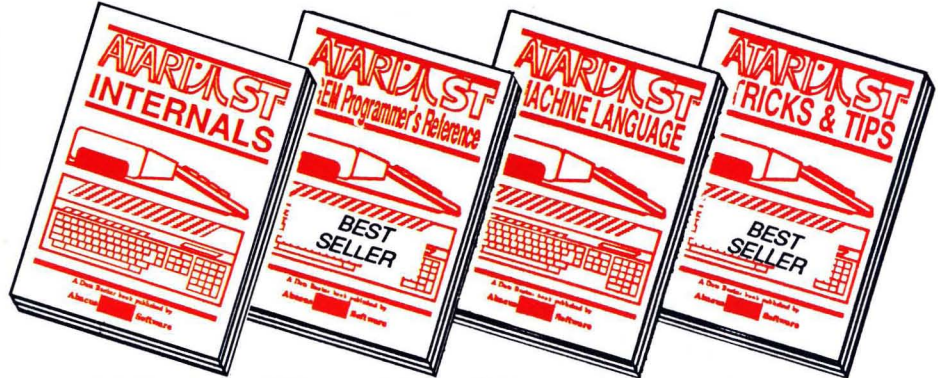
P.O. BOX 3475, GRANADA HILLS, CA 91344 • Dealer's inquiries invited. (818) 360-3715

CIRCLE #132 ON READER SERVICE CARD

REQUIRED READING



FOR THE ATARI[®] ST[™]



3D GRAPHICS

FANTASTIC! Rotate, zoom, and shade 3D objects. All programs written in machine language for high speed. Learn the mathematics behind 3D graphics. Hidden line removal, shading. With 3D pattern maker and animator. \$24.95

ST INTERNALS

Essential guide to the inside information of the ST. Detailed descriptions of sound and graphics chips, internal hardware, I/O ports, using GEM. Commented BIOS listing. An indispensable reference for your ST library. 450pp \$19.95

GEM Programmer's Ref.

For serious programmers needing detailed information on GEM. Presented in an easy-to-understand format. All examples are in C and assembly language. Covers VDI and AES functions. No serious programmer should be without. 410pp \$19.95

MACHINE LANGUAGE

Program in the fastest language for your ATARI ST. Learn 68000 assembly language, its numbering system, use of registers, structure & important details of instruction set, and use of internal system routines. Geared for the ST. 280pp \$19.95

ST TRICKS & TIPS

Fantastic collection of programs and info for the ST. Complete programs include: super-fast RAM disk; time-saving printer spooler; color print hardcopy; plotter output hardcopy; creating accessories. Money saving tricks and tips. 260pp \$19.95



ST GRAPHICS & SOUND

Detailed guide to graphics and sound on the ST. 2D & 3D function plotters, Moiré patterns, graphic memory and various resolutions, fractals, recursion, waveform generation. Examples written in C, LOGO, BASIC and Module2. 250pp \$19.95

ST LOGO GUIDE

Take control of your ST by learning ST LOGO—the easy to use, powerful language. Topics include: file handling, recursion-Hilbert & Sierpinski curves, 2D and 3D function plots, data structure, error handling. Helpful guide for ST LOGO users. \$19.95

ST PEEKS & POKES

Enhance your programs with the examples found within this book. Explores using different languages BASIC, C, LOGO and machine language, using various interfaces, memory usage, reading and saving from and to disk, more. 280pp \$16.95

BASIC Training Guide

Thorough guide for learning ST BASIC programming. Detailed programming fundamentals, commands descriptions, ST graphics & sound, using GEM in BASIC, file management, disk operation. Tutorial problems give hands on experience. 300pp \$16.95

BASIC to C

Move up from BASIC to C. If you're already a BASIC programmer, you can learn C all that much faster. Parallel examples demonstrate the programming techniques and constructs in both languages. Variables, pointers, arrays, data structure. 250pp \$19.95

ST Beginner's Guide

Written for the firsthand ST user. Get a basic understanding of your ST. Explore LOGO and BASIC from the ground up. Simple explanations of the hardware and internal workings of the ST. Illustrations, diagrams. Glossary. Index. 200pp \$14.95

The ATARI logo and ATARI ST are trademarks of Atari Corp.

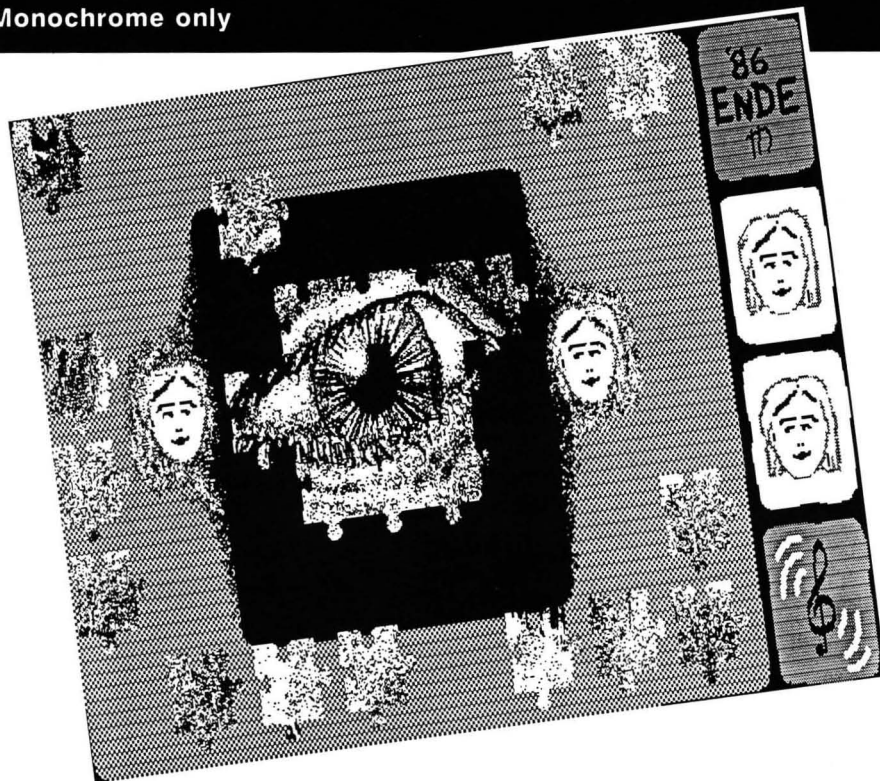
Abacus Software

P.O. Box 7219 Dept. NA Grand Rapids, MI 49510 - Telex 709-101 - Phone (616) 241-5510

Optional diskettes are available for all book titles at \$14.95

Call now for the name of your nearest dealer. Or order directly from ABACUS with your MasterCard, VISA, or Amex card. Add \$4.00 per order for postage and handling. Foreign add \$10.00 per book. Other software and books coming soon. Call or write for your free catalog. Dealer inquiries welcome—over 1400 dealers nationwide.

CIRCLE #120 ON READER SERVICE CARD



Puzzle it out

West German
software available
for your ST.

WITH A BONUS PUZZLE PROGRAM FOR DISK SUBSCRIBERS

by Douglas Weir

This month, **ST-Log** disk subscribers get (among other things) **PuzzlePuzzle**, a delightful "multidimensional puzzle game" produced by TommySoftware, a West German company. **PuzzlePuzzle** comes with its own original music and is being distributed as "shareware" by its developer (for more information, see the title screen). **ANALOG Computing** urges readers who enjoy the program (just about everybody, we believe) to send the requested \$10.00 to the address below.

Mr. Thomas Maier, head of TommySoftware, writes that the response to **PuzzlePuzzle** so far has been "very, very bad." It will be a shame if this program, which is a real work of art (and there are very few ST programs of which that can be said), does not repay its developers for some of the effort required to produce it.

For those who aren't disk subscribers, here's a brief description of the program: **PuzzlePuzzle** consists of a cleverly arranged sequence of (not difficult) puzzles, which the player assembles using the mouse. A distinctive and haunting musical accompaniment can be switched on or off. We haven't counted the puzzles, but TommySoftware says there are over twenty-five. There are a couple of surprises for the player, which we don't want to give away here. But we do suggest that you look at the customized mouse cursor closely when you end the program.

Note: **PuzzlePuzzle** runs only in high resolution (i.e., on a monochrome monitor). It's a good excuse for color monitor owners to look for one of the many bargains that seem to be available now on monochrome monitors.

We were so impressed by this program that we wrote to TommySoftware (with our \$10.00 check), asking for information on other ST programs they might have under development. Here's a list of titles currently or soon to be available.

Crypt_it — A GEM-driven program that encrypts "data and program files." Allows different levels of coding through usage of individual passwords. Requires ST, disk drive, monochrome or color monitor, for 98 DM (Deutsch Marks) plus postage. Available now.

LineWorks — A programmable 3D animator, GEM and TOS compatible. Runs with C and Pascal programs (future version will run with BASIC). Executes X32 files produced by MUSIX32. Requires ST, disk drive, monochrome or color monitor, for 148 DM plus postage. Available August 1, 1986.

LisPas II ST — Fast GEM-driven List interpreter (with windows, mouse usage, etc.) Contains over 130 functions; usable with any ASCII editor. Has "easy-to-use redraw routines for windows." Requires ST, disk drive, monochrome or color monitor (medium or high resolution), for 298 DM plus postage. Available now.

LisPas III ST — Enhanced version of **LisPas II**, with expanded graphics facili-

ties, expanded GEM access, and more. Requirements: same as for LisPas II. Cost is 298 DM plus postage. Upgrades to **LisPas II** will be available "at a low price." Available November 1986.

Lock_it I — GEM-driven copy protection program. Runs with C and Pascal programs. Requires disk drive, monochrome or color monitor, for 298 DM plus postage. Available now.

MUSIX32 — Full-featured GEM-driven, mouse-controlled music construction set (apparently used to create the music for **PuzzlePuzzle**). Requires disk drive, monochrome or color monitor, for 89 DM plus postage. Available now.

Personal Address — GEM-driven program "stores address data and allows various printouts" (telephone and mailing lists, address labels, mailmerge, etc.) Requires ST, disk drive, monochrome monitor. Available in German only for 98 DM plus postage, August 1, 1986.

Except for **Personal Address**, all programs are available in English and German. We hope to publish reviews of some of these programs in the near future.

TommySoftware is still searching for a U.S. distributor; until then you'll have to order software direct from them. Their address is: TommySoftware, Mainzer Landstrasse 147, D-6000 Frankfurt/M. 1, West Germany.

Please note that prices are given in German, not U.S., currency. **A**

Atari ST heats up with "Strip Poker..." and more.



Examine Artworx' expanding list of ST software:

STRIP POKER is the classic computer program. Play against Suzi and Melissa; the more you win, the more they take off! **Only \$39.95**

HOLE IN ONE GOLF plays like the real thing and includes an easy-to-use Editor for designing your own golf course. **Only \$29.95**

BRIDGE 4.0 has full graphic display of all hands, allows the user to be dealt good cards all the time and is completely mouse-driven. **Only \$29.95**

COMPUBRIDGE is Artworx' bridge tutorial, utilizing 10 chapters covering all aspects of the game. **Only \$29.95**

PEGGAMMON is a new and innovative approach to backgammon. Play against the computer or with a friend in the two-player mode. **Only \$17.95**

MAILLIST handles medium to large sized lists. It zip code sorts, alphabetizes, selects by keyword, prints labels, and more. **Only \$17.95**

BAKER STREET DETECTIVE brings you back to 1893 London with mysteries to solve just like Sherlock Holmes. **Only \$17.95**

For more information on these and other fine Artworx programs, see your software dealer or write to Artworx for a free catalog.

