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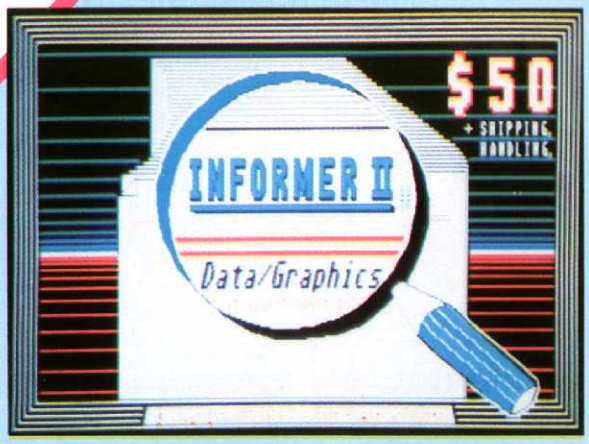

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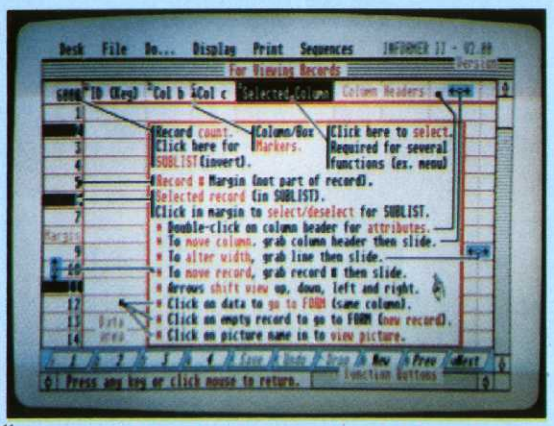

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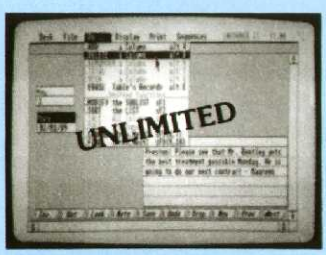

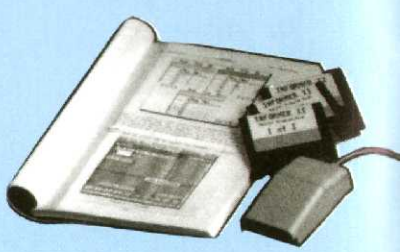

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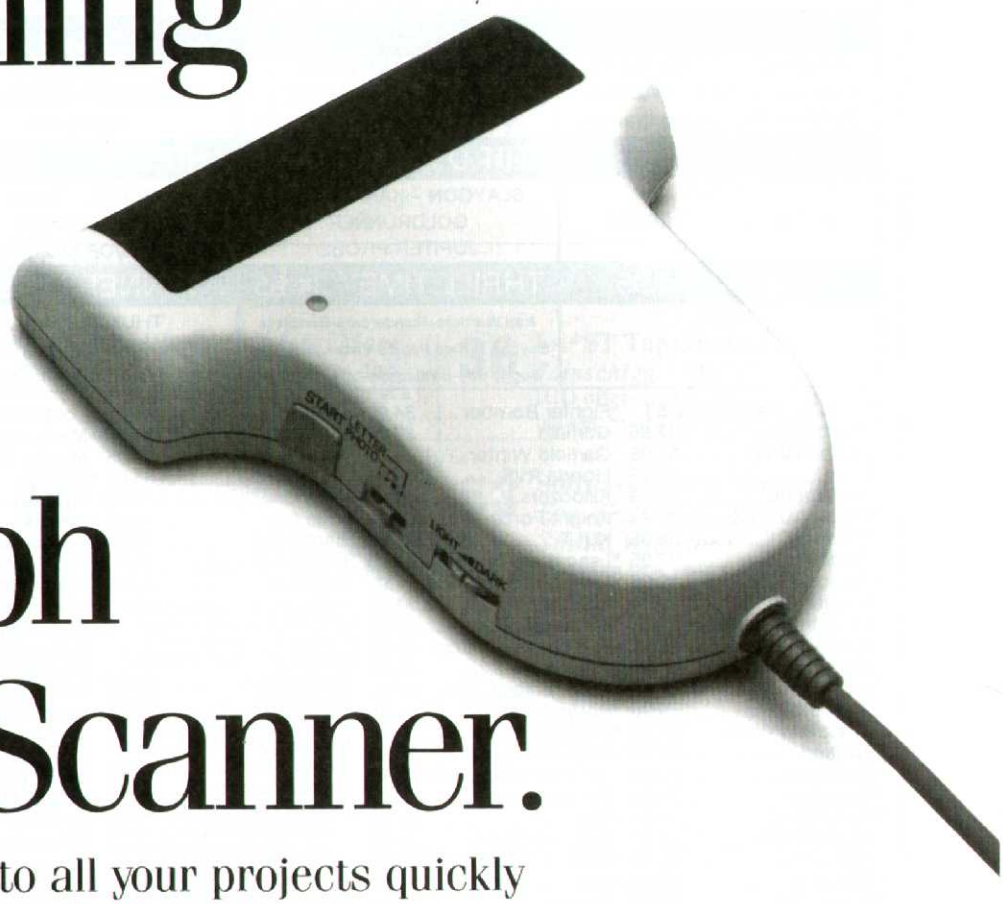

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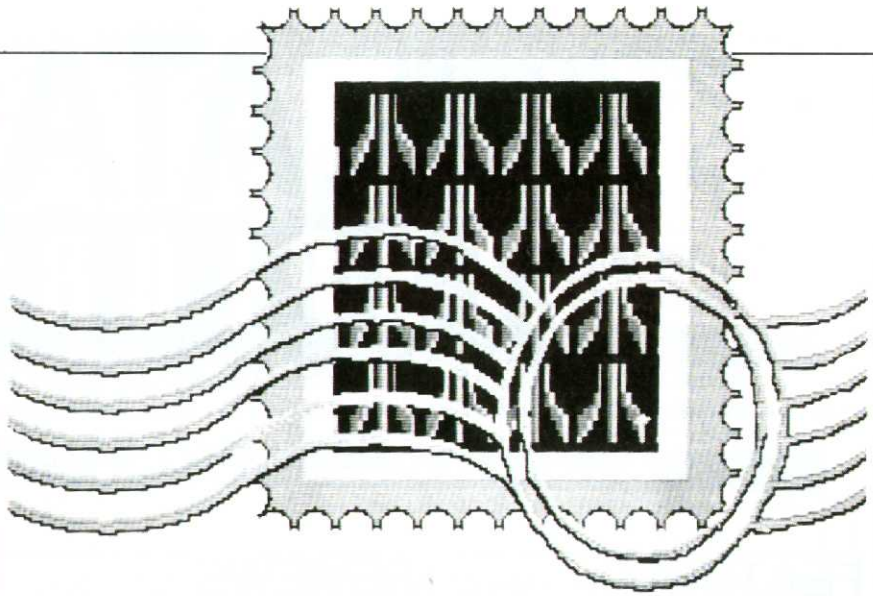


Letters To The Editor

A Computer FirST

Dear Editor:

I have subscribed to your publication for some time now, and I have enjoyed almost every issue—particularly Graphics Gallery and Software Survey.

It is because of your review of *Word Writer ST* that I purchased that fine program. I think the magazine is great and I will continue to trust and to use your fine reviews.

The only complaint I have (you can't please all the people) is that you are devoting more and more space to the musical side of the ST. Please don't forget that the Atari ST is, after all, a computer first and a MIDI interface second. Not everyone is musically inclined.

Please keep up the good work; I hope to be reading *Atari Explorer* for many years to come.

John Walker
606 E. Pleasant Run Rd.
Cedar Hill, TX 75104

Help Key Hinders

Dear Editor:

The 8-Bit Help Key, Copying Text on page 80 of the September/October 1989 issue is quite helpful but inaccurate in the comment on scrolling the screen. An article with diluted facts or shallow research hinders (no, sets back) the utility of our machines. Thank God, your publication/staff is more diligent than others.

COPY works the same for all devices. Using the E: device, COPY simply writes a file into a buffer upon a RETURN and transfers the buffer contents to another file with a Control/3 (end of file) signal. Therefore, the scrolled screen is retained.

A RETURN is needed to accept information. In other words, if AAAAAAAAA is keyed in and you then wish to insert ZZZZZZZZ ten lines below, you must close each logical line, whether empty or keyed in, with a RETURN. Three full screen lines is the limit prior to a carriage return.

This feature can be used as a built-in word processor. It will append files, too.

On another note, Peter Kelley has done a superb job in replacing the *Calamus* documentation with his "Calamus in Wonderland" in the same issue. He notes that *Calamus* does not support PostScript. I note that, given recent announcements by Apple and IBM, it won't need to.

On yet another note, the person who included a space for comments in your Reader Survey deserves a pay raise.

Still another note . . . I urge *Explorer* to publish a musicians' issue. Thank you for a fine magazine, which improves with each issue.

George Tashjian
31 University Lane
Methuen, MA 01844

Point of View

Dear Editor:

For nearly three years, I have enjoyed *Explorer* and found it to be a most helpful tool in understanding my computer and its uses.

It is truly a pleasure to find *Explorer* in my mailbox, and it gets read cover-to-cover. The reviews are wonderful and have been a decided influence on my software and hardware decisions. (Even though I've been using *1st Word Plus* v.3.14 for months, I learned some new tricks by reading Edmund Mann's review!)

And while I'm not the programming type, I make it a point to read *anything* John Jainschigg writes; what a wonderful sense of humor, and I'm sure the technical stuff reaches those who understand it.

I wrote to *Explorer* many months ago, complaining about service and customer support by both dealers and Atari Corp. Since then (not because I complained, I'm sure), I've seen at least one Atari dealership (Computer Works, Glendale, AZ) really come to life, expand its product, service, and customer support, and genuinely work at making me feel as though my business were necessary and appreciated. (Overnight service to repair a "lightninged" Mega 2, for example.) I don't feel orphaned anymore.

On another subject, *Notator* is, without a doubt, the finest musical notation/print management system going. It's complete, works flawlessly, is very expensive (which it should be), and is *copy-protected*. The C-lab manual states rather simply that if I lose my key, I buy a new program. I agree with that.

This humble computer beginner has become a devoted fan of the protected program. I talk every day with people who use or own IBM-compatibles, and it amazes me how proud they are that they have thousands of dollars worth of software, which they "got from a guy" at school or the office, installed on their hard drives.

Piracy, counterfeiting, whatever the choice of label, it is stealing, and I don't understand why programmers are so reluctant to protect their stuff. It's no big deal to have to install a dongle, or keep a master disk in the default drive. (Are we really *that* lazy?) I truly hope that software marketers take another look at copy-protection to keep the value of their products at a fair level for all.

Finally, I have some programs that are not public domain, but were published by companies that are no longer in existence. I have several friends who could benefit from such programs as *MaxPax*, written by Mark L. Ostlund and distributed by SoftWerx. My attempts at finding both author and publisher have proved futile.

Programs that were distributed by now-defunct magazines have also been very useful to me and would be equally

so to newcomers to the ST community, but the magazines are nowhere to be found and the programs unavailable.

Is someone somewhere legally making such programs available? If not, a "licensing service" is waiting to be born. What a shame to have all that great programming just sitting around not being used.

Keep up the wonderful work with a great magazine. Subscription renewal is forthcoming.

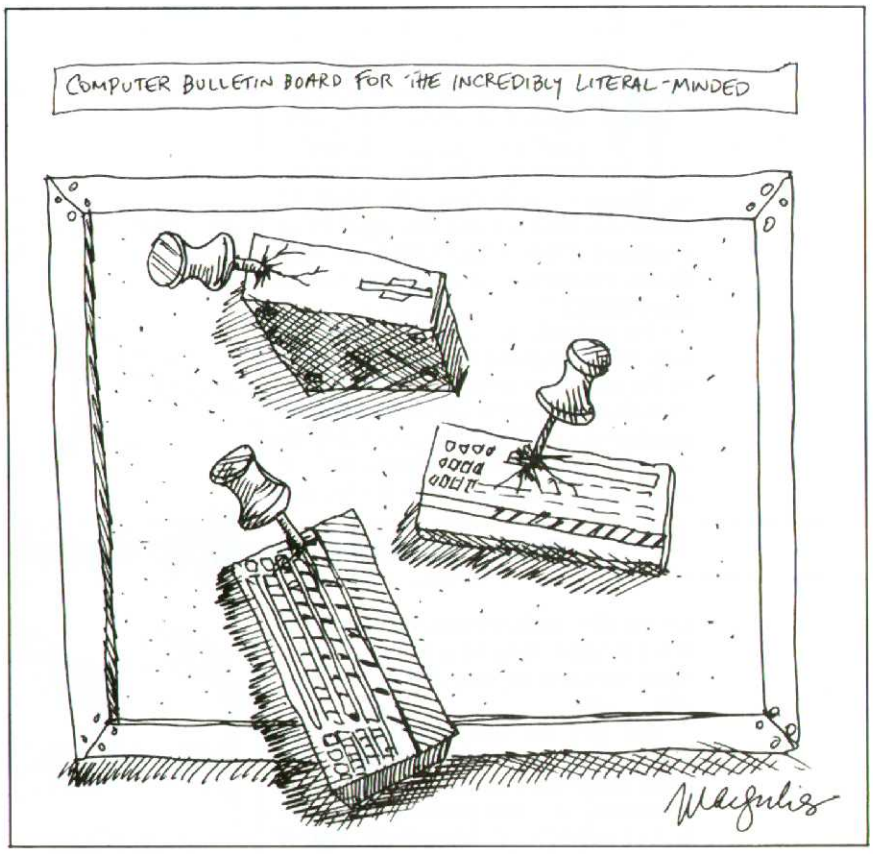
Johnny Harris
4057 E. Karen Dr.
Phoenix, AZ 85032

Formattr Correction

Gregg Hesling, author of the Formattr program, which appeared in the September/October issue of *Atari Explorer*, writes that he has discovered a small bug in that program.

In line 130, X=INT (VTOC2/256) must be changed to Y=INT (VTOC2/256). In addition, both of the X's that appear in line 140 must be changed to Y's.

This error, says Gregg, affects only dual-density disks running on Atari 1050 drives. ■



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EDITORIAL

Desktop publishing: The need for standards

By BETSY STAPLES

We recently received a press release announcing the publication of a newsletter specifically for desktop publishers. "Great," we thought, "now that any Atari ST owner can turn himself into a publisher overnight, there is truly a need for standards, guidelines, and general how-to information."

Our enthusiasm was short-lived. The very first column of the very first article in the very first issue of the newsletter contained a minor misspelling (*MacIntosh*) and a cliche. The second column contained a typographical error and another, more significant misspelling (*it's* for *its*). One of the three sentences in the third column boasted a lack of agreement between subject and verb (*Articles . . . is*).

The text on the remaining seven pages of the newsletter featured sentence fragments, more cliches, run-on sentences, incorrect punctuation, more lack of subject-verb agreement, lack of pronoun-antecedent agreement, and more misspellings (When we saw *ameteurish*, we thought, "You said it; we didn't!" Nor was the overall style of writing professional or even agreeable.

Then there were the twin considerations of layout and design—the very things with which this editor was purporting to be able to help budding publishers. The article on the first page was set "ragged right"—not justified along the right-hand margin—with neither extra vertical space (lead) nor indentations to mark the starts of new paragraphs—quite confusing.

Three other articles added varying amounts of lead between unindented paragraphs set ragged right, and the remaining two were right- and left-justified with both extra lead (allocated inconsistently) and paragraph indentations. The best way to describe this mishmash was "style-less."

One of the latter pieces suffered from the additional curse of justification-without-hyphenation, which causes short lines to be spread out with far too much space between letters and words to avoid having to break (hyphenate) long words.

Another minor annoyance was the inconsistent use of quotation marks. Setting aside the question of correct usage, anyone with the chutzpah to tell you how to be a publisher ought to be able to make his quotation marks face in the proper directions: "like this"; "not like this."

And if that weren't distracting enough, two articles used quotation marks that didn't face in either direction—the straight-up-and-down kind that typewriters and computer printers normally produce.

The point we are trying to make here is not that we are the world's best editors; we make mistakes, and we know it. You don't have to send in a list of all the errors you find in this issue to convince us of our fallibility.

The point is, rather, that we take our responsibility to the English language seriously, and we wish other editors and publishers—whether traditional or desktop—would do the same. We know that most Americans revere the printed word to the extent that almost anything that appears in print can be used as a reference, and we want the references we create to be correct. We don't want you to start believing that if you write "Articles . . . is" no one will question your level of intellect or education.

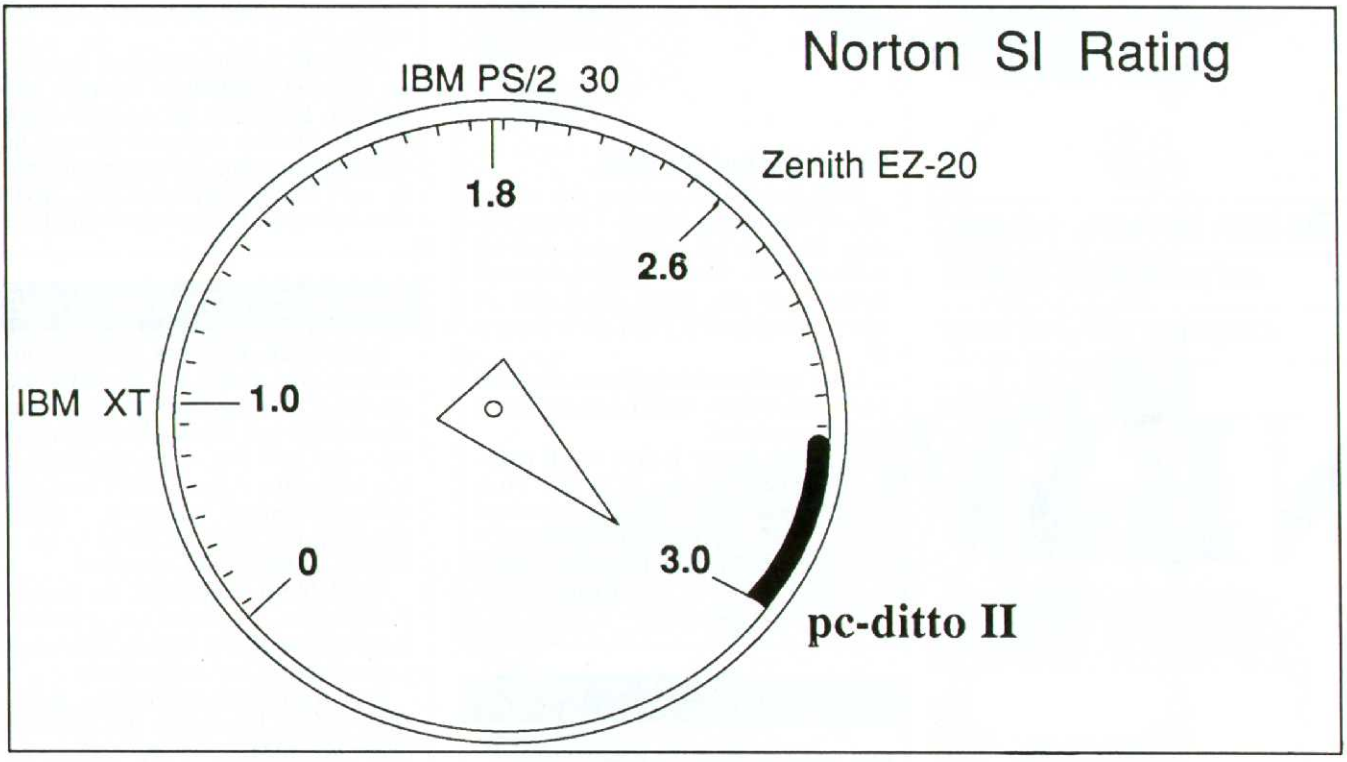
Nor do we want you to believe that you have to be an English or journalism major to qualify for a position on the staff of your user group newsletter. What we want is to encourage you to recognize your limitations. If you never check to see whether your subjects and verbs are in agreement, if you never "waste" precious writing time casting about for just the right word, if you never look up a word in a dictionary or use a spelling checker on your work, you should probably ask someone else, who has demonstrable facility with the English language, to look over anything you plan to distribute to more than three of your closest friends.

Desktop publishing has made it possible for millions of people, whose literary forays were, heretofore, limited to mimeographed Christmas letters, to spread their views and their unique spellings abroad and beyond. Anyone who can afford a computer, a printer, and few pieces of software can publish a newsletter, magazine, or catalog.

If you have a yen to become a desktop publisher, we urge you to assume the responsibility that has been incumbent on publishers since Gutenberg's day to preserve the integrity of your language. A little (human) knowledge, reinforced by a lot of (computer) power, can be a dangerous thing for future generations of English speakers and writers. ■

pc-ditto II

By Avant-Garde Systems



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NEW Products

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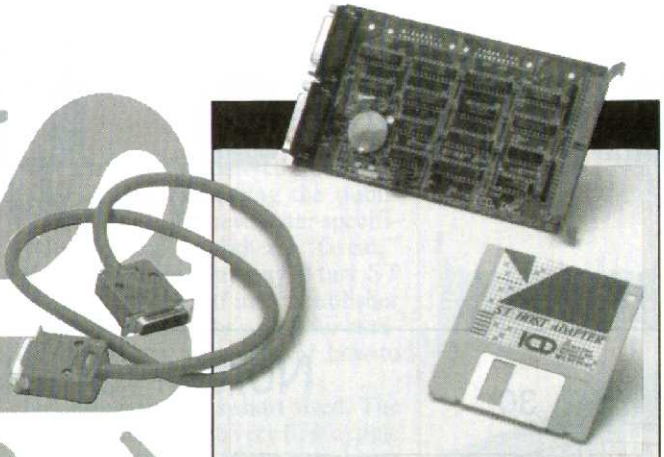


ICD Upgrades Hard Disk Booter

ICD announces version 4.0 of the FA-ST Hard Disk Booter. The new version includes an intelligent caching scheme that allows "unprecedented speed" for any hard drive system equipped with an ICD ST Host Adapter.

User-configurable buffers cache both reads and writes. AHDI 3.0x structure is also supported.

The new booter is free to all registered owners of the ICD ST Host Adapter via Genie (m475;3 download area 22), Compuserve (ATARIVEN DL1), or the ICD BBS (815-968-2229).

ICD, 1220 Rock St., Rockford, IL 61101, (815) 968-2228.

High-Speed Dot Matrix Printers

Brother International has announced four high-speed dot matrix printers designed for word processing and desktop publishing applications.

The M-1824L 80-column and M-1924L 136-column versions of the new 24-pin printers offer top printing speeds of 337 cps in 15-pitch draft, 270 cps in draft elite, 225 cps in draft pica, and 90 cps in LQ pica. High-resolution graphics are achieved through the 360×360 dpi graphics output capability.

Nine fonts are built in. They include Brougham, Prestige, Quadro, and OCR-B 10. An optional font card offers 12 additional fonts. The printers emulate the IBM ProPrinter X24, Epson LQ-850, and Diablo 630. Both 24-pin printers offer a 24K buffer and 64K RAM and are equipped with both serial and parallel interfaces.

Also available are the M-1809 and M-1909 9-pin printers. The M-1809 sells for $549, the M-1909 for $699, the M-1824L for $749; and the M-1924L for $949.

Brother International, 200 Cottontail Lane, Somerset, NJ 08873, (201) 981-0300.

MIDI Processor

The Pelican MIDI Processor from Future Music can be used in a variety of configurations, including a 1-by-2 MIDI Thru box, two independent channel/event processors, and a MIDI merge box.

Features include half-rack mount in an optional Roland or Yamaha rack adapter, battery or AC adapter operation, foot-switch control of Merge On/Off programming, full programmability with battery-backed RAM, MIDI data indicators for system troubleshoot-

PRODUCTIVITY SOFTWARE

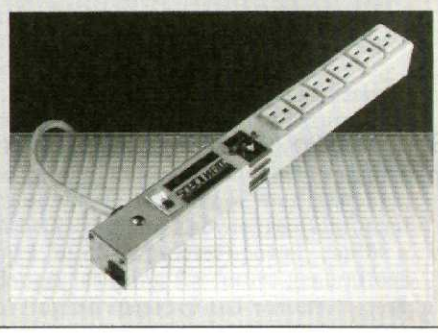
Scan-Tech Business Systems announces the *Aladin 3.0* emulator and *Aladin Exchanger*, which allow your Atari ST to run Apple Macintosh software and read and write Mac disks. It can utilize the Atari SH204 hard disk drive and contains many printer drives, including the Atari SLM804 Laser at 300 dpi. MIDI is also supported.

Available to complement the *Signum 2* document processor are *Headline Generator* and *Font Maker*, with which you can create and re-size fonts.

Scan-Tech Business Systems, #216-8204-104 St., Edmonton, AB T6E 4E6, (403) 446-1337.

Personal Database Applications has released *Personal Music Librarian*, a private music collection management system for the Atari ST. User-defined fields add flexibility, and up to 20 pages of notes can be appended to each entry. Available reports include album listings by category, title, or artist; and song or selection listings by title, artist, or category. User-defined reports can also be created. $55.

Personal Database Applications, 2634 Meadow Bend Ct., Duluth, GA 30136, (404) 242-0887.



ing, high-visibility lighted display, two independent inputs with processing, and MIDI Thru port/auxiliary output.

The channel processor allows the user to change any MIDI channel to any other, block all data on any one channel, or pass only data on any one channel (for Omni devices). At the same time, it is possible to filter specific types of MIDI data individually. The system sells for $149.

Future Music, Box 1090, Reno, NV 89504, (800) FOR-MIDI.

Neocept announces *WordUp 2.0*. New features include importation of GEM metafile images; hanging indents; support of 360×360 dpi 24-pin printers; scalable fonts; foreign and extended character set support; mail merge support of *Regent Base* and *The Informer;* and additional memory available to 520ST users. Among the more notable of the 26 bug fixes announced are: "No more crashing with graphics"; correct buffering of command and shifted keystrokes; correct display of .IMG images larger than 32K; and no more crashes when deleting entries from the glossary or when adjusting tab stops or formatting with multiple windows.

The press release that announces the upgrade is dated August 29, 1989, and was received by us in mid-September. The accompanying flier stipulates that owners can obtain the update for $20 in four to six weeks until August 6. After August 6, which it obviously was even at the time the press release was mailed, the update costs $30 and takes eight weeks to arrive at your door.

Neocept, 547 Constitution, Unit A, Camarillo, CA 93010, (805) 482-4446.

Shareware Info

Computer Publications Unltd. announces *The Atari ST Public Domain and Shareware Primer*. The book, which sells for $12.95, includes listings of ST programs with descriptions, system requirements, and author information.

Also available from CPU is a monthly newsletter devoted to public domain and shareware programs for the Atari ST. "The Shareware Connection" includes reviews, columns, and interviews focusing on this growing sector of the Atari software market. Subscriptions are $12 per year.

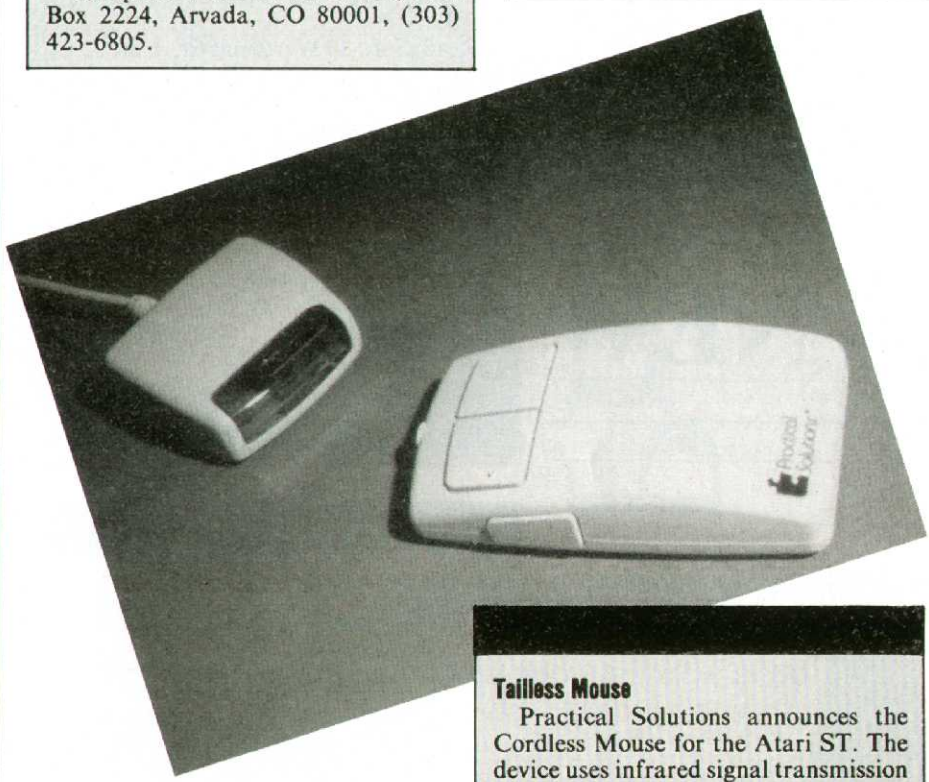
Computer Publications Unltd., P.O. Box 2224, Arvada, CO 80001, (303) 423-6805.

Music Software Catalog

Electronic Courseware Systems has released a catalog of instructional software, which includes 15 new products.

Programs cover tonal memory, music theory and note reading, instrumental techniques, language arts, social studies and geography, math and science, and computer science. Material is presented in game, tutorial, drill-and-practice, and testing formats. Classroom aids for teachers are also available. There is no charge for the catalog.

Electronic Courseware Systems, 1210 Lancaster Dr., Champaign, IL 61812, (217) 359-7099.



Tailless Mouse

Practical Solutions announces the Cordless Mouse for the Atari ST. The device uses infrared signal transmission technology to allow users to issue commands from up to five feet away from the base receiver.

Using an 8-bit, 12MHz CMOS cpu, the Cordless Mouse provides a high-resolution of 200 cpi and a tracking speed of up to 600mm/sec. No special gridplate or mousepad is required.

The Cordless Mouse carries a suggested retail price of $129.95.

Practical Solutions, 1135 N. Jones Blvd., Tucson, AZ 85716, (602) 332-6100.

Surge Protection

Advanced Electronic Systems announces the Stedi Watt Diagnostic Power Refinery. The unit boasts a "little blue button," which, when pressed, provides information on the integrity of any outlet.

Once outlet integrity has been assured, the industrial grade triple mode surge/noise protection takes over to protect hardware and date from surges, spikes, noise, and other forms of AC power pollution. Other features include a resettable circuit breaker, lighted master foot switch, triple insulated six-foot cord, aluminum alloy casing, and option RJ11 modem/fax protection.

The model 618, pictured here, sells for $99.95.

Advanced Electronic Systems, 2005 Lincoln Way East, Chambersburg, PA 17201, (717) 263-5681.

NEW Products

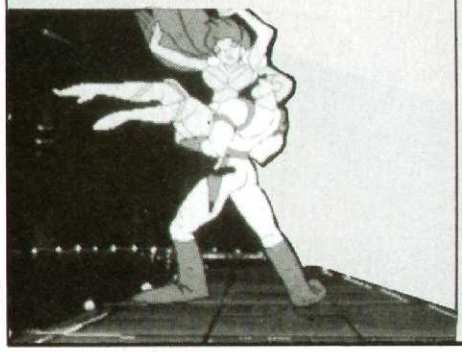
ENTERTAINMENT SOFTWARE

Britannica Software announces *Eye of Horus*, an arcade game set in ancient Egypt. You are Horus, son of Isis and Osiris and heir to the Egyptian throne. Your quest takes you through a series of mazes consisting of chambers and mystical elevators as you search for the amulets you will need to defeat the evil one who has usurped your throne. $39.95.

Britannica Software, 345 4th St., San Francisco, CA 94107.

ReadySoft has released *Space Ace* a sequel to *Dragon's Lair*. Ace, Earth's greatest hero is being attacked by the evil commander Borf, who has kidnapped the beautiful Kimberly and is plotting to take over the planet. Only you can help Ace save the Earth. $59.95.

ReadySoft, 30 Wertheim Ct., Unit 2, Richmond Hill, ON L4B 1B9, (416) 731-4175.



Medalist International, which appears to be affiliated in some way with MicroProse, has released *Weird Dreams*, a game for the Atari ST that puts you in the subconscious mind of a hospital patient as he undergoes surgery. You encounter giant wasps, carnivorous rose bushes, a psychopathic lawn mower, and a little girl who is not all sugar and spice. Your success in confronting these unusual challenges directly affects the health of the patient on the operating table. $39.95.

Medalist International, 180 Lakefront Dr., Hunt Valley, MD 21030, (301) 771-1151.

Epyx has announced *Project Neptune*, an action adventure for the Atari ST. Set 150 feet deep in the North Sea, Project Neptune is a top-secret, covert operation that demands stealth and cunning as you assume the role of special agent Rip Steel. $34.95.

Epyx, P.O. Box 8020, Redwood City, CA 94063, (415) 368-3200.

Multi-Font Printer

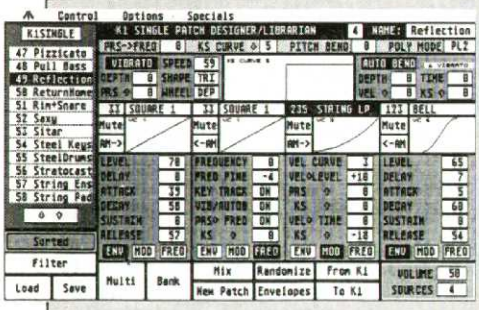
Star Micronics America has boosted the speed of its 9- wire dot matrix printer by 25% with the introduction of the NX-1000 II Multi-Font.

The new model offers NLQ text at 45 cps and draft output at 180 cps. Other features include four internal fonts, a 4K buffer and a paper-parking feature that allows users to feed single sheets without removing tractor-fed paper. The fonts—Courier, Sans Serif, Orator I, and Orator II—are selected from the front control panel. Italic printing is available in both draft and NLQ modes.

The NX-1000 II has a parallel interface and incorporates Epson LX-800 and IBM Proprinter II emulations. It sells for $299.

Star Micronics America, 200 Park Ave., Ste. 3510, New York, NY 10166, (212) 986-6770.

MUSIC AND MISCELLANEOUS



The *K1-VDS* Voice Development System from **Musicode** is an integrated editor, librarian, and sequencer for the Atari ST and Kawai K1 instruments. A sequencer is available from any point in the program, and new patches can be selected and parameter values changed while the sequencer is running. The sequencer also imports and exports standard MIDI files. $89.

Musicode, 5575 Baltimore Dr., Ste. 105-127, La Mesa, CA 92042, (619) 469-7194.

Personal MicroCosms announces *The Astronomy Lab*, a program for the ST that can produce movies that simulate a host of astronomical phenomena, charts that illustrate important concepts of astronomy, and printed reports that predict astronomical events. All movies, charts, and reports are customized for your location.

Personal MicroCosms, P.O. Box 33927, Northglenn, CO 80233, (303) 753-3268.

PostScript-Compatible Laser

Scalable fonts and complete control over graphics layout are available with the HL-8PS PostScript-compatible laser printer from Brother International.

The HL-8PS offers 300X300 dpi PostScript capabilities via BR Script, a proprietary PostScript interpreter. For applications that do not require PostScript capabilities, users can switch to HP LaserJet Series II emulation mode.

The new laser printer has 53 resident fonts in 11 font families. All fonts are fully scalable and rotatable. HP-compatible font cartridges can also be used.

The HL-8PS carries a suggested retail price of $4495.

Brother International, 200 Cottontail Lane, Somerset, NJ 08873, (201) 981-0300.

Scanners From U.K.

Scan-Tech Business Systems has signed an agreement with Signa Publishing in the U.K. to distribute all Signa's business products for the Atari ST.

The Hawk Colibri is a handheld scanner with a scan width of 105mm. It offers 100, 200, 300, and 400 dpi resolution with 8, 16, or 32 grey levels, and sells for under C$1000.

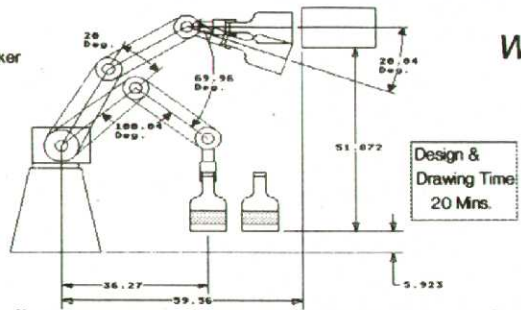
The Hawk 432 is a 200/300/400 dpi flatbed scanner that has an A4 scan width. It will scan a 400 dpi document in 14 seconds and sells for about C$2950.

The Hawk CP14, which sells for about C$2950, is also a flatbed scanner with 16 grey levels and A4 scan width. It will scan a 200 dpi document in 10 seconds. All of the scanners use the ScanSoft 2.61 software, which offers a full line of printer drivers, including one for laser printers.

The Augur OCR, an intelligent OCR for serious users, works with both the CP14 and the 432. It includes an editor bar, database facility, batch mode scanning, and many other features. It will process between 55,000 and 110,000 characters per hour, depending on the clarity of the original documents.

Other products to be distributed by Scan-Tech include the 1st CRP digitizing table, which comes in two sizes.

Scan-Tech Business Systems, #216-8204-104 St., Edmonton, AB T6E 4E6, (403) 446-1337.



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New and Improved

Need to know the latest version of a software package? Find it here.

Software packages are constantly being enhanced by their publishers to add features, fix bugs, and incorporate the latest technological advances. To derive the maximum benefit from your software investment, it is important to know what updates have been made to the packages you use. If you are not using the most current version of a package, contact the manufacturer to find out what enhancements have been made and what you must do to obtain the new version.

Working from information provided by the publishers themselves, we have compiled a list of the most current version numbers of many popular 8-bit and ST software packages and software/hardware products. Program version numbers are often found printed in the documentation, on the title screen, in a README text file on disk, or in an About . . . item in the left-most menu on the GEM desktop.

