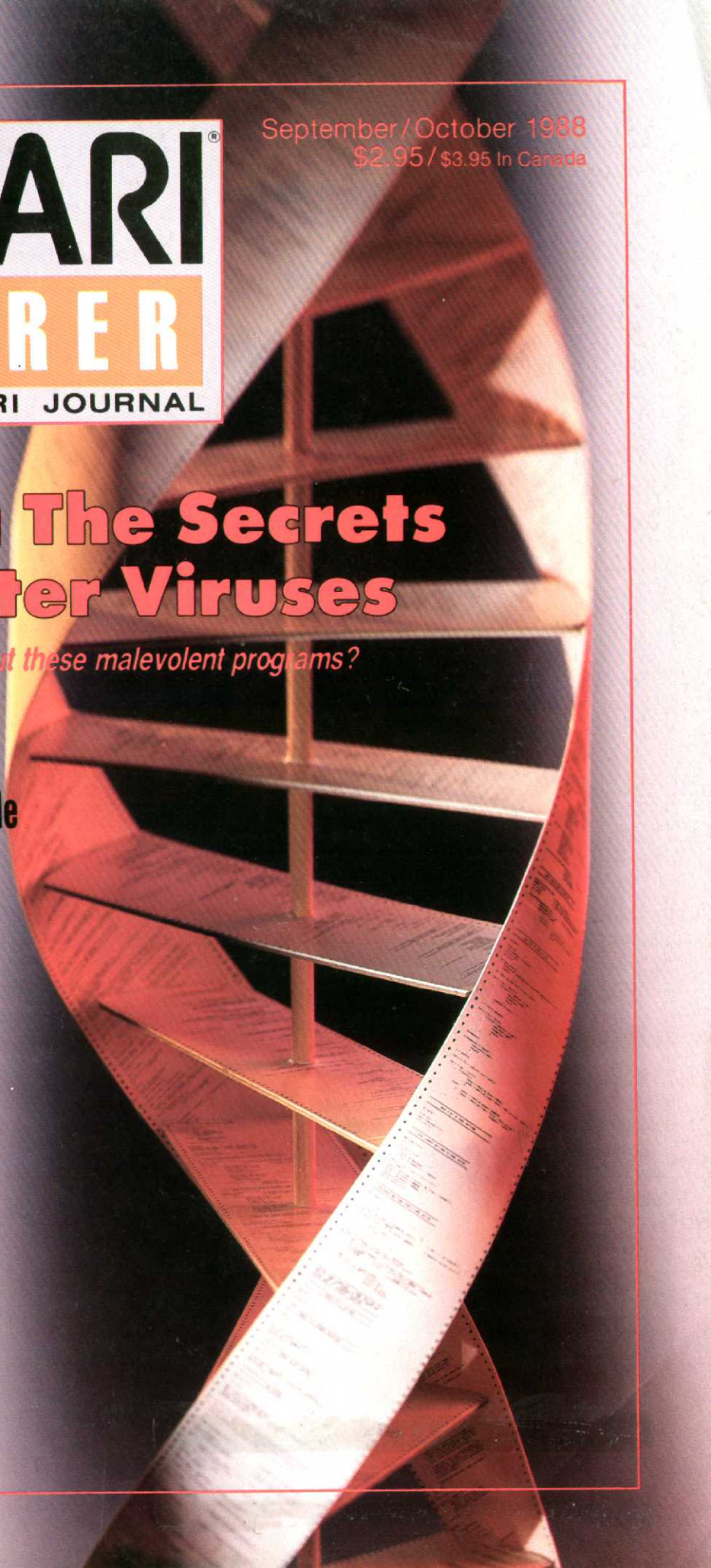
September/October 1988
$2.95/$3.95 In Canada

ATARI EXPLORER

THE OFFICIAL ATARI JOURNAL



Unlocking The Secrets Of Computer Viruses

Is it time to start worrying about these malevolent programs?

1K Contest Winners

Online Chat: The Down Side

Interview: Mike Breggar, Author Of Prime Time

Reviews:

- Supercharged Easy-Draw
- The Newsroom
- Atari XF551 Disk Drive
- Seymor-Radix IMG Scan
- ICD FA-ST Hard Disk
- XE Game Cartridges
- Sales-Pro Plus

Bulk Rate
U.S. Postage
PAID
Permit No. 7
Easton, PA 18042

Wise up to nightly savings online with GEnie.™

"GEnie has opened my eyes to what an online service can do for me. I thought I knew it all until I discovered GEnie's vast array of Special Interest Groups, offering thousands of software files, dynamic bulletin boards, lively discussions and "tips" from the experts. Not to mention services like Comp-u-store Online® shopping service, USA Today Decisionlines and access to Dow Jones News/Retrieval.® And those friendly people at GEnie really give a hoot about being helpful, day or night.

Compare GEnie for selection, services and price, night after night. It will open your eyes too. Only GEnie offers you so much online, for less."

P. M. Byrd

Services Available	Compare & Save	Pricing **			
		Registration Fee	Monthly Minimum	Non-prime Time Rates	
				300 baud	1200 baud
Electronic Mail • CB • SIGs/User Groups • Travel • Shopping • Finance • Reference Professional • Leisure • Games • News	**GEnie†**	**$29.95**	**None**	**$5.00**	**$5.00**
	CompuServe	$39.95	None	$6.00	$12.50
	Other	$49.95	$10.00	$8.40	$10.80

*Get 2 Free Hours with Sign-Up.

Still just $5 per hour. Get online today!

1. Have your major credit card or checking account number ready.
2. Set your modem for local echo (half duplex)—300 or 1200 baud.
3. Dial 1-800-638-8369. When connected, enter HHH
4. At the U#= prompt enter **XJM11760,GEnie** then RETURN.

Need help or more information? No modem yet? We can help. In U.S. or Canada call **1-800-638-9636** or write GEnie, 401 N. Washington St., Rockville, MD 20850.

We bring good things to life.

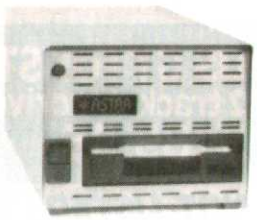
**Basic rates and services in effect 1/88 apply in U.S. only. †Non-prime time rates apply Mon.-Fri. 6PM-8AM local time and all day Sat., Sun., and nat'l. holidays. Subject to service availability. Some services offered on GEnie may include additional charges. • $10 credit applies. Offer good for 30 days from sign-up.

Astra News

2500-L So. Fairview, Santa Ana, CA. 92704 (714) 549-2141

NOW THREE SERIES OF HARD DRIVES !

System HD+ Series | Home / Office Series | Studio Series



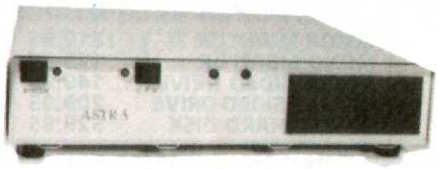
THE "TANK"

The System HD+ has been recognized as extremely tough and reliable by hundreds of Atari ST users. It is built to exacting standards and scrupulously tested. Astra Systems is so confident of the quality of this unit we offer a limited one year warranty.

Originally offered as a 20 Megabyte hard drive with built-in 3 1/2" floppy, it now is also available in 30 and 40 Megabyte units with floppy.

Supplied with formatting, partitioning software, and backup program.

The floppy used in this unit is a precision drive with direct drive motor, and can be formatted with high density format programs.



THE EXPANDER

Internally expandable hard drives come either with or without precision 3 1/2" floppy drives.

Four AC outlets with full three line surge suppression are installed at the rear of the unit. One of these controls the CPU and the others are available for monitor, printer, etc. Two push button switches on the front control the CPU independently of other peripherals. EMI and RFI filtration is included.

Twenty, thirty, and forty megabyte units expandable to 120 megs.

All necessary hardware is already installed in original unit so addition of upgrade kits is fast and easy.

RM 60/120

The RM 60 rack mount hard drive for the MIDI musician fits both permanent and portable racks.

Expandable from 60 to 120 Megabytes internally with the addition of the +60 kit. Or purchase it complete in the model RM 60/120.

Astra hard drives for the Atari MIDI musician have become the standard for the industry, and are being used by top professional groups worldwide. Our power supply is equipped for 120 and 240 volt operation by merely moving one wire. This makes performing in UK and Europe easier and safer.

MAKE YOUR ATARI SING !

Astra BBS now on-line in PC Pursuit area ! (714) 546-5956

CALL FOR NEAREST DEALER

COMPUTER GAMES +

VIP PROFESSIONAL
$99.95 PRO
$119.95 GEM

EUROPE'S #1 COMPUTER MAGAZINE
COMPUTER + VIDEO GAMES
$6.95

ASTRA'S MONITOR SWITCH BOX
$49.95

DB MAN
$89.95
(Best ST Data Base)

FOR YOUR ST COMPUTER

COLOR MONITOR	319.95
MONO MONITOR	179.95
SINGLE SIDED DRIVE	149.95
DOUBLE SIDED DRIVE	209.95
20 MEG HARD DISK	529.95

INDUS GT for ST
Full 82 track-d/s drive
$189.95

GUARANTEED LOWEST PRICES — CALL FOR TITLES NOT LISTED

EUROPEAN ST SOFTWARE FROM AMERICA'S #IMPORTER
DEALER INQUIRIES WELCOME

ADICTABALL	29.95
ALIEN SYNDROME	29.95
ALTAIR	29.95
AMERICAN POOL	19.95
ANNALS OF ROME	34.95
ARCADE FORCE FOUR (Gauntlet, Indiana Jones Road Runner, Metrocross)	49.95
ARKANOID	29.95
ARKANOID II	29.95
BMX SIMULATOR	29.95
BACK LASH	29.95
BAD CAT	29.95
BARBARIAN (PALACE)	29.95
BATTLE SHIPS	29.95
BEARDSLEYS FOOTBALL	29.95
BERMUDA PROJECT	34.95
BETTER DEAD THAN ALIEN	29.95
BEYOND ICE PALACE	29.95
BIONIC COMMANDO	29.95
BLACK LAMP	29.95
BLUE WAR	29.95
BUBBLE BOBBLE	29.95
CAPTAIN AMERICA	29.95
CHECKMATE	22.95
CLASSIQUES #1	29.95
COMPUTER HITS (Brataccas, Little Computer People, Deep Space, Hacker II)	49.95
CORRUPTION	29.95
CRAFTON & XUNK	29.95
CRASH GARRETT	29.95
CRAZY CARS	29.95
DEFLEKTOR	29.95
DIZZY WIZARD	29.95
EDDIE EDWARDS SUPER SKI	29.95
ELF	29.95
EMPIRE STRIKES BACK	29.95
ENDURO RACER	29.95
ENFORCER	24.95
EXTENSOR	19.95
FIREBLASTER	19.95
FLINTSTONES	29.95
FOOTBALL MANAGER 2	29.95
FORMULA 1	29.95
FOUNDATIONS WASTE	29.95
FOUR BY EPYX (Super Cycle, World Games, Winter Games, Champ-Wrestling)	49.95
FOUR PLAYER ADAPTER	12.95
FROST BYTE	29.95
GAMBLER	29.95
GAUNTLET II	29.95
GET DEXTER 2	29.95
GOLDRUNNER II	27.95
GLDRNR II SCNRY I	11.95
GLDRNR II SCNRY II	11.95
GIANNI SISTERS	29.95
I BALL	19.95
IKARI WARRIORS	29.95
INDIANA JONES	29.95
INTERNATIONAL SOCCER	29.95
JOE BLADE	22.95
KQ TRIPLE PACK	49.95
KARTING GRAND PRIX	19.95
KILLDOZERS	29.95
KNIGHTMARE	34.95
LEATHERNECK	27.95
LEGEND OF SWORD	34.95
LEVIATHAN	29.95
LIBERATOR	19.95
LIVINGSTONE	29.95
MACH 3	29.95
MASTERS OF UNIVERSE	29.95
MICKEY MOUSE	29.95
MIND FIGHTER	34.95
MISSION GENOCIDE	19.95
NORTH STAR	29.95
NOT A PENNY MORE	29.95
OUT RUN	29.95
PANDORA	29.95
PENGY	29.95
PHOENIX	29.95
PINK PANTHER	29.95
POWER PLAY	29.95
PREDATOR	29.95
RAMPAGE	29.95
RANA RAMA	29.95
RETURN TO GENESIS	29.95
REVENGE II	19.95
ROAD BLASTERS	29.95
ROAD RUNNER	32.95
ROAD WARS	29.95
ROLLING THUNDER	34.95
ST KARATE	19.95
ST PROTECTOR	19.95
SAPIENS	29.95
SCREAMING WINGS	29.95
SCRUPLES	29.95
SECONDS OUT	29.95
SHACKLED	29.95
SHUFFLEBOARD	19.95
SIDE ARMS	29.95
SKY FIGHTER	24.95
SKY RIDER	29.95
SLAP FIGHT	29.95
SOCCER SUPREMO	29.95
SOLOMON'S KEY	29.95
SPACE ACE	29.95
SPACE STATION	19.95
SPACEPORT	29.95
SPIDERTRONIC	29.95
SPITFIRE 40	29.95
SPY VS SPY	34.95
STAFF	29.95
STAR WARS	29.95
STARQUAKE	29.95
STIR CRAZY	29.95
STONE BREAKER	24.95
SUPER SPRINT	29.95
SWOOPER	29.95
TNT	29.95
TAI PAN	29.95
TERRAMEX	29.95
TETRIS	29.95
THREE D GALEX	29.95
THRUST	19.95
THUNDERCATS	29.95
TIME & MAGIC	29.95
TONIC TILE	29.95
TOURNMNT OF DEATH	29.95
TRACKER	34.95
TRANTOR	29.95
TRAUMA	29.95
TRIVIA TROVE	19.95
TRIVIAL PURSUIT	29.95
TURBO ST	19.95
TYPHOON	29.95
WAR HAWK	19.95
WAR ZONE	19.95
WARLOCK	29.95
WARLOCK'S QUEST	29.95
WIZARD WARZ	29.95
WORLD DARTS	29.95

for more detailed info please call 714-639-8189

DOMESTIC ST SOFTWARE

CAPTAIN BLOOD	34.95
CARRIER COMMAND	32.95
DARK CASTLE	29.95
DUNGEON MASTER	27.95
DUNGEON MAPS	4.95
DUNGEON MASTERY	12.95
FLIGHT SIMULATOR II	34.95
OBLITERATOR	27.95
OIDS	27.95
PALADIN	27.95
POLICE QUEST	34.95
ROCKFORD	27.95
SHANGHAI	24.95
STAR TREK	27.95
SUPERSTAR ICE HOCKEY	34.95
ULTIMA IV	34.95
U.M.S.	34.95
WIZBALL	17.95
TIMEWORKS PUBLISHER	89.95
PUBLISHING PARTNER PRO	129.95
GFA BASIC	39.95
ASSEMPRO	44.95
TYPING TUTOR	24.95
WORD WRITER	44.95
DATA MANAGER	44.95
SWIFT CALC	44.95
DEGAS ELITE	39.95
SPECTRUM 512	49.95
PC DITTO	69.95
PHASAR	69.95
DESK CART	69.95

DISK DRIVES

INDUS GTS-100	189.95
INDUS GTS-1000	219.95

IMPORTED MAGAZINES

COMPUTER VIDEO GAMES	6.95
ST ACTION	6.95
ST USER	6.95

COMPUTEREYES ST	179.95
IMAGE SCAN	79.95

come visit our new store at
1839 E. Chapman, Orange, CA
Store Hours: Noon-6 Mon-Fri (714) 538-1234
Mail Order Hours: 9-6 Mon-Sat (714) 639-8189

WE WILL BE CLOSED SEPTEMBER 4 — SEPTEMBER 20

ATARI

714-639-8189

ORDERS ONLY PLEASE
1-800-443-8189

MasterCard

SHIPPING: Software - free shipping on U.S. orders over $100, otherwise $2.50 U.S., $6.50 outside U.S. Hardware - depends on weight, call for quote.
Charge cards + 3%. C.O.D. orders are welcome, add $2.20 for UPS + 3%.

VISA

COMPUTER GAMES + • Box 6144 • ORANGE CA 92667 • (714) 639-8189

SEPTEMBER/OCTOBER 1988

ATARI EXPLORER

THE OFFICIAL ATARI JOURNAL

FEATURES

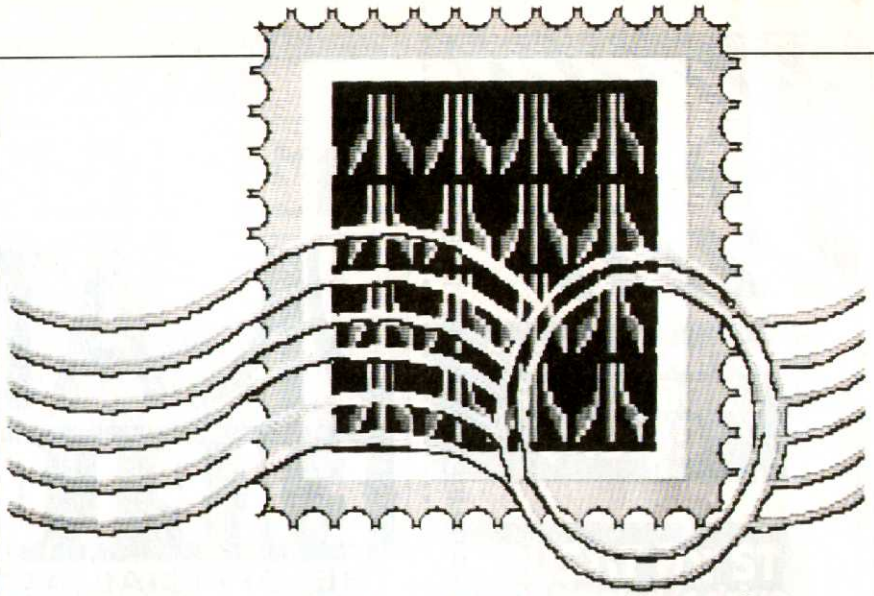
REVIEWS

PROGRAMMING

DEPARTMENTS

Cover photograph by Jeff MacWright

POSTMASTER:
Send address corrections to Atari Explorer, CN961, Netcong, NJ 07857-0691.



Letters To The Editor

Good Deal(er)!

Dear Editor:

I would like to reply to the letter titled "Another Explanation," which appeared in your March/April 1988 issue.

Last September, I looked in your Dealer Directory and found the name of a store just a 30-minute drive from my home—Computers Etc. The minute I walked into the store, I saw ST equipment that I had only read about until then.

The store supports the entire ST line, including Megas, and the people are very helpful and knowledgeable. Rory Freeman and his wife Lisa and their staff have been very helpful in my search for Atari hardware and software. This is a great store and fun to visit.

Anyway, I thought it should be known that there are stores and sales people who really care.

Jonathan Drummond
641 Milton Rd.
Rye, NY 10580

Thanks for the positive comments. It is our hope that Dealer Directory will lead to many more rewarding retail relationships. If you know a dealer who provides especially good service, why not encourage him to advertise in the directory, so other Atarians can share the benefits you enjoy?

8-Bits Forever!

Dear Editor:

I have sent the following letter to the publishers of software I have purchased in the past. I encourage your readers who care about the future of 8-bit Atari computers to write similar letters to their favorite software publishers:

I own an Atari 130XE and a 1050 disk drive. I am a dedicated user of my computer and your software, but recently your company has neglected to support the Atari 8-bit line.

I have read that the reason software companies are turning away from the 8-bits is piracy. I appreciate your situation; why should you make software for a computer if you are not going to make any money? All I can say is that there are a *lot* of faithful and honest people out here, including me, who are willing to purchase your software.

I have enjoyed your software very much in the past and so have my friends. I hope you will realize that Atari 8-bits still live in the hearts of many!

Aubrey Craig
HHC 5th Sig. Cmd.
Box 543
APO, NY 09056

New and Improved

Dear Editor:

Thank you for the two informative and worthwhile articles by Owen Linzmayer in the March/April 1988 issue—Inside Atari and New and Improved. They give us Atari users what we need. I found the latter feature helpful in finding out which of the software I own needs to be updated.

I hope that you will continue to publish this important information. It would be even more helpful if you would provide the addresses of the software publishers.

John R. Milne
1520 East Alto Lane
Fullerton, CA 92631

At the moment, space limitations preclude the addition of addresses. We suggest that you contact the dealer from whom you purchased the original package to obtain information about the updates listed in New and Improved.

WordPerfect: A Superb Package

Dear Editor:

I read with interest your opposing reviews of *WordPerfect* in the May/June 1988 issue. With respect to the review by Frank Kofsky, I must wholeheartedly disagree with his conclusions.

After reading other mediocre reviews about *WordPerfect* in other magazines, I bought the package with trepidation. Using the April 15, 1988, update, I have had nothing but success with it, and I am overjoyed that Atari users finally have a word processor that compares favorably to the high-powered programs available in the Apple and IBM worlds.

I have run into very few bugs during my use of *WordPerfect*. Indeed, having used *WordWriter ST* (a fine, if simple, package) for a time, I am happy to say that I am losing fewer words to crashes with *WordPerfect* than I did while using *WordWriter*.

As to the requirement for remembering non-mnemonic keystrokes and reading the entire manual before use, let me say that after installing the program on a one-drive system, I was doing everything I could do with *1st Word* and *WordWriter* without reference to the manual. Of course, when moving into its wealth of special features, the manual came in handy.

I agree wholeheartedly with the policy of printing negative reviews and send my thanks (and a subscription check) to you for having the standards to to so, but I hope that Mr. Kofsky's review did not stop people from buying this superb package or *WordPerfect* from supporting it. Let's not lose the support of one of the biggest software companies for the ST.

Keep up the great work, WordPerfect, and bring on version 5.0 for the ST!

Dieter Moeller
6431 Star Rte. 132
Goshen, OH 45122

Thanks for the vote of confidence. We, too, hope that WordPerfect for the ST will be an unqualified success. But we remain perplexed by the notion that a program can be judged acceptable simply because it has fewer bugs or causes fewer system crashes than a competing product.

ATARI EXPLORER
THE OFFICIAL ATARI JOURNAL

Publisher
David H. Ahl

Editor
Elizabeth B. Staples

Senior Technical Editor
John B. Jainschigg

West Coast Editor
Mark O. Jansen

Assistant to the Editors
Julia Winston

Contributing Editors

John J. Anderson
Stuart Dudley Dimond III
Andy Eddy
Roxane Farmanfarmaian
Arnie Katz
Frank Kofsky
Bill Kunkel
Timothy Onosko
Rick Teverbaugh
Joyce Worley

Art Director
Peter Kelley

Before You Write or Call: Please do not call or write to us about problems with individual Atari products or orders placed with Atari Corp. We will simply forward your query or complaint to Atari Customer Service (P.O. Box 61657, Sunnyvale, CA 94088), where it will arrive days, if not weeks, later than it would have if you had mailed it there yourself. Barbara Monahan and Diana Goralczyk, Atari's customer service experts, are much better equipped to solve individual problems than we are.

Editorial: Editorial material, including article submissions, press releases, and products for evaluation, should be sent to Atari Explorer, 7 Hilltop Road, Mendham, NJ 07945 (201) 543-6007. Atari Explorer is not responsible for the return of unsolicited manuscripts, tapes, disks, program listings, etc. not submitted with a self-addressed, stamped envelope.

Subscriptions: Domestic: 6 issues, $14.95; 18 issues, $39.95. Canadian: Add $5.00 per 6 issues. Foreign: Add $10.00 per 6 issues. Foreign subscription orders must be accompanied by a check in U.S. funds drawn on a U.S. bank. Send orders to Atari Explorer, CN961, Netcong, NJ 07857-0961.

Customer Service: If you have a problem with your subscription, please write to Atari Explorer, CN961, Netcong, NJ 07857-0961, or call (201) 347-8383.

Mouse support for 8-bits; Bushnell is back; new Atari products; and a look at the home computer market

News & Views

By DAVID H. AHL

We recently received an interesting 8-bit demonstration disk from Merrill Ward & Associates, producers of *The Celebrity Cookbook*. The disk contains a graphic operating environment (GOE) developed by Total Control Systems. Compatible with the 800XL and 130XE computers, GOE gives 8-bit users the ability to use an ST mouse as an input device. GOE also works with a joystick or the cursor keys.

Company president Shelly Merrill likes to refer to GOE as an "ST Jr," because it uses point-and-click to access pulldown menus, windows, and icons. Included on the disk are several application programs which operate under GOE: Gopaint, a graphics program; Gowrite, a word processor; Iconeditor, an icon editing utility; and Godesk, a desktop from which disk operations can be performed.

While the final release date has not been set, a completed version of GOE should be available sometime in the latter half of 1988. For those of you who can't wait to see GOE, Merrill Ward is selling copies of the demonstration disk for $5.00. Write to Merrill Ward & Associates, 255 N. El Cielo Rd., Ste. 222, Palm Springs, CA 92262.

Bushnell Returns

At the Summer Consumer Electronics Show, Michael Katz, president of Atari's video games division, announced that Nolan Bushnell, president of Axlon, had signed a video game development agreement with Atari. The terms of the agreement stipulate that Axlon will develop on an exclusive basis an unspecified number of games for the Atari 2600 and 7800 video game systems.

Bushnell, 45, founded Atari in 1972 shortly after introducing the coin-op video game, Pong. This marked the dawn of the video game era, a phenomenon which helped make Atari the fastest growing company in U.S. history. Bushnell sold Atari to Warner Communications in 1976, after which he started several other companies. His most recent startup is Axlon, which designs toys for licensing and develops and manufactures coin-op games.

New XE Games on the Way

Atari is planning to release many new games for the XE game system, most of which will run on 8-bit computers as well.

The most recent release is *Gato*, a game licensed from Spectrum Holobyte, in which the player acts as a submarine commander facing many difficult and realistic combat situations.

Two other war simulations are due out by September, *Ace of Aces* and *Into the Eagle's Nest*. In *Ace of Aces*, which is licensed from Accolade, the player pilots a British Mosquito fighter/bomber, selecting armaments and battling German fighter planes, V-1 rockets, U-boats, and trains. *Into the Eagle's Nest*, licensed from Pandora, challenges the player, a lone American soldier, to enter Hitler's infamous Eagle's Nest stronghold to complete one of four dangerous missions.

Arcade/action games planned for the XE include *Necromancer*, in which the player takes the part of a druid magician controlling an army of living trees and battling evil demon spiders and zombie-like "hammer fists" to reach the final confrontation.

The arcade classic, *Food Fight*, propels the player through more than 100 levels of an increasingly fast-paced food fight. In *Commando*, licensed from Data East, the player is a commando battling enemy soldiers and rescuing POWs, using his rifle and hand grenades for protection. Other games planned include *Desert Falcon* and *Karateka*.

Atari Products Win CES Awards

Atari video game products were big winners in the Electronic Industry of America Innovations '88 competition at the Summer Consumer Electronics Show.

The Atari XE video game system was cited for excellence in design and engineering, the only video game hardware product to be so honored.

Nine Atari video games, out of a field of 600 entries, were recognized and honored for originality and innovation in programming. The games honored were *Into The Eagle's Nest*, *Mario Bros.*, and *Thunderfox* for the XE game system; *Hat Trick* and *Impossible Mission* for the 7800 game system; *Super Football* for the 2600 game system; and *Crack'd* and *Planetarium* for the ST computer.

Heard at the Hannover Fair

Atari leaked news of several new products for the European market at the huge trade fair in Hannover, Germany. A laptop computer is said to be in the final prototype stage. Basically, it is an ST squeezed into a laptop size case. The mouse will be replaced by a trackball.

The big problem with the laptop design was in reducing the power consumption of the cpu circuits. The solution was to replace all the peripheral chips and combine them into one large and complex gate array, which uses comparatively little power.

The plan reportedly calls for a 512K or 1Mb machine with an LCD display and both a hard disk and single floppy disk drive.

Another machine in the planning stage is a Unix ST based on the 68030 mpu and the Unisoft version of Unix V. The machine will use an industry standard VME bus, which will allow it to take advantage of the many existing VME boards on the market.

Home PC Market Growing Steadily

Five years ago, analysts were predicting that one-half of all U.S. households

ENHANCE YOUR ST.

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

ST Video Digitizer

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

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

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

$79.95

ST Scan Image Scanner

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

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

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

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

ST Sound Digitizer

Digitize real-world sounds from microphones, record player, tape recorders, etc., then play back with your MIDI keyboard. The ST Sound digitizer can be used to create music, edit short commercials, or use for voice mail. Very easy to use software with powerful editing and mixing features. **$99.95**

Timekeeper

This is our popular clock calendar plug-in cartridge. The timekeeper comes complete with removable long life lithium battery ready to use. Just plug it into the cartridge slot and set up either an Auto folder or Accessory program to automatically set Time and Date each time you turn on your ST. **$29.95**

To order, call toll free
1-800-624-6545
or in California
408-378-8177
or send M.O. plus shipping (call for rates) to Navarone Industries, 454 Kenneth Ave., Campbell, CA 95008. VISA, M.C., C.O.D. welcome. California residents add 7% sales tax.

Navarone Industries

Prices and availability are subject to change without prior notice. Linotronic 300 is a registered trademark of Linotype Corp. Canon IX-12 and IX-12F are registered trademarks of Canon, Inc. Atari ST and MEGA are registered trademarks of Atari Corp. GEM is a registered trademark of Digital Research, Inc. DEGAS is a registered trademark of Batteries Included, Inc.

would own computers by 1990. However, as the video game market peaked out, analysts exchanged their rosy forecasts for gloomy ones. Meanwhile, customers, who don't pay much attention to analysts anyway, just continued to buy at a nice steady pace.

Currently, 19% of all U.S. households own *and use* personal computers (we're not counting old Sinclair ZX80s now serving as doorstops). Also, intention to buy a PC for home use is up a few percentage points from a year ago to 13%.

Of the computers at home, 52% are dedicated to home use only, 16% to business use at home only, and 32% to both home and business use. The most widely used applications are word processing (75%), games (75%), education (72%), programming (54%), home record keeping (54%), home finance (48%), and business record keeping (46%).

The average price paid for a system took a mighty jump from last year's $1230 to $1770 in 1988. Among brands, Atari ranked sixth among the computers now in use and fifth among the brands new consumers are most likely to buy.

Random Bits

Atari's John Skruch tells us that the XE game system light gun will be available separately (with the *Bug Hunt* cartridge) for use with 8-bit computers.

MegaByte Computers has announced an ST Accelerator board with a Mostek 68000 16 MHz mpu. The board can be switched between 8 and 16 MHz and costs $199.95. With the board, most programs will run about 75%-80% faster than on a standard ST, while *PC Ditto* will run about 60% faster (equivalent to a 4.77 MHz standard PC). Installation of the board is not a do-it-yourself job, as it requires many cuts of wires and pc board traces and some soldering, but a qualified technician should be able to do the installation in less than an hour.

Happy Computers has announced the Discovery Cartridge System for the ST, which will allow an ST to "read, analyze, format, write, and verify virtually any floppy disk format used in any computer." One purpose of the product, of course, is to make backup copies of protected software. However, it seems that it might allow Magic Sac owners to run Macintosh software directly. ■

8-BIT POWER WITHOUT THE PRICE

8-BIT COMPUTER SOFTWARE

AX2034	AtariWriter Plus (includes Proofreader)	disk	$49.95
RX8036	Atariwriter	cart	$19.95
AX2033	Proofreader (for AtariWriter)	disk	$16.95
CX415	Home Filing Manager	disk	$24.95
CX418	Home Manager (includes Family Finance and Home Filing Manager)	disk	$34.95
DX5082	Silent Butler	disk	$24.95
DX5089	SX Express	disk with cable	$19.95

PROGRAM LANGUAGES & INSTRUCTIONS

CXL4018	Pilot Kit	cart	$39.95
AX2025	Microsoft Basic II	disk/cart	$29.95
CXL4003	Assembler/Editor	cart	$24.95
CX8121	Macro Assembler	disk	$29.95
CX4117	Invitation to Programming III	tape	$ 7.50
KX7099	BASIC Tutor (includes Invitation to Programming I & II and two books, Inside Atari BASIC and Programming Tips and Tricks)	tape	$19.95

SPELLING, GRAMMAR, AND READING

AED80008	Spelling in Context/8 (grade 8)	disk	$ 6.95
AED80054	Prefixes (grades 3-6)	disk	$ 6.95
AED80069	Word Games (elementary)	disk	$ 6.95
CX4126	Speed Reading (grades 9-adult)	tape	$24.95
DX5050	Mickey, Great Outdoors (grades 2-5)	disk	$ 6.95
RX8059	Skywriter (grades 1-6)	cart	$19.95

MATHEMATICS

The Secret Formula Series teaches mathematical concepts by asking the player to create formulas that will duplicate a series of numbers generated by the computer.

Available on disk only.

AED80011	Division Drill (grades 7-9)	$ 6.95
AED80021	Secret Formula — Intermediate (grades 6-8)	$ 6.95
AED80022	Secret Formula — Advanced (grades 9-12)	$ 6.95
AED80055	Metric & Problem Solving (grades 3-7)	$ 6.95

SCIENCE AND SOCIAL STUDIES

The Atarilab series teaches science through experimentation.

AED80013	Atarilab Starter Kit	cart	$49.95
AED80014	Atarilab Light Module	cart	$39.95
CX8106	Bond Analysis (adult)	disk	$ 9.95
CX8107	Stock Analysis (adult)	disk	$ 9.95
CX8108	Stock Charting (adult)	disk	$ 9.95

MUSIC SOFTWARE

For grades 7 through adult.

Available on disk only.

DX5081	Music Painter (Transcribe your favorite songs and save them for later use, or compose your own songs and build a library of personal hits.)	$19.95
AX2020	Music I (Theory Lessons)	$24.95
AX2026	Music II (Advanced Theory)	$24.95

RECREATION

CXL4006	Super Breakout	cart	$19.95
CXL4008	Space Invaders	cart	$19.95
CXL4011	Star Raiders	cart	$19.95
CXL4012	Missile Command	cart	$19.95
CXL4013	Asteroids	cart	$19.95
CXL4022	Pac-Man	cart	$19.95
CXL4024	Galaxian	cart	$19.95
CXL4025	Defender	cart	$24.95
CXL4027	Qix	cart	$19.95
DX5084	Star Raiders II	disk	$19.95
KX7102	Arcade Champ Kit	cart	$24.95
RX8026	Dig Dug	cart	$19.95
RX8029	Football	cart	$19.95
RX8030	E.T.	cart	$19.95
RX8033	Robotron: 2084	cart	$19.95
RX8034	Pole Position	cart	$19.95
RX8040	Donkey Kong Junior	cart	$24.95
RX8042	Tennis	cart	$19.95
RX8043	Ms. Pac-Man	cart	$19.95
RX8044	Joust	cart	$24.95
RX8045	Pengo	cart	$19.95
RX8048	Millipede	cart	$19.95
RX8049	Jungle Hunt	cart	$24.95
RX8052	Moon Patrol	cart	$24.95
RX8059	Skywriter	cart	$19.95
RX8063	Rescue on Fractalus!	cart	$24.95
RX8064	Ballblazer	cart	$24.95
RX8067	Final Legacy	cart	$19.95
RX8077	BattleZone	cart	$24.95
RX8078	Star Raiders II	cart	$24.95
RX8079	Food Fight	cart	$24.95
RX8081	Blue Max	cart	$24.95
RX8082	Lode Runner	cart	$34.95
RX8083	David's Midnight Magic	cart	$24.95
RX8084	Hardball	cart	$24.95
RX8085	Fight Night	cart	$24.95
RX8086	Barnyard Blaster (Light Gun)	cart	$34.95
RX8090	Gato	cart	$34.95
RX8092	Archon	cart	$24.95
RX8093	One-on-One Basketball	cart	$24.95

ATARI® XE™ VIDEO GAME SYSTEM

$149.95

INCLUDES: 64K Keyboard (Built in Missile Command)
Light Gun and Joystick
Flight Simulator (Cartridge)
Bug Hunt Game

The latest hardware and software releases for all Atari computers

New Products

New Features For Supra Hard Disks

Supra Corporation announces the addition of several new features to the SupraDrive hard disk systems.

The new features include a 19-pin Atari DMA port, which passes the DMA signal through the drive to any attached DMA device, such as an Atari laser printer, Atari hard disk, or other Atari-specific peripheral; a 25-pin SCSI port, which allows additional SCSI devices, such as a hard disk drive, tape drive, or CD-ROM, to be connected; a battery-backed real-time clock and calendar; and a cooling fan to handle heat build-up from added components.

Supra drives, which are available in capacities ranging from 20 to 250Mb, are said to be compatible with all Atari ST computers, the TOS operating system, all Atari ST applications software, and all DMA bus peripherals and SCSI devices. Prices start at $699.

Supra Corporation, 1133 Commercial Way, Albany, OR 97321, (503) 967-9075.

SYSTEMS SOFTWARE

Prospero Software has announced 68881 co-processor support for its Atari ST Pascal and Fortran products. On Atari machines fitted with any 68881 co-processor board, Prospero Pascal ST68881 Library and Prospero Fortan ST68881 Library can effect increases in processing speed of between 5 and 50 times. $99.

Prospero Software, 100 Commercial St., Ste. 306, Portland, ME 04101, (800) 327-6730.

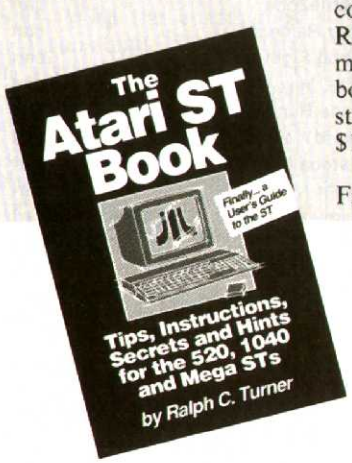
AL/65 from **Omega Soft** is a linker-based assembler for 8-bit Atari computers. It compiles source code into relocatable code, which can be used in other programs. The AL/65 editor is menu-driven and offers full-screen editing, user-definable macros, and custom character sets.

Omega Soft, P.O. Box 139, Harrells, NC 28444, (919) 532-2359.

Answers To ST Questions

The Atari ST Book by Ralph Turner is subtitled "Tips, Instructions, Secrets, and Hints for the 520, 1040, and Mega STs."

Aimed at users rather than programmers, the book is said to begin where the Atari Owner's Manuals leave off. The 159-page guide provides step-by-step instructions designed to help both beginners and experienced users get the most out of their STs.

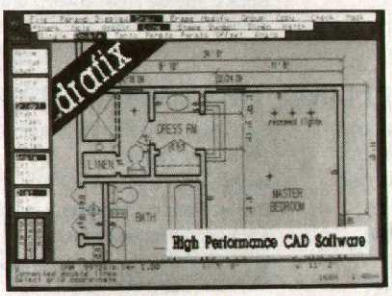


Topics covered include: item selector and desktop tricks, printer suggestions and control codes, using a word processor to alter the DESKTOP.INF file, overcoming common modem problems, RAM disks, files and their management, AUTO folders, cold boots vs. warm boots, public domain software, and installing applications. The book sells for $16.95.

Index Legalis, P.O. Box 1822-7, Fairfield, IA 52556, (515) 472-2293.

PRODUCTIVITY SOFTWARE

DotPlotter software from **Foresight Resources** works with *Drafix 1/Atari ST* to create super high-resolution hard copy with a variety of dot matrix, ink jet, and laser printers, including the Apple Imagewriter, Atari SMM804, Diablo C150, HP LaserJet and LaserJet+, Mannesmann Tally, NEC Pinwriter



P5, Okidata 92 and 292, Star SG series, Toshiba P1350, and Epson JX-80, RX-80, and LQ-1500. $45.

Also available for use with *Drafix 1* is a collection of symbol libraries, including *Professional Architectural Symbols Library*, *Professional Electrical Symbols Library*, *Professional Mechanical Symbols Libary*, and *General Symbol Library*, which includes symbols drawn from the three professional libraries. The professional libraries are priced at $150 each, and the general disk sells for $80.

Foresight Resources, 10725 Ambassador Dr., Kansas City, MO 64153, (816) 891-1040.

Hi-Tech Advisers announces the availability of source code versions of their software packages for the ST. Each version is supplied with a compiled run-time version of the program as well as the source code in standard *dbMan* code. Packages for which source code is available include *Sales-Pro*, *Sales-Pro Plus*, *Video/Rental-Pro*, *The Hi-Tech Church Manager*, *Fuel-Pro*, *Inventory-Pro*, and *Mail-Pro*. Prices start at $199.

Third Drive Cable For ST

Mars Merchandising has released the Third Drive Cable, which can be used with any Atari ST.