Artworx®

Artworx Software Co., Inc., 150 N. Main Street, Fairport, N.Y. 14450 (716) 425-2833 · (800) 828-6573
CIRCLE #133 ON READER SERVICE CARD

EZRAM™

**512K Memory
Upgrade for
the Atari520ST®**

520

Featuring the
EZTemp™
Soldering Guide

Upgrade Your 520ST to a Full Megabyte of RAM

- Increase spreadsheet and database capability
- Dramatically improve RAM disk capacity for enhanced I/O operations

Designed for Simple Installation

- Features the **EZTemp™** solder template. All the soldering occurs on the template not at the RAM chips. Eliminates chip stacking.
- Clear, easy to follow, illustrated installation instructions.

Free Software Made in the U.S.A

- Memory check diagnostic software and additional accessory programs included.

S.L.: \$199.00

6 Month Warranty



See your Dealer or
call us at (617) 232-2317
Brookline, MA 02146

EZRAM and **EZTemp** are Registered Trademarks of Apex Resources, Inc.
Atari & Atari 520ST are registered trademarks of Atari Corp.

CIRCLE #138 ON READER SERVICE CARD

Megamax C

for the

Atari ST

Featuring

- One pass Compile • In-Line Assembly • Smart Linker
- Full Access to GEM routines • Register Variable Support • Position Independent Code • and much more...

System Includes:

- Full K&R C Compiler (with common extensions)
- Linker • Librarian • Disassembler • C Specific Editor
- Code Improver • Documentation • Graphical Shell

Benchmark	Compile Time	Execute Time	Size
Sieve	70	2.78	5095
"Hello, world"	63	N/A	4691

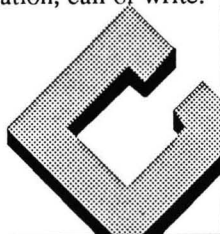
*Times in seconds. Sieve with register variables.

\$199.95 For more information, call or write:

Megamax, Inc

Box 851521
Richardson, TX 75085
(214) 987-4931

VISA, MC, COD ACCEPTED



CIRCLE #135 ON READER SERVICE CARD



Presents

A New 4xFORTH with a New Price!

The new 4xFORTH + (\$69.95*) for the Atari ST comes with a complete GEM interface including all VDI and AES calls, nothing has been left out. 4xFORTH also has an Editor, Assembler, Floating Point, Binary Save, Royalty Free Turnkey, Forth Accelerator, LineA, Stream Files, an incredible set of words which makes the creation and management of windows and menu bars easy, and the 4xFORTH User's Guide, 350+ pages of real documentation on every aspect of using 4xFORTH.

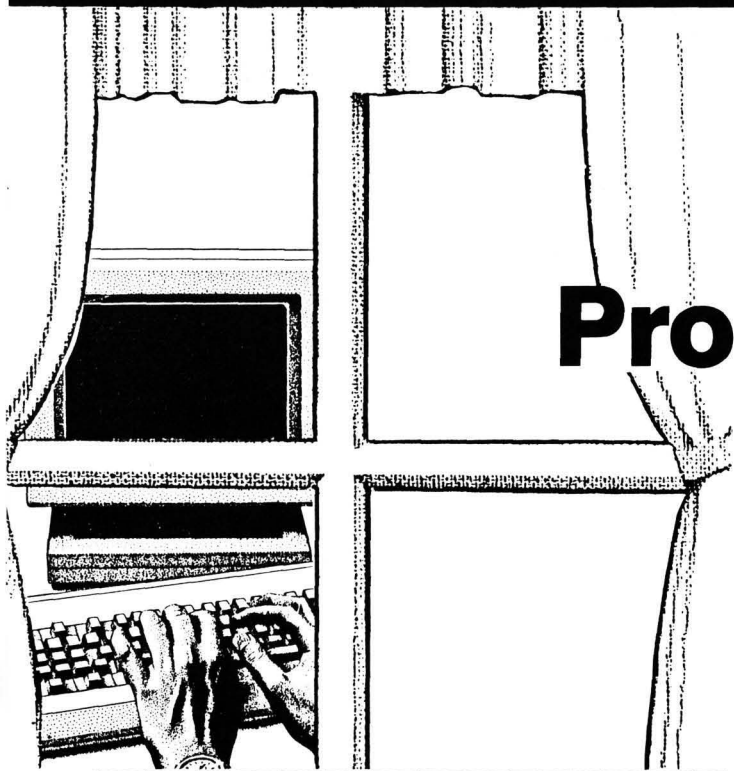
* All prices of The Dragon Group's products have been reduced, call for our new price list. All current users of 4xFORTH Level 1 may upgrade their systems for \$20.

The Dragon Group, Inc.

148 Poca Fork Rd, Elkview, WV 25071
304/965-5517, TLX 5106012426

Atari ST is a trademark of Atari Corp. GEM, VDI and AES are trademarks of DRI, Inc. 4xFORTH and Forth Accelerator are trademarks of The Dragon Group, Inc.

CIRCLE #136 ON READER SERVICE CARD



Programming with

by Douglas Weir

Here's something I wish had been available when I started learning GEM—a deluxe shell program that demonstrates how to create and use windows under GEM. But I should begin with a couple of warnings.

First, the entire source code for `wwx.c` is long—too long to be reprinted in its entirety here. It can be found on the ST subscription disk. However, the essence of the program lies in two relatively short functions and their associated data declarations. These two functions handle screen-area clipping and window buffer manipulation, and window redrawing, respectively. The source code for this part of the program is printed here, surrounded by some other crucial fragments.

The second warning is a corollary of the first. Because the part of `wwx.c` given here is not a complete program, and because so much territory is covered, I assume you're reasonably familiar with C and have already done some GEM programming. You'll need (besides a C compiler, of course) a fairly good set of GEM documentation—for example, the *Abacus Atari ST GEM Programmer's Reference* or the *Megamax C* manual should be adequate.

Finally, it will be very helpful if you have one of the many versions of Atari's `apskel.c` program floating around. Pages 172-178 of *Atari ST Tricks and Tips*, also published by Abacus, contain an almost exact copy of `apskel.c`. Since this program seems to have become a *de facto* standard, I've tried to make `wwx` resemble it as nearly as possible.

I must emphasize that the code in this article is only a *part* of `wwx` and is not "stand-alone." But, if you have the ingredients listed above, it shouldn't be difficult for you to write the rest of your own program. ST disk subscribers will have the complete version of `wwx`, which is ready to use as a GEM shell.

Window workings.

For me, GEM is windows. The VDI graphics routines are important, but their ancestors can be found in BASIC's "circle" and "line" statements, and it isn't very difficult to use them effectively. But try bulling your way through some code that will create and manipulate two or three (or more) windows simultaneously—and will let the user change their contents, resize them, move them around and activate desk accessories on top of them... and yet will always restore each window's current contents when necessary. Try this working with `apskel` as a model and you'll be in trouble quicker than you can say "ten thousand global variables."

The `apskel` program shows how to make the simplest use of one window. It's fine if you want to use only one window, and if you're satisfied with its restricted definition of a "redraw" operation.

The scheme followed in `apskel` is simply to redraw the window's original contents whenever GEM says the window must be "redrawn." But what if the contents have changed (say, due to user input)? Obviously, the current contents of all windows must be preserved somehow and then used as input for redraw operations. Yet the documentation isn't at all clear as to how one should go about accomplishing this.

The idea is simple: for each window used in your program, you reserve a memory area equal to the maximum size of the window. Usually, this will be the same as the ST screen memory size, 32K bytes. Every time the contents of a window change, you must update the contents of that window's buffer. Then when a window must be redrawn, your program simply transfers the contents of the window's buffer back to the window.

Of course, there's a bit more to it than that. The most important detail involves clipping. Suppose your program

GEM windows

displays two windows, and suppose the top (“active”) window partially hides the window underneath it. Now the user moves the active window slightly, so that more (but still not all) of the bottom window is displayed. Your program must now redraw the visible part of the bottom window. However, the portion still hidden by the top window must be “clipped” (i.e., must not be redrawn).

This means that, whenever you transfer window data to or from its buffer, you must make sure the screen area is properly clipped—in other words, that you’re working only with the portion of the screen which really “belongs” to that window.

In practice, clipping isn’t as complicated as it may sound. After all, when you’re updating a window’s buffer (transferring data from the screen memory), the clip area will always be a simple square or rectangle. This is because, by definition, only the contents of the active window can be changed, and the active window never has other windows on top of it. Doing a redraw of a partially hidden inactive window sounds more difficult—in this case, the area to be redrawn could be L- or U-shaped, or worse.

GEM provides a VDI function—`vs_clip()`—which sets the clip area of a window. However, it doesn’t do the whole job, and must be preceded by some additional code for our purposes. The details of figuring out just what portions of an inactive window are to be redrawn are demonstrated in the function `do_redraw()`, which is listed below. Here, I want to explain the mechanics of setting up the window buffers, and of transferring data between them and the screen memory.

We’ll use a GEM VDI function, `vro_cpyfm()`, one of the so-called “raster” functions. This one simply copies blocks of data from one memory area to another, very quickly. It expects five parameters. The first two will never change

in our program. The first is the application’s handle. The second is a code specifying how we want the source data to be combined with the contents of the destination. In our case, we will always want a window to “cover” whatever is “underneath” it, so we specify that the destination should contain only the source data when the transfer is completed.

The next parameter is an array of eight integers, containing the dimensions of the source and destination memory areas, respectively. The dimensions are expressed as the x- and y-coordinates of the top left and bottom right corners of both areas. The contents of this array will change as we save or redraw different portions of various windows.

The last two parameters are pointers to two GEM structures (called FDBs, for “form definition blocks”) which describe the source and destination memory blocks, respectively. The GEM header file `gemdefs.h` contains a declaration for this structure, and a commented version can be found in the listing below. Once the window buffers have been set up and described with an FDB (one for each buffer), and once the screen memory has been described in its own FDB, the contents of these structures will not change.

To use `vro_cpyfm()` in window buffering and redraw operations, we must do the following. First, we declare an FDB for the screen memory (I call mine `wind_actv`) and fill in the proper values. Next, we initialize an FDB for each window we plan to use. In `wwx`, each window’s FDB is found in a structure describing the window. The structures are organized into an array, called `ww[]` (see below for more details). So, to access the first member of the FDB for `ww[0]`, you would refer to `ww[0].wind_buff_fd_addr`.

Now we’re ready to use `vro_cpyfm()`. Let’s look at the

// GEM windows *continued*

portions of `wwx.c` reprinted here and see how you can use these to write your own window-handling shell program.

The data declarations come first. The most important of these is the structure type `w_pack`. Your program should declare an array of these structures; I call mine `ww`, and the number of its elements is determined by `NR_WWS`. Each element of the array will contain all the pertinent data for one of your program's windows. If you want to have three windows, your array will contain three elements; if you want only one window, your array will consist of a single element. (Feel free to add members to this structure declaration if there is additional information about your windows that you want to keep track of.)

Within your program, the subscript numbers of the array elements will be your means of identifying separate windows. Suppose you have three windows; you'll have three array elements, namely `ww[0]`, `ww[1]` and `ww[2]`, containing the data that describes each window.

After a newly created window is first drawn, the contents must be saved to its buffer. This is accomplished by calling `set_clip()`, which figures out the window's real clip area on the screen, the corresponding area in its buffer, and the source/destination coordinates to be passed to `vro_cpyfm()`. The sixth parameter to `set_clip()` has the value `TRUE` if a redraw operation is being prepared (i.e., if

data is to be transferred from the buffer to the screen), or `FALSE` if the buffer is being updated (data transferred from the screen to the buffer). In this case, obviously, the parameter will have the value `FALSE`.

After the call to `set_clip()`, `vro_cpyfm()` is called to perform the actual transfer. The process of creating the window and drawing it for the first time is now complete.

Further redraw or save operations follow the same pattern. In all cases `set_clip()` must first be called, both to set the clip area for GEM and to establish which kind of operation (redraw or save) is about to take place, and, of course, to determine the coordinates for the data transfer.