While every attempt has been made to make this list as comprehensive as possible, we realize that a few fine products may have been omitted. If you would like to see a specific program added to this list, please send your suggestion to New and Improved, *Atari Explorer*, 7 Hilltop Rd., Mendham, NJ 07945.

Note: we have not included entertainment and educational programs in this list because, as a general rule, these packages are not updated frequently.

•Bullets indicate new listings and program updates.

8-Bit Programs

Action, ICD/OSS	3.6
Bank Street Writer, Broderbund	1.0
Blazing Paddles, Baudville	04422
•**Chipmunk**, Alpha Systems	3.04
ComputerEyes, Digital Vision	1.3
Desktop Performance Studio, Virtusonics	1.4
DOS XE, Atari Corp.	
Draper Pascal, Draper	2.0
Enhancements To Basic II, Hathaway Electronics	5.0
FlashBack, ICD/OSS	1.4
Guitar Wizard, Baudville	11602
Kyan Pascal, Kyan	2.02
MYDOS, Supra	4.3
MagniPrint II+, Alpha Systems	4.1
Parrot II, Alpha Systems	2.8
Print Shop Companion, Broderbund	1.0
Print Shop, Broderbund	1.0
Scanalyzer, Alpha Systems	3.6
SpartaDOS Construction Set, ICD/OSS	3.2D
Super Archiver, Computer Software Services	3.03
Super Archiver II, Computer Software Servs.	3.03EHN
Top-DOS Plus, Eclipse	1.5+
Top-DOS Professional, Eclipse	1c
Top-DOS, Eclipse	1.5a
Turbofile Micromiser	1.0
Turboword Plus, Micromiser	2.0

ST Programs

1st Word Plus, Prospero	3.14
1st Word, Atari	1.06
Accounting Series, Hi-Tech Advisers	2.10
APL.68000, Spencer Organization	6.05C
Aegis Animator, Aegis Development	1.2
Alice Pascal, Looking Glass	1.5
Animatic Animation System, Kinetic Microsystems	1.0
ASM 32, Memocom Development Tools	3.0
•**Astronomy Lab**, Personal Microcosms	1.05
Athena II, Iliad	2.0
Award Maker Plus, Baudville	23716
BBS Express ST, ICD/OSS	1.3
Beta-CAD, Beta-CAD	1.0
CAD 3D, Antic	2.03
Calamus, ISD Marketing	1.09
Church Manager, Hi-Tech Advisers	2.0
ComputerEyes Color, Digital Vision	1.32
ComputerEyes Mono, Digital Vision	1.0
Copy II ST, Central Point	2.5
Cyber Mate, Antic	1.1
Cyber Paint, Antic	2.0
Dac-Easy Accounting, Dac	1.0
Dac-Easy Payroll, Dac	1.0
Data Manager ST, Timeworks	1.1
DataTrieve, Abacus	E2.05
Degas Elite, Electronic Arts	1.1
dbMan, Atari	4.0
DigiSound, Alpha Systems	1.62
Disk Library, Classic Image	1.2
Dollars & Sense, Monogram	1.2
•**DynaCADD**, ISD Marketing	1.68
EZ Calc, Royal	1.33
EasyDraw, Migraph	3.0
Edit-8000, Savant Audio	1.3
Edit-DSS, Savant Audio	1.0
First CADD, Generic	1.1
Flash, Antic	1.6
FlashBack, ICD/OSS	2.3
Fleet Street Publisher, MichTron	2.0
Fontz, Neocept	1.11
Fortran for GEM, Prospero	2.151
Fuel-Pro, Hi-Tech Advisers	3.00
•**GFA Basic**, Antic	3.07
Hard Disk Accelerator, Beckemeyer Development	1.13
Hard Disk Toolkit, Beckemeyer Development	2.00
•**Hard Drive Turbo Kit**, MichTron	1.25
•**Informer II**, Soft-Aware	2.01
Interlink ST, Intersect	1.85
Inventory Manager, La Foret	1.2
Inventory Master, Royal	1.5
Inventory-Pro, Hi-Tech Advisers	4.10
LDW Basic Compiler, Logical Design Works	2.0
LabelMaster Elite, Migraph	1.0
Laser C, Megamax	2.10
Laser DB, Megamax	1.1
MT C-Shell, Beckemeyer Development	1.20

Magic Sac, Data Pacific	6.1	**ST Control**, Trio Engineering	1.5
Mail Merge, Regent	1.3	**ST Hard Drive Utility Disk**, Supra	3.37
Mail-Pro, Hi-Tech Advisers	4.0	**ST Sprite Factory**, Future Software Systems	1.1
Mark Williams C, Mark Williams	3.0.9	**ST-Replay**, MichTron	4.0
•**Master Link**, Intersect	1.2	**ST-Talk Professional**, QMI	2.0C
Master Tracks Pro, Passport Designs	3.4	**STAccounts**, ISD Marketing	2.0
MasterPlan, ISD Marketing	1.0	**Sales-Pro**, Hi-Tech Advisers	4.10
Micro C-Shell, Beckemeyer Development	2.74	**Sales-Pro Plus**, Hi-Tech Advisers	4.10
Micro RTX Developer Kit, Beckemeyer Develop.	1.13	**Solapak**, Solar Powered Software	3.0
Mighty Mail, MichTron	2.1	**SQL Database**, Regent	11/27/88
Modula 2, Jefferson	1.5	**SuperBase**, Precision	1.049
Multi-Manager Professional, New World	1.6	**SuperBase Professional**, Precision	2.03
Multi-Manager, New World	1.0+	**Super Sales-Pro**, Hi-Tech Advisers	4.10
Navigator, Antic	2.0	**SwiftCalc ST**, Timeworks	2.0
NeoChrome, Atari	1.0	**SwitchBack**, Alpha Systems	2.0
PC-Ditto, Avant-Garde Systems	3.01	•**T-Basic**, Dr. T	1.0
Partner ST, Timeworks	1.0	**The Chameleon**, Future Software Systems	1.0
Pascal for GEM, Prospero	2.151	**Thunder**, Electronic Arts	1.32
Payroll Master, Royal	2.151	**Touch-Up**, Migraph	1.52
Personal OS-9/ST, Microware	2.3	**True Basic & Run-time**, True Basic	2.0
Personal Pascal, ICD/OSS	2.05	**Turbojet**, Neocept	1.20
Phasar, Antic	3.0	**Turbo ST**, Softrek	1.4
Power Print, Alpha Systems	2.1	**Tweakit**, Savant Audio	1.4
Print Master Plus, Unison World	1.61	**Ultra-Speed Plus**, Computer Software Services	1.5
Professional OS-9/ST, Microware	2.3	**Unispec**, Trio Engineering	1.11
Prospero C, Prospero	1.141	•**Universal Item Selector**, Application & Design	3.0
Pro Text, MichTron	4.0	**Utilities Plus**,MichTron	1.1
Publisher ST, Timeworks	1.11	**VIP Professional**, ISD Marketing	1.2
Publishing Partner, SoftLogik	1.03	**Video-Pro**, Hi-Tech Advisers	4.0
Regent Base 2, Regent	12/18/88	**Word Writer ST**, Timeworks	2.01
Regent Word 2, Regent	9/14/88	•**WordPerfect 4.1**, WordPerfect	8/18/89
Regent Word Student, Regent	9/14/88	**WordUp**, Neocept	2.0
Revolver, Intersect	1.1	**Zoomracks II**, Quickview Systems	1.0

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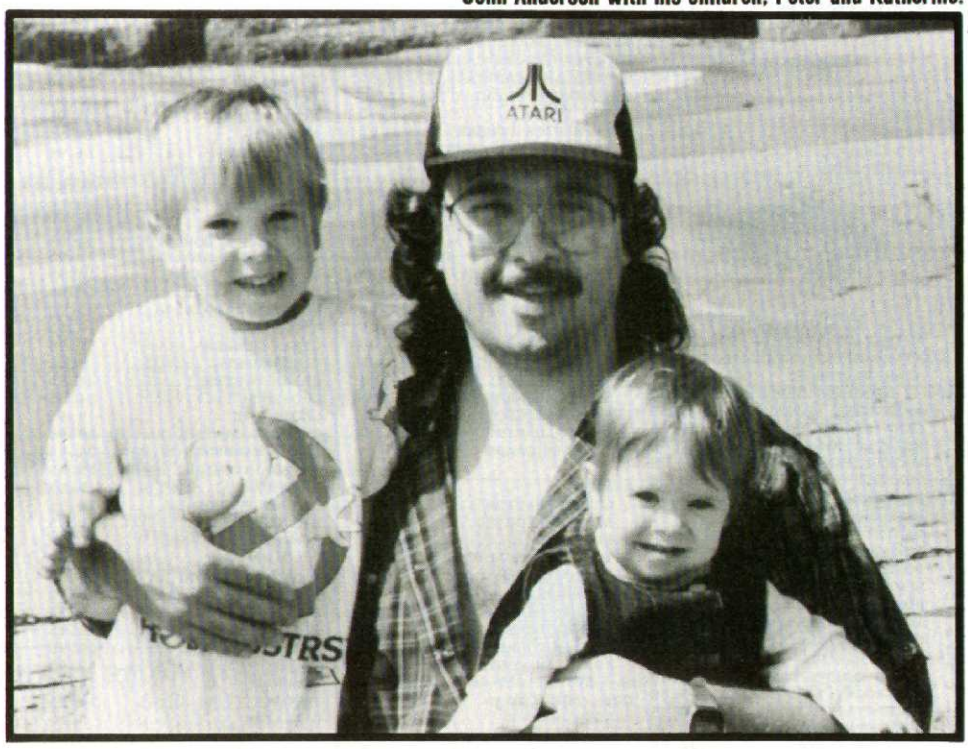
John Anderson with his children, Peter and Katherine.



John J. Anderson

In memoriam

The personal computing community lost a good friend and one of its youngest visionaries on October 17, 1989. John Anderson was killed during the San Francisco earthquake when the car he was driving was crushed by the crumbling facade of nearby building. He was 32 years old.

Born in New York City, John was raised in Bergen County, NJ. He graduated from New York University.

He first made his mark on personal computing as associate editor of Creative Computing, joining the magazine in the spring of 1982. After Creative was folded in 1985, John moved to Florida to join the staff of Computer Shopper and later accepted the senior position on the editorial staff of MacUser that he held at the time of his death.

John leaves his parents, Mr. and Mrs. John Anderson of Cresskill, NJ, and his wife, Lauren Hallquist, and two children, Peter, 4, and Katherine, 1, of Bryn Mawr, PA.

A trust fund has been established for John's children. Donations, which will be matched by his employer, Ziff-Davis Publishing Co., may be sent to: Anderson Trust Fund, c/o Nancy Woods, Ziff-Davis Publishing Co., One Park Avenue, New York, NY 10016.

Friends and fans who wish to send condolences to his family may do so c/o Atari Explorer, 7 Hilltop Rd., Mendham, NJ 07945.

John Anderson came into my life as an unsolicited resume, a resume that just happened to arrive at a time when we were looking for a new associate editor for *Creative Computing*.

The sample program he brought to his interview was for the Atari 800. I don't remember what the program did, but it was obviously of sufficient quality to qualify him for the job.

He had purchased the 800, he frequently reminded us, shortly after the machine was introduced by Nolan Bushnell's Atari in 1979 ... "I am proud to consider myself a member of the small but outspoken group of Atari loyalists. It might not have happened that way but for my tenacity in purchasing an Atari 800," he wrote at the beginning of his review of the Atari ST.

"It was a habit of mine back in the spring of 1980: during my lunch hour, I used to walk over to a computer store on Lexington Avenue to play with the Apple II computer on display there. I was saving for an Apple and, in fact, had managed to cull $800 from my meager salary toward buying it. I was nearly halfway to the purchase price and beginning to get really excited.

"One fateful afternoon, however, my sentiments changed. For after a few rounds of monochrome Lunar Lander on the Apple, I noticed a new machine lying neglected in the corner of the store. I will try to reconstruct that conversation as best I can.

"'What's that you've got over there?' I asked the salesperson innocently.

"'Oh that's nothing. It's just the new machine from Atari. You know, the people who make Pong.'

"'Huh. Got anything to run on it?'

"'Not really. Just this space game.'

"He tossed me a ROM cartridge. I had never seen such a thing before. It took me a few minutes to hook the computer up and discover how to plug in the cartridge. No help was proffered. The salesperson obviously hadn't spent a solitary moment with the machine.

"I was immediately impressed with how simple the thing was to use. No cryptic commands, no ribbon cables hanging out the back, no disk directories to call up. I shut the cartridge door, and in a split second the title screen came up. *Star Raiders* was the name of the game. I picked up the joystick and began my love affair with the Atari computer.

"'How much is this?'

John poses with an automated arm wrestler on a Tokyo street during a trip to Japan for Tskuba Expo '84. World's Fairs were one of his many passions. That's editor Staples standing with him.

"'You don't want one of those. They won't last through the year, and then you'll be high and dry.'

"'How much is it?'

"'It's $800, but I'm not going to sell one to you. You want an Apple II, and I'm going to save you from yourself. The Atari is just a game machine . . . '

"Well, you get the idea. I literally had to force the guy to sell me an Atari 800, and he 'tsked' at me on sight for the next two years. But I had bought the most advanced personal computer available at the time. And it was not just a game machine."

Manning the Outpost

One of his first assignments at *Creative* was to assume command of the monthly "Outpost: Atari" column, and by the spring of 1983, John was secure enough in his position as resident guru to start dreaming in print—expressing some of the unusual foresight and frankness for which he would become known in the personal computing community . . .

"Last month I frankly shared with you my disappointment with some of the attitudes and decisions that have recently emanated from Atari. Some of my complaints had to do with the issue of compatibility: I felt Atari had blown it by not making its next-generation games machines compatible with its computers, as the categories are in fact beginning to merge, and in their hearts the 400 and 5200 are the very same machine. I suggested that Atari then compounded the error by creating a new computer [the Atari 1200XL] that isn't very compatible with its own predecessors. I went on to criticize Atari's apparent hostility to third-party hardware and software development for its machines."

A few paragraphs later, in a section called "The Thinking Man's Atari," he called for a redesign of the 1200XL, demanding compatibility with the 400 and 800, the return of controller jacks 3 and 4, 80-column capability, and a parallel port . . . "Let's face it, guys. We loyal fans might just want something a little hotter than an Okidata Microline 80 hanging off the side of our 1200 XLs . . . Oh, and the sight of an RS-232 serial port would bring tears to our eyes. But no, we shouldn't even suggest it to you. It would be too good—too generous—too thoughtful. Why, if you did that, we could attach the modem of our choice in much the way we hooked up our parallel printers."

He then urged his fellow Atarians to mount one of the first of the write-in campaigns for which you are still noted.

Notes to Jack

When the Tramiels took the ailing Atarian behemoth off Warner Communications' hands in 1984, John seized temporary command of the Outpost again, using the opportunity to speculate about the future of the company and to tell Jack Tramiel exactly what computerists were looking for . . .

"What do micro buyers want? Easy. The want 1000K RAM; 10Mb of hard disk space; 3-D color animated graphics with a resolution indistinguishable from broadcast TV; a built-in modem, laserdisc interface, and printer; stereo sound on a par with a Moog; and ease of use like a Macintosh. And they want it for $99.95." Does that sound anything like a machine you can buy from Atari today?

By BETSY STAPLES

An Occasional Kludge

But John didn't spend all of his time dreaming of the future of personal computing; he enjoyed some the more pragmatic aspects of his job too—like creating hardware projects for readers to undertake.

He made our electrical engineer publisher, Dave Ahl, cringe with such instructions as, "Using a closed pair of scissors or a reamer, enlarge the switch hole . . . ," but I guess he figured he knew what tools our readers were most likely to have on hand.

In fact, that closed-scissor instruction was part of John's most famous hardware project—the Home Brew Light Pen. How many of you tried to build that neat little device when it appeared in the March 1983 issue of *Creative*?

Those who did will remember the experience all too well, along with the apology that appeared in the May issue . . . "Though it was many years ago, I can still vividly remember my frustration. I was new to the Atari and starved for programming applications to help me get the most from, and learn the most about, my machine. And there I was, having typed in a program from a magazine for hours on end, to discover not only that it didn't run, but that it *couldn't* run as it was printed. Sometimes I would be able to institute my own fix, and other times I couldn't. Sometimes the magazine would acknowledge the problem in a subsequent issue and print a fix. Sometimes the flaw would never be addressed.

"As a lasting result of these trials, I try very hard to make sure that everything that makes it into this column is correct when it gets here. It is hard for me to prove that assertion right this minute, however, because of a reversed figure, dropped program line, and lack of attention to the unique features of the Atari 400 in the March home brew light pen column. This has caused a lot of consternation. All I can do is tender my sincere apologies, and set out the corrections . . . "

Consumer Advocate

In all his work with the computer press—in *Creative Computing*, *Atari Explorer*, *Computer Shopper*, *MacUser*, and the many other magazines which published his freelance articles—John was a staunch advocate of the reader/consumer. No amount of pressure from advertisers or superiors could make him praise a product he considered less than praiseworthy.

The example that comes to my mind first is his review of the long-awaited and highly-touted *Jazz*, an integrated software package for the early Macintosh. Entitled "Gall that Jazz," the review began: "Here's a riddle for you: What's worthy in its strategic concept and displays at least one intelligent and powerful feature, but is disappointingly weak in its execution, a case study in compromise, plagued by bugs and delays, obsolete at the time of introduction, and heinously overpriced? Well the MX missile may spring to mind, but unfortunately, so might Lotus *Jazz*. And after the mushroom cloud of expectation, hype, and brand-identification blows over, the fallout will begin; mark my words."

After detailing the shortcomings of the program, he ended with a plea: "Please make a mental note that the only computer magazine on the market today with enough guts to tell you the honest, unadulterated truth about Lotus *Jazz* is good old *Creative Computing*. And remember, even if you own *Jazz*, things could be worse—at least you haven't bought toilet seats from the pentagon."

Keep Computing Creative

Another pressure to which John Anderson refused to bow was the pressure to allow personal computing to become a strictly utilitarian activity. He had a vision for high technology in general and personal computing in particular—a vision that incorporated a better and more exciting quality of life.

For the tenth anniversary of *Creative Computing* he wrote on the future of the microcomputer industry as he saw it. The following quotes are from that 1984 article.

- "Though I have made my share of predictions, right and wrong, in this magazine and elsewhere, I have always tried to take an active hand in shaping the future, rather than just reporting on it."
- "Nowadays the big corporations have stepped in, and in direct parallel to the fledgling motion picture industry, one by one all the little independents are being squeezed out. The last true visionaries and entrepreneurs of the micro industry will soon be dispossessed. And the unimaginative, lumbering moguls will have the game to themselves. The products will no longer be born of inspiration, but by formula."
- "Pardon my wrench, but the search for standardization is to my mind so much turkey too-toos. Has MS-DOS really done that much for the industry? Even the best MS-DOS programmers will tell you that MS-DOS is mediocre and that its main claim to fame was to aid the popularization of the relatively mediocre piece of hardware on which it was designed. Better to abandon a standard, if you ask me, than to converge around a lousy one."
- "We will never abandon the basic tenets of the philosophy that David H. Ahl brought to this magazine: that using computers should be fun; that learning about computers, too, should be fun; that a magazine is needed that can make those enjoyable aspects obvious and accessible; that computer users should be supported with software applications, tutorials, and reviews; that 100% computer literacy should always be our goal; that we shall always 'call them as we see them'; that we will do our reporting with humor and intellect; . . . and that we will continue to display an ongoing commitment to human creativity with computers."

"I have always tried to take an active hand in shaping the future, rather than just reporting on it."

These are some of the highlights of my professional relationship with John Anderson—in his own words. We had a personal relationship, too, of course, but I won't get into that, because then I might cry. ■

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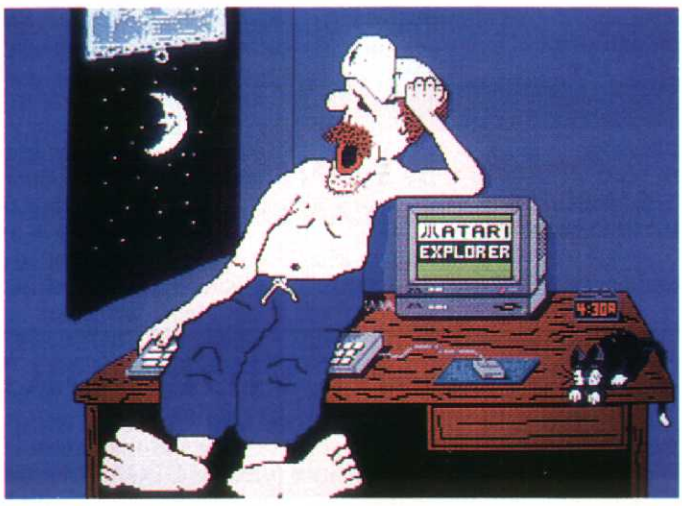
Eve (Suncom 8-bit) by Michael Lazarescu, Montreal, PQ.

Weather Map (Neo) by Dustin Stephens, Arlington, TX.



Playtime is Over (Neo) by James Cobb, Indianapolis, IN.

Fantasy Sunset (Neo) by Albert Ko, Los Angeles, CA.

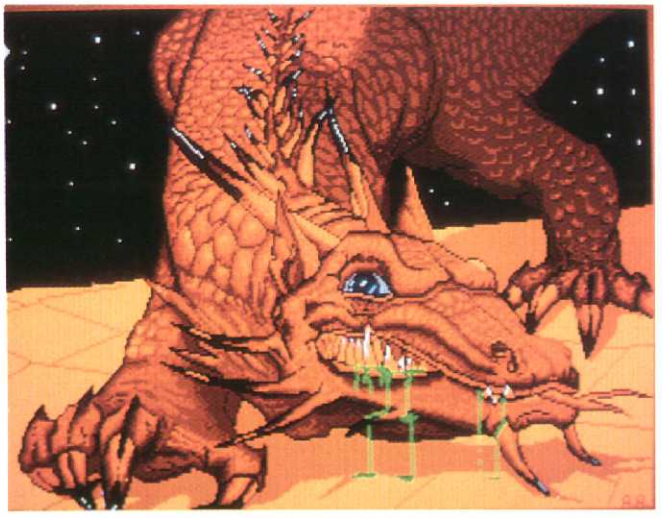
Entries for Graphics Galllery this issue came, once again, from around the world and covered a wide variety of subjects. Thanks, readers, for your entries.

We invite your entry in our ongoing contest, but *please abide by the rules.*

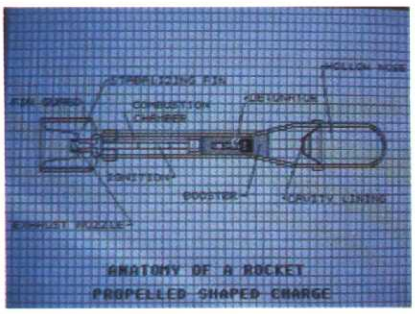
- You may use any package you wish to create your image. However, entries must be submitted in *NeoChrome*, *Degas*, or *Tiny* format.
- Print your name and address on a disk containing *one* or *two* entries. We will no longer accept disks full of images; *you* should make the initial cut to your best ones.
- Include a self-addressed, stamped envelope (# 10 size) with 45 cents postage for the return of your disk. We will return your disk with *ten new images.*
- Include on an 8½×11″ sheet of paper your name and address, the file name of your image, and the following statement: "I certify that the image submitted is my own personal work and that no portion was copied from any image belonging to another person or organization or from copyrighted printed or video material. I give *Atari Explorer* the right to print it, use it in promotional material, or distribute it via telecommunications service, BBS, or disk."
- Winners will receive a subscription to *Atari Explorer*. If you are already a subscriber, include an address label or copy so we can extend the correct subscription if you win. ■

By DAVID H. AHL

Cheeseburger (Degas) by David LaTour, Duluth, MN.



Red Dragon (Degas) by Arvid Arngrimson, Moose Jaw, SK.



Shaped Charge (Neo) by William Haddock, Aberdeen, SD.

At work (Neo) by Bob Morgan, Wichita, KS.

The Bug from Outer Space (Neo) by Randy Hoekstra, Richardson, TX.

Muffy: Soldier of Fortune (Degas) by Daniel Miller, Prince George, BC.

Killer Whale (Degas) by Andrew Nagata, Honolulu, HI.

Graphics Gallery

The author's portable planetarium features an image of the moon on-screen at left and a red-filtered computer display of the night sky at right. The moon globe atop the trunk aids in instruction.

A Portable Planetarium

Using a dedicated Atari 8-bit system as an aid to astronomical observation and instruction

Dedicated. Those of us who have remained loyal to the 8-bit Atari line are certainly not confused about the meaning of that word. Yet while our dedication to the less-powerful class of Atari computers seems sentimental to some, I hasten to remind them that the word has other, more pragmatic, meanings.

A *dedicated* computer, for example, is one that has been assigned a single task. The microprocessor in a wristwatch or microwave oven, though theoretically capable of more general purpose computation, is dedicated to serving the needs of the appliance in which it is installed.

Broader-based computing systems, too, are often dedicated to single tasks, though until recently, only science, heavy industry, and the military could afford the luxury of a devoting full-powered computer to only one job. The low price of current, "commodity" microcomputers, however, places efficient hardware within the grasp of budget-minded innovators. In fact, much computer equipment that could be put to good use in dedicated and special purpose systems lies fallow in closets and storage rooms, as users trade up to more powerful hardware.

Consider the inexpensive 800XL and 1050 disk drive that spend most of their time in a trunk in my garage. A waste of equipment? No, actually the unit is dedicated to doing one job—teaching astronomy—and doing it well.

The computer and drive are the heart of a portable planetarium and observatory. Whenever the moon is right, the old 8-bit is out at the local star party, attracting the attention of experienced amateur astronomers and on-lookers, alike. No dismantling of the family word processing or game center. No hookups to wrestle with in the dark. Just pick up and go!

Output of the system is to a pair of ancient, 8″ monochrome monitors, which also represent "obsolete" technology that continues to deliver.

By JOHN C. LaMONTE

On the screens are sharp images of the primarily black-and-white targets of astronomy. One screen displays the output of a surveillance-style video camera which is attached to a telescope. This is great for taking a peek at Saturn or the Jupiter system, but it is particularly effective for viewing our own moon. Craters and maria ("seas") show up beautifully, and several people can enjoy the view at once—no need to take turns at the eyepiece.

Planetarium

As fascinating as it is to see a real-time, telescopic image on the monitor, the second screen is the one that really holds star party guests spellbound. The second monitor is connected to the 800XL, which runs Deltron's *Planetarium* program.

Great to use at home, *Planetarium* is even more enlightening in the field, helping to make sense of the night sky above. Groups of stars plotted on the screen are, at the touch of a button, magically outlined and labeled. Planets can be located, and their motions traced.

Planetarium is also a functional database. Use the joystick to position the cursor over any object, and press the fire button. Information about the selected target begins to scroll across the bottom of the screen. Youngsters compete to read the messages aloud.

Coordinates for whatever star or planet is beneath the cursor are constantly displayed. The screen can be made to change to keep pace with the apparent movement of the celestial sphere. Also adjustable is the angle of view, from 72° down to 9°.

Pondering the menu for the coming evening's viewing, the author is joined by star party guests.

The low price of current, "commodity" microcomputers places efficient hardware within the grasp of budget-minded innovators.

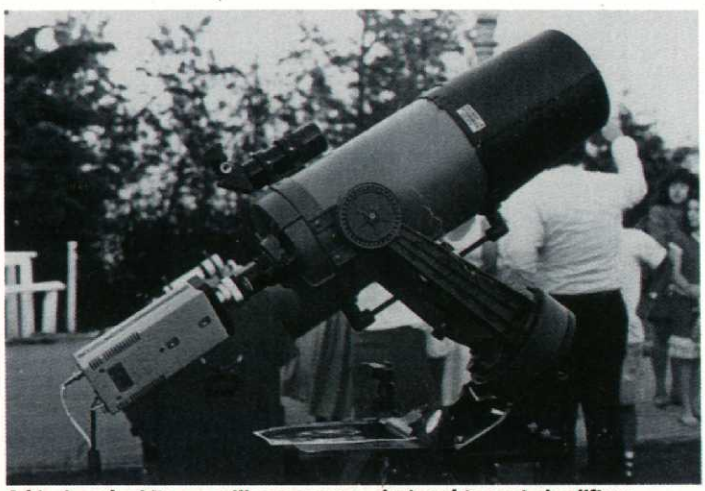
Many other astronomical programs are equally well-equipped to serve the educational objectives of the portable planetarium/observatory. Harry C. Koons' Starware is an early attempt at plotting the constellations. There is charm in the manner in which it very slowly builds up an image of the night sky.

Star Base, from *Antic*, is an excellent guide to the stars and deep-sky objects. Cursor movement is swift compared to other 8-bit astronomical databases, and the program includes Hertzsprung-Russell diagrams that show the relative temperature and luminosity of the stars.

Tech-Link Corp. has given us *Kepler's Laws*, an instructional program that illustrates planetary motion in simple graphics.

The Galilean Moons, by Bob Sandy, can be used to trace the movement of the four large moons of Jupiter, named in honor of Galileo, their discoverer. It is fasincating to watch the moons move around the huge planet through the night, their dance seemingly choreographed by the computer program on the second monitor.

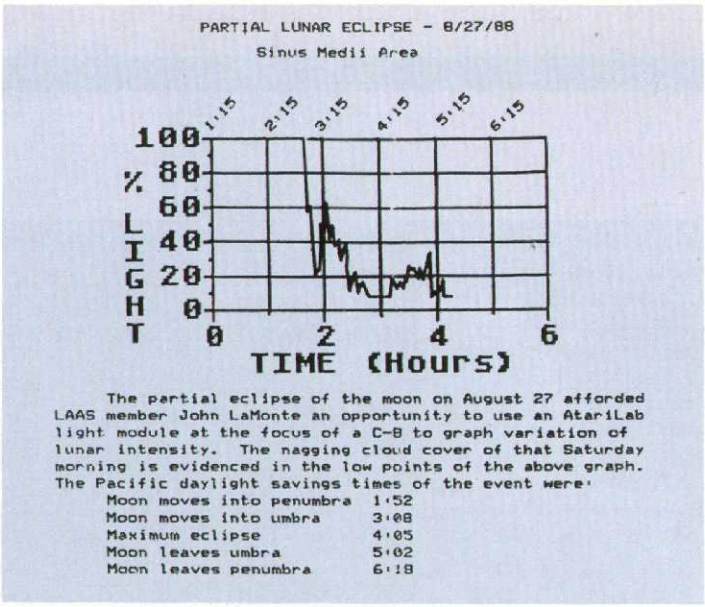
The study of comets is furthered by Halley Patrol and Halley Watch from *Antic* and an excellent Halley disk distributed by the National Science Tea-



A black-and-white surveillance camera, designed to spot shoplifters, is secured to the author's C-8 telescope for more celestial purposes.

chers' Association. Those who missed the 1986 appearance of the famous comet can enjoy an instant replay in the field, before turning skyward to search for a new one. (Not an impossibility, by any means—amateur astronomers have played an important part in the discovery of new comets.)

In addition, the observatory makes use of many public domain programs. One of these lets you compute the travel time to points within the solar system, via modes of transportation as varied as light waves and tricycles. Another, reprinted here in Listing 2, calculates your weight on any planet. Others illustrate circumpolar motion, display planetary data, and quiz you on the constellations.



One example of what can be achieved with an Atari 8-bit computer in the hands of a skilled user. The graph and caption, above, are reprinted from the September, 1988 Bulletin of the Los Angeles Astronomical Society. (Courtesy Los Angeles Astronomical Society.)

Two Astronomy Programs

Two of the many astronomy programs available for the Atari 8-bit computer are reprinted here by permission of Scholastic, Inc. Zodiac, shown in Listing 1, offers an informative glimpse of the 12 constellations in the zodiac—groups of stars that lie along a ribbon of sky, called the *ecliptic*, that encircles the earth.

As the earth moves through its orbit in the course of the year, the sun appears to move along this corridor and through the constellations, one by one. The Zodiac program shows you what these constellations look like in the sky, highlights their brightest stars, and tells the days of the year when the sun seems to travel through them.

After you have studied the constellations, the program can quiz you on what you've learned. All dates used in the program are *astronomically* correct and, thus, differ slightly from the normalized dates used by astrologers.

Weight on Other Planets, shown in Listing 2, gives you an easy way to figure out how much you would weigh if you moved to the moon or another of our eight planetary neighbors. The program employs gravitational constants in a simple, weight-conversion equation. The program is short, and easy to type in—perfect for youngsters and computer beginners! ■

ZODIAC

Listing 1. Zodiac by John Jainschigg. Copyright 1985, Scholastic, Inc.

ATARI KEY

- Any Atari 8-Bit Computer
- Atari Basic

```
10 DIM NAM$(77),BST$(93),DAT$(160),R$(20),NAM(13),BST(13),DAT(13),STN(12),STR(1
2,18)
20 OPEN #1,4,0,"K:"
30 SETCOLOR 2,0,0
40 POKE 752,1
50 FOR X = 1 TO 12
60 READ R$
70 NAM(X)=LEN(NAM$)+1
80 NAM$(NAM(X))=R$
90 READ R$
100 BST(X)=LEN(BST$)+1
110 BST$(BST(X))=R$
120 READ R$
130 DAT(X)=LEN(DAT$)+1
140 DAT$(DAT(X))=R$
150 READ A
160 STN(X)=A
170 FOR Y=1 TO A
180 READ B
190 STR(X,Y)=B
200 NEXT Y
210 NEXT X
220 NAM(13)=LEN(NAM$)+1
230 DAT(13)=LEN(DAT$)+1
240 BST(13)=LEN(BST$)+1
250 PRINT CHR$(125)
260 POSITION 18,0:PRINT "ZODIAC"
270 POSITION 2,5:PRINT "PRESS <V" TO VIEW THE"
280 PRINT "CONSTELLATIONS OF THE ZODIAC,"
290 PRINT "<Q> FOR A QUICK QUIZ,"
300 PRINT "OR <E> TO END THE PROGRAM.";
310 GET #1,K
320 IF K=ASC("E") THEN END
330 IF K<>ASC("V") AND K<>ASC("Q") THEN 310
340 Z=(K=ASC("Q"))
350 SC=0
360 FOR I=1 TO 12
370 IF Z THEN X=INT(RND(0)*12)+1:GOTO 480
380 X=I
390 PRINT CHR$(125);
400 PRINT "THE SUN IS IN THE CONSTELLATION"
410 PRINT NAM$(NAM(X),NAM(X+1)-1);" BETWEEN ";DAT$(DAT(X),DAT(X+1)-1);"."
420 PRINT
430 PRINT NAM$(NAM(X),NAM(X+1)-1);"'S BRIGHTEST STAR IS"
```

Data Capture and Analysis

The 800XL setup is not, however, used simply to display star charts and guide observation. It plays a direct role in the process of discovery.

For example, we have often used the dual-monitor setup with ComputerEyes to capture digitized video images of the moon. The actual digitization process takes about 90 seconds, and then the fun really begins. Using *Magniprint II+* for conversion, the image is fed to *Blazing Paddles*, *Micro-Illustrator*, or any of several other graphics programs, and enhanced in the field with joystick, stylus, or light pen. Labels can be typed next to significant lunar features.

Moonscapes captured in this manner are being saved to disk. In coming years, they will be used to help viewers locate areas of the moon appearing on the telescope monitor.

The portable planetarium/observatory has also been used with the AtariLab Light module in an attempt to measure the darkening of the moon during a lunar eclipse. Clouds drifted in to complicate the readings, but the Bulletin of the Los Angeles Astronomical Society did publish a graph of the results in September of 1988—not bad for outdated technology! ■

```
440 PRINT BST$(BST(X),BST(X+1)-1);"."
450 PRINT
460 PRINT "PRESS ANY KEY TO VIEW ";NAM$(NAM(X),NAM(X+1)-1);".";
470 GET #1,K
480 PRINT CHR$(125)
490 FOR Y=1 TO STN(X)
500 Q=INT(STR(X,Y)/40)
510 POSITION STR(X,Y)-Q*40,Q:PRINT CHR$(42-22*(Y=1));
520 NEXT Y
530 FOR D=1 TO 1000
540 NEXT D
550 IF NOT Z THEN 710
560 PRINT CHR$(125);
570 PRINT "WHAT CONSTELLATION"
580 PRINT "WAS THAT";
590 INPUT R$
600 IF R$=NAM$(NAM(X),NAM(X+1)-1) THEN SC=SC+1:PRINT "RIGHT!":GOTO 620
610 PRINT "NO, IT WAS ";NAM$(NAM(X),NAM(X+1)-1);"."
620 PRINT "WHAT IS ITS"
630 PRINT "BRIGHTEST STAR";
640 INPUT R$
650 IF R$=BST$(BST(X),BST(X+1)-1) THEN SC=SC+1:PRINT "RIGHT!":GOTO 670
660 PRINT "NO, IT IS ";BST$(BST(X),BST(X+1)-1);"."
670 PRINT
680 PRINT "PRESS ANY KEY TO CONTINUE."
689 REM -- CLEAR KEYBOARD BUFFER --
690 POKE 764,255
700 GET #1,K
710 NEXT I
720 IF NOT Z THEN 250
730 PRINT CHR$(125);
740 PRINT "YOUR SCORE WAS ";SC;" OUT OF 24."
750 PRINT "THAT'S ";INT((SC/24)*100);" PERCENT CORRECT."
760 PRINT
770 PRINT "PRESS ANY KEY TO CONTINUE."
780 GET #1,K
790 GOTO 250
1000 DATA CAPRICORN,ALGEDI,1/20 AND 2/18,13,156,275
1010 DATA 423,747,825,740,655,531,368,410,415,421,269
1020 DATA AQUARIUS,SADALMELIK,2/17 AND 3/13,12,103,433
1030 DATA 822,178,17,95,93,407,807,922,481,480
1040 DATA PISCES,ALRISCHA,3/13 AND 4/19,18,800,725,727
1050 DATA 650,652,655,666,710,830,874,755,672,565,370
1060 DATA 253,172,90,13
1070 DATA ARIES,HAMAL,4/19 AND 5/15,7,622,786,866,365
1080 DATA 346,138,62
1090 DATA TAURUS,ALDEBARAN,5/14 AND 6/21,13,342,224
1100 DATA 306,384,427,10,163,593,662,748,873,598,719
1110 DATA GEMINI,CASTOR,6/21 AND 7/21,16,97,99,29,224
1120 DATA 512,639,757,300,299,377,294,493,661,746,954
1130 DATA 949
1140 DATA CANCER,BETA CANCRI,7/21 AND 8/11,5,954,64
1150 DATA 425,584,900
1160 DATA LEO,REGULUS,8/12 AND 9/16,14,749,956,550,464
1170 DATA 305,71,153,197,943,887,650,641,410,453
1180 DATA VIRGO,SPICA,9/21 AND 11/1,12,862,732,591,555
1190 DATA 478,318,317,427,185,541,455,445
1200 DATA LIBRA,ZUBEN ELGENUBI,11/1 AND 11/22,6,382,54
1210 DATA 289,818,849,929
1220 DATA SCORPIO,ANTARES,11/23 AND 11/30,15,425,347
1230 DATA 72,154,353,473,463,581,660,739,895,850,687
1240 DATA 607,530
1250 DATA SAGITTARIUS,NUNKI,12/19 AND 1/19,14,296,53
1260 DATA 373,379,343,494,544,308,626,628,743,865,850
1270 DATA 886
```

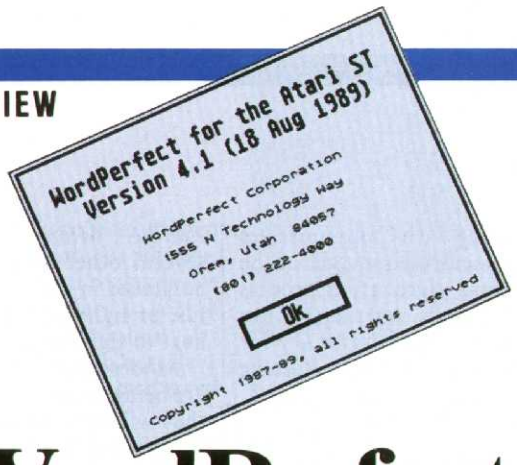
WEIGHT ON OTHER PLANETS

Listing 2. Weight on Other Planets by Joey Latimer.
Copyright 1986, Scholastic, Inc.