Designed to allow users to switch between a second and third disk drive without unplugging equipment, the cable is said to be especially useful to users of 5¼" *PC-Ditto*-compatible drives.

Suggested retail price for the 6' cable is $31.95.

Mars Merchandising, 15W615 Diversey, Elmhurst, IL 60126, (312) 530-0988.

Hi-Tech Advisers, P.O. Box 7524, Winter Haven, FL 33883, (800) 882-4310, (813) 294-1885.

Howard Enterprises introduces the first in a series of *Degas*-format clip-art disks for the Atari ST. Among the themes included on the disk are holidays, office surroundings, finances, and transportation. $29.95.

Howard Enterprises, 1222 S. Dale Mabry, Ste. 910, Tampa, FL 33629, (813) 831-5339.

Progressive Peripherals & Software has announced the release of *Superbase Professional Database Management System* for all Atari ST computers. The program offers four main tools—an intelligent forms editor, a text editor, a report generator, and a database management language.

Superbase Professional is designed to facilitate development of custom database applications with a database management language that supports 200 data management commands. Based on the *Superbase Personal Relational Database*, the new package carries forward the features of its predecessor—VCR-style control panel, picture database capability, and unlimited file size. $299.95.

Progressive Peripherals & Software, 464 Kalamath St., Denver, CO 80204, (303) 825-4144.

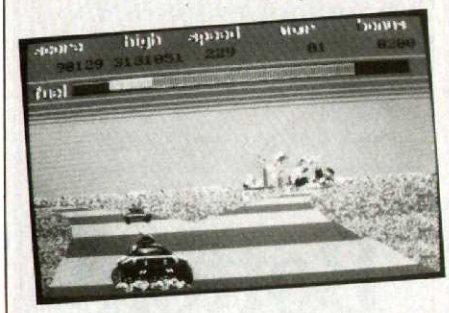
Desktop Publisher ST from **Timeworks** is a full-featured integrated desktop publishing program for Atari ST computers. It includes word processing, page layout, typesetting, and graphics functions.

Other features are GEM user interface, built-in fonts, high density printout format, text importing, built-in graphics toolbox, graphics importing, adjustable kerning, automatic text flow and word wrap, and multiple size page views. $129.95.

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

ENTERTAINMENT SOFTWARE

Fire & Forget from **Titus Software** for the ST challenges you to save the Earth in Thunder Master, a fighting machine equipped with a V-16 triple turbo engine and tetra-nuclear propulsion missiles. You can test your skills on



three levels of six conflicts, ranging from guerilla to global war. A second player can operate the magnetic levitation unit, Thunder Cloud, which helps protect Thunder Master on its mission to save the world from destruction. $39.95

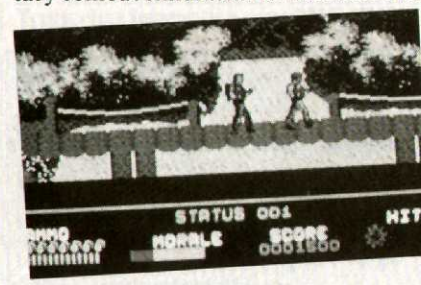
Titus Software, 20432 Corisco St., Chatsworth, CA 91311, (818) 709-3693.

Recently released by **Scorpion Software**, *Foundation's Waste* offers the Atari ST owner an opportunity to escape from a hostile planet in a stolen

spacecraft. The game features arcade action set against the scrolling background of the planet's terrain. $39.95.

Scorpion Software, 19 Harbor Dr., Lake Hopatacong, NJ 07849, (201) 663-0202.

Data East USA has translated the movie "Platoon" into a strategic military combat simulation of the same title



for the ST. The object of the game is to keep a platoon of five men intact through a series of six missions in Vietnam, maintaining their sanity and morale, and returning them to base safely. $44.95.

Data East USA, 470 Needles Dr., San Jose, CA 95112, (408) 286-7074.

Epyx has released *Impossible Mission II*, a game for the ST that challenges you to defeat Elvin Atombender, one of the world's leading experts on robotics, computers, and cryptography, and thwart his plan to dominate the world. $39.95.

Epyx, 600 Galveston Dr., Box 8020, Redwood City, CA 94063, (415) 366-0606.

Murder on the Atlantic for the ST is being launched by **IntraCorp** with a contest featuring $500,000 in prizes. The mystery game is set in 1938 on the luxury liner S.S. Bourgogne, and the player must explore 600 salons and staterooms, seeking clues, decoding messages, looking for booby traps, and questioning suspects. A contest entry form is included with each package. $39.95.

Intracorp, 14160 S.W. 139th Ct., Miami, FL 33186, (305) 252-9040, (800) 468-7226.

IntelliCreations has announced three new games for the Atari ST. *BattleDroidz* is a multi-level game featuring 3-D graphics. You must maneuver the BattleDroidz through a maze of obstacles, including acid pools, enemy Cyborites, and bottomless pits. Each BattleDroid has unique qualities, and all are armed with smart bombs and photon guns. $34.95.

Global Commander puts you in control of 16 members of the United Nuclear Nations, each of whom looks to you for guidance, natural resources, and protection from the other 15. The game is an icon-driven, interactive game with multi-screen layouts. $39.95.

The Rubicon Alliance is a starfighter simulator with cockpit controls, a 3-D locator map, overhead readouts, and dual flight logs. Your task is to protect the Rubicon Alliance from the pirate planet Nono and its warships. $29.95.

IntelliCreations, 19808 Nordhoff Pl., Chatsworth, CA 91311, (818) 886-5922.

Broderbund Software has released *Typhoon Thompson in Search for the Sea Child*, an arcade adventure for the ST. A space cruiser has crashed on a remote planet and the automatic distress signal indicates that there is only one survivor, an infant boy. Your assignment is to rescue the child, dealing with mischievous sea sprites, ancient technology, and spirits from a long-dead civilization as you go. $34.95.

Broderbund Software, 17 Paul Dr., San Rafael, CA 94903, (415) 492-3200.

Sales-Pro Plus offers point-of-sale convenience to retailers

Bottom Line

By TED SALAMONE

Sales-Pro Plus is not your run-of-the-mill business application. It doesn't process words like *1st Word Plus* or crunch numbers like *SwiftCalc*; instead, it is a point-of-sale (POS) system designed for retailers and wholesalers (with over-the-counter sales).

If this sounds like an unusual application for a personal computer, consider your last purchase in a large department store or chain. The sale was undoubtedly tallied on an electronic cash register driven by custom POS software. Now, courtesy of Hi-Tech Advisers, *Sales Pro Plus* brings some of that same power to the ST.

Although *Sales Pro Plus* is written in the *dbMan* application generation language, *dbMan* itself is not required to run the program. That is because the POS application is completely free-standing, incorporating a runtime version of *dbMan*.

Sales-Pro Plus controls inventory, accesses a cash drawer, maintains a master customer file, handles layaways, tracks accounts receivable, and takes orders. It even accommodates back-orders, a situation that occurs when a customer wants an item that is temporarily out of stock. The (back)order is kept on file, and when the item comes in, the order is filled.

Origin of the Software

Sales-Pro Plus is based on the less powerful *Sales-Pro* system. It acquired the "Plus" suffix when modules #1 (customer list and backorders) and #2 (accounts receivable and layaways) were added.

The existence of modules #3, mail merge capability with *ST Writer* or any word processor that creates ASCII files; #4, accounts payable; and #5, general ledger, belie the current contention that *Sales-Pro Plus* is a complete POS system. It may be someday, but not until it offers (among other things), profit margin calculations, a way to keep track of purchasing, and complete control over an electronic cash register rather than just a cash drawer.

But rather than dwell on the missing functions, Let's look beyond the marketing hype and see what the *Sales-Pro Plus* has to offer.

Better Buy a Hard Drive

The application comes on a single double-sided floppy, so there is very little room for data files. In other words, you cannot run your business from the distribution disk.

Sales-Pro Plus is available, by special request, in a two-floppy version. One disk for the program; another for the data. While this is an improvement over the single-disk version, the numerous slow disk accesses and the relatively low ceiling on data storage limit its usefulness. (To get the two-floppy system, you must return the original disk to Hi-Tech Advisers and wait for regular mail to deliver the goods. At least HTA promises that your request will be fulfilled the same day it is received).

No matter how you slice it, a floppy-based system is a poor alternative to a hard drive. The extra storage capacity alone makes the investment worthwhile—especially if you are selling hundreds or thousands of items to hundreds or thousands of customers.

Hi-Tech Advisers claims that a hard drive system runs up to ten times faster than a dual floppy system. Though I can't vouch for the actual increase in speed, there can be no doubt that *Sales-Pro Plus*, like most programs, runs faster on a hard drive.

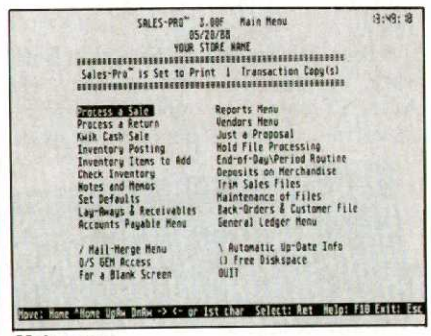
When viewed from a busines perspective, a hard disk becomes a necessity rather than a luxury. Without it, transaction times increase and sales may be lost as customers tire of waiting.

Have It Your Way

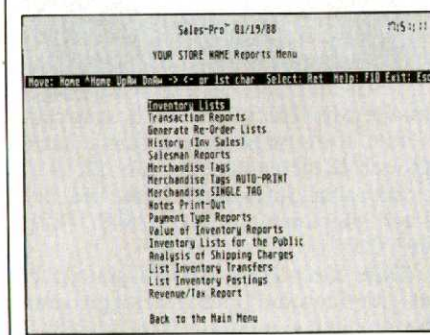
On the plus side, Hi-Tech Advisers will customize the system to provide the special reports and functions you need—all for a fee, of course. They also supply a cash drawer ($499) and a serial cable to connect an ST with a drawer—theirs or one with a suitable interface built-in.

As it comes out of the box, *Sales-Pro Plus* has a rather impressive list of features. For example, the package includes perpetual inventory control, (optional) variable taxation rates by item, and multiple pricing structures (one wholesale price and one retail price per item) with a single discount level calculated automatically.

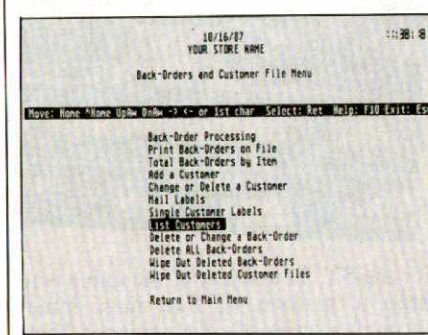
In addition to logging sales, the program also tracks returns. What's more, returns are not tied to specific invoice numbers; only the customer name is required to retrieve the record of a tranaction. And you can specify the dollar value of a return; the system price is not forced on you. This is useful, because you may choose not to refund the entire amount of the sale, charging a re-stock-



Main menu.



Reports menu.



Backorders and customer file menu.

ing fee or offering only the sale price of an item that has been reduced.

On layaways, all deposits are tracked, and the balance due is automatically calculated until the entire amount is paid. As required in most states, the sales tax on a layaway item is calculated and included in the first installment. Similar attention to detail in the Tax Collected report, should make life a lot easier when it comes to sales tax reporting and remittance.

On the output side, *Sales-Pro Plus* provides a host of reports; most of which are date- or range-driven. Complete sales and inventory information is available, along with cost of goods data, product labels, mailing lists, and salesperson activity reports.

Major on-demand printouts include vendor and item lists, re-order reports, payment type (cash, check, credit card) reports, inventory valuation and a combination summary/analysis report of shipping charges.

The interactive nature of the program is not compromised by the need to wait for reports to be printed. Critical data, such as vendor, item, and customer-related information, can be viewed on-screen by searching for its associated number or typing in its alpha description. Convenience, real convenience!

Another convenience is the menu option, which lets you define system defaults such as company name, address and telephone number; date format; transaction slip message ("Buy Now and Save," "Ask About Our Disk Washing Service," etc.); security parameters; and variable- or single-level taxation.

Additional nice touches include online help screens, two-level password security, an electronic notepad for jotting down notes, and the ability to print invoices/receipts in full- or half-page format.

Upgrades

Before delving into my impressions of *Sales-Pro Plus*, I should mention that several enhancements are already shipping as version 3.00. They have not been reviewed for this article, but I mention them so you can get an idea of the level of support Hi-Tech Advisers offers and the direction in which they are pushing the program.

A print alignment option has been added to assure that the inventory item automatic label generation feature doesn't miss its mark. Shipping charges are now part of the end-of-day and end-of-period reports, and inventory lists can be produced in vendor order.

Version 3.00 allows you to design customer and inventory lists, and optional password security has been added to the layaway and receivables sections. In addition, you can now access your GEM accessories from the program and find out how much disk space is free simply by choosing an option on the Main menu.

Other changes are said to fix bugs which are resident in the version reviewed. They include, but are not limited to, shipping charge problems in the Proposal (or Quote) option and a problem which occurred when using the "?" inventory search procedure.

Somewhat disconcerting is the fact that two "accessories," as distinguished from the previously mentioned "modules," are available. This means there are now three possible ways to augment a "complete" POS application. Accessory #1 makes it possible to ship a product to one address and bill it to another. Accessory #2 offers several utilities for use with *Sales-Pro Plus*. These add-ons are useful, but each costs an additional $39.

Impressions

My first experience with *Sales-Pro Plus* left me thoroughly underwhelmed. I had problems getting started, because the manual does not specify the sequence in which files must be built. When I tried to add inventory, I was told that no vendors were identified, and I had similar problems in several other areas.

By paying attention to the alert messages, I was able to determine that the first step is to add vendors. Then you can proceed to enter inventory and customers. Then, and only then, can orders and returns be processed. This typifies the lack of organization and dearth of operational information found in the manual. Luckily, a little trial and error produces acceptable results; the application isn't so sophisticated as to be unusable without printed instructions.

Then a strange thing happened. The following message appeared: "An unusual error has occurred. Do not panic. Error is #55, make a note of it. Check data then start over. If it happens repeatedly contact dealer or HTA." Error #55 was not mentioned in the manual. It turned out that the unusual error was a write-protected disk!

Sales-Pro Plus

System: Atari ST

Version reviewed: 2.13BF

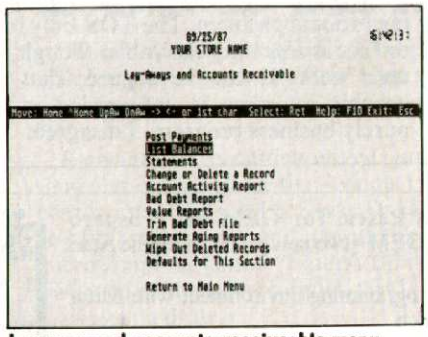
Required equipment: Double-sided disk drive; Epson-compatible printer; hard disk recommended

Copy protection: None

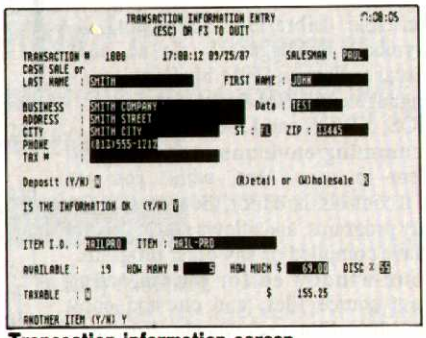
Summary: An inexpensive, adequate, though incomplete, point-of-sale system created as a runtime dbMan application

Price: $199

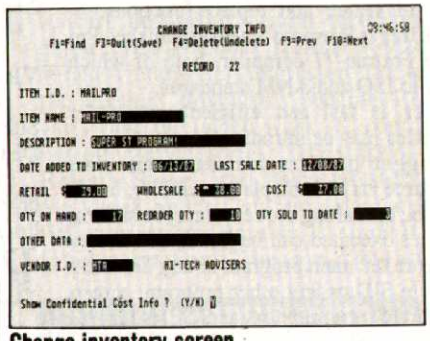
Manufacturer:
Hi-Tech Advisers
P.O. Box 7524
Winter Haven, FL 33883
(813) 293-3986



Layaway and accounts receivable menu.



Transaction information screen.



Change inventory screen.

***When viewed from a business** perspective, a hard drive becomes a necessity rather than a luxury. Without it, transaction times increase and sales may be lost as customers tire of waiting.*

For some reason, my data was a bit scrambled after that, so in frustration I left the package alone for a few days.

When I returned to my evaluation, I encountered no problems. Additional trial and error coupled with a more careful approach to data entry and the program in particular paid off. I entered all the master files without incident, and maintenance was performed as expected. I was able to record sales and effect returns smoothly.

What does all this mean? It means that you should plan to spend a day or two learning to use the program without benefit of documentation before you expect *Sales-Pro Plus* to do useful work for you.

Aside from the dialog boxes used to report errors, *Sales-Pro Plus* does not support GEM. No pulldown menus, no mouse or icon interfaces; you use the cursor keys to highlight full screen menus and press Return to make your selection.

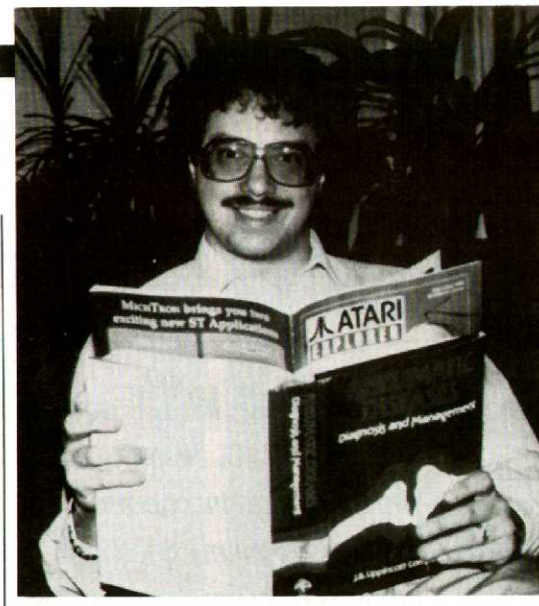
All Sales Final

Sales-Pro Plus has two significant deficiencies and one fair-to-middling operational problem. The TOS-only interface is less than desirable, though it does work. It can be argued, that a graphic interface is not needed in a purely business program. I disagree.

The other deficiency is in the lack of completeness. The full POS claim is just that—a claim. *Sales-Pro Plus* may be complete when all the modules and accessories are finally developed, but right now it is missing a few key pieces. As it stands, the application is useful. Just don't expect it to control the entire POS environment.

The operational problem stems from the less-than-stellar error handling capabilities of the program. Much of the problem is attributable to the fact that the program is written in *dbMan*, rather than C or machine language. All the weaknesses of *dbMan* are inherent in the program, along with a some *Sales-Pro*-specific difficulties.

Despite these initial problems and omissions, *Sales-Pro Plus* fills a need. Overall, it does an adequate job at a reasonable price. It even displays a few flashes of genius. If you are in the market for this type of program, consider it seriously—just be sure that you know exactly what you need and what you are getting. ■



Mike Breggar's simulation is a TV spectacular

He's Ready For Prime Time

The profession of computer game designer is so new that few electronic authors have set out to make it a career. Talk to an entertainment software designer for a few minutes, and you are likely to discover a former teacher, auto mechanic, or fashion model.

Mike Breggar, the author of *Prime Time* from First Row Software, fits squarely within this job-changing paradigm. Though currently a practicing podiatrist, the loquacious 33-year-old Philadelphian has taken his first major step into a new career with the publication of his superb simulation of the television network jungle.

Although he had a few brushes with computing in the late 1960's, Breggar's introduction to programming came while he was an undergraduate at Temple University. "I had to fulfill my foreign language requirement," he says, "so I tried to convince the school that Fortran was a language, arguing that it has its own vocabulary and syntax. They bought it." So the future foot doctor grappled with the intricacies of a DEC mainframe to earn the needed credits.

Shortly after he completed his residency at a Philadelphia hospital, Breggar had his first close encounter with electronic gaming in the form of an Atari 2600. He started with *Space Invaders*, as did most of his contemporaries, but his real favorite quickly became *Missile Command*.

***Shortly after he completed his** residency at a Philadelphia hospital, Breggar had his first close encounter with electronic gaming in the form of an Atari 2600.*

He next acquired a Vic 20. "I started programming for fun," he says."I compacted some of my college programs to fit the Commodore." Working in Basic, he created a program to analyze horse races. "It didn't have any graphics, of course," Breggar notes, somewhat critically.

He declines to comment on the efficacy of his computerized tout, but he soon stepped up in computing class with a Commodore 64. "I wanted the programming tools and extra memory the system offered," he explains. Lack of sufficient memory even in the C64 impelled him to learn assembler. "I bought a book and taught myself," he remembers.

Know It All, a computerized game show loosely based on the Avalon Hill board game Facts in Five, was Dr. Mike's first serious attempt at producing a microcomputer game. "I didn't think it was good enough," he admits, "so I put it away in a drawer."

An Early Adventure

In 1984 he discovered a program manufactured by Codewriter called *AdventureWriter*. He used this text adventure authoring system to design a game called *Sherlock Holmes Returns*. When Codewriter expressed interest, the mystery adventure became Breggar's first published work. It contains two interactive stories, "The Case of the Rosetta Stone" and "The Mystery of the Clock Seller," starring the world's first consulting detective. "I think it's a fabulous program," he says, " but then, it wasn't really my programming."

Whether because of negative feelings left by this brush with software publishing (Breggar feels that the publisher still owes him money) or the demands of his growing podiatric practice, Breggar allowed game designing to lapse into hobby status. "It was for me like golf is to other people," he says.

He did little more than dabble in his hobby until *Micro League Baseball* was published by Micro League Sports Association. Seeing that statistical replay baseball game ignited his desire to create a similar simulation for basketball.

First came the research. He delved into *The Sporting News* and bought all the existing basketball board games to get a feel for what others had done in this highly specialized field. Finding none of the existing games very appealing, he designed his own computerized NBA basketball simulation, which he offered to MLSA.

His efforts to market the program brought him into contact with Paul Kelly, then an executive at MLSA, and although Micro League decided to stick with baseball, the two became friends.

When things stalled on the hoop front, Breggar returned to an idea he had had while watching an Alan King special on HBO. "He was doing a hilarious routine about a crazy network programmer, and I thought to myself, 'everyone wants to do that.' "

After toying with the idea of a serious

By ARNIE KATZ and BILL KUNKEL

business simulation, Breggar decided to handle the subject with a light touch. "I wrote up 125 shows, the number needed to fill the schedules of three networks." At that stage, the game was much simpler; the player assembled a schedule and earned a rating based on how well it did against the two computer-controlled rivals.

This play-mechanic requires a ratings system, but Breggar ran into a roadblock when he tried to study the one used by the real TV industry. "I talked with several people at A. C. Nielsen, all of whom offered incoherent answers to all my questions." Frustrated, he invented the "Nelson rating" (named after Ozzie Nelson) and wrote the demographic profiles of the shows himself.

Broadening The Scope

At this crucial point in the development process, Breggar decided to widen the focus of the game, extending the "Prime Time" simulation to cover the full 10-month television season. This decision led to the inclusion of the news stories in *Variety*, which generate ratings trends.

A couple of publishers passed on the preliminary proposal, mainly due to the absence of graphics. Breggar shoved it into his desk drawer; "maybe it isn't fun," he remembers thinking.

"I talked with several people at A. C. Nielsen, all of whom offered incoherent answers to all my questions."

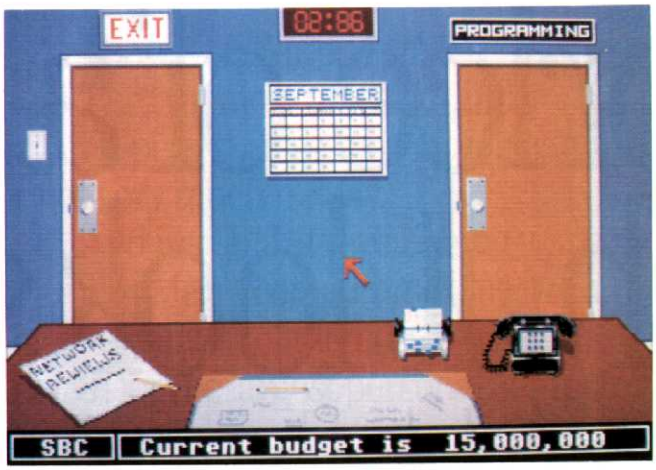
But maybe it was. Paul Kelly thought it was when Mike showed it to him in the spring of 1987. Kelly, by this time president of First Row Software, introduced Breggar to programmers James Dorsman and Doug Mackall, who helped him finish the project.

When it became clear that *Prime Time* needed more shows, Mike's wife, whom he calls "the lovely Marilyn," joined the team. She invented many additional series, helped concoct the specials needed to implement the controller-operated bidding sequence, and wrote the TV Wise Guide, which presents the schedules on the screen. "She also helped write the 25 commercials included in *Prime Time*," Breggar says.

Prime Time, the first major release by First Row, made its debut at the January 1988 Consumer Electronics Show, and the package is well on its way to making Breggar the next big name in game design.

The byte-bashing medico is already hard at work on his next two projects. "Both are based on licenses," he offers as a hint of things to come, "and at least one will be available in time for Christmas 1988."

Is he a doctor who designs games or a game designer who fixes feet? For now, the energetic Breggar will try to ride both horses. "The toughest thing about having two careers," he remarks, "is working all day and then coming home and working all night." ■



The view from the network executive's desk.

Opponent Fred Silverfish tells what he has done during his turn.

Prime Time: The Simulation

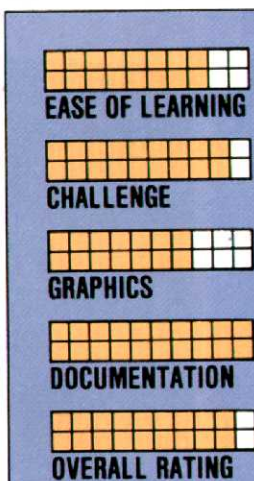
It's a conspiracy. The other two networks have gotten together, saddled their third competitor with a schedule full of dogs, and put you in charge of the whole mess. Now they watch from the shadows, licking their chops at the prospect of picking up your network as the bankruptcy judge lowers his gavel.

That's the situation you face at the start of *Prime Time*, a TV simulation by Mike Breggar. It takes canny product development, a nose for trends, and little luck to keep the enemy's plan from coming to fruition. You monitor the ratings, develop shows, bid on specials, and slug it out for video supremacy against two human- or computer-controlled opponents.

Each turn represents a month of real time. You set the first fall schedule in August and put the season's final programming log to bed in June. The goal is to get your network into first place by the end of the 10-month season.

Each simulated month starts with a series of information screens. The TV Wise Guide describes existing on-air programs; *Variety* provides monthly news that affects program ratings; the Network Standings screen tells which broadcasting company is ahead in the ratings race; and the Ratings and Rankings summary provides information that can help in fine-tuning the next month's schedule.

The scene then shifts to the programmer's office, viewed from behind the big desk. Using mouse, joystick, or keyboard order entry, you set the schedule, develop new programs, bid for specials against the other networks, and arrange lunches with powerful industry leaders.



System: Atari ST

Copy protection: Yes

Summary: Challenging, entertaining simulation of life at a network TV station

Price: $39.95

Manufacturer:
First Row Software
900 East 8th Ave.
Suite 300
King of Prussia, PA 19406

The presidents of the rival networks also appear periodically to describe their scheduling maneuvers.

To simulate the ulcer-producing tension of the network wars, each programmer has just five minutes in which to arrange each month's schedule. Fortunately, the control system is so simple

A page from the TV Wise Guide.

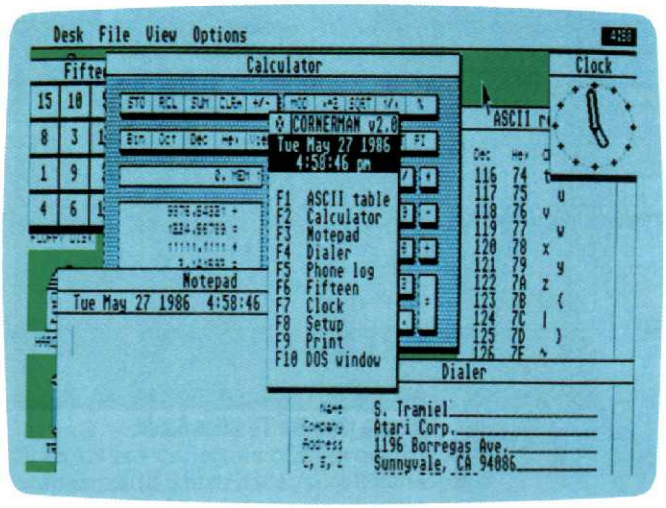
To simulate the ulcer-producing tension of the network wars, each programmer has just five minutes in which to arrange each month's schedule. Fortunately, the control system is so simple and effective that, with a little practice, players can prepare a new line-up with plenty of time to spare.

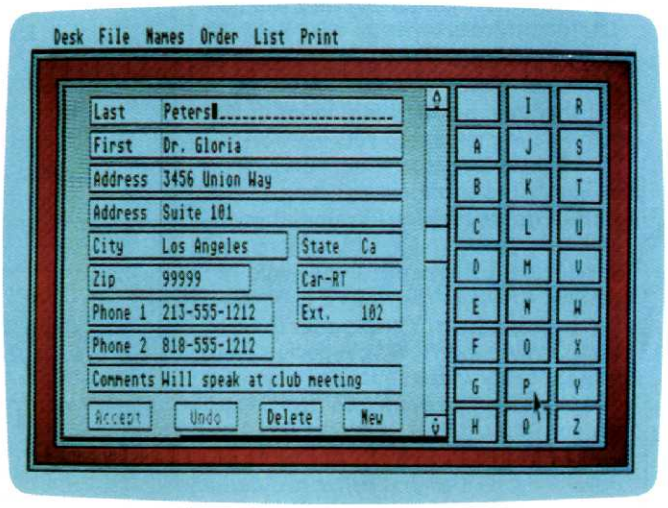
Although *Prime Time* is a fairly realistic simulation, the design team views the subject with a decidedly satiric eye. The program descriptions in the on-screen TV Wise Guide are full of jibes at banal video fare, and the documentation assumes the same light tone.

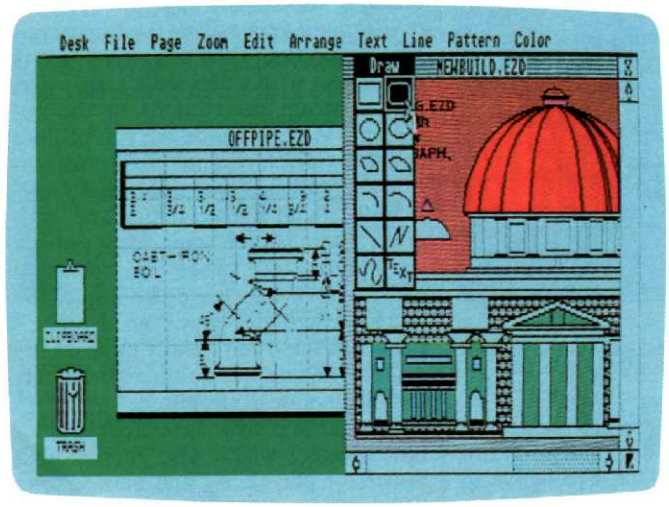
Both sound and graphics are well-done. There is even some voice synthesis. For instance, when you decide to end the turn and leave the office, the secretary actually says, "good night." Frills like these don't really improve the simulation, but they do add to the entertainment value of the game.

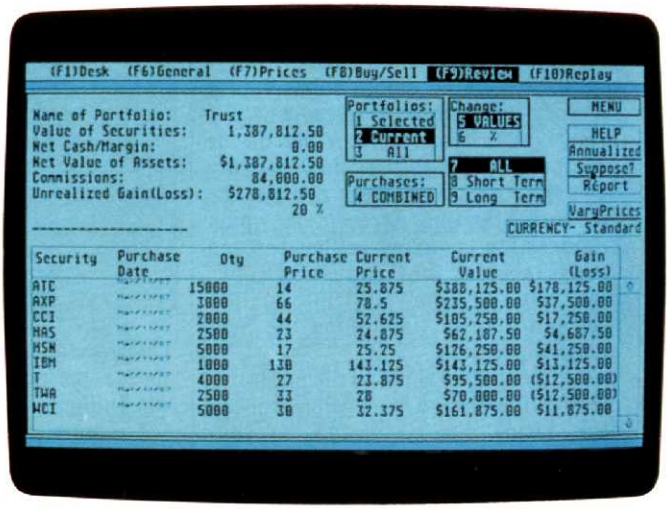
Breggar and crew have created a detailed game, which also merits high praise for playability and pace. *Prime Time* could well be the best program on television. ■

At almost half the price of a Macintosh, it looks even better.









This could be love at first sight. And who would blame you?

After all, you're looking at the business end of the new business machines from Atari®.

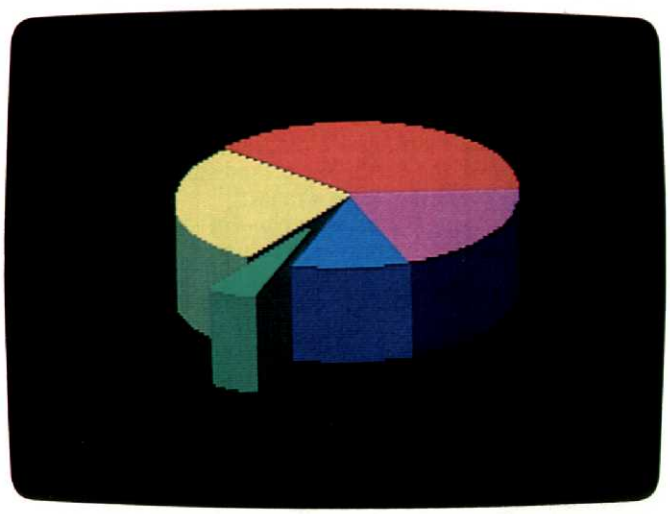
The Mega2™ and Mega4™.

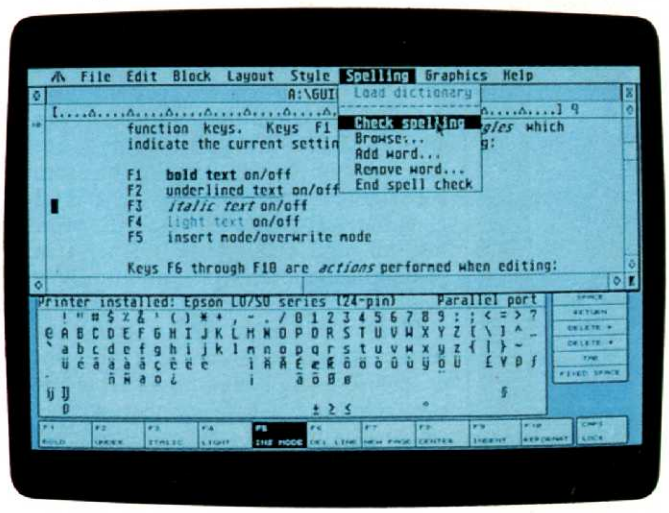
The two most powerful, full-featured personal computers you can buy for not very much money.

And just look at everything you get.

The Mega™ computers come with 2 or 4 megabytes of memory, standard. Enough for the largest personal computer applications.

There's a graphics accelerator, our exclusive BLiTTER™ chip, for faster, smoother scrolling, graphics and even animation.





And since our resolution is one of the highest of any standard personal computer monitor, you'll like what you see.

In color, of course.

There's no shortage of programs to put on that screen, either.

From word processing to data bases to spreadsheets to powerful CAD and desktop publishing solutions.

And they're as reasonably priced as our computers.

Which brings us back to the reason the new Atari Mega looks so good in the first place.

Simply put, it's a faster, more feature-rich computer than a Mac SE.

For just about half the price.

Now, for the name of your nearest Atari Mega dealer, call us at (408)745-2030 or 2034.

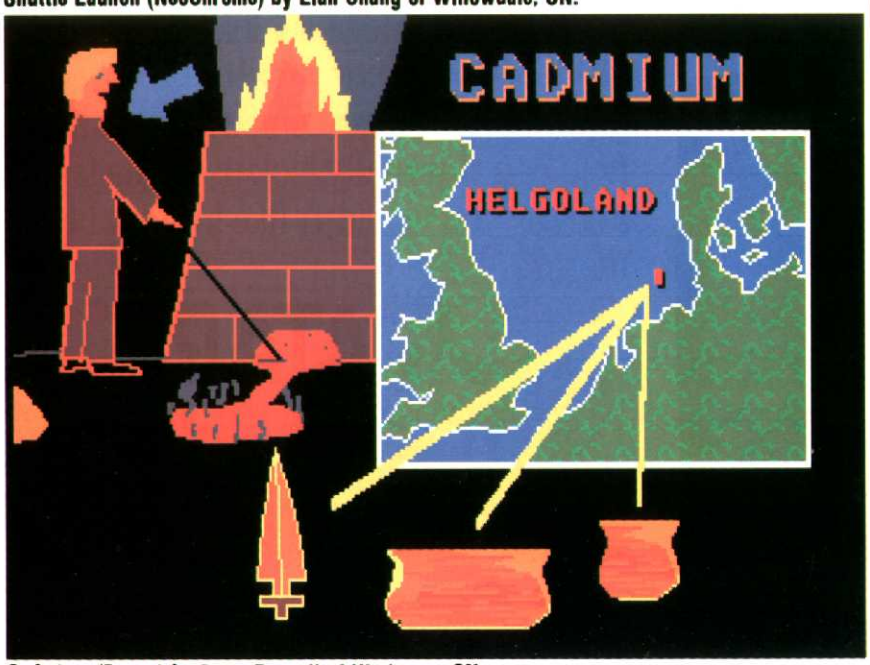
Because knowing what you know now, can you really look us in the face and say you wouldn't like to see a little more?

ATARI®

Power without the price.™

ZZ Top Eliminator (Degas) by Eric Schwartz of Seabrook, NH.

Shuttle Launch (NeoChrome) by Lian Chang of Willowdale, ON.



Cadmium (Degas) by Peter Russell of Kitchener, ON.

Graphics Gallery

Last issue we were deluged with entries; this issue the flow dropped to a trickle. Come on, you artists out there, let's see your stuff! As a result of the dearth of entries, we have picked only eight winners instead of our usual ten.

Top prize of a three-year subscription goes to Michael Morgan of Haskell, NJ, for his image called "Shell." Michael writes that "the image started as a spiral doodle and ended up as what you see here." He continues, "I wish I could have included more images, but what free time I have is usually spent on using other excellent software on the ST."

Peter Russell of Kitchener, ON, sent in no fewer than 14 entries, most of which were of an educational nature—rock and crystal structures, geologic maps, and a diagram of the mantle of the earth. We picked one called "Cadmium" as a winner.

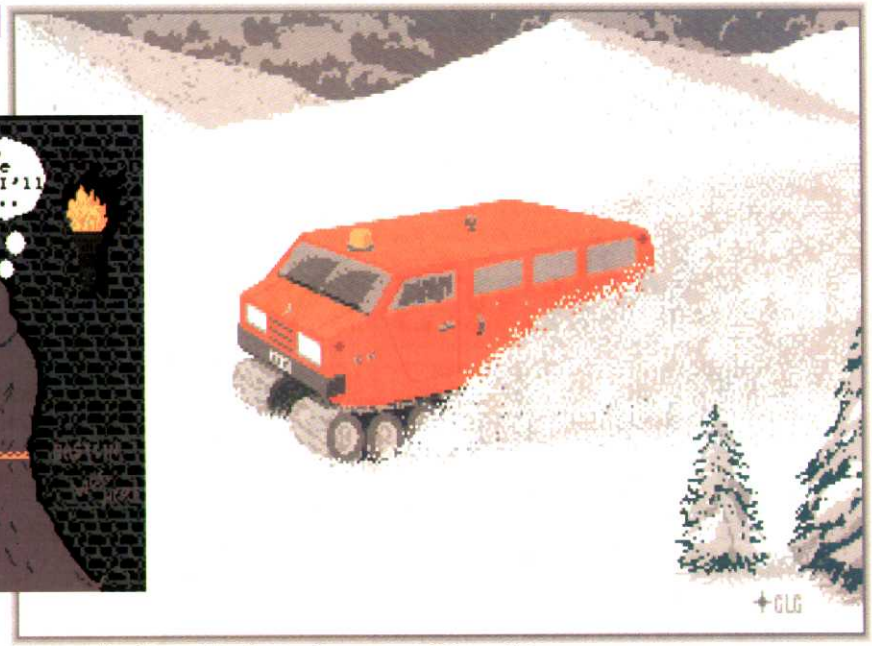
Other winners—of one-year subscriptions—are as noted in the picture captions.