A redraw operation is a bit more complex than a save, however. This is because a redraw is performed in stages, as GEM passes to the application a series of rectangles which define possibly irregular areas of inactive windows to be redrawn. Each rectangle is first clipped, then redrawn. The listing of `do_redraw()` below will show how this is done.

The following sketch of the overall plan of `wwx`, which includes the complete listings for `set_clip()` and `do_redraw()`, will, I hope, make clear how a program determines when to save or redraw windows, and how it manages more than one window. ■

(see listing, opposite)

Cal Com inc

ST-Copy \$34.95
Protect Your Valuable ST Software!
Fast Backup Utility for the ST.
Copies Single & Double Sided Disks.
Regular Revisions Available!

Meg-A-Ram \$149.95
Now have the memory of a 1040ST!
520ST Upgrade Board - Easy Installation.
Includes J-Disk.

J-Disk \$19.95
A configurable ST RamDisk Program that sets
the date and time and creates any size RamDisk up
to the Maximum Ram Available!

To Order: Call, Visit or Write Cal Com inc
EAST COAST (301) 933-3074
2503-B Ennalls Ave.
Silver Spring, MD 20902
WEST COAST (714) 523-5353
6820-A Orangethorpe Ave.
Buena Park, CA 90620

Dealer Inquiries Welcomed



CIRCLE #137 ON READER SERVICE CARD

TIMEKEEPER™ for Atari ST

\$39⁹⁵

TIMEKEEPER™ is a plug-in battery-backed Real Time Clock Calendar for the ATARI ST Computers. The Timekeeper module plugs into the cartridge port on the ATARI 520/1040 ST Computer. A program is supplied with Timekeeper that operates as an accessory like the control panel. A feed through cartridge slot allows Timekeeper to remain installed while using other cartridges.

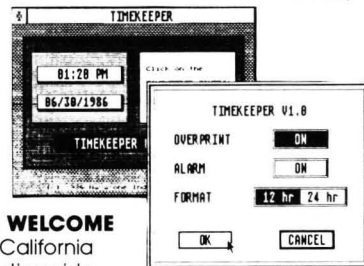
The Timekeeper program automatically gets the time and date from the Timekeeper modules during the power up or boot sequence. The computer's own clock is set up and the Timekeeper is then disengaged until the computer is turned on again.

AVAILABLE AT YOUR LOCAL ATARI DEALER,

or you may use your MasterCard or VISA to order direct by calling our

TOLL FREE NUMBER below or send check or M.O. Please add \$2.00 shipping or \$10 shipping if outside U.S. California residents add 6% sales tax.

DEALER INQUIRIES WELCOME
800-654-2821 in California
800-624-6545 Nationwide



NAVARONE INDUSTRIES, INC.
21109 LONGEWAY ROAD, SUITE C
SONORA CA 95370 • (209) 533-8349
TLX:WWI 650-230-9046

CIRCLE #134 ON READER SERVICE CARD


```

/* following is an outline of the program's main interpretive loop! */
int gem_loop(wm,wind_actv,raz_pts)
/* source/dest packet for 'vrc-cpyfmc()'. */
/* source/dest packet for 'vrc-cpyfmc()'. */
int raz_pts[];
/* index variable */
int wm_ix; /* array subscript of current window structure */
do /* do the following till user closes main window or what- */
/* ever you want him to do to show that he's finished */
{
    for (i = 0; i < MR_HMS; i++) /* look at all windows */
    /* 1. Call 'event_wuit()'. */
    /* 2. Figure out the array subscript of the window */
    /* the AES is talking about by comparing */
    /* 'msgbuff_gt3j' with the 'wm_ix' handle. Members of */
    /* each of the array elements. Put this subscript */
    /* into 'wm_ix'. */
    switch (msgbuff_gt3j)
    /* 3. Check for possible window management messages-- */
    /* for example... */
    case WM_REDRAW:
        msgbuff_gt3j = WM_REDRAW;
        break;
    /* ... NOTE that you have to watch out for a lot */
    /* of 'ask' messages. For example, a 'WM_SIZE' mes- */
    /* sage will require a redraw operation, even */
    /* though 'ask' essentially does nothing about */
    /* this message. */
    /* 4. Here you could process some possible keyboard */
    /* input. If so, when you detected a mouse button */
    /* pressed or mouse movement or anything that would */
    /* indicate that the user had gone back to moving */
    /* the windows around, or whatever, you would re- */
    /* begin tracing your keyboard-input subroutine */
    /* and continuing with AES processing in */
    /* 'gem_loop()'. */
    /* end of 'for' loop */
    /* ... whatever user doesn't close the main window, */
    /* or whatever-- your own stopping condition goes */
    /* here */
} while (1);
/* 5. Close any other windows not already closed, and exit from */
/* the program. */
/* following are the two important user-programmed functions for */
/* window manipulation -- THESE FUNCTIONS ARE COMPLETE... */
/*****
* set_clip-- set clipping rectangle for draw or redraw, and set up
* coordinates for raster operation.
*****/
int set_clip(wm,x,y,w,h,redraw,raz_pts,wind_actv)
/* dimensions to be transformed into clip_rect */
int x,y,w,h; /* TRUE == this is preparatory to a redraw */
int redraw; /* source/dest packet for raster operation */
/* pointer to FDB for screen */
fdb wind_actv;
int clip(x,y) /* coordinates of clipping rectangle */
/* find the region in the window buffer corresponding */
/* to the area to be redrawn in this window */
/* this is a GEM call */
wind_set(wm,wind_actv,handle,WM_DRAWKYM,(&wm->xwork),(&wm->ywork),
(&wm->work),(&wm->hwork));
if ((x + w) > r_width - 1)
if ((y + h) > r_height - 1)
/* calculate dimensions extending beyond screen edge */
/* calculate rectangle for 'vs_clip()'. */
clip(x = x);
clip(y = y);
clip(x = x + w - ONE);
clip(y = y + h - ONE);
/* calculate coordinates for raster operation */
if (redraw)
/* buffer == source */
raz_pts[0] = screen_x_g + x - wm->xwork;

```

Infocom introduces four new gam

Infocom,™ the crazy people who brought you “Zork”® and “The Hitchhiker’s Guide to the Galaxy,”™ has a habit of coming up with games that add a new dimension to interactive fiction. And the best keeps getting better. Case in point: “Leather Goddesses of Phobos.”™ It has a scratch n’ sniff card and a 3-d comic book to excite all your senses. Once your interest is

piqued, you’ll embark on a rowdy romp through the solar system. This hilarious spoof of 1930’s pulp science fiction has 3 “naughtiness levels,” for the prude to the lewd. “Leather Goddesses” is sure to amuse members of either sex.

One’s really warped.

Then there’s “Trinity.”™ It answers the question of whether a game can be both light-hearted

and profound. You journey through a time warp into a mischievous fantasy world where all atomic explosions are mysteriously connected. “Trinity” takes you back to the dawn of the atomic age and puts the course of history in your hands.

One’s a real circus.

It has been said that the circus is the only really mysterious thing left in civilization.

One thing’s for sure, there is plenty of mystery in “Ballyhoo.”™ While trying to locate the circus owner’s kidnapped daughter, you are somersaulted into a three-ring world of deception and crime. To solve the crime



es. One really smells.



Every package includes an integral set of props to excite your senses and enhance the game.

and save your hide from a permanent spot in the freak show, you'll need to stretch your puzzle-solving skills to the limit.

One's really haunting.

Wrapping up this new quartet is a classic gothic mystery set in a haunted castle on the mist-shrouded seacoast of Cornwall. In "Moonmist"™ you'll explore the darkest reaches of Tresyllian

Castle and get involved with an eccentric cast of characters, including British nobility, while trying to save your best friend from a vengeful ghost. "Moonmist" offers four distinctly different sets of clues, problems, solutions and hidden treasures. So you'll die to replay it again and again.

All four are easy to get.

Simply follow your nose to your local software store today.

INFOCOM™

For more information, call 1-800-262-6868, x. 17Y. Or write to us at 125 CambridgePark Drive, Cambridge, MA 02140.

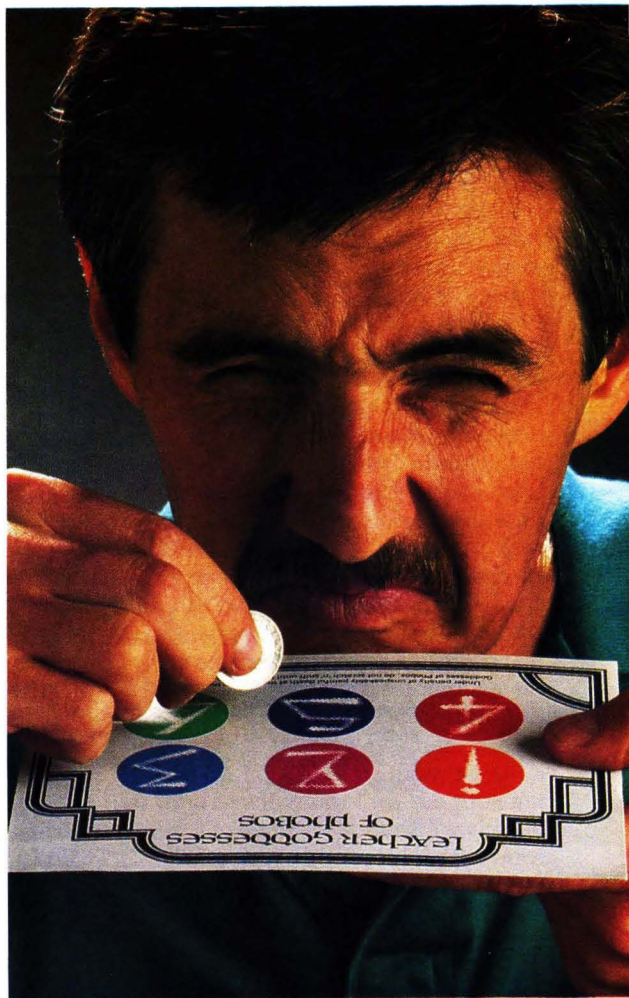
© Infocom, Inc. Zork is a registered trademark and Bally-hoo, Trinity, Leather Goddesses of Phobos and Moonmist are trademarks of Infocom, Inc. The Hitchhiker's Guide to the Galaxy is a trademark of Douglas Adams.