ATARI KEY

- Any Atari 8-Bit Computer
- Atari Basic

```
10 OPEN #1,4,0,"K:"
20 DIM PL$(72),T$(8),G(9)
30 FOR I=1 TO 9
40 READ T$,V
50 PL$(LEN(PL$)+1)=T$
60 G(I)=V
70 NEXT I
80 PRINT CHR$(125);
90 PRINT "HOW MUCH DO YOU WEIGH IN POUNDS";
100 INPUT P
110 PRINT CHR$(125);
120 PRINT "TYPE IN A NUMBER AND PRESS <RETURN>"
130 PRINT "TO SEE HOW MUCH YOU'D WEIGH"
140 PRINT "ON ANOTHER PLANET"
150 PRINT
160 FOR I=1 TO 9
170 PRINT I;") ";PL$(I*8-7,I*8)
180 NEXT I
190 PRINT
200 PRINT "WHICH NUMBER DO YOU CHOOSE";
210 INPUT N
220 IF N<1 OR N>9 THEN 110
230 PRINT CHR$(125);
240 PRINT "YOU WOULD WEIGHT ";G(N)/9.72*P
250 PRINT "POUNDS ON ";PL$(N*8-7,N*8)
260 PRINT
270 PRINT "PRESS <P> TO TRY ANOTHER PLANET,"
280 PRINT "<W> TO ENTER ANOTHER WEIGHT,"
290 PRINT "OR <Q> TO QUIT.";
300 GET #1,K
310 IF K=ASC("P") THEN 110
320 IF K=ASC("W") THEN 80
330 IF K<>ASC("Q") THEN 300
340 END
999 REM --INCLUDE SPACES IN DATA AS SHOWN!--
1000 DATA MERCURY ,3.78,VENUS   ,8.6,THE MOON,1.62
1010 DATA MARS    ,3.72,JUPITER ,27.89,SATURN  ,12.831
1020 DATA URANUS  ,9.03,NEPTUNE ,11.95,PLUTO   ,0.291
```



WordPerfect Update

Now that the bugs are gone, this top-of-the-line word processor is a good choice for users who need everything

When *WordPerfect* for the Atari ST made its long-awaited debut in early 1988 it was greeted with mixed reviews (see "WordPerfect: Triumph or Tragedy" in the May/June 1988 issue of *Explorer*).

Most reviewers acknowledged that the program was packed with unique features; few were willing to overlook the cloud of bugs that had users slapping their keyboards and their foreheads. Subsequent revisions made little difference in the overall utility of the product.

Recently, however, WordPerfect Corp. released a much-improved version of the program. It is available free of charge to all users who purchased the previous 08/01/88 version within three months of the new release. Owners of older copies can receive the update for $17.50.

In addition to bug fixes, the 08/18/89 version offers some enhancements that you may find useful.

The Virtual Memory

All computer users *know*, but often forget, that to avoid losing data they should save their work every few minutes. *WordPerfect* has always allowed you to specify how often you want the program to save the document you are working on *automatically*. Thus, if a child or pet brushes against your power cord and accidentally disconnects your computer or a power glitch causes a spontaneous reset, you will lose very little of your valuable work.

WordPerfect

System: Atari ST

Version reviewed: 08/18/89

Required equipment: 1 Mb RAM and hard drive recommended

Copy protection: None

Summary: The Mercedes Benz of word processors

Price: $329

Manufacturer:
WordPerfect Corporation
81 North State St.
Orem, UT 84057
(801) 225-5000

This feature, called Timed Backup, which saves your text in what WordPerfect calls *virtual memory*, was intended to avert catastrophe not substitute for the routine saving of documents to disk. Virtual memory can get you out of some tight spots, but it does have its drawbacks.

Unless you use two floppy disk drives or a hard disk, *WordPerfect* is all too willing to expose your work to other sorts of human error. This accident-prone condition exists because neither the system disk nor the spelling checker can be write-protected when used with a single-drive 520, 1040, or Mega ST.

I found no way to efficiently or safely use *WordPerfect* to create or edit lengthy documents using an SF354 single-drive 520ST system. The inefficient, unsafe method is as follows: Boot your system using the non-write-protected system disk, remove the disk from drive A, and replace it with a blank formatted disk. When you want to use the spelling checker and/or thesaurus, replace the blank formatted disk with the required utility disk.

To obtain a help screen or to print, you must replace the blank formatted disk in the drive with the system disk. Two caveats: 1) If you fail to exit *WordPerfect* correctly, everything on the disk can be lost forever, and 2) with a single-disk system do not change the virtual memory from drive C, which apparently is an invisible RAMdisk.

If you become careless, when using a *dual*-floppy system, you can lose everything on your spelling checker disk and/or your document disk (write-protect your system disk). On a dual-drive system, use the Set Path option from the Startup program to direct the virtual memory *and* document storage to drive B, but leave the spelling checker and thesaurus in drive A. Boot and use your computer with the system disk in drive A and a blank formatted disk in drive B. To use the spelling checker or thesaurus, replace the system disk in drive A with the correct utility disk. Because the spelling checker cannot be used with the write-protect tab in the protected position, failure to exit *WordPerfect* correctly can, under some circumstances, destroy the data on the utility *and* document disks.

It appears that *WordPerfect* was designed for use in businesses, where the expense of a hard disk is an affordable tax write-off. Using the program with the single- and dual-floppy drive systems most personal users still have invites operator error.

WordPerfect still lacks the ability to show how much available RAM remains. This means that you still lack the ability to decide whether sufficient memory remains for your document. This is a matter of particular concern to 520 owners.

Enhancements

WordPerfect Corporation has added the following features to the system:

•A running word count appears on

By EDMUND D. MANN

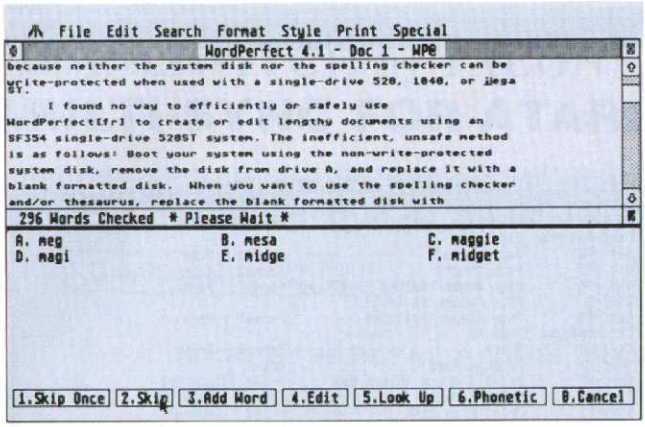
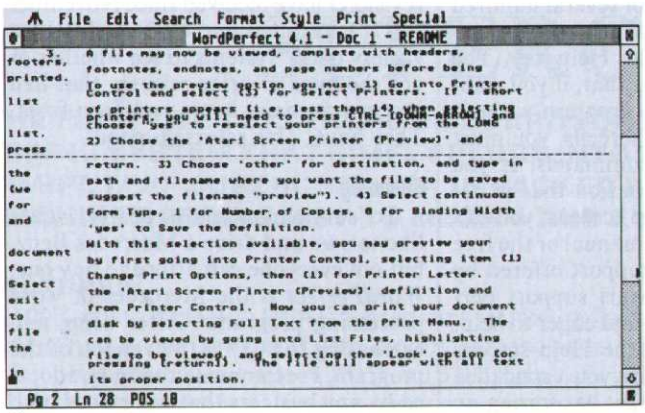


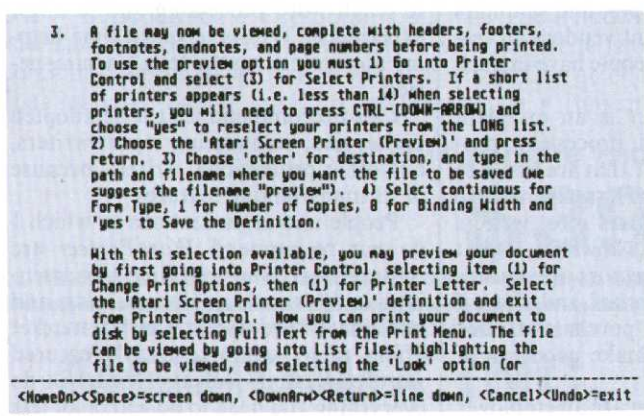
Figure 1. During a spelling check, the new version of WordPerfect keeps a running count of the words checked.

WordPerfect is the Mercedes of word processing programs.

Figure 2. Because WordPerfect is not a WYSIWYG word processor, the program allows you to preview text by printing it first to disk and then to screen, so you can see how the final document will look. Figure 2a shows the document as it appears on the screen. Figure 2b shows the screen preview of the same text.



2a



2b

the screen below the document while the spelling checker performs its job.

- Because *WordPerfect* is not a WYSIWYG (What You See Is What You Get) word processor, the 08/18/89 version permits you to "print" to disk—and then to screen—to preview the appearance of the document before you print it on paper. One way in which *WordPerfect* outshines all other word processing software that I have used with the Atari ST is that the preview shows the document on the screen with all page numbers, footnotes, and endnotes.
- If you prefer to use the A&D *Universal Item Selector* rather than the built-in TOS selector, you can avail yourself of its features by including that third-party program on your boot disk.
- Print speed is faster when you use multiple windows.
- Drivers have been added for the following printers: Star NX1000, Star NX2400, Panasonic KX-P1124, Panasonic KX-P4450 Laser, H-P Deskjet+ without cartridge, H-P Deskjet+ with Times Roman cartridge, H-P Deskjet+ with Helvetica cartridge, NEC 5200 multiple color, and NEC 5200 single color.
- *WordPerfect* now permits you to write documents that are longer than 64K.
- The built-in print spooler is now 32K.

Saving Time and Avoiding Errors

Both the spelling checker and the thesaurus will fit on one disk, if you have a double-sided disk drive (SF314 or compatible), so you can reduce the number of disk swaps required on a one- or two-floppy system.

To avoid destroying previously saved documents in the ways described above, use a blank disk to save whatever you write during any given session. Before you perform a spelling check, copy your document to a second blank disk. After the job is printed and after you copy the document to a permanent storage disk, you can reformat the two work disks and reuse them.

How Much Power Do You Need?

WordPerfect is an excellent program, but it boasts more power and more features than the average secretary or personal computer user will ever need.

For example, the Modern Language Association has established new rules for parenthetical notation of scientific and academic papers that obviate the

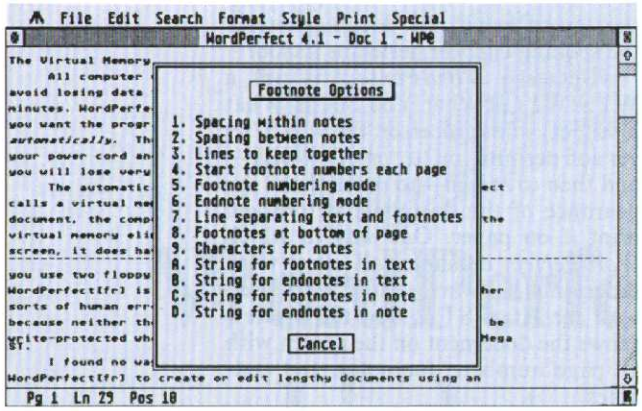


Figure 3. WordPerfect offers the most flexible and comprehensive footnote utility available for Atari computers.

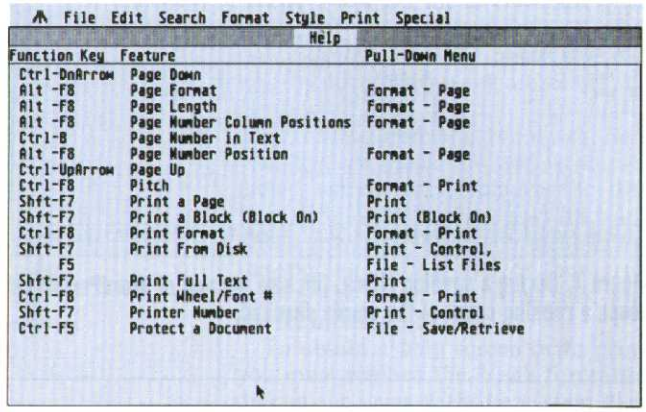


Figure 4. Easily accessible Help screens list the key combinations and menu selections required to invoke the most-often-used commands.

need for footnotes; endnotes are now not only preferred, but required. Traditional footnotes are now used primarily by textbook writers.

Apparently oblivious to the current requirements of academia, WordPerfect has included with the program a footnote utility that combines the best features of the dedicated word processors of the 1970's and early 1980's . . . which is great if you're writing a textbook.

Another part of the *WordPerfect* package that hasn't quite kept pace with current standards is the user interface. The original software was written for MS-/PC-DOS computers, and while it does run in the GEM environment, it does not take full advantage of the the easy-to-use GEM interface. The command structure is keyboard-command oriented rather than menu-based, so you must memorize the commands that invoke the functions you use most frequently.

To Market, To Market

Apple, IBM, and WordPerfect all use a similar marketing strategy. They sell their products to schools and teachers at prices considerably lower than the published "suggested retail" prices and offer very helpful educators' packages to go along with them. Their rationale is that employers, eager to reduce training costs, will buy the products with which their employees are most familiar, i.e., the products they learned to use in school.

The inflated retail price also appeals to dealers, who can obviously offer a better "deal" on a package that carries a suggested retail price of $350 but costs them only about $150 than they can on a $99 package that costs them $45.

Conclusions

There is no such thing as one "best" word processing program; each package has its own set of virtues and shortcomings. The prospective purchaser must evaluate each program by comparing his own needs with the features (and bugs) it offers. Let's look at some of the features you will find in the new version of *WordPerfect*.

WordPerfect has excellent Help screens; descriptions of several hundred functions and commands can be accessed by pressing the Help key. The bad news, of course, is that, if you want to be able to use the program without recourse to the Help screens, you must memorize all these commands! If you find yourself in a situation that is not addressed by the Help screens, you can refer to the 500-page manual or the free telephone technical support offered by WordPerfect. The Atari support personnel are competent and eager to help.

Your first look at the Help screens and the manual will give you a good idea why an entire submarket has sprung up in support of the *WordPerfect* learning curve. Books, videotapes, and seminars offered by independent vendors all testify to the difficulty people have in mastering the program.

While *WordPerfect* is an excellent package, other word processing programs for the Atari ST that are easier to learn, easier to use, and less expensive to buy have all the features most writers need. Most important, however, is that most other word processors are considerably more bullet proof and few of them require you to purchase a hard disk before you can make good use of them.

In my opinion, if you are an employer who cannot afford to train employees, you *should* buy *WordPerfect*, because it is the program that your potential employees are most likely to have learned to use in high school or college.

I use *WordPerfect* because it can automatically create tables of contents and indexes for the articles and books I write, and because it can assemble legal documents from stored boilerplate interspersed with dictated material.

The 08/18/89 revision is the fifth revision I have received since November 1987. I installed and evaluated it on a variety of ST systems to see whether or not the bugs in prior releases that had cost me so many hours had been fixed. They have. This release is good.

Summary

To summarize, most people would like to own and drive a Mercedes Benz, but not everyone can afford to buy one. *WordPerfect* is the Mercedes of word processing programs. After using and evaluating the 08/18/89 version of the program, I recommend that it be adopted by any business that can afford both to employ a supervisor who is qualified to teach word processing and to allow experienced typists to spend time helping novices during the long learning period.

I also recommend that it be adopted by lawyers, engineering report writers, and other professional writers, because of its many unique features.

People and organizations to which I do *not* recommend *WordPerfect* are those that are short on time (for training) and/or money (for training and additional hardware). The ST market offers many competent, full-featured word processing packages that will do everything you need to do with a lot less equipment and training. ■

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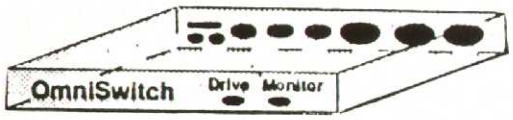

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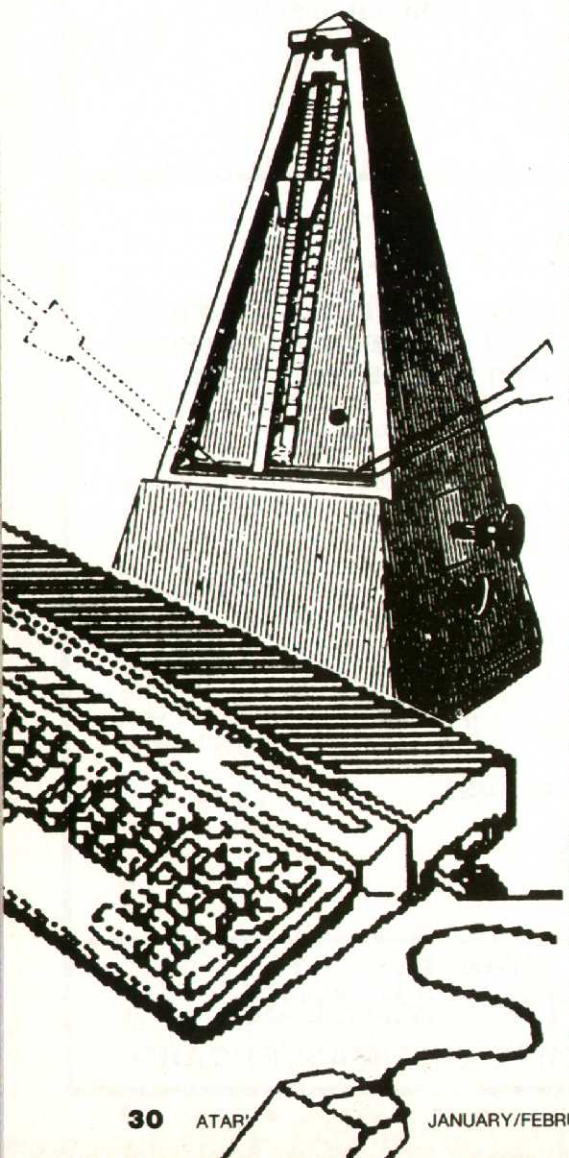
Notes on synchronization and reviews of Master Tracks Pro and MIDI Transport



And a one . . . and a two . . . and . . . Synchronization is one of the most important aspects of musical performance. A string quartet would sound pretty silly, after all, if the first violin finished two bars ahead of the cello.

Musicians who play together on stage can keep in sync by taking cues from a conductor, who keeps time by waving a baton. In the recording studio, however, where multiple tracks—some recorded live, some played back from tape or executed in real time by a sequencer—must all be assembled into a single piece of music, the problem of synchronization becomes more complicated. Even very precise electronic timers tend to "drift"—so much so that some form of time correction is needed to coordinate the recording of even short compositions.

Before MIDI became standard on electronic musical instruments, click-type synchronization (*Frequency Shift Keying*, or FSK) was routinely used to make recording equipment perform in time. FSK apparatus generates a "click track," produced by modulating a sine wave between two discrete values.

Circuits onboard studio gear used this pulse to maintain constant speed with one another, and the FSK signal could also be used to guide human players as live tracks were recorded.

One problem with old-style FSK was that different manufacturers used incompatible sync codes, so ways had to be found to sync different brands of equipment. Moreover, FSK offered no way to start synchronized playback from an arbitrary point in a score; each time a change had to be made, the whole song had to be played through from the beginning.

When MIDI came along, it incorporated its own methods for synchronization and cueing. The standard MIDI clock pulse, marked by a unique status byte sent 24 times per quarter note, provides a system for synchronizing sequencers, drum machines, and other MIDI equipment.

At the simplest level, cueing is accomplished using MIDI Song Position Pointer, which specifies a particular point in a song in terms of groups of six elapsed MIDI clock pulses (six clock pulses resolve to the duration of a 32nd note at current tempo). Smart FSK is an advanced form of FSK which incorporates MIDI Song Position Pointer information within the signal. This recent development is used as one of the sync modes of Passport's MIDI Transport, discussed below.

Though better than old-style FSK, MIDI clock and song pointer still offer only relative means for synchronizing with elapsed time—minutes, seconds, and subdivisions thereof. While sufficient for maintaining sync within an ensemble or in simple recording situations, these measures are inadequate for handling more complex timing problems, such as those encountered when scoring for film and video. To provide real-time synchronization, therefore, MIDI incorporates its own time code, a system for real-time cueing that is based on SMPTE time code.

SMPTE is a kind of sync code based on elapsed time (hours, minutes, and seconds) plus a visual component—film or video *frames*. The system was developed in 1969 by a standards committee established by the Society of Motion Picture and Television Engineers (SMPTE).

There are four types of SMPTE code in use: 30 frames per second (used for audio sync and monochrome video); drop-frame (which is 29.97 frames per second and is used for audio/color video sync); 24 FPS (used for film sync); and 25 FPS (the standard used by European video).

Using SMPTE for multi-track recording allows you to work at home on audio/video projects and then take your work to any professional studio for further development without encountering the synchronization headaches inherent in other sync types.

Not too long ago, only the most advanced home studios had features such as SMPTE sync capability and automated mixing. These days it would be hard to find a high-end sequencer that did not support SMPTE, a feature that is absolutely essential for video or film projects.

An external hardware device is needed to read and write this type of data, and your sequencer must be able to communicate with this device. Unfortunately, different sequencers support different sync boxes. *Realtime*, reviewed in the November/December issue of *Explorer*, supports Dr. T's Phantom. *SMPTETrack* from Hybrid Arts works with its own box. And Passport's *Master Tracks Pro* Rev. 3.2 or higher works with the Midi Transport, also manufactured by Passport.

By MIHAI MANOLIU

Master Tracks Pro

Passport, one of the oldest manufacturers of music hardware and software, supports Atari, Apple, IBM, and Commodore computers. In fact, *Master Tracks Pro* was ported to the Atari from the Macintosh version, which set a standard on that machine. Although some features, such as real-time editing and multi-tasking, have yet to be implemented in *Master Tracks Pro*, it is still a solid program for professional sequencing and video projects.

Along with the MIDI Transport, *Master Tracks Pro* can pay for itself by the end of the first visual project you undertake for pay. Ease of use and versatility are two of the primary advantages of this particular system.

The program interface is organized into six main windows: Transport controls play, stop, record, fast forward, and so on. Track Sheet allows you to control the track channels and engage the record and solo modes. Song Editor displays tracks and allows regional editing. Step Editor is a piano roll type of display that shows the individual notes in a track and allows precise editing of single notes. Conductor provides control over the tempo and meter. And MIDI Data windows which allow display and editing of graphic plots of Pitch-Bend, Channel Pressure, Key Pressure, Modulation, Controller values, Program Changes, and Conductor Track data (an excellent feature that is great for plotting out tempo/meter changes for a "live" feel). The attempt to model the interface after the more traditional tape recording technology makes the program easy to use and understand.

SMPTE is a kind of sync code based on elapsed time—hours, minutes, seconds—plus a visual component—film or video frames.

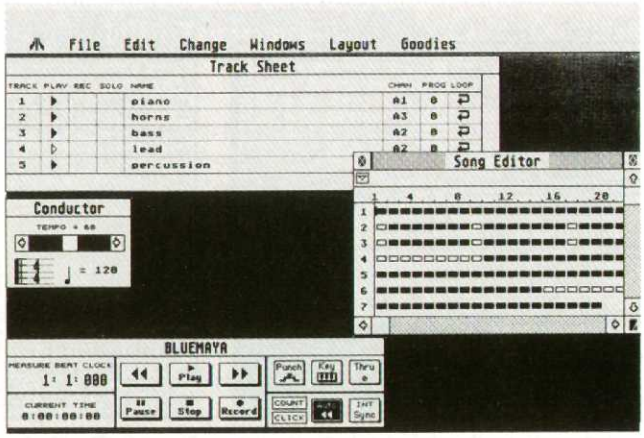


Figure 1. Master Tracks Pro offers multiple control windows. The window in the bottom left corner controls the MIDI Transport. The Conductor window, which gives overall control of performance parameters, is above. The Track sheet is on the left, and the Song Editor window is on the right.

All the requisite sequencer features are provided: 64 tracks of real-time and step recording; cut, copy, clear, paste, and mix editing of all data; transpose; and quantize functions. In addition, the program offers many subtle extras that make it especially useful for audio/video projects. The most powerful of these is the Markers window, which has been greatly expanded to serve as a SMPTE Hit list (more on this later).

Master Tracks Pro has a 240 internal clocks/quarter note timer resolution, which is fine enough for the most discerning applications. The Transport window, shown in Figure 1, displays both measure/beat/clock data and time (hours, minutes, seconds, and frames).

Master Tracks Pro

System: Atari ST

Version reviewed: 3.5

Required equipment: MIDI Transport SMPTE interface, optional

Summary: Powerful sequencing package with SMPTE capabilities

Price: $345

Manufacturer:
Passport Designs
625 Miramontes St.
Half Moon Bay, CA 94019
(415) 726-0280

The Auto rewind option returns to the most recent start point. Count In gives you a one-measure count before recording or playback starts. The Punch In/Out feature can be set numerically or by using the mouse, and it makes recording onto existing tracks a breeze.

You can configure the MIDI keyboard to control such Transport commands as Play, Record, and Pause by selecting Keyboard in the Goodies menu.

A Weak Point

The Song Editor window, also shown in Figure 1, displays track information as measures colored in to represent MIDI information. Since the program is more like a tape recorder than a pattern-based sequencer, if you have a section you want repeated you must copy it the requisite number of times. This is one weak spot: although a looping command is provided for each track, there is no option to specify how many times to loop, thereby limiting the usefulness of the feature.

By using the special Conductor track, you can control the tempo and meter of each individual measure and achieve smooth ritardandos/accelerandos and odd meters. This data can be edited both graphically and numerically.

The Step Editor window, shown in Figure 2, is used for sophisticated graphic editing of single note events (only one track at a time). The Zoom In/Out function allows you to view your data at one of six screen resolutions, ranging from one pixel per clock to one

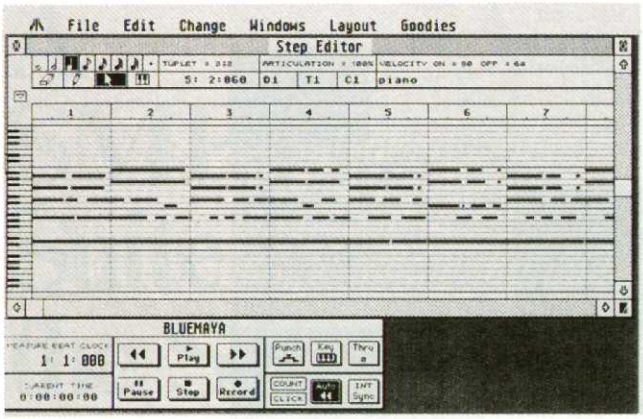


Figure 2. The Step Editor window shows the piano track. To the left are icons used for mouse-entry of notes. Double-clicking on any note opens a Note Editor window for that note.

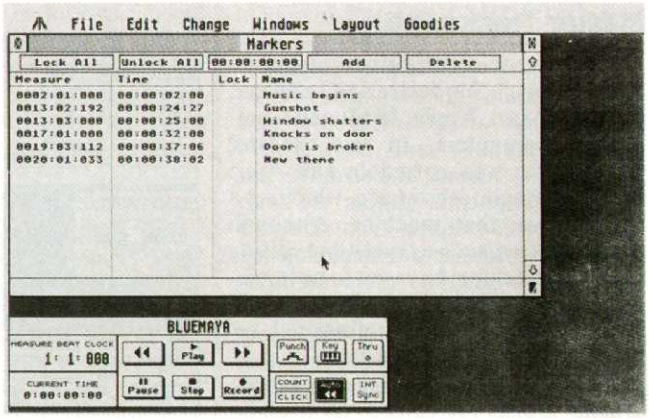


Figure 3. The Markers window is used for precise placement of Hit points, correlated to SMPTE time.

pixel per 24 clocks.

The MIDI keyboard can also be configured for use in Step recording by defining seldom-used keys to select note duration values, reducing the amount of back-and-forth between keyboard and computer as rhythmically complex passages are entered. The time cursor moves automatically from beat position to beat position as notes are entered—a nice feature that makes it easy to step a whole performance in without any keyboard ability. The ability to enter most information from the MIDI keyboard makes *Master Tracks Pro* especially easy to use.

Double-clicking on an individual note opens the Note Edit window. You can then choose to alter the pitch, start time, duration, velocity, and channel parameters for that note. The articulation command in the Step Editor window can define sections of a track to play staccato or legato.

To help new users, who may find it difficult to place the cursor on the desired note in the lower-resolution screens, the program provides an axis-locking feature that confines the mouse cursor to vertical or horizontal movement when you hold down the mouse button.

The most powerful feature of *Master Tracks* is the ability to graph important MIDI parameters, including pitch bend, channel, key pressure, modulation, controllers, program change, and tempo/meter. This information is available in the MIDI Data windows, on a track-by-track basis. Data can be mapped from one controller to another, allowing for interesting effects. A Sys-Ex load/dump utility even helps you manage non-standard data (e.g., patch bank information) from different components in your system.

Hit Points and More

A few more features are worth noting if you plan to work in a visual medium. Fit Time can stretch or compress the length of a passage without losing the feel of tempo or meter changes. This feature can be especially useful for work on commercials or in fitting sections to work with important "hit points" in film and TV. A hit point is a place where music (or a sound effects) must coincide with visual action—a door slamming, footsteps, a gunshot, a breaking window, etc.

The latest versions of *Master Tracks* have a greatly expanded Markers window which now acts as a SMPTE Hit list (shown in Figure 3), in which all hit points are shown in terms of both SMPTE time and measure/beat/clock data. Marker positions can be added and moved through the Song window, Step Edit window, or any MIDI Data window, meaning that wherever you find yourself in *Master Tracks Pro*, you can always keep track of how things time out—a real aid to productivity.

Though markers can be placed only at the beginnings of measures while in the Song window, the other windows let you locate hit points with very high accuracy, depending on the current Zoom level. If you decide to change the SMPTE start time of a sequence or the SMPTE format (let's say 30 FPS to 24 FPS), then all marker positions are automatically adjusted.

Any or all of the markers can be locked so that you can tie musical events to particular SMPTE locations. Subsequent tempo and other time-related changes can be arbitrated in a variety of intelligent ways to preserve the integrity of the music in terms of the timing constraints you have established.

Overall, *Master Tracks Pro* is a solid program for all levels of music sequencing. The interface is very easy to learn and use, and the manual is well-written. Despite some minor flaws, *Master Tracks* can be an efficient tool for visual projects when teamed with a SMPTE hardware box such as the MIDI Transport by Passport or the PPS-1 Version Three by JL Cooper Electronics.

MIDI Transport

Passport's MIDI Transport is a small unit that packs a lot of power. It is a MIDI interface and synchronizer that can read and write both SMPTE and FSK sync data. Designed by sync pioneer and authority Jim Cooper, the Transport attaches to your ST via the serial (modem) port, thence to your multi-track recorder. Using the Transport allows you to start your multi-track machine anywhere in a song, causing the sequencer to "chase tape" automatically, starting at the proper location using the correct tempo.

The simple front panel of the Transport consists of four on/off switches and four LEDs. The Sync switch toggles between FSK and SMPTE; the Mode switch toggles between Read and Write; System gives you the option of working with an ST or an IBM PC; and the purpose of the power switch is obvious. The various LEDs light to indicate the operation in progress (reading or writing sync data, and to show the presence or absence of MIDI data coming through the Transport.

The back panel includes three MIDI OUT ports and a sync in (for control by a drum machine), tape in/out, and a plug for the removable power supply that comes with the unit.

In FSK write sync mode, the Transport sends a smart FSK sync tone based on MIDI clock and Start/Stop/Song Position Pointer messages from *Master Tracks*. This tone is recorded on one of the tracks of your multi-track and is then used to control the sequencer from tape.

In FSK read mode, the Transport reads the sync tone from tape and converts it back to MIDI clock and Start/Stop/Song Position Pointer messages for *Master Tracks Pro*. You can thus record only the live tracks, such as guitar, bass, and vocals, and run all your MIDI tracks in sync from the tone on one of your tracks.

The Transport reads all formats of SMPTE and converts them to MIDI Time Code (MTC), described above. To read SMPTE from tape, you simply choose the format using *Master Tracks* and make sure the sequencer is set to external sync (MTC). For real-time cueing, you can set a SMPTE offset to control the location at which your sequence will start playing.

MIDI Transport

System: Atari ST

Required equipment: Master Tracks Pro Sequencer, v. 3.2 or higher ??

Summary: Versatile SMPTE time code interface device

Price: $395

Manufacturer:
Passport Designs
625 Miramontes St.
Half Moon Bay, CA 94019
(415) 726-0280

Stars and Stripes

To "stripe" a tape using SMPTE, you must set the SMPTE start time and format using the TRANSPOR.PRG that comes with the unit. The first dialog box reminds you to set the right Sync and Mode switches. The second dialog allows you to set the SMPTE start time, format, and the number of seconds of "preroll," before the code is actually sent out. Once you have the right parameters, you click on Send and start your tape rolling.

The Transport seems very accurate, without any noticeable glitches or problems. It takes from one to two seconds to lock the sequencer to tape, using either FSK or SMPTE, when starting in the middle of a song. The manual could be better-written, though you should have no problem getting set up if you approach the process logically.

The price of the unit is somewhat high, but it may be worth it to users who need the 32 MIDI channels provided by the Transport in conjunction with the latest version of *Master Tracks Pro*. If you need a less expensive unit, you might want to take a look at JL Cooper's PPS-1, which lacks the extra MIDI channels and has only two MIDI OUTs, but still provides both smart FSK and SMPTE for $195. ■

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Best Electronics Mouse

Increased sensitivity and ergonomic design make this controller a good choice—especially for lefties

In the October issue of *The Journal of Computer Game Design*, Chris Crawford was complaining that his new PC clone came with four—count 'em, *four*—manuals for the mouse! He felt, rightly, that a mouse shouldn't require *any* manuals.

Fortunately, that is largely true in the Atari world. We take the GEM interface with its windows and mouse control pretty much for granted. Unlike PC owners, we don't have to decide whether we want a one-, two-, or three-button mouse; a serial or bus interface; or one of a variety of software protocols. The downside to having a single mouse standard is that not many mouse alternatives have appeared in the Atari world.

But now, Best Electronics has introduced an ST-compatible mouse that boasts several improvements over the standard Atari mouse. The most obvious difference is its rounded shape. While for keyboard-intensive applications, shape isn't all that important, for long sessions with graphics or mouse-oriented games like *Arkanoid*, the ergonomic design of the Best mouse is a distinct improvement.

Best claims that its design provides "maximum user input sensitivity and high resolution tracking of 200 pulses per inch." In contrast, the Atari mouse produces about 140 pulses per inch. This is a result of the photo optic interrupter disk which has 17 holes on the Best mouse compared to 12 on the Atari mouse.

On short movements, this sensitivity difference is barely noticeable. However, when you move the cursor from the bottom to the top of the screen or draw a long line in a graphics program, you immediately notice that you don't have to move the Best mouse as far. Using *NeoChrome*, for example, with the Best mouse, I found I had to lift the mouse from the mouse pad far less often than usual.

The Best mouse has Teflon rollers on the shafts that turn the photo optic interrupters in contrast to the steel ones in the Atari mouse. Best claims this improves "ease of maintenance and cleaning." Maybe so, but needlessly *complicating* the cleaning job is the fact that the screws holding the mouse together are hidden under the three Teflon glide pads. This means you have to use something thin and flexible (an X-acto knife tip) to lift the glide pads so you can peel them off and unscrew four screws (three hidden, one exposed, compared to two on the Atari mouse) to get at its guts.