To enter our ongoing Graphics Gallery contest, submit your image(s) on disk in either *NeoChrome* or *Degas* format. Your disk must be labeled with the format used and your name and address. Also send a self-addressed stamped envelope with 45 cents postage for the return of your disk. We will return your disk with *ten new images* in the format of your choice.

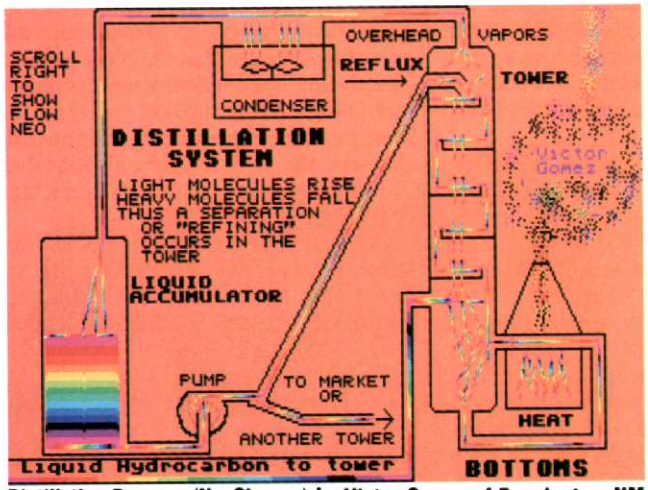
Your entry must include a signed statement as follows: "I certify that the image(s) submitted is (are) my own personal work and that no portion was copied from any image belonging to another person or organization or from copyrighted printed or video material. I give *Atari Explorer* the right to print my image(s) and/or use it (them) in promotional material or computer show displays."

Please allow eight weeks for the return of your disk. If you are a subscriber, please include an address label (or copy) showing all code numbers so that we can extend the correct subscription if you win. ■

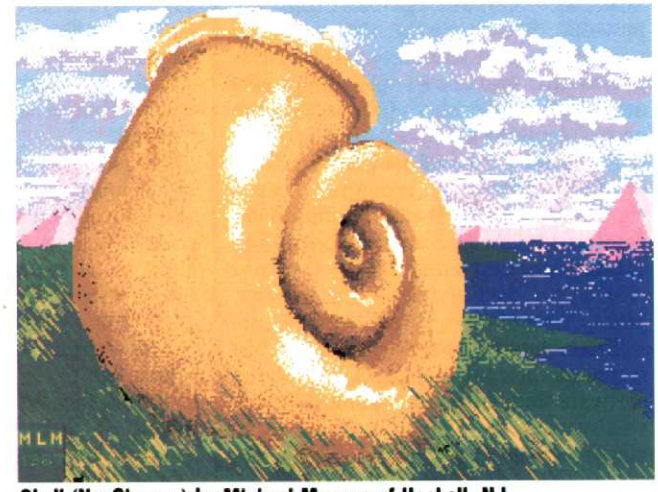
Entering Dungeon (Degas)
by Robert Reitz of Sunbury, PA.



Snowcat (NeoChrome) by Gantry Gappmayer of Orem, UT.

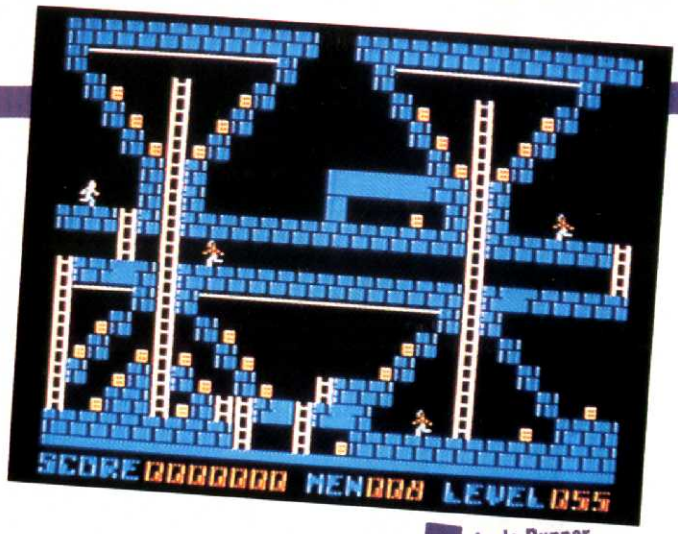


Distillation Process (NeoChrome) by Victor Gomez of Farmington, NM.



Shell (NeoChrome) by Michael Morgan of Haskell, NJ.

Dragon (Degas) by Edward Liu
of Morris Plains, NJ.



Lode Runner

What's New For The XE?

Atari keeps the XE Game System and other 8-bit systems supplied with game cartridges

By BILL KUNKEL and JOYCE WORLEY

The Atari XE software library is an interesting collection of classic computer games from the past decade embellished with a pair of new offerings. It includes sports, strategy, combat simulators, arcade games, and even a target-shoot for use with the new Atari light gun.

All games reviewed are packaged and distributed by Atari, though the copyright is retained by the original publishers. Let's take a title-by-title look at the catalog, starting with . . .

Strategy Games

Broderbund's *Lode Runner* ($34.95) is one of the real success stories of the software industry. The design, which was inspired by the Universal arcade classic Space Panic, involves a player-controlled Lode Runner who scrambles, tumbles, and clambers across 75 different playfields in a race to reclaim strategically placed chests of gold, which the villianous Bungelings have stolen from the peace-loving Galactans.

In addition to the deadly Bungeling guards, whose very touch is fatal, the playfields consist primarily of ladders, horizontal bars, and large, blue bricks. The player's only defense against the guards is a laser drill pistol which, when fired, disintegrates one brick at a time, creating pits into which the none-too-bright Bungelings can be lured and trapped.

Lode Runner is a classic action-strategy contest in that it mixes its arcade and strategy elements. Free Fall Associates' *Archon* ($24.95), on the other hand, uses action and strategy as separate elements within a single game.

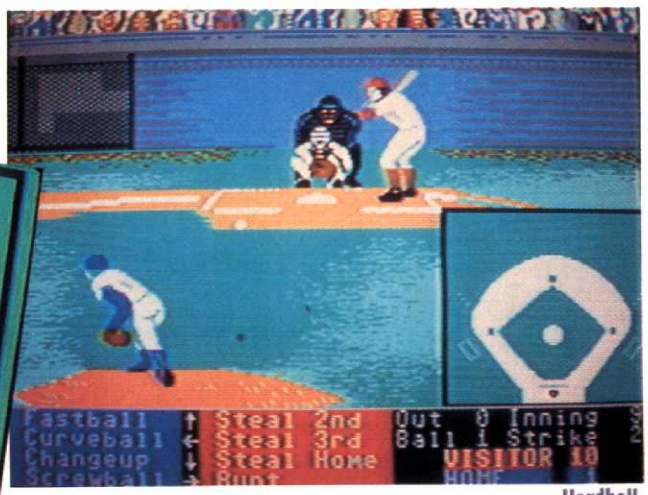
Archon is, basically, a redefinition of chess for the computer age. Two armies, representing the forces of light and darkness, face off on a game board composed of light, dark, and neutral squares. The squares which begin the game as neutral, however, undergo an inexorable metamorphosis from light to dark and back again once the action begins. The army of light has an advantage on white squares, while dark pieces hold sway on the dark ones, and both strive to take advantage of the changing squares as they wax and wane.

Some pieces move along the surface, some fly, and others teleport to new positions on the board. *Archon* also differs from chess in that the pieces are not simply analogs of earthly powers, but of mythological creatures as well. In addition to icons representing knights and archers, the army of light also musters unicorns, golems, phoenix, djinn, and Valkyries.

The army of darkness includes such interesting recruits as basilisks, manticores, trolls, shapeshifters, dragons, banshees, a sorceress, and those footsoldiers of the night, goblins.

What really makes *Archon* distinctive, however, is its combat feature. When two pieces attempt to occupy the same square, they are immediately transported to a combat screen where they get to settle things, *mano a mano*.


Archon



Hardball

The advantage is determined by the power of the pieces, the light/dark status of the combat square, and the skill of the player, who not only maneuvers the piece but unleashes its distinctive power via the joystick action button.

Sports Games

Baseball, basketball, and boxing are all represented in the XE software library. The baseball simulation, Bob Whitehead's *HardBall* ($24.95), was a major hit back in 1985-86 and is still state-of-the-art in terms of its graphics and duplication of the pitcher-batter confrontation. Once the ball is actually hit, however, *HardBall* becomes a rather ordinary arcade-style baseball game.

But oh, that pitcher vs. batter action! Seen from the perspective of TV's popular "left-centerfield camera" with the pitcher in the left foreground, the graphics and animation are impressively realistic. Players have access to a four-pitch selection while in the field and maintain complete bat control while at the plate. An overview of the diamond appears in the lower right corner.

Depending upon where the ball is hit, the perspective shifts to a half-field-wide view as seen from the stands just behind home plate. Attempting to condense the entire length of a baseball field into a single screen causes a flattening of the outfield that will be disturbing to baseball purists, but no game is better at capturing the essence of the hitting and pitching experiences.

One-on-One Basketball ($24.95) is, of course, the classic Eric Hammond program, *Julius Irving and Larry Bird Go One-on-One* originally distributed by Electronic Arts. This game is based on an irresistible idea: wouldn't it be fun to "control" either Bird or the Doctor in a game of one-on-one? Hammond worked extensively with both Dr. J and Bird to produce computerized simulacra that run, jump, dunk, and shoot just like the originals. The impressive results are still entertaining gamers half a decade later.

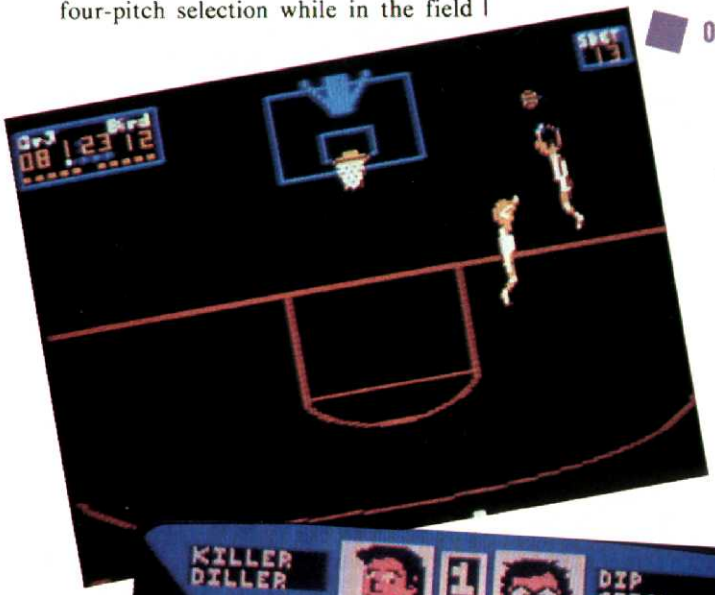
The graphics are rather ordinary by contemporary standards. Even the bits that knocked 'em dead in '83—slow-mo replays and the occasional smashing of the glass backboard by a slamdunk, which brings out the janitor to dutifully sweep it up—seem humdrum. But the on-screen Bird and the on-screen Dr. J still play astonishingly like their archetypes and respond instantly to joystick commands. And, for those reasons, this game is still a lot of fun.

Accolade's *Fight Night* ($24.95) is the weakest of the three sports simulations, a game in which the player guides the careers of boxers with names and physiognomies more akin to those of professional wrestlers than real fighters. *Fight Night* comes with five predesigned pugilists, but users can also construct boxers from a bank of body parts, then rate them in four areas (power, stamina, speed, and intelligence) for further individuality.

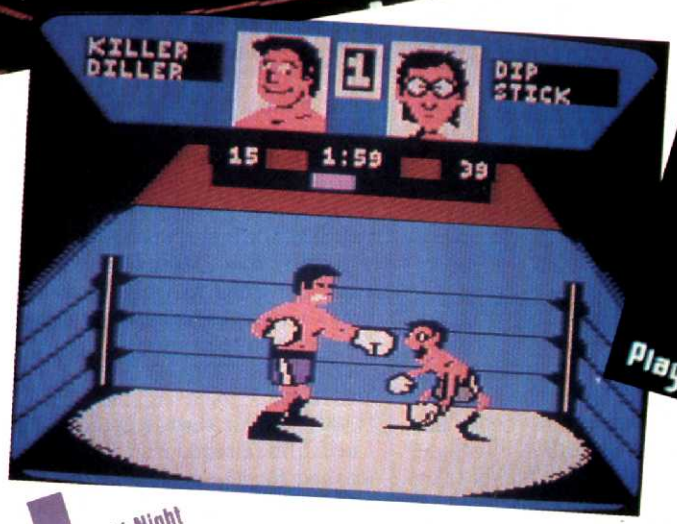
The boxing action has a cartoonish quality to it that should amuse younger players, as will the relatively simple joystick control, but *Fight Night* will probably disappoint older gamers with its simplistic underpinnings and unsophisticated visuals.

Arcade Games

When the folks at Lucasfilm decided to get into computer software design a few years back, they knew that their first releases would be their most impor-



One-on-One Basketball



Fight Night

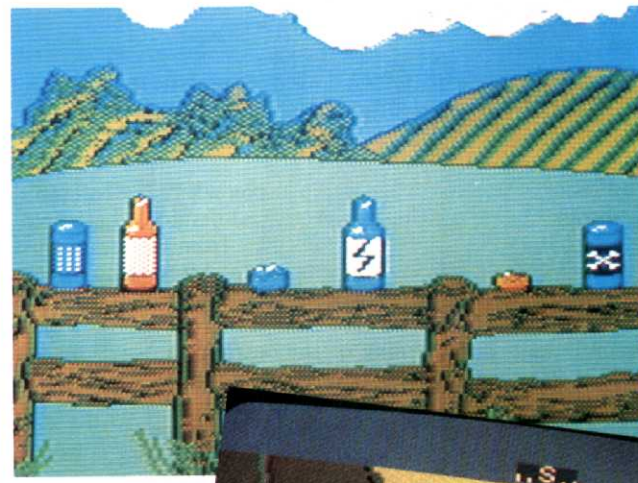
David's Midnight Magic

tant. Lucasfilm needed to establish instant credibility, and they did, thanks to a pair of outstanding releases.

The first, *Ballblazer* ($24.95), puts the player inside a Rotofoil, a one-person hovercraft used in the playing of a high tech form of soccer/hurling/rugby in the year 3097. *Ballblazer* players blast around the Grid (a gigantic matrix-like playing field composed of 1155 squares) at a speed of five meters per second, attempting the gain control of the Plasmorb (ball) and fire it between a pair of moving goalposts at the far end of the Grid.

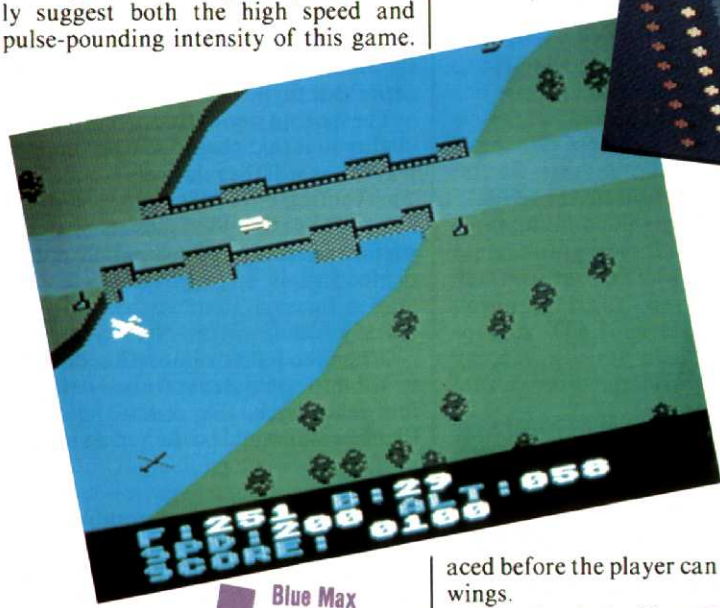
The *Ballblazer* playfield splits the screen horizontally, providing the point-of-view of both Rotofoil pilots (the game is played one-on-one with a three-minute time limit), making it ideal for head-to-head play. The computer, however, is a very worthy adversary and should test most players to their limits.

The graphics, though simple, perfectly suggest both the high speed and pulse-pounding intensity of this game.



Barnyard Blaster

Rescue on Fractalus



Blue Max

The throbbing sound track and audio effects also help keep the excitement level high. *Ballblazer* is a classic that belongs in every gamer's library.

Blue Max ($19.95), originally published by Synapse (which was, in turn, purchased by Broderbund) in 1982, puts the player in control of a far more prosaic craft—a circa-WWI biplane. The biplane is seen from above and to its right as it moves over the scrolling terrain, bombing bridges and airfields and engaging in an endless series of dogfights. Three specially designated targets lie along the river that dominates the game landscape, and these must be aced before the player can truly earn his wings.

The visuals in *Blue Max* are somewhat primitive by today's standards, but its unusual concept has never really been duplicated. So if you have ever wanted to pilot a biplane over Europe, raining death and destruction on everything that moves, *Blue Max* is the arcade game for you.

And speaking of arcades, what arcade would be complete without a target-shoot or a pinball table? The XE library offers both. *Barnyard Blaster* ($34.95) is a visually unimpressive target game from K-Byte that interfaces with the XE light gun. The player takes potshots at bottles and cans lined up along a log fence, then has a go at keeping the cornfield varmint-free. Finally, old Grampa tosses bottles into the air, skeet-style, for the would-be marksman to blast away.

Other than the novelty of the light gun, the main appeal of *Barnyard Blaster* is to young children, who can compete on an almost-equal footing with their elders in this simple game.

Pinball action, meanwhile, is supplied by *David's Midnight Magic* ($24.95), David Snider's classic pinball simulation. Computer pinball games have come a long way since this game was released in 1982, but *Midnight Magic* holds up pretty well. The table is a little light on features, but the action is realistic and the flipper response (from two sets of flippers) is hair-trigger.

Again, this is a game that can be enjoyed by children; their scores won't break any records, but they can play it for hours on their own level.

Simulations

At the same time that the wizards at Lucasfilm released *Ballblazer*, they unleashed *Rescue on Fractalus* ($24.95), a combat flight simulator with powerful cinematic overtones. The player, as a

CARRIER COMMAND

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

THE TIME: The 22nd Century.
THE PLACE: 64 islands in the Southern Ocean.
THE PROBLEM: A worldwide energy crisis.
THE MISSION: Gain control of the islands, set up centers to mine, recycle and produce materials to form a large network of power plants.
JUST ONE MORE PROBLEM: Enemy terrorists are destroying the islands. . . one by one.

FAST-PACED ARCADE ACTION: You are in control of up to 4 aircraft and 4 amphibious vehicles simultaneously. Capture enemy islands and destroy its forces.
STRATEGIC TACTICAL WARFARE: Conduct war maneuvers in a huge territory that includes over 60 islands. Protect your ship with defense drones and 360-degree turret mounted laser cannon with telephoto tracking.
SENSATIONAL GRAPHICS: Three-dimensional solid filled graphics, smooth scrolling, fabulous sound and special effects.
ADDICTIVE, HOURS OF PLAY: Your choice of action game or strategy game, plus save-game option provides hours and hours of extraordinary adventure!

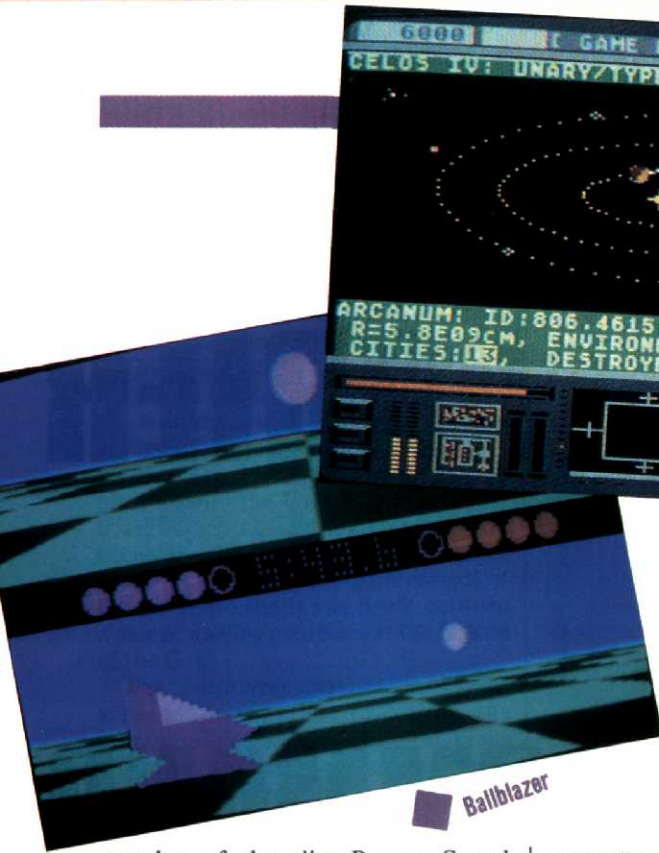
REALTIME GAMES SOFTWARE LIMITED

RAINBIRD

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

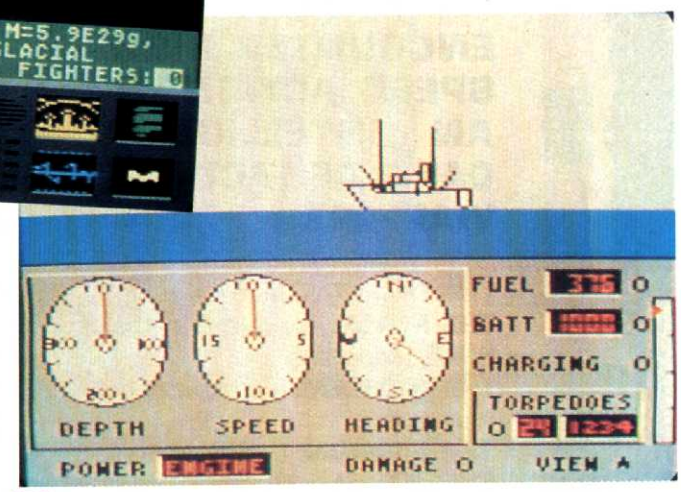
HOW TO ORDER: Visit your software dealer today, or call (800) 227-6900 from U.S. or Canada for Visa, MasterCard, Amex or C.O.D. To order by mail, send check/money order: Rainbird, P.O. Box 8123, San Francisco, CA 94128. CA add 6% sales tax and TX add 7½%. Shipping/handling is $4.50. 2-3 weeks for delivery.

AVAILABLE: IBM CGA/EGA/VGA $39.95. Amiga and Atari 512K $44.95. Macintosh 512K $49.95. Commodore 64/128 coming soon.



Star Raiders II

Ballblazer



Gato

member of the elite Rescue Squad, must cruise the rocky surface of the planet Fractalus, homeworld of the hostile (and extremely unattractive) Jaggies, in search of downed human pilots. These search and rescue missions invariably produce a good deal of combat, with Jaggie aircraft and ground emplacements doing their best to blow all rescue craft into the ether.

Rescue on Fractalus is a first-rate game made even better by phenomenal sound and graphics. The heroic theme music is reminiscent of John Williams, while the groundbreaking use of fractal geometry gives the landscape a remarkably realistic appearance.

Few, if any, computer games released to date have as successfully created the sensation of being in a movie theater. There is even a genuine shock in store for unwary players, but we won't spoil the surprise.

Rescue on Fractalus is a classic computer game that has aged hardly a day since its release in 1985.

Almost as impressive is *Star Raiders II* ($24.95), the *long*-awaited sequel to the very first tactical space combat game to offer arcade-style graphics.

More a revamping of the original than an actual sequel, *Star Raiders II* once again sends the player (equipped with this year's model Atarian Federation fighter craft, the Liberty Star) against the evil Zylon Masters in action that spans two star systems, six planets, and a moon.

The Liberty Star is some piece of work, too, with a range of technological equipment including a tactical scanner, sub-space radio, master and library computers, and three types of weaponry. The twin pulse laser cannons are designed for taking out Zylon Fly Fighters, while the ion cannon launches torpedos capable of wiping out Zylon Destroyers and even Command Ships. The SSB's (Surface Star Bursts) permit the player to fire volleys of missiles at the planet surfaces to eliminate the ground-based Zylon attack bases.

The graphics are quite impressive—to the point of providing visually distinctive surfaces for the various planets. Although few *Star Raiders* fans will remember this, the original was not in color. The colors in the new version, however, are both plentiful and selected for maximum impact.

While perhaps not worth the almost-ten-year wait, *Star Raiders II* is a fine program that is relatively easy to learn and should appeal to most gamers.

Finally, for those players who prefer their computer recreations a little less fanciful, there is *Gato*, a World War II submarine simulation.

Gato ($29.95) casts the user as a sub commander in the South Pacific. Using the various gauges, status readouts, and maps that appear on the screen, he must carry out a mission outlined at the start of play in a coded message. The missions are variable and include intercept, resupply, and rescue assignments.

The main screen includes a surface view (from either the periscope or the conning tower) as well as depth, speed, and heading indicators. Fuel, battery, and oxygen status are also displayed, and the player has access to a radar screen as well several area charts and maps.

There are, unfortunately, some problems with *Gato*. Although only three years old, it is a long way from state-of-the-art in a genre (sub simulators) that has been extensively explored by game designers. Worse, the XE translation by Xanth F/X is visually weak; the limited use of color combined with over-simplified graphics gives the game a dated look.

Overview

The XE library, like all software catalogs, has some hits and some misses. There are strong titles—*Ballblazer*, *Rescue on Fractalus*, *Star Raiders II*, *Lode Runner*, and *HardBall*—which are worthy of consideration by the most seasoned gamer.

Then there are classic games burdened by graphics which are unimpressive by today's standards—*Archon*, *One-on-One Basketball*, *David's Midnight Magic*, and *Blue Max*. These are inexpensive enough and have enough play value left in them to earn space on most XE Game System owners' shelves, however.

Finally, there are a couple of out-and-out weak sisters—*Fight Night* and *Gato*—and one package—*Barnyard Blaster*—that should be reserved for families with light guns and small children.

All of these cartridges can be purchased from dealers or ordered direct from Atari Corp., P.O. Box 61657, Sunnyvale, CA 94088.

The one question that remains as we budget our software dollars for the fourth quarter is . . . When can we expect to see *Star Raiders III*? ■

OFF SHORE WARRIOR

VIOLENCE ON THE HIGH SEAS, THE ULTIMATE TEST OF MANHOOD

AMIGA VERSION

IBM AND COMPATIBLES VERSION

ATARI ST VERSION

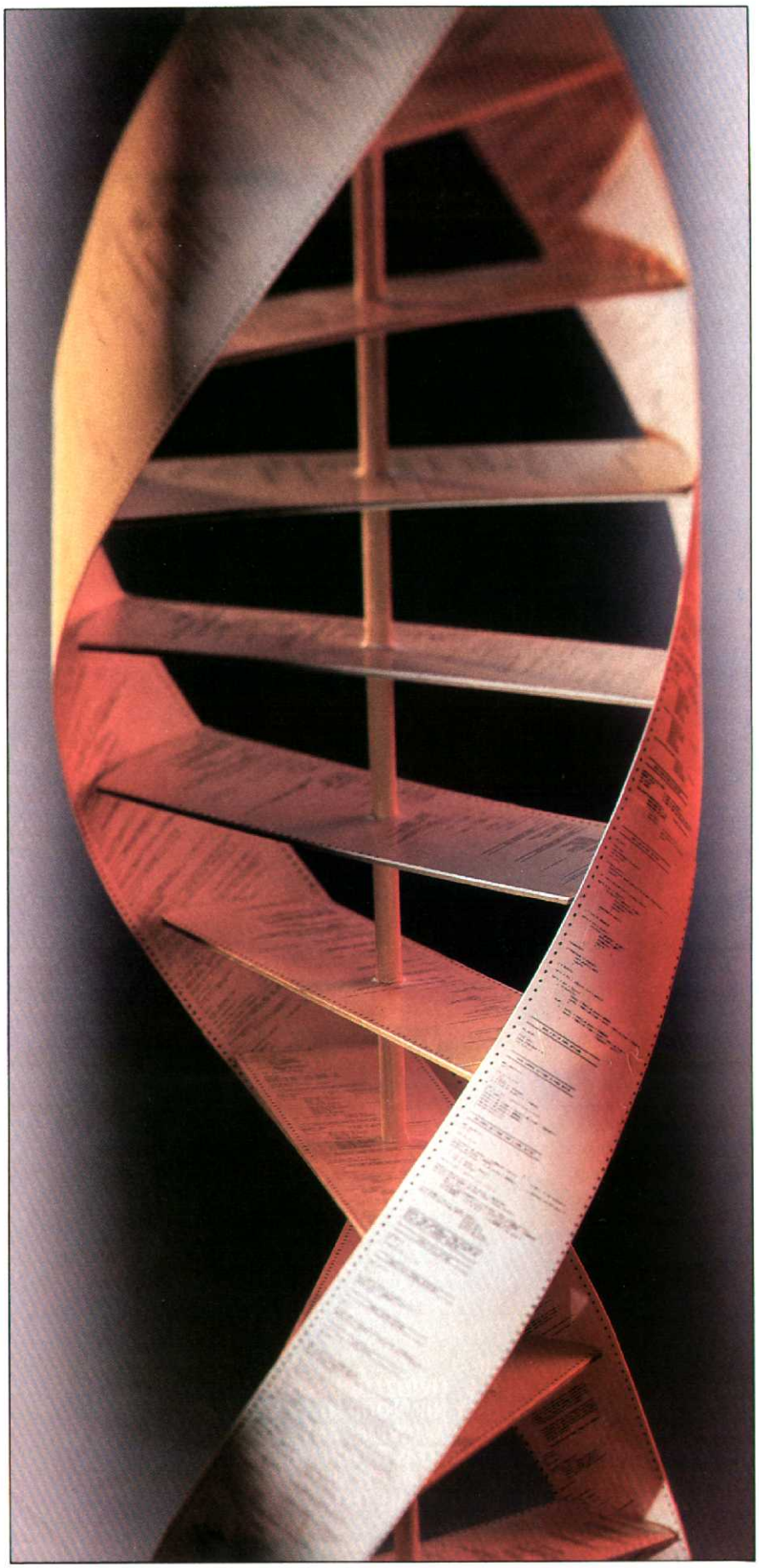
DEALER INQUIRIES WELCOME

IF YOUR DEALER DOESN'T CARRY TITUS PRODUCTS
THEN HAVE HIM ORDER IT FOR YOU
OR ORDER DIRECT BY CALLING:
(818) 709-3693

THE YEAR IS 2050.
VIOLENCE AND TERROR HAVE TAKEN OVER THE WORLD, CIVILIZATION HAS DISAPPEARED,
VIOLENT STREET SPORTS ARE NOT ENOUGH TO SATISFY THE BLOOD LUST OF A NATION.
A NEW SPORT HAS EVOLVED. YOU ARE AN OFF SHORE WARRIOR, ANYTHING GOES.
THE BATTLE CAN BRING YOU FAME OR DEATH... THE ONLY RULE IS TO WIN WHATEVER THE COST.
CAN YOU MEET THE CHALLENGE AND BECOME THE SUPREME OFF SHORE WARRIOR.
A WORLD AWAITS, PREPARE FOR THE ULTIMATE TEST...

TITUS™

20432 CORISCO STREET, CHATSWORTH CA 91311 PHONE: (818) 709-3693 - FAX: (818) 709-6537



Is it tim

Unlo
Of

I am the jolly virus,
Who's seldom ever seen.
I'll infect all your disks . . .
Put garbage on your screen.

The verse above is all I remember of a rhyme I found embedded in the DOS image of a bootable Apple II disk one afternoon back in 1983. The poem was sunk in the tail end of a free sector, surrounded by a simple envelope of 6502 code whose head was superimposed on the entry point of a legitimate part of the DOS. The whole assemblage was designed to be loaded quite neatly into memory when someone used the disk to boot a system.

What did the code do? Nothing much. It just sat, waiting, in memory until the Apple user decided to save something on disk. The write request was then intercepted while the alien code checked for a boot image on the target drive. If the disk was bootable, the program copied itself onto the disk, then passed the original write request on to AppleDOS as if nothing had transpired; otherwise, it just incremented an internal counter.

Things continued in this vein until a certain number of disk writes had been passed—then, suddenly, without warning, the program turned ugly, clicking the Apple keyboard speaker with abandon . . . Dzk! Dzk! Dzk! . . . and writing punctuation marks into random locations on the screen.

That strange little Apple program was a *virus*, a tiny bit of self-replicating code that sustained and perpetuated itself by piggybacking on the legitimate

to start worrying about these malevolent programs?

cking The Secrets omputer Viruses

functions of a computer system. In this case, the only purpose of the virus was a little harmless (if annoying) mischief. That was lucky, because the program was found in an office filled with Apple systems—all potential infectees. But what might have happened had the program author been less budding poet and more sociopath?

This has become an increasingly important question in recent months; not only in the relatively insular world of home and personal computers, but in the larger domain of institutional, commercial, financial, and even military computing. Virus programs are here, and they are very real—but what kind of threat do they really constitute? Where did the idea of virus programming originate? How do viruses work and spread, and what can and must be done to defend against them?

The End of the Hacker Ethic

Subversive programming has been around for a long time—ever since computers were invented. Conventional hacking—whether we're talking about "War Games"-style infiltration of computer systems, or other *modus operandi*—is always limited in the scope of its effects, either by the energy and motivation of the hacker or by the design of his tools.

The contest in a bout of conventional hacking is typically carried out between the mind of the hacker and the automatic barriers placed in his path—a David/Goliath kind of contest in which the odds are pitched strongly in favor of the system.

Virus programming turns this equation around. Because a computer virus is both self-replicating and, to some extent, self-directing, once it is released into a system pool, it is essentially independent of the programmer who created it. The contest is no longer between the lone individual and the faceless machine, but between machines gone haywire and the poor humans who would secure the valuable data they contain. As before, the odds are skewed in favor of the machines—an ugly thought, particularly if you are the poor soul sitting in the driver's seat.

The Idea of a Virus

There is some evidence to suggest that virus programs were originally conceived as a result of research in the design of multiprocess operating systems. In a multiprocessing system, such as Unix, programs take the form of semi-independent *processes*, which execute concurrently, communicating with each other and with their users along narrowly-defined channels. Normally, processes are managed and restricted by the OS, both in access to system resources and in terms of execution time, and it is difficult to get around this system of internal controls.

According to a story that has been passed around for some years in academic computing circles, the prototypical "virus episode" occurred as the result of an attempt to circumvent process scheduling and access restrictions on a large distributed campus computing system. According to the legend, a programmer who had been having difficulty finding execution time for a large-scale project dreamed up a scheme by which his program could copy itself from machine to machine across the network, eventually showing up on the execution queues of all available systems. The programmer was thus assured that if any machine in the system became free, a copy of his program would be there to use it. One or another copy would eventually finish executing and return the results of its computations to its master. The other copies would then be instructed to terminate.

Unfortunately—or so the story goes—the program had a bug: normal termination of a single copy did not cause the immediate abortion of still-executing copies elsewhere in the network. The result was to bog down the system, and eventually the cause of this traffic jam was discovered. There followed the high-priority creation of a "hunter-seeker" program with similar capacity to reproduce, which eventually brought down the interloper.

In certain versions of the story, the names Creeper and Reaper are used to refer to the Ur-virus and to its nem-

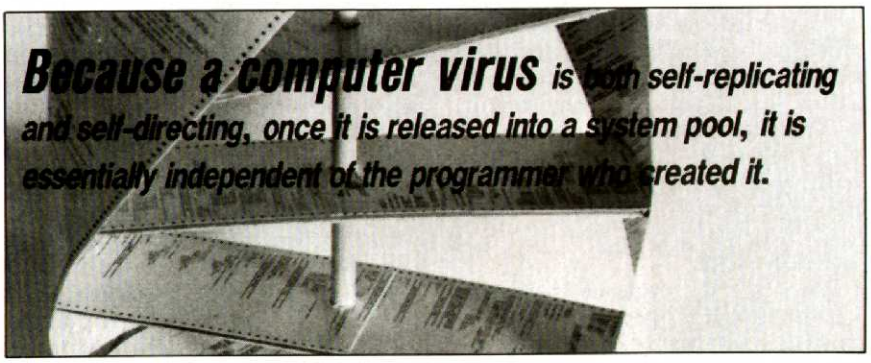
By JOHN JAINSCHIGG

esis—adding to the charm of what is almost certainly a modern legend. It is interesting to note, moreover, that several of the most widely circulated reports of viral attack bear some resemblance to the prototypical Creeper story. Are the reports apocryphal, or is this is a case of life imitating art?

Other potential sources for the virus concept are not hard to find in the annals of computing research. Robert Coyne, a systems programmer at Cambridge-based Symbolics, Inc., and a historian of the artificial intelligence subculture, suggests that the idea for virus programs may have come out of research pertaining to a computer game called Core War, originated at Canada's McGill University.

In Core War, programs written in a simplified assembly language called RedCode stalk, evade, and subdue one another under the control of an interpreter program that acts as sideline commentator and referee. Considerable effort has been expended by Core War devotees to find the best algorithms for attack and defense, and redundant, self-replicating programs that subtend the classic virus model have consistently been high scorers.

In the end, perhaps it is closest to the truth to suggest that virus programming evolved from a variety of conceptual sources—some esoteric and some mundane. After all, today's real computer viruses exploit functions common to all computer systems. Any computer—including yours—can thus be at risk of infection.



How Does a Virus Work?

A computer virus can be introduced into a system in a wide variety of ways. It can be attached to, or form an invisible component of, apparently legitimate software and enter the system when this software is executed. It can hide in portions of the disk image of an operating system or secrete itself in boot code loaded automatically from disk on power-up.

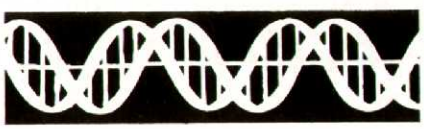
Depending on its design, the virus may do its thing immediately upon execution, or—more likely—hide out for a time, get the lay of the land, and infect whatever new media or systems it can get its mitts on before carrying out its ultimate purpose. This ultimate purpose, if one can generalize from reports of virus infiltration coming now from everywhere in the microcomputer community, both here and abroad, is usually the destruction of data stored on disk. Other forms of malice, such as the simulation of component failures leading to unnecessary repair bills, have also been reported (see sidebar).

The National BBS Society, a non-profit group based in Santa Clara, CA, has identified 39 different strains of software virus, and more are apparently being discovered every day.

Given that the free exchange of information is more the rule than the exception in the computing community, the potential for the spread of infection is enormous. Earlier this year, editors at the Providence *Journal-Bulletin*, in Rhode Island, were stunned to discover a virus running rampant through their IBM PC systems. According to the *Bulletin's* Systems Editor, Don Sokol, the virus first appeared when a reporter attempted to print out files on a central PC system.

"She seemed to be having trouble calling up the files she needed," said Sokol, "and I was called in to help. We ran CHKDSK (a disk analysis utility distributed with MS-DOS) and it reported inability to find anything readable on the disk in question.

"I'd seen situations before in which files were partially or wholly eaten and even situations in which the contents of entire disks were destroyed—like when a reporter leaves a disk in the rear window of a car and it gets melted. But this total disappearance of files from a disk that had been usable only moments before was something new to me."



Sokol sent the disk to Peter Scheidler, head of the *Bulletin's* Systems Division, who subjected it and other disks to close analysis using the *Norton Utilities* and other software tools.

Dissecting the disks revealed a virus containing an embedded message indicating that its point of origin was Lahore, Pakistan. Even more terrifying, the message went on to suggest that payment of $2000 to Brain Computer Systems of Lahore would avail the victim of an immunizing program to destroy the virus—a clear-cut case of computer blackmail.

Nor was the *Bulletin* the only target of the program now called the Pakistani Brain Virus. Reports of the virus also surfaced at the University of Delaware and other installations. Estimates posted on Usenet suggest that as many as 50,000 PC systems in the US have been infected by the alien code.

While the most terrifying computer viruses spread widely and attack at random, other, more insidious, viruses are reported to select their targets more carefully. Recently, Electronic Data Systems, of Dallas, a subsidiary of General Motors, and Apple Computer have cooperated to identify and provide means for destroying a virus, dubbed Scores, that attacks EDS software running on Macintosh computers.