CIRCLE #139 ON READER SERVICE CARD

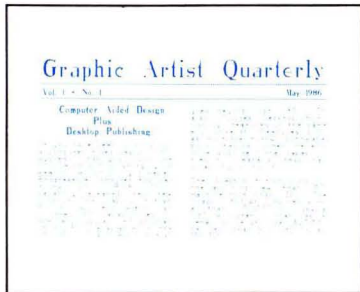
```

raz_pts(1) = screen_y + y - ww - uworn;
raz_pts(2) = (raz_pts(0) + h - one);
raz_pts(3) = (raz_pts(1) + h - one);
raz_pts(4) = clip(0);
raz_pts(5) = clip(1);
raz_pts(6) = clip(2);
raz_pts(7) = clip(3);
}
else
{
  /* buffer == destination */
  raz_pts(0) = clip(0);
  raz_pts(1) = clip(1);
  raz_pts(2) = clip(2);
  raz_pts(3) = clip(3);
  raz_pts(4) = screen_y;
  raz_pts(5) = (screen_y + h - one);
  raz_pts(6) = (screen_y + h - one);
  raz_pts(7) = clip(3);
}
/* set clip rectangle for gem */
/* this is a gem call */
vs_clip(handle_g, clip);
)
/*****
# do_redraw-- redraw an application window.
*****/
int do_redraw(ww, xc, yc, w, hc, wind_actv, raz_pts)
struct w_pack *wp; /* pointer to a window data structure
int xc, yc, w, hc; /* wghbuff.cld..711 dimensions of area to be
FOR wind_actv; /* pointer to FOB for screen
int raz_pts(1); /* src/dest packet for raster
{
  CRECT tl, tz; /* from 'obdr.h': holds rect dimensions
  /* tl == dimensions of rectangle from rect-
  /* tz == dimensions of area to be redrawn,
  /* from parms
  /* hide the mouse-- this is a gem call */
  if (hidden_g)
  {
    graf_mouse(255, (long)0);
    hidden_g = TRUE;
  }
  tz_x = xc; /* transfer parms (rather clumsily-- but
  tz_y = yc; /* the structures are required by
  tz_w = w; /* the dimensions of 'wghbuff.cld',
  tz_h = hc; /* passed are elements of 'wghbuff.cld',
  /* get the first rectangle from rectangle list */
  /* this is a gem call */
  wind_get(w, wind_actv, MR_FIRSTYMH, &tl_x, &tl_y, &tl_g_w, &tl_g_h);
  /* keep redrawing while there are valid rectangles in the list */
  while (tl_g_w && tl_g_h)
  {
    /* if the rectangles intersect, redraw that area
    {
      set_clip(w, tl_x, tl_y, tl_g_w, tl_g_h, TRUE, raz_pts,
      wind_actv);
    }
    /* raster from buffer into current window */
    /* this is a gem call */
    vrcopy(handle_g, 2, ONLY, raz_pts, &(w - wind_buff),
    wind_actv);
  }
  /* get the next rectangle from the list */
  /* this is a gem call */
  wind_get(w, wind_actv, MR_NEXTYMH, &tl_x, &tl_y, &tl_g_w,
  &tl_g_h);
}
/* show the mouse-- this is a gem call */
if (hidden_g)
{
  graf_mouse(257, (long)0);
  hidden_g = FALSE;
}
}

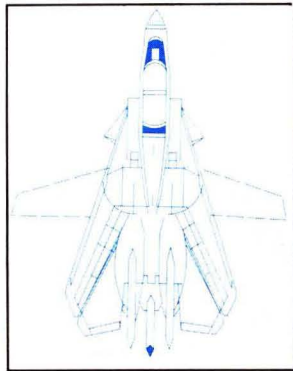
```



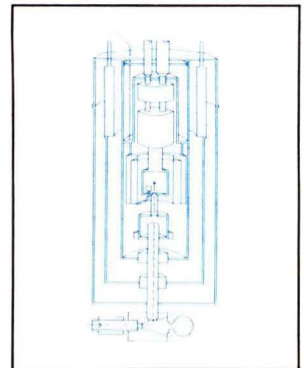
the Graphic Artist®



NOW ONLY



\$199.95!



reduced from \$495.00

All sample designs
were designed and
printed using
the Graphic Artist

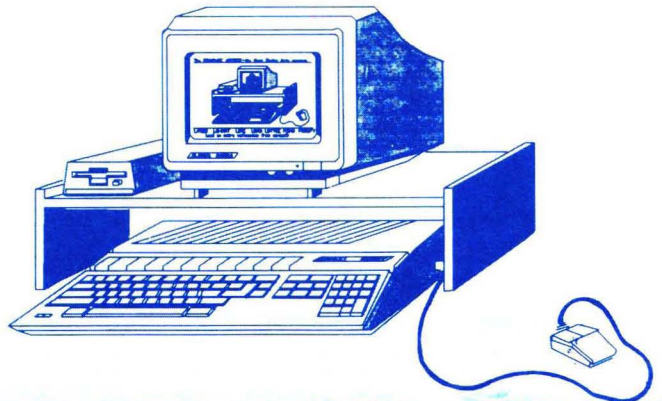
The Complete Professional COMPUTER AIDED DESIGN & DESKTOP PUBLISHING

System for the Atari ST

the
Graphic
Artist
FONT EDITOR
Now Sold Separately
for \$79.95

"The GRAPHIC ARTIST is one of the first programs that tries to take advantage of the tremendous power of the ST... the first ST program to use the printer to its highest resolution and the results are extremely impressive... The GRAPHIC ARTIST can indeed produce professional drawings, not available through EASY DRAW... quite an impressive product."

—Current Notes



PCA PROGRESSIVE
COMPUTER
APPLICATIONS®

2002 McAULIFFE DR. ROCKVILLE, MD 20851 (301) 340-8398

CIRCLE #140 ON READER SERVICE CARD

Setting the clock on your ST

A simple alternative to using the control panel desk accessory

(or: How to “Include the Batteries” where one was excluded)

by Mark Skapinker

The Atari ST is designed with an internal clock. What's been left out is a battery to allow the ST to “remember” the time from the point at which it was switched off until next time you switch it on—an oversight by Atari, when you consider that a simple battery would cost just a dollar or two. Having the date and time set is a help in using your ST; when you create new files, the ST writes the time and date of their generation. This capability is also important to some programs that use the date and time—**Thunder!**, for example, which can automatically insert the information into documents for you.

This means that, every time you switch on your ST, you need to reset the date and time. A number of companies have developed “clock cards,” which plug into the ST to do this for you. If you don't own such a card, the only way to set the time and date in each case is by using the “control panel” desk accessory. This method isn't convenient at all, because it means you must have the desk accessory present always; you must remember to go and set the clock; and you need to type in the complete date and time in each instance, from the default of November 25/85. It's hardly worth the effort!

There had to be an easier way. For that reason, I developed the little program BICLOCK.PRG for Batteries Included, who have decided to place the program into public distribution, as a service to the ST community. Feel free to make copies of this program.

It's based on three very simple principles: first, the ST has a way of allowing you to run a program automatically every time you switch on your computer. Second, you should only have to change the date and time since last time you set them, rather than November 25/85 each time. Finally, the time and date should be very easy to change.

On your “boot” disk (the disk you place in drive A when you switch on your computer), the ST always looks to see if there's a folder called AUTO. If there is such a folder, it will automatically run any programs found there. For that reason, if you don't have a folder called AUTO on your boot disk, create one (using the “make folder” option from the desktop). Copy the program BICLOCK.PRG into this folder, and it will run every time you start your ST.

The program displays three dates. The first is the “system date” (usually November 25/85) in the computer when you start up. The second is the “date when you last set the date” using BICLOCK.PRG, and the third is the date you're now setting (defaulting to the second date).

By using the up and down arrow keys, you can increase or decrease the day, and by using the left and right arrow, you can increase or decrease the month. Press the TAB key, and you can use the arrow keys to increase or decrease the hour and minute. When you're finished, simply press RETURN to set the computer's date and time to those you've selected, or press ESC to leave the program without changing the date and time at all. (All this is explained on the screen with the program). Next time you run the program (or next time you switch on your ST), you'll only have to advance the date and time from the setting last noted.


How will this help you? Most people's computer use takes place at a similar time each session, so the date need only be advanced since the last use. For example, let's say you're like me—I switch on my ST every morning at the same time. The first time I switch on, I set the time and date to the current ones. Thereafter, whenever I switch on my ST and BICLOCK.PRG comes up, I just press the down arrow to advance by one day and press RETURN. Let's say you use your ST less often, every few days—you only have to press the down arrow for a short while as it scrolls through the days. Of course, it automatically goes on to

the next month if you reach the last day of a month (except for February on a leap year). It's worth the few seconds to set the date and time, isn't it?

The inside scoop.

How does it work? Every file on the ST has a date and time associated with it (the ones you see when you choose "show info," or when you view the files in "text"). This date and time is known as the "timestamp." When you start BICLOCK, the program reads its own timestamp. This time is given to you as the default time, when you last used the program. When you set the date and time, the program does two things: it sets the internal date and time of the ST, and it changes the timestamp associated with BICLOCK.PRG to the new date and time—a simple, but very useful method! (One warning, because it writes the new date and time to your boot disk, you should make sure that disk isn't write protected.)

Sorry the program wasn't written to use the GEM interface (which would have been easier for us all), but the ST only loads in the GEM "engine" after running all files in the AUTO folder. You can use the program at any time after the machine is on, but don't move your mouse, or it will make a "hole" in the screen.

Enjoy! 

EASY CLOCK SETTER
 By Mark Skapinker, V1.0 1986.
 A gift from Batteries Included, Inc.
 30 Mural St, Richmond Hill
 Ontario, L4B 1B5 Canada.
 Tel: (416) 881-9941

System Date: 29/May/1985 17:33
Last Used: 29/May/1985 17:34
New Setting: ~~29/May/1985~~ 12:31

Press:
 LEFT ARROW Decrease Month
 RIGHT ARROW Increase Month
 DOWN ARROW Decrease Day
 UP ARROW Increase Day
 S Use 'System Date'
 L Use 'Last Used Date'
 TAB Change Time
 HELP Help
 RETURN Use New Setting
 ESC Abort

Mark Skapinker is Director of Product Development for Batteries Included, Toronto, Canada. He's in charge of such software as *DEGAS*, and is the author of *Thunder!*

For you technical types, the following page provides the program's principles, with examples of C code used in getting the ST date and time, and changing a file's timestamp. (Please note that the C binding to get/set the timestamp is exactly the opposite of that in most documentation.)

Readers should also realize that the "Easy Clock Setter" is a public domain program, available on some BBSs, Delphi and CompuServe. The listing which follows is not to be typed in, but for information only.

Running an ST bbs?
 Looking for a bbs with greater
 sophistication and more
 flexibility?

FoReM ST

The ULTIMATE ST BBS SYSTEM
 is NOW available!

For a limited time, receive \$10 off the regular
 \$99.95 price of FoReM ST when you trade in
 your current commercial ST BBS system.

Offer expires August 30, 1986.

Requires receipt of proof of purchase.

For a trial run, call the FoReM ST BBS at 301-552-2573
 FoReM ST's lengthy list of features includes:

Status window	300 9600 baud	Hard disk support	Privilege system
Individual user	restrictions	Accounting system	64 sigs
Electronic Mail	Full Message Editor	Distribution lists	20 file sigs
Kermit	Xmodem	65536 access levels	Multiple Data Bases
Built In Terminal Mode		Full remote sysop access	
Full Message Editor			

To Order Phone 301-428-0474.

For Technical Assistance phone 301-552-2517.