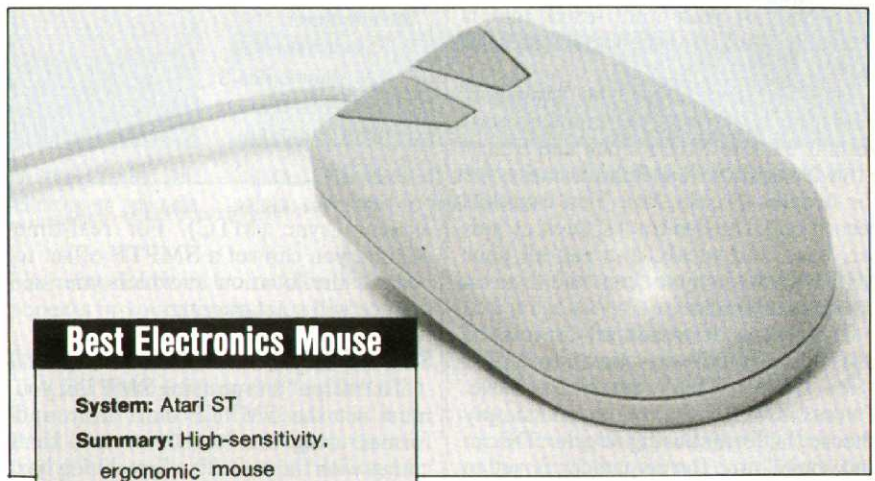
Perhaps I'm being unfair. For normal cleaning, simply taking off the ball cover and swabbing the rollers with lighter fluid on a Q-tip will do the job, so disassembly is not usually necessary. Incidentally, the three Teflon feet on the Best mouse compared to four on the Atari mouse don't seem to make any difference in performance.

While we were inside, we noticed that the Atari mouse uses discrete electronic components compared to an IC and fewer discrete components in the Best mouse. So in the very long run, the Best mouse ought to have somewhat higher electronic reliability.

On the other hand, in any mouse, the moving parts probably will give out long before the electronics. Speaking of which, the ball cover on the Best mouse has two flimsy plastic lips which will be the first things to go if you happen to torture your mouse occasionally by throwing it on the floor (as I did recently when I lost a half day's work in a power glitch). I have not similarly tortured my Atari mouse, so I don't know what its weak spots are.

The cable (tail?) of the Best mouse is 54″ long compared to the 34″ cable on the Atari mouse. In general, I think that longer is better, and I know some left-handed Atarians who will agree wholeheartedly. Tidy right-handed users may view the extra-long tail as just 20 more inches of cable to keep under control in the work area.

All in all, I like the Best mouse. Its ergonomic shape and increased sensitivity more than make up for its less accessible interior and flimsy ball cover (which, in normal use, is more than adequate). If you're in the market for a rodent replacement, give this one a try. ■



Best Electronics Mouse

System: Atari ST

Summary: High-sensitivity, ergonomic mouse

Price: $49.95

Manufacturer:
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2021 The Alameda, Ste. 290
San Jose, CA 95126
(408) 243-6950

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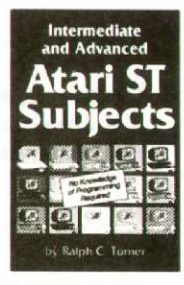

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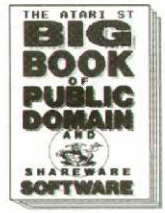

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The answer, of course, is to make regular backups. Depending on how you use your ST, this may or may not be a problem. My own 20Mb Atari hard disk system, used to prepare material for publication in *Atari Explorer*, is set up in such a way that backup to floppy disks is quite convenient. I have a more-or-less fixed folder structure in which major applications (word processor, C compiler, etc.) are segregated in their own directories; data is saved in subdirectories related to each program.

Since backup copies of the programs themselves are already preserved on floppy disk (you *always* backup software to floppy before installing it on a hard disk, don't you?), backing up the hard drive is accomplished by copying the contents of data subdirectories to floppy—a few moment's work. Periodically, when changes are made to the contents of the AUTO folder on my C drive, for example, that and certain other master directories may also be backed up to floppy disk. The upshot is that even after a rogue utility completely scrambles my hard disk, restoration of my working environment takes only about an hour—at least in theory.

Problem and Solution

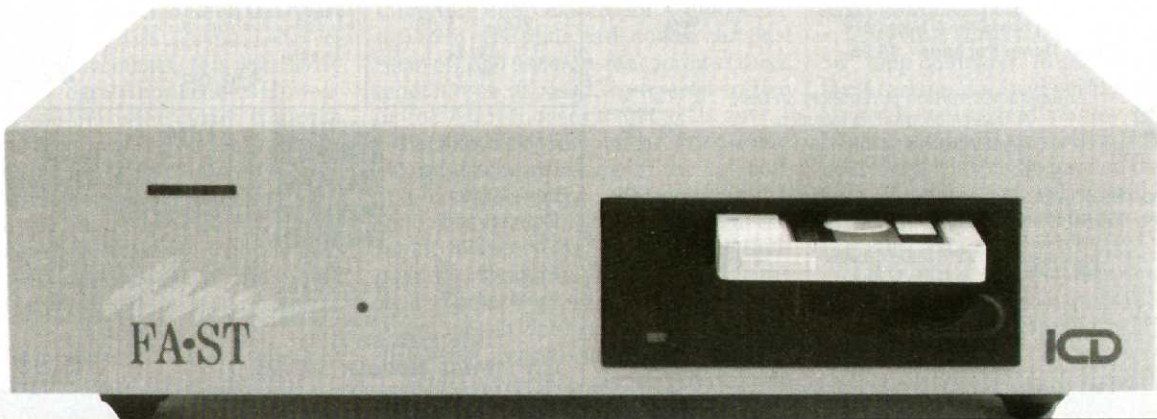
Ha! Welcome to the real world. Fact is, human nature, circumstance, and bad luck usually combine to produce sub-optimal results when this method of backup is employed. You forget to back up something. You install something without backing it up (as an "experiment") and it ends up being a normal part of your working suite of applications. Backup disks fail. Things get ugly.

The last time my hard disk screwed up, I discovered, for example, that I had somehow neglected to maintain backups of ARC, the *Universal Item Selector*, QMI's DeskCart software, and my *Flash* configuration files and dial directory—all of which are absolutely essential to my way of working.

But hey, no problem. A few phone calls, a modem episode, a one-day trip to New Jersey, and the U.S. mail solved my problems adequately. Total time for full restore: one week.

The answer to this mess is obvious: make backups routine, painless, and thoughtless—then back up *everything*. But how do you do that? Backing up a large-capacity hard drive to floppy disks takes an enormous amount of time and a lot of disk space. Doing it *manually* is a stone drag and complicated as well—okay for a computer person, but more trouble and tech than you would want to heap on the head of the average Joe—your secretary, for example. Even when you use a backup and compression utility, the job can get tricky. So what's an ST owner to do?

Enter ICD, and their marvelous FA*ST streaming tape backup system. For those of you unfamiliar with the vocabulary of high-tech mass storage, "streaming tape" systems read and write data onto high-capacity, data-grade cassettes—very much like the audio cassettes we used to use with our



By JOHN JAINSCHIGG

Atari 8-bit systems.

The new generation of tape drives, however, is much smarter than the old Atari CX10M. They can seek forward and backward without manual intervention, writing data at very high density and with considerable speed. The recording process also differs. Whereas old-style cassette units saved an analog record of bit patterns converted to an audio signal (much the same as output from a modem), the new drives save information in pure digital form. They also employ ECC and other forms of error-checking, reducing recording errors to factors as low as one bit in ten million.

What does all this mean to the average ST owner? It means that with ICD's Tape Backup on line, you can back up a 20Mb hard drive in about five minutes. The process can be initiated with a gesture, and left to proceed unattended. Depending on the backup method you select, you can back up individual files and directories or whole partitions (or groups thereof). It is really neat.

Installation

The FA*ST unit measures 11¼″×11″×2¾″—a little smaller than a Mega ST. The steel case is sturdy and well enough ventilated so that Mega owners can stack the device atop the system unit and use it as a monitor stand. In fact, the FA*ST documentation suggests screwing out the front pair of the four rubber feet on the device to set the monitor at a convenient angle for viewing.

I don't imagine it would cause any harm to extend this concept a little and stack the Mega, a MegaFile hard disk, and the FA*ST system together—in fact, I bet it would look pretty cool. Owners of 520 and 1040 STs who have and shoebox-style hard disks, will, of course, have to make do as they can. To render matters a little more convenient, ICD has packaged the backup unit with a longer-than-normal DMA cable.

For all the high technology it contains, the FA*ST tape backup is remarkably simple in appearance. The front of the unit contains a small slot (with levered closure) into which the data cassette is inserted. A small cluster of power and busy LEDs is mounted flush with the case, over on the left side of the front panel. Around the rear are clearly-labeled DMA input and expansion ports, a Centronics-style SCSI (Small Computer System Interface) port, a SCSI device selector switch, power switch, and line-cord connectors.

The device is DMA/SCSI interfaced, meaning that its SCSI ID number must be set to an unused number before physical installation is possible. If you know the SCSI IDs of the other devices in your setup, you can easily set the FA*ST ID by means of the counter switch on the back. Considering that setting a SCSI ID on most equipment involves opening it up and fiddling around with DIP switches, ICD's inclusion of this simple device is to be considered a great convenience.

If you don't know the SCSI IDs of your various system components, there is a simple way around the problem. Before hooking up the FA*ST drive, you can run ICDCHECK.PRG—a simple utility included on the distribution disk that scans your system and identifies the SCSI ID and Logical Unit numbers pertaining to each piece of equipment attached. Then you can set the FA*ST ID to an unused number and plug in.

Installing the device physically is a matter of daisy-chaining it somewhere on the DMA line—simple, since both input and expansion ports are provided. The only caveat, ICD warns, is that no more than three DMA devices should be connected to an ST, even though more *may* work, depending on equipment. That means that with a standard ST hard disk, an SLM804 laser printer, and the FA*ST tape backup unit, you have reached your limit.

ICD has the answer for that little problem, too, of course. The FA*ST tape unit contains an SCSI host adapter that will let you chain up to seven SCSI-compatible devices off its Centronics-style expansion port. These devices (hard disks, etc.) need not contain their own host adapters, and cables connecting them to one another can be up to 20′ long (as contrasted with the mandatory short length of direct-DMA cables). The manual contains full instructions for installing and configuring such devices, as well as for making the required cables.

Using the System

Turning the system on requires only one bit of new knowledge: SCSI devices like to be switched on in order, starting at the ST DMA port and moving out along the daisy chain. Like a hard disk, the FA*ST backup unit goes through a brief self-check, rewinding its tape if a cassette is installed, before quieting down and getting ready for business.

To interface the backup unit with your system, a little more care is required. The FA*ST backup unit makes use of features currently found only in ICD's own hard disk driver software (v. 3.1 or later), so this software must be installed in place of your regular hard-disk handler.

The required booter—in both a long version (ICDBOOT.PRG) that supports data-verification and a short version (ICDBOOTX.PRG) that does not, permitting faster disk writes—is included on the distribution disk. If you boot your hard drive from floppy, you need simply copy the ICDBOOT.PRG of your choice

ICD FA*ST Tape Drive

System: Atari ST

Required equipment: Hard disk drive

Summary: An efficient, high-tech, if somewhat pricey, way to back up your hard disk drive

Price: $899.95

Manufacturer:
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Streaming tape systems ***read and write data onto high-capacity, data-grade cassettes—very much like the audio cassettes we used to use with our Atari 8-bit systems.***

into the AUTO folder of your boot disk, replacing AHDI.PRG (or whatever boot software you normally use).

Alternatively, you can install the driver after booting by double-clicking on ICDBOOT.PRG from the desktop. A third option, booting the whole system from your hard disk, is also offered. However, this requires the use of ICD's hard disk utilities software to install ICDBOOT in your root directory.

The ICD HDUTILS package, while not included with the FA*ST drive, is available on ICD's BBS, CompuServe, and Genie, for no more than the cost of downloading. The ICD driver is said to be somewhat faster than Atari standard hard disk drivers in the AHDI series and may be a good thing to acquire in any case.

One small dark spot is that because the FA*ST device really *is* SCSI-based, it isn't compatible with early hard drives in Atari's SH204 series, as there seems to be a small bug in the SCSI interface on those systems. This can cause more than trivial problems when installing a FA*ST box—and unfortunately, the FA*ST documentation does not describe the dangers in full detail.

Suffice to say, I scrambled the contents of my SH204 quite neatly in the process of installing the test unit, and I suggest that SH204 owners hold off on buying the device until they have their hard drives upgraded through an authorized Atari dealer, a process that involves installing a single chip. Later SH204s do not suffer from this problem, though a bug in their SCSI host adapter units seems to cause other difficulties in using the FA*ST backup system. SH205 and MegaFile units are all perfectly compatible.

Backing up a large-capacity hard drive to floppy disks takes an enormous amount of time and a lot of disk space.

The Software

Once everything is installed and operational, making backups is a snap. Two automatic (i.e., unattended) backup operations are supported: by file and by partition image. The first is vastly preferable for several reasons.

First, it saves only those portions of a hard disk that are in use, saving considerable time in both backup and restore procedures. Second, it permits the selective restoration of files and directories from backup copies. Third, it permits the restoration of files and directories into disk partitions of different sizes from the ones from which the files were originally obtained.

It should be noted, however, that file backup does not trace the links between file sectors, copying them as continuous units to the tape and restoring them in the same way. Instead, it copies all the used sectors in a track as one unit, regardless of the files they belong to, and restores these sectors into available sectors on the target volume. Automatic file backup thus compacts data on the restored volume, but cannot be used to "defragment" hard disks.

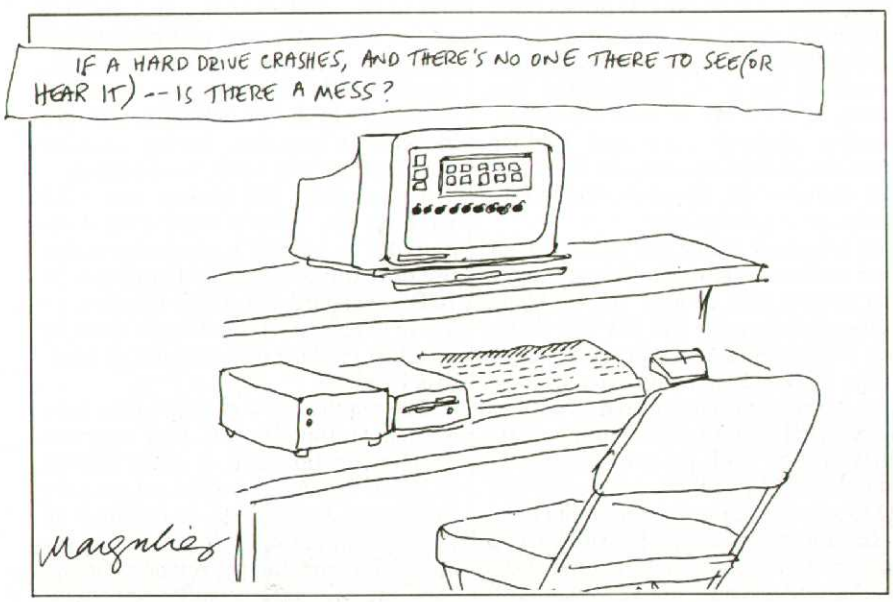
Image backup simply copies an image of a hard disk partition onto the tape, sector-for-sector, including unused sectors. It thus takes a great deal of time to both backup and restore. Restoration (which can only be done to a hard disk partition of the same size) entails overwriting every sector in the partition. Image backup is included primarily as a method for backing up non-GEM partitions, such as those employed by Magic Sac.

To employ one of the unattended backup procedures, you simply select the type, tag the disk volumes to be backed up, decide whether to rewind the tape or append the backed-up data to the end, label the new backup, and let the system do its stuff. Up to 155Mb of data can be saved on a single cassette, making one cassette more than adequate to handle multiple backups of all but the most humongous hard disks. That in itself is lucky, since the current version of the FA*ST system does not support backups requiring more than one cassette.

Automatic file restore is equally simple—just select the target partitions and/or directories, insert the proper tape, and go. Naturally, automatic file restore will restore only partitions saved with automatic file backup, skipping image and manual backups. In addition, it will restore only the first of multiple automatic file backups of the same material saved on a single tape. (The manual copy function, which permits the tagging of specific contents of an automatic or manual file backup for restoration, provides a convenient way of accessing multiple, similar automatic file backups on an individual basis).

In contrary fashion, the automatic image restore function will scan from the beginning of the tape to the end, presenting you with the label of each image backup it finds, until it finds the one you wish to restore.

The FA*ST system makes no use of file archive bits (which, in any case, are handled incorrectly in all versions of TOS prior to 1.4) and, unlike some flop-



py-backup software, does not write archive summaries on the hard disk to guide future restore operations. Automatic (as well as manual) file backup will thus overwrite files bearing the same names as files saved on tape. New material, however, will be left unchanged.

The manual copy function of the FA*ST software is somewhat more complicated to manage. It gives the power to copy individual files, directories, and partitions between tape and disk, or between different areas of the hard disk itself. Tape partition files produced by manual copy will not be restored by the automatic file (or image) restore procedure.

Speed! Ease of Use!

They're not kidding . . . it's fast. Image backup of a 60Mb Supra hard disk took about three minutes per partition—way, way out of the league of any floppy-backup program. Restore was slightly faster—not bad when you think it takes 15 minutes just to reformat the thing! File backup, as advertised, was quicker, since there was considerable empty space on the disk.

The software, which employs the GEM interface for all operations, performs admirably and was easy to understand once a bit of the manual had been digested.

The manual, which was available only in a preliminary version when the FA*ST backup system was reviewed, is nevertheless well-written and complete. It includes full information on system setup, software installation and use, and troubleshooting, as well as several informative appendices on the ICDBOOT handler and SCSI interface. Surprisingly (especially for mass-storage device documentation), the FA*ST manual is complete, but does not bury the reader in obscure technical information about cylinders and controller specs.

Besides the boot module, backup/restore utility, and SCSI ID check software, autoexecute software is included on the boot disk to read the current time from the battery-backed clock in the FA*ST drive and set the ST clock therefrom—a boon to pre-Mega owners.

Incidental software goodies include a nifty hard disk performance tester. As noted above, the drive also comes with the requisite cables (power and DMA), plus one data cassette of ICD's own make. Additional cassettes are available from ICD (for $39.95) or other manufacturers, though they seem to be hard to find.

Needless to say, the relatively high price is attributable to the fact that these cassettes are specially designed for data recording; audio cassettes, regardless of quality, cannot be substituted. The manual suggests adopting a backup procedure in which three tapes are rotated, two used for daily, and one for weekly backups.

At $899.95 retail, the ICD FA*ST tape backup unit isn't cheap. But if you are using an ST in a production environment or if your own time is worth considerable money, it should be viewed as a bargain. The unit is well-designed and provides, in addition to backup security, the base for expanding into additional SCSI hardware. ■

Rename Your Drives

ST HELP KEY

You can change the names displayed under the disk drive icons on your desktop by selecting Install Disk Drive, editing the name displayed, and clicking on the Install button. Saving the desktop will record the new name permanently in your DESKTOP.INF file, so that it will be installed automatically on powerup.

Change The Directory Line

ST HELP KEY

To change the directory line of the GEM file selector to the root directory of any drive other than drive A (e.g. B:*.*):

1. Click on the directory line.
2. Press the Esc key.
3. Enter B: (or the letter of any other drive you want, followed by a colon).
4. Click on the Move bar in the directory window.

B:*.* (or whatever drive you indicated) will appear on the directory line.

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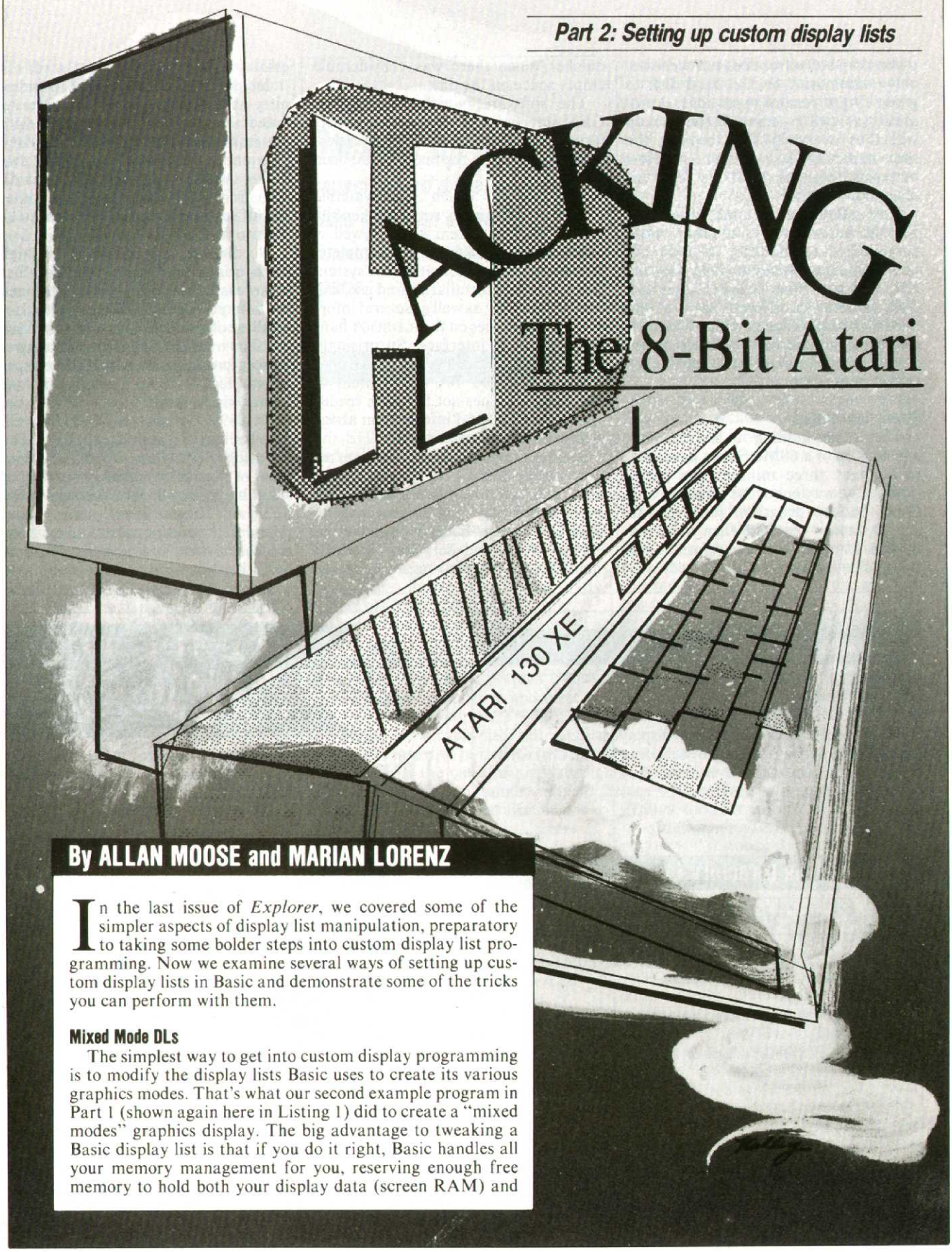
Part 2: Setting up custom display lists

HACKING The 8-Bit Atari



By ALLAN MOOSE and MARIAN LORENZ

In the last issue of *Explorer*, we covered some of the simpler aspects of display list manipulation, preparatory to taking some bolder steps into custom display list programming. Now we examine several ways of setting up custom display lists in Basic and demonstrate some of the tricks you can perform with them.

Mixed Mode DLs

The simplest way to get into custom display programming is to modify the display lists Basic uses to create its various graphics modes. That's what our second example program in Part 1 (shown again here in Listing 1) did to create a "mixed modes" graphics display. The big advantage to tweaking a Basic display list is that if you do it right, Basic handles all your memory management for you, reserving enough free memory to hold both your display data (screen RAM) and

your display list instructions. Moreover, Basic can easily be coerced into thinking that your custom display is one of its normal screens. That means you can use familiar Basic PRINT, PLOT, and DRAWTO statements to bring your custom screens to life.

So how do we go about it? The recipe follows.

The first step in designing a custom display is—naturally enough—to figure out exactly what you want it to look like in terms of graphics mode lines. (If you don't remember what a mode line is, you had better refresh your memory with a look back at Part 1.) The most important restriction to bear in mind at this point is that no screen can contain a total of more than 192 scan lines (excluding the blank lines added at the top to compensate for overscan), since this will cause the screen image to "roll."

Each mode line represents a certain number of scan lines, so a bit of addition and multiplication is required to work out the figures for a custom screen that mixes several graphics modes. For example, the screen layout shown in Figure 1 consists of two lines of Basic mode 2 (16 scan lines per mode line), followed by 128 lines of Basic mode 8 (one scan line per mode line), and ending with four lines of Basic mode 1 (eight scan lines per mode line). As you can see, the total number of scan lines used is 192.

Next, you have to compute the amount of screen memory required to store your custom display. Again, each mode line represents a certain amount of screen RAM. In our example display, each mode 2 line requires 20 bytes, each mode 8 line requires 40 bytes, and each mode 1 line requires 20 bytes. Total RAM required is thus 5240 bytes (see Figure 1).

The third step is to find a Basic graphics mode that requires just a little bit more memory than the custom screen you have designed. The idea here is that if you use such a Basic mode as your starting point for modification, you can be sure that the system will reserve ample RAM both for the screen itself and for whatever little additions you make to the display list. (On the other hand, neither will it reserve much more memory than your application requires.) In our example, because we are devoting so much of our screen to graphics mode 8 already, only GR.8 will fill the bill.

The next step is to "map out" where in memory the different parts of your screen will be located. Since you already know how much memory each region of your custom screen will consume, it is simple to figure out individual offsets from from the start of screen RAM for each subsequent region.

In our example screen, the very first byte of the first mode 2 line falls at offset 0. The first byte of the first mode 8 line occurs 40 bytes above that at offset 40. The first byte of the mode 1 region at the bottom of the screen occurs 5120 bytes above that at offset 40 + 5120 = 5160. The end of screen RAM falls 80 bytes above that at offset 40 + 5120 + 80 = 5240.

Having this information is important for several reasons. First, it will assist you in employing Basic graphics commands to work with your custom screen. The method for doing this involves POKEing the start location of the region you want to work with into memory locations 88 and 89 (in low byte/high

DISPLAY LIST MOD

ATARI KEY

- Any Atari 8-Bit Computer
- Atari Basic

Listing 1. Program that modifies a Basic display list to create a mixed-mode display.

```
5 REM MIXED MODE DISPLAY LIST
10 REM CALL GRAPHICS MODE YOU ARE MODIFYING
20 GRAPHICS 8+16
30 REM ESTABLISH VARIABLE TO KEEP TRACK OF STARTING
   ADDRESS OF DISPLAY LIST
40 DL=PEEK(560)+PEEK(561)*256
50 REM MODIFY THE ORIGINAL LMS INSTRUCTION IN
   DISPLAY LIST
60 REM 1ST LINE OF DISPLAY LIST IS MODE 2
70 POKE DL+3,71
80 REM PUT IN 1 MORE MODE 2 LINES
90 POKE DL+6,7
100 REM COUNT DOWN 128 GRAPHICS 8 LINES
110 REM TAKING INTO ACCOUNT 2ND LMS INSTRUCTION
115 REM PUT IN 4 MODE 1 LINES
120 POKE DL+137,6
130 POKE DL+138,6
140 POKE DL+139,6
150 POKE DL+140,6
160 REM POKE IN JVB
170 POKE DL+141,65
180 REM LO-BYTE/HI-BYTE OF RETURN ADDRESS
190 POKE DL+142,PEEK(560)
200 POKE DL+143,PEEK(561)
210 REM TELL OS WHAT MODE TO USE
220 POKE 87,2
230 POSITION 0,0
240 PRINT #6;"ATARI DISPLAY LIST"
250 REM TELL OS NEW MODE
260 POKE 87,8
270 REM LOCATE CURRENT TOP OF SCREEN
280 TOPSCN=PEEK(88)+PEEK(89)*256
290 REM OFFSET TOPSCN BY # OF MEMORY BYTES FOR
    MODE 2 LINES +1
300 TOPSCN=TOPSCN+41
310 REM POKE THIS LOCATION BACK INTO 88,89
320 POKE 88,TOPSCN-(INT(TOPSCN/256))*256
330 POKE 89,INT(TOPSCN/256)
340 COLOR 1
350 FOR I=0 TO 720 STEP 3
360 ANGLE=I/57.26
370 R=5*ANGLE
380 X=INT(R*COS(ANGLE))
390 Y=INT(R*SIN(ANGLE))
400 IF I=0 THEN PLOT 160+X,64-Y
410 DRAWTO 160+X,64-Y
420 NEXT I
430 REM TELL OS NEW MODE
440 POKE 87,1
450 REM LOCATE CURRENT TOP OF SCREEN
460 TOPSCN=TOPSCN+5160:REM MODE 2 BYTES + MODE 8 BYTES
470 POKE 88,TOPSCN-(INT(TOPSCN/256))*256
480 POKE 89,INT(TOPSCN/256)
490 POSITION 0,2
500 PRINT #6;"MIXED MODES DISPLAY"
530 GOTO 530
```

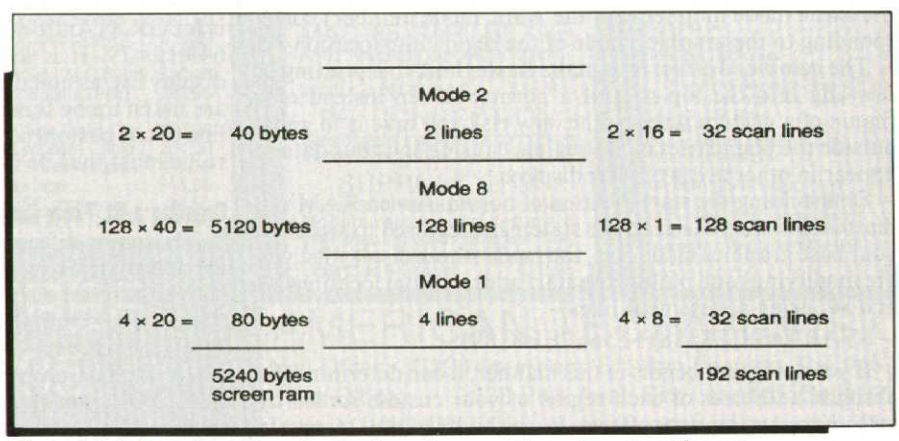


Figure 1. Laying out a custom display. Scan lines used in each mode region are computed and summed at right; total scan lines must not exceed 192. Screen RAM requirements are computed and summed at left.

Some Important Memory Locations

560,561	SDLSTL: Display list pointer. Contains the low byte and high byte of the starting address of the display list.
877	DINDEX: Current screen mode.
88,89	SAVMSC: Contains the low byte and high byte of the starting address of screen memory.
741,742	MEMTOP: Contains the low byte and high byte of the address of the top of free memory used by the OS. This address is the highest free location in RAM for data and programs. The display list starts at the next byte above MEMTOP.
160	RAMTOP: Points to the highest address in main RAM. The value in RAMTOP is always expressed in pages (multiples of 256 bytes). In an Atari computer with 48K or more memory, RAMTOP is initialized to 160, corresponding to memory address 40960.
752	CRISINH: Cursor inhibit. POKEing a 1 into this location makes the cursor invisible. POKEing 0 here turns it back on.

byte format), telling Basic, in effect, that screen RAM begins there. This can be done using a series of Basic statements such as:

```
POKE 89,INT(TOPSCN/256)
POKE 88,TOPSCN-PEEK(89)*256
```

where TOPSCN is the absolute address of the start of the region into which you wish to print or plot. Next, you POKE the Basic mode number (not the Antic mode number) corresponding to the graphics mode of the region into location 87.

The combined effect is to make Basic think it is printing or drawing into the top part of a normal screen instead of a region of a custom screen. The only risk you take is in going outside the boundaries of the region, causing spurious data to appear in other areas of your display.

Determining the start location of normal screen RAM is a matter of issuing the graphics statement required to switch to your base graphics mode (i.e., the mode whose display list you are modifying) and pulling the start address from locations 88 and 89, using a statement like:

```
START=PEEK(88)+256*PEEK(89)
```

If your program begins in this manner, it can determine the absolute addresses of each region of your custom screen by adding the appropriate offsets. It is usually helpful to equate each of these to a variable or place them in a numeric array.

The second reason you need to know your screen memory layout is that—though it is not often a problem unless you work with very large amounts of screen RAM or very long DLs—special cases arise if your screen RAM or display list falls at certain locations in memory. Specifically, screen RAM may not cross an even 4K memory boundary unless an extra Load Memory Scan instruction is placed in the corresponding location in the display list. (Particular problems arise in this respect when screen memory is located such that a 4K memory boundary falls in the middle of a mode line.) In addition, a display list cannot itself cross an even 1K boundary unless a jump instruction is used to bridge the gap.

Depending on how complicated your screen layout is, the number of bytes of memory each region requires, the location in which Basic puts a normal screen in the base mode you have chosen to modify, and other variables, a variety of strategies is available for circumventing these problems.

For example, since our sample screen occupies a total of 6140 bytes, we know for certain that a 4K memory boundary will fall somewhere in the middle of it. We can find out where by determining the base of screen memory in our base graphics mode (GR.8), using the following statement:

```
GRAPHICS 8:BASE=PEEK(88)+256*PEEK(89)
```

In the case of our 130XE, BASE equals 33104. We can find the top of memory required by our custom screen by adding 6140 to BASE and subtracting 1, giving us the highest address our screen will employ, TOP = 6140 + BASE - 1 or 39243.

We then divide this value by 4K (1024×4=4096), use the INT function to eliminate any remainder, and re-multiply by 4096, giving us the location of the 4K memory boundary that falls immediately below the top of our proposed screen RAM:

```
BOUND=INT(39243/4096)*4096
```

In this case, the boundary falls at address 36864. Luckily, this address falls in the middle of the GR.8 region at the center of our custom display. Because our display is based on GR.8, we can assume that Basic has already set up the appropriate LMS instruction in its display list. All our program has to do is anticipate running into that LMS instruction as it performs its display list modifications.

We do this by adding an extra three bytes to the 128-byte display list region that corresponds to the 128 lines of graphics 8 that we are allowing to remain in the center of our custom screen (see lines 90-120).

Finally, if necessary, you calculate a new LMS byte for the first instruction in the display list, based on the mode of the line you are putting there. In our case, Basic's own display list is for GR.8 (Antic mode 15); thus the LMS byte has the value 64+15=79. It is located three bytes past the head of the display list, as noted in locations 560 and 561 (those locations are taken up by three "blank 8 lines" instructions). The first line of our custom screen is to be in GR.2 (Antic mode 7). Its value must thus be 64+7=71.

Creating a DL From Scratch

The major difference between modifying a Basic display list and creating your own from scratch is that you must deal with storing the list (and perhaps screen RAM as well) in a "safe" area. One way to handle this task is to lower RAMTOP (see sidebar)—the value the OS uses to remind itself of where the last physical RAM location is found. By altering RAMTOP, you can fool the OS into protecting an area of high memory from overwriting by system functions.

RAMTOP is stored at location 106. The value stored there is the number of memory "pages" (blocks of 256 bytes) in main RAM. To reserve an amount of memory, issue the

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D.L. BYTE	ADDRESS	VALUE	
1	40192	112	Instructions to display 24 blank lines
2	40193	112	
3	40194	112	
4	40195	71	LMS
5	40196	0	Lo-byte start of screen memory
6	40197	154	Hi-byte start of screen memory
7	40198	7	Instructions to display 11 lines of Graphics 2
.	.	.	
.	.	.	
.	.	.	
17	40208	7	
18	40209	65	JVB
19	40210	0	Lo-byte start of D.L. address
20	40211	157	Hi-byte start of D.L. address

Figure 2. A draft of the display list for the program in Listing 2.

information will appear. Except for the highest-resolution graphics modes, it is possible to sidestep the memory boundary problem by reserving enough RAM so that your screen area and display list can fall between even 4K boundaries and even 1K boundaries, respectively.

We will be using memory rather loosely in the following example (see Listing 2). We have written the program this way so that you can use it as a skeleton for other, larger programs you may write. In addition, this display list will be the basis for graphics programs in upcoming issues.

As with modifying a Basic display list, writing your own should be approached in a sequential manner. Coding the display list will be simplified if you work it out as follows:

1. Figure out how you want to present the screen. In our example, we are re-creating the Basic graphics mode 2 screen without a text window, creating the equivalent of GRAPHICS 2+16.

2. Calculate the number of bytes the display list will use, including blank line instructions, LMS bytes, the total number of mode lines, plus bytes for the terminating instruction, a JVB (Jump and wait for Vertical Blank). For our example, we are using three "blank 8 lines" instructions, one 3-byte LMS instruction (the instruction header byte, plus a 2-byte address for the start of screen RAM in low/high format), 11 mode 2 line instructions of one byte apiece, and a 3-byte JVB instruction (the header byte, plus the 2-byte, low/high address of the start of the display list), making a total of 20 bytes in all.

3. Calculate the amount of screen memory needed. Our example uses 12 lines of mode 2, each of which requires 40 bytes of RAM for a total of 480 bytes.

4. Determine the number of pages to reserve. This is done by dividing the total number of bytes needed to store the list (and perhaps the screen as well) by 256 and adding one extra page, if required, to cover any remainder. This can be computed with the Basic statement:

RESERVE=INT(INT(BYTES/256)+.5)

which essentially rounds the value up to the nearest page. For our example, (480+20)/256=1.93 or two pages. We are actually reserving 12 pages in the program to give ourselves lots of elbow room.

5. Calculate the LMS value for the first byte of your display list by adding 64 to the value representing the Antic mode of the first line of your display. Here, 64+7 (Antic mode 2)=71.

6. Decide upon the relative position, in your reserved area, of the display list and screen memory. In our example, screen memory will start at page 154 (address 154×256=39424), while the display list will begin higher than that at page 157 (157×256=40192).

7. Make a draft display list to double-check everything before you sit down and start coding. One for our example program is shown in Figure 2.