Reportedly, the virus chooses its targets by searching for the signatures ERIC and VULT embedded by EDS programmers in their applications. Although EDS spokesmen have said that the virus is capable of attacking only software that is now obsolete, plus certain internal programs that have never been released to the public, a program to destroy it (called VirusRX) has been made available on Compuserve's Apple Users Forum (MAUG) and is being widely circulated on Macintosh BBSs.

The Scores virus strongly suggests the dangerous potential viruses offer as tools for industrial, and even political sabotage. Another story, again Macintosh-related, underscores the point and adds the chilling suggestion that even systems whose only contact with the outside world is via costly commercial software may still be at risk.

According to reports, copies of the Aldus Systems (of *PageMaker* fame) drawing program, *Freehand*, were contaminated by a virus that was spread to them by training disks produced for Aldus by Chicago-based Macromind, Inc. The Macromind disks were apparently infected by disks originating at the

Montreal-based disk magazine, *MacMag*.

As it turned out, the *Freehand* virus was relatively benign, spreading itself to system files before flashing a brief message of peace on March 2nd—the Macintosh's birthday. Nevertheless, in recent months Aldus spokespeople have had their hands full quelling more gruesome rumours and have volunteered to replace infected disks free of charge. Moreover, other Macromind customers, including Microsoft, Ashton-Tate, and Lotus Corporation, have had to institute measures to suppress the inevitable rumours that their software also was infected.

Clearly, reputations may be damaged by the suggestion of infection by even the most benign viral program. What, then, might be expected when a really nasty virus turns up? Reports earlier this year from the Hebrew University in Jerusalem warned of the discovery of an IBM PC virus that was apparently written as a tool of political protest.

The virus, which was of a type that spreads by attaching itself to application programs, was reportedly discovered thanks to a bug which failed to prevent the program from re-infecting already-infected files. Unexplained gross changes in the size of supposedly unmodified files caused system slowdowns, which eventually induced programmers to examine the infected disks more closely, revealing the presence of the virus. Like the *Freehand* virus, the Israeli virus was a date-seeker, programmed to turn destructive on March 13th—anniversary of the founding of the state of Israel.

Viruses in Larger Systems

Software enters a microcomputer pool from a wide variety of sources: disks that have been used on home systems are brought to work, public domain utilities work their way in among commercial programs, programs arrive from computer consultants, disks are passed from one office department or division to another, etc. All of this increases the chance of initial infection by virus programs. Once a single micro is infected, spread of the virus to nearby micros is virtually assured by the frequent disk sharing that takes place in typical non-networked, micro-based computer installations.

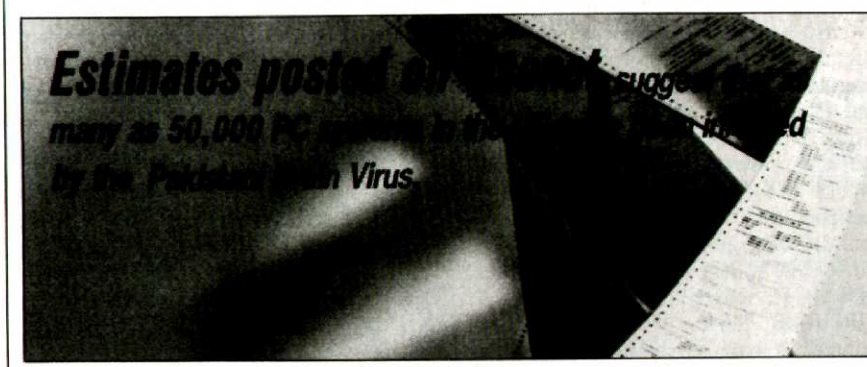
However, while these factors contribute to the ease with which viruses are introduced to and spread among unconnected micros, other factors limit the amount of practical damage such viruses can cause. Usage patterns differ widely from machine to machine in the typical office setting. Thus, unless the virus is designed to turn ugly when it registers some event that will occur simultaneously on all machines (like the date change on an accurate realtime clock), it is unlikely that it will strike more than one machine at any given moment. Once a single copy of the virus has gone off in highly visible fashion, chances are good that the general infection will be discovered and preventive measures taken before more damage can be done.

The opposite is true of networks and multiuser systems. Components of a network installation are closely connected, meaning that a virus designed to infiltrate this kind of environment can easily find means to coordinate its destructive behavior to maximum effect. Moreover, the amount of data nominally accessible to such a virus is typically many times greater on a commercial system than on any single-user micro; and damage to that data has proportionately greater repercussions.

Because of this, there would seem to be much reason to fear the effects of virus programs on large-scale academic, commercial, financial, industrial, and military systems. Yet, even given the fact that universities, MIS departments, and governments are seldom eager to reveal the details of security breaches they may suffer, surprisingly few reports of viral infiltration on large-scale systems have seen the light of day. Those that have, moreover, are surprisingly benign.

Among the most charming of these recent stories is one that involves a Christmas card program written by a West German student and sent to friends via a European academic Email system. Every time the card was executed for viewing by a recipient, it took the opportunity to examine other Email messages awaiting the recipient's attention, then sent copies of itself to all their authors. Like a self-starting electronic chain letter, the Christmas Card Virus spread via Bitnet to a variety of systems in Europe and the US, and finally to IBM's Email system, flooding them all with trash mail.

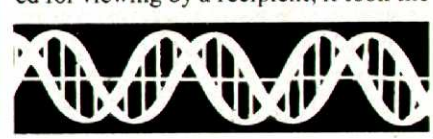
Other reports are far more nebulous, amounting to little more than rumour. According to security industry trade journals, viral attacks against mainframe installations have recently occurred, both in the United States and Western Europe. Yet names, dates, and details are strangely missing from the majority of these reports, and in most cases, it is difficult to conclude other than that they are apocryphal.



In reality, although mainframes and network systems are indeed potentially vulnerable to virus attacks, as they are to other forms of computer sabotage, the real threat against systems of this kind does not appear to be very great at present. Why not?

Perhaps it is simply because virus programs designed to infect complex systems must be developed and tested on such systems—a barrier that would tend to prohibit their development, at least by the most classic culprit in cases of industrial sabotage: the "disgruntled (former) employee." By complementary reasoning, those who have easiest access to mainframes and networked systems are (at least, in general) those who have the least interest in subverting them.

One is bound to note, however, that there is at least one plausible scenario in which this equation fails to hold: the case in which one corporation or government makes a well-funded attempt to subvert the computing facilities of another. Moreover, as technology advances to the point where personal computers are exploiting the same operating systems and architectures as institutional computers, the day is not far off when a lone sociopath will be



able to invent a virus program on his home machine and port that virus to a much larger target with little difficulty.

Atari Viruses

Surprise! And you thought you were immune? No such luck. In recent months, at least two Atari ST viruses have been identified and may be heading in your direction.

The more widespread and virulent of the pair seems to have originated in West Germany, where the ST is especially popular. Dubbed the Boot Sector Virus, it inhabits the boot sector found on auto-booting floppy disks. When an infected disk is used to boot an ST system, the virus is loaded into memory and attaches to a system call vector relating to disk access. Thereafter, whenever that system call is made, the virus checks the targeted disk for its own presence and copies itself onto appropriately configured disks. When it decides that it has spread itself around enough, it begins to corrupt the File Allocation Tables (FATs) of all the floppies it can reach, rendering their contents irretrievable.

Creepy, eh? Read on. The second virus is more benign (if, for example, you view slipping on a banana peel and doing a pratfall as more benign than falling down a long flight of stairs on your head). Also inhabiting the boot sector of autoboot disks, this tiny wonder o' technology loads itself into your system and simulates the kind of errors you might see if portions of your ST RAM memory were going sour—flecks of garbage on the screen, unaccountable lockups, etc. Cute, no?

Well, suppose you have a 520 ST upgraded to 2Mb back when RAM chips cost $1.50 each. They now cost $6.00 each, and when you did the upgrade you voided the warranty and hard-soldered all those dozens of chips directly to the board . . . maybe not so cute, especially when the system shows no improvement after retrofitting.

Both of these viruses are spread from ST to ST by the hand-to-hand exchange of contaminated autoboot disks and have thus struck with greatest virulence in the closely-knit user group community. At least one group—the Buffalo Region Atari Group (BRAG)—has taken the virus threat seriously enough to address it directly at a monthly meeting, and more will do the same in months to come.

In addition, it should be noted that if you use your ST with an emulator such as *PC-Ditto* or Magic Sac, particularly if you are working with disks in native PC or Macintosh format (ST drives can read PC-format 3½″ disks without assistance, and can access Macintosh-format disks via Data Pacific's Translator I accessory to the Magic Sac emulator), there is a small chance that you could pick up a virus native not only to the ST but to the system being emulated—the IBM or Macintosh.

This will probably never be a widespread problem, because viruses typically operate outside the realm of the "legal" program operations supported by emulators. However, as these emulators are enhanced to be compatible with more and more popular application software that also misbehaves, the threat of making them compatible with viruses native to these systems is also increased.

Nor are 8-bit owners entirely free from worry. In a widely reprinted report in the Portland Atari Connection newsletter, PAC President Bill Pike warns of the discovery of an insidious 8-bit virus that, unlike ST boot sector viruses, can attach itself to application programs. The threat of such a virus is manifestly increased, since—by riding along with a program or file—it can infect a system via download as well as by direct disk transfer. Pike goes on to add that traditional boot sector viruses also exist in the 8-bit world. This is one time you 8-bit owners probably wish software de-

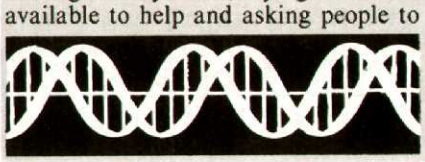
Ask Dr. Virus

George R. Woodside, long-time Atari user and expert programmer, has made a mission of identifying and helping to eradicate virus programs that plague the Atari community. In the process of developing the ST anti-viral utilities Peniciln and VKiller, Woodside has probably logged more exposure to ST virus programs than anyone else on the side of the angels. In the following interview, he shares his opinions of the virus problem in the Atari community and tells readers what they can do to protect and, if necessary, disinfect their systems.

Atari Explorer: What has been your experience with virus programs, and to what do you attribute your interest in them?

George Woodside: The interest came before the experience. I'm just an overgrown Boy Scout, I guess. I've been in the software business since 1967, and most of the time I've spent has been helping others. I believe that those of us with the knowledge and experience ought to help those who need it. I look on the virus situation as an attack on the innocent/helpless by the overpoweringly capable. It seems to me that the good guys in the capable category ought to be the first line of defense.

Once I decided to spend the time to examine the virus situation, I posted messages everywhere, saying that I was available to help and asking people to send me virus disks. I figured that I'd need the virus samples to work on adequate defenses. So far, this has yielded several false alarms and two distinctly different virus programs. I have information about a third one, but I don't have a copy of it yet.



There are three phases in the life cycle of a virus, as I see it. First, you must introduce the virus into a system. The easy way is to get an infected disk into the hands of an unsuspecting victim. Once he boots or resets with that disk in his ST, the virus starts spreading. If you can get it onto a distribution disk, like a PD disk distributed by a user group, so much the better. Or, you can write some potentially useful program which has some reason to access a disk and, while you're at it, infect the disk. That could be a utility, a game, a demonstration, almost anything.

Once the infection is started; it can spread with astonishing speed. That is the second phase—spreading itself for a while before it does any damage. This increases the probability of the virus being loaded the next time the ST is used, and so on. It also improves the probability of the virus being spread to another ST.

Finally, in the third phase, the destruction takes place. The virus does whatever damage it has been designed to do. If it launches a quick, sudden attack, it can destroy only what is within immediate reach. If it is the slow, methodically destructive type, it can do a great deal more damage. Or, it can attack a hard disk drive. So far, I haven't heard of one doing that; that takes quite a bit more code than can be hidden in a

velopers would ignore your machines, but no such luck.

There is some good news, however. Most of it comes in the person of a man named George R. Woodside, a longtime Atari user and expert programmer, who has made a mission of the identifying and eradicating Atari-based computer viruses. Woodside is the author of Penicilin and VKiller—public domain programs capable of identifying and obliterating boot sector viruses on Atari ST disks. Both are available in DL5 of the Atari 16-bit Forum on CompuServe and on many BBS systems. His comments on Atari viruses and methods for their prevention inform our sidebar.

Prevention is Better Than Cure

According to the experts, the first line of defense against viral infection of your system is to adopt a defensive posture regarding the acquisition of software. View disks and downloads—at least those from non-commercial sources—with suspicion, keeping them separate from other material in your software library until proven to be reliable and uncontaminated.

Since most of the viruses heretofore reported tend to inhabit the boot sectors of autostart disks, be especially cautious of PD game software, disk magazines, and other types of software typically distributed in this form. If you have used such software to coldstart your system or have coldstarted with any suspicious disk in your drive, turn your computer off after using the software in question, and restart from a boot disk you know to be good before continuing with other work.

When working with software or files of which you are not sure, keep your disks write-protected whenever practical, and be alert for disk accesses that don't make sense in the context of what the program is supposed to be doing.

These defensive measures should serve to minimize damage even in the relatively unlikely event of viral infection. ■

sector or two.

AE: What do you think is the potential significance of this boot virus and other future virus programs for the Atari community?

GW: Disastrous. They (the virus programmers) are getting sneakier very quickly. Those most vulnerable to the threat are those least capable of dealing with the problem. Since one of the viruses slowly destroys the File Allocation Table of each disk (whether the disk has the virus or not), you may not know it is around until most of what you own has been damaged or destroyed.

Another virus (of which I have a copy) doesn't attack disks at all. It uses time delays and memory accesses to make your ST look like it develops memory problems after it gets warm. It checks out perfectly when examined by a service technician, because the machine is fine, but you still have frequent system crashes and garbage pixels popping up on your screen.

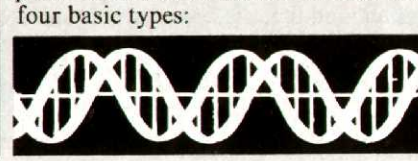
If this virus found its way into your software, you would never know it was a virus, but your ST would never be reliable again, until you figured out what was happening and disinfected all your disks.

Most of the virus programs, so far, have come from Europe—West Germany, to be precise. There is a very capable Atari ST community there. I have even heard a rumor from several different sources that someone in West Germany has created a "virus construction kit," which builds virus programs to order for whatever level of mayhem you want to cause, though I haven't seen any solid confirmation on that yet.

Other rumours abound. According to an item posted on Usenet, for example, the Dutch distributor of GFA Basic just released a book titled *GFA Basic 3.0* that had a disk inside that had been accidentally infected with a boot sector virus prior to duplication. The book is in German, written by G. P. Engels and M. C. Gorgens, ISBN-3-89317-004-9. GFA-Systemtechnik is reportedly aware of the situation and helping to spread the word about the virus.

MichTron, distributor of GFA Basic in the US, has released a public domain virus called Vaccine, which is available for download on Genie. MichTron emphasizes, however, that versions of GFA Basic released in this country are completely free of contamination.

A recent article in *Los Angeles Computer Currents* classified viruses into four basic types:



•**Shell viruses** "wrap" themselves around a host program, leaving the original unmodified. In layman's terms, such a virus tacks itself onto a program file, so it can be loaded with the program. It must do this in a manner that causes the virus to be executed before the host, because the host certainly will not pass control to the virus.

This is a particularly complex task on an ST. In simple terms, an executable ST file (a program) is a series of unique sections—a header, the code, data, a relocation map, and possibly a symbol table. So, to hook into a program file, a virus would have to split the program file; attach itself to the beginning of the code segment (where execution begins); re-attach the data, relocation, and (possibly) symbol table segments; update the relocation map (all the original references would have to be moved); update the header; then re-write itself to the original disk. That is a lot of work to develop and a lot of code to sneak into a system for the original infection. I doubt that anyone would take this approach in writing an ST virus.

•**Intrusive viruses** work by patching themselves into an existing program. The writer of an intrusive virus has two possibilities open to him: render the host program useless or attempt to coexist with it. If he is willing to allow his virus to corrupt the host, this type of program is not too difficult to write. It replaces a part of the host program, modifies the relocation map, and waits to be run. When it is executed, it abandons the original task of the host program and launches its attack.

An example of this is the virus-bearing version of a word processor that struck the IBM compatible market about a year and a half ago. It signed on, looking just like a popular shareware program, but while the user was waiting for it to load, it was busy re-formatting

his hard disk.

The other flavor of intrusive virus—the one that attempts to coexist with the host program—is terribly difficult to create. It has to modify the host in a manner that either accomplishes the host's task while also doing its own, or it must find a part of the host that is no longer used and hide there. It must then modify some other part of the host in order to get itself executed.

cial security (or life expectancy) of the creator becomes somewhat dubious.

•**Source code viruses** are intrusive programs that are inserted into a source program before it is compiled. This is the least common type of virus, because it is not only difficult to write but has a limited number of hosts compared to other types.

It seems to me that infection of this sort would be nearly impossible to ac-

In either case, a virus of this type almost has to be aimed at one specific host program; there is no way it could perform the analysis necessary to locate the necessary portions of a randomly selected program. For that reason, an intrusive virus must target a program that resides on a large number of the target computers—a program that is certain to be available to tamper with when the virus introduction occurs—which for most computers usually means either the operating system or some virtually ubiquitous utility program.

This type of virus is also very difficult to create and spread. And because the ST operating system is in ROM and there really isn't any one utility program that is sufficiently widespread, I don't see this type of virus as a serious threat.

•**Operating system viruses** work by replacing a portion of the operating system with their own code. As a part of the operating system, the virus can sneak onto a hard disk, find an unused part, mark it as defective, and hide there. Once again, because the operating system of the ST does not load itself, it is very difficult to infect an ST with this type of virus.

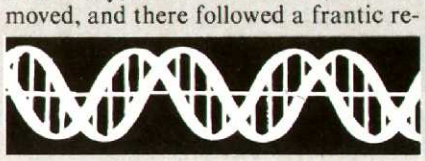
It could possibly be done by infecting GDOS or by incorporating the virus into a system-enhancing accessory (such as a replacement file selector). In either case, the virus would have to be the work of someone extremely capable (there are people good enough to do this) or be designed into the software originally.

The latter possibility is extremely unlikely, because software that is good enough to be used in this manner usually has a known source. And once the source of a virus is identified, the financomplish in software. If, on the other hand, *Computer Currents* is referring to a part of the program added by a malicious member of a development team, then the concept is quite credible.

It brings to mind the story (which I can't verify, but which I've heard from enough different sources to believe it is true) about what may well have been the first virus. As you know, C compilers usually consist of several different programs, which must be run in proper sequence, passing files and options from one to the next. Usually, this is all done by another program, called a *compiler driver*, which is almost always called cc. You execute cc, passing it the necessary flags and the name(s) of the program(s) you want compiled, and it drives all the necessary tasks to do the compilation.

Ken Thompson was one of the originators of the Unix operating system, back in the 70's at Bell Labs, and the story goes that when Ken wrote the first versions of Unix, C, and cc, he designed a backdoor that would let him into any Unix system. He built the backdoor code into cc in the following way:

First, cc checked to see what it was compiling. If it was the module login, it incorporated the backdoor into the module, so that he could get into the system past the login prompt. If, on the other hand, cc was compiling a copy of itself, it included both the code to recreate itself and the code to build the backdoor into login. So, every cc included the code, and consequently every Unix system included the backdoor. Eventually, it was discovered, and removed, and there followed a frantic re-



building of every Unix system in existence. I have no problem believing that this happened.

AE: How might readers best go about protecting their computers against virus infection?

GW: The strongest defense is also the simplest: the write-protect window. Keep it open whenever possible. Enable writing only when you have to. And boot from a known-sterile disk with the write-protect window open when you power up and when you do a reset.

Users of 8-bit systems should observe the same precautions using write-protect tabs on 5¼" disks.

And (blowing my own horn a bit here) if you have an ST, use my new program, VKiller. It has a GEM interface and can be used without your having to understand what a virus is or how it can hurt you. VKiller detects the two types of viruses I have copies of and warns you if any disk you insert has executable code in the boot sector, though you should note that just because there is executable code in the boot sector doesn't necessarily indicate the presence of a virus. All autobooting disks have executable boot sectors.

VKiller also warns if there is data where it shouldn't be, even if the code isn't bootable. It will detect a virus working in the ST while the program is running. It will let you examine, print, or write to a file the critical sectors of the disk (so the file can be sent to me, hopefully!). When it does detect a known virus on a disk, it tells you what that virus does to your system. I have probably forgotten to mention something, but it does everything I could think of.

(Note: VKiller is in the public domain and is available on CompuServe's 16-bit SIG, on Genie, via Usenet, and through the Atari BBS system in Sunnyvale.)

AE: Before VKiller, you wrote Peniciln—a boot-virus killer program that is now widely available. If a reader thinks that his system has contracted a virus, how should he go about eradicating it with Peniciln?

GW: To explain that, it helps to know how these boot sector viruses work on the ST. ST disk drives contain write-protect detection logic that informs the system when a media change has occurred. When you access a drive on which a disk change has just taken place, even if all you have done is pull out and re-insert the same disk, the ST uses a function called Getbpb( ) (Get BIOS-Parameter Block), which returns

information about the disk currently in the drive. The ST executes this function on every disk you insert into the machine and access, regardless of what program accesses the disk or for what reason.

The virus attaches itself to the system Getbpb( ) function call. Then, when the ST checks the disk, the virus writes itself into the boot sector of that disk—unless the disk is write-protected. That is very significant: the virus can not spread itself to a write-protected disk.

If the virus has reproduced itself on a disk that did not originally contain an active boot sector (e.g., an autostart disk), the disk will be turned into an autoboot disk in the process. If the infected disk was bootable, the original boot code will be overwritten by the virus, and anything on that disk that was related to the boot codes will be unusable.

The virus keeps count of how many times it has reproduced itself. It zeroes and restarts the count each time it writes itself to a new disk. I assume the philosophy here is: "If I see a non-infected disk, I haven't spread enough yet. When I see X infected disks in a row, I'm pretty well spread around."

When the virus counts X infected disks in a row, it trashes the disk. It remains in RAM and will continue trashing every disk it sees from that point on.

The virus cannot load itself into your system except when you power up or do a system reset. It can not enter your system via a disk read occurring at any other time.

The Peniciln program forces a system Getbpb( ) call to the disk before it zeroes the boot sector to insure that if your system is currently infected, the virus will be written to the disk before Peniciln zeroes the boot sector, not afterwards. Then, after writing zeroes to the boot sector, Peniciln (when in keypress mode) sits and waits for another command before releasing control of the system. In this way, it can be used to disinfect as many disks as you like.

Disinfecting a system is not difficult. Just follow these steps:

1. Get a copy of Peniciln, and run the program with the -k option specified on the command line. Put a disk with the write-protect window closed in drive A, and press A. This tells Peniciln to zero the boot sector on the disk in drive A.

2. Wait for the disk access light to go out. Don't do anything else! This insures that any virus that may already be resident doesn't get the opportunity to alter the boot sector after it has been cleared.

3. Turn off the power to your system and wait 15 seconds. This insures that memory, including any virus present in your system, is completely erased.

4. Remove the disk from drive A. Open the write-protect window, and reinsert the disk in drive A. This provides a disk that can no longer be altered and from which you can safely boot.

5. Power up your system. Run your favorite sector editor or sector dump program to check the contents of sector zero on the disk in drive A. This insures that your copy of Peniciln hasn't been tampered with by some *%&@!$#. There should be zeroes in bytes 0-7 and 30-509.

The data in 8-29 represent the serial number and disk configuration parameters. The numbers in 510 and 511 force a zero checksum on the disk, telling GEMDOS that the boot sector is not executable. If your disk matches these requirements, you have a safe boot disk and a disinfected system. If the disk doesn't have the zeroes everywhere else, (assuming you didn't specify an MS-DOS boot sector), destroy that copy of Peniciln (and whoever gave it to you, too!).

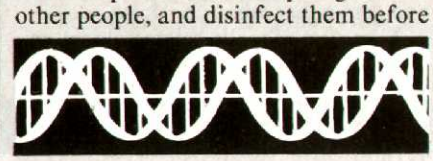
6. Collect all of your working copies of all of your disks for clean up. You should probably set aside the originals, however. Also set aside any disks that are normally self-booting (games or other software which you have to insert into drive A before powering up or pressing reset). These disks must not have their boot sectors altered, or they will be useless.

7. Run Peniciln again with the -k option specified. Feed it every disk you own, except those you have set aside. This disinfects all your disks. At this point, you have a clean system, and all your disks are clean, with the possible exception of the self-booting ones you set aside.

To keep your system clean, never power up or press reset with a non-disinfected disk in drive A. And keep the write-protect window open on disks unless you know you will have to write on them.

If you must use a self-booting disk, be sure to use only the original distribution disk or a backup made directly from the original on a clean system. Avoid placing other disks in the drive during a session in which you have booted from a self-booting disk.

Be suspicious of disks you get from other people, and disinfect them before using them (unless they absolutely must be self-booting). One reported virus came from disks purchased at a computer store. So remember, any disk you introduce to your system can spread a virus.



Hopefully, this plague can be wiped out. But, I will probably never feel 100% safe from this sort of sabotage.

Of course, things will be a bit simpler now. VKiller will take over more of the task. It will detect any virus in the ST when it first tries to clean up a disk. It does that by wiping the disk clean, then re-accessing it as if it were a new disk, then re-reading it. If it is not still clean, there is reason to believe that a virus is working in the system. After that, it just checks the disks and zeroes things if so instructed.

VKiller includes a sector-examine facility, so you can see what is in the boot sector before you wipe it clean. Outside of that, the steps taken to disinfect a system are the same.

One of the virus programs I have is too big to fit in the boot sector, so the virus spread itself to one of the unused sectors in the File Allocation Table. A normally-formatted ST disk has two copies of the FAT, each five sectors long. Only three sectors are required, however. That leaves two sectors available in each of the two copies of the FAT. VKiller checks those, too.

I contacted Allan Pratt at Atari as soon as I discovered that trick. After discussing the situation with a security specialist, he decided not to alter the FAT size but to go public with a warning.

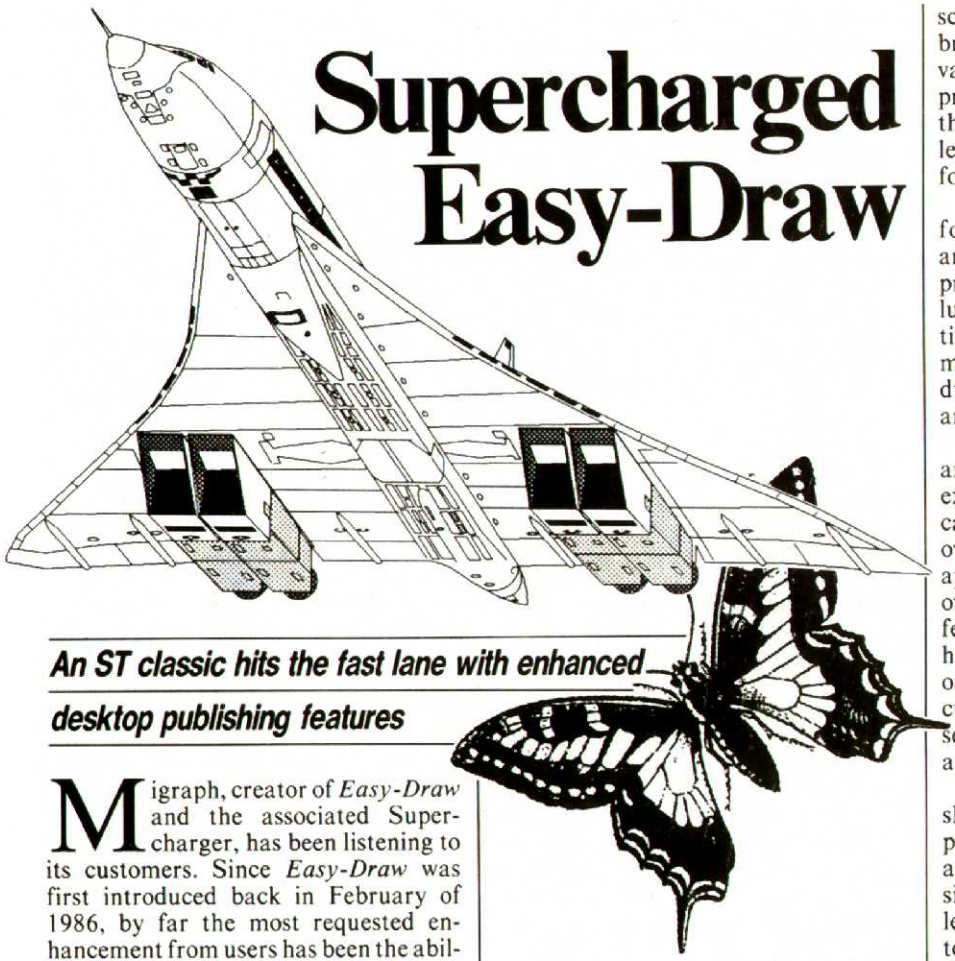
One of the real dangers in disinfecting disks is wiping something out by mistake. Self-booting disks are not all bad. Games, for example, can be on self-booting disks. Wipe the boot sector out, and you destroy the game. The same is true of the old STs, which don't have TOS in ROM. They use a self-booting disk, which just happens to look very much like one particular virus. So, a few cautions must be observed when you start poking around.

* * * *

George continues to work on improvements to VKiller and continues to collect viruses and information about them—the better to provide tools for self-defense. He would appreciate hearing (via Email or USPS) from anyone who has seen a virus or suspects having suffered a virus attack.

Write to George R. Woodside, 5219 San Felicia Dr., Woodland Hills, CA. Email may be sent via CompuServe (76537,1342) or Genie (G.WOODSIDE). ■

Supercharged Easy-Draw



An ST classic hits the fast lane with enhanced desktop publishing features

Migraph, creator of *Easy-Draw* and the associated Supercharger, has been listening to its customers. Since *Easy-Draw* was first introduced back in February of 1986, by far the most requested enhancement from users has been the ability to import bit-mapped paint graphics created with *NeoChrome* and *Degas* and higher-res GEM .IMG files produced by such new ST scanners as the Navarone 300 dpi image scanner and the Seymor-Radix IMG Scan.

The Supercharger is a new companion application program that provides an easy way to load, convert, edit, crop, and save bit-mapped images. Later, these .IMG files can be added to your *Easy-Draw* pages if you have the supercharged version of the program. You can also use the Supercharger to convert and edit images for programs other than *Easy-Draw*.

In addition to allowing you to load and mix image files into your *Easy-Draw* pages, the supercharged version comes with other enhancements, including additional font styles and 400K of scanned art, which are helping to make a best seller even better.

The Evolution of Easy-Draw

Since it was introduced as version 1.03 back in February 1986, few other software programs for the Atari ST have been as popular or as useful as *Easy-Draw*. In fact, I wouldn't be surprised to learn that this object-oriented drawing program was responsible for sales of more than a few STs.

Though it was originally marketed as a general purpose drawing tool, each successive version of this very productive program has offered enhancements that have increased its utility for a wider range of tasks. And beginning with version 2.26, *Easy-Draw* has been supercharged with additional desktop publishing functions.

The Significance of Object-Orientation

Easy-Draw for the Atari ST is akin to *MacDraw* for the Macintosh and GEM Draw for the IBM. All three programs are classified as object-oriented drawing programs because of the unique way in which they construct, manipulate, and remember what you draw.

These functionally related object-oriented drawing programs are actually scaled-down versions of their big CAD brothers. While lacking some of the advanced technical drawing features of programs like *AutoCAD* and *Drafix 1*, these smaller programs are easier to learn and use, and they offer enhanced font capabilities which set them apart.

The popular paint programs are ideal for creating expressive, free-hand artwork. But because these programs produce bit-mapped graphics, the resolution of printouts is limited to the relatively low resolution offered by bit-mapped screens. This is why screen dumps (especially from color monitors) are plagued with the jaggies.

A paint program can be likened to an artist who paints with a brush. If, for example, he first paints an apple on the canvas and then paints a larger solid box over the apple, he cannot separate the apple from the box, because by painting over the apple with the box, he has effectively deleted the apple. If, instead, he cuts out an apple which he has drawn on a sheet of paper and affixes this apple cutout to the canvas, he has created a separate object called, in this case, an apple.

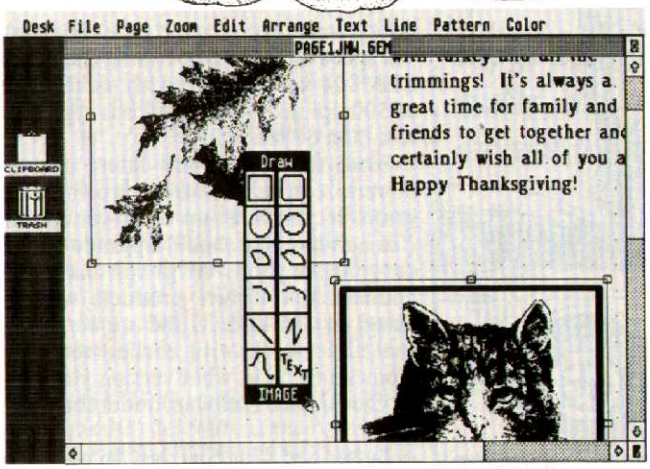
If he then cuts out another object shaped like a solid box, this second paper shape can be positioned on top of the apple. He can, however, change the position of the apple cutout by simply selecting it with his hand and placing it on top of the box. In fact, he can relocate either or both of the cutouts any way he wishes, because they are separate objects.

Easy-Draw works like the second example above, creating separate objects and saving up to 10,000 of them on a page as a .GEM file. The objects you draw are remembered as mathematical

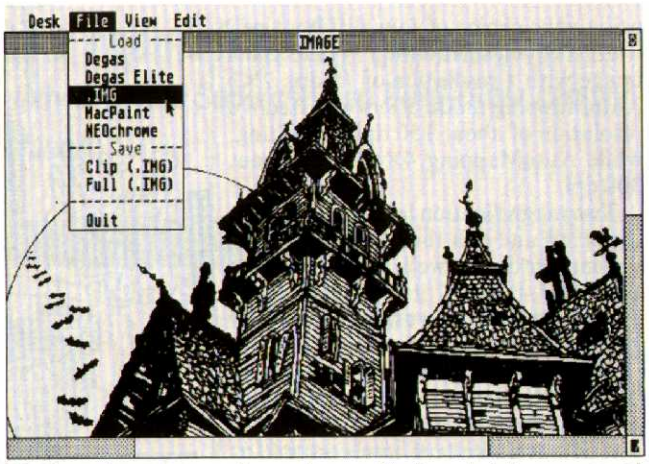
Easy-Draw

System: Atari ST
Version reviewed: 2.26
Copy protection: None
Summary: A versatile, dependable desktop publishing program; especially useful for short documents.
Price: $99.95; with Supercharger, $149.95
Manufacturer:
Migraph
720 S. 333rd St., (201)
Federal Way, WA 98003
(206) 838-4677
(800) 223-3729

By JIM WALLACE



A new Image icon in the Easy-Draw tool box allows the easy importing of high-res .IMG files.



The Supercharger converts popular graphic formats into compressed .IMG format.

locations rather than bit-maps; a line is stored as a start and an end point, a circle is stored as a center point and a radius, etc. These object files save disk space and are device-independent, which means that they will print out at the highest resolution of the printer, rather than the relatively low resolution of the screen.

In addition to a wide variety of drawing tools, *Easy-Draw* provides extensive editing tools that make it easy to create the design or page layout you want. For instance, you can flip and mirror objects; edit polylines by adding, deleting, or moving any point on the polyline; and rotate objects by 90 degrees (with the new *Easy-Tools* accessory you can rotate objects by $^1/_{100}$ of a degree).

Another advantage of using objects is that you can group them together with other objects to form complex figures. At any time the figure can be ungrouped, edited, and grouped back again, or if you prefer, grouped with yet another object, and each object maintains its integrity. Grouping objects is an easy way to move several objects on the page to create a new layout or design, rather than having to move them individually.

Easy-Draw includes a simple text processor, which enables you to add text to your graphics. You can either type in the text yourself (in a variety of point sizes and styles) or load in an ASCII file. Text can be grouped with graphics to create eye-catching headlines and special effects.

The Supercharger

While object-oriented graphics are more accurate when it comes to geometric shapes like circles and polygons, there are many times in publishing applications when you want to reproduce black-and-white line art and digitized photos. By scanning photos and readily available clip art, for example, you can add some real pizzazz to your printed pages.

While paint images are limited to the resolution of the screen (about 91 dpi on a monochrome monitor), scanned art created with a high-res scanner enjoys a much higher resolution of up to 300 dpi. Standard GEM compressed .IMG files produced in accord with Digital Research standards can handle images of much higher resolution, because they are device-independent.

Previously, *Easy-Draw* worked only with object graphics, but the new supercharged version allows you to load images from *Degas*, *NeoChrome* and *MacPaint* as well as high-res scanned images. Using the Supercharger, you can convert color and monochrome paint images into .IMG files, which *Easy-Draw* can then load.

The Supercharger is actually a separate program that is used outside of *Easy-Draw*. It offers you a familiar GEM screen with pulldown menus. From the File menu you select a *Degas*, *Degas Elite*, *NeoChrome*, *MacPaint*, or .IMG file. If the file you want loaded is in color, you must convert it to a black-and-white image, since that is what will be printed on your printer. Several conversion methods are available, each of which produces a different result.

To get a quick preview of your image, you can convert some, most, or all of the original colors to black. This produces a pure black-and-white image with no patterns. Once you know what you will be working with, you might choose AutoMapping 2×2, an option that turns each pixel in the original image into a 2×2 pixel matrix. This allows black-and-white patterns to be substituted for colors, producing a more detailed image.

Other choices are AutoMapping 4×4 and Table Mapping. In the AutoMapping 4×4 mode, each pixel in the original is converted into a 4×4 pixel matrix, allowing a greater selection of patterns. Using the slower Table Mapping method, you can select the best pattern for each color yourself. Unfortunately, there are no rules for determining which mapping method is likely to yield the best result for a given image, so you must rely on trial and error.

After you have loaded your image, you can edit it with an onscreen pen,

The Supercharger is a new companion

application program that provides an easy way to load, convert, edit, crop, and save bit-mapped images.

using your choice of four different pen widths. If you start with a typical paint image with a resolution of 75 dpi, 2×2 AutoMapping mode offers an effective resolution of about 150 dpi for editing, while AutoMapping 4×4 yields about 300 dpi.

Two magnification levels let you view the pixels and edit them. Although this system works very well, it can be rather slow and tedious. Hopefully, more drawing tools will be added to the program to make editing faster.

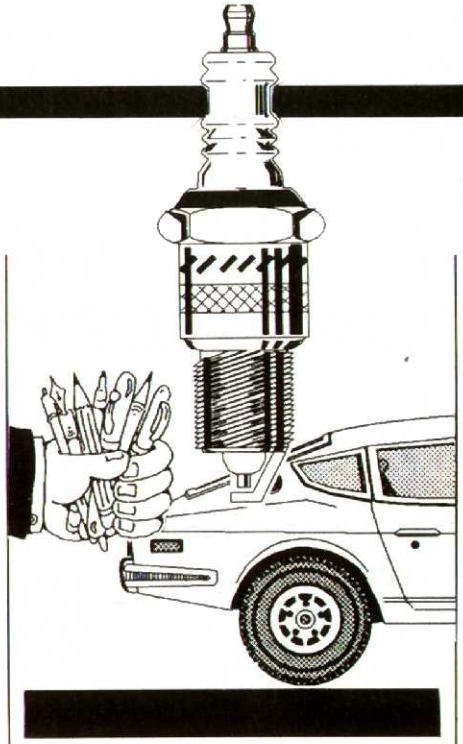
In addition to pixel editing, you can "invert" the image (similar to a photographic negative) and then save all or part of it as a standard compressed .IMG file. Incidentally, these .IMG files can also be used by other programs such as Timeworks *Publisher ST* for the Atari and *Ventura Publisher*, *Gem Desktop Publisher* and *Publish-It* for the IBM.

Using the supercharged version of *Easy-Draw*, you can load these .IMG files onto your page and mix them with text and other graphics in almost any combination you choose. In addition, you can stretch and size the imported .IMG files to almost any size and either keep the image in proportion to the original or distort it as you please.

Included with the Supercharger are some useful bonuses. You get a handy Snapshot utility that allows you to capture all or part of a color or mono screen while in any GEM application. This utility saves your screen shots in either *Degas* or .IMG format.

Easy-Draw Enhancements

When you enter your local computer store to buy *Easy-Draw*, you will have a choice of *Easy-Draw* alone for $99.95 or *Easy-Draw* with the Supercharger for $149.95.



