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FEATURES

12 Companies To Watch/*Ahl*
The publisher talks to five Atari developers about their products and problems.

18 New Atari Products At Comdex
New hardware emphasizes "Connectivity, Technology, and Solutions"

36 Graphics Gallery/*Ahl*
The first in a series and the beginning of contest in which you can win fame and free subscriptions.

38 Will Piracy Kill Atari?/*Linzmayer*
As "Power With the Price" leads to "Programs Without the Price," the health of the entire Atari market is threatened.

48 Avoiding Computer Widowhood/*Kofsky*
How to keep your spouse from leaving home after an Atari moves in.

REVIEWS

52 World War II Simulations/*Katz and Kunkel*
8-bit Atari computers contribute to the growing popularity of electronic wargaming.

56 ARTablet/*Eddy*
EI/O Products releases a graphics tablet to facilitate graphics entry on the ST.

58 Software Survey/*Eddy and Teverbaugh*
An assortment of game software packages to suit every taste—or lack thereof.

66 Make Your Own Awards/*Teverbaugh*
Awardware and Certificate Maker: Two programs to help you recognize achievements of all kinds.

68 ST Scan/*Kofsky*
An introduction to scanning and a review of an indispensable adjunct to your desktop publishing applications.

PROGRAMMING

74 Puzzles & Problems/*Ahl*
A look at some solutions to problems from previous issues and a few new ones for you to solve.

76 Try This!/*Ahl*
Use this program to draw the wonderful curves of Waclaw Sierpinski on your Atari.

78 Puzzles & Problems Revisited/*Ahl*
A solution to the Vicious Neighbor problem.

82 Subway Scavenger/*Ahl*
This modern-day adventure challenges you to master the New York subway system. Can you make all your deliveries by 5:00?

DEPARTMENTS

4 Letters To The Editor/*Readers*
Product updates, a program fix, and more on Trojan horses.

8 News & Views/*Ahl*
Atari buys Federated; Supra announces monster drives; and more . . .

16 New Products/*Staples*
Recent releases of hardware and software for Atari 8-bit and ST computers.

19 Homefront/*Farmanfarmaian*
From uni-user to power-user: How to break the single-use computing habit.

22 Bottom Line/*Ahl*
Double Eagle Software releases The Tax Advantage, a comprehensive tax planning and preparation package for all Ataris.

24 Languages/*Ahl*
DBasic: A drag racing Basic for the ST.

26 Sound Chip/*Dimond*
Reviews of Guitar Wizard and Dr. T's MIDI Recording Studio and a look at things to come.

32 Atari Classroom/*Worley*
Sesame Street games for preschoolers.

80 Teletalk/*Anderson*
A service that may lower your phone bill; a proposal that may increase your on-line charges; and look at ST files on CompuServe.

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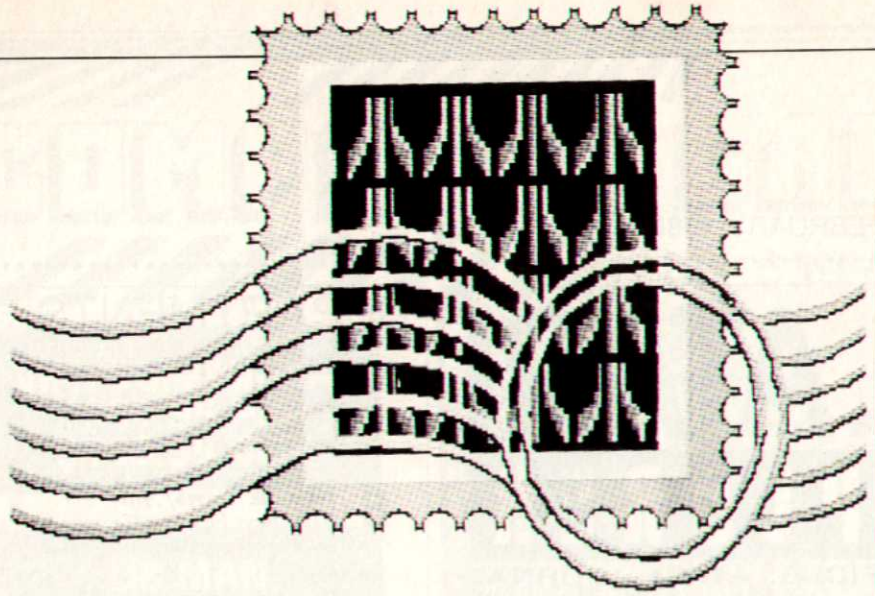

Letters To The Editor

U.S. Distributor for 1st Word Plus

Dear Editor:

In the November/December 1987 issue an excellent review of the new *1st Word Plus* by GST Holdings was presented. This improvement in the original *1st Word* seemed to be exactly what I needed. But to my great dismay, ST software stores I called in the Chicago area informed me that *1st Word Plus* was not available in the U.S., might be available sometime in the future, or due to licensing difficulties might never be available in the U.S.