In Part 3, we will continue our coverage of display lists, focusing on a very powerful feature by which the efficiency of the already powerful display capabilities of the Atari computer can be multiplied manyfold: display list interrupts. ■

CUSTOM DISPLAY

ATARI KEY

- Any Atari 8-Bit Computer
- Atari Basic

Listing 2. Program that reserves RAM by lowering RAMTOP to provide secure space for a custom display list and screen memory.

```
310 REM CUSTOM DISPLAY LIST
311 REM RESERVE MEMORY
315 POKE 106,PEEK(106)-12
320 GRAPHICS 18:POKE 752,1:PRINT #6;CHR$(125)
325 REM 3 BLANK 8 LINE INSTRUCTIONS
330 FOR I=0 TO 2
340 POKE 40192+I,112
350 NEXT I
360 REM LMS AND SCREEN MEMORY ADDRESS
370 POKE 40195,71
380 POKE 40196,0:POKE 40197,154
390 REM 11 ANTIC MODE 7 LINES
400 FOR I=0 TO 10
410 POKE 40198+I,7
420 NEXT I
430 REM JVB LO-BYTE/HI-BYTE D.L. ADDRESS
440 POKE 40208,65
450 POKE 40209,0
460 POKE 40210,157
470 REM TELL ANTIC AND OS WHERE DISPLAY LIST AND SCREEN
    MEMORY ARE
480 POKE 560,0:POKE 561,157
490 POKE 88,0:POKE 89,154
500 POSITION 2,6
510 PRINT #6;"STAY TUNED FOR"
520 POSITION 3,8
530 PRINT #6;"DISPLAY LIST"
540 POSITION 4,9
550 PRINT #6;"INTERRUPTS"
560 GOTO 560
```

statement:

POKE 106,PEEK(106)-N

where N represents the number of 256-byte blocks you wish to protect. To ensure that the change percolates throughout the system, issue any graphics command immediately thereafter. This will cause the system to update MEMTOP and other variables.

When reserving space in this way, it is wise to remember that screen-clearing operations and text scrolling actually overwrite up to about 1K (four pages) worth of memory above RAMTOP (normally, this area is occupied by ROM, and isn't damaged by overwriting).

One of the great advantages of manipulating RAMTOP in order to provide secure space for a display list and screen is that it gives you more or less complete control over where this

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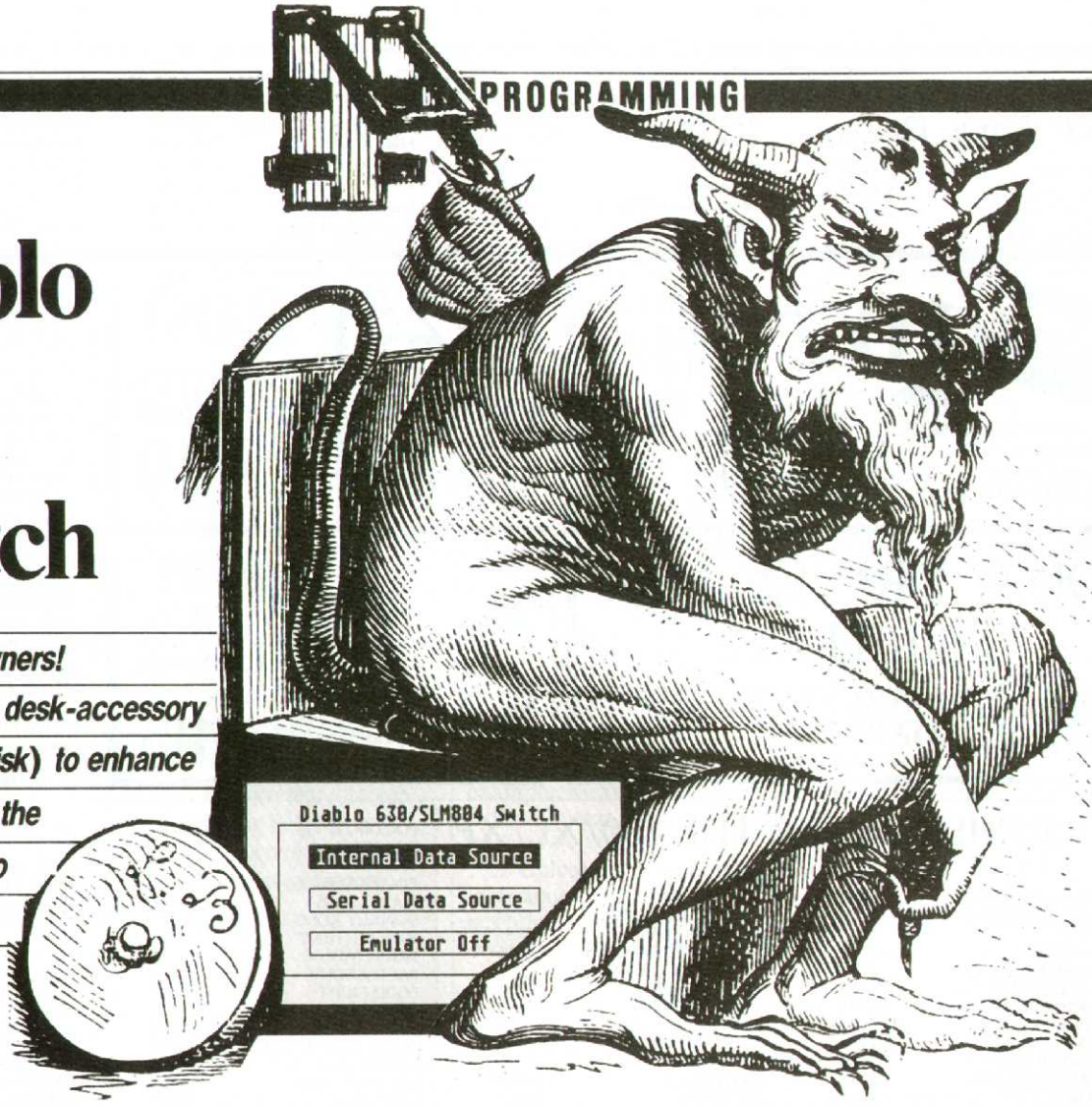

Every computer user knows the frustration that results when you can't make your system do what you want it to do. Even programmers, accustomed as they are to exercising transcendental authority over their machines, are often forced by limitations of time and energy to tackle system problems by orthodox means. You know the routine: call customer service, scan the bulletin boards and information services for clues, and if all else fails, weep bitterly. Sometimes, there's just no help for it.

Then again, sometimes there is. The other night, I was futzing around with my brand-spanking new SLM804 laser printer. The SLM804 is probably the least expensive laser unit on the market, yet its capabilities compare favorably with even the most costly systems. This enormous price/performance advantage derives from Atari's having included only the simplest possible circuitry inside the machine. (Most laser printers, by contrast, contain as much, if not more brains and RAM than the computers that drive them.) To compensate for its lack of intelligence, the SLM804 calls on its host ST for support in converting data to dot images for printing.

SLM804 software support is accomplished in a variety of ways. GDOS printer drivers provide SLM804 support for GDOS applications. Desktop publishing software that provides PostScript output is neatly interfaced to the SLM804 via the UltraScript PostScript interpreter. But for regular old printing, the usual approach is to install the Atari Diablo 630 Printer Emulator, which is distributed free with the SLM804.

The Diablo Emulator turns your SLM804 into the functional equivalent of a Diablo 630 letter-quality printer. When the emulator is installed in your ST, it intercepts all system print functions, processing character streams and escape sequences just as a real Diablo printer would. Since most word processing and other productivity software can easily be configured to support the Diablo, the emulator makes using the SLM804 a real breeze.

Until you hit a snag. As I was saying, the other night I was futzing around with the laser, trying to figure out how to address envelopes. Naturally, the first thing I tried was to feed one into the printer, the wide way, under manual feed control. No dice . . . the SLM804 feeder slot is a fraction of an inch too narrow to accommodate a #10 business envelope.

Next, I tried feeding one in the long way. That worked great; the envelope fed cleanly through the machine. Now all I had to do was figure out how to put the Diablo 630 emulator into "landscape mode," so it would print sideways. Unfortunately, that is not possible with the current revision of the emulator software (version 1.2).

Horrors. Was I going to have to load a desktop publishing program just to address an envelope? Casting around for a better answer, I realized that I *did* still have a standard printer (HP DeskJet) in the office. All I'd have to do to use it was to plug it into the ST printer port and reboot without the Diablo emulator in place, freeing up the system print functions.

Piece of cake. But then it hit me. Was

By JOHN JAINSCHIGG

```
Address      Dump              Mnemonic              Comment

  000B4   ?? ?? ?? ??          [Points to Emulator] #BIOS Trap 13 vector
  000B8                            |
                                   |
                                   V
  ..000   4A 79 ?? ?? ?? ??    tst.w FLAG           #If FLAG not zero ..
  ..006   66 00 ?? ??          bne.w BAILOUT        #branch to bailout
  ..00A                            .
                                   .
                                   .
BAILOUT:  4E F9 ?? ?? ?? ??    jmp OLDVECTOR        #exit to BIOS
                                   .
                                   .
                                   .
FLAG:     ?? ??                                     #word-length variable
```

Figure 1. Simulated disassembly of the head end of the Atari SLM804 Diablo 630 emulator, illustrating BIOS trap intervention when installed.

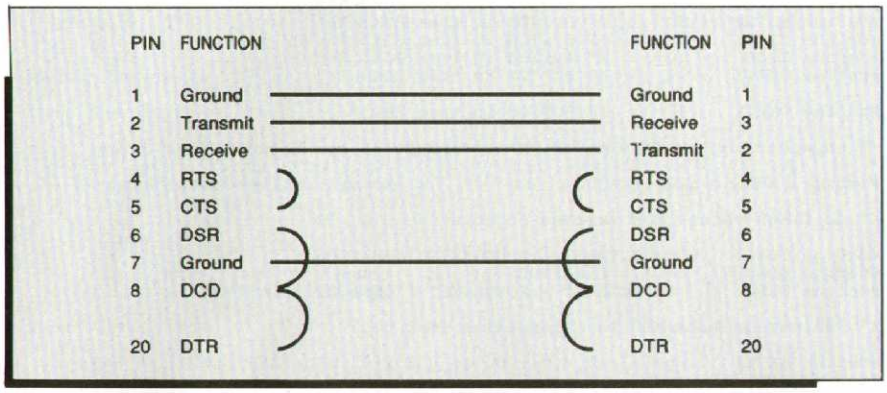

Figure 2. Diagram for a do-it-yourself null modem cable. Swapping receive and transmit wires does the trick of letting two pieces of Data Communication Equipment (such as your ST and a remote computer) talk to each other, directly. Note that this may be insufficient to convince certain software or remote computers that your ST is actually a Diablo 630 daisywheel printer. You may have to experiment, particularly with the cross-wiring of control lines such as RTS/CTS and DSR/DCD/DTR.

I going to have to do this every time I wanted to address an envelope? Drag city . . . there *must* be a better way. I pondered the problem late into the night and at about 3:00 a.m. decided to *do* something about it.

An Awful Hack, and How It Grew

The result was something I'm not proud of. But sometimes the urge to "fix" a contrived and ephemeral problem-oid becomes so imperious that it overrides common sense (not to mention good programming practice). The result is a *solution-oid*, also known as a *kludge*, a *quick-and-dirty-fix*, a *spit-and-baling-wire job*, a *one-off*, a *proof-of-concept*, a *work in progress*, a *piece of code not yet ready for release*, or an *awful hack*.

Normally, neither computer manufacturers (like Atari) nor the computer magazines they publish (like *Explorer*) would have anything to do with code produced in the above manner, i.e., by a lunatic with an axe to grind. However, since the lunatic in question is also the senior technical editor of the journal you are now reading, I have decided to exploit editorial fiat *just this once*, in hopes of amusing you.

But before we continue, dear reader, I'm going to have to place you under a quasi-legal constraint: If you read any further, you automatically agree to indemnify and hold harmless Atari, *Atari Explorer* magazine, and (most important) me, from liability for any damages, incidental or consequential, including etc., etc., so help you God.

Hmmm . . . looks like the crowd has really thinned out. So, kids, here's the scoop. Working from minimal clues given me by an unnamed spy, I began reverse-engineering version 1.2 of the Diablo emulator. Using Alan Pratt's brilliant db debugger, I managed to figure out how the emulator manages to intercept all the system print functions. It does so by rewriting the ST BIOS Trap vector.

Traps are one way the 68000 chip makes the design and evolution of sophisticated systems somewhat easier to manage. In brief, the low 64 bytes of RAM on the ST are given over to a table of 16 4-byte-long (longword) addresses, set to point to dispatching routines for various components of the operating system. The GEM dispatcher, for example, occupies slot 2, the BIOS slot 13, and so on.

Application programs don't normally examine these addresses directly, especially since access to low memory is forbidden to programs operating in 68000 user mode. This is just as well, since the location of operating system components may change as a system is upgraded over the years. Applications can, however, call these OS components *indirectly*—by executing a 68000 Trap instruction with an appropriate argument.

In response to such an instruction, the 68000 pulls the requisite OS address out of the vector table and branches to it, returning to the application when the OS function is completed. The result, in theory, is to create a system in which application software and operating system components can be kept rigorously separate.

Right. The fact is, hacking the system trap vector table is a very handy way to make quick improvements to the operating system. The way this is usually done is to grab the system function address you are interested in "improving" from the trap table and substitute the address of your own code. That way, when the trap is executed by an application, control is passed to your routine rather than to the original system address. Your program can then do its little thing before either returning control to the application or jumping to the system through the stolen vector. All clear so far?

So that's what the emulator does when it loads—it saves the vector in trap slot 13 and hacks the slot to point to its own start address. That way, each time a program calls a BIOS function, control is passed to the emulator rather than to the original BIOS code. All well and good—you can disconnect the emulator by hacking the trap 13 vector back to its original state.

Unfortunately, that brings up another set of problems. Different versions of the ST may have slightly different BIOS entry points, depending on their version of TOS. So you can't just write in a vector that works on one type of ST, say a 1040, and expect the program to work on another type, say a Mega.

Second, on certain systems the emulator may not be the only piece of software that is doing this vector-stealing trick. For all you know, the emulator has stolen a vector that actually points to some *other* program and not to the BIOS at all.

The best approach is to have your program figure out, at runtime, what vector the emulator has stolen in order

to insert itself in the BIOS trap sequence. Then, you can de-install the emulator by hacking the trap back to *this* address, without worrying about whether it points to the BIOS or to some other piece of code. The only problem with this approach is how to find the address in question. The answer that occurred to me, horrifyingly enough, was to steal it back from the emulator.

By rebooting my system with no fancy software on-board, I was able to use db to determine the original trap 13 vector address for the BIOS. Then, rebooting once more with the emulator in place, I did a search for this address in the body of the emulator code. Eureka! There it was, only a few bytes from the head end of the emulator, tied into a 68000 jump instruction. Clearly, this was the emulator's bailout point—the place from which it would exit if it intercepted a BIOS call unrelated to printing.

Upon investigation, however, I discovered that things were a bit more complicated. At the emulator entry point, there is a pair of instructions that test a certain word of memory, which is buried somewhere in the code body of the emulator. If the value found here is non-zero, a branch is taken right to the place I had identified as the bailout point (see Figure 1).

My initial assumption was that the location acted as a simple switch—that the author of the emulator, Dave Staugas, had anticipated the need to turn the emulator off and had provided a flag for doing so.

My initial foray produced a program that started by jumping into Supervisor mode at load time and tracing through the BIOS trap 13 vector to wherever that vector pointed. The program would then make some checks on the opcode values found there to see if they corresponded with those found in my disassembly of the head end of the emulator.

While far from infallible, this method at least offered some assurance that version 1.2 of the emulator was, in fact, in place, and that my program wasn't just looking off into the blue beyond. The program then proceeded to pull the 4-byte address of the emulator flag variable out of the body of the emulator's first instruction.

By hacking the word value found at this address to 0 or 1, my prototype desk accessory seemed able to detach and reattach the emulator at will. Output to the printer would show up on the SLM804 or the DeskJet, depending on how the flag was set. It was only later,

SWITCH630

ATARI KEY

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- Mark Williams C-Language Development System

Listing 1. Switch630, a desk accessory enhancement to the Atari SLM804 Diablo 630 emulator.

```
#include <aesbind.h>
#include <gemdefs.h>
#include <obdefs.h>
#include <osbind.h>

/* resource set indices for dialogs */

#define INTERNAL 3      /* BUTTON in tree SWITCHES */
#define EXTERNAL 4      /* BUTTON in tree SWITCHES */
#define OFF      5      /* BUTTON in tree SWITCHES */

#define BAUD     6      /* BUTTON in tree BOX3 */
#define PARITY   7      /* BUTTON in tree BOX3 */
#define WSIZE    8      /* BUTTON in tree BOX3 */
#define STOPS    9      /* BUTTON in tree BOX3 */
#define FLOW     10     /* BUTTON in tree BOX3 */
#define OKAY1    11     /* BUTTON in tree BOX3 */

#define OKAY2    3      /* BUTTON in tree ERR */

/* ob_spec long bitmaps defining appearance of box objects */

#define BSPEC    (0x011100L)            /* Normal outlined box */

/* ob_flags values for various objects */

#define FLAG1    (SELECTABLE | TOUCHEXIT | RBUTTON)
#define FLAG2    (FLAG1 | LASTOB)
#define FLAG3    (SELECTABLE | TOUCHEXIT | DEFAULT | LASTOB)

/* Defines to make AES function calls look cool. */

#define RECT1    box[0].ob_x,box[0].ob_y,box[0].ob_width,box[0].ob_height
#define RECT2    rs2[0].ob_x,rs2[0].ob_y,rs2[0].ob_width,rs2[0].ob_height
#define RECT3    err[0].ob_x,err[0].ob_y,err[0].ob_width,err[0].ob_height
#define PRECT1   &box[0].ob_x,&box[0].ob_y,&box[0].ob_width,&box[0].ob_height
#define PRECT2   &rs2[0].ob_x,&rs2[0].ob_y,&rs2[0].ob_width,&rs2[0].ob_height
#define PRECT3   &err[0].ob_x,&err[0].ob_y,&err[0].ob_width,&err[0].ob_height
#define SRECT    0,0,0,0

#define TRAP13   (0xB4L)                                    /* 68K Trap 13 vec */

/* Defines for controlling emulator */

#define DIABLO_INT      0                                   /* Internal data src */
#define DIABLO_EXT      1                                   /* External data src */
/* Defines for controlling vectors */

#define INSTALL_EM      0                                   /* Install emulator */
#define DESTALL_EM      1                                   /* Remove emulator */

#define DUMMY           0L                                  /* Dummy pointer */

/* OBJECT array definition for main switchbox */

OBJECT box[] = {
-1,1,2,G_BOX,NONE,0x10,BSPEC,8,16,272,160,
2,-1,-1,G_STRING,NONE,NORMAL,"Diablo 630/SLM804 Switch",40,16,192,16,
0,3,5,G_BOX,NONE,NORMAL,BSPEC,24,32,224,112,
4,-1,-1,G_BUTTON,FLAG1,SELECTED,"Internal Data Source",24,16,168,16,
5,-1,-1,G_BUTTON,FLAG1,NORMAL,"Serial Data Source",24,48,168,16,
2,-1,-1,G_BUTTON,FLAG2,NORMAL,"Emulator Off",24,80,168,16
};

/* OBJECT array definition for RS232 configuration panel */

OBJECT rs2[] = {
-1,1,11,G_BOX,NONE,NORMAL,BSPEC,0,0,224,112,
2,-1,-1,G_STRING,NONE,NORMAL,"Baud:",8,16,40,16,
3,-1,-1,G_STRING,NONE,NORMAL,"Parity:",104,16,56,16,
4,-1,-1,G_STRING,NONE,NORMAL,"Word Size:",8,48,80,16,
5,-1,-1,G_STRING,NONE,NORMAL,"Stops:",120,48,48,16,
6,-1,-1,G_STRING,NONE,NORMAL,"RTS/CTS:",8,80,64,16,
7,-1,-1,G_BUTTON,TOUCHEXIT,NORMAL,"19200",56,16,40,16,
8,-1,-1,G_BUTTON,TOUCHEXIT,NORMAL,"NONE",168,16,40,16,
9,-1,-1,G_BUTTON,TOUCHEXIT,NORMAL,"8",96,48,16,16,
10,-1,-1,G_BUTTON,TOUCHEXIT,NORMAL,"1",176,48,16,16,
11,-1,-1,G_BUTTON,TOUCHEXIT,NORMAL,"OFF",80,80,32,16,
0,-1,-1,G_BUTTON,FLAG3,NORMAL,"OKAY",152,80,56,16
};

/* OBJECT array definition for error dialog. */

OBJECT err[] = {
-1,1,3,G_BOX,NONE,OUTLINED,BSPEC,8,16,192,80,
2,-1,-1,G_STRING,NONE,NORMAL,"Diablo Emulator v. 1.2",8,0,176,16,
3,-1,-1,G_STRING,NONE,NORMAL,"is inaccessible.",32,16,128,16,
0,-1,-1,G_BUTTON,FLAG3,NORMAL,"Okay",64,48,56,16
};
```

```
/* Global variables used by accessory */

long emvec;                     /* pointer to emulator head */
long biosvec;                   /* pointer to BIOS entry point */
int *cpoint;                    /* pointer to emulator control variable */
int okayflag = 0;               /* flag for acc */

/* Arrays for string values used by RS232 Configurator */

char *baud[] = {"19200"," 9600"," 4800"," 3600"," 2400"," 2000",
               " 1800"," 1200"," 600"," 300"," 200"," 150",
               " 134"," 110"," 110"," 75"," 50"};
char *parity[] = {"NONE","EVEN"," ODD"};
char *stops[] = {"1","2"};
char *wsize[] = {"7","8"};
char *flow[] = {"OFF"," ON"};

/* Offsets into above arrays, denoting initial parameter values */

int b = 0,p = 0,s = 0,w = 1,f = 0;

/* Setup routine: This examines the trap vector table and traces the BIOS
   vector out to where version 1.2 of the emulator should be. It performs
   some nominal checks to see if the emulator is in place, and sets a flag
   if things are copacetic. Then, it grabs the first reference to the
   emulator's control variable, as well as the original BIOS entry point
   out of the emulator code. */

void getemvec()
{
long save_ssp;

save_ssp = Super(0L);                   /* Go into 68000 Supervisor mode */
emvec = (long) *(long *)TRAP13;         /* Get vector to emulator head */
if (*(char *)emvec == 0x4a &&           /* Emulator signature: tst.w */
    *(char *)(emvec + 1) == 0x79 &&
    *(char *)(emvec + 6) == 0x66 &&     /* ... bne.w */
    *(char *)(emvec + 7) == 0x00){
        okayflag = 1;                   /* Emulator is there */
        cpoint = *(int **)(emvec + 2);  /* Get emulator control point */
        biosvec = *(long *)(emvec + 10 + *(int *)(emvec + 8));
        }
Super(save_ssp);                /* Go back to (choke) 'user' mode */
}

/* Switch the Trap 13 vector between the emulator and the original BIOS
   entry point. Call with 0 to install emulator, 1 to de-install. */
```

through an accident, that I figured out what was really happening.

I was doing some telecommunications with *Flash* at the time and decided to test the SLM804 switch by causing *Flash* to dump to the DeskJet. Imagine my surprise when I hit the button that was supposed to vector printer output to the Jet, and the SLM804 fired up—even before I had a chance to tell *Flash* to start printing!

Eventually (okay ... about three hours later) I determined that what I had originally assumed was a simple on/off switch was, in fact, a flag that told the Diablo emulator to accept its input not via BIOS print functions, but from the RS-232 port.

What a neat idea! And of course, I should have figured it out sooner. As mentioned in the documentation, the Diablo emulator has the capacity to co-opt the ST into the role of a front end for the SLM804, receiving data from a remote computer via the serial port. If you happen to have another computer with serial capability (for example, an Atari 8-bit system with appropriate interface), a simple null modem hookup can

A further development

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serve to let you render printouts on your laser, courtesy of your ST.

Normally, you engage the serial data source feature by running the main Setup630 utility; no provision for activating this feature is included in the Setup630 desk accessory normally used to monitor and control the emulator and laser printer.

By fiddling around with the RS-232 configuration, I was soon running the laser off my 130XE. But what a bother, having to adjust the serial status of the ST via the Control Panel.

And ... hold on! A more serious problem still existed. While I could use the printer port more or less freely when the emulator was switched to serial input, using telecommunications software at the same time was out of the question, because the serial port was effectively tied up by the data capture process of the emulator. This is disappointing, because a cheap dot matrix printer is much more appropriate than an expensive laser for dumping reams of telecom transcript.

The best approach, I realized, would be to design a switcher that would let you choose among three options: 1) to install the emulator normally, taking its input from the BIOS trap; 2) to modify the emulator to take its input from the serial port and at the same time let the user configure serial communications in a manner appropriate for printing from a remote system; and 3) to switch the emulator completely out of service, leaving both the printer port and the serial port free.

Accessory to the Crime

The program I came up with is shown in Listing 1. It is an absolutely minimal desk accessory, employing dialog boxes instead of windows in the manner of Setup630.ACC, the program it is designed to complement. The dialogs are represented as data structures in the body of the code, eliminating the need for an external resource file.

When loaded, the accessory jumps into Supervisor mode and traces through the BIOS trap vector, checking the code it finds for the "signature" of emulator v. 1.2. If it encounters an unfamiliar pattern, a flag is reset to prevent further operation. Opening the accessory will simply cause a warning dialog to be displayed. This should reduce, though it cannot eliminate, the possibility that the accessory would install itself without the proper version of the emulator in place.

If code resembling the emulator is

```
tweakvec(n)
int n;
{
long save_ssp;

save_ssp = Super(0L);
*(long *)TRAP13 = (n)? biosvec : emvec;
Super(save_ssp);
}

/* The accessory itself: Gosh ... what a beautiful thing. */

main()
{
extern int gl_apid;
int buf[8],ret;

appl_init();                                    /* init application */

menu_register(gl_apid,"  Switch630");           /* register in menu */

form_center(box,PRECT1);                        /* center forms */
form_center(err,PRECT3);
rs2[0].ob_x = box[0].ob_x + 24;                 /* Cartesian sleight */
rs2[0].ob_y = box[0].ob_y + 32;

rs2[BAUD].ob_spec = (long) baud[b];             /* set RS232 panel vals */
rs2[PARITY].ob_spec = (long) parity[p];
rs2[STOPS].ob_spec = (long) stops[s];
rs2[WSIZE].ob_spec = (long) wsize[w];
rs2[FLOW].ob_spec = (long) flow[f];

getemvec();                                     /* get emulator values */

while(1){
        evnt_mesag(buf);                        /* await message */
        if (buf[0] == AC_OPEN){                 /* if acc is opened ... */
                if (okayflag){                  /* if all is well ... */
                        drawbox(box,RECT1);     /* draw switchbox */
                        ret = form_do(box,0);   /* manage it */
                        tweakem(ret);           /* handle user choice */
                        undrawbox(RECT1);       /* undraw switchbox */
                        }

                else{                           /* otherwise ... */
                        drawbox(err,RECT3);     /* draw error box */
                        form_do(err,0);         /* manage it */
                        err[OKAY2].ob_state = NORMAL; /* deselect button */
                        undrawbox(RECT3);       /* undraw error box */
                        }
                }
        }
}

/* Handle the emulator: If the user wants the emulator completely off,
   set the Trap 13 vector to bypass the emulator, and set the emulator's
   serial input flag to zero. This will permit the printer port to function
   normally, and force the emulator to ignore serial input. If the user
   wants the emulator to accept serial input, set the Trap 13 vector to
   point to the emulator, and set its serial input flag to 1. If the user
   wants the emulator to function normally, set the Trap 13 vector to
   point to the emulator, and set its serial input flag to zero. If external
   data source is selected, throw up the RS232 control panel. */

tweakem(r)
int r;                                          /* user selection */
{
tweakvec((r == OFF)? DESTALL_EM : INSTALL_EM);
*cpoint = (r == EXTERNAL)? DIABLO_EXT : DIABLO_INT;
if (r == EXTERNAL) dors232();
}

/* Configure the RS-232 port. No attempt is made to figure out the current
   configuration, since that's too much trouble. Variables 'flo' and 'ucr'
   are set to useful default values, indicating XON/XOFF flow control, and
   8 bit words, no parity, one stop. */

dors232()
{
static int flo = 1,ucr = 136;
int ret;

objc_draw(rs2,0,MAX_DEPTH,RECT2);               /* draw RS232 sub-panel */

do {                                            /* as long as user likes .. */
        ret = form_do(rs2,0);                   /* manage the form */
        if (ret != OKAY1){
                switch(ret){

/* Baud rate is indicated by an integer from 0 to 15, ranging from 19200
   to 50 baud. */

                        case(BAUD):     b = (b + 1) % 16;
                                        rs2[BAUD].ob_spec = (long) baud[b];
                                        break;

/* Parity, stop bits, and word size are bitmapped into the variable 'ucr'
   Bits 1,2 of ucr control parity. */

                        case(PARITY):   p =  (p + 1) % 3;
                                        ucr = ucr & 249;
                                        if (p) ucr = ucr | ((p == 1)? 6 : 4);
                                        rs2[PARITY].ob_spec = (long) parity[p];
                                        break;
```

```
/* Bits 3,4 of ucr control stop bits. */

                        case(STOPS):    s = (s + 1) % 2;
                                        ucr = ucr & 231;
                                        ucr = ucr | ((s == 0)? 8 : 24);
                                        rs2[STOPS].ob_spec = (long) stops[s];
                                        break;

/* Bits 5,6 of ucr control word size. */

                        case(WSIZE):    w = (w + 1) % 2;
                                        ucr = ucr & 159;
                                        if (!w) ucr = ucr | 32;
                                        rs2[WSIZE].ob_spec = (long) wsize[w];
                                        break;

/* Flow control is set via an integer with value 1 (XON/XOFF used alone) or 3
   or 3 (XON/XOFF and RTS/CTS used together). The emulator requires XON/XOFF
   to be on, so user can only flip RTS/CTS on and off. */

                        case(FLOW):     f = (f + 1) % 2;
                                        flo = (f)? 3 : 1;
                                        rs2[FLOW].ob_spec = (long) flow[f];
                                        break;
                        }
                objc_draw(rs2,ret,MAX_DEPTH,RECT2);     /* redraw button */
                }
        } while(ret != OKAY1);          /* until user hits 'OKAY' */

rs2[OKAY1].ob_state = NORMAL;           /* then deselect exit button */
Rsconf(b,flo,ucr,-1,-1,-1);             /* and configure RS232 port */
}

/* Draw a dialog box */

drawbox(p,x,y,w,h)
OBJECT *p;
int x,y,w,h;
{
form_dial(FMD_START,x,y,w,h,x,y,w,h);   /* reserve space for dialog */
form_dial(FMD_GROW,SRECT,x,y,w,h);      /* draw growbox */
objc_draw(p,0,MAX_DEPTH,x,y,w,h);       /* draw dialog */
}

/* Undraw a dialog box */

undrawbox(x,y,w,h)
int x,y,w,h;
{
form_dial(FMD_SHRINK,SRECT,x,y,w,h);    /* draw shrinkbox */
form_dial(FMD_FINISH,x,y,w,h,x,y,w,h);  /* release screen space */
}
```

found, the accessory proceeds to assess two critical values. The first, stored in the integer pointer cpoint, is a long (4-byte) pointer to the emulator status word, taken from bytes 3 through 6 of the first instruction (i.e., at an offset of two bytes from the emulator entry point).

The second value, stored in the long variable biosvec, is a long pointer to what is assumed to be the BIOS entry point. The address of this value is found by computing the offset implied by the second instruction of the emulator—bne.w.

As noted above, should some other piece of software have stolen this vector before the emulator gets there, the "bailout vector" will point to the entry point of that code—not directly to the BIOS. This, in itself, is probably not too critical; if a piece of software is capable of working in sequence with the emulator, it shouldn't be troubled by the accessory.

Once these values have been determined, the rest of the functions of the accessory are fairly simple. To switch the emulator inline with the serial port,

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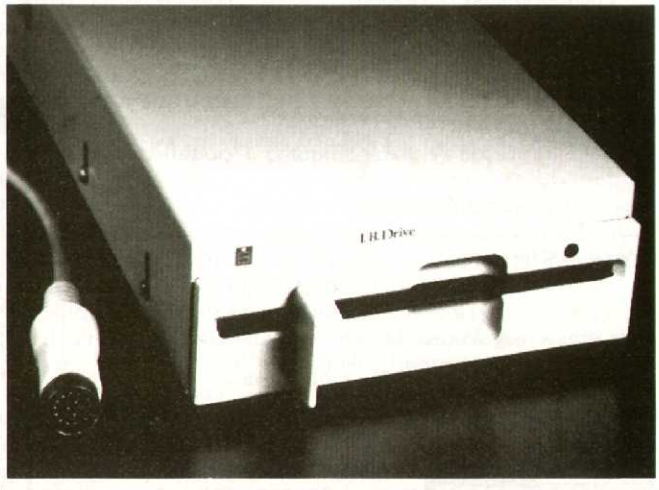

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the accessory sets the emulator status word to 1, causing it to ignore BIOS-directed print requests and turn its attention, instead, to monitoring RS-232 activity.

To return the emulator to normal status, the same value is set to 0. When the user wants the emulator detached completely, freeing up both serial and printer ports, the accessory re-installs the BIOS entry point into the trap 13 vector, simultaneously setting the status word to 0. This causes the RS-232 monitoring routine of the emulator to ignore serial port activity, while at the same time preventing BIOS-level print requests from reaching the emulator entry point.

As an added convenience, I have built in a quick RS-232 configuration stage for use when switching the emulator to serial input. This is not a general-purpose RS-232 configurator. For one thing, it insists on activating XON/XOFF flow control—one of the emulator's requirements.

For another, it does not interrogate the serial port UART to determine initial parameters, but merely imposes whatever configuration is displayed on exit. Defaults are 9600 baud, one stop, no parity, 8-bit word size, RTS/CTS flow control inactive, which seems reasonable for printing at high speed from a remote computer, direct-connected via a null-modem adapter (see Figure 2). To reconfigure the serial port for purposes other than printing, you will have to depend on your terminal program, the VT-52 emulator, or the Control Panel.

The accessory works with version 1.2 of the Diablo 630 emulator and is not guaranteed to work with earlier versions. The next revision of the emulator, v. 1.3, in fact incorporates the functions of this accessory, rendering it obsolete—so much for progress.

While the accessory has been tested with a variety of software on several different system configurations, you may very well be the lucky one who discovers a combination that makes it blow up. In fact, that may not even be too challenging. After all, the program is making a lot of assumptions about how the emulator works that may be partially, or totally incorrect. Nothing ventured, nothing gained. But don't hold me responsible.

The serial port configuration code, in particular, bears examination—representing as it does the very epitome of bad programming style. Note all the undocumented "magic numbers," and other impedimenta to understanding. Part of this, of course, is due to the acute non-orthagonality of the RS-232 UART itself; the greater portion, however, is just bad coding. Please re-write at will, and God bless you.

If you have the Mark Williams C-language development system, you can compile this little beauty yourself by issuing the following command line from the Mark Williams MSH shell:

```
>cc swtch630.c -o swtch630.acc
-VGEMACC
```

which means, "compile the source file swtch630.c, producing object code under the name swtch630.acc and linking in the GEM desk accessory startup code." Copy the .ACC to the root directory of your boot disk, and watch out! ■

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MICROMISER SOFTWARE, 31413 WESTWARD HO, SORRENTO, FL 32776

Software Survey

Start the new year right with exciting new software for your Atari computer

Archipelagos

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST

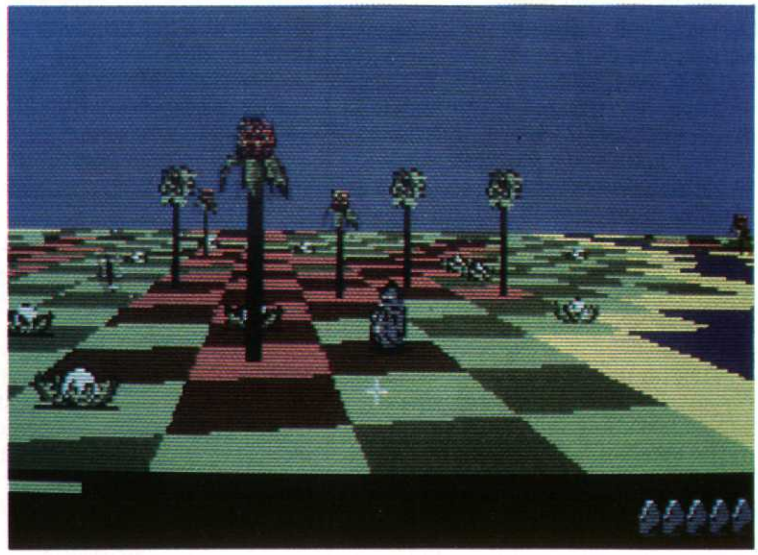
Required equipment: Color monitor

Copy protection: Keyword

Summary: Highly addictive game demands strategy and problem-solving skills

Price: $39.95

Distributor:
Britannica Software
345 Fourth St.
San Francisco, CA 94107
(415) 546-1887



If the name *Archipelagos* has you scratching your head, think of the Florida Keys. The Keys are an archipelago—a group or chain of islands—that resembles what remains of the Earth in this new game from Britannica Software.

As the game begins, you learn that about 200 years ago, the planet became so polluted by nuclear and chemical waste that the ozone layer disappeared. The polar ice caps melted, leaving only islands behind. The human population has long since fled.

Now man has learned his lesson and has begun the clean-up of Mother Earth. Automated air purifiers were sent in first. The human forces that followed, however, never returned. Reports say that they have become paranormal lost souls (necromancers), who roam the coastlines in a zombie-like state.

It is time to try again, and the improved plasmic hoversphere, with its thicker shield and nanosecond response offers new hope for the massive cleanup task.

This half fantasy, half reality scenario was concocted when the software documentation was re-written for the U.S. market, but it isn't all that important to the game. If you enjoy the challenge, the rationale is irrelevant.

As you have probably guessed, you are the pilot of the hoversphere. Your view is behind-the-wheel, with the terrain below represented in a two-dimensional patchwork that scrolls in three-dimensional perspective.