If you choose regular *Easy-Draw* and later decide that you want or need the Supercharger, you can return your disks to Migraph along with $49.95 plus $3 for shipping for a full upgrade. (Note that the Supercharged version requires 1Mb of memory and a double-sided drive or a single-sided drive with a hard drive.)

The following is a list of the major enhancements that were added to version 2.26 of both regular *Easy-Draw* and the supercharged version.

Outprint. Starting with version 2.26, the old Output program was replaced with Outprint, which offers some additional choices when printing files. You can, for example, now change device printer drivers on the fly and specify different paper sizes. Of particular interest is the ability to abort your printout in midstream by pressing Control-X. This is quite handy if your dot matrix printer happens to skip a line or if you notice a mistake on your page. The output speed of *Easy-Draw* using the Atari SLM804 laser printer with a full page of 300 dpi text and graphics is typically less than 60 seconds.

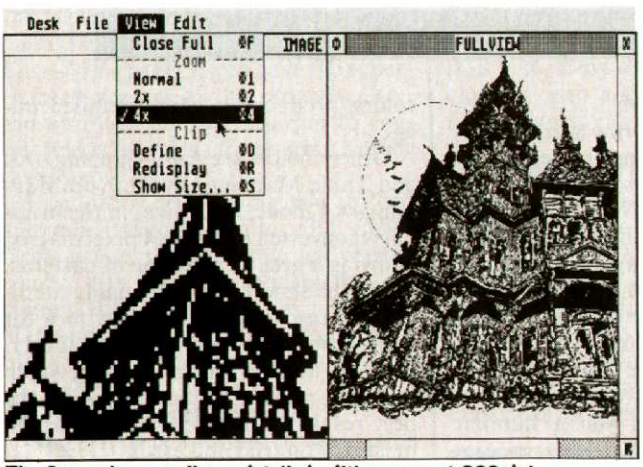
Note that Migraph's latest printer drivers require the new Outprint program. If you have an older version of *Easy-Draw*, you should upgrade to the current version. Migraph has announced that future products will be based on version 2.26 and are not guaranteed to work with earlier versions. You can find out what version you own by checking the Info box under the Desk menu.

Letter and Line Spacing. In previous versions, extra white space around characters made text look airy and somewhat unprofessional. Version 2.26 was designed specifically to work with the SLM804, and different text spacing has been incorporated to allow more text to fit on a line and on a page.

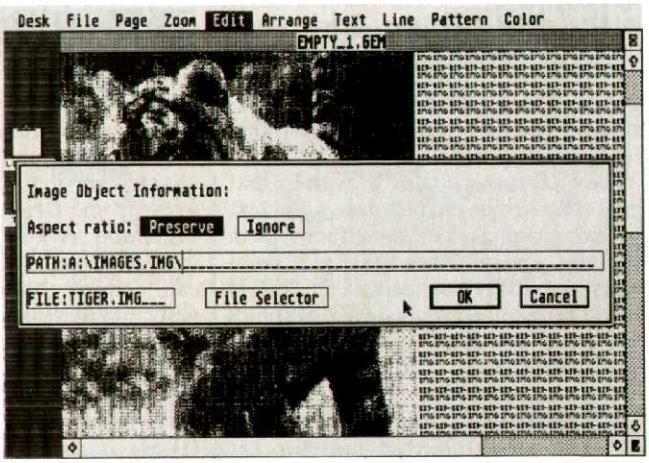
Although more sophisticated publishing programs have the ability to adjust vertical line spacing still further, the output of *Easy-Draw* is more than adequate for most users' needs. Overall this tighter spacing produces more attractive, professional-looking output.

Loading Nonstandard Files. By the time you read this, Migraph should be shipping version 2.3 of *Easy-Draw*. With it, you can load nonstandard GEM files from such programs as *Athena II* and *CAD-3D*, a capability that obviously opens up many new possibilities.

Extended Character Set. Version 2.26 comes with a new Swiss font that includes the extended international character set, which is especially useful for those who need to use special char-



The Supercharger allows detailed editing even at 300 dpi.



From the Edit menu, you can select the new Image Object Information dialog box.

acters such as the registration or trademark symbols. Note that you do not need a foreign language TOS to access these special characters.

If you are using 300 dpi fonts and don't want to use these extra characters, you can delete them from each font to give yourself more disk space, additional memory, and faster font loading. You can do this and more with a good commercial program called *Fontz*. Use it to delete unwanted characters and create new ones, such as math symbols and logos.

I use an HP DeskJet printer that uses the same 300 dpi fonts as the Atari laser printer and the HP LaserJet, and these high-res fonts alone take up a whopping 650K of memory when printing. Removing the characters I don't use has been very helpful.

New Printer Drivers. New optimized GDOS drivers are included for the 9-pin Epsons and compatibles. New versions for the 24-pin Epson LQ/Star NB/Nec P/Toshiba and compatibles, the HP LaserJet Plus and Series II, and the new HP DeskJet drivers are available separately. The program also works directly with the Atari laser, which includes its own driver. New plotter drivers have just become available for the HP 747x-7550 series and the Roland and Houston Instrument plotters. New drivers are continually being introduced.

Supercharged Easy-Draw Features

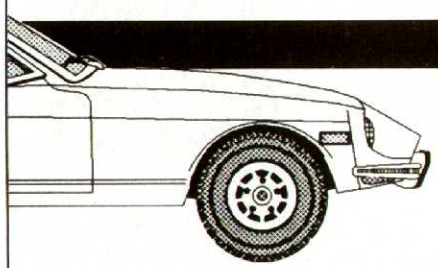
The following features apply specifically to the supercharged version of *Easy-Draw*, which is included in the bundled pack and which is supplied with the Supercharger when purchased separately from Migraph.

Image Import. The supercharged version adds another option to the drawing tool box, allowing you to import both high- and low-res bit-mapped images and place them anywhere on your page. Images can then be sized or stretched, kept in proportion or distorted. After positioning the images, you can turn off the image display, giving you a faster screen redraw. When the display is off, the image is replaced by a patterned box.

Images can be opaque or transparent. They can also be grouped with other images, text, or graphics, offering greater flexibility when creating pages.

New Fonts. Regular *Easy-Draw* includes one font called Swiss, which is a generic name for the common sans serif typeface usually known as Helvetica.

Migraph has a reputation for publishing high quality, bug-free software, and Supercharged Easy-Draw can only enhance that reputation.



The supercharged version includes an additional font called Dutch, which is similar to Times Roman (the typeface you are reading now), and a font called Typewriter which is similar to Courier.

The type sizes available and the output quality of the fonts depend, of course, on your hardware, but every printout I have seen, from dot matrix to 300 dpi laser, has been absolutely superb.

Companion Products

In addition to the just-released *Easy-Tools* accessory, which adds many powerful drawing features to *Easy-Draw*, Migraph is working on several other programs, including libraries of high-res scanned art, professionally drawn object-oriented art, a Postscript driver and more.

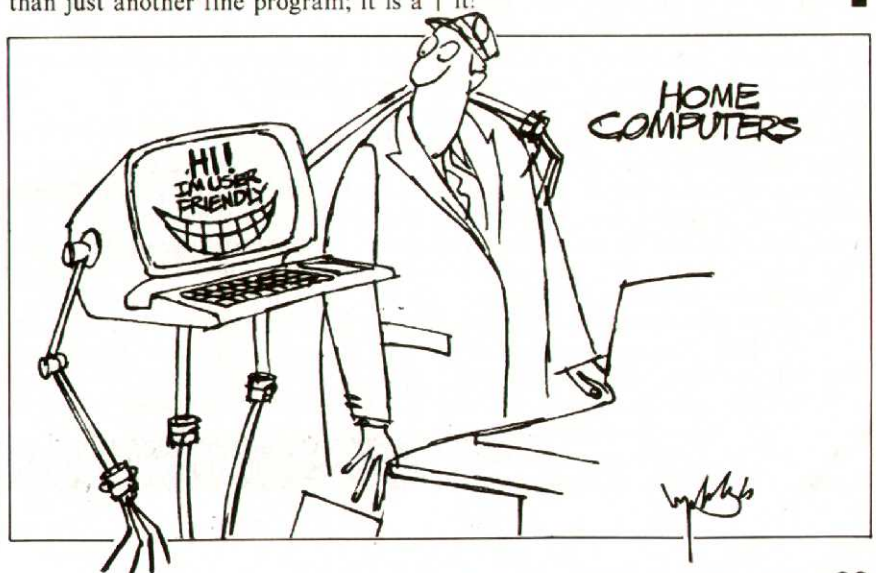
A Classic

Supercharged *Easy-Draw* is more than just another fine program; it is a classic that improves with each new incarnation. Migraph has a reputation for publishing high quality, bug-free software, and Supercharged *Easy-Draw* can only enhance that reputation.

Users unfamiliar with drawing programs may need some time to master the genre, but the excellent documentation and technical support provided by Migraph should make the learning process a pleasant one.

While originally designed to produce drawings quickly and accurately from a rich palette of geometric shapes and editing tools, *Easy-Draw* has evolved into a supercharged desktop publishing system that can be used to provide some of the best output available to ST owners today.

Since its introduction, *Easy-Draw* has been an extremely popular program because of its unusual ability to do so many things well. Though not designed to handle long documents easily (you cannot create master pages or dynamically linked text frames), the new supercharged version is fantastic for producing short, professional-looking newsletters, forms, charts, technical illustrations, and many other desktop publishing projects in a hurry. The more you use *Easy-Draw*, the more you'll like it! ■



The Newsroom

Springboard Software offers its popular desktop publishing program for 8-bit Atari computers

Sample newsletter created with The Newsroom.

Each time I sit down for a session with *The Newsroom* from Springboard Software, I visualize someone creating a company newsletter. He clips interesting items from newspapers and trade journals. He types in articles submitted by other employees. He edits. He rewrites. He pulls out a sheet of typing paper and pastes the clippings and pieces of manuscript in place. He cuts illustrations from a clip art book. He adds shading. He inks in special fonts for headlines. Finally, after several hours of labor, he sits back to admire the result: a polished creation of cartoons, quotes, birthday listings, and other information of interest to employees.

Had my imaginary employee used *The Newsroom* to create his newsletter, he would have found the task easier and perhaps a bit quicker. For $59.95, he could have enlisted the aid of a limited text editor and a crude but effective drawing program. When finished, he would have been impressed with the professional appearance of his newsletter.

The Newsroom arrives in a package that suggests quality. A rigid plastic case with a flip-lock cover contains the master program on a copy-protected, single-sided 5¼" disk. A 98-page paperback manual accompanies the program, as does one additional 5¼" flippy disk that contains 600 pieces of attractive clip art (also copy-protected). Three add-on volumes of clip art are also available for prices ranging from $29.95 each to $39.95 each. The full collection would equip you with about 2600 drawings.

Springboard Software offers a lifetime replacement warranty on all their software ($5 is charged to cover shipping and handling), and backup copies of *The Newsroom* can be obtained for $12.

To run *The Newsroom*, you need an Atari 800XL, 65XE, or 130XE computer; one or, preferably, two disk drives (Atari 1050 or compatible); and a dot-matrix printer. A joystick is optional.

The Newsroom manual is detailed, clearly written, and basically error-free. A table of contents provides quick access to full explanations of all *Newsroom* features, and a 17-page tutorial offers a thorough introduction to those who prefer a hands-on approach to learning. Also included in the manual is an appendix, which offers "creative and organizational tips" and an index to the clip art on the disk.

Getting Started

Each session with *The Newsroom* opens with an option for selecting one or two disk drives. If you don't have two drives, be prepared to spend a great deal of time swapping disks.

The main menu consists of cartoon drawings of a newspaper office, including a drawing board where banners are created, a photo lab, a copy desk, a layout table, a press room, and an exit door.

If you have a joystick connected to your computer, you can use it to make selections from this and other menus you will encounter in the program. The joystick is quite sensitive, however, and a careless click of the fire button can transport you to the wrong area before you know it.

Alternatively, you can use the cursor control keys to move about on the screen.

The Banner

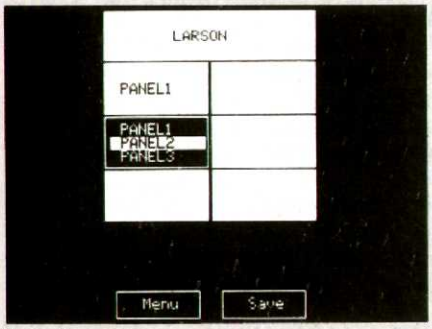
The program manual assumes that the banner will be the starting point of your document, and since the banner area does contain options that are standard throughout the program, I shall describe a typical session to illustrate the mechanics of *The Newsroom*.

The banner table sub-menu consists of a series of icons stacked on the left-hand side of your screen. To the right of the menu icons is a white space that represents a blank banner.

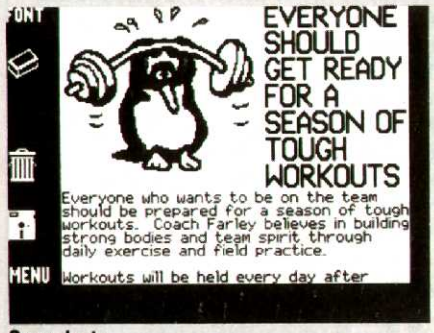
Clicking on the clip art icon (a square

By MIKE HARRINGTON

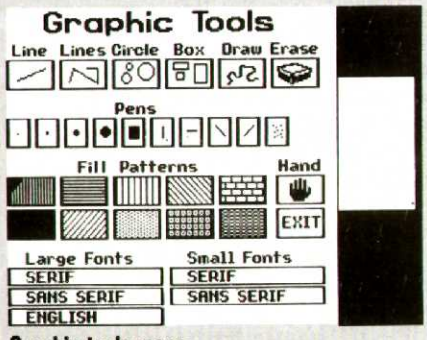
Banner screen.



Layout screen.



Copy desk.



Graphic tools menu.

with a cartoon head drawn on the inside) displays an alphabetized directory of the files on the clip art disk. Approximately 50 files are stored on each side of the disk. Each file is saved as a screen page, and each page holds three to six drawings. No typing is required to select a file. You scroll through the directory, locate the desired file, then press the fire button to display the page on your screen.

You next move the cursor over a drawing of your choice, press the button, carry the piece of artwork to the left edge of the page, then choose an icon in the upper left corner of the screen to return to the drawing board.

Back in the blank banner area, you position the picture (or any part thereof) and press the button to drop it in place. You can create multiple copies of any piece of clip art, and each banner can contain as many as 30 drawings. You also have the option of relocating any piece of clip art as your banner evolves.

A minor complaint concerning clip art and disk operations: although the program does mark and remember the last clip art file you had open, it does not return you directly to that file. This leads to lots of tedious scrolling.

Directly beneath the clip art icon is the flip icon, which is used to produce a mirror image of a clip art drawing. This icon appears only when there is a piece of clip art in the banner work area.

The crayon icon, next in line, is used to access the graphics tools menu from which you can select various standard drawing tools, including boxes, circles, an airbrush, nine pen sizes, a lines routine, and assorted fills and fonts. These tools are crude and make free-hand drawing very difficult.

To add to the inconvenience imposed by the tools, the cursor moves too quickly. Even when you press Control-S, a toggle to slow cursor movement, you will find fine control nearly impossible.

The manual makes no mention of how to exit the lines mode. By trial and error, I discovered that simply stretching the line off the left edge of the banner snaps the line free at the last starting point.

The graphic tools menu offers three large fonts and two small fonts. You may use only two sizes per banner. Both the banner area and the photo lab provide a text editor which offers basic type and delete operations. You can, however, preselect a text starting point within the work area. The copy desk text editor is more advanced, but it does not allow this preselecting of a text starting point. I wish it did.

Beneath the crayon icon is the magnifying glass icon. Although a block picture of the magnified object is displayed on screen beneath the magnification, the enlarger over-expands the image, making it difficult to tell exactly where you are working.

Like the drawing tools, the magnifier is difficult to use. The cursor moves too quickly, making it all but impossible to polish your banner with the joystick. By combining the Control and arrow keys and using Select as a trigger, I was able to perform some detailed pixel-by-pixel drawing modifications, but I concluded that the effort required was out of proportion to the results achieved.

Oops, as written out below the magnifying glass, is for undoing your most recent action. No problems or complaints with this one; this built-in forgiveness key can be a lifesaver.

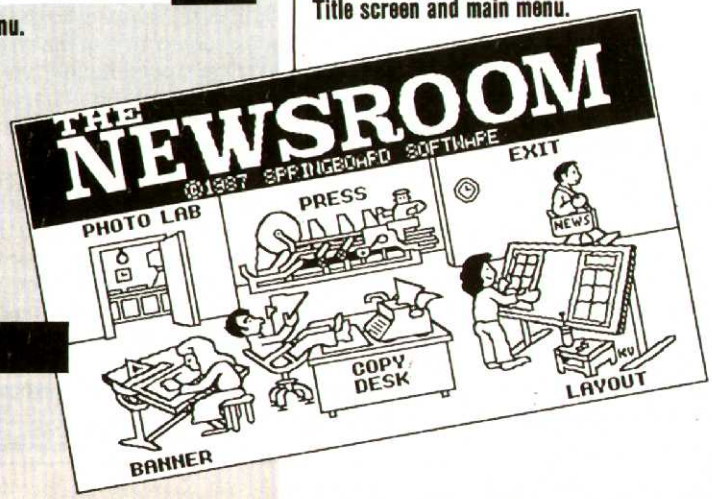
The garbage can icon is used to clear the work area. This function offers no warnings before trashing a screen, but it does require that you press the fire button twice in rapid succession before the computer will do its stuff.

The disk icon is used to save the banner, load an old banner, or (praise, praise) format a data disk from within the program. Loading files is quick and easy. The program lists all your files on screen, and you simply scroll to the one of choice and fire it in.

File saving is less convenient. Although *The Newsroom* protects you from overwriting a previously created file, it forces you to remember and retype the name from which a previously saved file was originally loaded.

The Newsroom program assigns its own filename extensions. A series of files consisting of a banner, a panel, a photo, and a layout can share the same root name, which is a nice convenience.

Title screen and main menu.



The Copy Desk

Skipping over the photo lab, which is essentially the same as the banner drawing board, let's take a look at what goes on at the copy desk.

The basic building block of *The Newsroom* is the panel. Each page you create consists of six, eight, or ten panels, depending on the length of your paper and the presence or absence of a banner.

To begin to build the body of your page, you load any previously saved photos you want to use and paste them into a blank panel. Next, you click on the font icon to select a style of type (the copy desk offers the same five fonts as the graphics tool menu in the banner and photo lab).

In addition to changing fonts, you can perform five major functions in the copy desk text editor. You can insert text; add new text to existing text; delete text one character at a time; delete all text in a panel; or delete, copy, and move blocks of text.

Text wrap is automatic. Adjustments are made for even such major changes as the repositioning of a photo.

If you are accustomed to using a reasonably competent word processor, you will find the editor less than scintillating. To begin with, it is very slow, and if you are a touch typist, you will notice that it drops characters (most often double letters) and that you spend lots of time waiting for screen updates to catch up with your fingers.

The Backspace key is not activated, a programming choice I find unforgivable. To delete a mistyped key, you must use Control and the arrow keys to back up, then press Shift/Delete. Given the frequency with which the editor drops characters, this can be very frustrating.

Neither is the Tab key activated. Should you desire to create white space within a line, you must do it with repeated presses of the spacebar.

The word-wrap sometimes functions incorrectly, breaking words in incorrect and awkward places. You can, however, use hyphens to control word breaks.

The editor rewrites the screen with every keystroke, which makes inserting or deleting text a time-consuming process.

I worked with the editor. I accomplished what needed to be accomplished. I was often irritated, sometimes frustrated, and always certain that the program could be greatly improved. But even the most cumbersome editor seems like greased lightning when compared with white-out and an eraser.

Layout

As mentioned above, *Newsroom* pages are composed of banners and panels. An 8½" × 11" sheet of letter-size paper with a banner can accommodate six panels; the same paper without banner has room for eight panels. Add two panels to either option when using legal size paper.

Placing the banner and panels on the page takes place at the layout table and can be accomplished quickly and easily. The outline of your page, with blank sections used to identify each panel and the banner space (if included), is displayed on the screen. You select a panel position and press the fire button. An alphabetized directory of saved panels is then displayed. When you choose a file, its filename appears within the previously-selected panel on the layout page. You do not have to use all panels, nor must you work from top to bottom.

The Press

After creating a banner, snapping photos, pasting panels at the copy desk, and arranging panels at the layout desk, you are ready for a trip to the press room. Here, after selecting a printer from a list of 60 (this is a one-time chore, as the program saves your printer choice on your disk), you can choose to print a single photo, a single panel, a banner, or an entire finished page.

Printing takes about three minutes and flows easily. If, however, you do not own one of the 60 listed printers, you are in trouble. *The Newsroom* makes no allowances for printer configuration. My Okimate 10 color printer would not work with program, and although I have a Panasonic KXP-1080i printer, I don't have an interface for connecting it to my Atari. In order to complete this review, I had to borrow a Star Gemini from a friend.

Conclusions

The Newsroom is a useful program that can produce a satisfying newsletter. The drawing routines are crude and often difficult to work with, but they do suffice. The text editor functions fully as stated in the manual, but, along with being tediously slow, it sometimes drops keys, and the word-wrap algorithm occasionally fails to break words correctly. The program lacks a printer configuration option, but the list of supported printers will meet most people's needs.

It took me five hours to produce my first page, but I was searching for bugs and taking the time to become familiar with every feature, goals that led me on many detours from the direct route. The average user should feel comfortable with the program in about three hours, after which he should be able to produce a newsletter within about two hours.

The Newsroom is designed for small-scale publishing. It would be excellent for a club or company newsletter, a church bulletin, a garage sale notice, a neighborhood news flyer, a small business sale circular, or a poster to accompany a school science project. If you own an 8-bit Atari and have the urge to publish, buy *The Newsroom*. It does the job. ■

The Newsroom

System: Atari 800XL, 65XE, 130XE

Required equipment: 1050 disk drive; dot matrix printer; joystick (optional)

Copy protection: Yes

Summary: Limited but versatile desktop publishing program

Price: Retail, $49.95; direct from manufacturer, $39.95 (ask about additional savings on clip art packages)

Manufacturer:
Springboard Software
7808 Creekridge Circle
Minneapolis, MN 55435
(800) 654-6301
(612) 944-3915

A series of files consisting of a banner, a panel, a photo, and a layout can share the same root name, which is a nice convenience.

ATARI ST POWER

COLOR COMPUTEREYES™

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

MEGADISK

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

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

Megadisk can be configured according to your needs. • Set it up as one large disk • An 800K double sided disk and a 200K hardware print buffer • Or as two 400K single sided disks and a print buffer

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

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

$299.95
Price Subject to change

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

Polydisk

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

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

Polydisk (512K Solid state drive) **Only $199.95**
(Clock option card is also available for Polydisk $29.95)

PowerPrint ST — BLOW YOURSELF UP

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

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

Digisound ST

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

DIGISOUND **ONLY $89.95**

DIGISOUND PROFESSIONAL

All the excellent features of DIGISOUND plus these great extras

LOGARITHMIC SAMPLING – Special hardware extends the sound quality far above the other ST sound digitizers. Logarithmic sampling and playback (external amplifiers only) greatly extends the dynamic range while reducing distortion and noise.

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

SWITCH/BACK - Turn your ST into two; requires 1 meg - Hardware & Software $69.95
ST PROTECTION TECHNIQUES Book & Disk Package $39.95

ATARI 8-BIT POWER

ALPHA SYSTEMS is constantly innovating to provide more power for your 8-bit Ataris

NEW HACK PACK Special OFFER

The Alpha Systems HACK PACK contains all our finest products for making Back-up copies, Analyzing, Understanding and Protecting your Atari programs. It comes complete with Atari Protection Techniques (Book and Disk I), Advanced Protection Techniques (Book and Disk II), The Chipmunk, The Scanalyzer, The Impersonator and Disk Pack 1000. Worth over $150. Get them all for the special price of **Just $99.95**

Atari Software Protection Techniques Vol I & II

These Book and Disk packages detail the most advanced copy protection methods in use today. They guide you through the methods used to create the protection as well as the copying techniques to get around them. They include information on Phreaking • Hacking • On-line security • Black boxes • Self-destructing programs • Pirate bulletin board systems • Logic bombs • New piracy laws • Hardware data keys • Weak sectoring (Phantom, Fuzzy and unstable sectors) • Overfilled tracks • CRC errors • Bank Select cartridges and MUCH, MUCH MORE. The disks include automatic program protectors, Protection Scanners, directory hiding and more.

BOOK I and DISK I $24.95
BOOK II (Advanced protection) and DISK II $24.95
Special Offer, Order both sets for Only $39.95

CHIPMUNK

Automatic Disk Back-Up System. Make perfectly running unprotected back-up copies of hundreds of the most popular Atari programs. Chipmunk's sophisticated programming Automatically finds and **REMOVES copy protection** from most Atari programs. Back-up even heavily protected programs with ease. Finally, a back-up system that needs no special hardware or skills.
(If you need a full list of what Chipmunk copies, call or write for our free catalog) **$34.95**

Scanalyzer Automatically scan & analyze commercial programs. Unlock programming secrets and learn from the masters **$29.95**
Impersonator Cartridge to Disk back up system. Create running back-up copies of any cartridge (up to 16K) **$29.95**

NEW CHEAT

Get more from your games with CHEAT. Tired of spending days trying to beat a game? Tired of getting stuck just when you need another life? Cheat is an innovative new product that gives you the chance you need to beat your favorite games. Cheat works with hundreds of Atari games to give you unlimited lives or power. End the frustration and get hours more enjoyment from your games. (Call or write Alpha Systems for our free catalog with a full list of the programs that work with Cheat) **ONLY $24.95**

BASIC TURBOCHARGER

NOW for the first time a BASIC programmer can get the power, flexibility and incredible speed of machine language. BASIC TURBOCHARGER is a **book and disk package** that contains over 150 ready to use machine language routines. Complete instructions show how to add them to your own BASIC programs to get these features and more: • Smooth Scrolling • Player/Missile control • Load & Save Picture files • Sorting and Searching • Special Effects Graphics • Incredible Speed • Much, Much More • Over 150 programs. You've heard of the power of Assembler, now harness it for your own needs. **$24.95**

NEW PARROT II

An All New Parrot sound digitizer for your Atari. Parrot II is a sophisticated new hardware device that plugs into your joystick port. Parrot II has two inputs, One for a microphone and one for a powered source such as a tape player, radio or Compact Disk.

The Powerful Parrot II software lets you record sounds into your computer and play them back on any Atari. Parrot II turns your computers keyboard into a musical instrument with nine different sounds covering three octaves each. The sounds can be anything, a dogs bark, a piano, a complete drum set, a symphony or your own voice.

Parrot II lets you modify the sounds on a graphic display to create brand new sounds and special effects. Best of all, the sounds and voices can be put into your own programs that can be used on any standard Atari. Explore the world of digital sound and music. ONLY **$59.95**

Pre-Recorded Sound Disk More pre-recorded sounds for Parrot **$4.95**
PARROT II Demo Disk (Does not require Parrot to run) **$5.00**

NEW POP-N-ROCKER

a fast paced, multi-player trivia game that mixes questions with real songs (digitized with Parrot). Be the first to identify the songs and answer the music trivia questions. *Pop-N-Rocker* comes with three data disks and lets you add new questions so it will never get old. You can use a Parrot Sound digitizer to add new songs too! Use any kind of music from Rock to Classical to Nursery Rhymes. A new concept in entertainment and a perfect add-on for Parrot. **$24.95**

COMPUTEREYES & MAGNIPRINT II +

Turn your computer into a digital portrait studio. This complete package lets you **capture, save & print** digital images from your **Video Camera, VCR or TV.** COMPUTEREYES hardware plugs directly into your joystick ports for easy use. Print your picture on a 6 foot poster. **$119.95**

GIANT WALL SIZED POSTERS.

ComputerEyes camera system
Comes complete with everything above, plus a black and white video camera and connecting cable. **$329.95**

Graphics 9 Software – Add a new dimension to your COMPUTEREYES pictures – captures images in 16 shades of grey. **$12.00**

Magniprint II +
Easily the most powerful print program available today. Print graphics from almost any format in hundreds of shapes, sizes, and shades. Supports **color printing** and lets you create **giant posters.** Magniprint II + lets you stretch and squeeze, invert, add text, adjust shading and much more. Works with EPSON, NEC, Citoh, Panasonic, Gemini, Star, XMM801, and compatible printers. (850 interface or equivalent required) **$24.95**

Graphics Transformer
Now you can combine the most powerful features of all your graphics programs. Create print shop icons from a Koala pad picture, from a photo digitized with ComputerEyes, or any picture file. Graphics Transformer lets you **Shrink, Enlarge and Merge** pictures for unequaled flexibility. **$22.95**

YOUR ATARI COMES ALIVE

SAVE MONEY. Finally an alternative to buying expensive computer add-ons. Your Atari Comes Alive shows you how to **built them yourself.** This 'How-To' **book and disk package** gives you complete step by step instructions and programs needed to built and control these exciting devices and MORE • Light Pen • Light & Motor Controllers •Alarm Systems • Voice Recognition • Environmental Sensors •Data Decoders • More than 150 pages. **Your Atari Comes Alive** **$24.95**

24 HOUR HOTLINE **216-374-7469**
VISA & MASTERCARD, ORDER BY PHONE, OR SEND MONEY ORDER TO:

ALPHA SYSTEMS 1012 SKYLAND DRIVE MACEDONIA, OH 44056 **FREE BONUS:** DELUXE SPACE GAMES (3 games on a disk) Free with any order of 3 or more items. Include $3.00 shp & hdlg (US Canada) Ohio res. add 5 1/2% sales tax. Foreign orders add $8.00 shp & hdlg. Call or write for free catalog. Customer Service Line (216) 467-5665 M-F 9-3.

1K Programming Contest

Three outstanding programs win subscriptions for their authors

Presenting the very first crop of *Atari Explorer* 1K Programming Contest winners! Response to the 1K Contest was overwhelming—not only did we receive a large number of entries, but the overall quality of entries was superb. We reviewed programs in virtually every language available for Atari computers, from MAC 65 8-bit assembler to Action, C, Pascal, and Logo.

Choosing the winners was difficult, and in the end, we liked so many of the programs we received that we can't even print all of them in this issue.

Here, then, are the first three 1K winners—all for the Atari 8-bits. (ST people, where are those entries?) Type them in and enjoy! We'll be printing more winning programs in upcoming issues of *Explorer*.

A SHORT LIFE

Listing 1.

ATARI KEY

- Any Atari 8-Bit Computer
- Atari Basic

```
10 DIM A$(2),ML$(404):N=1
20 READ A$:IF A$="XX" THEN 60
30 H=ASC(A$)-48:H=H-7*(H>9)
40 L=ASC(A$(2))-48:V=H*16+L-7*(L>9)
50 ML$(N)=CHR$(V):N=N+1:GOTO 20
60 I=1:O=0:LIM=64
70 GRAPHICS 0:POKE 752,I:POKE 710,208
80 FOR N=I TO LIM:POSITION INT(RND(0)*20+10),INT(RND(0)*10+6
):? "*";:NEXT N
90 POSITION 5,23:? "Generation:    0    Cells:";:G=0
100 N=USR(ADR(ML$)):G=G+I:ON (G<LIM)+I GOTO 80,100
870 DATA 68,D8,38,A5,58,E9,01,85,CB,A5
880 DATA 59,E9,00,85,CC,A5,D4,85,CD,A5,D5,18,69,02,85,CE
890 DATA 18,A9,2A,65,CD,85,CF,A9,00,65,CE,85,D0,A2,17,A0
900 DATA 28,B1,CB,91,CF,88,D0,F9,A9,2A,18,65,CF,85,CF,90
910 DATA 02,E6,D0,A9,28,18,65,CB,85,CB,90,02,E6,CC,CA,D0
920 DATA DE,A5,CD,85,CF,A5,CE,85,D0,A2,17,A5,CF,18,69,2A
930 DATA 85,CF,90,02,E6,D0,A0,28,B1,CF,A0,00,91,CF,C8,B1
940 DATA CF,A0,29,91,CF,CA,D0,E3,A5,CD,38,E9,01,85,CF,A5
950 DATA CE,E9,00,85,D0,A9,C6,18,65,CF,85,CB,A9,03,65,D0
960 DATA 85,CC,A0,2A,B1,CB,91,CF,88,D0,F9,A0,54,B1,CF,91
970 DATA CB,88,C0,2A,D0,F7,A5,58,38,E9,56,85,CB,A5,59,E9
980 DATA 00,85,CC,A9,17,85,CF,A2,28,A0,00,98,18,71,CD,C8
990 DATA 71,CD,C8,71,CD,A0,2A,71,CD,A0,2C,71,CD,A0,54,71
1000 DATA CD,C8,71,CD,C8,71,CD,C9,1E,D0,06,A9,0A,91,CB,D0
1010 DATA 08,C9,14,F0,04,A9,00,91,CB,E6,CB,D0,02,E6,CC,E6
1020 DATA CD,D0,02,E6,CE,CA,D0,C1,A5,CD,18,69,02,85,CD,A9
1030 DATA 00,65,CE,85,CE,C6,CF,D0,AE,A5,58,18,69,AD,85,CB
1040 DATA A5,59,69,02,85,CC,A0,FF,98,29,03,C9,00,D0,05,A9
1050 DATA 0C,91,CB,88,B1,CB,D0,06,A9,11,91,CB,D0,13,C9,19
1060 DATA F0,08,18,69,01,91,CB,18,90,07,A9,10,91,CB,88,D0
1070 DATA D7,A5,58,38,E9,01,85,CB,A5,59,E9,00,85,CC,A9,00
1080 DATA 85,CD,85,CE,A2,17,A0,28,B1,CB,C9,0A,D0,0D,F8,18
1090 DATA A5,CD,69,01,85,CD,D8,90,02,E6,CE,88,D0,EA,A5,CB
1100 DATA 18,69,28,85,CB,90,02,E6,CC,CA,D0,DA,A0,23,A5,CD
1110 DATA 29,0F,09,10,91,CB,A5,CD,4A,4A,4A,4A,09,10,88,91
1120 DATA CB,A5,CE,09,10,88,91,CB,60,XX
```

A Short Life by Barton M. Bresnik

Barton Bresnik's Life is a graceful implementation of the game invented by John Conway to explore what happens when simple sets of rules are applied repeatedly to data. Conway proposed creating a simulation of cell growth by populating a 2-dimensional grid of arbitrary size with "cells," then producing successive "generations" of cells by applying the following rules to each cell in the grid:

- A new cell is born in any empty space adjacent to three cells (filled spaces).
- A cell dies if adjacent to fewer than two or more than three other cells; otherwise, it survives to the next generation.

In Bresnik's version of Life, the computer lays down 64 cells in random positions near the center of the screen. It then follows these cells through 64 generations, after which another random batch of 64 cells is overlaid on the first, and the process continues.

Bresnik uses 6502 machine language to produce each generation of cells, resulting in a very fast display that appears animated. His machine code is also very space-efficient; only 404 bytes of code are needed for this impressive result. Discounting Basic loader code, used to represent the machine language as data so that you can type in and use the program without a 6502 assembler, total active code for Bresnik's Life totals only 994 bytes.

Bresnik uses the time-honored tech-

By JOHN JAINSCHIGG

nique of storing machine language in a string buffer—an added challenge, because such code must be relocatable (you can't be sure exactly where in memory Atari Basic will place a string). Type in the program as shown in Listing 1, and remember to save it to disk before typing RUN. If you have made an error in one of the machine language data statements, the program may crash your system.

Bomby by Norman T. Thornton

In a slightly lighter vein, Norman Thornton has composed a true-to-life arcade game in only 1021 bytes of 6502 machine code. Would you believe bombs? Rockets? Missile fire? Alien hordes? Burning cities? *Sturm (und drang)*? It's all here in Bomby!

The Bomby scenario pits you—valiant commander of a mobile defense station—against alien supply shuttles streaking over head and a rain of radiant spheres which fall from the top to the bottom of the screen.

Using your joystick to maneuver, earn points by firing missiles to nullify the shuttles and spheres or swallowing and/or sideswiping the latter. The spheres you miss accumulate at the bottom of the screen and eventually destroy the land mass it is your sworn duty to protect.

Spheres caught on the edges of your defender drain its energy, hastening the inevitable end. Radiant horizons—another of the alien's lethal tricks—appear when you least expect them, blinding you to the approach of enemy hordes. Check your progress on the graphs at the bottom of the screen.

To prepare for playing Bomby, type in Listing 2, and remember to save it to disk before typing RUN. The DATA statements contain executable machine code, so a typing error could cause your system to crash.

When you are finished typing, format a new disk and place DOS on it to make it bootable. Re-load the program, place your new disk in the drive, and type RUN. The program will create an autoboot version of Bomby on your disk under the filename AUTOEXEC.BAT. Thereafter, you can play Bomby simply by booting from this disk and plugging your joystick into port 0.

Jumpin' Frogs by Henry Malavolti

It looks like a game . . . it plays like a game . . . but is it? Jumpin' Frogs, by Henry Malavolti, wins our vote for most unusual and most charming entry. We

BOMBY — Listing 2.

ATARI KEY

- 32K Atari 8-Bit Computer
- Joystick
- Atari Basic (program creates a self-executing machine-language batch file)

```
50 CHKSUM=136758:ELM=998
60 CLOSE #1:OPEN #1,8,0,"D:AUTORUN.SYS"
61 RESTORE
62 TRAP 63:READ X:PUT #1,X:SUM=SUM+X:SUMN=SUMN+1:GOTO 62
63 IF SUM<>CHKSUM THEN ? :? CHR$(253);"TYPING ERROR IN DATA
STATEMENTS"
64 IF SUMN<>ELM THEN ? :? CHR$(253);"DATA ELEMENT MISSING IN
 DATA STATEMENTS. FOUND=";SUMN;" OF ";ELM;" ELEMENTS"
66 CLOSE #1
67 END
200 DATA 255,255,0,120,217,123,169,0,133,241,76,245,121,169,
17,133,235,173,48,2,133,205,173,49,2
201 DATA 133,206,160,6,169,4,145,205,200,192,26,208,249,32,1
14,121,160,0,32,148,122,200,192,17,208
202 DATA 248,165,203,133,226,165,204,133,227,32,148,122,165,
203,133,228,165,204,133,229,169,15,133,224,133
203 DATA 225,32,114,121,169,128,133,205,169,123,133,206,160,
0,177,205,145,203,200,192,40,208,247,32,148
204 DATA 122,165,203,133,222,165,204,133,223,169,168,133,205
,169,123,133,206,32,114,121,160,0,32,148,122
205 DATA 200,192,20,208,248,165,203,133,216,165,204,133,217,
32,148,122,165,203,133,239,165,204,133,240,32
206 DATA 102,123,160,0,177,205,145,203,200,192,40,208,247,32
,214,122,160,0,132,77,165,216,133,205,133
207 DATA 207,165,217,133,206,133,208,56,165,207,233,40,133,2
07,176,32,198,208,32,162,122,165,19,201,110
208 DATA 144,8,173,10,210,41,127,141,26,208,32,69,122,173,1,
210,201,64,240,3,206,1,210,174,10
209 DATA 210,142,25,208,177,205,133,215,177,207,133,214,165,
214,201,212,208,94,165,215,201,86,208,6,32
210 DATA 152,121,76,63,121,201,66,208,6,32,152,121,76,63,121
,201,88,208,6,32,152,121,76,63,121
211 DATA 201,83,208,6,32,176,121,76,63,121,201,70,208,6,32,1
84,121,76,63,121,201,71,208,6,32
212 DATA 184,121,76,63,121,201,77,208,6,32,184,121,76,63,121
,201,78,208,6,32,184,121,76,63,121
213 DATA 165,214,201,0,240,6,145,205,169,0,145,207,200,192,4
0,208,137,160,0,165,207,133,205,165,208
214 DATA 133,206,165,207,197,222,240,3,76,176,120,165,208,19
7,223,240,3,76,176,120,32,123,121,76,157
215 DATA 120,165,88,133,203,165,89,133,204,96,32,114,121,32,
148,122,165,19,133,231,169,212,172,10,210
216 DATA 192,40,176,9,174,10,210,228,231,176,2,145,203,96,23
0,219,165,219,201,200,208,3,76,213,121
217 DATA 169,0,133,214,169,79,141,1,210,96,32,148,122,169,0,
145,207,32,114,123,96,169,0,141,31
218 DATA 208,230,221,165,221,201,39,208,7,169,0,133,221,76,2
13,121,169,0,133,214,145,205,145,207,96
219 DATA 165,240,133,204,165,239,133,203,32,148,122,165,241,
201,0,240,11,160,0,169,212,145,203,200,196
220 DATA 241,208,247,165,220,133,241,169,0,141,0,210,141,2,2
10,174,10,210,142,25,208,173,31,208,201
221 DATA 6,208,243,169,64,141,8,210,169,64,141,1,210,169,100
,141,0,210,162,0,169,0,149,213,232
222 DATA 224,28,208,249,32,114,121,162,0,160,0,32,148,122,16
9,0,145,203,200,192,40,208,249,232,224
223 DATA 21,208,237,169,100,133,20,133,19,76,7,120,173,120,2
,201,7,208,13,230,224,165,224,201,36
224 DATA 144,23,198,224,76,107,122,201,11,208,14,198,224,165
,224,201,0,240,6,201,255,144,2,230,224
225 DATA 132,218,32,119,122,165,224,133,225,164,218,96,162,0
,164,225,189,208,123,145,226,200,232,224,5
226 DATA 208,245,164,225,189,208,123,145,228,200,232,224,10,
208,245,96,24,165,203,105,40,133,203,144,2
227 DATA 230,204,96,165,224,132,218,32,114,121,32,148,122,32
,148,122,164,232,200,192,37,144,3,32,202
```

(cont'd.)