Commnet Systems

7348 Green Oak Terrace, Lanham, MD 20706

CIRCLE #141 ON READER SERVICE CARD

COMPUTER ACCESSORY BARN **GRAND OPENING GIVE AWAY**

BUY AN
ATARI 520 ST
COLOR SYSTEM
 AND RECIEVE A
10 PK BOX OF 3.5" MEMOREX DISK

CALL: (516) 385-1858
 "ASK ABOUT OUR COMPLETE LINE
 OF COMPUTER ACCESSORIES"

COD ORDERS WELCOME, PERSONAL & BUSINESS CHECKS ALLOW
 3 WKS. TO CLEAR. CALL MON. THRU. SAT. 10 TO 8
 RETURNS NEED AUTHORIZATION

CIRCLE #142 ON READER SERVICE CARD

```

/*FILE DEFINITIONS:*/
#define ESC '\033'
#define CR '\015'
#define UPARROW 0x48
#define DOWNARROW 0x50
int hndl; /* file handle */
unsigned int timeptr[2]; /* long ptr */
unsigned int sdate,time; /* system date and time*/
int day, month, year; /* date */
int hrs, mins,secs; /* time */
int uday,umonth,uyear,uhrs,umins,usecs; /* keycode from keyboard*/
long retc;
char chr1,chr2;

/* Get the dates and convert them to integers: */
/* In order to get the timestamp, the program file must be "opened"
First open the program file in the current directory/folder: */
hndl = Fopen("biclock.prg",0); /* returns a file handle:hndl */
if (hndl<0) /* hndl less than 0 means that the file could not
be opened in this folder.
On bootup, even though your program is in the
AUTO directory, the default current directory
is still the root directory so try open the
program file in the auto folder:*/
{hndl=Fopen("\\auto\\biclock.prg",0); /* try in the auto folder*/
if (hndl<0) /* still not open*/
{Cconws("Cannot find biclock.prg. Press Any Key.");
Cnecin(); /* wait for a key*/
exit(); /* exit the program */
}
} /* successful open:*/
Fdatetime(timeptr, hndl, 0); /* get the timestamp 0=get*/
sdate=Tgetdate(); /* get the ST system date*/
stime=Tgettime(); /* get the ST system time*/
/* Now format the dates and times:*/
day = sdate & 0x1F; /* put system day in integer*/
month = (sdate & 0x1E0) >> 5; /* put system month in int*/
year = ((sdate & 0xFE00) >> 9)+1980; /* put system year in int*/
secs = stime & 0x1F; /* put system secs in int*/
mins = (stime & 0x7E0) >> 5; /* put system mins in int*/
hrs = (stime & 0xF800) >> 11; /* put system hrs in int*/
uday = timeptr[1] & 0x1F; /* put timestamp day in integer*/
umonth = ((timeptr[1] & 0x1E0) >> 5); /* put timestamp month in int*/
uyear = (((timeptr[1] & 0xFE00) >> 9)+1980); /* year*/
usecs = timeptr[0] & 0x1F; /* seconds */
umins = ((timeptr[0] & 0x7E0) >> 5); /* minutes */
uhrs = ((timeptr[0] & 0xF800) >> 11); /* hours */

/* We now have the date and time, We display it on the screen and allow
the user to change it: */
while(1) /* main loop waiting for input */
{retc=Bconin(2); /* wait for keycode from keyboard */
chr1=retc; /* keycodes from keyboard */
chr2=(retc & 0xFF0000L) >> 16;
if (chr1==ESC || chr1==CR) break; /* Return or ESC means END */
else if (chr1==0 && chr2==UPARROW) day_up(); /* move to next day and display */
else if (chr1==0 && chr2==DOWNARROW) day_down(); /* move to previous day and display */
/* do the same for the others */
} /* end loop */

if (chr1==ESC) exit(); /* ESC pressed. Exit the program*/

/* If the user wants to use the date and time we set thedate and time: */
timeptr[0]= (hrs << 11) | (mins<<5) | (secs >>1); /* 1st int is time*/
year=year-1980; /* year - 1980*/
timeptr[1]= (year<<9) | (month<<5) | day; /* second int is date*/
Tsetdate(timeptr[1]); /* Set system date*/
Tsettime(timeptr[0]); /* Set system time*/
Fdatetime(timeptr, hndl, 1); /* Change timestamp 1=set*/
exit();

/* the following is a little routine to set the month name given the
month number. Please note that you should ensure than mon_num is 1
to 12. The routine does not check this.
*/
BYTE monstr[3]; /* string for month name */
set_mon(mon_num)
int mon_num; /* pass 1 to 12 Month number */
{
static char *mon_array[12]={"Jan","Feb","Mar","Apr","May","Jun","Jul",
"Aug","Sep","Oct","Nov","Dec"};
/* a static array with month names */
strcpy(monstr,mon_array[mon_num-1]);
/* place correct string according to month number */
}

```

Thunder!

BATTERIES INCLUDED
30 Mural Street
Richmond Hill, Ontario
Canada L4B 1B5
(416) 881-9816
\$39.95

by Arthur Leyenberger

Thunder! is three programs in one: a real-time, 50,000-word spelling checker, a word expander and corrector, and a writing analysis tool. It was designed and programmed by Mark Skapinker and is published by the Canadian company Batteries Included, a long-time publisher of quality 8-bit (and now ST) Atari software.

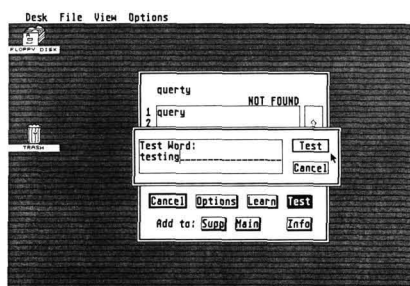
Two versions of **Thunder!** are provided on the distribution disk. One is a desktop accessory. This version only works with GEM-based word processors. Actually, it will work with any GEM-based program—but may not be appropriate with some. For example, there's little need for a spelling checker in a graphic design program. In such cases, **Thunder!**'s "Autoproof" feature can be temporarily turned off, via the option command.

Here's how it works: once **Thunder!** has been loaded as an accessory, and when Autoproof is turned on, the program follows your keystrokes. Whenever the program detects an end-of-word, such as a carriage return or space, it checks in its memory-based dictionary to see if the previous word exists. If it doesn't, you're offered several suggestions, or given the opportunity to add the word to a supplemental dictionary. If you accept one of the suggested spellings, **Thunder!** will backspace over the word and automatically type the correct spelling.

The other version of **Thunder!** is a stand-alone program to use with any file. It's convenient for checking files created by non-

GEM programs, as well as for examining an entire file created by a GEM program.

This second version of **Thunder!** runs from the desktop, and the possible word error is highlighted in context. The technique lets you see immediately whether you've made a mistake, or the word's correct but not yet in the dictionary. Adding new words is easy, and they can be saved to separate, supplemental dictionaries.



Thunder!

In addition to doing a spelling check, **Thunder!** provides you with a range of statistics, such as: character, syllable, word and sentence count, and two types of readability indices. Both the Fog and Flesch indexes are used. These widely used tests indicate how many years of schooling are required for the average reader to understand what you've written. (Incidentally, this review is written at the 10th-grade reading level.)

When **Thunder!** tries to find the correct spelling of a word, it displays alternatives,

based on letters in different positions of the word originally typed. How? It looks at the first letter and substitutes various words spelled the same except for that letter. Then it looks at the second letter with the first letter, then, finally, at similar words. In this way, the list of alternatives is based on the type and frequency of errors most people make. Most of the time, **Thunder!** gets it right.

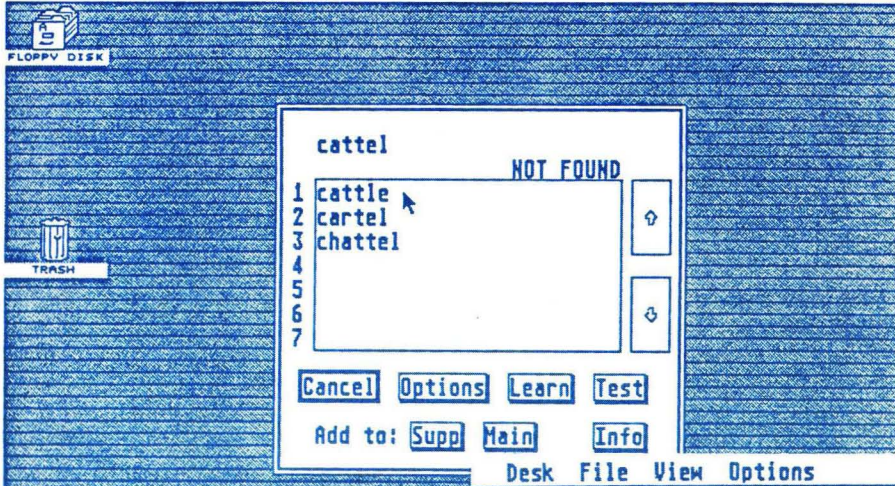
One of the unique features of the program is its ability to correctly check a word which contains a number. No other spelling checker currently on the market—for any computer—can handle this type of spelling error.

As mentioned earlier, **Thunder!** has 50,000 words in its dictionary. Other products may claim as many or even more words, but may be counting word *derivations* separately. For example, the words *walk*, *walks*, *walked* and *walking* could be counted as four separate words in some spelling checker programs. In **Thunder!**, these four derivations are considered as one word, just as in an English dictionary.

A note of caution should be given about the statistics segment. Since it's very difficult for a program to define a syllable, the statistics are not 100-percent accurate for short documents. For longer documents, though, **Thunder!**'s stats are quite accurate.

Another problem is that there are, unfortunately, still a few bugs in TOS. If the program opens a virtual workstation in a desk accessory, TOS is supposed to allocate 300 bytes. It doesn't do so correctly and, therefore, can waste from 40 to 60K. What this means is that **Thunder!** can re-

Desk File View Options



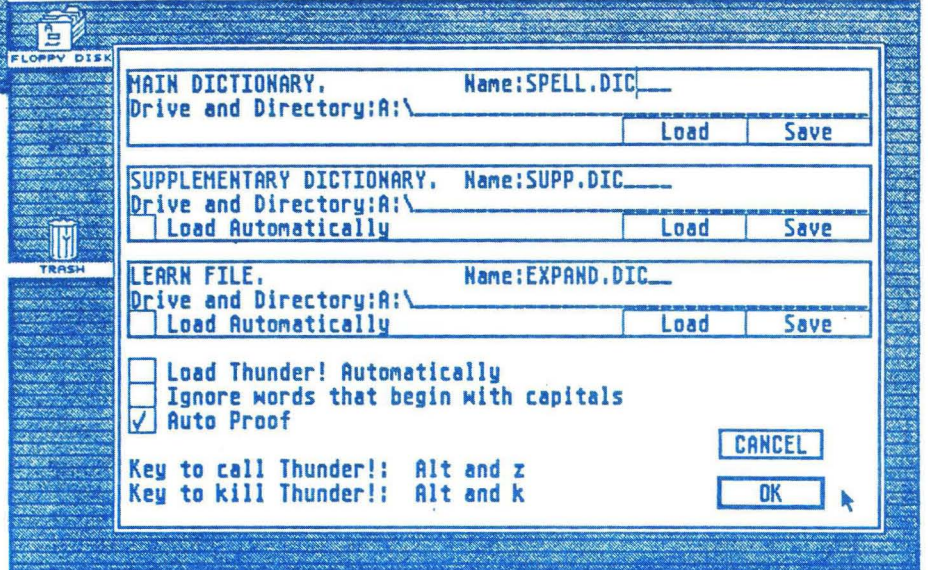
quire 100 to 140K of memory. Once the bug is fixed, only 100K will be used by the program.

Another TOS bug, out of the control of any programmer, can result in a system crash. This bug may occur with any desk accessory, and Atari's aware of it. If, with a desk accessory active, you get a message like *put disk B into drive A*, or *your disk is corrupt*, or any system error message at all, the next time a similar message appears with an active accessory the system will crash (three bombs). All you can do is be sure to save your work often... especially after you've received a system error message.

The dictionary is 80K, and the program itself about 40K. But, whenever the ST's booted, the program asks if you want to load the checker. In its desk accessory guise, **Thunder!** and its dictionary need 100K. Fortunately, should you need that extra memory at any time, you can simply call up **Thunder!** (the accessory) and disable it. You've immediately freed up 100K—and saved the hassle of rebooting. Thanks, BI, for a very handy feature.

In addition to a spelling checker desktop accessory, **Thunder!** provides a word expansion feature. For example, say I've defined BI as *Batteries Included*. Whenever I type BI, *Batteries Included* is typed in.

As many files as you want can be set on your disk, each containing up to 100 expansions. In addition, the expansion isn't limited to just one or two words. An entire paragraph or block of text can be defined.



Another use of the expansion feature is for automatic word correction. For example, I type fairly rapidly, but often mistakenly capitalize the first two characters of a word instead of just the first. This is because I don't let go of the SHIFT key fast enough. Therefore, I often spell *Atari* as *ATari*. With **Thunder!**'s expansion feature, I can tell the program ahead of time to correct the word *ATari* whenever it sees it.

Here's a little on **Thunder!**'s roots. It's an unusual program from an interesting company. Batteries Included is the type of small company that can bring a product from conception to market in less than three months. Take, for example, **Thunder!**'s creation.