Would you be able to update readers as to the availability of this program in this country?

The *Explorer*, by the way, is a finely written journal and an indispensable resource.

Emanuel D. Pollack
8632 N. Lawndale Ave.
Skokie, IL 60076

When the Nov/Dec issue went to press, GST did not have a U.S. distributor. Since then, however, the company has entered into a distribution agreement with Prospero Software, 100 Commercial St., Ste. 306, Portland, ME 04104, (207) 874-0382.

No MaxThink for the ST

Dear Editor:

I am writing in regard to the review of the *MaxThink* idea processor that appeared in your September/October 1987 issue.

I contacted the manufacturer and they informed me that they are no longer making the software for the Atari ST.

John Weitzel
29 Suncrest Ave.
Wheeling, WV 26003

We checked with MaxThink before publishing the review and were assured that the product was available. Subsequently, the company did, indeed, drop the ST version from its product line, citing piracy in the Atari community as the reason for the decision. For more information on piracy and MaxThink, see "Will Piracy Kill Atari?" in this issue.

Nametag Slowdown

Dear Editor:

The September/October Homefront included an interesting program called Nametag. I use my Atari 130XE in our church office, and I plan to use Nametag at future teacher meetings, committee meetings, and church socials.

I had a little problem with the program at line 560. It moved so quickly from 560 to 570 that there was almost no time to read the message. It then moved on to 785 and back to 380 to begin again. This all happened so quickly that folks—especially those who had no experience with typing or computers—had no time to figure out what was going on.

I added the lines in Listing 1 to slow things down a bit and make the program easier for novices to use.

Thanks for a good magazine.

Robert G. Masenheimer, Jr.
Longswamp United Church of Christ
RD 2, Box 3
Mertztown, PA 19539

Listing 1.

```
375 GOTO 783
565 FOR DELAY = 1 TO 1000 : NEXT DELAY
781 GOSUB 1000 : PRINT "THANKS FOR SHARING THIS VERY
    PERSONAL INFORMATION"
782 FOR DELAY = 1 TO 1000 : NEXT DELAY
783 GOSUB 1000 : PRINT "NOW, WOULD THE NEXT GUEST"
784 PRINT ".....SIGN IN, PLEASE?"
785 PRINT : PRINT "PRESS <RETURN> AFTER"
786 PRINT "ANSWERING EACH QUESTION."
787 PRINT : PRINT "PRESS <RETURN> TO BEGIN"
788 GET #1,K : GOTO 380
```

More on Trojan Horses

Dear Editor:

The September/October Teletalk made some very important points about programs posted on BBS's that are not what they seem.

A friend and I developed a "computer virus" on our 8-bit Ataris. Of course, we will never distribute this program, but we do want to distribute some of the lessons we learned while writing it.

People should be leery of any program that cannot be listed. Public domain software does not need that kind of protection. However, the commands to format the disk can be hidden in DATA statements.

If you are on a BBS that you know little or nothing about, I recommend that you download any software to a blank floppy disk and keep your hard disk turned off when you run it.

It is also a good idea to own a disassembler—even if you are not a hot-shot programmer. Learn what commands will cause a disk to be erased, formatted, or destroyed, and look for them before running a new program.

The people who distribute these programs are the same people who knocked down other kids' blocks in Kindergarten. They have become more sophisticated, but they are still nasty, hateful people.

Beth Jane Freeman
1265 Hawthorne Dr., E.
Wantagh, NY 11793

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Letters To The Editor

Game Strategies

Dear Editor:

I have an Atari 520 ST and have enjoyed it for a little over a year now. Your magazine has answered many questions for me and has introduced me to many new ideas and products.

One area which is not addressed, however, is game strategies and tips. Would it be possible to run a short column in this area using your game experiences or those of your readers? For instance, a reader would send in a query, and if you could not answer it, perhaps a reader could respond with the answer.

Some examples: In *Ultima II* I have achieved approximately 9999 in every category (hit points, provisions, experience, gold pieces), but, alas, I am not a "clever" player and have not learned how to increase my attributes. I would like to know how to do so.

I have visited every time zone and planet and the dungeons and towers of each, yet in the Land of Legends castle I have not been able to enter the time zone area. What is the secret? And what do you do in dungeon level 17 besides leave it?

I'm sure there are others who experience frustration in their leisure use of games on the computer. A small hint could open a whole new outlook on their game play. Your column could provide that much needed hint.