Listing 2. Continued

```
228 DATA 122,132,232,169,0,145,203,200,169,13,145,203,200,16
9,95,145,203,164,218,96,169,0,145,203,200
229 DATA 192,41,144,249,160,0,96,132,218,165,238,201,80,240,
37,165,235,201,2,208,11,32,46,123,169
230 DATA 0,141,2,210,76,3,123,201,16,176,6,32,22,123,76,3,12
3,173,132,2,201,0,208,3,32
231 DATA 6,123,164,218,96,164,224,200,200,132,236,198,235,23
0,238,169,175,141,3,210,96,32,83,123,164
232 DATA 236,169,92,145,203,206,2,210,32,148,122,164,236,169
,0,145,203,198,235,96,32,83,123,164,236
233 DATA 177,203,201,13,208,3,32,114,123,201,95,208,3,32,114
,123,169,0,145,203,32,148,122,169,0
234 DATA 145,203,169,17,133,235,96,162,20,165,216,133,203,16
5,217,133,204,32,102,123,202,228,235,208,248
235 DATA 96,56,165,203,233,40,133,203,176,2,198,204,96,230,2
20,132,218,164,220,136,169,212,145,239,164
236 DATA 218,96,128,128,162,175,173,162,185,128,136,227,137,
128,145,153,152,152,128,226,249,128,174,239,242
237 DATA 237,225,238,128,180,142,128,180,232,239,242,238,244
,239,238,128,128,70,77,77,71,78,78,70,77
238 DATA 77,71,78,78,70,77,77,71,70,77,77,71,78,78,70,77,77,
71,78,78,70,77,77,71,70
239 DATA 77,77,71,78,78,70,77,0,66,83,86,0,0,72,88,74,0,226,
2,227,2,50,112
```

JUMPIN'FROGS

Listing 3.

ATARI KEY

- Any Atari 8-Bit Computer
- Two Joysticks
- Atari Basic

```
10 GRAPHICS 18:POKE 710,216:FOR D=1 TO 175:POSITION 0,4:? #6
;"***jumpin'**frogs***":NEXT D
20 GRAPHICS 8:POKE 712,216:POKE 710,6:POKE 704,194:POKE 705,
192:POKE 559,62:I=PEEK(106)-
8
30 POKE 53257,0:W=48:X=48:G=48:H=48:J=I*256+1024:L=I*256+128
0:POKE 54279,I:POKE 53277,3:POKE 53256,0:POKE 623,1
40 FOR M=L+80 TO L+95:READ F:POKE M,F:NEXT M:RESTORE :FOR Y=
J+156 TO J+171:READ Z:POKE Y,Z:NEXT Y
50 DATA 128,128,231,231,60,60,62,62,62,62,60,60,231,231,128,
128
60 A=STRIG(0):B=STRIG(1):IF A=0 THEN X=X-
4:H=H+INT(RND(0)*9):IF X<40 THEN X=48
70 IF B=0 THEN W=W-
4:G=G+INT(RND(0)*9):IF W<40 THEN W=48
80 IF H>200 THEN H=48
90 IF G>200 THEN G=48
100 IF A>0 THEN X=H
110 IF B>0 THEN W=G
120 POKE 53248,X:POKE 53249,W:POKE 77,0:GOTO 60
```

think you'll agree.

Here's how Henry describes Jumpin' Frogs: Jumpin' Frogs is a good ol', summer-in-the-country, county-fair-style, frog-jumping contest. Each player warms up his frog by holding down the fire button on his joystick.

Only the fire button is used to play the game. When the buttons are released, the frogs jump. There is no rule saying that both players must jump at the same time; frogs don't follow rules. Beware! Too much warm-up for each jump may cause your frog to lose his footing and slip, resulting in poor performance. To return your frog to the starting line, keep the fire button depressed.

Not only does this game fit exactly in 1024 bytes using Atari Basic, but it is a two-player arcade-style game using player-missile graphics. The game gives the impression of requiring skill, but the length of the jump is really random. The best video game player and the least-skilled novice are on equal ground.

Because only the joystick fire button is used, it is simple for the very young to compete with better-coordinated friends and relatives. Little children can easily beat Daddy or Mommy with no help. My youngsters, ages four and five, often choose to play this game over some of the commercial software we own.

As Henry says, Jumpin' Frogs employs player-missile graphics in an arcade-style game simulation appropriate for younger players. Type it in, give each kid a joystick, and BOI-I-NG!

Contest Rules

The contest continues. We hope you have been inspired to send in your own, potential 1K Contest winners. For each issue, we will select and print a new crop of programs for your delectation. Just read the contest rules, below, and start programming!

- Programs, including data, dimensioned arrays, etc.—must fit in 1K (1024 bytes) or less RAM.
- Programs may be written on either an Atari 8-bit or ST computer in any standard, widely-available language. Machine-language programs should, if possible, be provided with a Basic loader (the size of which will not figure in the 1K limit for contest entries) that will permit a neophyte to type in and use the program.
- The program should be submitted on a disk containing the program itself (in executable form), extra modules (e.g., a Basic loader or other ancillary code), plus source code, commentary, and full instructions for use. These last three items should be saved as standard ASCII (or ATASCII) files (we don't own a copy of every word processor in the world), or, in the case of ST disks, as *1st Word*-compatible files. If possible, also enclose printouts and sample program runs.
- Entries should be submitted to 1K Contest, Atari Explorer, 7 Hilltop Rd., Mendham, NJ 07945. Materials submitted are non-returnable. All submissions become the property of *Atari Explorer*.
- Winning programs will be chosen on the basis of usefulness, originality, and quality of programming style. Winners will be notified by mail or phone.
- One or more programs will be selected as winners every issue and will appear in *Atari Explorer*. Thereafter, certain of these programs may be disseminated by BBS or other online service at the discretion of the editors.
- The author of each winning entry will receive a 3-year subscription to *Atari Explorer*, plus a recently-released game software package. ■

The reviews are in . . .

"'A Best Buy' I'm impressed"
David H. Ahl, Atari Explorer, Nov-Dec 1987

"If you've got an Atari, you probably need this program."
Jerry Pournell, Byte Magazine, October 1987

"pc-ditto is a winner."
Charlie Young, ST World, July 1987

"This is the product we have been looking for."
Donna Wesolowski, ST Informer, August 1987

"This truly incredible software emulator really works."
Mike Gibbons, Current Notes, September 1987

NOW! RUN THESE IBM PROGRAMS ON YOUR ATARI ST.

Lotus 1-2-3	Flight Simulator	Framework	Symphony
Enable	Ability	DESQview	Q&A
Sidekick	Superkey	Norton Utilites	dBase II,III,III+
Crosstalk IV	Carbon Copy	Chart-Master	Print Shop
EasyCAD	DAC Easy Accounting	BPI Accounting	Turbo Pascal
GW Basic	Managing Your Money	Silvia Porter's	pfs:Professional File

And Hundreds More!

---

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

pc-ditto features include:

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

System requirements:

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

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

$89.95

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

Avant-Garde Systems, 381 Pablo Point Dr.
Jacksonville, Florida 32225 (904) 221-2904
Yes! Please send information on pc-ditto.
Name_____
Address_____
City_____ **State**____ **Zip**____

The Atari XF551

Power mass storage for the 8-bits

Those of us who cut our computing teeth on the old Atari 810 disk drive have a little trouble believing that anything that isn't larger than a shoe box, doesn't have a drive-door you could pitch pennies into from six feet away, doesn't raise the ambient temperature of your computer room by 14° Centigrade while on standby, and doesn't sound like an 18-wheeler on a 45° uphill grade while in operation can be a *real* mass storage device.

So, when I opened up my shiny new Atari XF551, plugged it into the XE, hit the power switch, slotted DOS 2.5, and turned the CPU on, I naturally expected to hear . . . what? A new kind of raspy noise, of course! Something in a cool, clean, nerve-shattering, high-tech buzz-saw sound that would harmonize with the basso *Gr-r-r-r-zap* of my 810 and the tenor *Whirr-ir-ir-ank* of my 1050 (a sound that I've just recently gotten used to after four years of living with the thing).

Nothing. Couple seconds wait, and then a DOS menu appears onscreen. Peripheral vision tells me the drive is operational—I can see its little green pilot light. So what gives? I turn off the system and reboot, hoping that premature deafness hasn't tolled the death knell for my musical career.

Atari XF551 Disk Drive

System: Atari 8-bit

Price: $199.95

Summary: Sleek, quiet replacement for the Atari 1050 drive; true double-sided, double-density capability awaits exploitation by a new DOS and compatible applications.

Manufacturer:
Atari Corp.
P.O. Box 61657
Sunnyvale, CA 94088
(408) 745-2000

Again, zip. Forest Lawn. After a few more seconds of stunning silence and a few more of deliberate suspension of disbelief, I am forced to conclude that Atari has finally created a disk drive that makes no sound at all.

XF551 Outside

Yes, folks, it's the end of an era. No more noisy, boxy peripherals for the 8-bit line. Besides being silent, the new Atari XF551 disk drive is svelte, measuring a scant 2¾″ × 7¼″ × 11½″.

Available (to paraphrase Henry Ford) in any color you want, so long as it's gray, the 551 is color- and design-matched to the XE personal computer line. And like the XE, it retains compatibility with older software and hardware while sporting new features and capabilities that put it in a different class from its predecessors.

The front of the 551 is the part users will handle most often, so let's start our overview there. As on the 1050, the front slot on the 551 is just wide enough to admit a disk and is closed by turning a small lever so that it snaps down over the opening, holding the disk in place. Finger recesses to the left of the lever and at the center of the slot provide quick access.

Because it is easy to grasp the edge of a disk and remove it from the drive, you are not so dependent on the return spring for disk ejection as you are on the 1050. This "feature" of the 1050 caused occasional problems, particularly when a write-protect tab came partially unglued while a disk was in the drive, preventing the return mechanism from operating cleanly.

On top of the unit are two rows of ventilation slots, which provide considerably more vent capacity than any previous Atari drive. Because the 551 incorporates a denser circuit board than the 810 or 1050, plus a very standard drive mechanism and controller circuitry, the extra ventilation is probably needed. However, the drive does not seem to get particularly hot in operation.

Moreover, it seems exceptionally reliable in the usual, loosely-stacked arrangement with other peripherals. Left on for days in the steaming attic to which *Explorer* exiles its technical personnel, buried under a 1050 and an SX212 modem, the XF551 showed no signs of unbalance or failure due to heat (unfortunately, I cannot say as much for myself).

At the rear of the drive are the expected two, wedge-shaped serial interface ports, which permit the 551 to be daisy-chained to any Atari 8-bit CPU and to other drives, interfaces, and peripherals (such as the SX212 modem).

The power switch is accessible by reaching around the right-hand side of the rear panel—an arrangement that

By JOHN JAINSCHIGG

works well when your peripheral stack is placed to the right of the CPU and monitor, but that some users might find a bit less convenient than the front-mounted switches on earlier drives.

The 551 has no power-on indicator. The small green pilot light, located to the left of the door lever, is lit only when the drive is being accessed. This could allow you to leave the drive on for long periods, though it seems more or less unaffected by such abuse.

Like older Atari drives, the XF551 is powered by a standard brick-shaped transformer. This keeps the cost of the unit down and makes it more reliable, since fewer components must be included inside the box, and the failure-prone transformer circuit can be kept separate from the guts of the drive. Needless to say, it is easier and faster to replace a transformer than to send a whole drive out for repair, should the worst occur.

Configuring the XF551 to function as part of a daisy-chain peripheral group is done via a pair of DIP switches accessible at the rear of the unit. Assorted combinations of these switches permit you to configure the drive as number 0 (the boot drive), 1, 2, or 3. Thus a total of four drives can be connected to a single CPU.

This recapitulates the configuration arrangement on earlier drives, though the switches on the 551 can be reached more easily than those on prior models (810 users will remember what fun it was to poke pens and screwdrivers into a hole the rear of the drive to reconfigure it, each time you rearranged your setup).

The XF551 and Software

The XF551 is shipped with Atari DOS 2.5, so it can be used in single-density single-sided (90K/disk) and enhanced-density single-sided (130K/disk) modes. It is also completely compatible with DOS 2.0, which permits only SS/SD operation.

When run under DOS 2.5, the XF551 examines disks directly to determine their density, so no special commands are required to use disks formatted to different densities during a single work session. Naturally, under DOS 2.0, the 551 will be unable to read enhanced-density disks. DOS 2.5 provides two separate Format commands for creating disks in either density.

What DOS 2.5 doesn't exploit is the capability of the XF551 to format and use both double-density single-sided (180K/disk) and double-density double-sided (360K/disk) disks. ADOS, an all-new 8-bit DOS currently being written by Bill Wilkinson (who wrote all former Atari DOSes and who collaborated on the original Atari cartridge Basic), will be released by Atari later this year and will allow users to exploit all of the hidden power of the XF551.

Meanwhile, a variety of third-party DOS substitutes (from manufacturers such as ICD, Astra Systems, and others) will let you format and use SS/DD disks in most cases. You should note, however, that these "enhanced" DOSes may be incompatible with certain application programs.

Except for its silence and somewhat (but probably not noticeably) increased speed, the XF551 functions as a plug-compatible (and, at $199.95 retail, price-compatible) replacement for the 1050 drive, working normally with all the software we tested.

When ADOS is released, however, the real spirit of the drive should start to shine through. Higher storage capacity means more than just being able to store more or bigger files and save money on disks. High-performance software requires more mass storage space for basic operations, and though it is possible to perform miracles even in single or enhanced density (as some recent 8-bit releases such as *Atari Planetarium* have demonstrated) the availability of more disk workspace can only improve the quality of software on the 8-bit Atari market. ■

The XF551, like the XE, retains compatibility with older software and hardware while sporting new features and capabilities that put it in a different class from its predecessors.

Seymor-Radix IMG Scan

IMG Scan

System: Atari ST
Summary: Innovative, low-cost scanner produces high quality images
Price: $99.95
Manufacturer:
Seymor-Radix
P.O. Box 166055
Irving, TX 75016

(214) 255-7490

Inexpensive image scanning offers exciting graphics potential for the Atari ST

By DAVID H. AHL

IMG Scan is a simple but clever device that attaches to your printer to produce high-quality black-and-white scanned images that can be used in desktop publishing and other graphics applications.

Physically, the device is no more than a small printed circuit interface housed in a tidy plastic case that plugs into the cartridge port on the left side of the ST. Two slender 4′ fiber optic cables, which terminate in a tiny sensor (actually, simply the ends of the cables), are attached to the interface.

After removing the ribbon from your printer, you attach the sensor to the printhead with tape (a few pieces of reusable metal tape are included in the package), and you are ready to start scanning.

Problems With Printers

The IMG Scan sensor must be taped to the printhead so that the tip is about 1/16″ from the page to be scanned. Normally, the material to be scanned is placed in the printer and advanced by friction feed. With smaller subject matter, you can tape the original to sprocket feed paper.

When you select Scan from the software menu, the printhead makes one pass back and forth across the page. The paper is then advanced by a very small increment—1/216″ or 1/144″, for example—depending upon your printer, and the process is repeated.

The software is designed to work with a wide range of printers, and the distribution disk contains specific configuration files for eight printers: Epson FX and MX series, Gemini 10X, Citizen 120D and MSP-10, Panasonic 1091, Riteman, Seikosha SP-1200AI, Nissho NP-10, and Star LV-1210. If you have one of these printers, or if your printer has a true Epson FX/MX emulation mode, you should have no problems.

If you have some other printer, your potential for problems is much greater. For example, we tried to use IMG Scan with printers made by Mannesmann Tally, Okidata, Toshiba, IBM, and Tandy (none of which had an Epson emulation mode) and, even following the instructions for creating a custom configuration file, could not get any of them to work correctly.

A custom configuration requires that you set four variables in the software. First, you must set the command for a one-time variable linefeed, which is an increment much smaller than a standard linefeed. Three of our printers lacked this feature.

Second, the return delay factor—the time it takes for the printhead to return from the right to the left side of the page—must be set, so the printer does not start to scan a new line prematurely.

Third, you must set the scale factor to determine how often to sample the image cable. This affects the aspect ratio of the scanned image.

Fourth, you may have to change the string of characters—usually spaces—that causes the printhead to move across the page. Unfortunately, some "smart" printers interpret a row of spaces as an 80-column tab and whip the printhead across the page too fast for a scan.

Basically, the older and smarter the printer, the more problems you will have. However, once you have a workable printer/software combination, IMG Scan is a joy to use.

Once you have a workable printer/software combination, IMG Scan is a joy to use.

Easy-to-Use Software

The main menu screen of IMG Scan has five major elements. First is sizing. By setting a slider on an enlarge/reduce scale, you determine the magnification at which to scan. This, in turn, sets the size of a box on an imaginary page, which you can then position over the portion of the image you want to scan. Using sizing, you can set the scan area from the size of a postage stamp to an area approximately 8″ × 7″.

The second menu element offers controls to scan, view, and recalculate an image. Scan simply starts the scanning process. View allows you to view an image or portion that has been scanned. In view mode, the exact value of the gray under the cursor is displayed in the lower left. This feature is very useful in determining how to adjust the gray scale to bring out the parts of your scanned image that you want to emphasize.

Recalc works with the third part of the menu screen, the gray scale adjustment slider and buttons. IMG Scan actually scans 256 levels of gray, but the ST can display only eight gray tones. These controls allow you to assign a certain range of scanned gray levels to each of the eight displayed gray tones.

The color palette adjustment, the fourth part of the menu screen, consists of sliders for red, green, and blue, which allow you to assign a color to a range of gray levels just as the gray sliders allow you to assign a gray tone. This can lead to some very interesting—and bizarre—effects.

The last part of the menu screen is a pulldown menu used primarily for saving and loading images. Images can be saved as *NeoChrome* files or high- or low-resolution *Degas* files. You can also save the raw data (all gray levels), although a low-resolution image requires 64,000 bytes and a high-resolution image a whopping 256,000 bytes.

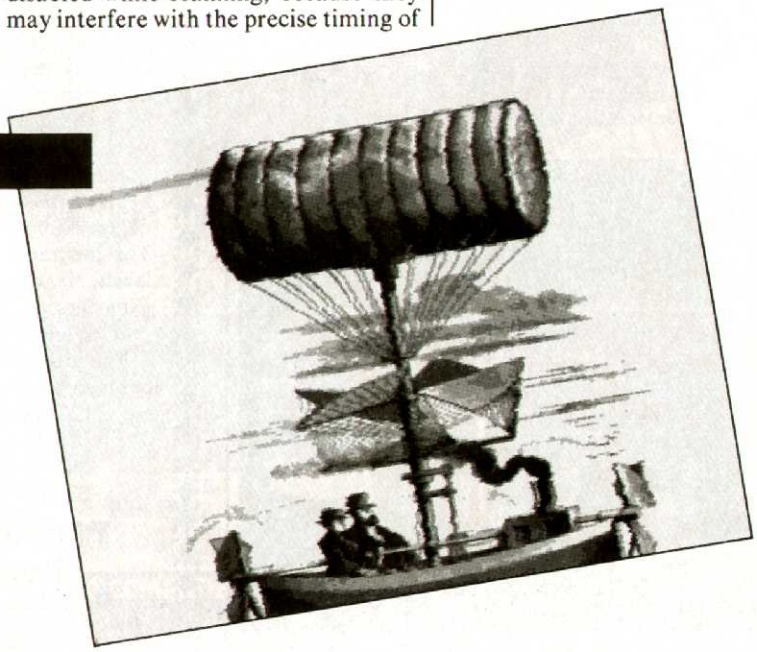
Several shareware utility programs that process raw image files are included on the disk. One rather amazing program, called Laplace, performs a combination of edge enhancement, contrasting, and sharpening. Another program—which the author admits is untested—prints image files on a Postscript laser printer (but not the Atari laser printer).

A README file on the software disk warns that desk accessories should be disabled while scanning, because they may interfere with the precise timing of the scanning software and because they may occupy memory required for the large IMG Scan image buffer. This is especially true on a 520ST.

The README file, coupled with the comprehensive 29-page instruction manual, provides complete documentation for all functions except the use of color. However, a small amount of reasonably intuitive experimentation with the color feature will get you up to speed quite quickly.

Another small annoyance was the instruction in the manual that advises you to practice scanning the photocopy of an image included with the package until it looks like the sample on the disk. Problem one: my package did not contain a photocopy image. Problem two: the images on the disk are in .NEO format and cannot be loaded into IMG Scan, which can load only its own raw data files, so you must exit the program and view the images from *NeoChrome* or Neoshow.

The problems, however, are minor when viewed in the light of the clever innovation and low cost of IMG Scan. All in all, IMG Scan is a marvelous little device that will open up many new artistic possibilities in graphics, desktop publishing, and just plain having fun with your computer. ■



Mouse Master

A practical solution for mouse and joystick users

System: Atari ST and 8-bit

Summary: Switch-operated controller port extender

Price: $39.95

Manufacturer:
Practical Solutions
1930 E. Grant Rd.
Tucson, AZ 85719
(602) 884-9612

Those who use their STs for both business and pleasure will be glad to learn about Mouse Master—a switch-operated mouse port extender from Practical Solutions. Mouse Master lets you attach up to three controllers to the ST, simultaneously, eliminating the inconvenience of plugging and unplugging accessories in the difficult-to-reach mouse and joystick ports.

The Mouse Master is a small, grey box, style- and color-matched to the ST, with an integral cord bearing two female, nine-pin connectors at its business end. These connectors are wired through a switch on top of the unit and extend to three nine-pin, male controller plugs on the side of the unit.

To install, you simply attach one of the plugs on the cord to the ST mouse port, the other to the auxiliary joystick port, and plug your mouse and joysticks into the appropriate ports on the box.

When the switch on the unit is thrown left, the mouse (in the leftmost port of the unit) and the right joystick (in the rightmost port) are active, just as if they were plugged directly into the left and right controller ports on the ST. When the switch is thrown right, the joystick in the center port of the Mouse Master is made active, and the mouse taken offline. Switching from productivity applications to two-player games is a snap.

Because the Mouse Master uses standard wiring, it is also compatible with Atari 8-bit systems (including the XE game system) and controllers. One can imagine it being used to keep two joysticks and a touch tablet attached to an XE computer, or a pair of sticks and a light gun attached to a game system. The unit requires neither batteries nor power supply.

The Mouse Master is a clever device that efficiently eliminates one of the minor annoyances faced by ST owners who refuse to limit the use of their computers to a single kind of application. ■

By JOHN JAINSCHIGG

FIRE AND FORGET

DREAM-UP 45.84.29.79

THE FUTURE IS IN YOUR HANDS ! FIRE AND FORGET ! NEVER LOOK BACK

YOU ARE OUR ONLY CHANCE...

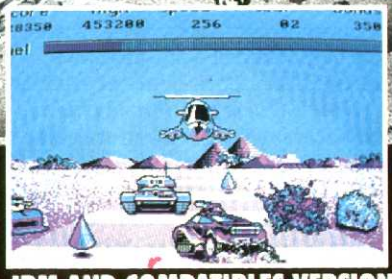
DEALER INQUIRIES WELCOME

TOP SECRET

SOON AVAILABLE FOR COMMODORE 64/128

IF YOUR DEALER DOESN'T CARRY TITUS PRODUCTS THEN HAVE HIM ORDER IT FOR YOU OR ORDER DIRECT BY CALLING: (818) 709-3693

AMIGA VERSION



IBM AND COMPATIBLES VERSION

ATARI ST VERSION

TITUS™

20432 CORISCO STREET, CHATSWORTH CA 91311 PHONE : (818) 709-3693 - FAX : (818) 709-6537

Software Survey

A potpourri of entertaining, educational, and utilitarian software packages

Ultima IV

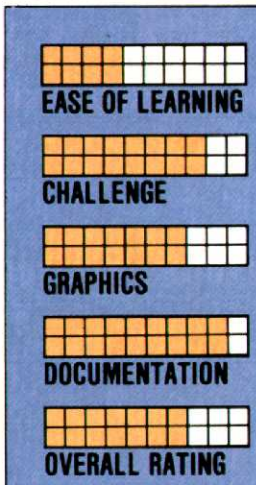
By the time you got to "Friday the 13th Part 4," didn't Jason seem a whole lot less scary? By the time you watched "Rocky IV," hadn't he lost a bit of his punch? Well, don't expect the same reaction when your play *Ultima IV* by Lord British.

It is refreshing to find an adventure game in which the key to success lies in conversing with the hundreds of characters in Britannia to obtain information and then becoming a shining example of virtue and heroism yourself. That last part alone will be enough to scare off many gamers.

That shining example is called an Avatar, and it takes an Avatar to vanquish the evil that pervades the land—evil in the form of physical threats, of course, but more importantly, evil in its most dangerous form as found in the hearts and minds of the Britannians.

As in most adventures, there are mysteries to solve and monsters to kill, but the scope of *Ultima IV* is greater in both purpose and physical area than most of us are used to. There are more than 200 screens for dungeon rooms and combat, and graphics that keep the game moving.

If, however, you like a game you can just boot up and start to play, this is one to avoid. In addition to an eight-page Player Reference Card, there is a 36-page History of Britannia and a 61-



System: Atari 8-bit and ST
Copy protection: Yes
Summary: Challenging high-quality graphic adventure
Price: $49.95
Manufacturer:
Origin Systems
136 Harvey Rd.
Londonderry, NH
03053
(603) 644-3360

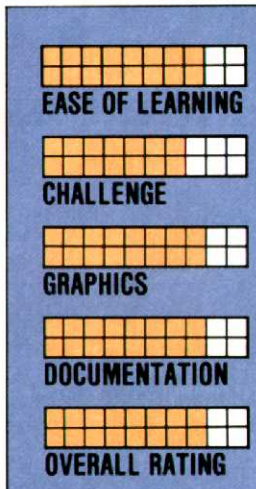
Space Quest II: Vohaul's Revenge

Bad news, guys. Remember that nasty business with the Sariens back in Sierra's *Space Quest*? Well, when you screwed up the Sariens' Evil Plot to rip off the Star Generator, you unknowingly upset the apple cart of one Sludge Vohaul, a guy so repulsive, vile, and socially undesirable that he makes Darth Vader look like Mr. Belvedere. And guess what? He hasn't forgiven you!

That's the background of *Space Quest II*, an appropriately whacky sequel to the original by Two Guys from Andromeda (Scott Murphy and Mark Crowe). The *Space Quest* games follow the overall format and form of the other Sierra Quest games, but add a twisted sense of humor that I find refreshing.

Like the other entries in the Quest series (*King's Quest* and *Police Quest*), *Vohaul's Revenge* is an adventure game in which the always-humble player surrogate (in this case, space janitor Roger Wilco) must travel far and overcome numerous obstacles. The mouse or joystick and elementary parser allow you (as Roger) to issue commands and converse with other characters.

As usual, the graphics are first rate and produced in such a way that the onscreen character can move behind or in front of any object. In the original *Space Quest*, Roger Wilco started the game by hiding in a closet. This time, you find yourself sweeping out an anti-gravity chamber.



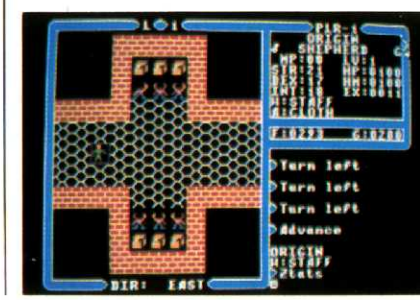
System: Atari ST
Required equipment: Color monitor
Copy protection: Yes, but can be installed on hard disk
Summary: A truly funny space adventure
Price: $49.95
Manufacturer:
Sierra On-Line
Coarsegold, CA 93614
(209) 683-6858
(800) 344-7448

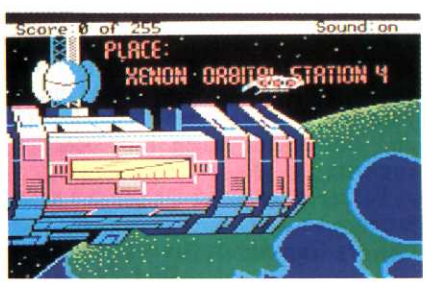
page Book of Mystic Wisdom. That makes 105 pages of preliminary reading. I predict an early death for any adventurer who wanders far without reading all of it and remembering some of it. I'll also wager that only the most steadfast traveler will complete the quest without the *Way of the Avatar*, a hint book Origin Systems offers for an additional $12.95.

To give you a good idea of the depth and variety of this challenge, I need mention only that while your character is on the screen, you have an option for every letter of the alphabet. There are enough spells to exhaust the alphabet, too, but don't expect to create a magical concoction simply by pressing a couple of keys; first the ingredients must be bought and mixed. And it is always a good idea to have a few spells pre-mixed and at the ready, because you never know what you might find.

That is really the beauty of the game. You have so much to discover and so many possible courses of action to pursue that it is unlikely that you will ever grow tired of playing or that the frustration level will ever become intolerable. The latest package from Origin Systems sets a high standard for *Ultima V*.

—Rich Teverbaugh





But it isn't long before you are piloting a space shuttle to the jungle world of Labion, an equatorial pest hole redolent with humidity and unpleasant odors. With much effort, you can eventually reach the *sanctum sanctorum* of Sludge Vohaul himself—a disguised asteroid deathtrap.

Vohaul's Revenge is a delightful example of the Quest play system, but I do think that it is time to upgrade that system a bit. This is especially true of the parser, the system that interprets the commands you type in from the keyboard.

The problem with parsers is that they force you to guess what the program wants you to say and how it wants you to say it. In any situation, there is a limited number of rational options and a large number of ways in which those options can be expressed. Many designers of adventure games, therefore, have replaced parsers with menus that allow you to issue commands simply by clicking on the desired selections with your mouse.

I prefer the menu method and hope that Sierra will consider incorporating it in future releases.

The package includes streamlined game instuctions and a booklet containing more detailed information. The first few pages of the booklet are a mini comic book, which fills you in on the plot of the first *Space Quest*.

Space Quest II takes this game format as far out, both literally and figuratively, as it has ever gone. The characters are funny and the situations are genuinely comical—a combination that makes the game well worth playing.

—Bill Kunkel

Gunship

EASE OF LEARNING

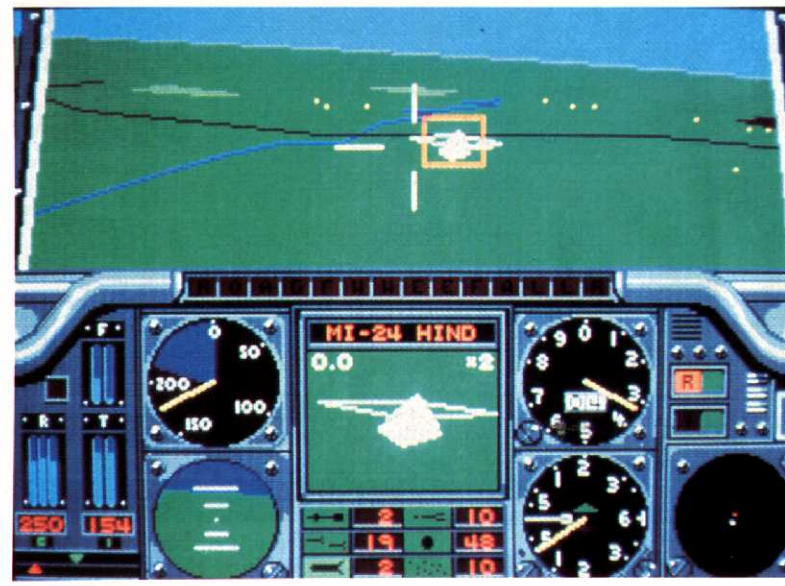
CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST
Required equipment: Color monitor
Copy protection: Yes
Summary: Realistic helicopter combat simulation
Price: $49.95
Manufacturer: MicroProse
180 Lakefront Dr.
Hunt Valley,
MD 21030
(301) 771-1151



Frustrated by complex game systems that require either a memorization course or constant references to the manual to get any enjoyment out of the product? MicroProse has the answer in *Gunship*.

If you have used a complex word processor or spreadsheet, this idea won't seem new at all, and in truth it isn't the idea that is new, but the use of it with a game.

MicroProse furnishes a cardboard cutout that fits neatly around the keyboard and helps you find the keys you need in a moment of crisis. In so doing, it frees you to concentrate on flying the Apache helicopter (no mean feat in itself) and completing the selected mission. And that is a lot more fun than thumbing through the pages of a manual in the heat of battle.

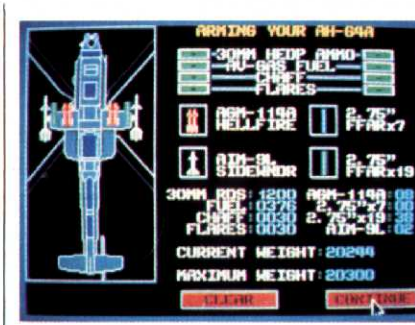
But if prefer the more traditional approach, you will find a user's reference card in the package, too. And don't let these handy additions keep you from reading the manual, which offers nearly 80 pages of crisply written, to-the-point text that includes a step-by-step flight tutorial for players who have never flown a helicopter—which, I assume, includes most of us.

It isn't necessary to read the entire tome just to get into the air. There are, however, a few things that must be done. First, you are presented with a drawing of a vehicle, which you must compare with drawings in the manual and identify before you can proceed. Then, you sign your name on the pilot roster, get an assignment, and select a style of flying (regular, volunteer, or volunteer hazardous).

The main viewing screen is a busy place. In the top half is the view outside the front cockpit window. Below that you see about 20 different guages that report on fuel, airspeed, altitude, heading, and status of weapons.

Flying the helicopter always requires some use of the keyboard, but most of the job can be accomplished with either mouse or joystick. Perhaps because I have been conditioned by other flight simulations, the joystick worked best for me.

Moving the stick forward and back changes the pitch of the nose of the craft, while moving the stick left and right rolls it in those directions. The stick moves in eight directions, so moving it to the lower right-hand corner rolls the Apache to the right and brings the nose up at the same time—a very useful feature when involved in dogfights with the enemy or when you have a missile on your tail.



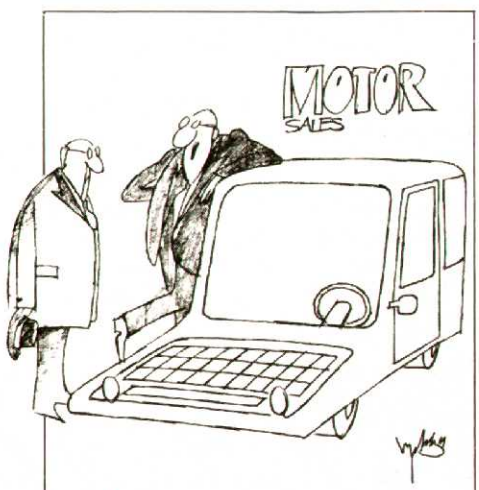
At the end of each mission (providing you make it back safely), you receive a rating based on your success or failure to meet the objectives of your mission. All promotions are noted on your permanent record and saved to disk for the next time you boot up.

The Apache is a serious fighting machine with a price tag of $7.3 million. It can carry 16 Hellfire missiles, 76 FFAR rockets, 1200 rounds of ammunition, 6 Sidewinder missiles, and 6 Stingers, and reaches speeds of up to 220 mph.

MicroProse has done such a fine job with the graphics that at times you really feel as if you are moving that fast; my wife tells me that I lean forward, back, and side-to-side when I'm locked in combat.

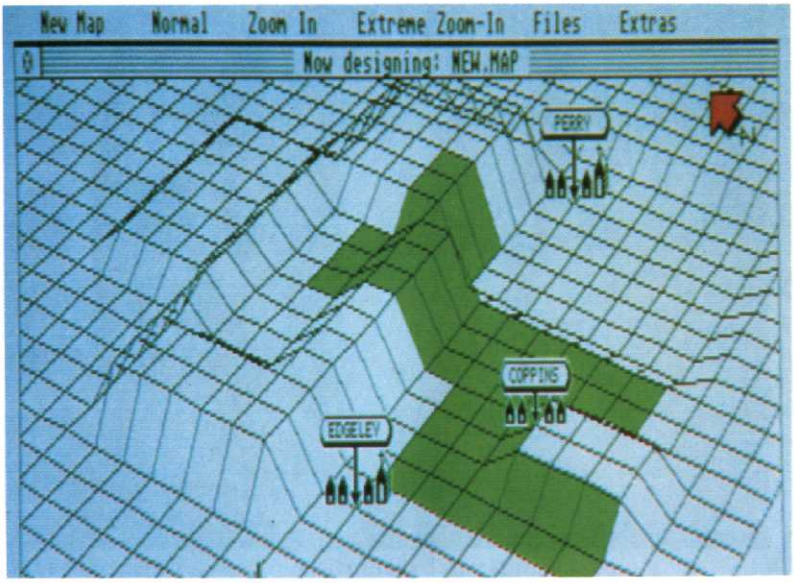
For a real arcade-type combat simulation with a big dose of high technology, try *Gunship*. It has everything.

—Rick Teverbaugh



"This is our micro-commuter."

Universal Military Simulator



EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST

Copy protection: None

Summary: Make-it-yourself military combat simulator

Price: $49.95

Manufacturer:
Rainbird Software
P.O. Box 2227
Menlo Park, CA
94026
(415) 940-6087

It is not my way to get all gushy over game programs; in fact I pride myself on being a pretty tough critic. But this game is different.

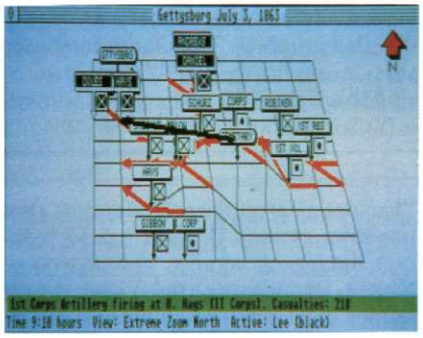
I am not a history buff, nor am I a devotee of war movies, nor do I collect war memorabilia or read military magazines. But I have always enjoyed war games, dating back to the time when there were only board versions and it was often impossible to find an opponent.

Universal Military Simulator is the first computer war simulation that I could run without spending a great deal of time with the manual, though there are two fine pieces of documentation, which I strongly recommend that you get to eventually. But one of the strengths of the program is that you don't have to read it right away.

Instead, I urge you to peel off the shrink wrap, boot it up, pick a scenario, and dig in; you'll be surprised how confident you feel almost immediately. But experienced war gamers need not fear that this game is too simple for their tastes either. There is an astounding amount of detail in *UMS*, but that detail doesn't interfere with the game system or bog it down in any way.

Five scenarios are included with the game, and a do-it-yourself utility and the promise of more scenario disks from Rainbird make the possibilities almost limitless.

The five are: Arabella, a battle between Alexander the Great and Darius of Persia that decided possession of Asia Minor in 331 B.C.; Hastings, a medieval clash set in England in 1066; Marston Moor, where Oliver Cromwell guided young Parliament's army to victory; Waterloo, the last gasp of Napoleon; and Gettysburg, the most famous of our own Civil War battles.



After selecting the scenario, you can have the computer take command of either or both sides. You can allow the machine to choose its own strategy, or you can force it to use an attack or defense strategy. Further, if you pick attack, you can select what type of attack it will be. This option is perfect for playing out "what-if" possibilities.