There are no acrobatic mouse maneuvers to be learned. The right button activates the Pan mode, which rotates your point of view 360°, keeping the hoversphere as the center point. The left mouse button, considered the action button, moves the vehicle forward. This is a simple procedure; you just point the cursor where you want to move, hit the left button, and the scenery scrolls until you get to the selected patch.

The visible objects are drawn in simulated 3D and look realistic from any viewpoint, but they are not terribly complex, so that's not saying much. Objects include simple rocks, palm-like trees, arboreal trees (palm trees that are infected), spore pods (golf balls surrounded by a few green leaves), and necromancers (clear cats' eyes).

It is the gameplay, not the graphics that make *Archipelagos* worth the effort. The game calculates 9999 different islands or island groups, each of which must be conquered in order—a feature that ensures many hours of challenging play if you get hooked. To ensure that you don't end up spending

Continued on next page

Archipelagos

the rest of your life conquering the archipelagos, each completed level is saved to the game disk, so you can start a new game at any previously conquered level. Because the game is keyword copy-protected, you can make copies on which to save your conquests.

Gameplay is relatively easy, but it can be very addicting. Simply put, you move to an uninfected area of land near a stone and hit the mouse button with the cursor pointing to the patch of land it sits on. The stone splits into fragments, at which time it is considered cleansed. Once all the stones on an island have been destroyed, you have 90 seconds in which to destroy the obelisk, a large piece of statuary that resembles the Washington Monument.

The level of difficulty progresses slowly and smoothly, so the frustration factor of a long learning curve is not readily apparent. As you reach higher levels of difficulty (11 and up), you must build land bridges to link the island on which the obelisk is located with the smaller stone-littered islands. This construction is easily accomplished with the press of a function key. It does, however, require energy, so you must collect the spore pods that hold the fuel you need.

Landing on infected land or sand is deadly. At level 13, the necromancers start to appear. If one should happen to claim the patch of land you are resting on, it will turn the terra firma into quicksand and you into one of "them"! At level 20, blood eggs spew poisoned blood, that spreads like wildfire. At level 25, the Lost Souls manifest themselves in a whirlwind. If you get caught in it, your soul is transported to an island of lost souls for all eternity.

Pressing another function key reveals a map of the current island, but only your current position and the locations of infected sections are shown. You must find the stones and obelisks on your own. Yet another function key turns off the musical soundtrack.

The game boasts absolutely no bloodletting of any kind, so parents can confidently encourage kids to play it without fear of fostering their violent tendencies.

In conclusion, Britannica's first release is at least as good as the very popular strategy game, *Tetris*. It may not have the hype behind it and it may never become a coin-op hit, but it is one good play for gamesters who prefer strategy to violence. ***—Frank Eva***

King of Chicago

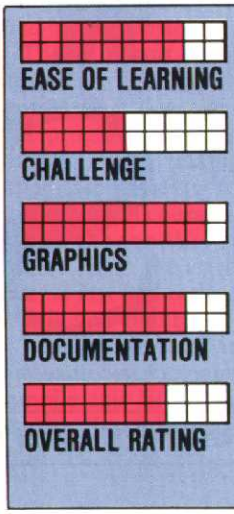
Al Capone has been sent up the river, and Chicago is up for grabs. In Cinemaware's latest interactive movie you take on the role of Pinky Callahan, a Northside hood, who wants control of the city.

Pinky is third in line for control of the Northside gang, and the first part of the game deals with Pinky's attempts to remove the old man (the current leader of the gang) from power. You then have to convince Ben, the second in command, that you should take over.

That done, you attempt to seize control of the West, Loop, and South sections of the city through intimidation, bribery, and various forms of violence.

Through most of the game, pictures of the actors occupy the screen. When Pinky has to make a decision, you see a closeup of him along with two or three thought balloons that describe the choices available. You click on what you want him do, and the story continues.

After you gain control of the gang, you are given access to your desk, on which is located the ledger that you use to determine how much to pay your gang members, how much to allow for to bribes, and so on. Also on your desk is a map of the city's four divisions. When you click on an area over which you do not have control, you begin a discussion



System: Atari ST
Required equipment: 1Mb RAM; double-sided disk drive; color monitor
Copy protection: None
Summary: A decent, but not inspiring, movie-type game
Price: $24.95
Manufacturer:
Cinemaware
4165 Thousand Oaks Blvd.
Westlake Village, CA
91362
(805) 495-6515

Robocop

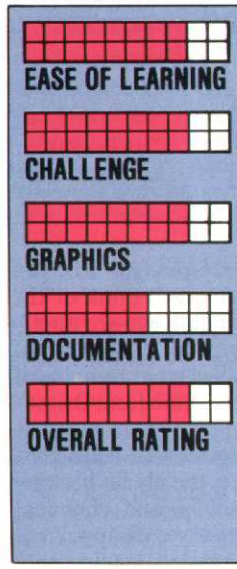
Robocop was a very hot action film—a natural to form the basis of a video game. When Ocean Software started to develop the idea, they were torn between creating an original game and converting an existing arcade game done earlier by Data East. They apparently decided to compromise, taking the arcade concept and adding segments designed to recall scenes from the film.

The premise of the film is rather simple. Detroit has become a criminal playland, and innocent people are no longer safe on the streets. A conglomerate, OCP (Omni Consumer Products) is running the police force and needs a new weapon to stop the criminal element. Their answer is a cyborg—half man, half machine—police officer who combines the power and experience they need.

Your job, as Robocop, is to defeat the criminals who have taken over the city. As you walk through the horizontally scrolling scenes, you are assaulted by bikers, snipers in the windows, goons with grenades, and members of Clarence Bodicker's villainous gang.

As the criminals' shots hit their targets, your energy is depleted, and once it is gone the game is over. You can replenish your supply during the bonus rounds that appear between levels of play.

If you survive the criminal onslaught, you face an end-of-level guardian, which is usually an ED-209 (an out-of-control robot policeman) or some piece of heavy construction equipment. These opponents are tough and can absorb multiple hits before succumbing.



System: Atari ST
Required equipment: Color monitor; joystick
Copy protection: Yes
Summary: A terrific movie/coin-op hybrid
Price: $39.95
Developer:
Ocean Software
Distributor:
Data East USA
470 Needles Dr.
San Jose, CA 95112
(408) 286-7074

with Ben about how to go about taking it.

Finally, there is a picture of your moll, Lola. Click on her picture, and you can talk to her. Most of the time, however, she complains about the things she wants and doesn't have—and if she doesn't get what she wants, watch out.

King of Chicago has a couple of action sequences, but for the most part they are rather lame and reminiscent of the action sequences in the early Cinemaware titles.

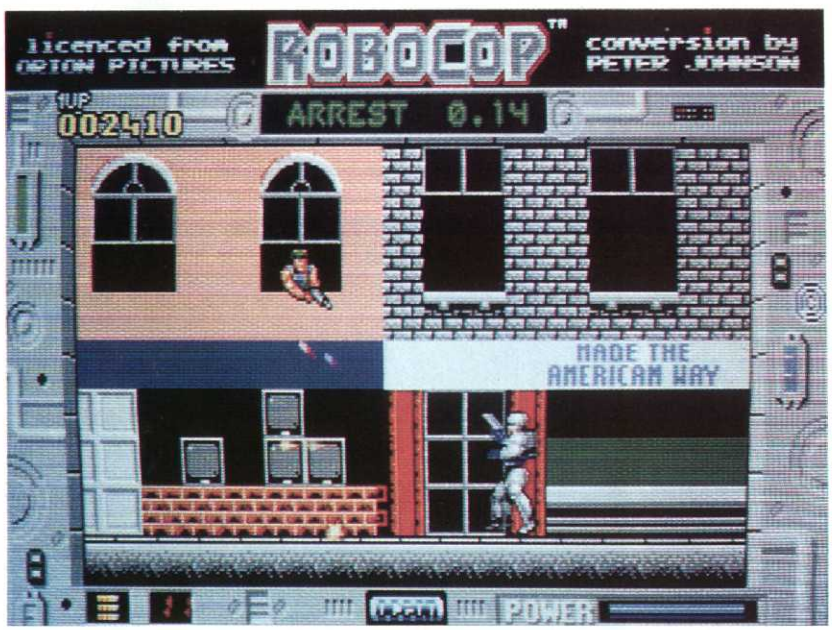
The faces of the actors in *King of Chicago* look wonderfully realistic, measuring up to Cinemaware's standard of graphic excellence. All the men do seem to be wearing the same tacky brown suit, however.

The sound effects are a big disappointment. The auditory stimulation the game provides is limited to a couple snippets of music and one digitized gunshot and death scream.

The game comes on two disks—one single-sided and one double-sided, and it needs at least 1Mb of memory. The manual says that if you have more memory, the game will store previously accessed sequences and disk access will be reduced. I was using a Mega 2 and didn't notice any improvement.

King of Chicago reminds me of those "choose a fate" storybooks. The main difference is that because the game is computerized, you don't always get the same result when you make a given decision. It's not a perfect game, but it is reasonably priced, and it will give Cinemaware lovers something to do until something better comes along.

—Clinton Smith



If you defeat the guardian, you get to play a bonus round, which is where the scenes from the film appear. In Shooting Gallery, you must hit as many targets as you can within the time limit. In Photo-Fit, you are faced with a puzzle that requires you to combine various digitized noses, ears, mouths, eyes, and chins to create a composite that matches a specified mug shot.

In Hostage, you must shoot the criminal, who is using an innocent woman as a shield. Good performance on the bonus tasks restores your energy.

Scattered throughout the scenes are crates containing goodies Robocop can use in his business. Baby Food, for example, is Robo's main comestible, and one valuable jar will replenish your energy. A three-way gun enables you to shoot three bullets at once. The bullets fan out as they leave your weapon, increasing your chances of hitting the snipers in the windows. A higher caliber gun gives you more powerful bullets, which can travel farther and take out more criminals with one shot.

Some criminals carry high-powered cobra assault cannons. If you shoot them, they drop these valuable pieces of hardware, which you can then pick up and use to good advantage.

The graphics in *Robocop* are very detailed, and the horizontal scrolling is quite smooth. The sound effects are limited, but there is a nice rendition of the Robocop theme that plays in the background.

Robocop is very entertaining and very playable. Fans of the movie or the arcade game and anyone who enjoys putting the bad guys in their place with some good shoot-'em-up action should get *Robocop*.

—Clinton Smith

I know of no one who has not at least heard of J.R.R. Tolkien's Ring Trilogy. The story of how Bilbo Baggins obtained the One Ring (*The Hobbit*) and how Frodo Baggins sought to destroy it (*The Lord of the Rings*) holds fascination for readers of all ages.
heard of J.R.R. Tolkien's Ring Trilogy. The story of how Bilbo Baggins obtained the One Ring (*The Hobbit*) and how Frodo Baggins sought to destroy it (*The Lord of the Rings*) holds fascination for readers of all ages.

Now you can take part in Frodo's adventures with the Atari ST version of *War in Middle Earth* from Melbourne House. Can you mobilize the forces of elves, men, and dwarves and get the Ring to Mount Doom in Mordor before the armies of evil Sauron take it from you? This is not a task for the weak of spirit, though even a hobbit can complete it.

War in Middle Earth lets you participate in Frodo's adventures through animated action and the application of the elements of strategy wargaming. You have entire armies to move around on a huge scrolling map, and when the action heats up in one area, you can zoom in and see the action in detail. You can see the Nazgul hurl balls of fire and Frodo draw his sword. When armies fight, though, you just get a running commentary on the number of soldiers being killed on each side.

The game has three screen levels: Full Map, Campaign, and Animation. On the Full Map level you get an overall view of Middle Earth on a colorful map. Characters and armies you manipulate are blinking blue dots. At the start there are just three—Frodo, Sam, and Pippin as they set out with the Ring in hand; Eomer with 120 Cavalry; and Faramir with 200 Rangers.

The entire game is played with icons and menus. Clicking on a magnifying

War in Middle Earth

EASE OF LEARNING
CHALLENGE
GRAPHICS
DOCUMENTATION
OVERALL RATING

System: Atari ST
Required equipment: Color monitor
Copy protection: Keyword
Summary: A challenging animated wargame; best for intermediate to advanced players
Price: 49.95
Distributor:
Melbourne House
18001 Cowan Ave., Ste. A
Irvine, CA 92714
(714) 833-8710

The Real Ghostbusters

EASE OF LEARNING
CHALLENGE
GRAPHICS
DOCUMENTATION
OVERALL RATING

System: Atari ST
Required equipment: Color monitor; joystick
Copy protection: None
Summary: An entertaining arcade translation
Price: $39.95
Developer:
Activision UK
Distributor:
Computer Games +
Box 6144
Orange, CA 92667
(800) 443-8189
(714) 639-8189

For those of you who don't watch Saturday morning TV, let me begin by explaining that the movie "Ghostbusters" has spawned a very successful animated series called The Real Ghostbusters. Data East created a coin-op game based on the series, and now Activision UK has released a home version.

Your job as a Ghostbuster (or in this case, a *real* Ghostbuster) is to battle your way through 10 levels of the super-

glass icon takes you down to the Campaign or Animation level. A map icon takes you up to the next map level.

On the Campaign level you see only a small section of the scrolling map at a time, with characters detailed and armies represented by symbols such as swords (infantry) and bows (elves).

You can give orders to your characters and armies, telling them where to go in Middle Earth, and they will make their way there as best they can. Sometimes they will meet other citizens of Middle Earth, some of whom provide clues that can help you in your quest.

Among the most important things you must find are the items that allow you to mobilize the armies of men, dwarves, and elves. You must give the dwarves the Dwarven Ring, for example, or their armies will not follow your orders.

War in Middle Earth can be frustrating and slow as you traverse the map and try figure out how to mobilize all the different armies. Fortunately, you can change the speed of the game from normal to hasty or very hasty. Very hasty is useful for traveling long distances.

When one of your characters, meets another character, such as the wizard Gandalf, you are given the choice of "going there" or continuing the game. If you go there, you are switched to the Animation level. You see Frodo and friends marching across a digitized country scene and meeting Gandalf. The wizard may have some words of advice or a hint, so it is a good idea to take notes at such meetings.

Some of these meetings are less-than-friendly. The evil Nazgul lords are searching for Frodo and the Ring. If they meet up with one of your parties, you must fight or suffer some injury.

Combat takes place on the Animation level. You can choose what each member of your party will do—charge, engage where you are, withdraw, or retreat. You may, for example, want Frodo to retreat with the Ring while Eomer and his men charge the Nazgul.

The game can be saved to one of the original game disks and restored later. The quest is perilous, so saving frequently is a good idea.

I noted above that *War in Middle Earth* is a strategy wargame. This aspect of the game comes into play when the forces of Sauron eventually come out of Mordor. By the time that happens, you should have mobilized enough armies of men, elves, and dwarves to hold them off long enough to get the Ring to Mount Doom and win the game.

You can station your armies in various fortresses to make it more difficult for Sauron's forces to defeat them. But remember that your goal is to get the ring to Mount Doom, so some of your forces must go with the ring bearer.

If the ring bearer is killed in battle, the Nazgul may wrest the Ring from the forces of good and try to get it to the evil fortresses of Orthanc or Barad-Dur. If they succeed, the forces of evil win the game and you lose. You can get the Ring back if you intercept the Nazgul and kill it before it reaches a fortress.

War in Middle Earth is not a game you will learn to play or even begin to master in a day. Getting used to using the three levels and developing a strategy took me about a week of casual play.

On the 520 ST there is a considerable amount of disk swapping when moving between map levels and on the Animation level. This can be minimized by using the Animation level only when meeting other characters, collecting objects, and fighting.

War in Middle Earth is a massive adventure and wargame that may well occupy your game-playing hours for weeks—or even months. If you haven't read the Ring Trilogy, I strongly suggest that you do so before playing the game; the background will really increase your enjoyment of the game.

War in Middle Earth is a respectful, well-implemented translation of Tolkien's trilogy. It has all the feel of the original stories and plenty of challenging gameplay. If you are an intermediate to advanced player looking for a good strategic wargame or love Tolkien—or both—don't hesitate to buy *War In Middle Earth* for your ST.

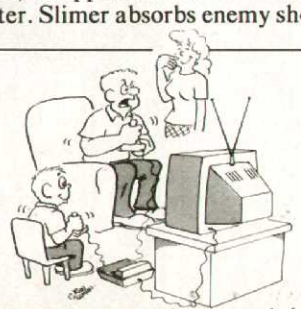
—John S. Manor

natural. You must maneuver your hero of the hereafter through the eight-way scrolling landscape, zapping unearthly creatures (thus turning them into the ghosts), and capturing them with your proton pack.

Located at the northern end of the level is a doorway guarded by one or more guardian creatures, which must be eliminated. If you succeed at that, the key to the next level appears and enables you to move on.

At your disposal are a gun and your proton thrower. You can use the gun, which has unlimited ammo and a truly astonishing range, to turn creatures into ghosts. The proton thrower has limited energy and limited range, but it can suck ghosts into your backpack. When you exit a level, the ghosts you have collected are placed in a containment unit. You get bonus points for each ghost thus stored and an extra life for each group of 50 you put away.

You can also collect special bonus items, which may be either just lying around or hidden within some of the creatures. When you kill such a creature, its ghost appears with the bonus symbol on its stomach. Absorb this ghost, and you gain the bonus. Bonuses include: extra energy, which helps recharge your proton beam energy; an extra shot, which turns your bullets into more powerful fireballs; an aura, which generates a force field around your ghostbuster, rendering him temporarily invulnerable; and a Green Ghost, which causes Slimer (everybody's favorite ghost) to appear and start circling your buster. Slimer absorbs enemy shots and turns any creature that he comes into contact with into its ghostly form.



"Three things in life you can't beat—death, taxes, and a kid at Atari."

If you want to double your fun, you can take a friend along on the bust.

The graphics are very good, and the sound effects have a nice arcade ring to them; the "Ghostbusters" theme that plays in the background is particulary good.

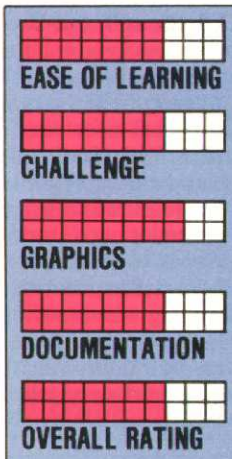
One of the most interesting things about *Real Ghostbusters* is that it isn't copy protected. This means that in addition to being able to make a backup, you can speed up disk access between levels by playing the game from a hard disk or, even better, from a 500K RAMdisk.

Copy all the files to the hard disk or RAMdisk, remove TITLE.PRG from the AUTO folder, and place it in the main directory. Click on TITLE.PRG, and off you go.

The Real Ghostbusters is a good translation of a popular coin-op. It has an entertaining, if somewhat bizarre theme, and is cleverly executed.

—Clinton Smith

The Games: Winter Edition



System: Atari ST
Required equipment: Color monitor; joystick
Copy protection: Yes
Summary: A satisfying collection of new winter sporting events on disk
Price: $49.95
Manufacturer:
Epyx
600 Galveston Dr.
Redwood City,CA 94063
(415) 366-0606

The first game I bought when I got my ST was *Winter Games* from Epyx. I really enjoyed it, so I learned the Epyx had released another winter games package, *The Games: Winter Edition.*

The new package is a collection of events from the Winter Olympics. The program starts with an opening ceremony set in Calgary. A runner carrying a torch enters the stadium and lights the official Olympic flame. All players are then invited to enter their names and the countries they want to represent in the eight winter events.

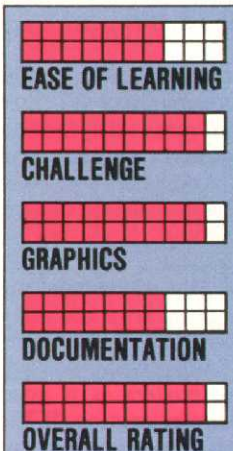
In the Luge, you ride a one-man sled as it speeds through one of four high-speed tracks of ice. In Cross Country Skiing, you ski as fast as you can across mostly level ground by moving the joystick rhythmically.

To compete in Figure Skating, you first choose the style of music to which you want to skate, then choreograph your moves, and finally execute them to the music during the competition.

In Ski Jumping, you assume a first-person perspective as you start down the hill trying to keep your skis straight. When you reach the jump, your perspective changes, and you watch your skier fly through the air. You must keep his body a perfect 45° angle to the ground while he is in the air, and you must land on your feet.

In the Slalom event, you ski down a hill, weaving back and forth between the flags that mark the course. Speed Skating again calls for a rhythmic mo-

Xenophobe



System: Atari 8-bit computer
Required equipment: Joystick
Summary: Eliminate a bunch of ugly aliens in Earth's space stations
Price: $34.99
Manufacturer:
Atari Corp.
P.O. Box 61657
Sunnyvale, CA 94088

Coin-op fans will remember that the arcade hit *Xenophobe* pits you against a bunch of slimy alien monsters that have infested Earth's space stations throughout the galaxy. You are part of an elite team with one mission: regain control of the stations and pick up any valuable hardware the aliens leave behind.

The aliens are a swarming band of uglies, straight out of your worst nightmare. Whether you team up with another member of your squad or go it alone, you will need all of your talent and bravery just to stay alive as you rid each station of these pests.

Nine stations, each with one to five levels of eight rooms each, give you more than 190 rooms of creepy crawlies to eliminate. You face five varieties of alien scum—critters, pods, tentacles,

tion of the joystick as you skate around an oval track as fast as you can.

And for Downhill Skiing, you again assume the first-person perspective as you ski the course, trying to pass between pairs of flags.

A medal ceremony is held after each event. The winning athletes standing on a platform, the winner's flag descends, and his national anthem is played. If you do really well in an event, you might break a previous world record, and your name will be saved on the world record list.

The graphics for the events are very good, especially in the ski jumping and downhill events, which parallax scroll (the various levels of the background scroll at different speeds) to give a good illusion of depth. The sound effects and music are very good, considering that they are not digitized.

The only criticism I have is that my copy of the game consistently crashed when I tried to run it on a single-sided disk drive. It worked fine on my double-sided drive. So I you plan to run the *Winter Edition* from a single-sided drive, check with Epyx before making the purchase to find out whether this bug has been fixed.

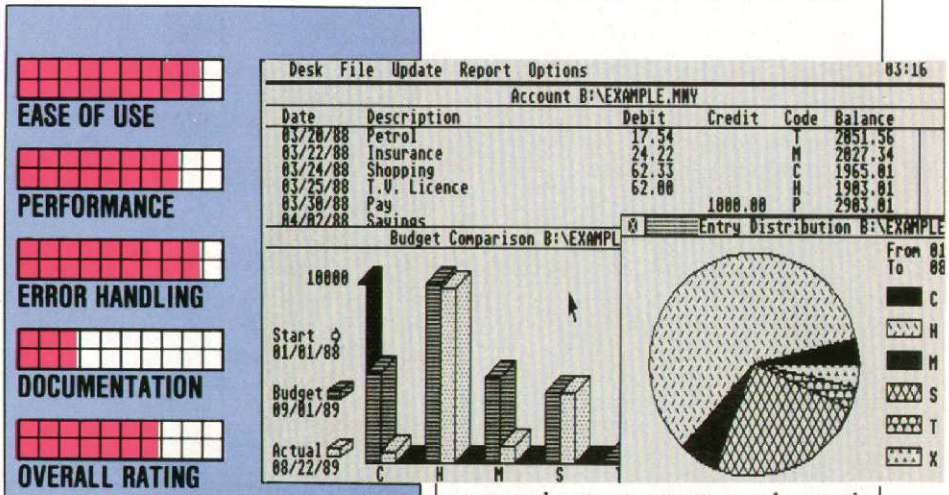
If you're a fan of the Epyx Games series, you will enjoy *The Games: Winter Edition.*—***Clinton Smith***

rollerbabies, and snotterpillars—each of which requires a given amount of force and a special fighting technique (like squat and shoot) to take it out.

As you move about, you find weapons, valuable hardware, and food strewn about. Switch weapons if you find one more powerful than what you have, grab a burger and soda if your health gauge reads low, and pick up valuables when you see them—especially the self-destruct code for the station. But don't waste time searching for stuff, because you have a limited amount of time in each station.

Completely faithful to the arcade version, Atari's cartridge-based *Xenophobe* offers a split screen that allows you and a friend to move independently as you take on the alien hordes. The smooth scrolling of the coin-op, crisp detail of the aliens, dynamite sound effects, and responsive player controls—not to mention the danger, excitement, and challenge—combine to make *Xenophobe* one of the most outrageous action games around for Atari 8-bit systems. —***Wayne Wharton***

Personal Finance Manager



System: Atari ST

Version reviewed: 1.07

Copy protection: None

Summary: An electronic checkbook register with graphs

Price: 49.95

Manufacturer:
MichTron
576 S. Telegraph
Pontiac, MI 48053
(313) 334-8726

Personal Finance Manager is a program designed to provide an electronic record of checking and savings account balances, credit card transactions, and the like. On the screen, it looks very much like a listing of a checkbook register with columns for date, transaction description, debit, credit, budget code, and balance. In addition to providing an account listing, *PFM* has several graphic options to show account balance, individual transactions, and budget comparisons over a selected time period.

Using the program is quite easy. To enter a transaction, from the New Entry screen, you enter the date, amount, budget code (if any), and description. You then click on Credit or Debit and press Return to enter the transaction. After each entry, the main account screen reappears, showing the 19 most recent transactions. *PFM* automatically calculates the new balance in your account.

Recurring transactions such as mortgage and auto payments can be specified as "standing orders" which the program will automatically enter with the frequency you specify.

PCM allows you to specify up to ten budget categories such as house, auto, and clothing for your entries. If you wish, you can set a monthly, quarterly, or annual limit for each budget category and compare your actual expenses to your budget.

In addition to calculating your ongoing balance, *PFM* tries to help you reconcile your bank statement. It does this by juggling recent checks that might not have cleared until it matches the "target balance" from your bank statement.

The program offers three types of graphs. First, a line graph shows your total balance over a period of time—interesting, but not particularly useful. Second, a pie chart shows a summary of transactions by budget code. And third, a bar graph shows comparisons of actual expenditures with your budgeted amounts. Both graphs and account listings can by printed.

Documentation is rather dismal. Reflecting its British heritage, dates are in the dd/mm/yy form. The text is terse in some spots and wordy in others, and there are no screen illustrations at all. Page numbers in the index are all off by 2, e.g., an item listed on page 12 will be on page 14.

Despite the poor documentation, *PFM* is intuitive and easy to use, making good use of the mouse and windows. On the other hand, the program does very little beyond what you could do with a spreadsheet and template. But the real question is: Do you need an electronic checkbook register at all? If you do, check out *PFM*; if you don't, check out *Airball* or *Shuttle II*.

—***David H. Ahl***

L.A. Swat/Panther

System: 64K Atari 8-bit computer

Required equipment: Disk drive; joystick

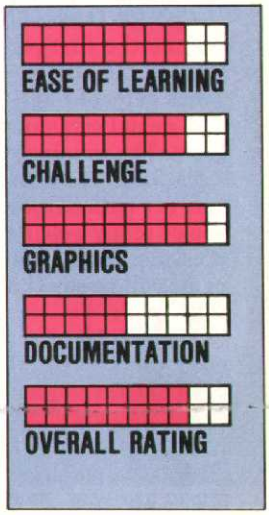
Copy protection: Yes

Summary: Two action-packed games for the price of less than one

Price: $9.99

Manufacturer:
Mastertonic International
18001 Cowan Ave., Ste. A Irvine, CA 92714
(714) 833-8710

L.A. Swat



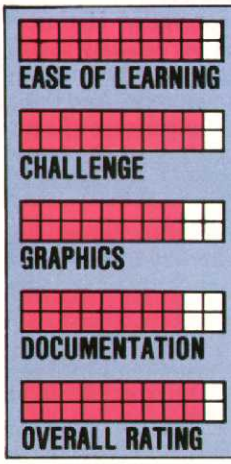
The latest release from Mastertronic International for 8-bit Atari computers includes two games on one disk. *L.A. Swat* is a combat game that takes place in the streets of Lost Angeles, and *Panther* is a futuristic, fast-paced aerial game that challenges you to rescue prisoners from the hostile planet surface of Xenon. Both games offer good graphics and acceptable playability and combine to make the package worth a good deal more than the asking price of $9.99.

The goal of *L.A. Swat* is to steer a squad of three men through the streets of L.A. to save hostages being held by terrorist gangs armed with grenades and rifles. The graphics and animation are well done, but the gameplay is somewhat limited.

You control the leader of the squad, helping him avoid grenades and sniper bullets. At the start of the game, you have three lives, just as you do in many other games. The difference here is that your extra lives are participants in the action; if your team leader gets killed, one of the remaining team members assumes the position of leadership.

You are equipped with a short-range machine gun, which is the only weapon that works against the many gang members who attack you from the top of the screen. If one of these gets past you, he can complicate your defense by sneaking up behind you. If you get too close to

Speedball



System: Atari ST

Required equipment: Color monitor; joystick

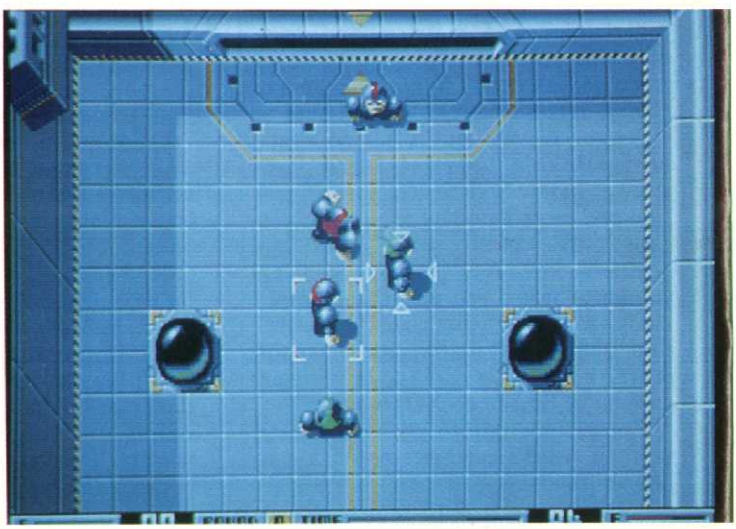
Copy protection: Yes

Summary: Imaginative futuristic sports challenge

Price: $39.95

Developer: Mirrorsoft

Distributor:
Cinemaware
4165 Thousand Oaks Blvd.
Westlake Village, CA 91362
(805) 495-6515

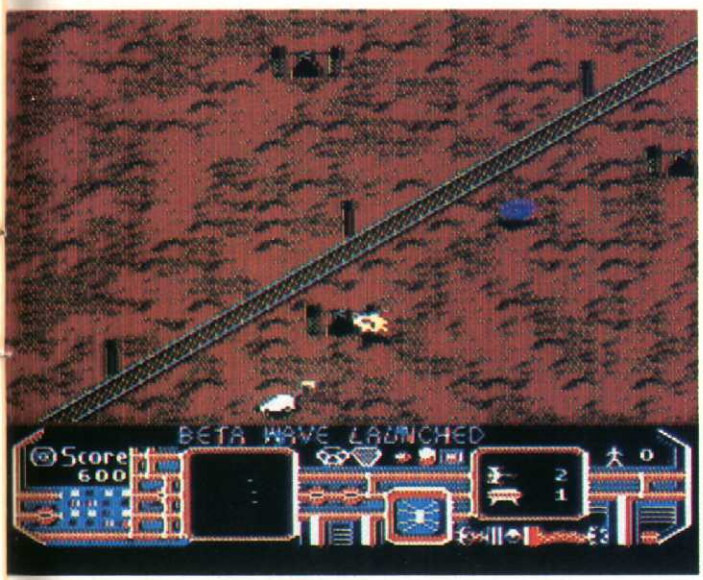


Computer game programmers all seem to enjoy speculating on what sports will be like in the future, and the British Bitmap Brothers are no exception. Cinemaware has imported and released their efforts as *Speedball*, a wonderful futuristic mix of soccer, hockey, and basketball.

In *Speedball*, you control a team of five men whose objective is to put a heavy metallic sphere into an opposing team's goal. Your men can run, slide, pass, and tackle as they attempt to score.

The games are played in a vertically scrolling arena that has several interesting features. The first is height; the goal extends to only a limited height, so it is possible to throw the ball too high and have it bounce off the wall.

The arena has a pair of warpgates at midfield. When a ball is thrown through the left one, it immediately emerges from the right one—very handy for passes. The arena also contains round force field devices called Reflectors, which act as bumpers as the ball



Panther

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

an enemy gang member, a brief moment of hand-to-hand combat ensues, but the other guy always emerges the victor.

You shoot by holding the joystick button down and aiming, a task that is made more difficult by the barrage of grenades that falls almost constantly.

Eventually, your team reaches a crossroad, where a continuous attack of enemy forces attacks from the top of the screen. When all of these attackers have been dispatched, a single gang member emerges holding a woman hostage. The object is to shoot the gang member as he weaves back and forth across the screen without hitting the innocent hostage. No matter how well or badly you do at this, you advance to the next level, where you take on a tougher band of terrorists.

L.A. Swat, although challenging, becomes monotonous after a while. But I guarantee you will get $9.99 worth of enjoyment out of it before that happens.

Panther is an aerial shoot-'em-up that makes exceptional use of the graphics capabilities of the 8-bit Atari systems. Unfortunately, the game suffers from a lack of documentation and is so difficult to play that you may be tempted to give up long before you master it.

Panther puts you in command of a spaceship that looks like some kind of hovercraft. The scrolling graphics and perspective will remind you of the popular *Blue Max*, but the similarity ends there.

You have five ships with which to complete your mission, which requires that you overfly a variety of landscapes while battling enemy aircraft. The enemy ships are difficult to hit. To shoot one, you must take your craft to the same altitude, which doesn't seem that difficult until you learn that you must do so while dodging missiles and avoiding hazards such as buildings and telephone poles on the ground.

If you destroy an entire attack wave, you get a chance to land and rescue prisoners stranded in bunkers on the surface of the planet.

The very brief instructions on the back of the game box describe a spaceport on the other side of the city, but how you get there remains a mystery to me. Before you even reach the city, you must survive several attack waves, which is a difficult task in itself.

If you do get there, almost immediately upon entering the city, the screen displays the message "Fly Under Radar." About the time you finish reading the message, your craft is blown to smithereens by barrage of missiles. It is possible to shoot and dodge some of the missiles, but the outcome of the encounter is always the same.

The control panel of your ship provides such information as your current score, the number of ships you have left, and the number of enemy aircraft currently attacking. The joystick controls all ship movements and gun firing. The keyboard is not used in either *Panther* or *L.A. Swat*.

The main thing that makes *Panther* less than a winner in my book is the fact that it is simply too difficult to play, a shortcoming that is aggravated by the dearth of documentation. The graphics, however, are excellent, and the action is certainly there.

Overall, this two-in-one package from Mastertronic is a good buy, and I hope to see more similar releases in the future.—***George Hulseman***

bounces around the field.

Appearing on the field at random intervals are tokens and bonuses. You can use tokens to buy extra time (if you have lost a close game and want one last crack at a tie or a win); additional strength, stamina, or skill for your team; diminished strength, stamina, or skill for your opponent; or even an extra goal.

Bonuses are special powers which go into effect for a few seconds. They can freeze the other team, slow it down, make you invulnerable, turn the ball into a weapon, cause a bunch of weapons to go flying all over the place, or reverse your opponent's joystick control (only in two-player matches).

The game offers three modes of play. The first is a simple two-player game. The second, one-player knockout, pits you against ten different computer teams in succession. Each team has different strengths and weaknesses, and you play each three times. You earn two points for a win, one for a draw, and none for a loss. If you get three points, you advance to face the next toughest team.

In the third mode, one-player season, you play the ten teams in random order—one game per week. You select the duration of the season in number of weeks (ten to 100), and the top-rated teams go to the playoffs, competing for a chance to play in the Blood Bowl.

Speedball has attractive graphics and has a good musical theme that plays in the background during the games. The playability is excellent, although goalie control can be difficult, and the two-player mode is very well executed. And if you don't have an opponent, you will face no dearth of challenge from the computer teams. It's a great game!

—***Clinton Smith***

"Lots of people can't make it to the third level in PacMan."

Deflektor

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari 8-bit computer

Required equipment: Joystick

Summary: Novel concept requires logic and quick thinking

Price: $24.99

Manufacturer:
Atari Corp.
P.O. Box 61657
Sunnyvale, CA 94088

Atari's games division has released on cartridge one of the best games many 8-bitters have played in years. *Deflektor* is a unique strategy game that challenges you to complete an optical circuit on each level. To do this, you guide a laser beam around the screen by arranging a variety of optical devices in logical sequence. The beam originates in a generator; its goal is a receiver located elsewhere on the current level.

The laser emits a high-intensity beam with which you must destroy light-blocking cells to clear the path to the receiver. You determine that path by reflecting, refracting (bending), and transferring the beam via fiber optics from one point on the screen to another.

To change the direction of the beam, you use your joystick to rotate mirrors to the desired orientation. Some of the mirrors revolve automatically, making adjustment particularly tricky. While adjusting the beam, you must be careful not to hit energy mines or reflect the beam back along its own path, either of which will create a power surge and overload your laser. The laser will also overload if the length of the beam is too great, and if you take too long to complete a level, the laser will run out.

Only the mirrors can be controlled directly, but you can aim the beam at a number of other items to reflect or redirect it. Fiber optic blocks are particularly useful, because they transfer the beam from one point on the screen to another.

To add a bit more challenge to the task, the programmers at Atari have thrown in some pesky gremlins, who wander about, undoing your careful adjustments and generally wreaking havoc. To get rid of one of these pests, position your cursor over it and hit the fire button on your joystick. Zappo! Gremlin is vaporized. But don't waste time shooting gremlins unnecessarily or you will run out of laser energy before finishing the level.

To get the hang of *Deflektor*, I made good use of the Practice Mode with its very slow energy drain and no risk of overload. At first I found the game a bit difficult, but my frustration soon turned to compulsion, and I just couldn't tear myself away from it. Amazingly clever and incredibly challenging, *Deflektor* may well be the most compelling game you have ever played.

—Brad Butler

Titan

Holy Cow—another Breakout variant! Well, I guess there's always room for another . . . and another . . . and another (this is a recording of a broken record).