Back in early March, President Michael Reichmann and Product Development Director Mark Skapinker were having their usual morning coffee. They were discuss-

ing the Turbo Lightning spelling checker for the IBM PC and clones. Both agreed that BI could easily do a program like it—do it better and do it quickly. Less than three months later, **Thunder!** was shipping and being shown at Chicago's Summer CES.

The bottom line for me: **Thunder!** from Batteries Included represents the first serious desktop accessory for the Atari ST. Author Mark Skapinker has shown what can be done with a useful idea, good programming and a company willing to support the ST.

Thunder! isn't copy protected, so please don't give or receive unpurchased copies of the program. Doing so will only hurt you, the ST user, and the ST software market in general.

If you write, you need **Thunder!** I recommend it highly. **A**

Start Your Own BBS! New for the 520 & 1040ST

This user friendly BBS is loaded with special features...Passwords, E-Mail Message Base, X-Modem Protocol col and can run on any number of drives including Hard Drive. Will work with any Hayes Compatible modem. Complete Package with all utilities and **Source Code** enabling easy modification and customizing of this BBS.

Everything you need in one package. **\$54.95**
Plus \$3.50 Shipping
Add 7% Outside USA



Our Famous 1050 DUPLICATOR has now been converted to service the **ATARI™ 520 ST**. This is a revolutionary, new, software only, disk copy system. Now you can back-up heavily copy-guarded and protected disks. And, most important, if new forms of software protection should appear on the market, Duplicating Technologies will provide you with the necessary software upgrades.

Our exclusive **ST DUPLICATOR™** comes complete with user friendly software and instructions.

520 ST BACK-UP!

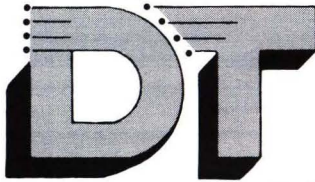
DUPLICATING TECHNOLOGIES IS
PROUD TO PRESENT

THE 520 ST DUPLICATOR™



Only
\$39.95

Plus \$3.50 Shipping
Add 7% Outside U.S.A.
Dealer inquiries are welcome,
call for quantity price quote.



"Constantly Working on New Products and Software."

**DUPLICATING
TECHNOLOGIES inc.**
Formerly Gardner Computing

TECHNICAL
INFO ONLY (516) 333-5504, 5712

WEEKDAY
ORDERS ONLY (516) 333-5805

EVE. & WKEND.
ORDERS ONLY (516) 333-5950

99 Jericho Tpke., Suite 202, Jericho, N.Y. 11753



TERMS: We accept American Express, Visa, MasterCard and C.O.D. orders. Foreign orders must be in U.S. dollars. All personal checks allow 14 days to clear. Shipping: 7-10 days

CIRCLE #143 ON READER SERVICE CARD

Atari ST best-sellers

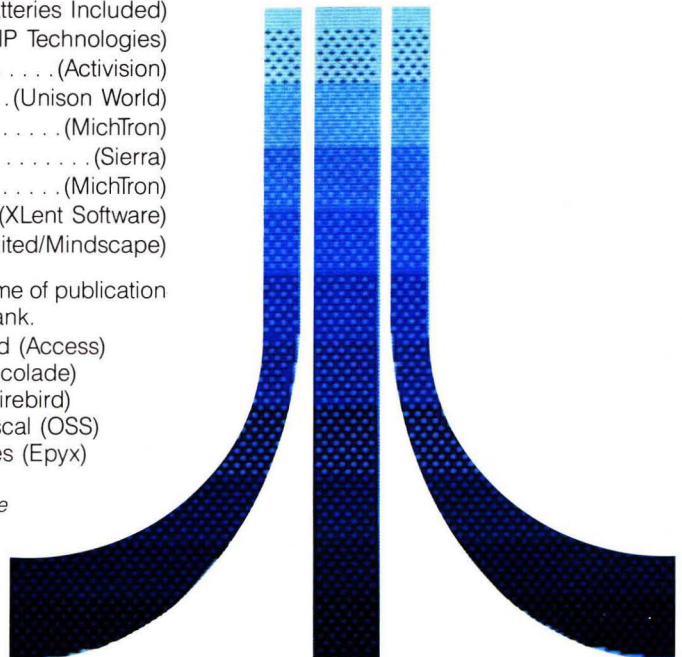
The following is a list of the best-selling ST software titles, collated since the ST's introduction in the summer of 1985. Please note that these are not the current best-sellers, but those which have sold more copies over the entire period.

1. Sundog: The Frozen Legacy(FTL Games)
2. DEGAS(Batteries Included)
3. VIP Professional(VIP Technologies)
4. Music Studio(Activision)
5. PrintMaster(Unison World)
6. Time Bandit(MichTron)
7. King's Quest II(Sierra)
8. Major Motion(MichTron)
9. Typesetter ST(XLent Software)
10. Brataccas(Psygnosis Limited/Mindscape)

The following were the fastest up-and-coming titles at the time of publication (August 1986). They're listed in alphabetical order, not by rank.

Black Cauldron (Sierra)	Leader Board (Access)
dB Man (Versasoft/Atari)	Mean 18 (Accolade)
Easy Draw (Migraph)	The Pawn (Firebird)
N-Vision (Audio Light)	Personal Pascal (OSS)
Lattice C (Metacomco)	Winter Games (Epyx)

We would like to thank the following companies for their assistance in compiling these lists: APEX Resources, 17 St. Mary's Court, Brookline, MA 02146; The Bit Bucket, 1294 Washington Street, West Newton, MA 02165; ComputAbility, P.O. Box 17882, Milwaukee, WI 53217; Computer Creations, P.O. Box 493, Dayton, OH 45459; Computer Palace, 2160 W. 11th Avenue, Eugene, OR 97402.



ATARI SERVICE
FACTORY AUTHORIZED NETWORK

 **ROCKY MOUNTAIN**
1750 30th STREET • BOULDER, CO 80301

 **ATARI SERVICE**
FACTORY AUTHORIZED NETWORK

EXTENDED SERVICE CONTRACTS
SALES • CONSIGNMENTS • TRADE-INS
TO FIND THE SERVICE CENTER NEAREST YOU
NATIONWIDE — Dial: 1-800-66-ATARI
IN COLORADO — Dial: 1-800-55-ATARI
DENVER/BOULDER Metro — Dial: 44-ATARI
VISIT ELECTRIC LAND: 303/447-ABBS

ATARI SERVICE
FACTORY AUTHORIZED NETWORK

CIRCLE #144 ON READER SERVICE CARD

THE WAIT IS OVER!

**MT C-SHELL™
IS HERE.**

**MAIN FRAME PERFORMANCE
FOR YOUR ST . . .**

- Multiuser and Multitasking
- Electronic Mail
- Print Spooling
- Unix™ Like Environment
- And it Runs TOS Programs

\$129⁹⁵
COMPLETE

 **Beckemeyer
Development Tools** 

592 JEAN STREET, #304, OAKLAND, CA 94610
415/658-5318

CIRCLE #145 ON READER SERVICE CARD



**COPY II
ST™**

**BACKUP PROTECTED
SOFTWARE FAST.**

From the team who brought you COPY II PLUS (Apple), COPY II PC (IBM) and COPY II MAC (Macintosh) comes a revolutionary new copy program for the Atari 520 and 1040 ST computers.

- Copies many protected programs — automatically. (We update COPY II ST regularly to handle new protections; you as a registered owner may update at any time for \$15 plus \$3 s/h.)
- Supports single and double sided drives.
- Includes both a fast sector-based copier and a true bit copy mode for protected disks.

Requires an Atari 520 or 1040 ST computer with one or two drives.

Call 503/244-5782, M—F, 8—5 (West Coast time) with your   in hand. Or send a check for \$39.95 U.S. plus \$3 s/h, \$8 overseas.

\$39.95

Central Point Software, Inc.
9700 S.W. Capitol Hwy. #100
Portland, OR 97219

*Central Point
Software*
INCORPORATED

*Backup utilities also available for the IBM, Apple II, Macintosh and Commodore 64.
This product is provided for the purpose of enabling you to make archival copies only.*

CIRCLE #148 ON READER SERVICE CARD

 **ST-MAIL ORDER
SPECIALS**

ONLY **\$12⁹⁵** EACH

- ST Printer Cable ■
- ST RS232 Modem Cable ■
- Surge Bar with 6 outlets ■
- ST Disc Drive Cable 6 foot ■

1200/300 Auto Modem (Hayes Type) . only \$179.95
Citizen Printer model 1200 super buy \$199.95
Authorized Atari Sales and Service
Free shipping with any order
We service what we sell since 1983
COMPUTER OUTLET
(619) 282-6200

5861 Mission Gorge Rd. / San Diego, CA 92120
15 DAY TRIAL / MONEY BACK WARRANTY
Call or write for our monthly Hot Sheet

CIRCLE #146 ON READER SERVICE CARD

SarU
**A NEW graphics drawing program
for the
Atari ST™**

Features

- ★ GEM™ based program with drop down menus.
- ★ Too many drawing modes to list in this ad.
- ★ Save & load a whole screen or *part of a screen*.
- ★ Make a picture from many pieces.
- ★ Works with color & monochrome systems
- ★ TOS™ in ROM/RAM, 520ST™/1040ST™

\$29.95

Instruction manual included as data file on disk, or add \$10 for printed copy of instruction manual. Add \$3 S/H. Texas residents add 5 1/8% sales tax. (Checks or money orders please)


**Nebula
Software**

P.O. Box 543 Sherman, TX 75090
(214) 892-0803

*ATARI ST, 520ST, 1040ST, TOS™ are registered trademarks of Atari
Corp. *GEM™ is a registered trademark of Digital Research Inc

CIRCLE #147 ON READER SERVICE CARD

Now available: Prospero's professional language compilers for the Atari ST

PRO PASCAL & PRO FORTRAN-77 FOR ATARI ST - \$149

USE THE LANGUAGES THE PROFESSIONALS USE: PASCAL AND FORTRAN.

C is high on performance but low on safety, structure, portability and maintainability. Pascal is excellent for education and for long-term projects. Fortran gives you access to hundreds of existing programs – and uses established programming skills!

ISO-PASCAL

Pro Pascal is validated to ANSI 770X3.97 Class A (no errors) on the Z80 processor under CP/M and the 8088 processor under PC-DOS. This provides a guarantee that the compiler is complete and works perfectly.

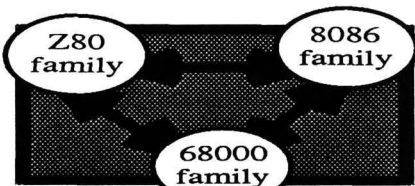
FORTRAN-77

Pro Fortran-77 is a full implementation of ANSI Fortran-77 with no omissions and many useful extensions.

Our Compilers Work!

No known bugs when we ship - so you don't have to fill in all the holes.

"Lazy I/O" for interactive use.



Prospero compilers:
portable source code

Good Housekeeping

All files closed on exit from procedure

Hand-coded library

Produces compact and efficient programs.

Ideal for

- Atari software developers
- schools and colleges
- students of computing
- development of personal skills
- solving technical problems
- training institutions

16 digit accuracy

Single and double precision IEEE format arithmetic gives 7 or 16 digit precision.

Big

Compiles big programs >50000 lines... >5000 identifiers... Separate compilation to build libraries and massive program suites.

Compilers include:

- compiler,
- linker,
- run-time libraries,
- librarian,
- X-ref program,
- sample programs,
- full GEM AES and VDI bindings,
- 230 page manual.

Pascal «—» Fortran

Interlinkable code means you can use the best of both languages.

We Specialize

At Prospero we specialize in writing language compilers. We produce the best possible compilers, conforming to the appropriate standard, and giving

programmers a secure base on which to build.

"Pro Pascal is not only ISO-validated, it is also a superb-quality and very full software development tool." Personal Computer World Nov 1985

Prospero software is used at more than 5000 sites around the world.

It's easy to order!