The graphics of *UMS* aren't something you call your friends to come over and view, but they offer everything you need to supervise the battles effectively. You can view the battlefield from any angle with any of three different zoom perspectives.

Each scenario has two main phases. One allows you to issue orders to the troops, and the other is a movement/battle phase in which the units carry out your orders. The program will automatically zoom in on any action, and you can hit a mouse button to get a detailed report of who won each skirmish, the amount of damage suffered, and the current status of both combatants in several critical areas.

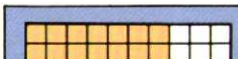
After each series of movement/battle phases and before going back to the next command phase, the program provides an analysis of the battle, detailing the number of contacts between hostile forces, elapsed time of the battle, and the number of casualties suffered by each side.

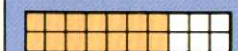
It is quite easy to give orders to the troops. Black arrows mark where the unit has been ordered to move so far in the turn. Once you have finished moving a unit, those arrows turn red to remind you of what you have done. You can also select from four different modes for each unit—attack, defend, maneuver, or reserve.

You can create your own maps and armies, so you can recreate any historical or fantasy scenario. The units can be named, given a strength number, allotted a number of moves per turn, and assigned speed and efficiency ratings (poor, average, crack, or elite.) It is also possible to create nearly any type of terrain for your map; add landmarks, cities, and towns; and select the length of the scenario. You can create anything from Star Wars to World War II to neighborhood skirmishes. The only limit is your imagination.

And it is all so easy to use—even for the novice war gamer. *UMS* is an outstanding product—one that will provide you with many hours of educational entertainment —***Rick Teverbaugh***

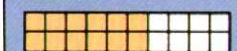
Xevious


EASE OF LEARNING

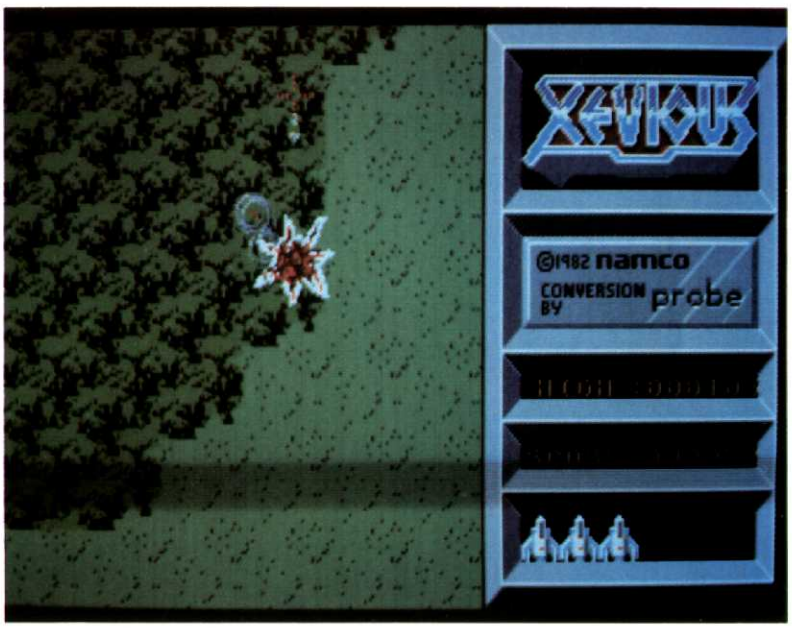

CHALLENGE


GRAPHICS


DOCUMENTATION


OVERALL RATING

System: Atari ST
Required equipment: Color monitor; joystick
Copy protection: Yes
Summary: A good—not great—translation of a coin-op favorite
Price: $29.95
Manufacturer:
Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
(312) 480-7667
(800) 221-9884

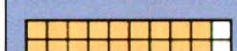


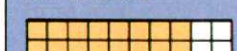
Namco's Xevious was one of the most popular coin-op games of the arcade-crazed early 80s, and Mindscape's excellent adaptation (translated by Probe) shows ST users why. Pronounced "ZEE-vee-us," the original version (produced by Atari in the U.S.) offered a new perspective on action combat games—an overhead view rendered in richly colored, highly detailed graphics. This home computer version duplicates its coin-op inspiration to a flaw.

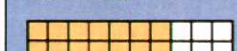
You pilot an attack craft called a "solvolu" past a gauntlet of air and ground forces while moving above the surface of a verdant alien world in search of the opposition's mothership. The vertically-scrolling landscape abounds with visually stunning topography, from lush, green forests to glit-

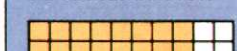
Uridium


EASE OF LEARNING

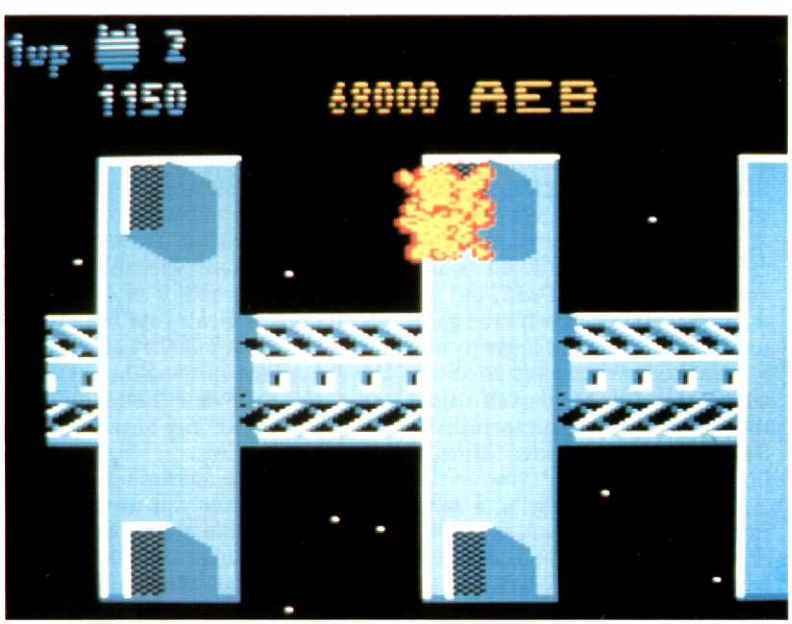

CHALLENGE


GRAPHICS


DOCUMENTATION


OVERALL RATING

System: Atari ST
Required equipment: Color monitor; joystick
Copy protection: Yes
Summary: Exciting science fiction arcade game
Price: $39.95
Manufacturer:
Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
(312) 480-7667
(800) 221-9884



Andrew Braybrook's *Uridium* is that rarity among entertainment programs: a great science fiction arcade game that is not a coin-op translation. Even though it wasn't birthed in an arcade, *Uridium* looks, sounds, and plays like the very best coin-op shoot-out.

You are cast in the familiar role of "last defender of the solar system" (not our solar system; this one has 15 planets), facing off against a squadron of Super-Dreadnoughts. These aptly named mega-ships resemble vast metallic cities, bristling with smaller spacecraft, deadly weaponry, and bad intentions.

The gimmick here is that each of the 15 planets under attack mines a specific metal on which life depends. When the supply is exhaused, life ends. You begin at the Zinc level, and when you have destroyed the Super-Dreadnought in orbit around that planet, you advance to the next level, then the next, right up to level 15, Uridium.

You pilot a unique spacecraft dubbed

tering, high-tech ground installations.

You must use a combination of evasion and aggression to survive the farrago of attack ships and ground-based anti-solvolu fire. Fortunately, the solvolu is armed with both bombs and cannon. The cannon fires straight ahead in the tried-and-true arcade manner, but the bombs behave in a unique manner. A bombsight is attached to the front of the solvolu, and when you have a target lined up in the crosshairs, the fire button launches the bomb. The program simultaneously fires the cannon and drops bombs, and as long as the fire button is held down, bombs will continue to fall.

As mentioned earlier, this version of *Xevious* duplicates is predecessor "to a flaw," and that flaw is the only thing that mars an otherwise excellent game. Unfortunately, the game restarts from the beginning after each sovolu is destroyed. This old coin-op device, which forced the player to start over on every turn has, thankfully, been eliminated in many play-for-pay parlors by a new feature that allows you to drop another token in the machine and pick up play from the point at which you lost your last life/ship/weapon.

In a home game, the point is not to increase revenue by shaking tokens from the player's pocket. You have already purchased the game and unlimited access to it. So why shouldn't you have the option of picking up where you left off if you want to?

The game also lacks the most rudimentary features of home entertainment software. The instructions are absurdly slim and include almost no information on the game or how to play it. Nor are you offered a pause feature or a way to restart the game once play has begun.

But there is no missing the fact that *Xevious* looks and sounds great. The music might tend to get on your nerves after a while, particularly as the theme song overlaps the start of play, thereby eliminating sound effects for the first few seconds. Once the sound effects kick in, however, the music drops in volume and provides a nice, frenetic background score.

Xevious is a very good translation that could have been great if only Mindscape had requested a few simple changes to make it more appropriate for home users. Nevertheless, fans of the coin-op version should be delighted by the ST version. —***Bill Kunkel***

a Manta fighter, which resembles the sea creature of the same name and is notable more for its maneuverability than its weaponry (nothing more impressive than a standard laser cannon). You control your vertical approach to the Super-Dreadnought by moving the joystick forward and back. Speed and direction are controlled by moving the stick left and right.

The use of these four simple commands, coupled with the vivid graphics on your screen, permits a fantastic range of movement and maneuvers. Loops, rolls, and full reverses are all available to you—and all quite necessary to your (unlikely) survival.

The graphics are absolutely stunning. A horizontally-scrolling display offers an overhead view of both the Manta and the Super-Dreadnought. Because you must be able to discern the altitude of the Manta at a glance, tremendous care has been lavished on the details of the vast surface of the Super-Dreadnought. Each girder and bulkhead is delineated with painstaking care, and the game itself has the glistening veneer of the highest quality computer graphics.

The action begins as your Manta is launched from an "intergalactic teleporter," which transports it into the vicinity of the first enemy craft. Polishing off a Super-Dreadnought is no milk run, even on the lower levels. These lethal leviathans can only be beaten by first destroying their defenses—waves of fightercraft which take several stafing runs to obliterate. Once enough of the fighters are taken out of action, the message "Land now" appears on screen, indicating that the Manta can touch down on the master runway at the far right end of the Dreadnought.

You land your craft and enter the "fuel rod chamber." Once inside this chamber, you can not only destroy the Super-Dreadnought and advance to the next level, but you can also pick up bonus points by timing the destruction to take place while the bonus indicator is on.

The game comes with both a well-written instruction/background booklet and a quickstart card that details loading instructions, commands, and game options (including a permanent score board, a pause feature, and a choice of one or two players).

Uridium is an exciting, compelling game experience, featuring state-of-the-art visuals and excellent ST sound effects. It is hard to imagine anyone who enjoys action games not being impressed by *Uridium*. —***Bill Kunkel***

Moebius

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST
Copy protection: Yes
Summary: Humane graphic/arcade adventure
Price: $39.95
Manufacturer:
Origin Systems
136 Harvey Rd.
Londonderry, NH
03053
(603) 644-3360

I like *Moebius*. It is one of the best adventure games I have seen for players who enjoy the added challenge of arcade elements on top of the strategy and puzzle-solving normally found in role-playing games.

Moebius is an easy program to like for several reasons. First, it doesn't require a lot of reading. I like to read as much as the next person, but in games, the play's the thing and *Moebius* plays well. The documentation package consists of a six-page Player Reference Card and the 24-page Book of Moebius. That's it. Instead of 100 pages or more and three or four reference tools, you have only two booklets and barely 30 pages of information to soak up.

Before you can actually begin to play the game, however, you must take training in the use swords, martial arts, and mind control. If you are an impatient adventurer, this process may be tedious, but once you're out there, you'll thank Moebius the Windwalker for his diligence in assuring your proficiency.

To pass the martial arts and sword-fighting phases of your training, you

must take on palace guards or assassins until you defeat one by using a sword and one by using your hands and feet. If you want a real challenge, take on the assassin; if you prefer to get on with the game, choose the palace guard.

At this level you can select from nine different speeds for the arcade action. The range is from television-like super slow motion to a more dangerous real-life pace.

As a test of your ability to discipline your mind, you are required to keep a randomly moving orb contained in a box using the arrow keys on the keyboard. This is probably the hardest part of the test.

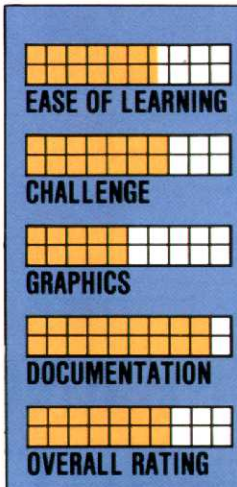
The graphics make the environment look quite attractive, but don't be fooled; the island kingdom of Khantun is an evil and dangerous place. A renegade warlord has stolen the magic Orb of Celestial Harmony and plans to destroy the balance of natural forces that maintains peace and harmony throughout the land.

It is, of course, vital that you defeat the bad guys and reclaim the elusive Orb, but it is almost as important that you avoid injuring innocent local residents along the way. *Moebius* doesn't reward a slash and burn strategy.

The animation for the arcade elements is smooth and about what you would expect from Origin Systems. The music and sound effects are useful but not extraordinary.

The game fills both sides of two disks, so be prepared for several saves and as many as 100 hours of actual playing time. After all, we're talking about saving a kingdom here. ***—Rick Teverbaugh***

Wargame Construction Set



System: Atari 8-bit and ST

Required equipment: Color monitor

Copy protection: Yes

Summary: Do-it-yourself wargame generator

Price: 8-bit, $29.95; ST, $34.95

Manufacturer:
Strategic Simulations
1046 N. Rengstorff Ave.
Mountain View, CA 94043
(415) 964-1353

Wargame Construction set is first and foremost exactly what the name implies—a scenario builder that is more than just a frill appended to another game. The eight included scenarios are, more than anything else, examples to help you understand the game system. It is a tutorial that will painlessly make it easier for you to create your own battles, based on history or your own imagination.

There is a limit to the scope of the battles you can create. For example, only 31 units are available for the map at any given time. Each unit is rated in 12 categories—firepower, defense, assault, movement, strength, range, fire type, unit type, transportability, dig-in capability, and anti-tank capability. If you are designing a scenario to be played by one player against the computer, you also need to pick an aggression rating for the opponent.

You can also create your own map for the fray, choosing from icons that represent roads, rivers, woods, bridges, buildings, and mines.

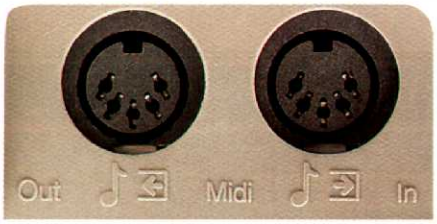
The titles of the included scenarios give you a good idea of the versatility of the program: Rommel's 88s, To Cross a River, Abuse the Meuse, Return to Beta 4, Delta Force Rescue, Fulda Gap, First Bull Run, and Castle Siege. Roger Damon, who designed *Wargame Construction Set*, created the first four scenarios himself and had guest designers help with the final four.

The documentation suggests starting with Return to Beta 4 as an introduction, but I found that one a bit dull, not to mention very difficult to win. I suggest starting with Delta Force Rescue, because it is taken right from today's headlines and is somewhat easier to win, because you have only 16 units to keep track of on the map.

Wargame Construction Set gets high marks for versatility and fairly good marks for playability. What the game lacks as much as anything is a sense of style and pizzazz. It does almost everything you could want it do; it just doesn't do it with any flair. Perhaps there really shouldn't be anything slick or glamorous about military conflicts and the destruction they cause, but I'll leave that thought for another article.

Wargame Construction Set is reasonably priced and includes a game, a construction utility, and a well-written 27-page manual. I recommend it as a good value for those who are interested in wargames. Just don't expect it to fulfill your fondest wishes for gaming excellence and excitement.

—Rick Teverbaugh



THE DIFFERENCE BETWEEN A COMPUTER THAT MAKES MUSIC, AND ONE THAT MAKES TROUBLE.

Of all the personal computers you can buy to make music, none makes it easier than Atari computers.

That's because, unlike the others, the Atari 512-kilobyte 520ST™, 1-megabyte 1040ST™, and 2- and 4-megabyte MEGA™ computers have more of what you need already built-in.

Here's what we mean.

MIDI. The Key to Electronic Music.

As you may already know, the MIDI interface is the key to electronic music.

If you're unfortunate enough to not be working with an Atari, you'll have to buy an interface separately.

And make sure it's compatible with the rest of your equipment, not to mention your software.

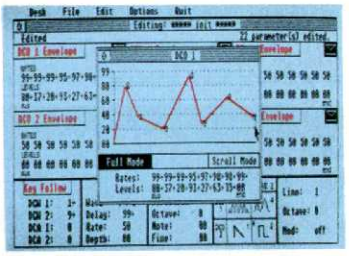
And then you'll have to make sure everything is installed correctly.

What's that like?

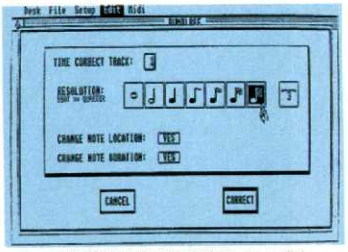
You know the song, "What are you doing for the rest of your life?"

Atari ST™ and MEGA computers, on the other hand, have a MIDI port built right into the back of the computer.

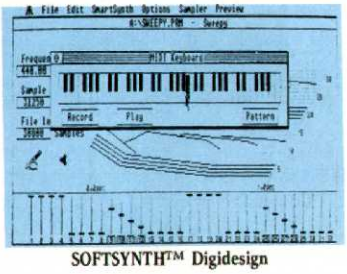
So you can connect all kinds of equipment—synthesizers, samplers, drum machines, SMPTE controllers, pitch-to-MIDI converters—as easily as plugging into an amp.



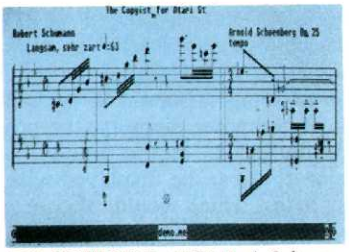
CZ-ANDROID™ Hybrid Arts™



MIDISOFT STUDIO™ Passport™



SOFTSYNTH™ Digidesign



THE COPYIST™ Dr. T's™ Music Software

A Musician's Music Box.

No other computer company has made the commitment to music and musicians the way Atari has.

That commitment, by the way, doesn't end with our hardware.

We're working in harmony with all the major music software houses to produce the software you want to make music with.

And building a distribution network of music dealers—not computer dealers—who know electronic music well enough to help you, no matter how much you know.

This Should be Music to Your Ears.

The Atari ST and MEGA computers are just parts of a full system. So there are lots of things you can add when you're ready.

Like our MEGA File 20™ 20-megabyte hard disk for storing your magnum opus.

And our SLM804™ laser printer for publishing it.

Plus one of the largest libraries of music software in the industry.

But perhaps the nicest thing about an Atari is how little it costs.

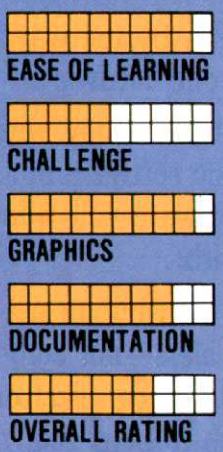
With what you save on an Atari, you could buy yourself a synthesizer. And some software.

Want to learn more? Write or call for the name of the Atari music dealer nearest you.

ATARI®

Atari Corporation • Attention: Music • 1196 Borregas Avenue • Sunnyvale, California 94086 • Tel: (408) 745-2367

Micro League Wrestling



System: Atari ST

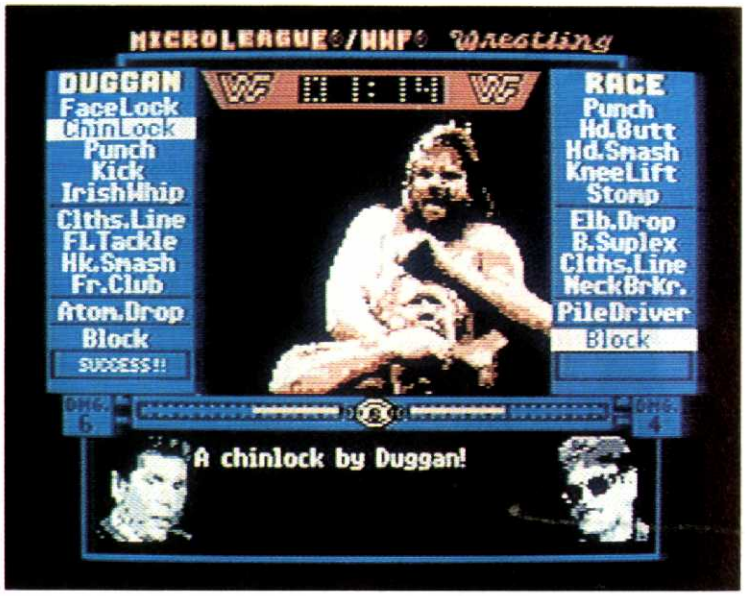
Required equipment: Color monitor

Copy protection: Yes

Summary: Wrestling match with digitized action

Price: $49.95

Manufacturer:
Micro League Sports Assn.
2201 Drummond Plaza
Newark, DE 19711
(302) 368-9990



A fascination with professional wrestling is sweeping the country. The theatrics of Hulk Hogan and George "The Animal" Steele, the intimidating monikers of Rick Rude and Jimmy "Superfly" Snuka, and the sheer power of Andre The Giant all provide heavy doses of camp. Some people even think of it as sport!

To fuel the fire, Micro League Sports Association has created a software version of the squared circle. In this offering, MLSA has used digitized action shots to bring these battles to your monitor.

When you boot up the program, you choose the match you want to play—Hulk Hogan vs. Randy Savage or Hulk Hogan vs. Paul Orndorff (MLSA promises additional match disks in the future)—a time limit (up to 60 minutes), and whether you want to have the computer or another person play the opposing manager. After that, you can sit back and watch the feisty interviews and pre-fight announcements scroll across your screen, or you can go directly to the ring.

The game can easily be played without reading the manual, but you will find some useful information in it. Each wrestler has a series of moves listed on the sides of the display for selection by mouse, keyboard, or joystick. When you choose a maneuver, the computer takes over and, based on the players' strength and damage levels, determines whose move will be used. A few frames forming a digitized sequence are page-flipped for a semblance of action, and banter from Vince McMahon and his associates on the status of the combat appears as text onscreen.

Micro League Wrestling reminds me a little of the arcade games of old that employed video disk players to mix real video images with computer graphics, even though the resolution of the screens, while nicely shaded to minimize jaggies, can't match the quality of a video recording. Also, due to the constraints of computer memory, the program is limited as to the amount of animation that can be displayed without disk loads, which would, of course, destroy the real-time feel of the game.

The game disk can be moved to a RAM or hard disk for quicker loads, but I found that this method conflicts with use of the extra data disks. It appears that the program looks for a folder called DATA to load a match, and overwriting the original DATA folder with a new match doesn't work correctly.

I'm not much of a wrestling enthusiast, but *Micro League Wrestling* is fun to play with. I did, however, find it a bit boring to view the same moves over and over, even though the software is designed with a random aspect to keep each match different. Picking up other match disks when they are released, is probably the only way to keep your ringside perspective from getting stale.

—Andy Eddy

Print Power

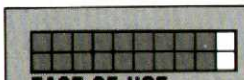
Print Power is a fine printer product for Atari 8-bit computers. At $14.99, it is less expensive than other popular graphic printing systems for the Atari, and it has advanced features that many of its competitors lack.

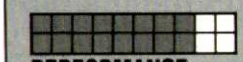
The package includes two 5¼" flippy disks, an instruction booklet, a card showing examples of all available borders and images, and a list of the 24 printer drivers, among them, the Atari XMM801.

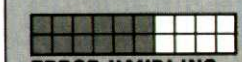
Print Power uses a series of menus to walk you through the creation process to the final printout. Menu selections are easily made with the arrow keys.

The disks are in 1050 enhanced density mode and not copy-protected. If your Atari has more than 64K of RAM, the program uses the extra RAM to

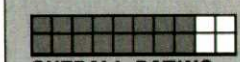
Juggler


EASE OF USE


PERFORMANCE


ERROR HANDLING


DOCUMENTATION


OVERALL RATING

System: Atari ST

Version reviewed: 1.0

Copy protection: None

Summary: Two STs are better than one

Price: $59.95

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

Not too long ago, MichTron released a product called *The Juggler*. It was designed to allow a user to keep two or more applications resident in memory at once and switch back and forth from one to another. Unfortunately, the list of programs that would run with *The Juggler* was shorter than most users found acceptable.

Wanting to keep the concept alive, MichTron programmer Tim Purves (author of the program) ran back to the lab and created a second program, which he named Juggler II. The combination of these two programs in one package now lives up to the original expectations of most ST users.

Let's make one thing clear from the start: *The Juggler* does not allow multitasking. When it was first released, many people thought that it would allow them to start a telecommunications file transfer, then run off to a quick game of *Airball* while the transfer took place backstage. Unfortunately, *The Juggler* does not allow that.

It is, instead, a switcher, which lets you keep more than one program resident in memory simultaneously. If, for example, I am reviewing a program, I can boot it, use *The Juggler* to switch to my word processor, then bounce back and forth between the two as I write the review.

If both applications are properly written in GEM, Juggler I will be able to toggle between the portions of RAM that they inhabit.

The second method, Juggler II, actually divides the RAM of your ST into equal parts, treating each section as a separate computer, and is particularly powerful if you own a Mega. You can even boot in different resolutions with different desktop configurations. The Alernate-Shift combination or the *The Juggler* accessory program swiches between partitions. It is nothing short of amazing to press the key combo, hear the telltale bing, see the screen fade, and watch another desktop appear.

Of course, the nature of the program dictates that it be left unprotected on the disk, allowing you to move required files to your AUTO folder and boot disk. The installation process is explained clearly in the documentation.

MichTron lives up to its reputation for user support by offering a free upgrade to any registered user of the pre-Juggler II package. All you have to do is call for authorization and then return the original program disk.

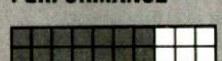
As mentioned above, I have used *The Juggler* to confirm information in my reviews, switching from the program under test to my word processor and back again, and found it very handy. Of course, if you crash one side of your *The Juggler* partition, the other dies with it, so you must take some care with your data.

Lastly, while the list of incompatible software has been trimmed, there are still some programs, such as games that autoboot, which beat the system. I was, for example, really looking forward to keeping *Oids* in one partition to provide needed relaxation while I worked on a program in the other, but it was not to be. Tim Purves has hinted that a fix to this problem is in the offing.

The Juggler is a well-written package that will allow you to switch between most of the software packages you own. If you regularly use your ST for more than one application, you will soon begin to wonder how you ever got along without *The Juggler* —***Andy Eddy***


EASE OF USE


PERFORMANCE


DOCUMENTATION


OVERALL RATING

System: Atari 8-bit

Required equipment: Disk drive

Copy protection: None

Summary: Capable card/banner/letterhead maker

Price: $14.99

Manufacturer:
Hi Tech Expressions
584 Broadway
New York, NY 10012
(212) 941-9073

speed up the printing process.

With *Print Power*, you can design and print cards, signs, posters, flyers, banners, and letterheads. Cards can be printed in three styles: double-fold wide, double-fold tall, and tent. Signs and posters can be printed vertically, horizontally, or in a half-page layout.

Type sizes vary according to the document being printed. Cards are limited to three type sizes, but banners can have up to 11. Each of six different fonts can be printed in any of six special effects modes, including bold, italic, outlined, "jazz," shadow, and raised.

As you plan your creation, you have 40 borders patterns and 60 images from which to choose. Borders can be ½″ or 1″ wide and can be positioned on any combination of the sides of a printout. Images can be sized at 1″, 2″, a quarter page, a half page, or a full page.

Print Power uses an interesting device to show you how your finished product will look. The lower half of a split screen shows the words being typed, while the outline of the page appears in the upper half. The outline shows exactly where the text, graphics, and border are positioned. As text is typed, it can be automatically centered or right- or left-justified.

The only complaint I have about *Print Power* is the speed (or lack thereof) with which it prints out. Although having extra RAM reduces printing time, you may want to plan your printouts to take place around meal times, so you will have something to do while you wait.

If, however, print speed is not an important consideration for you, I recommend *Print Power* as an excellent, inexpensive way to give vent to some of your creative urges. —***M. E. Bennett***

ICD FA-ST Hard Disk Drive

Enormous capacity and reliability—a winning combination

Megabytes of hard disk storage space are a lot like peanut M&Ms—5 are good, 10 are better, and even after 20, you still want more. Well, to satisfy your appetite, ICD has released a line of hard disk drives ranging from 20Mb up to 100Mb, with a mind-boggling 280Mb unit promised for the near future.

Some of the appealing features of the ICD drives include built-in clock with battery backup, low-noise fan, ability to boot directly from the hard drive, and expansion port for connecting additional hard drives.

The ICD drive is housed in a tidy enclosure with short adjustable legs on the front, which serves as a monitor stand. (It's about time somebody got around to making a sensible size and shape enclosure.) The case measures a bit over 11″ square by 2¾″ high. Colored the same creamy gray as the Atari ST, the drive has a green power on and red drive-in-use indicator toward the left front.

Megabytes of hard disk storage space are a lot like peanut M&Ms—5 are good, 10 are better, and even after 20, you still want more.

The case can accommodate one or two drive mechanisms. ICD currently uses 20, 30, and 50Mb mechanisms, so finished drives are available with capacities of 20, 30, 40, 50, 60, and 100 Mb. The 20 and 30Mb mechanisms have an average access time of 60 ms, while the 50Mb mechanism has an average access time of 35 ms. We tested the FA50ST, a unit with a single 50Mb mechanism installed.

Getting Set for a Test Drive

When they leave the ICD factory, FA-ST drives are formatted and partitioned; 20 and 30Mb units are divided into two equal partitions; the 50Mb unit is divided into four equal partitions. If you don't like this partitioning scheme, a README file and a program on an included 3½″ floppy disk can be used to reformat and repartition the hard disk drive.

To use the drive, you connect the DMA cable from your ST to the hard disk drive, plug in the power cord, turn on the drive (the switch is in the back, darn it), wait for the heads to unpark and initialize (about 10 seconds), and turn on your computer. The FA-ST drive autoboots, and the desktop comes up with the current configuration displayed.

The FA-ST drive has a built-in clock on the Host Adapter board inside the case. A program in the AUTO folder reads the clock when the system is booted and sets the computer clock accordingly. Resetting the clock does not require a special program; you simply use the standard ST control panel. Unlike some other ST clocks, the time is not displayed in the upper right corner of the screen. However, the time and date are appended correctly to files when they are saved.

The Atari ST operating system has a bug that causes the time and date of your files to be wrong when you copy them from one place to another. A COPYFIX program that comes with the FA-ST drive solves this problem by monitoring GEMDOS activity and setting the correct time and date in all new and replaced files.

In total, the FA-ST drive comes with some 19 programs, most of which are used to configure and format drive mechanisms from different manufacturers: Adaptec, Rodime, Seagate, and Xebec. Our unit happened to have an Adaptec drive mechanism, so had we wanted to alter the partitioning, we would have used the program for the Adaptec 4000.

Dreadful Documentation

The documentation for the FA-ST hard disk, like the documentation for so many other peripherals, is poorly written and poorly organized. Everything you need is there, but it isn't always easy to find the information you want.

In addition to assembled drives for the Atari ST, ICD also makes hard disk drive kits for the Atari and other computers. Hence, you get a manual, the first 14 pages of which are an assembly guide for the kit version of the FA-ST drive. In general, you can ignore this section, if your drive has already been assembled.

This do-it-yourself guide is followed by an 8-page section that deals with setting up and formatting your drive. Some, but not all, of this section applies to users of pre-assembled drives. For example, you can ignore the part about setting up a format data file with loads

By DAVID H. AHL

ICD FA-ST Hard Disk Drive

System: Atari ST

Prices: 20Mb, $699.95; 30Mb, $949.95; 50Mb, $1099.95; 2 × 20Mb, $1149.95; 2 × 30Mb, $1349.95; 2 × 50Mb, $1699.95

Summary: Hard disk drive with clock, autobooting, low-profile housing, and ability to daisy chain additional drives

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

of fun-to-know information about cylinders per drive, head parking cylinder, buffered step rate, interleave pattern, bytes per sector, etc. Other parts of this section, such as the instructions for setting the clock, parking the head, and connecting a second hard disk drive to the ICD unit, do apply.

The page-and-a-quarter of troubleshooting information and separate half-page titled "FA-ST Hard Drive Notes" are among the most useful items in the box.

Taking the FA-ST Out For a Spin

So what does an average access time of 35 ms, burst data rate of 500K bytes per second, and sustained data rate of 30K bytes per second mean in the real world? Well, I'm never quite sure how to translate numbers like these, so I simply loaded in some largish data files and started copying them, stopwatch in hand, from one partition to another.

At the beginning of a partition, it took about 45 seconds to copy ten 32K *NeoChrome* image files. As the partition began to fill up—after saving, say, 100 image files (3.2Mb)—it took about 94 seconds to copy the same ten images, or three times as long as at the start of the partition. As the partition continued to fill, copy time continued to increase.

We ran a similar—but not identical—test on an Atari SH204 hard disk and recorded considerably less degradation as the partitions filled up. For example, with 3.2Mb in each partition, the SH204 was still copying ten image files in less than a minute, and with 10Mb in each partition, the Atari drive copied the ten files in 72 seconds.

Like speed figures, error rates are difficult to relate to the real world. A soft error rate of 1 in 10^{10} bits, hard error rate of 1 in 10^{12} bits, and seek error rate of 1 in 10^{6} seeks is meaningless to most users. So we simply set the drive to loading and comparing 300 large (32K) files over and over—actually for several 48-hour stretches—looking for errors. With the exception of one system crash, which was apparently the fault of the program, performance was flawless—and very impressive!

We did, however, have one curious problem with our FA-ST when, after loading about 1.2Mb of files into partition E, it simply refused to take any more. Selecting Show Info indicated 10.7Mb free, but the drive would not accept another byte. ICD technical support recommended zeroing the directory of Drive E using the ICD Utility program; we did so, and the problem was cured as mysteriously as it appeared.

If you already have another hard disk drive and want to daisy chain it to your new FA-ST, you can do so, but some changes must be made. If you simply plug your existing drive into the "out" connector on the FA-ST, your system won't come up at all, and you run the risk of causing a major disaster in your system.

Before you can use another drive, you must set it to a SCSI device identification code other than zero (the FA-ST drive must be device zero). With the Atari SH204, you must open the case and set the internal DIP switch to 7 (three switches on); with a Supra or Astra drive, jumpers can be set to 1, 2, 3, etc. Formatting, partitioning, and data on these drives are not compromised by the change in SCSI ID number.

By the way, in addition to a DMA output port for another hard disk drive (or other DMA device), the FA-ST also has a SCSI output port for additional expansion. At the moment, there are no devices that require such a connector available, but it is nice to have for the future.

ICD does not have a toll-free technical support line, nor do they have a large technical support staff, but every time we called, either we spoke immediately with a support technician or our call was returned within an hour.

After two months of sporadic heavy use, our FA-ST drive is still performing like a champ. It most definitely does not like to be moved—even a little bit—when it is on, and if you forget and jostle it, it will appear to forget everything it ever knew just to give you a mild heart attack.

But despite this inconvenience, the minor problems noted above, and the miserable documentation, we have been generally quite pleased with the FA-ST. We especially like the built-in clock, the quick and easy booting from the hard drive itself, the sensible housing design, the whisper quiet fan, the ability to daisy chain additional hard drives, and the full one-year warranty, which demonstrates ICD's confidence in the product. ■

Topics in ST C-language programming: The file selector

C Life

By JOHN JAINSCHIGG

The GEM AES, or Application Environment Services package, gives you,the programmer, considerable power to create custom user interfaces. Clearly, however, not every part of a program profits from customization. Operations common to most programs—accepting filenames prior to loading things from or saving them to disk, warning the user of error conditions, asking for confirmation before proceeding with an irrevocable operation such as file erasure, etc.—are best provided for in some fashion that remains constant from one application to another. From the programmer's viewpoint, this saves time. From the user's, it provides a familiar frame of reference, which makes GEM applications easy to learn and use.

Alert boxes and the File Selector are built into GEM to encourage standard approaches to common tasks. Learning how to program with them is a good first step toward learning how more advanced AES resources can be employed. Used imaginatively, moreover, these high-level AES functions can go a long way toward giving a program GEM "look and feel," without the concomitant effort of custom resource design.

The AES Application Framework

Applications that employ the AES are obliged to announce their coming and going so that their actions can be coordinated with other system functions. The function appl_init( ) is used to link a program into the GEM application environment; its opposite number, appl_exit( ), serves to unlink the program and prepare it for termination. (Note: appl_exit( ) does not terminate the application, but only detaches it from GEM services. A program may continue to perform "cleanup" tasks even after relinquishing access to AES via appl_exit( ).)

What this translates to in programming terms is a standard AES application framework that begins with a call to appl_init( ) and ends with a call to appl_exit( ).

Appl_init( ) returns a GEM *application handle*, which AES uses in referring to your program when it passes messages. However, unless your program employs a menu bar, providing access to desk accessories, or exploits other functions of the AES screen manager (such as event monitoring), this can be ignored. The basic AES application framework is shown in Figure 1.

Alert Boxes

Alert boxes are general-purpose dialogs containing an optional, attention-getting icon (exclamation point, question mark, or stop sign), up to five lines of text, and up to three labeled buttons.

The function form_alert( ) is used to place on-screen an alert box with which the user can interact using the mouse. Form_alert( ) takes two arguments. The first is an integer from 1 to n, where n is the number of exit buttons specified, indicating which of these buttons should be displayed in outlined form and treated as the default option (remember, GEM lets the user press Return to choose the default option in a dialog box). The second is a character pointer referencing a string of the form: "[i][text][button(s)]".

Each element of the alert specification string is set off by square brackets. The first element, i, is an integer from 0 to 3, drawn from the list in Figure 2, and specifies which icon you want displayed in the alert.

The second field is for the text you want displayed in the alert. From one to five lines of text can be specified, with line breaks marked by the vertical line symbol used to signify binary OR in C. The lines of text should be of approximately equal length to avoid confusing the algorithm used to lay out the alert box, and no single line of text should contain more characters than will fit on one-half of a single screen line. This may mean that you have to reformat alert box texts for use at different screen resolutions.

The last field contains text used to specify the labeling of the exit buttons you wish to offer (from one to three). It should consist of no more than 20 characters of text in all, and labels for multiple buttons should be separated by the vertical line character.

The form_alert( ) function returns the number of the button used to exit the alert—1, 2, or 3. Figure 3 shows a sample alert box specification, calling sequence, and return processing code.

Using Alerts

Alerts are normally employed when the user must be made aware of a particular circumstance or condition, or to ask the user whether to go ahead with an irreversible operation. There is no reason, however, to limit their use to these situations. The alert box is, after all, a dialog, and with a little imagination it can be used to accept many different kinds of input from a user.

```
#include <aesbind.h>      /* AES bindings */

main()
{
appl_init();              /* Announce application */

/* Main program code goes here */

appl_exit();              /* Detach application */
}
```

Figure 1.

```
0 - no icon
1 - exclamation point
2 - question mark
3 - stop sign
```

Figure 2.

For example, alerts can be used to select among a small number of options at any point in the execution of a program. Figure 4 shows a function that employs alert boxes with which the user can specify a default disk drive for future disk operations. The function performs a bit of string manipulation to adapt its alert text to conditions. The function is limited to use on systems with three or fewer real or virtual drives, because each drive must be assigned its own button in the selector alert.

Three TOS functions are used in this example. The first, Dgetdrv( ), returns the current drive in the form of an integer, 0 for drive A, 1 for drive B, 2 for drive C. The second, Drivemap( ), returns a long bitmap of drives attached to the system. If bit 0 is 1, drive A is attached; bit 1 references drive B, and so on. The third function, Dsetdrv( ), serves to set a new default drive. It accepts an integer argument like that returned by Dgetdrv( ).

File Selectors

File selectors are somewhat more difficult to manage than alerts, only in that one is obliged to perform disk operations both to prepare for their use and to process their output. Fsel_input( ) is used to display and activate a file selector. It takes three arguments: a pointer to a character buffer containing the current path, including drive specification and wildcard; a pointer to a buffer containing a default filename; and a pointer to an integer in which the number of the exit button pressed by the user will be placed.

The contents of the two buffers can be modified freely by the user in the course of searching through the file system and specifying a filename. Thus the buffers must be of adequate size to accommodate the longest possible path (66 characters) and filename (12 characters), plus terminating nulls. The function fsel_input returns 0 if all went well, -1 on error.