Why any historical background is necessary to "set the stage" for a Breakout clone is beyond me, but Titus included it, so I will include it. It seems that we are in the year 2114, and a Professor Hybris has created a new leisure concept. *Titan* is driving crowds crazy (and I think I know why . . .). It is probably the fabulous 1000-Kronur bonus awarded to the winner. (Yup, that's got to be it . . .).

To play the game, you guide a power sphere across each of 80 synthetic worlds, using a single control unit, all the while attempting to avoid assorted death icons. Along the way, there are bricks to break; some require only one hit, while others require many.

All kidding aside, Titus has embellished the old standard with quite a few new and unique twists. You are no longer constrained by a single screen. Several screens are linked together by fast multi-directional scrolling. Actually, fast is not the word; lightning is more like it. The scroll is almost too fast for comprehension.

Nor are you confined to moving a paddle back and forth along the bottom of the screen. The Control Unit, which substitutes for a cursor, can be positioned anywhere on the screen, using a joystick. The movements are completely intuitive. The trigger button is used only to slow down the action.

The control unit has the nasty habit of allowing the power sphere to pass directly through it at high speed. When this happens, the sphere reverses direction and frequently winds up tracing a continuous loop, from which it is almost impossible to divert it.

The graphics are nice—walls and bricks are represented in simulated 3D—but they're nothing to write home about. The sound effects are suitable, but the musical intro lasts too long and can't be terminated early.

A major problem with the original concept of playing 80 levels in succession was supposedly addressed in *Titan*. Each high score is saved to disk, along with the last level completed. I'm sure the intention was for you to enter any level number from 1 to the last level conquered and start a new game from there. Unfortunately, this is just not what happens, and this can only be attributed to a bug in the ST version.

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST

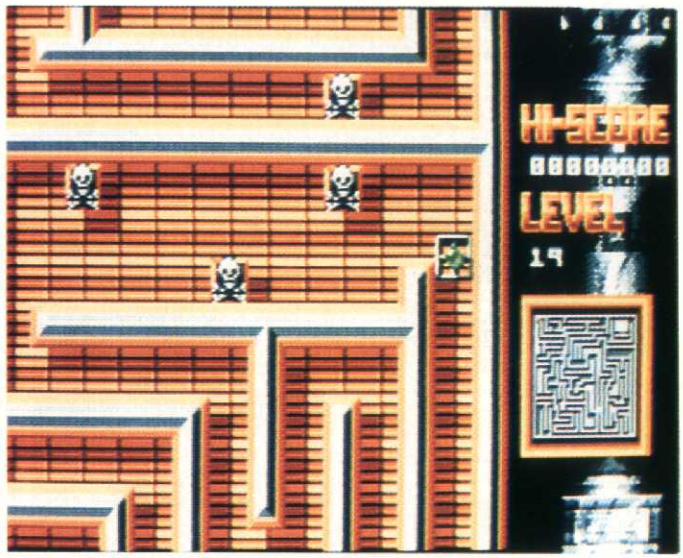
Required equipment: Color monitor

Copy protection: Yes

Summary: Bug-infested reprise of an arcade favorite

Price: $44.95

Manufacturer:
Titus Software
20432 Corisco St.
Chatsworth, CA 91311
(818) 709-3693



During my play testing, I reached level 11 before losing my last life. I also played again to level 15 before calling the game because of trauma. After each game was saved, I was able to confirm that my high score had been recorded correctly, but the restart level number refused to budge from 4! Can you imagine playing through all those lower levels again and again? Not me! I'm no masochist!

Finally, F5 is supposed to invoke a restart at any time. In actuality, you must press F5 for each remaining life, and since you get nine lives, you may be stuck here for quite a while, before the game actually ends. This is just not the way a restart works, folks.

It is too bad that the bugs in *Titan* ruin an otherwise decent effort; its 80 levels of progressive difficulty are surely tantalizing, if you can master the frustrating control unit. Because of these problems, however, I can not really recommend *Titan* to arcade fans.

—***Frank Eva***

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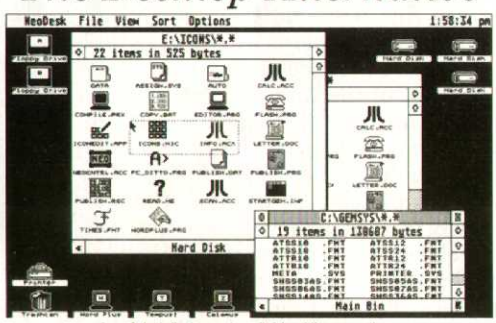

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Time and Magik

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST

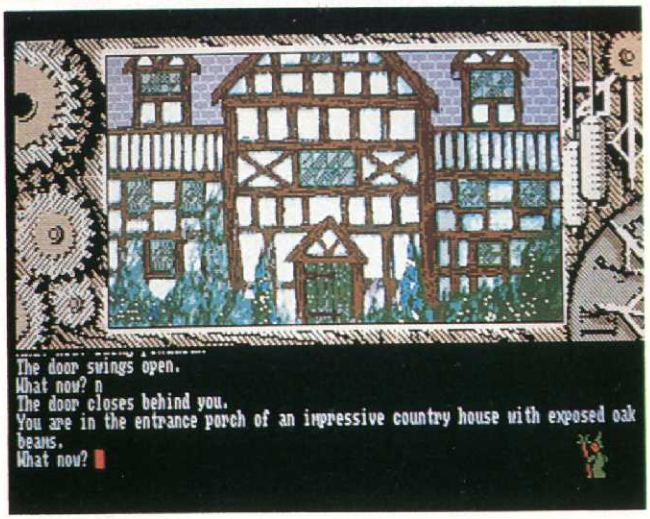
Required equipment: Color monitor

Copy protection: None

Summary: An elegant adventure with a fascinating theme of time travel and magic

Price: $39.95

Manufacturer:
Software Toolworks
19808 Nordhoff Pl.
Chatsworth, CA 91311
(818) 885-9000



Time and Magik is a graphic adventure that is actually three games in one. All three adventures take you on a fascinating journey into the sometimes haunting land of magik, where you must struggle with the Timelords to preserve history and magik by solving puzzles and overcoming obstacles.

Within minutes of first booting *Time and Magik*, I knew I liked it. Some adventure games keep you stumbling about in the forest or locked in the bedroom for so long that you lose interest before you find out what the game is about. *Time and Magik*, by contrast, gets you involved immediately.

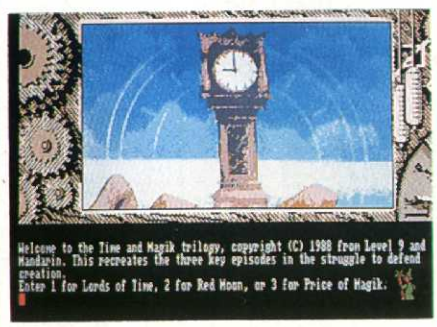
In the first of the three adventures, "Lords of Time," you find that nine evil Timelords have changed history to suit their ends. Father Time, the tenth, good Timelord, gives you your mission: You must travel through time to gather nine magical objects that will restore history.

You time-travel inside an old grandfather clock. Figuring out the mechanism for time travel was a simple introductory puzzle. The rest of the game had me reaching for the hint book frequently. Maps are given for all the timezones you visit in Lords of Time, but I still made my own maps and marked where I found objects.

You travel to nine time zones, including the Middle Ages, the age of the Vikings, and a prehistoric era. You can move from any one to any other at any point in the game, but the manual suggests taking them in order.

In the second adventure, "Red Moon," you must recover the lost Red Moon Crystal that holds all the magik that remains in the world. You must make your own maps for this and the third adventure, but that's no problem. You start out exploring grassy plains and a volcano and eventually find yourself underground.

The final adventure is "The Price of Magik," in which the atmosphere is one of dark foreboding. It seems that the protector of the Red Moon Crystal (recovered in the second adventure) has gone mad and stolen the crystal. Once again, you must recover it. This time, however, you must use magik and cast spells as you progress toward your goal.



In *Time and Magik*, as in all adventures, you must search everywhere, map all locations, and examine everything. The solutions to the puzzles are not obvious and will challenge even the most jaded adventurer. The only hint I can offer the novice adventurer is that every object you find has some purpose or use in the game, though there are some locations that are red herrings.

Time and Magik is a pleasantly easy game to play with lots of built-in commands and special features. I especially appreciate the way the game allows you to change the size of the text to make it easier to read.

A demo lets you see the game played before trying it yourself, and you can save the game to a formatted disk or to RAM. The graphics can be turned on or off, and the descriptions made Verbose or Brief. Exits can be displayed automatically if you want.

If you make a serious mistake, you are supposed to be able to Undo your move, but I found that this worked only if I had previously saved the game position in RAM.

Time and Magik has a special measure of playability that I have seen in few other adventure games. The fascinating time travel theme in "Lords of Time," was especially enjoyable for me, because it presented a wide variety of situations and problems—hungry dinosaurs, a Black Knight, and a larcenous pirate to name a few.

Time and Magik comes with a manual and a hint book. The manual provides some playing hints and a background story for each of the adventures. The hints are designed to mete out only a little information at a time so as not to detract from your enjoyment of the game.

I have played other multiple-adventure games, but none has had the elegant style and presentation of *Time and Magik*. The stories involve you from the very beginning, and the graphics give the game a mysterious feel. The individual puzzles are challenging and interesting.

Combine all of these elements in three adventures, and you have a game package that you will keep you entertained for hours. *Time and Magik* is a top-notch adventure game that I'll have spinning in my disk drive well into the next timezone. ***—John S. Manor***

GoGo ST

This handy utility allows you to run any application with a single click of the mouse button

GoGo ST

System: Atari ST
Version reviewed: 1.2
Required equipment: Hard disk recommended
Copy protection: None
Summary: Single-click application selector
Price: $34.95
Manufacturer:
Maxwell CPU
507 W. Baseline Blvd.
Lafayette, CO, 80026
(303) 665-4849
(303) 666-7754
(303) 666-4470 (BBS)

GoGo ST is a utility program designed to allow the running of a program with but a single mouse click, regardless of how deeply imbedded that program is within directories and sub-directories, folders and partitions. You select the program you want to run from a screen list of up to 50 files. Up to 90 such lists can be stored, so *GoGo ST* has a capacity for 4500 programs—more than you will probably need in this lifetime.

GoGo ST comes with a 12-page manual and a two-page README.1ST file which contains version 1.2 update information. Installation on a hard drive is simplicity itself; all you do is copy the contents of the disk to a folder in any partition of the hard drive. Double-clicking on GOGOST.PRG creates two additional files, effectively installing the program.

From this point on, a double-click runs the program. It can also be easily installed so that it can be loaded with a single combination keystroke (Control-Enter).

Once you have loaded the program for the first time, the process of adding programs to the list is as easy as navigating the file selector. Maxwell CPU recommends the use of the *Universal Item Selector*, but I had absolutely no problem with the built-in GEM item selector.

You simply click on the program that you want to add to your *GoGo ST* list and continue on to the next one. No specific order is required, as the selections are automatically sorted alphabetically, and there is no reason to return to the *GoGo ST* menu until 50 files are selected, or until you want to save the list.

Menu selections consist of Add, which is used to construct lists of files or programs; Clear, which is used to erase a list; Delete, which is used to selectively remove files and programs from a list, and Set Up, which is used to to save lists.

If you don't want to call up a particular list, or you don't know exactly which list a desired program is in, no problem. There is a Find feature, which includes wild card capability, so you don't even have to know the exact spelling of the file name. When a match is found, a single click runs the program.

The ability to set the system clock from *GoGo ST* highlights another interesting feature. Log allows you to print to the screen or to the printer a list of the applications you have used and the amount of time you have spent with each.

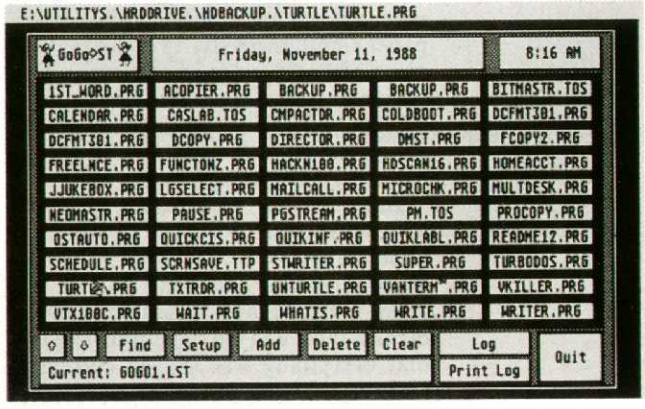
Desk accessories are available at the top of the *GoGo ST* menu bar; this neat little program doesn't even make you relinquish your other favorite accessories and utilities.

Another nifty little extra is the ability to view the application path of any item in the *GoGo ST* list simply by pointing to it and pressing the right mouse button. The menu bar is replaced by a display of the entire path for as long as the button is depressed.

And, by clicking on the *GoGo ST* logo, you can bring to the front any open window behind the *GoGo ST* panel.

I have found *GoGo ST* to be compatible with every application that I have added to it—and I have added quite a few as I become accustomed to the convenience of choosing my applications from a single list rather than a nest of partitions and folders.

If I were to suggest an improvement, it would be to have the flexibility to customize the names that appear on the display panel. Microsoft *Write*, for example, carries more meaning to my overloaded brain than WRITE.PRG, especially when displayed along with 49 other program names. This, however, is a minor inconvenience, and does not detract from the utility of the program. It is well worth buying. ■



By DAVID NOYES

A DeskJet Envelope Accessory

Now your high-end printer can print high-end envelopes

A few months ago, I wrote a review of the HP DeskJet printer—a high-quality inkjet unit that offers laser-like output at fairly low cost. The large volume of mail we received in response to the review is evidence that the DeskJet has been the choice of many Atari ST owners.

Interfacing the DeskJet to a working ST system is fairly simple—a fact that accounts for much of the success the machine has enjoyed in ST circles. Public domain DeskJet drivers exist for most popular ST word processors, for *Degas*, and for many other programs. GDOS support is available from MiGraph (*Easy-Draw*) and others. All of which means that you can use a DeskJet to accomplish a wide variety of tasks, from straight text printing to graphics and desktop publishing.

However, one nifty feature of the DeskJet—its ability to handle #10 business envelopes—remains basically unsupported. Loading an envelope on the DeskJet is simplicity itself: you slip the envelope, face down, under a pair of guides in the paper-out tray, then move it into printing position by pressing the up and down arrow keys on the control panel simultaneously. It is a beautiful piece of engineering, made even more elegant by the fact that the DeskJet print path is always clear (thus ready to accept envelopes) when the printer is not actually printing a page.

But once you have loaded an envelope, what then? Well, the answer used to be that you would load your favorite word processor and bang out an address, hoping that you had put enough blanks, tabs, and carriage returns in so that everything was spaced correctly. Unless you were practiced at the art, several tries were often required before you got an envelope that didn't look like an imbecile typed it. This was emphatically *not* an elegant approach.

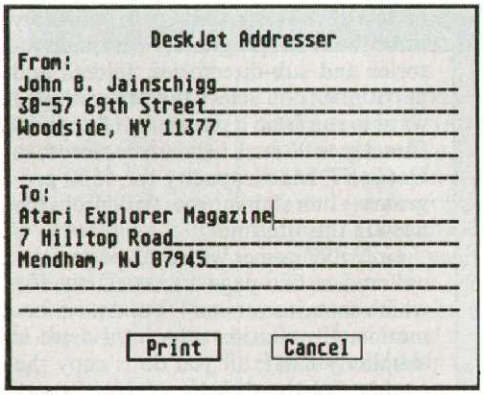


Figure 1. The ENVELOPE desk accessory dialog box.

Then Charles McGuinness came along with a public domain DeskJet envelope-addresser, made available through the Atari Productivity forum (GO ATARIPRO) on CompuServe. (McGuinness is a talented and energetic programmer who was responsible for one of the first public domain *Degas* picture-dump utilities, which is also available on CompuServe.) ENVELOPE .TOS has some nice features—among them the ability to draw a default return address from a disk file (saves repeated typing). However—and this is no criticism of Charles's work—it *is* just a .TOS application. After using the program for a while, I became tired of having to find and execute it as such and decided to repackage the basic idea as a desk accessory.

Hereunder, said accessory, written in Mark Williams C. Listing 1 can be entered as a text file (ENVELOPE.C) and

By JOHN JAINSCHIGG

compiled to accessory form using the following command to the Mark Williams MSH shell:

```
cc envelope.c -o envelope.acc
-VGEMACC
```

In this command, -o envelope.acc causes the compiler to output executable under the appropriate name, and the expression -VGEMACC causes the inclusion of *accessory*, rather than *application* (.PRG) startup code in the final product.

When clicked on from the Desk menu, the accessory searches the root directory of the boot disk for a five-or-fewer-line text file called RET.ADR, containing a default return address. It then throws up the dialog box shown in Figure 1. If RET.ADR is found, the return address in question is displayed; otherwise, the From: space on the form is left blank for you to type in another return address. When you finish filling out the form, load an envelope into your DeskJet, and click on Print.

The accessory employs no DeskJet-specific print codes and, as such, should be usable with other standard printers, as well. As noted above, some experimentation may be necessary to properly position and center an envelope on a printer that employs a standard platen.

Tech Notes

ENVELOPE.ACC is a fairly simple program, interesting mostly in that it demonstrates one way of handling resource objects as data structures embedded in code. As you probably know, it is not a great idea for GEM desk accessories to make use of external resource files, because space allocated for resources is not reliably freed up when switching from one screen resolution to another.

The alternative most frequently employed is to embed resources in code, as shown below. The simplest approach is to design your resources using a standard Resource Construction Set such as the Atari RCS, then convert them to C code in one of two ways: either by engaging a "C-code output" option offered by the RCS itself, or by using a separate resource-conversion utility.

Because of the way GEM handles resources, the process of conversion to C code is only partial and usually suboptimal. When an external resource file is loaded in the standard fashion, via the AES function rsrc_load( ), a lot of fixup is automatically performed to render the in-memory structure of the resource coherent. When a resource is represented in data, however, it is the responsibil-

ENVELOPE.ACC

Listing 1. An envelope-addressing desk accessory.

ATARI KEY

- Any Atari ST computer
- Mark Williams C-language Development System
- HP DeskJet or other sheet-fed printer

```
/*****************************************************************
ENVELOPE.ACC -- Desk accessory for addressing #10 envelopes. Set
up envelope by hand, and feed to first print position. (c) 1989,
Atari Explorer Magazine. Written in Mark Williams C. Compile with:

>cc envelope.c -o envelope.acc -VGEMACC
*****************************************************************/

#include <obdefs.h>
#include <aesbind.h>
#include <gemdefs.h>
#include <osbind.h>
#include <ctype.h>

/* Resource indices for dialog box */

#define BOX       0       /* form/dialog */
#define LABEL1    1       /* STRING in tree BOX */
#define LABEL2    2       /* STRING in tree BOX */
#define LABEL3    3       /* STRING in tree BOX */
#define E1        4       /* FTEXT in tree BOX */
#define E6        9       /* FTEXT in tree BOX */
#define E10       13      /* FTEXT in tree BOX */
#define PRINT     14      /* BUTTON in tree BOX */
#define CANCEL    15      /* BUTTON in tree BOX */

#define DUM       0L      /* dummy pointer */
#define RD_ONLY   0

/* rectangles for simplifying input to object management functions */

#define RECT    box[BOX].ob_x,box[BOX].ob_y,box[BOX].ob_width,box[BOX].ob_height
#define SMRECT  0,0,0,0

/* General template and validation strings */

char *temp = "                                                  ";
char *vald = "XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX";

/* OBJECT array for dialog box */

OBJECT box[] = {
-1,1,15,G_BOX,NONE,OUTLINED,0x21100L,8,0,336,272,
2,-1,-1,G_STRING,NONE,NORMAL,"DeskJet Addresser",104,16,136,16,
3,-1,-1,G_STRING,NONE,NORMAL,"From:",8,32,40,16,
4,-1,-1,G_STRING,NONE,NORMAL,"To:",8,128,24,16,
5,-1,-1,G_FTEXT,EDITABLE,NORMAL,DUM,8,48,320,16,
6,-1,-1,G_FTEXT,EDITABLE,NORMAL,DUM,8,64,320,16,
7,-1,-1,G_FTEXT,EDITABLE,NORMAL,DUM,8,80,320,16,
8,-1,-1,G_FTEXT,EDITABLE,NORMAL,DUM,8,96,320,16,
9,-1,-1,G_FTEXT,EDITABLE,NORMAL,DUM,8,112,320,16,
10,-1,-1,G_FTEXT,EDITABLE,NORMAL,DUM,8,144,320,16,
11,-1,-1,G_FTEXT,EDITABLE,NORMAL,DUM,8,160,320,16,
12,-1,-1,G_FTEXT,EDITABLE,NORMAL,DUM,8,176,320,16,
13,-1,-1,G_FTEXT,EDITABLE,NORMAL,DUM,8,192,320,16,
14,-1,-1,G_FTEXT,EDITABLE,NORMAL,DUM,8,208,320,16,
15,-1,-1,G_BUTTON,SELECTABLE | TOUCHEXIT | DEFAULT,NORMAL,"Print",88,240,64,16,
0,-1,-1,G_BUTTON,SELECTABLE | TOUCHEXIT | LASTOB,
                        NORMAL,"Cancel",192,240,64,16
};

/* text string bank for TEDINFOs */

char *text[] = {
"@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@",
"@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@",
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"@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@",
"@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@"
};
```

ity of the programmer (and the program) to perform this fixup—a matter largely of resolving address references that tie different components of the resource together. Because the absolute address to which a program (or accessory) will be loaded cannot be known in advance, the program must resolve such references dynamically.

This can be tedious when you are dealing with complex resource structures. The resource of ENVELOPE.ACC, however, is fairly simple—a dialog box containing a few G_STRING objects (used as labels), a few G_BUTTON objects (the control buttons), and ten G_FTEXT (editable text) objects, used for address entry.

The basic resource is represented as an array of OBJECT structures, most of which are self-contained (see Listing 1). The only complexity involves the editable text objects, each of which employs the ob_spec field of its OBJECT structure as a pointer to a TEDINFO array. These pointers are declared null for fixup at execution time.

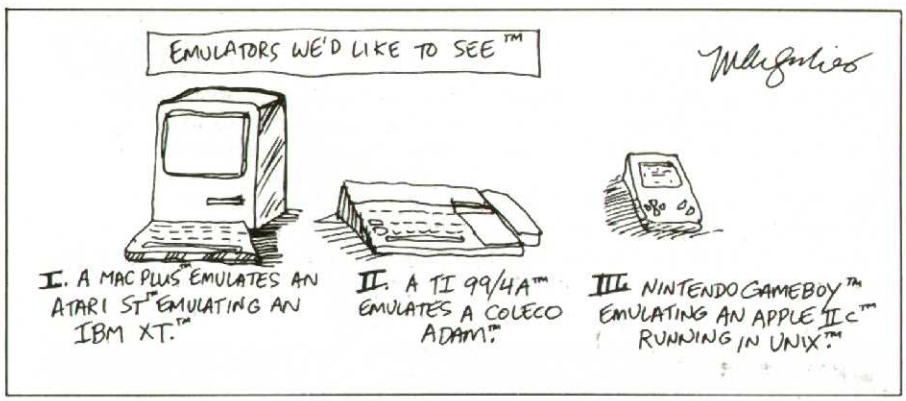
Each TEDINFO structure contains three pointers—to a text string, to a template string, and to a validation string—all of which must also be set dynamically. Since all editable text objects are identical, the same template and validation strings may be used for each; only the text string, used to save text entered by the user, must be stored separately. The actual fixup of address references is handled by the function setup_rsc( ), called when the accessory is first loaded into RAM.

Other aspects of the program are quite standard for a desk accessory and simpler than most. Once initial fixup is performed and the accessory is registered in the Desk menu, the program enters a simple evnt_multi( ) loop, which returns when a GEM message is received. If this message indicates that the accessory has been selected, the disk is searched for the file RET.ADR, and the dialog box is drawn on-screen. The AES function form_do( ) is then called to take user input. This vastly simplifies the job of managing the dialog box on-screen, at small cost to user convenience.

Alternatively, the accessory could have been made to function in a window, but this would have required additional, quite complex, window management code. Note that the disk and printer I/O is at the OS level, because GEM does not permit desk accessories to employ higher-level (stdio) functions. ■

```
/* TEDINFO bank for editable objects */

TEDINFO teds[] = {
DUM,DUM,DUM,0x3,0x6,0x0,0x1180,0x0,0xFFFF,41,41,
DUM,DUM,DUM,0x3,0x6,0x0,0x1180,0x0,0xFFFF,41,41,
DUM,DUM,DUM,0x3,0x6,0x0,0x1180,0x0,0xFFFF,41,41,
DUM,DUM,DUM,0x3,0x6,0x0,0x1180,0x0,0xFFFF,41,41,
DUM,DUM,DUM,0x3,0x6,0x0,0x1180,0x0,0xFFFF,41,41,
DUM,DUM,DUM,0x3,0x6,0x0,0x1180,0x0,0xFFFF,41,41,
DUM,DUM,DUM,0x3,0x6,0x0,0x1180,0x0,0xFFFF,41,41,
DUM,DUM,DUM,0x3,0x6,0x0,0x1180,0x0,0xFFFF,41,41,
DUM,DUM,DUM,0x3,0x6,0x0,0x1180,0x0,0xFFFF,41,41
};

main()
{
extern int gl_apid;
int msgbuf[8],start_edit,count,ret = 0;
char path[11],buffer[210];

appl_init();                                    /* Init GEM application */
menu_register(gl_apid,"  Envelope");            /* Register in desk menu */
getdrvpth(path);                                /* Get boot path */
setup_rsc();                                    /* Fixup resource */

form_center(box,&box[BOX].ob_x,                 /* Center dialog box */
                &box[BOX].ob_y,
                &box[BOX].ob_width,
                &box[BOX].ob_height);

for(;;) {                                       /* ... ever */
        evnt_mesag(msgbuf);                     /* Wait for a message */

/* If we're to open the accessory, check the boot path for the
   return-address file, ret.adr. */

        if (msgbuf[0] == AC_OPEN){
                if ((count = readadr(path,buffer)) == 0)
                        start_edit = E1;
                else{
                        movebuf(buffer,count);
                        start_edit = E6;
                        }

/* Draw the dialog */

                form_dial(FMD_START,SMRECT,RECT);
                form_dial(FMD_GROW,SMRECT,RECT);
                objc_draw(box,0,MAX_DEPTH,RECT);

/* Handle user input */

                do{
                        ret = form_do(box,start_edit);
                        if (ret != CANCEL)
                                print_adr();
                        objc_change(box,ret,0,RECT,NORMAL,1);
                        } while(ret != CANCEL);

/* Undraw the dialog */

                form_dial(FMD_SHRINK,SMRECT,RECT);
                form_dial(FMD_FINISH,SMRECT,RECT);
                }
        }
}

/* Print out the address */

print_adr()
{
int i;

for(i = 0;i < 5;i++){
        if (*text[i] != '@') println(text[i]);
        println("\r\n");
        }

println("\r\n\r\n\r\n\r\n\r\n");

for(i = 5;i < 10;i++){
        if (*text[i] != '@'){
                println("                                ");
                println(text[i]);
                }
        println("\r\n");
        }
println("\f");
}
```

```
/* Print a null-terminated string to the printer via BIOS */

println(s)
char *s;
{
while(*s != '\0') Bconout(0,*s++);
}

/* Do fixup on the internal resource */

setup_rsc()
{
int i;

for(i = E1;i <= E10;i++){
        box[i].ob_spec = (long) &teds[i - E1];
        teds[i - E1].te_ptext = text[i - E1];
        teds[i - E1].te_ptmplt = temp;
        teds[i - E1].te_pvalid = vald;
        }
}

/* Get boot drive and return pathname expression for return address file. */

getdrvpth(s)
char *s;
{
*s++ = Dgetdrv() + 'a';
strcpy(s,":\\ret.adr");
}

/* Read RET.ADR file. Return zero if FNF or error. Count of chars if OK. */

readadr(s,buffer)
char *s,*buffer;
{
int handle;
long count;

if ((handle = Fopen(s,RD_ONLY)) < 0)
        return(0);
count = Fread(handle,210L,buffer);
Fclose(handle);
return((int) count);
}

/* Move contents of read buffer into TEDINFO line buffers */

movebuf(buffer,count)
char *buffer;
int count;
{
int i;
char *p = buffer;

for(i = 0;i < count;i++)
        if (iscntrl(buffer[i])) buffer[i] = '\0';

for(i = 0;i < 5;i++){
        strncpy(text[i],p,40);
        p = p + strlen(p);
        while(*p == '\0') p++;
        if (p - buffer > count) break;
        }
}
```



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315 Two flexible database programs, a nice working PD spreadsheet, more ...
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337 Cyberscape Animation - The BEST ST graphics and sound demo (DBL/1MEG/COLOR).
359 Music Studio #6 - Many songs plus several PD Music Studio song player programs.
392 Anti-Virus disk - Virus detector and killer, ...
409 Uniterm 2.0d - The best ST modem program! Tons of features including a GEM interface.
413 Assistant Chef - Great recipe program (COLOR).
414 Geneological Tree and Astronomy programs.
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520 Great Chess game, Boggle, Cribbage, more...
522 ST Vegas - Poker, Slots, Roulette... (COLOR).
524 PacMan and Midway strategy game (COLOR).
528 Jumpster (QBert Clone), multiplayer Monopoly, HiQ Peg game, Taipan trading game (COLOR).
529 Superb arcade game (ROCM) and Tennis game (COLOR/JOYSTICK).
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Columbus, OH 43202

HiSoft C Interpreter

A good choice for beginning C programmers

C is historically a compiled language. This means that in order to execute a program written in C, a text file containing the program (called the source file) is generally translated into assembly language by a program called a compiler and converted to executable format by a program called a linker. The output of the linker is (usually) a stand-alone assembly language program, differing in no particular way (beyond the stylistic) from an assembler program coded by hand.

Working with a compiler can be difficult for several reasons. First, there is the inconvenience of having to write your program using a text editor, then leaving the editor, activating the compiler/linker, waiting (sometimes for a long time) while the compiler does its job, then either executing the resulting program or returning to the editor to fix the errors that prevented successful compilation.

For most projects, the edit-compile-to-failure-edit cycle will continue for several rounds before syntax errors are worked out; thereafter, an edit-compile-execute-to-crash-debug cycle will commence and continue for who knows how long. When working with a classic compiler, such as Mark Williams C, the process is complicated by having to learn an arcane set of commands for compiler control, the Unix-style command-line shell used to issue these commands, and (optionally) a .TOS-based (i.e., mouseless) editor. Almost needless to say, the learning curve is steep, and the process of programming tedious.

Several companies, notably Megamax, have tried to simplify the business of C programming by developing GEM-based, dynamic compiler/editor environments. These programs (Laser C being the prime example) permit you to use the mouse, windows, and other GEM tools in writing C programs, then engage a high-speed compiler to generate and execute code in a single pass, returning you to the editor environment if all went well and reporting errors if all did not. Using such an environment takes much of the pain out of the compile-edit-debug cycle, without sacrificing the advantage of producing stand-alone code.

About Interpreters

HiSoft C, originally a product of the French Loriciels, Inc., now distributed in the U.S. by MichTron, takes a different approach, offering a similarly integrated environment, but one based around a C interpreter. An interpreter differs from a compiler in that its job is not to produce stand-alone assembly code to be executed directly by a microprocessor, but to *interpret* source code and execute it at one remove.

The disadvantage of an interpreter is that it cannot produce stand-alone applications; the interpreter must be present to execute your program. Moreover, interpretation—a symbolic process—takes longer than direct execution of assembler code, so interpreted programs can't usually compete with compiled programs for speed.

On the other hand, writing and running programs under an interpreter allows the interpreter to monitor syntax and prevent certain kinds of errors from occurring—at least in principle—and this can be reassuring for the beginner.

Certain languages, like Basic, were designed to take full advantage of the protection offered by the interpreter environment. Arguments to Basic functions are normally both type- and range-checked as the interpreter does its work, and access to data-structures, which are finite in type and size, is similarly monitored.

The result is that unless you attempt to manipulate memory directly (using the Basic function POKE, for example), it is fairly difficult to write code that will crash a standard Basic interpreter. It also means that unless your version of Basic supports a controlled interface to esoteric operating system features, it is fairly difficult to write anything really *nifty* with the language, at least without losing the advantage of some of this protection.

C is quite different. For one thing, its syntax is extremely flexible, compared to that of Basic. For another, the approach C takes to data is very concrete, and information such as the location of a data structure in memory is readily available and easily used. Third, although compilers may cluck disapprovingly, they will not forbid certain kinds of "tricky" programming, such as the assignment of one type of data to a variable of another type.

These aspects of the C language exist to make it a) terse, b) fast, and c) powerful, the assumption being that, when compiled, C programs will execute on the same level as pure assembly language and must compete with assembly wherever practical.

The result is to make it extremely difficult to write a C interpreter that will allow full use of the language while insuring the integrity of the system—at least on a computer like the ST, the 68000 microprocessor of which offers only the most rudimentary hardware-level protection. Such an interpreter would be cumbersome in the extreme and would have to be almost clairvoyant.

Because it was created by mortal Frenchmen, HiSoft's interpreter isn't written to clairvoyant specifications. It is thus fairly easy to crash, even when running C code written to a fairly high level of abstraction. That is, even when you have taken pains to make your code *look* as if it would be easy to check. For example, when filling a linear array in C, it is common to use direct memory reference, as shown in Figure 1.

It is also possible to use a more indirect form of reference such as that shown in Figure 2—a syntax which more closely resembles that used with Basic arrays. If the first approach, applied in error, were to crash an interpreter, I would hardly be surprised.

The second, you would think, should be easier to check—except that according to the rules for standard C, *the two methods are identical and will produce the same code.* Sure, they look different to the programmer, but by the time the

By JOHN JAINSCHIGG

```
long i;                 /* declare a looping index */
char c[20];             /* .. a 20-element linear character array */

/* Now, run a loop that increments the counter many, many times,
   writing zeros into the array (and BEYOND!) by direct pointer
   access to memory. This ought to crash anybody's system. */

for(i = 0;i < 200000;i++) *(c + i) = '0';
```

Figure 1. Difficult-to-interpret C code containing a logic error that is quite likely to be fatal.

```
long i;                 /* declare a looping index */
char c[20];             /* .. and a 20-element linear character array */

/* This time, just increment the index, and let C figure out where
   to store the zeros. Shouldn't an interpreter catch this before
   it gets out of hand? Not the HiSoft interpreter! Crash-city! */

for(i = 0;i < 200000;i++) c[i] = '0';
```

Figure 2. Easier-to-interpret C code that performs the same function as code shown in Figure 1—namely, to crash the system.

HiSoft C Interpreter

System: Atari ST

Version reviewed: 1.0

Copy protection: None

Price: $99.95

Summary: Interesting, well-designed C interpreter environment. Good for beginners.

Distributor:
MichTron
576 S. Telegraph
Pontiac, MI 48053
(313) 334-5700

pre-processor of the compiler is finished with them, they are indistinguishable.

So what's an interpreter to do? Either observe the standard, and let the code go through in both cases, or opportunistically apply limitations and create distinctions that aren't really observed by the C language in its purest form. HiSoft C does the former, apparently, since both of the above examples crash the system quite reliably.

Working with HiSoft C

So what is the point of a C interpreter? None, if crash-protection is what you're after. Bus errors, which occur most frequently when direct reference is made to the zone of protected memory in the ST, are nicely fielded by HiSoft—but most other kinds of crashes occur just about as frequently under the HiSoft interpreter as they do when working with the average compiler. Still, there are several advantages to the HiSoft product.

The first is ease of use. The HiSoft editor environment is very handy. It supports eight separate text buffers, or "modules," which can be run, saved, and loaded independently, or linked at runtime into a single program. Cut and paste between buffers is supported, and a full range of editing functions, including search functions that operate on multiple buffers, is available.

Keyboard and function key commands can be remapped at will to make the editor more closely resemble editors with which you may already be familiar. Complete help files—files containing information on every facet of the interpreter, as well as C language syntax and conventions—can be accessed from within the editor.

Second, HiSoft C supports a variety of efficient debugging features. Syntax errors are reliably flagged and can be fixed while a program is merely paused. Other errors, insofar as they can be fielded, are fielded well, causing various more-or-less verbose error dialogs to pop up.

Other debugging features include a TRACE function that permits single-stepping through a program. TRACE can be turned on and off either from the interpreter menu or by a program itself, using the special function calls TRACE_on( ) and TRACE_off( ). A variable index, showing the current values of all variables or subsets selected by type, is also available, and given variable values can be observed during a TRACEd run.

A memory dump and stack display are offered, along with a variety of little programming amenities. These last include a very well-designed hex, decimal, and octal pop-up calculator (integer-only), that employs Reverse Polish notation; an ASCII table; file printing via built-in print spooler; and a very nice disk formatting tool.

Third, there is simplicity. Much of the more-or-less-raw interface to GEM AES, VDI, Line-A, and other system components, offered by standard C compilers, has been partially reworked by HiSoft into a collection of somewhat easier-to-use, slightly higher-level functions (the normal functions are also available). All in all, HiSoft's libraries contain 460 functions—comparable to most high-end compiler environments.

Finally, the HiSoft system offers a considerable speed advantage over any compiler in actually firing up a program. The interpreter is thus very efficient when programs involve a lot of individual testing of small, independent routines, or are simply large in size.

Installation and Docs

The HiSoft C interpreter comes on two single-sided disks, which are not copy-protected. The first disk contains the interpreter environent and supplementary files. The second contains a range of header files and help files, each in its own directory, plus a directory filled with example C programs and full source to the HiSoft C toolbox functions. This last is a terrific inclusion, since it gives the beginning programmer some idea of how professionally-written C code looks and works.