Credit card holders phone 1-011-441-741-8531*. Mastercard, Visa, Diners & Amex good. Also available from Atari dealers and distributors nationwide.

Reviews & Info

Call* 1-011-441-741 8531 for a free info pack with datasheets and magazine reviews!

Atari specialists:
Contact us for our Worldwide
Distribution Guide.

Mail order

Send this coupon with check to Prospero Software Ltd, 190 Castelnau, London SW13 9DH, England. Add \$5 shipping.

Allow 28 days for delivery.

Please supply ___ copies Pro Fortran-77 for Atari ST at \$149.

Please supply ___ copies Pro Pascal for Atari ST at \$149.

Special offer: both compilers for \$269.

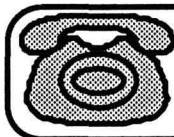
I enclose payment of \$ ____.

Name _____

Address _____

Telephone No _____

In case of query call 1-011-441-741 8531* or telex 8814396



***Call early!**

Before 1pm East coast,
10am West coast

Prospero Software

LANGUAGES FOR MICROCOMPUTER PROFESSIONALS

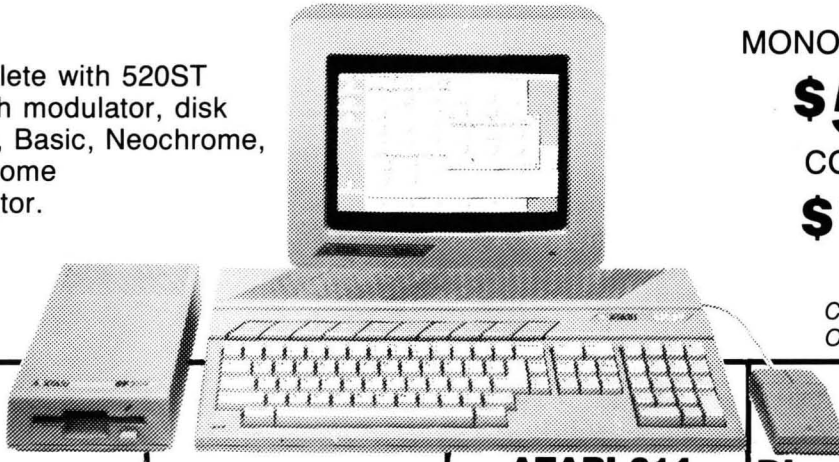
190 CASTELNAU, LONDON SW13 9DH, ENGLAND TEL 01-741 8531 TELEX 8814396

CIRCLE #149 ON READER SERVICE CARD

ATARI SPECIALISTS

ATARI 520ST SYSTEM PACKAGE

Comes complete with 520ST computer with modulator, disk drive, mouse, Basic, Neochrome, and monochrome or color monitor.



MONOCHROME SYSTEM

\$549⁰⁰

COLOR SYSTEM

\$749⁰⁰

CALL FOR PRICING
ON 1040 SYSTEMS!

SUPRA DISK

20 Meg HARD DRIVE
\$699⁰⁰

**SUPRA MODEM
MODEL
1200ST \$159⁰⁰**

**ATARI 314
1 Meg Double Sided
DISK DRIVE
\$219⁰⁰**

**ANCHOR
520
Direct Connect MODEM
300/1200 Baud
\$139⁰⁰**

— PRINTERS —

CITIZEN	
MSP-10 (80 col.).....	\$279.00
MSP-15 (132 col.).....	\$419.00
MSP-20 (80 col.).....	\$349.00
MSP-25 (132 col.).....	\$499.00
C.I.TOH	
Prowriter 1550P.....	\$299.00
Starwriter 10-30.....	\$299.00
EPSON	
Homewriter 10, LX80.....	CALL
FX85, FX286, RX100.....	CALL
SQ2000, H180, HS80, AP80.....	CALL
LQ800, LQ1000.....	CALL

JUKI	
6000 Letter Quality.....	CALL
6100 Letter Quality.....	CALL
6200 Letter Quality.....	CALL
6300 Letter Quality.....	CALL
6500 Letter Quality.....	CALL
5510 Dot Matrix.....	CALL
5510 Color.....	CALL
OKIDATA	
182, 183, 192, 193, 292, 293, 84.....	CALL
Okidata 93.....	\$279.00
Okimate 20.....	\$149.00

LEGEND	
880 Dot Matrix 100 cps.....	\$179.00
1080 Dot Matrix 100 cps.....	\$259.00
1380 Dot Matrix 130 cps.....	\$289.00
1385 Dot matrix 165 cps.....	\$339.00
NEC	
3000 Series.....	\$779.00
8000 Series.....	\$1099.00
ELF 360.....	\$399.00
Pinwriter 560, 660, 700.....	CALL

PANASONIC	
KX1091.....	\$239.00
KX1092.....	\$359.00
KX1592.....	\$469.00
TOSHIBA	
P321 (80 column).....	\$489.00
P341 (132 column).....	\$749.00
P351 (132 column).....	\$1049.00
STAR	
NX/SB/SD/SR Series.....	CALL
PowerType Letter Quality.....	CALL

V.I.P PROFESSIONAL \$9999

ACCESS	
Leaderboard.....	\$29.99
ACTIVISION	
Hacker.....	\$29.99
Borrowed Time.....	\$34.99
BATTERIES INCLUDED	
D.E.G.A.S.....	\$27.99
ELECTRONIC ARTS	
Financial Cookbook.....	\$37.99
HABA/ARRAYS	
Hippo-C.....	\$44.99
Business Letters.....	\$29.99
Write Your Own Will.....	\$29.99
Haba Writer.....	\$37.99
Habadox Phonebook.....	\$27.99
Mail Room Manager.....	\$39.99

SOFTWARE

INFOCOM	
Cutthroats.....	\$29.99
Deadline.....	\$34.99
Enchanter.....	\$29.99
Hitchhiker's Guide.....	\$29.99
Infidel.....	\$34.99
Planetfall.....	\$29.99
Sea Stalker.....	\$29.99
Sorcerer.....	\$34.99
Starcross.....	\$34.99
Suspect.....	\$29.99
Suspended.....	\$34.99
Wishbringer.....	\$29.99
Witness.....	\$29.99
Zork I.....	\$29.99
Zork II.....	\$29.99
Zork III.....	\$29.99

MINDSCAPE

Deja Vu.....\$37.99

MIRAGE

Express.....\$34.99

MUSE SOFTWARE

Final Word.....\$99.99
Hex.....\$27.99
PC Intercom.....\$79.99

O.S.S.

Personal Pascal.....\$49.99

PENQUIN SOFTWARE

Crimson Crown.....\$29.99

SIERRA-ON-LINE

Ultima II.....\$39.99
King's Quest.....\$37.99

SUBLOGIC

Flight Simulator II.....\$37.99

ATARI 520ST

Hardware/Peripherals

Atari 520 CPU.....	\$369.00
Atari 124 Monochrome Monitor.....	\$189.00
Atari 1224 14" Color Monitor.....	\$329.00
Atari 354 Single Sided Drive.....	\$179.00
Atari 20 MB Hard Disk.....	\$699.00
Atari 804 Graphic Printer.....	\$219.00

BLANK DISKETTES & ACCESSORIES

AMARAY	
Disk Tub 3 1/2".....	\$9.99
MAXELL	
(10) 3 1/2" SS/DD.....	\$18.99
(10) 3 1/2" DS/DD.....	\$29.99
SONY	
(10) 3 1/2" SS/DD.....	\$18.99
(10) 3 1/2" DS/DD.....	\$29.99

CURTIS Surge Protectors & Accessories

Emerald.....	\$39.99	Safety Strip.....	\$19.99
Ruby.....	\$59.99	Sapphire.....	\$49.99
Diamond.....	\$29.99	Universal Printer Stand	\$14.99

COMPUTER MAIL ORDER

CALL TOLL-FREE 1-800-233-8950

TELEX:
5106017898

477 East Third Street, Dept. B710, Williamsport, PA 17701



POLICY: Add 3% (Minimum \$7.00) shipping and handling. Larger shipments may require additional charges. Personal and company checks require 3 weeks to clear. For faster delivery use your credit card or send cashier's check or bank money order. Pennsylvania residents add 6% sales tax. All prices are subject to change and all items are subject to availability. Defective software will be replaced with the same item only. Hardware will be repaired or replaced at our discretion within the terms and limits of the manufacturer's warranty. We cannot guarantee compatibility. All sales are final and returned shipments are subject to a restocking fee.



1-800-268-3974
Ontario/Quebec

1-800-268-4559
Other Provinces

— CANADIAN ORDERS —

All prices shown are for U.S.A. orders.
Call the Canadian Office for Can. prices

1-416-828-0866
In Toronto

Telex:06-218960
2505 Dunwin Drive,
Mississauga, Ontario
Canada L5L1T1

ProCopy

ST BACKUP UTILITY \$34.95

★ Duplicate virtually any disk

★ ProCopy works with all ST, S/S & D/S floppy disk drives

★ Updating policy: \$10 with return

★ Protects against accidental loss of expensive software

★ Not copy protected

You can't back up your investment because copy protection locks you out. **ProCopy** is the key!

Send \$34.95 (check or money order). VISA & MC accepted. Add \$2.00 shipping & handling in North America. Overseas shipping & handling add \$4.50. Dealer inquiries welcome.



PROCO PRODUCTS

P.O. BOX 665, CHEPACHET, RHODE ISLAND 02814 USA

For ordering only, call: (800) 843-1223

For information, call: (401) 568-8459

CIRCLE #150 ON READER SERVICE CARD

ST INDEX TO ADVERTISERS

READER SERVICE #	ADVERTISER	PAGE #
120	Abacus Software	46ST, 67ST
129	Access Software Incorporated	58ST
—	ANALOG Computing	48ST
133	Artworx Software Co., Inc.	69ST
—	Batteries Included	57ST, OBC (regular pages)
145	Beckemeyer Development Tools	83ST
137	Cal Com, Inc.	72ST
148	Central Point Software	83ST
141	Commnet Systems	78ST
155	CompuServe	88ST
142	Computer Accessory Barn	78ST
119	Computer Mail Order	57ST
146	Computer Outlet	83ST
—	Delphi/ANALOG	IFC (regular pages)
151	Disk-of-the-Month Club	86ST
136	The Dragon Group, Inc.	69ST
143	Duplicating Technologies	82ST
122	Grafikon, Ltd.	52ST
139	Infocom	74ST, 75ST
124	InSoft, Corp.	52ST
123	Lionheart	52ST
135	Megamax, Inc.	69ST
154	Michtron	87ST
132	Microillusions	66ST
174	Microprose	IBC (regular pages)
152	Mountain Magic Software	86ST
134	Navarone Industries, Inc.	72ST
147	Nebula Software	83ST
125	Newell Industries	54ST
131	Omnitrend	66ST
140	PCA/Progressive Computer Applications	76ST
150	Proco Products	86ST
149	Prospero Software	84ST
153	Quack Computer Company	86ST
130	Regent Software	63ST
144	Rocky Mountain Atari Service	83ST
126	Serious Software	55ST
127	SRM Enterprises	55ST
138	Terrific Peripherals	69ST
121	Timeworks	50ST
151	Unlimited Software	86ST
—	VIP Technologies	61ST

EXCLUSIVE PRO...
DISCOUNT PR...
EDUCATIONAL...
BONUS COUPONS...
CATALOGS & NEWSLETTERS...
TOLL FREE ORDER LINE...
UNLIMITED SOFTWARE, INC.
DISK-OF-THE-MONTH CLUB
GUARANTEES
Lowest Prices
NO PURCHASE OBLIGATION
ORDER LINE (800) 345-CLUB (201) 794-3220
SEND FOR DETAILS
This unique club beats them all

DISK-OF-THE-MONTH CLUB
P.O. BOX 116, FAIR LAWN, N.J. 07410-0116

NAME _____
STREET ADDRESS _____
CITY _____ STATE _____ ZIP _____

CIRCLE #151 ON READER SERVICE CARD

Mountain Magic Software

Wizardware for Atari ST

Route 1, Box 653
Boone, North Carolina 28607
704/264-3021

B+C Tree \$69.95

C-Isam/B+Tree Utility that makes handling files a simple matter.