Once space for the buffers has been reserved, the usual course of action prior to calling fsel_input( ) is to determine the current drive and path and assemble a legal path string, terminating in an appropriate wildcard expression. This can be done conveniently using the TOS functions Dgetdrv( ), which returns the current drive in integer representation, and Dgetpath( ), which places a string representing the current path in a character buffer that you specify. Figure 5 shows a function that accomplishes this, placing the current path in a buffer referenced by a pointer passed to the function.

The next step is to call fsel_input( ) and process the information it returns. Before fsel_input( ) is called, a wildcard expression of some sort must be appended to the end of the string in the pathname buffer. This wildcard expression will be used by fsel_input( ) to determine which files to display during its

```
#include <aesbind.h>

main()
{
char *alert =
"[1][This is a sample|alert box spec.|It's several lines|\
long. You like?][Si!|Nyet!]";
int ret;                /* return code */

appl_init();            /* Announce GEM application */

/* Display alert, encouraging user to enter a positive response
   by designating the first button as the default */

ret = form_alert(1,alert);

/* Interpret results */

if(ret == 1) printf("Good show!\n");
else printf("... evidence of a lack of good taste, I think.\n");

appl_exit();            /* Detach from GEM prior to exit */
}
```

Figure 3.

```
#include <osbind.h>             /* OS bindings */

newdrive()                  /* Sets and returns selected drive */
{
int ret,i,c = 0;
long map,v = 1L;
char s[128] = "[0][Current drive is X:|Select default drive.][A:";
char d[3] = "X:";

s[22] = Dgetdrv() + 'A';
map = Drivemap();
for(i = 0;i < 16;i++){
     if (map & v){
          d[1] = i + 'A';
          strcat(s,d);
          if (c++ > 2) break;       /* No more than 3 drives! */
          }
     v = v << 1;
     }

Dsetdrv(ret = form_alert(drive + 1,s) - 1);
return(ret);
}
```

Figure 4.

An alert box is, after all, a dialog,* and with a *little imagination it can be used to accept many different kinds of input from a user.

Figure 5.

```
#include <osbind.h>

char path[66];

get_current_path(path)
char *path;
{
int drive;

*path++ = ((drive = Dgetdrv()) + 'A';
*path++ = ':';
Dgetpath(path,drive);
}
```

```
#include <aesbind.h>
#include <osbind.h>
#include <stdio.h>

get_filepointer(s)
char *s;
{
static char path[66],file[12];
int button,i;
FILE *fp;

get_current_path(path);

strcat(path,"\\*.*");

do{
     do{
          if(!fsel_input(path,file,&button) || button == 1) return(NULL);
          } while(*file == '\0');

     i = strlen(path);
     while(path[i] != '\\') path[i] = '\0';
     strcat(path,file);
     } while((fp = fopen(path,s)) == NULL);

return(fp);
}
```

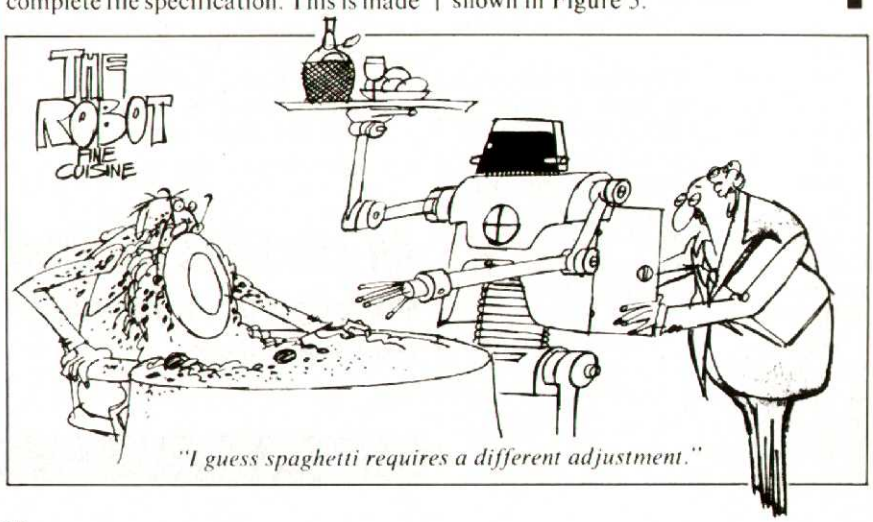
Figure 6.

first pass. If the user changes directories, the universal wildcard expression (*.*) will be automatically appended to the pathname string during subsequent passes.

Once fsel_input( ) has done its work, the job of interpreting the information it returns remains. Before exiting, the function returns the default drive and path to their original values. Thus if the user has selected a new drive and path as a function of searching for his file, no record of this remains except for the information stored in the modified path buffer.

It is, therefore, necessary to append the filename returned by the function to the path buffer in order to produce a complete file specification. This is made more complex by the fact that the path string is terminated by a wildcard expression, which must be removed. (Naturally, this is unnecessary if the user has chosen CANCEL.)

A function to handle all of the possible fsel_input( ) return results is shown in Figure 6. It accepts an I/O type string of the kind used with the stdio function fopen( ) (r, read; w, write; rb, read binary; wb, write binary, etc.) and returns a FILE pointer that can be used to reference the newly-opened file. The value of this pointer will be NULL if the user selects CANCEL or if something goes wrong with fsel_input( ). The function assumes the presence of the related function get_current_path( ) shown in Figure 5. ■



"I guess spaghetti requires a different adjustment."

INDEX TO ADVERTISERS

Atari Explorer

The User-Friendly Computer Magazine

Why did you originally buy an Atari computer? To do word processing? To compose music? To manage your business? To play games? Chances are, whatever your initial reason for buying an Atari, you've discovered that it has many additional capabilities and potential applications.

The flip side of the coin is that you've probably experienced some frustration as well. Maybe your word processing package won't do subscripts or underlining. Perhaps your database won't sort on as many fields as you need. Or, it could be that when you write a program, your whole system acts user-hostile.

Depending upon the balance between your satisfaction and your frustration, you may continue to use your computer or set it aside. But there is a better way: **Atari Explorer**.

As the premier magazine for Atari computer owners, it is our responsibility to make sure that you get the most out of your computer. To us, that means making sure your Atari does more than you bought it to do, more than friends' and associates' computers do, and more than you ever imagined a computer could do.

To make sure that you get the most out of your computer, **Atari Explorer** brings you objective, in-depth reviews of hardware and software; up-to-date information about new products; practical tutorials; stimulating columns; thought-provoking articles; and valuable inside information.

Hard-Hitting Evaluations

At **Atari Explorer**, we obtain new peripherals and software packages as soon as they are released. We put them through their paces in our on-site laboratory and also in the environment for which they are intended—home, office, lab, or school.

Our evaluations are unbiased and accurate. We are not afraid to call a spade a spade or a lemon a lemon. Our first obligation is to you, our readers, and editorial excellence and integrity are our highest goals.

Practical and Stimulating

We know that some of our readers are beginners and others are experts. Thus it is our responsibility to make what we publish both comprehensible to newcomers and interesting to veterans. That does not necessarily mean that the material is simple; we know you like to be challenged. What it does mean is that we provide the inexperienced user with every possible means to seize the subject matter and make it his own.

However, we don't want the experts to be bored, so although articles are accessible to beginners, they are theoretically non-trivial, cover topics in depth, and present information on more than one level.

At **Atari Explorer**, we are intensely interested in all aspects of computing. Ours is the magazine of pragmatic applications, communicative graphics, stunning animation, mind-expanding games, and realistic simulations. We take our business seriously, but we have fun too. We are convinced that you will, too, when you go exploring with the **Atari Explorer** family.

A Great Deal! Guaranteed!

To order your subscription to **Atari Explorer**, simply fill out the coupon and mail it to the address below. There is no risk; if at any time your are not completely satisfied, we will refund the unfilled portion of your subscription—no questions asked.

By subscribing now, you'll be on the inside track to Atari—the company, the people, and the products—you won't miss a single information-packed issue, *and* you'll save 16% to 25% over the newsstand price. Act today!

Send to: Atari Explorer
CN961
Netcong, NJ 07857

Yes! Please enter my subscription to **Atari Explorer** at the money-saving rate I have checked below.

	USA	Canada*	Foreign*
6 issues	☐$14.95	☐$19.95	☐$24.95
18 issues	☐$39.95	☐$54.95	☐$69.95

*Checks must be in US funds and drawn on a US bank.

My computer is: ☐ST ☐8-bit ☐Game System

Name _____

Address _____

City _____ State ____ Zip ____

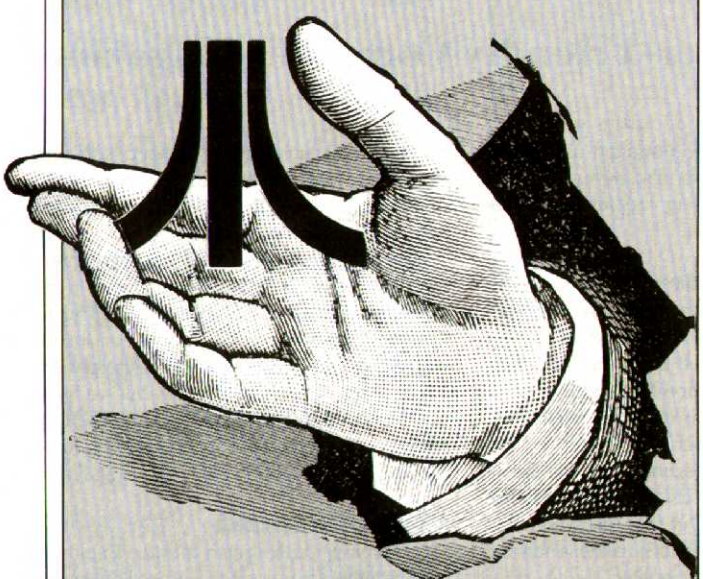
☐ Payment enclosed ☐ Visa ☐ MasterCard

Credit card number _____

Expiration date _____ Signature _____

Send to: Atari Explorer, CN961, Netcong, NJ 07857-0961.

Real programmers don't eat quiche, part II; simulating IF . . . THEN . . . ELSE in 8-bit Basic; and a stern warning



User Friendly

By OWEN LINZMAYER

User Friendly is dedicated to sharing the best material culled from the dozens of Atari user group newsletters sent to our editorial offices each month. These newsletters range from several photocopied pages stapled together to professionally typeset publications that rival the quality of consumer magazines.

All of the reprints found here appear with the gracious permission of their authors and the publishers of the newsletters in which they first appeared. While very attempt is made to retain the style and flavor of the original, most items are edited for length and clarity.

Note to newsletter editors: If *Atari Explorer* is currently on your user group's mailing list, please check the address. Many groups are still sending their newsletters to us by way of Sunnyvale—a route that adds weeks to the delivery time. If we are not already on your mailing list, we would like to be. Please send all newsletters to *Atari Explorer* at 7 Hilltop Rd., Mendham, NJ 07945.

Real Programmers Don't Eat Quiche, Part II

•Real programmers don't read manuals. Reliance on a reference book is the hallmark of the novice and the coward.

•Real programmers don't write in RPG. RPG is for the gum-chewing dimwits who maintain antiquated payroll programs.

•Real programmers don't write in APL unless the whole program can be crammed into one line.

•Real programmers don't write in Lisp. Only sissy programs contain more parentheses than actual code.

•Real programmers disdain structured programming. Structured programming is for compulsive neurotics who were prematurely toilet trained. They wear neckties and carefully line up sharp pencils on an otherwise clear desk.

Real programmers never write memos on paper. They send memos via electronic mail.

•Real programmers don't like the "team programming" concept. Unless, of course, they are the Chief Programmer.

•Real programmers never *write* memos on paper. They *send* memos via electronic mail.

•Real programmers have no use for managers. Managers are a necessary evil. They exist only to deal with personnel bozos, bean counters, senior planners, and other mental midgets.

•Real programmers scorn floating point arithmetic. The decimal point was invented for pansy bedwetters who are unable to think big.

•Real programmers don't believe in schedules. Planners make up schedules. Managers firm up schedules. Frightened coders strive to meet schedules. Real programmers ignore schedules.

•Real programmers don't bring brown-bag lunches to work. If the office vending machine sells it, they eat it. If the vending machine doesn't sell it, they don't eat it. Vending machines don't sell quiche.

Since publishing the first installment of "Real Programmers Don't Eat Quiche" in our March/April 1988 issue, we have come across several variations on the theme. The above is attributed to an unknown author and appeared in the Jan/Feb 1988 issue of the SBACE Gazette, the official publication of the South Bay Atari Computer Enthusiasts, P.O. Box 83668, Los Angeles, CA 90083.

Simulating IF . . . THEN . . . ELSE in Basic
by Matt Pritchard

If you have ever tried to translate a program from another computer into Atari 8-bit Basic, you have probably encountered the ELSE statement, a statement that tells the program what to do when the criterion of an IF . . . THEN statement is not satisfied. For example:

```
100 IF X>4 THEN GOTO 500 : ELSE  GOTO 400
```

To translate this into Atari Basic you could use the following:

```
100 IF X>4 THEN GOTO 500
110 GOTO 400
```

This method, although acceptable, is not the most efficient. And if you are translating a program, the similarity in form is lost—and an extra line is added to the program.

Contrary to popular belief, there is a way to simulate an IF ... THEN ... ELSE statement in Atari Basic. But this simulation does have its limitations. Specifically, if the ELSE statement in the original program is not followed by a GOTO command, the THEN statement must be. Confused? Read on.

Ok ... so how do we do it? It's simple, really; we just replace the IF ... THEN with ON ... GOTO and drop the ELSE statement. For example:

Operator	Replacement
>	<=
<	>=
=	<>
<> or ><	=
>=	<
<=	>

Table 1.

```
100 IF X>4 THEN GOTO 500 : ELSE  GOTO 400
```

becomes:

```
100 ON (X>4) GOTO 500 : GOTO 400
```

We have turned the IF ... THEN statement into a Boolean comparison by placing parentheses around the expression X>4. If the comparison is evaluated as true, then the command immediately following (GOTO 500, in this example) is executed. If the comparison in parentheses is not true, the first command is skipped, and the next command on the same program line is executed.

But what if the command following the THEN statement (that which will be executed if the Boolean comparison is true) is something other than a simple GOTO? This can be handled as well. Just reverse the ELSE and THEN parts of the program line by changing the operator and following the Boolean comparison with a GOTO command. (This is why either the THEN or the ELSE statement must be followed by a GOTO command). For example:

```
100 IF X>4 THEN PRINT "4+" : GOTO 500 : ELSE GOTO 400
```

Using Atari Boolean Logic, we have:

```
100 ON (X<=4) GOTO 400 : PRINT "4+" : GOTO 500
```

The rules for reversing the comparison operators are very simple. Table 1 shows the correct replacement operators.

How much simpler can it get? Here's one last example. What if both the THEN statement and the ELSE statement contain a GOTO? Well, then an even more efficient method can be used. For example:

```
100 IF X>4 THEN GOTO 500 : ELSE  GOTO 400
```

becomes:

```
100 ON (X<=4) GOTO 400 : GOTO 500
```

But better yet ...

```
100 ON (X>4)+1 GOTO 400,500
```

The ON ... GOTO statement instructs the computer to go to one of several possible program lines, depending on the value of a Boolean comparison, expression, or variable. Boolean comparisons equal 1, if true, or zero, if not true. So in the example above, if X is indeed greater than 4, then the Boolean comparison is true and equates to 1. Adding 1 to the Boolean comparison tells the computer to GOTO the second (1+1) line number (i.e., line 500).

Reprinted from the January 1988 issue of Keeping Pace, a publication of the Pittsburgh Atari Computer Enthusiasts, P.O. Box 13435, Pittsburgh, PA 15243, which reprinted it from the Washtenaw Atari User Group Newsletter. ■

Achtung! Alles Lookenspeepers

Das computenmachine is nicht fur gefingerpoken und mittengrabben. Ist easy schnappen der springenwerk, blowenfusen, und poppencorken mit spittzensparken. Ist nicht fur gewerken by das dummkopfen. Das rubbernecken sightseeren keepen hands in das pockets—relazen und watchen das blinkenlights.

Reprinted from the February 1988 issue of Computah, "The Premiere Utah Atari Journal," published by the Atari Computer Enthusiasts of Salt Lake City, P.O. Box 26664, Salt Lake City, UT 84126. ■

Chat services—
too much of a good thing
can make you an addict

Teletalk

By PAMELA J. STEMBERG

Interactive "chat" services are a major draw on national networks such as Compuserve and Genie. Each night, network users from all over the world convene, disembodied, to communicate with one another via modem, keyboard, and screen, negotiating an egalitarian medium that by its nature and design, dissolves the social barriers of nationality, race, class, appearance, age, and gender, as easily as it overcomes the practical barriers of geography.

You've read the ads: "Last night we had a party for 20 people and only used one glass!" Interactive chat services promise quick friendship, camaraderie, and a chance to share interests and enthusiasms—all for a small hourly fee. More than information online, electronic shopping, or any of the countless other services that large networks provide, it is electronic chat that seems to bring the utopian promise of the "electronic global village" into the realm of everyday experience. For most users, the chat services fulfill this promise, becoming a rewarding diversion in a lifestyle that remains well-balanced both on- and off-line.

For a small but growing number, however, the urge to chat online becomes compulsive. Eventually, it can come to constitute an addiction that, in its own way, is as disruptive as the compulsive use of alcohol or drugs and that can lead to debauchery and dissolution on much the same scale as these more conventional abuses.

The Medium is the Message

Hooks for the potential addict are embedded both in the physical nature of computer chat and in the peculiar online culture it supports. Typically, a user's experience with chat begins some time after he masters the more straightforward, "non-realtime" portions of the system—databases, special interest forums, and other menu-driven services—and achieves a degree of confidence in network navigation.

Ironically, when he enters chat mode for the first time, the user discovers that his new-found skills are all but useless. Chat mode software is typically command- rather than menu-driven, and in most cases, one is obliged to type commands into a continually scrolling display filled with a welter of incoming and outgoing messages.

The effect is immensely confusing and a bit frightening, causing some new users to stop and exit gracefully (or not so gracefully), abandoning interactive chat to those with flatter learning curves and faster reading speeds. Most, however, jump right in and start plugging away, eventually getting the hang of the commands and skills needed for basic communication.

This is no trivial task. Commands available to a user of Compuserve CB are similar in number to those available under MS-DOS, comprising methods for checking who is online, moving from channel to channel (the CB service simulates aspects of communication by Citizen's Band radio), monitoring conversations on one channel while participating on another, moving in and out of private (one-on-one) and small-group conversation modes, etc.

Other skills that must be mastered by the new user include the ability to read scrolling text at high speed and the art of following the sense of multiple, simultaneous conversations. When one finally achieves mastery, two quick payoffs are in store: the sense of being in control of the medium and the sense of being (finally!) able to communicate.

These psychic payoffs—a feeling of self-control coupled with a sudden freedom of self-expression—are similar to the cognitive benefits of alcohol and drugs reported by certain compulsive users. Yet for such benefits to induce the cycle of addiction, there must be other payoffs as well—more subtle "pleasures" that reinforce the repetition of behavior until habit patterns are formed.

Anonymity and Other Pleasures

Ironically, these are not difficult to identify, for they revolve around the same aspects of interactive chat that make the medium such a revolutionary proving ground for new styles and methods of communication.

Chat brings people together without obliging them to make any of the normal physical or psychic effort required for self-presentation. One can "attend" an interactive chat session without wor-

rying about what to wear, without fretting about transportation, without concern for any of the logistic or causal details that govern a normal social life.

The medium of interactive chat—keyboard and screen—renders the physical traits of its users null and void. Ethics alone obliges users of the service to represent themselves in ways contingent on physical reality. Nor does the medium afford its users the opportunity to judge one another according to physical characteristics or the visible aspects of personal style.

In using interactive chat, one is obliged to conform to the rhythm of communication established by the technology. Because users of interactive chat communicate via messages of limited length and because all have access to functions that can mask the communications of others on a selective basis, it is impossible for the very aggressive or the very articulate to dominate a chat session. Turn-taking and brevity of expression are enforced by the medium.

These factors would seem to combine to create a uniquely non-threatening environment and a most democratic and egalitarian forum for conversation. Unfortunately, the sense of liberation granted by ease of access, freedom from prejudice, and the rule of order becomes all too easily perverted in individual cases.

Easy access to the surrogate social world of telecommunications can encourage laziness, isolation, and the abandonment of normal social life with all its painful obligations and constraints. Freedom from prejudicial judgment and physical limitation can be interpreted as license to exploit anonymity and indulge fantasy—mostly in the adoption of new personae and modes of behavior that would be scandalous or dangerous in the physical world.

The rule of order and the enforcement of brevity—forces that would seem to encourage efficiency, directness, and honesty in conversation—seem instead to encourage the development of ritual modes of communication; the acronymic phrase RUMF? ("Are you male or female?") is a standard introductory line on the nets.

In recognizing the theoretical promise of the medium, on the one hand, and the scurrilous reality, on the other, the chat user is left in a position of cognitive dissonance. This conflict between myth and reality is not unlike that faced by drinkers in resolving the myth of good fellowship promoted by the drinking culture with the facts about the real effects of alcohol.

In both cases, the "normal" personality tends to caution, tempering belief in the ideal by remaining aware of its pernicious aspects. The addict, by contrast, uses the ideal to rationalize his own abandonment to those pernicious aspects—aspects which are, in the final analysis, the real attractants.

The Way of All Flesh

The result of addiction to interactive chat resembles—particularly in its extreme stages—the result of alcohol or drug abuse. Diminishment of affect, abandonment of normal social life, dissolution of primary relationships, job absenteeism, and ultimately, financial ruin.

You think I'm kidding? John Robbins (name changed), a computer company executive, suffered two bouts of telecommunications addiction, the first involving Compuserve's CB simulation, the second involving a prototype system not yet available to the general public. At the culmination of the second, more severe, cycle, he reported spending upwards of 260 hours per month online, incurring charges ranging from $6 to $12 per hour.

At this level of use, he had effectively abandoned normal social life. His friends disappeared. His wife insisted that he seek counseling after learning that he had been carrying on an affair with a network playmate he had never met face-to-face. His job performance suffered due to his exhaustion and lack of motivation.

After one credit card was cancelled because he could not pay the bills he had run up online, he began to run up charges on a company network account, which occasioned further disputes with his superiors at work. Ultimately, Robbins was forced to abandon all network usage—to quit "cold turkey" to avoid destroying his life completely.

This is "no joke" pathological behavior, and Robbins is by no means a unique or exceptional case. More spectacular abuses—and more devastating consequences—are commonly related on the nets.

Moreover, although the most severe damage is reserved for the relatively small number of dyed-in-the-wool addicts, even the most superficial research into the use of chat services reveals a pattern of situational abuse that seems to affect the majority of users at one time or another. In the same way that most of us can remember a period in our lives during which we drank too much or committed other excesses due to circumstance, it seems that many chat users routinely go through a period of excess before settling down to more circumspect habits.

Interactive chat services promise quick friendship, camaraderie, and a chance to share interests and enthusiasms—all for a small hourly fee.

In most cases, circumstantial addiction terminates upon receipt of the first budget-breaking bill for connect time. But even then, there is ample opportunity for the true addict to postpone the inevitable or to deny reality completely. In general, networks insist on payment by credit card or automatic cash transfer—"invisible" debits that are relatively easy to ignore—at least for a time.

Recently, Compuserve has instituted a "commitment plan" for CB simulator usage that permits the purchase of membership in a CB Club. Members of the club pay from $25 to $100 per calendar month to enjoy reduced rates for usage and exemption from higher connect charges during daylight hours.

A $100 per month investment allows the user to take advantage of a special rate of $1.00 per hour of connect time. Thus, one could spend 100 hours online in a given month for a total cost of

On-Line Directory

Many Atari software publishers and hardware manufacturers have on-line representatives available to help answer questions, solve problems, and keep in touch with their customers. This support is usually provided free of charge and complements the conventional technical help hotlines that most firms operate.

The benefits of on-line support include direct access to top personnel, prompt and thorough replies, and savings in long distance telephone calls to company headquarters.

Printed below is a partial list of companies that may be found on the CompuServe and Genie telecommunications networks. The individuals assigned to these accounts will usually reply to inquiries promptly or, at the very least, direct your comments to the appropriate employees within their company.

Company	Compuserve	Genie
Analog	72337,13	-
Antic	76703,1077	ANTIC
Argonaut	72247,3661	-
Atari Canada	70007,1070	J.OKLAMCAK
Atari Corporation	70007,1135	NHARRIS
Atari Corporation	-	MJANSEN
Atari Developer Support	-	CINDY.C
Atari Developer Support	-	ATARIDEV
Atari Developer Support	-	APRATT
Atari Explorer	76004,1616	EXPLORER
Atari Journal	75046,476	J.DURRE
Atari Technical Support	-	DMAY
Atari Technical Support	-	DANSCOTT
Atari Technical Support	-	TOWNS
Avant-Garde Systems	73537,617	AVANTGARDE
Beckemeyer Development	74236,625	-
Brosis	72637,144	-
Circular Logic	73147,3171	T.MCCOMB
Comnet Systems	72655,1231	M.SINGER
Data Pacific	76004,1612	DAVESMALL
Dolphin	73245,1001	M.GIAMBRUNO
Drafix	76703,4226	-
FTL Games	76244,130	FTL
Factory Programming	-	JWEAVERJR
Focus Computer	72767,2563	-
Groundglass Systems	76410,267	GROUNDGLASS
Hi-Tech Advisers	-	HITECH
Hybrid Arts	76237,562	S.DAYSTROM
ICD/OSS	76004,1600	ICDINC
Iliad	76246,1051	DL.SHOWALTER
Infocom	76703,4270	-
Intersect	76004,1577	INTERSECT
Interstel	73637,3032	INTERSTEL
Kyan	73225,450	KYAN.SOFT
Magic Elf	73637,317	-
Marathon Computer Press	75766,505	GRIFJOHN
Megamax	73766,1027	MEGAMAX
Merrill Ward & Associates	-	D.R.SULLIVAN
MichTron	76004,1607	GORDON
Migraph	-	MIGRAPH.KCM
Navarone	76004,1666	-
Neocept	73637,1066	NEOTRON
Pecan Software Systems	71310,105	-
Practical Solutions	74206,356	PRACTICALS
QMI	76004,1601	QMI
Reeve	-	REEVESOFT
Regent	76004,1573	F.COHEN
ST Applications	-	STAPPLIC
Seymor-Radix	-	T.PAINTER
Sierra On-Line	76701,222	SIERRA
Softlogik	75046,476	J.DURRE
Softrek	-	W.BUCKHOLDT
Stardust	74030,3712	-
Supra	76004,565	SUPRATECH
Synergist	-	SYNERGIST
TDI Software	75026,1331	-
The Computer Room	76625,1210	-
Timeworks	72347,3017	-
UltraBasic	72347,1643	-
Virtusonics	70007,1565	-
Visionary Systems	76224,66	COREY
WordPerfect	72447,3427	JRWILSON
World Music	-	MOORE.R
Zmag	71777,2140	-

$200—this, as opposed to about 18 hours of connect time for the same amount of money at standard night rates. Since total network credit on Compuserve between payments is an average of $700 per account, the opportunity for truly grandiose abuse is very real.

The Cure—One Day at a Time

The cure for telecommunications addiction—as for so many other compulsive behaviors—involves many steps. Admission that one is powerless over the addiction and that one's life has become unmanageable is but the first in an irreducible series of reparative and restorative actions centering around maintaining and reinforcing a state of total abstinence. In other words—the addict must stop using the system entirely, then take coherent steps to repair the damage the addiction has caused and eliminate, insofar as possible, the root causes of susceptibility.

In most cases, circumstantial addiction terminates upon receipt of the first budget-breaking bill for connect time.

This is best not done alone. In France, where videotex has been, for some time, available on a wide scale, its potential for abuse is somewhat better recognized than in the US, and rehabilitative programs have been instituted. Unfortunately, no TA (Telecommunicators Anonymous) program yet exists to address the specific concerns and problems of the American telecom addict—though as videotex services and their users increase in number over coming years, such programs will surely appear.

In the meantime, those who require aid are encouraged to seek private counseling and to review the materials and literature distributed by Alcoholics Anonymous, which outline a uniquely successful 12-step program for the maintenance of sobriety that has proven effective when applied to a variety of compulsive syndromes. ■

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 a new listing or program update.

8-Bit Programs

Action, ICD/OSS	3.6
B/Graph, Electronic Arts	1.1.1
Bank Street Writer, Broderbund	1.0
•**Blazing Paddles**, Baudville	04422
•**Celebrity Cookbook**, Merrill Ward	1.04
Chipmunk, Microdaft	3.03
ComputerEyes, Digital Vision	1.3
•**Desktop Performance Studio**, Virtusonics	1.4
Draper Pascal, Draper	2.0
•**Elite Personal Accountant**, Clearstar Softechnologies	3.0
Enhancements To Basic II, Hathaway Electronics	5.0
First XLent Word Processor, XLent	2.1
FlashBack, ICD/OSS	1.4
Guitar Wizard, Baudville	11602
Kyan Pascal, Kyan	2.02
•**Lightspeed C**, Clearstar Softechnologies	3.0
MagniPrint II+, Alpha Systems	4.0
MYDOS, Supra	4.3
PaperClip with Spellpak, Electronic Arts	2.1
Parrot II, Alpha Systems	2.8
Print Shop, Broderbund	1.0
Print Shop Companion, Broderbund	1.0
QuickCode, Stardust	1.1
Scanalyzer, Alpha Systems	3.6
SpartaDOS Construction Set, ICD/OSS	3.2D
Super Archiver, Computer Software Services	3.02
Top-DOS, Eclipse	1.5a
Top-DOS Plus, Eclipse	1a
Top-DOS Professional, Eclipse	1c
TypeSetter 130XE, XLent	1.4
TypeSetter 48K, XLent	1.3

ST Programs

1st Word, Atari	1.06
1st Word Plus, Prospero	2.02
Aegis Animator, Aegis Development	1.20
Agenda, Inagem Technologies	1.5
Alice Pascal, Looking Glass	6.05C
APL.68000, Spencer Organization	1.9
•**Athena II**, Iliad	23716
•**Award Maker Plus**, Baudville	1.8
Backup, MichTron	1.12
BB/ST, QMI	1.3
BBS Express ST, ICD/OSS	2.02
CAD 3D, Antic	1.04
•**Celebrity Cookbook**, Merrill Ward	1.60
•**Church Manager**, Hi-Tech Advisers	1.32
•**ComputerEyes Color**, Digital Vision	1.0
ComputerEyes Mono, Digital Vision	2.5
Copy II ST, Central Point	2.2
Cross-16, Memocom Development Tools	2.0
Cyber Paint, Antic	1.0
Dac-Easy Accounting, Dac	1.0
Dac-Easy Payroll, Dac	1.1
Data Manager ST, Timeworks	E 2.04
DataTrieve, Abacus	4.0
dbMan, Atari	1.1
Degas Elite, Electronic Arts	1.02
DeskCart, QMI	1.62
DigiSound, Alpha Systems	1.2
Disk Library, Classic Image	1.2
Dollars & Sense, Monogram	1.2
•**DynaCAD**, ISD Marketing	2.3
EasyDraw, Migraph	1.1
Edit-8000, Savant Audio	1.33
EZ Calc, Royal	1.0
First CADD, Generic	1.6
Flash, Antic	1.1
Fleet Street Publisher, Spectrum Holobyte	1.11
•**Fontz**, Neocept	2.13
Fortran for GEM, Prospero	2.027
GFA Basic, MichTron	1.13
Hard Disk Accelerator, Beckemeyer Development	1.05
•**Hard Disk Toolkit**, Beckemeyer Development	1.0
•**Hi-Tech Accounting Series**, Hi-Tech Advisers	1.04
Informer, Regent	1.8
Interlink ST, Intersect	1.2
Inventory Manager, Regent	1.2
Inventory Master, Royal	3.00
•**Inventory-Pro**, Hi-Tech Advisers	2.03
IS Talk, Electronic Arts	1.0
LabelMaster Elite, Migraph	1.0
•**Laser C**, Megamax	2.03
•**LDW Basic Compiler**, Logical Design Works	

•**Magic Sac**, Data Pacific	5.91
•**Mail-Pro**, Hi-Tech Advisers	2.10
•**Mark Williams C**, Mark Williams	3.0
Master Tracks Pro, Passport Designs	2.0
MasterPlan, ISD Marketing	1.0
•**Micro C-Shell**, Beckemeyer Development	2.72
Micro RTX Developer Kit, Beckemeyer Development	1.13
•**Modula 2**, Jefferson	1.5
Modula-2, TDI	3.01A
•**MT C-Shell**, Beckemeyer Development	1.20
Multi-Manager, New World	1.0+
Music Studio, Activision	1.0
P.M. Interface, XLent	1.1
Partner ST, Timeworks	1.0
Pascal for GEM, Prospero	2.13
Payroll Master, Royal	2.1
PC-Ditto, Avant-Garde Systems	3.0
Personal OS-9/ST, Microware	2.2
Personal Pascal, ICD/OSS	2.02
Phasar, Antic	3.0
Power Print, Alpha Systems	2.1
Print Master Plus, Unison World	1.61
Professional OS-9/ST, Microware	2.2
Publishing Partner, SoftLogik	1.03
Real Basic, Computer Crossware Labs	1.3
Regent Base, Regent	1.1
Regent Word II, Regent	870403
•**Sales-Pro Plus**, Hi-Tech Advisers	3.00
•**Solapak**, Solar Powered Software	3.0
•**ST Hard Drive Utility Disk**, Supra	3.19
ST Sprite Factory, Future Software Systems	1.1
ST-Replay, MichTron	3.0
ST-Talk Professional, QMI	2.0
STAccounts, ISD Marketing	2.0
•**Super Directory**, MichTron	2.0
SuperBase, Progressive Peripherals	1.027
SwiftCalc ST, Timeworks	1.1
The Chameleon, Future Software Systems	1.0
The Manager, BMB Computerscience	1.0
The Navigator, Antic	2.0
Thunder, Electronic Arts	1.31
True Basic & Run-time, True Basic	2.0
TuneUp, MichTron	1.25
Turbo ST, Softrek	1.0
Universal Item Selector, Application & Design	1.01
•**Video-Pro**, Hi-Tech Advisers	2.01
VIP Professional, ISD Marketing	1.2
Word Writer ST, Timeworks	2.01
•**WordPerfect 4.1**, WordPerfect	04/15/88
WordUp, Neocept	1.00
Write 90°, XLent	1.3
Zoomracks II, Quickview Systems	1.0

ATARI® ST POWER WITHOUT THE PRICE

ST PERIPHERALS AND SUPPLIES

SF354	Single Sided Disk Drive	$199.95
SF314	Double Sided Disk Drive	$299.95
SX212	300/1200 Baud Modem	$ 99.95
CA070025	Mouse	$ 49.95
C070263	Ribbon for the SMM804 Dot Matrix Printer	$ 12.95
C026224	Blank Disks, 3.5" Double Sided (box of 5)	$ 16.95
C0266313	International ST Software Catalog	$ 12.95
C026220	ST BASIC Source Book and Tutorial (new version)	$ 12.95
LPS004	Toner Kit for SLM804 Laser Printer	$ 59.95
LPS005	Drum Kit for SLM804 Laser Printer	$199.95

EDUCATION

High School

DS5060	Algebra I, Vol 2	$19.95
DS5061	Algebra II, Vol 1	$19.95
DS5062	Algebra II, Vol 2	$19.95
DS5063	Algebra III	$19.95
DS5065	Geometry, Vol 2	$19.95
DS5067	Trigonometry	$19.95
DS5068	Biology, Vol 1	$19.95
DS5069	Biology, Vol 2	$19.95
DS5070	Biology, Vol 3	$19.95
DS5071	Biology, Vol 4	$19.95
DS5072	Chemistry, Vol 1	$19.95
DS5073	Chemistry, Vol 2	$19.95
DS5074	Physics, Vol 1	$19.95
DS5075	Physics, Vol 2	$19.95
DS6066	Statistics	$19.95

General

TP6036	Perfect Match	$39.95

Elementary School

TP7601	Math Wizard	$39.95
TP7602	Fraction Action	$39.95
TP7603	Decimal Dungeon	$39.95
TP7604	Read & Rhyme	$39.95
TP7605	Kinderama	$39.95
TP7606	Animal Kingdom	$39.95
TP7607	Read-A-Rama	$39.95
TP7608	Aesop's Fables	$49.95

DRAWING

DS5027	Neochrome	$39.95
TP6025	GFA Draft	$99.95
TP6026	Make-It-Move	$69.95
TP6701	Easy Draw	$99.95
TP6705	Personal Draw Art #1 (requires Easy Draw)	$29.95
TP6706	Technical Draw Art #1 (requires Easy Draw)	$29.95

ENTERTAINMENT

DS5007	Home Planetarium (NEW)	$ 39.95
DS5018	Missile Command	$ 29.95
DS5019	Star Raiders (color monitor required)	$ 29.95
DS5020	BattleZone	$ 39.95
DS5080	Crack'ed (NEW)	$ 29.95
TP6011	Major Motion	$ 39.95
TP6012	Time Bandit	$ 39.95
TP6013	Cards	$ 39.95
TP6024	8-Ball	$ 29.95
TP6027	Match Point	$ 39.95
TP6037	Gold Runner	$ 39.95
TP6041	Airball	$ 39.95

BUSINESS

TP6301	Zoomracks I	$ 79.95
TP6302	Zoomracks II with Zoomracks Templates	$119.95
TP6303	Business Starter Kit	$ 19.95
TP6304	Home Starter Kit	$ 19.95
TP6305	Accounting Starter Kit	$ 49.95
TP7101	EZ-Calc	$ 69.95

MUSIC

TP7301	MIDI Play	$ 49.95
TP7302	Beatles, Vol 1	$ 19.95
TP7303	Classics, Vol 1	$ 19.95
TP7304	Hits '86	$ 19.95

PROGRAMMING LANGUAGES

TP6019	GFA Basic	$ 79.95
TP6020	GFA Basic Compiler	$ 79.95
TP6402	Fortran 77	$ 99.95
TP7801	Mark Williams "C"	$179.95

UTILITIES

TP6029	Michtron Utilities	$ 59.95
TP6031	Stuff	$ 39.95
TP6703	Fast	$ 49.95

ATARI ORDER FORM

Mail order form and payment to:

Atari ST, Dept. S12
P.O. Box 61657
Sunnyvale, CA 94088

NAME _____ ( ) PHONE _____

ADDRESS _____

CITY _____ STATE ZIP _____

Please allow six to eight weeks for delivery.

PART#	DESCRIPTION	PRICE	QUANTITY	TOTAL

Use blank paper for additional items.

SUB TOTAL

☐ Check or money order enclosed
☐ VISA or ☐ MasterCard

CALIF. RESIDENTS ADD 7% SALES TAX

Shipping and handling
(under $50, add $3.50
over $50, add $5.00;
over $100, add $7.00)

Exp. ____ / ____

TOTAL $

No COD's,please

Signature _____

CRAZY CARS

DEALER INQUIRIES WELCOME

IBM AND COMPATIBLES VERSION

AMIGA VERSION

ATARI ST VERSION

IF YOUR DEALER DOESN'T CARRY TITUS PRODUCTS THEN HAVE HIM ORDER IT FOR YOU OR ORDER DIRECT BY CALLING: (818) 709-3693

CORVIOLE -D-

TITUS™

20432 CORISCO STREET, CHATSWORTH CA 91311 PHONE: (818) 709-3693 - FAX: (818) 709-6537

SupraDrive™

Atari ST™ Disk Drives

Now with Real-Time Clock and DMA Output!

NEW!

SupraDrive FD-10™
10MB Removable Floppy

- Uses 10MB Removable Floppy Diskettes for Unlimited Storage
- Fast Transfer Speed and Disk Access (80ms Average Seek Time)
- Connects to the Atari ST™ DMA Port
- Useful for Hard Disk back-ups and archival storage of software and data

- High-Performance SCSI Hard Drives for Atari 520ST™, 1040ST™, and Mega ST™
- 20, 30, 60, 120, and 250 MB Capacities
- DB-25 Connector for Daisy-Chaining Additional SCSI Devices
- Includes Useful Utilities:
  - Format Software that Allows Partitioning the Drive into up to 12 Logical Disks
  - Auto-Boot Directly from Hard Disk
  - Bad Sector Mapping
  - Boot Sector Editor

Supra Corporation
1133 Commercial Way / Albany, OR 97321 USA
Telex: 5106005236(Supra Corp) / Fax: (503) 926-9370