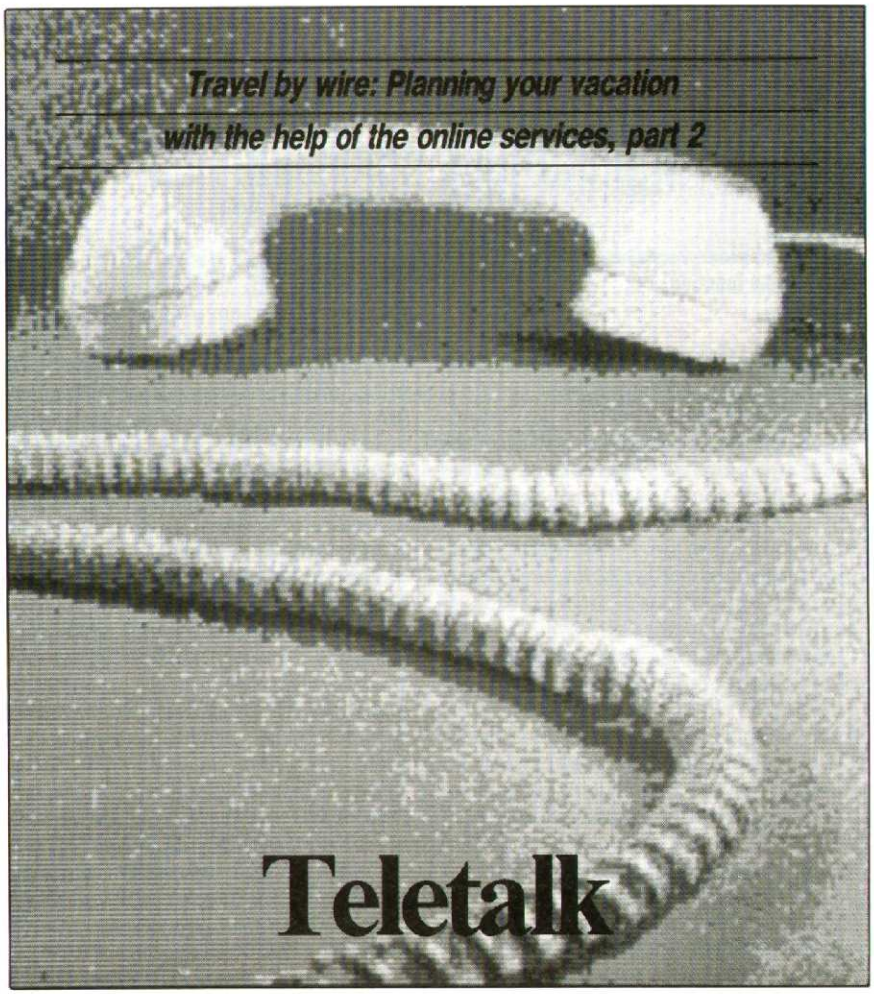
The system will run from a pair of disks, a single double-sided disk, or a hard disk. Installation on the latter two is simply a matter of copying essential files (the interpreter, its resource file and supplementary files, plus the header and help directories) to whatever medium you prefer.

The 329-page spiral-bound manual is translated from the French, but correctly and idiomatically so, making it easy to follow. A full tutorial on the interpreter is followed by a chapter on beginning C programming, illustrated with numerous examples.

Next come several reference sections, detailing the use of HiSoft's many special functions, plus standard library functions drawn from ANSI, Unix, GEM, TOS, and BIOS. Answers to the exercises (a very nice touch!), a concise language reference, a bibliography for further reading, and a full index are also included.

Though largely complete, the manual omits certain important details, particularly in reference to GEM functions. Beginning programmers may wish to cross-check references in the HiSoft manual with references found in Abacus or other standard GEM documentation.

All in all, I would call HiSoft's C interpreter a good buy. It offers enough power, flexibility, and ease of use to be appropriate for the beginning C programmer, so long as he does not expect that working with a C interpreter will be as secure an experience as working in Basic. More experienced programmers will enjoy playing with the interpreter and inventing ways to apply its many helpful features to production work. ■



Teletalk

Travel by wire: Planning your vacation with the help of the online services, part 2

By BETSY STAPLES

Serious travelers—in whose ranks I include anyone who relies on public transportation in foreign countries, belongs to more than one airline's frequent flyer club, or has stayed in more than two non-chain hotels outside of the U.S.—enjoy planning their trips almost as much as they enjoy traveling. They take pride in their ability to gleen all the information they need to plan a three-week stay in Mozambique from guidebooks, newspaper travel articles, and an occasional travel club newsletter. They are the people you meet on the banks of the Nile, the pampas of Argentina, and the steppes of Mongolia.

If you are one of them, the online travel services of Compuserve, Delphi, and Genie are good places to develop your latent travel agent talents.

In the May/June '89 issue of *Explorer*, we took a close look at the travel services available to CompuServe and Genie subscribers. For this issue, we spent quite a few hours familiarizing ourselves with the services offered by Delphi.

Delphi's Travel & Leisure menu lists 14 options, which vary in utility and information value from "Wow! I never knew that" to "Who cares?" To dispense with the latter category quickly, don't waste your connect-time on TQ Travel Trivia Contest—a contest that was nothing but a bit of promotional hype for Eaasy Sabre when it was current, which it wasn't when we checked—or Directory of Travel+Plus Services—a search feature that requires you to know the contents of the database before you can search on the keywords it recognizes.

PARS TravelShopper and Eaasy Sabre are the same services that appear on the Compuserve and Genie travel menus. For detailed descriptions of these services see "Travel By Wire" in the May/June '89 issue.

The News and Bulletins section contains news items of interest to travelers, such as reports on the latest airline bankruptcies and cholera outbreaks.

Guides & Directories

Guides & Directories offers nine options—again of widely varying value to the prospective traveler. The Lodging Guide, which you would expect to be among the most useful, is a throwaway. Obviously relying on information supplied in a random and self-serving fashion by the hotel chains themselves, this section asks you to type in the name of a hotel chain and then displays a short series of "news" articles about that chain—"Corporate rate quotas lowered," "Frequent stay program." Basically a hodgepodge.

The Airline Guide offers a similarly heterogeneous, but somewhat more useful collection of information for each of the major airlines. You can learn about their first class clubs, frequent flyer programs, special fares, special meals, and whatever other programs and policies they choose to include. The Car Rental Agencies Guide follows the same format.

The Tour Guide, Cruise Guide, and World Ski Guide bring you much closer to the sort of information you probably signed on to find. The Tour Guide, for example, lists 26 tour operators—from Club Med to Access Tours for the Handicapped. Choosing one of them leads you to a list of available tours, from which you can select detailed descriptions of the ones that interest you. Again, these descriptions are rather promotional.

The Cruise Guide offers access to CruiSearch, and the World Ski Guide asks where you want to ski and then provides information on facilities, rates, and the mountain itself.

Services and OAG

Services for Travelers offers the following subtopics: Insurance, Limousine Rental, Punchin Wine & Dine, Theater Tickets, and Visa Application.

Punchin Wine & Dine provides mini restaurant reviews, which include the name and address of the restaurant, type of cuisine, price range, and a rating. Unfortunately, the database is something less than comprehensive; it lists, for example only seven eating establishments in the state of New Jersey.

```
TRAVEL & LEISURE Menu:
MetroLine City Search          Official Airline Guide (OAG)
WorldLine Country Search       Reservations and Information
EAASY SABRE                    Services for Travelers
CruiSEARCH                     Guides & Directories
Travel+Plus VIP Club           Index of Travel+Plus Services
Adventure Atlas                Commercial SABRE
PARS TravelShopper             For Travel Agents Only
Instant Message to TRAVEL      TQ Travel Trivia Contest
News and Bulletins             Help
Message Forum                  Exit
```

Figure 1. The Travel & Leisure menu.

```
ADVENTURE ATLAS Menu:
1 What is the Adventure Atlas?
2 How to use the Adventure Atlas
3 List Trip Types & Destinations
4 Search for a Tour
>Select one of the above: 3

SEARCH OPTIONS Menu:
1 Identify Destination
2 Identify Trip Type
3 Proceed directly to search for a tour
4 Return to Adventure Atlas Main Menu
>Select one of the above: 2

TRIP CATEGORIES Menu:
1 Adventure              7 Luxury
2 Cruises                8 Seminars
3 Cultural               9 Special
4 Extreme Adventure      10 Sports
5 General                11 Return to previous menu
6 Gourmet                12 Proceed to search for tours
>Select one of the above: 1
```

Figure 2. The Adventure Atlas menu.

```
The following Adventure Trip Types are offered:
 Ballooning              Llama Packing
 Bicycle Touring         Lodge - Wilderness
 Bicycling/Wineries      Men Only
 Camel Expeditions       Mountaineer/Ski
 Canoeing                Mountaineering
 Caving/Spelunking       Mystery Tours
 Cruise - Expedition     Nature Expeditions
 Cultural Expeditions    Outdoor Survival
 Discovery Expeditions   Overland Journeys
 Diving Seafaris         Photo Expeditions
 Dog Sledding            Rafting
 Dory Trips              Rafting-Gastronomic
 Elephant Safaris        Research Expeditions
 Helicopter Journey      Safaris - Wildlife
 Hiking/Rambles          Sailing
 Horseback Journeys      Space Voyage
 Hut-to-Hut Hiking       Train Journeys
 Jetboating              Trekking
 Kayaking - River        Wagon Train
 Kayaking - Sea          Windjammers
                         Women Only
```

Figure 3. Adventure Atlas lists 41 different kinds of adventure trips.

```
38 Tours selected.
1    A Taste of Nepal, 13 days, from $1401
2    Best of Nepal, 29 days, from $2411
3    Canadian Rockies Panorama, 7 days, from $785
4    Dhaulagiri Base Camp, 27 days, from $2103
5    Everest Panorama, 22 days, from $2017
6    Grasslands and the Gobi, 21 days, from $3073
7    Introduction to Expedition Travel, 34 days, from $2985
8    Kashmir Ladakh Panorama, 22 days, from $2105
9    Land Down Under, 25 days, from $2900
10   Leh - Manali - Zanskar - Ladakh Trek, 30 days, from $1995
11   Nepal Panorama, 20 days, from $1753
12   New Zealand Adventure: Land of the Kiwi's, 17 days, from $1995
13   North India Panorama, 22 days, from $2457
14   Pakistan K2 Base Camp, 32 days, from $2809
15   South India Panorama, 22 days, from $2809
16   Thailand Adventure, 26 days, from $2017
17   The Reef to the Rock, 15 days, from $1668
18   Tibetan Mountain Bike Explorer, 22 days, from $3296
19   Ama Dablam Anglo-American Expedition, 42 days, from $7200
20   Antarctica: Mt. Vinson Expedition, 30 days, from $15,150
21   Baltoro/K2/Concordia/Masherbrum La, 41 days, from $6500*
22   Everest To Mt. Mera, 37 days, from $2225*
23   Hongu Expedition, 39 days, from $3340*
24   Mt. Darwin Expedition, 24 days, from $2700
25   Muztagata Ski Expedition, 38 days, from $5640*
26   Rongbuk Expedition: Climbing Mt. Everest's Satellite Peaks
27   Switzerland: Skiing the Haute Route, 12 days, from $1640*
28   Tibet: Rongbuk-Kellas Expedition, 31 days, from $5000*
29   Tilman's Col Expedition, 22 days, from $1640*
30   Trek to Mt. Everest, 21 days, from $1700*
31   Ultimate Everest Trek, 30 days, from $2045*
32   Unclimbed Summits of Bhutan, 35 days, from $5829
33   Everest Alpine, 25 days, from $1625
34   K2 Concordia Expedition, 29 days, from $2795
35   Kokoda Trail, 13 days, from $1200
36   Leh - Manali - Zanskar - Ladakh Trek, 30 days, from $1995
```

Figure 4. Narrowing the search to "extreme adventure" yields a list of 38 tours.

If you choose Theater Tickets, you get very brief descriptions of current New York theater offerings. Both Tickets and Wine & Dine offer an option that allows you to book a seat or a table. We didn't test this feature.

The Visa Application option connects you with a service that will procure a visa for travel to a foreign country. There is an additional charge of $4.50 for each visa processed.

Selecting OAG, the online edition of the Official Airline Guide, connects you with this premium (extra charge) service. We played around with it for a little while, but didn't see anything that inspired us to pay premium rates. We think you can get most of the information you need from the other services.

MetroLine City Search

Returning now to the main Travel & Leisure menu, let's take a look at the MetroLine City Search option, which invites you to enter the name of a city about which you would like information. If you enter the name of a low profile city such as Lima, Peru, you may find only a few topics from which to choose—in this case, only Climate and Lodging. Climate lists rainfall and average high and low temperatures for four representative months.

Lodging allows you to make a reservation at a hotel in the city. If you do not have a specific hotel in mind, you specify dates, hotel type (downtown, resort, or suburban), price category, and room type, and Travel+Plus will make a reservation for you. Oddly, you are never given a choice of hotels or even a description of the hotel that has been chosen for you. Your final confirmation

arrives from the agency to which Travel+Plus has assigned your account (see below).

The feeling of insecurity engendered by making a reservation at a mystery motel may by alleviated shortly when Delphi adds a hotel database. This addition, which will list 60,000 hotels cross-referenced with city and country profiles, will allow you to search the database and then book the hotel of your choice. Substantial discounts will be available on many reservations.

If your City Search choice is a larger city—say, New York City—the list of topics available is much larger. The 24 topics from which prospective visitors can choose include Art Galleries, Bicycling Clubs, Seat Belt Law, Shopping, and Yacht Charters.

The descriptions of Broadway shows are cursory—"A new comedy by Lanford Wilson," "A musical review"—but theatre locations, show times, and in some cases, prices are listed.

If you pick a large enough city, City Search will tell you some interesting things about even cities you have visited many times or have no intention of ever visiting. This option is definitely worth a stop.

```
TOUR NAME: K2 Concordia Expedition
LOCATION : Baltoro Glacier, Concordia
ITINERARY: (1-3)USA/Rawalpindi (4)Skardu (5)Dassu (6)Braldu Gorge
           (7) Askole (8)Biafo Glaciers (9)Baltoro Glacier (10)rest
           (11) Liligo Peak (12)up glacier (13)Mustagh Tower
           (14)Concordia (15)Chogolisa Glacier (16)K2 Base Camp
           (17-25)Goro/Urducas (26)Skardu (27-28)Rawalpindi
           (29)depart/USA
GATEWAY(S)  : Rawalpindi  Pakistan
DURATION    : 29 days
TYPE OF TOUR: EXTREME TREKKING, TREKKING
HIGHLIGHTS: The traditional expedition route to K2 follows the great
            Baltoro Glacier to Concordia, the spectacular point of
            confluence of the Baltoro and Godwin Austin glaciers;
            this is the greatest concentration of peaks on our planet;
            the area is the most heavily glaciated outside the polar
            regions and creates a true sanctuary of mountain grandeur.
DEPARTURE DATES: 1989-MAY 13; JUN 24; JUL 22,29; AUG 29
ADDITIONAL DETAILS:
Lodging                    : Camp, Hotel
Meals                      : All meals are included on trek and in towns
Mode of Transportation     : On foot
Baggage Transportation by: Porters
Equipment                  : Group gear is provided
Distance                   :
Elevation                  : 16,500 FT.
Orientation                :
Lecturer                   :
COST
Price Per Person : $2795
Single Supplement:
Deposit          : $250
We will encounter glacier conditions, river crossings, and flights
which may be delayed due to weather conditions.
OTHER REQUIREMENTS:
Difficulty                          : Very strenuous
Special physical Requirements?      : No
Open to Seniors?                    : No
Special Dietary needs accommodated? : No
Visas required for US Citizens?     : Yes
Immunization requirements           : Recommended
```

Figure 5. Choosing trip number 34 calls up a detailed description of the K2 Concordia Expedition.

WorldLine Country Search

Choosing a country from the WorldLine Country Search database will net a wide range of information from tipping tips to travel advisories from the U.S. State Department. The travel advisories suffer from the same staleness we noted back in May/June. I don't know about you, but finding a two-year old advisory on terrorism in my destination country doesn't make me feel very secure. If the danger no longer exists, the advisory should be removed; if travel in the area is still perilous, I want more up-to-date information.

Other Country Search topics provide a mini social studies lesson about the country under consideration. You can learn about the economy, educational system, history, and government of your destination; for some non-English-speaking countries you will even find a short list of useful phrases with phonetic pronunciations.

CruiseSearch helps you find a cruise that satisfies your requirements for cost, departure date, duration, destination, cruise line, and even specific ship, if you know which one you want. When you have narrowed your search to a specific cruise, a detailed itinerary is displayed.

Choosing a country from the WorldLine Country Search database will net a wide range of information from tipping tips to travel advisories from the U.S. State Department.

Adventure Atlas

If the passive life of a cruise passenger is not for you, you may be ready to join today's fastest-growing group of serious vacationers—adventure travelers. If a trip climaxed by a climb to the summit of Mt. Vinson, the highest peak in Antarctica, appeals to you, have a look in the Adventure Atlas.

This option offers detailed descriptions of some 15,000 adventures—from seminars to safaris, from ballooning to bear watching. Itineraries, departure dates, and prices are included; names of tour operators are not.

I could spend all day browsing in this section, gaping in awe at descriptions of trips that make my honeymoon in the Amazon look like an afternoon in the park. If can you see yourself scaling K2—even in your imagination—don't miss the Adventure Atlas.

Travel+Plus

Travel+Plus is a service that bridges the gap between the online services and traditional travel agents. You do the shopping—find the flight, cruise, hotel, or adventure tour you want to book—and a member travel agent issues the ticket.

If the travel agent in your nearby

```
Search Criteria Menu:
SHIP NAME
MONTH
CRUISE LINE
AREAS AND PORTS
LOWEST RATE CATEGORY
NUMBER OF DAYS
(CTRL-Z TO EXIT)
Search on what criteria? ship
Enter SHIP NAME ("?" for help): regent sea
5 listings in current collection.
Contents
   1  REGENT SEA          08  DAYS                          SE
   2  REGENT SEA          08  DAYS                JUN
   3  REGENT SEA          08  DAYS                JUN      AU
   4  REGENT SEA          08  DAYS                JUN      AU
   5  REGENT SEA          08  DAYS                JUN JUL AU
SEARCH>(Enter Number, Scan, Make reservation, "?" or Exit): 1
   1  REGENT SEA          08  DAYS                          SE
Ship      : Regent Sea Cruiseline: Regency Cruises
Itinerary:
 Whittier AS          Day 1 (Anchorage)
 College Fjord        Day 2 6:00 am
 Columbia Glacier     Day 2 12:00 noon
 Valdez AS            Day 2 3:00 pm
 Hubbard Glacier      Day 3
 Yakutat Bay          Day 3
 Lynn Canal           Day 4
 Skagway AS           Day 4
 Juneau AS            Day 5
 Ketchikan AS         Day 6
                      Day 7 at sea
 Canada Vancouver BC  Day 8
Sailing Dates:
     SEP-89  01, 15
 Rates:
          I=Inside O=Outside U=Uppr/Lowr
     Rates   Categ.  Deck Name(s)
      1195    9 Upper,Main,Allegro,Bolero     I
      1335    8 Main,Allegro,Bolero           O U
      1495    7 Main,Allegro,Bolero,2 lowers  O
      1655    6 Bolero,2 lowers               O
      1755    5 Upper,Main,Allegro,2 lowers   O
      1865    4 Main,2 lowers or lg dbl,super. O
      1945    3 Sun, Upper,superior dbl       O
      2045    2 Upper,Main,deluxe with bath   O
      2145    1 Upper, deluxe with bath       O
      2275    S Sun,large double suite        O
      2375   RS Regency Suite,sit.room,b.r.   O
Single Supplement: avail
3rd/4th Persons: $635 adult, $515 child
Air/Sea: available from many cities; or deduct $200 for air allowance
Early booking discount for 90 day advance deposit: $250 per person
category 6 or above, $200 per person category 7 and below.
```

Figure 6. Using CruiSearch to find detailed information about a cruise on a specific ship.

```
TRAVEL>Which service? world
Which COUNTRY? india
INDIA
REPUBLIC OF INDIA
Additional topics available:
BUSINESS HOURS                  CLIMATE
COURTESIES AND CUSTOMS          CURRENCY
CUSTOMS FORMALITIES             DEPARTURE FROM INDIA
ENTRY & EXIT FORMALITIES        GENERAL INFO
HEALTH ISSUES                   HISTORY
INDIAN AIR SPECIAL FARES        LIFESTYLE
LIQUOR PROHIBITION              NATION
PEOPLE                          PHOTOGRAPHY
PUBLIC HOLIDAYS                 RESTRICTED & PROTECTED AREAS
SHOPPING                        SUGGESTED READINGS
TRANSPORTATION                  US STATE ADVISORIES
EXIT
```

Figure 7. WorldLine Country Search provides a wealth of useful and not-so-useful information about the countries in its database.

```
TRAVEL>Which service? met
Which CITY? new york
NEW YORK CITY
Additional topics available:
ART GALLERIES               BICYCLING CLUBS             BROADWAY THIS WEEK
CLIMATE                     DINING                      HELICOPTER TOURS
HISTORIC SITES              JFK AIRPORT INFO            LAGUARDIA AIRPORT
LIBRARIES                   LODGING                     MUSEUMS
NEIGHBORHOODS               NEWARK INTL AIRPORT INFO    PARKS,GARDENS,ATRIUMS
RELIGIOUS PLACES            SEAT BELT LAW               SHOPPING
TRANSPORTATION INFO         VISITOR ATTRACTIONS         YACHT CHARTERS
EXIT

NEW YORK CITY Subtopic? nei
NEIGHBORHOODS
5 Listings selected.
     Selection
1    Chinatown
2    City Island
3    Greenwich Village
4    Soho
5    Times Square
(Enter Number, Scan, "?" or Exit): 1

Chinatown is a web of narrow streets just west of Chatham Square in
lower Manhattan.  It has been the heart of the large Chinese community
in New York City for over a century.  Chinatown has many fine
restaurants and interesting stores, and even the telephones are
Chinese-style.  The annual Chinese New Year's Festival is one of
the most spectacular events of the year in New York.
```

Figure 8. MetroLine City Search yields a potpourri of facts about the cities in its database.

shopping mall is not a member of Travel+Plus, you will be assigned one that is. This "agency of record" communicates with you via voice, fax, courier, Email, carrier pigeon, or any other mutually convenient medium.

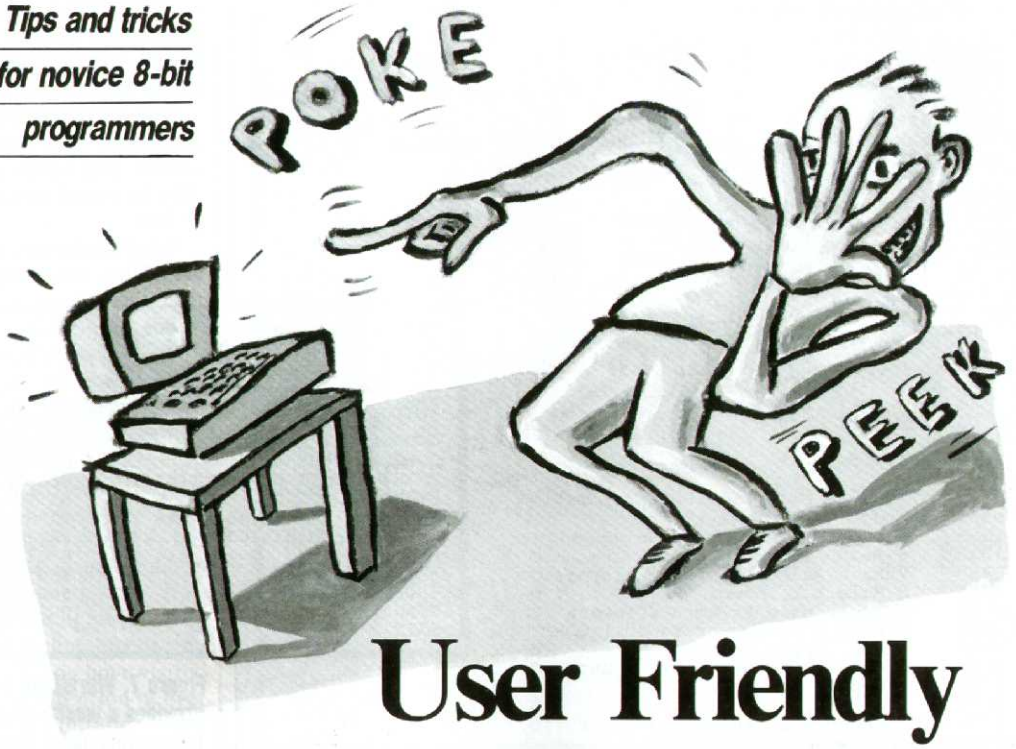
The service is free, and Travel+Plus members may even qualify for discounts and rebates of between 2 and 30% on travel arrangements they make on line.

Fred Levinson, spokesman for Travel+Plus, encourages member travel agencies to share the savings that they realize when a client does his own research and booking. He would like to see agencies offer Travel+Plus accounts to their clients. The agency, rather than the information service, would then bill the user, and the agency could offer additional discounts on minimum billings.

The involvement of professional travel agents in the reservation process makes me feel much more secure about the future of on-line travel planning. It is certainly a lot of fun to plan your own dream vacation, with just about everything you need literally at your fingertips, but when it comes to making the dream a reality it is awfully nice to know that someone who is familiar with the complexities of dream conversion is overseeing the process.

For more information, call Travel+Plus at (800) 544-4005 or (617) 876-5551. For a free online demonstration of the system, dial (617) 576-2981. When the connection is established, press Return twice, and when prompted for username, enter TRAVELDEMO and Return. ■

Tips and tricks for novice 8-bit programmers



User Friendly

By DAVID NOYES

As an Atarian who cut his cybernetic teeth on an 8-bit Atari 800XL, I still have a soft spot in my heart for that machine and, for that matter, all 8-bit Atari computers. My 800XL occupies a place of honor next to my Atari 1040 ST as a working piece of hardware that shares my two printers, 2400 baud modem, and 64K printer buffer. As I have noted before, I am a true 24-bitter.

To the point! In these days of mega-RAM and ballistic clock speeds, it is refreshing to see an occasional article on beginning 8-bit Atari computing in magazines (*See "Hacking the 8-Bit Atari" elsewhere in this issue*) and user group newsletters. It is good to know that there are beginning 8-bit Atarians out there!

I have a special appreciation for such aids, because I spent my first year of computing completely on my own, aware of neither the existence nor the value of either user groups or their newsletters. The value of user groups transcends the 8-bit world, of course, but for this issue I would like the focus there and share the following introduction to 8-bit Atari computing by Dave Morel that appeared in the October 1989 issue of the SLCC (San Leandro Computer Club) Journal. Dave's article, entitled "8-Bit Beginner Boogie: Some Tidbits of Particular Interest to New Users," approaches the subject with a bit of humor.

8-Bit Boogie

When I recently heard a new 8-bit user ask a bunch of question a meeting, two things occurred to me. The first was that I remembered how lost I was when I first started to compute. The second was that I realized that the switch to 16-bit Atari computers by veteran hobbyists has left in its wake a large body of first-time users who have new second-hand Atari 8-bit systems and no idea how to use them.

For these people, I offer the following tips:

The first thing to learn is that all books and manuals for computers or peripherals contain at least one error and a great many more confusing statements. This is required by federal law but is not, as far as I know, part of a larger conspiracy. What this means is that if you have followed the instructions in the book and still can make the computer do what you want it to, you are probably not at fault.

Magical PEEKS and POKES

A computer works mainly by magic, and part of the magic is in the instructions that tell it what to do. These instructions are in memory locations, or addresses, somewhere off in the fifth dimension. If you want to, you can look into these addresses and even change the information you find there. This is done by means of PEEKs and POKEs.

To look at an address, you tell the computer to ?PEEKaddress. If typed, for example, PEEK(712) the computer return a zero, because a zero is what is memory location 712.

If you want to change the information in an address you type POKEaddress,number. As an example, you could POKE712,24. I'm willing to wait if you want to turn on your Atari and try it.

Surprised at what happened to your screen border? The color changed be-

ILLUSTRATION BY JOHN BOPPERT

cause 712 is the location that controls the border. Location 710 controls the screen itself. If you want to experiment by POKEing those locations with even numbers from 0 to 254, I'll wait some more.

Back already? By the way, in case you are wondering (and it's a little late now, Bunky), no POKE will hurt your computer and none is permanent. You can restore the defaults at any time by pressing RESET or by turning your computer off and on. Another solution is to use a PEEK to place the default in a variable. Later you can POKE that variable back into the address.

Now that you are an expert at PEEKing and POKEing, let's see what else we can do with these commands. One neat thing we can do is to turn the screen off during long math programs. Why? Because if the computer doesn't have to put time into refreshing the screen, it can put the time into counting on its fingers and toes, and by doing so, go about 30% faster.

To do this, POKE559,0. Turn the screen back on with a POKE559,34; if you are using OSS Basic XL, the END command will also work. Be sure to add a TRAP to your program if you cut off the screen; otherwise you will have no way of knowing if an error occurs or the program aborts.

While we are on the subject of screens, have you ever noticed that if you don't press a key for seven to ten minutes the screen starts changing colors? The location for the timer/flag is 77. POKE77,128 to start the color changes. To stop the changes, write your program so that it POKEs a 0 in there every once in a while.

Want to use the console keys? All you that you have to do is PEEK(53279). A 0 means all are pressed, 1=Option-Select, 2=Option-Start, 3=Option, 4=Select-Start, 5=Select, 6=Start, and 7 means that none is pressed. The Help key is address 732. A 17 means the key has been pressed alone, an 81 means you have pressed Help and Shift together, and 145 means Control and Shift are pressed simultaneously. POKE a 0 to clear it.

If the flickering cursor distracts you when the computer is printing to the screen, you can turn it off by POKEing a non-zero number to 752. POKE a 0 to turn the cursor back on.

Shortcuts

Let's take a break from PEEKs and POKEs and do something else. If you haven't yet, you will soon discover that the question mark after an input command isn't always appropriate. It is easy to get rid of, as this example shows:

```
10 ?"Insert Answer"7;:INPUT #16,A$
```

The way this works is that the ghost of Elvis vaporizes the question mark, using psychic powers bestowed on him by the Mystic Seer of Planet X. That's my understanding, anyway. Have you ever needed to fill a string with something repetitious? Here's an easy way to do it:

```
10 DIM A$(100):A$="X":A$(100)=A$:A$(2)=A$
```

That's all there is to it. You don't need to fill up the whole string either, just make the start and end wherever you like. And as an added bonus, the string that you are propagating can be more than one character long.

Here are some additional time savers. Your mother probably never told you this, but:

- Many Atari Basic keywords can be abbreviated

and

- Atari Basic isn't (usually) all that fussy about spaces.

As an example, let's compare two lines:

```
10 FOR X = 1 TO 20: PRINT "Whee": NEXT X: PRINT "What": INPUT A$: GOTO 100
```

and

```
10F.X=1TO20:?"Whee":N.X:"What":I.A$:G.100
```

The first line is 74 characters long; the second is only 42. Admittedly, the example is a little contrived, but there will come a time when you, too, will write strange lines. And yes, the second line is harder to read than the first. But as soon as you LIST your program to the screen, Basic will obligingly spell out the abbreviations and add spaces.

Personally, I like the audible response you get when you press the keys on your keyboard, but some people don't. If you're one of them, cut that sucker off with a POKE731,1.

Is the keyboard too slow for you? Address 729 controls the time elapsed before a key will repeat, and address 730 controls the rate of repeat. Give them a PEEK and replace the values as you see fit.

Frustrated because your Atari computer gives you a hard time when you try to print a quotation mark in a program? Tell it to print a CHR$(34) instead. That is the ATASCII code for the quote. You can take a look at all the ATASCII characters by making up a loop from 0 to 255 and running it through CHR$( ). Be sure to POKE766,1 first, or else the control characters will carry out their assignments rather than print to the screen. And remember to POKE766,0 when you are done.

If you would like to change your screen margins, check address 82, which controls the left (the default is 2), and address 83, which controls the right (the default is 39).

The switch to 16-bit Atari computers by veteran hobbyists has left in its wake a large body of first-time users who have new second-hand Atari 8-bit systems and no idea how to use them.

Disk Tips

If you have ever inadvertently duplicated a filename on a disk, you know what a hassle that can be. When you try to change one name, they both change. When you try to erase one file, they both erase. If you are using DOS 2.5 and have the COM files, this problem is an easy one to fix.

If you are not using DOS 2.5 or don't have the COM files, you still have a way out. Go to Basic and POKE3118,0. Now go back to DOS; when you do a rename, only the first file will change. Unfortunately, this fix works only with a non-memory resident DOS. If your DOS is memory resident, you will have to get somebody to teach you how to use a sector editor.

Did you know that you could copy files to the screen or the printer from DOS? If you are using DOS 2.5, all you

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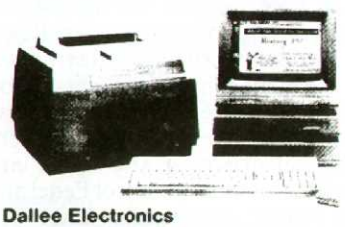

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have to do is to pick the COPY FILE command. When it asks COPY—FROM,TO?, you just look it right in the eye and type filename,E: for the screen or filename,P: for the printer. Notice that there is no space after the comma.

If you are working with another DOS, use the appropriate COPY command for it. Be careful to copy only LISTed files to the printer or you will waste a lot of paper.

If you have ever wanted a quick way to randomize a variable arrray, want no more. Watch closely:

```
110 REM Assume your array has
100 elements and is named A
120 FOR X=0 TO 99
130 R=INT(RND(0);cns100)
140 T=A(R):A(R)=A(X):A(X)=T
150 NEXT X
```

Pretty neat, huh? I wish that I had figured it out myself. Actually I swiped it from a Commodore magazine. By the way, you did know that variable arrays started with zero, didn't you?

If you own an 800XL, I have some bad news for you. The built-in Basic has a flaw that adds 16 extra bytes to the end of any file that it saves—each time it saves that file. Try this on a junky disk:

```
10 ?FRE(0):SAVE "D:JUNK":
RUN "D:JUNK"
```

The command ?FRE(0) shows how much memory you have available for programming. When you run the above program on an 800 XL you can watch the memory shrink 16 bytes at a time until your system crashes.

There are several things you can do about this. One is to LIST your programs only to disk. Another is to buy and use an Atari Basic cartridge or an OSS Basic XL cartridge. The OSS cartridge is particularly powerful; I recommend it.

Did you know *that you could copy files to the screen or the printer from DOS?*

You may have noticed that some game disks refuse to work on your XL/XE. This could be because the disk is damaged or because you forgot to lock out Basic. Or it could be that the game was written for the Atari 800 computer and won't work with the XL/XE Operating System.

To solve the problem, you need a translator disk. A translator disk holds a program that swaps the XL/XE Operating System for the one used by the Atari 800. Boot the translator before booting your game. Most user groups have copies of translator programs in their libraries.

Well, that's it. I've pretty much run out of things to say, other than to caution you not to hit your new computer very hard with a hammer, as this might void the warranty. I cheerfully accept credit and kudos for all that is good and warm and huggable in this article. All errors are the sole responsibility of my cat. ■

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The newer version of CONTROL.ACC, currently being distributed with Mega STs, uses only one slot and combines these functions. The new CONTROL.ACC is in the public domain and is available on many BBS systems and on the AtariBase BBS.

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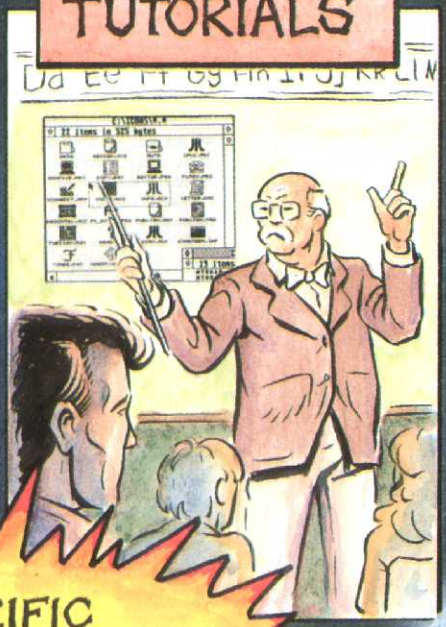

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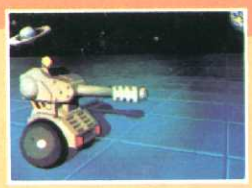

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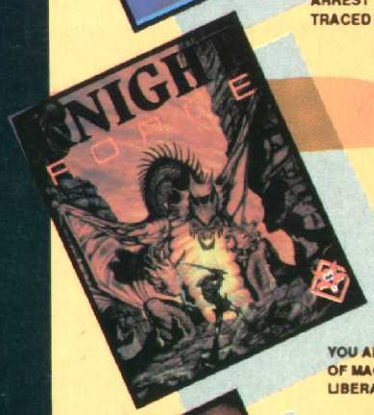

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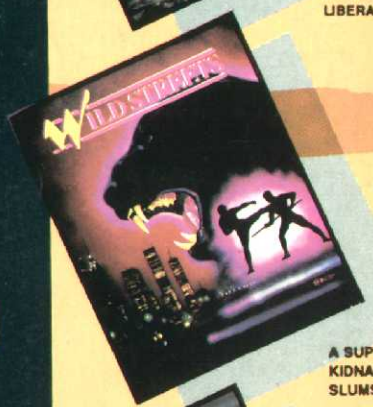

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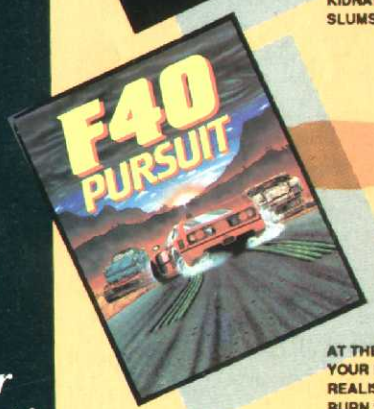

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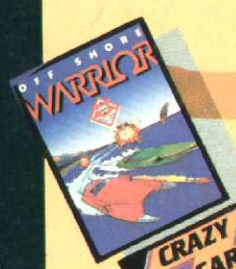

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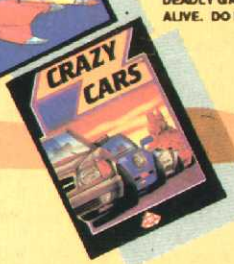

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