Designed for software developers who need the power and flexibility of a C-ISAM. Available for Megamax, Alcyon and Lattice C.

- * NO ROYALTIES
- * Sample Programs Supplied
- * Complete Documentation
- * Easy to Implement
- * JULIAN date functions FREE
- * Special \$49.95 if ordered before October 1, 1986

Lattice C is a trademark of Lattice, INC
Megamax C is a trademark of Megamax, INC
Alcyon C is a trademark of Alcyon Corp.
Atari ST is a trademark of Atari Corp.

CIRCLE #152 ON READER SERVICE CARD

NO WASTE

SQUEEG for the ATARI ST squeezes most files by 50 - 70%. Many are squeezed much more. It's especially good at those big space wasters - graphics files. It can even squeeze and unsqueeze folders and other groups of files at once. Fast, efficient SQUEEG can PAY FOR ITSELF in greater disk space. Used by Antic Publishing for its subscription disk!

ORDER TODAY!
CHECK, M.O., C.O.D.

\$24.95
Dealer Inquiries Invited

Quack Computer Company
257 Robinson Avenue
Bronx, New York 10465
(516) 689-8738 © 1986

CIRCLE #153 ON READER SERVICE CARD

NEW for the ST -- only from MichTron

BBS 2.0 by Timothy Purves **\$79.95**

A Bulletin Board System that's full featured, easy to use, and affordable? Only from MichTron! *BBS* turns your computer and auto-answer modem into a full-blown electronic mail and message system!

- **Easy to set up:** Have it running within an hour!
- **Versatile message base** - Limited only by your disk space. Messages can be up to 99 lines long.
- **Up to 16 SIGs** - Each of 16 access areas has its own messages, upload/download area, and user access!
- **Multi-user capacity** - The operator and one caller can both use the *BBS* at the same time, independently!
- **Tracking Mode** - You can see your callers actions, and can even assist them from your computer!
- **Four Transfer Modes:** XMODEM, XMODEM-CRC, DFT, and ASCII file protocols.
- **Adjusts to callers** - Automatically adapts to most users' modem and terminal set-ups!
- **Practically self-maintaining** - It takes just a few minutes to update user logs and files.
- **System security** - Users are isolated from the system so that tampering and accidental hang-ups have no effect.
- **Call our *BBS*!** For a test run, call 313-332-5452.

MIGHTY MAIL by Timothy Purves **\$49.95**

If you sift endlessly through messy, out-dated customer lists, then spend hours typing mailing labels, *Mighty Mail* is a dream come true. It sorts and prints all your customer lists and labels. You'll save enough with your first zipcode-sorted bulk-mailing to pay for the program!

- **Easy to use** - GEM's pulldown menus make it simple.
- **Mailing labels** - Make labels of almost any size.
- **Full-sized reports** - Get up-to-date mailing lists. You can even create your own personal phone book!
- **16 user-definable flags** - Each entry has its own set of conditional flags. Use them to mark mailing classes or a customer's special interests.
- **Versatile sort and select** - Use alphabetic ranges, flags, and the data itself to print any range of entries.
- **Visual layout system** - To design custom reports, just position data fields with the mouse, stretch them to the desired length, and print! It's all done graphically!
- **Maintains any address base** - Limited only by disk size, *Mighty Mail* stores up to 1,400 addresses on a single-sided disk, or over 65,000 on a hard-drive!
- **And more** - Deletes redundant entries, retrieves report layouts, prints to disk files, and even makes test labels.

MichTron Utilities by Timothy Purves **\$59.95**

What would a tool be worth that could turn back time and end frustration? Before you find out that such a tool would be priceless, prepare yourself with *MichTron Utilities*. This program lets you recover lost data, repair damaged disks, and change bytes on your disks or hard drive.

Take complete control of your disk files:

- **Change file contents** - Edit individual bytes of information to patch or debug programs and files.
- **Change file names, volume names, and attributes**
- **Copy or verify individual sectors**
- **Restore deleted files** - As long as they're not physically overwritten, your file can be reconstructed.
- **Recover data from damaged disks** - Flip through the disk data and click on the mouse to accept or reject it.
- **Repair damaged disks** - Reformat affected areas without harming the rest of the disk.
- **10-sector format utility** - Add up to 80k to disk space.

And other fine programs by Timothy Purves:

DOS SHELL (\$39.95) Replace the Desktop with a more effective system! *DOS Shell* mimics the MS-DOS command structure, known for speed and power. Supports full file handling, wildcards, batch files, and more!

ECHO This wireless remote-control system takes control of lights and appliances. Unique schedule system even considers weekends & holidays. Software only: \$39.95. With X-10 master controller (required): \$99.95.

DFT (\$49.95) With this utility and a null-modem cable, you can transfer files between your Atari ST and IBM PC almost effortlessly. (Optional null-modem cable \$19.95)

M-DISK (\$39.95) Our RAM-disk emulator gives you the equivalent of an extra disk drive! It's faster and tougher than a hard drive, at only a fraction of the cost!

SOFT SPOOL (\$39.95) Stop waiting for the printer to finish its task; this software print spooler lets your ST print and compute at the same time!

All reasonably priced, with more coming every day. Ask for our latest catalog!



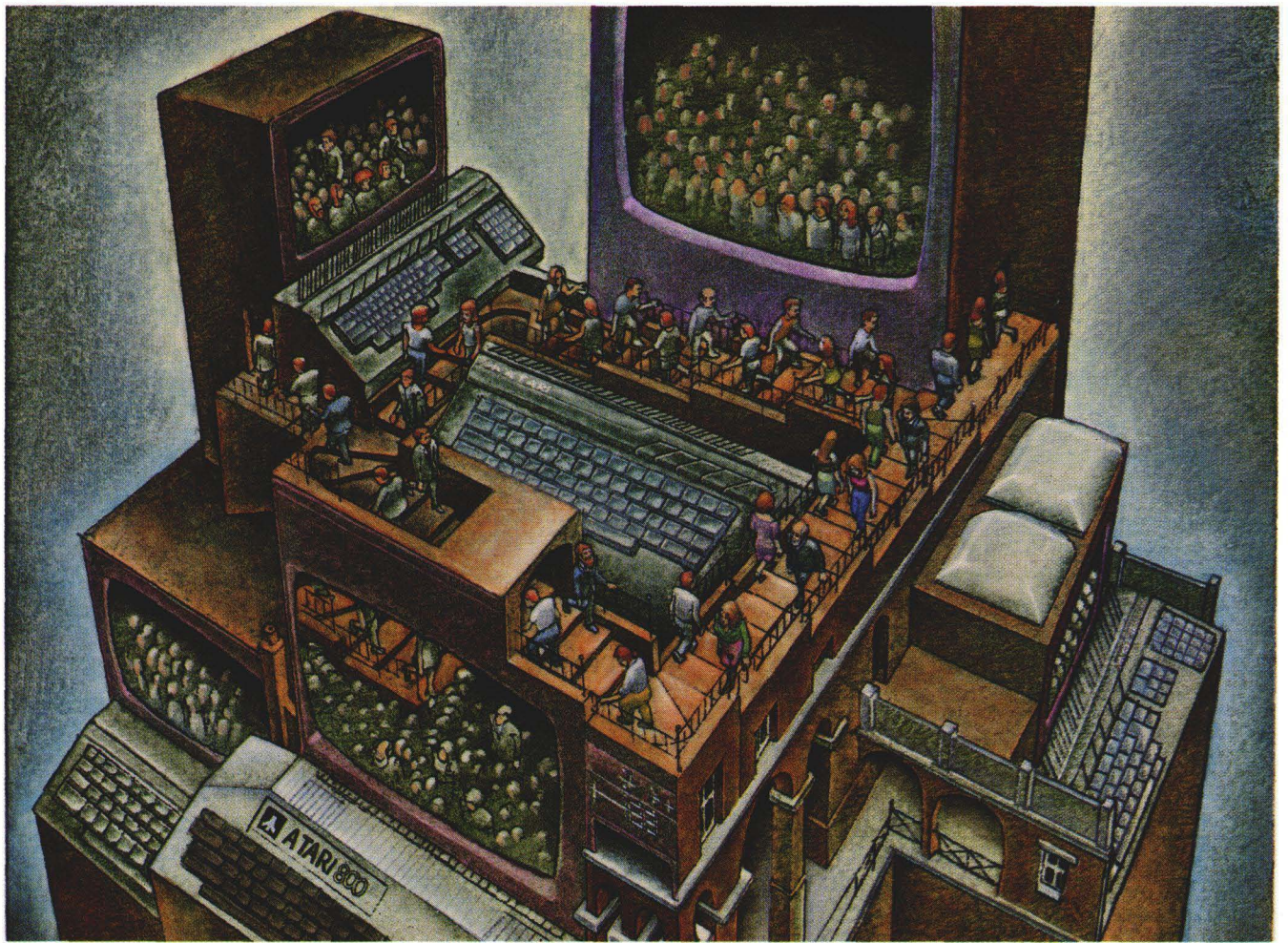
Dealer inquiries welcome • Visa and Mastercard accepted • Add \$3.00 shipping and handling to each order.

MichTron

576 S. TELEGRAPH, PONTIAC, MI 48053
ORDERS AND INFORMATION (313) 334-5700



CIRCLE #154 ON READER SERVICE CARD



USE THE BRAINS YOUR ATARI WASN'T BORN WITH.

Right at your fingertips in CompuServe's Atari® Forums.

Our Atari Forums involve thousands of Atari users worldwide. These forums show you just how easy and how much fun it is to get the most from your Atari computer.

The **Atari 8-bit Forum** provides the chance to talk with Atari enthusiasts on all levels. You'll learn all kinds of useful information from all kinds of interesting people. It's the leading national Atari Forum.

Devoted exclusively to users of the ST-series, the **Atari 16-bit Forum** provides programs, textfiles, assistance, product reviews, transcripts of online conferences and more.

The **Atari Developers Forum** is the authorized distribution area for all updates to Atari's registered software developer's kit for both the 8-bit and 16-bit

Atari Computers. Members may access conferencing channels, data libraries, free programs and software.

Easy access to free software.

- Download first-rate, non-commercial user-supported software and utility programs.
- Take advantage of CompuServe's inexpensive weeknight and weekend rates (when forums are most active, and standard online charges are just 10¢ per minute).
- Go online in most major metropolitan areas with a local phone call.
- Receive a **\$25.00 Introductory Usage Credit** when you purchase your CompuServe Subscription Kit.

Information you simply can't find anywhere else.

Use the Forum Message Board to exchange mail with fellow members. Join ongoing, real-time discussions in a Forum Conference with Atari luminaries like Sam Tramiel and Bill Wilkinson. Scan Forum Data Libraries for free software, documentation and contributions from Atari enthusiasts.

Enjoy other useful services too, like electronic editions of your favorite magazines, newsletters and articles, including ANTIC, Family Computing, OMNI Online, and Electronic Gamer.™

All you need is your Atari computer and a modem... or almost any other personal computer.

To buy your CompuServe Subscription Kit, see your nearest computer dealer. Suggested retail price is \$39.95. To receive our free brochure, or to order direct, call 800-848-8199 (in Ohio, call 614-457-0802). If you're already a CompuServe subscriber, just type GO ATARI at any ! prompt and see what you've been missing.

CompuServe®

Information Services, P.O. Box 20212
5000 Arlington Centre Blvd., Columbus, Ohio 43220

800-848-8199

In Ohio, call 614-457-0802
An H&R Block Company