Also, are there game strategy guides available?

Monica McCabe

Better be careful, or people will begin to think that Atari computers are game machines. We have no plans to include such a column at the moment, but we will definitely consider your idea as the magazine grows and has space for additional editorial material. As for other sources of hints, try writing to the publisher of the program that has you stumped. Many of them will sell you a hint book to get you out of the traps they set.

Another interesting source of tips and information about adventure games is a newsletter called QuestBusters, The Adventurers' Journal. In addition to hints of the sort you describe, each issue includes reviews of adventure games, new product announcements, and classified ads for those who want to swap (legal) programs. A one-year subscription (doesn't say how many issues) is $16 from the Addams Expedition, POB 525, Southeastern, PA 19399-9968.

Deciphering Superconductivity

No, the last page (71) of the Superconductivity story in the Nov/Dec issue of *Atari Explorer* was not an extension of Puzzles & Problems, although it might well have been. If you want to read the story for content, skip from page 70 to the last line of paragraph 3 ("would generate . . . "), then from the third line in the second column to the top of the first column, and finally, from the line above "would generate . . . " to line 4 in column 2. There will be a quiz.

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The Celebrity Cookbook

volume one

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That's electronic junk mail.

Atari buys Federated; Supra announces monster drives; and more . . .

News and Views

By DAVID H. AHL

Back in August, Atari bought the Federated Group Inc., a retail electronics chain, for $67.3 million. Hemorrhaging badly, in their last fiscal quarter (ended May 31, 1987) before the purchase, Federated posted a loss of $895,000. Atari, on the other hand, has returned to profitability. In the second quarter (ended July 4), Atari's profit rose to $13.5 million on total revenue of $70.7 million.

What does the Federated purchase mean? First, it means that Atari will gain 65 retail stores in California, Arizona, Texas, and Kansas through which they can sell their products the way they want them sold. Second, it gives Atari a controllable retail environment in which to test market other products (we have already seen calculators with the Atari name on them, and you can look for other Atari consumer electronics products soon).

Investor's Daily talked to Jack Tramiel about the reasons for the purchase. In the interview, Tramiel said, "Our overall game plan, set way back, is to build a vertically integrated consumer products company in the U.S. where we share research and development from design to end product. Our plan in the U.S. is to copy successful, totally integrated Japanese companies like Fujitsu, Sony, and others. The next piece in our strategy is to buy a semiconductor company."

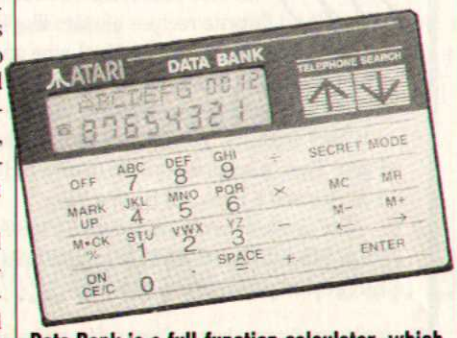
Tramiel continued, "In addition, our U.S. strategy is to copy our European strategy (Europe now accounts for two-thirds of Atari's sales) by serving our dealers and doing a lot of advertising, nearly $20 million this fall alone."

At the time of the purchase it was stated that the chairman (Wilfred Schwartz) and management of the Federated Group would remain in place. Tramiel believes that "management is not the problem. Federated chose to grow rapidly and add new stores, and new stores cost money. I think the expansion was a good move. Additionally, my philosophy and Schwartz's are similar, that is giving customers the best value for their money."

To industry watchers who have said that it will be difficult to make Federated successful, Tramiel has a sharp reply, "They don't know my background to say that. I've done it before. When I go into a business, I plan how it will work. How it won't work isn't even in my vocabulary."

Tramiel on his success formula: "I work my butt off, and I give value to my customers. For some reason, Europeans recognize this, but Americans have to be told. Apple Computer's products cost twice as much as ours, and they're in 10th place in Germany while we're number one. In the U.S., the key is advertising. People want what their next-door neighbor has."

Although retailer stores are glutted with consumer electronics products, Tramiel believes they will still want to carry the Atari computer line: "We will give them the right profits and products and tell customers about it. They'll love it."



Data Bank is a full-function calculator, which stores up to 150 data sets, each with seven letters or numbers, plus 12 additional numbers.

Random Bits

First it was promised; then Atari said "no, it won't happen." But now some of the latest 1040ST computers are coming through with a new revision motherboard that has a socket for the Blitter chip. Apparently, this is as much of a surprise to people in Sunnyvale as it is to customers.

Speaking of ST variations, music stores are now being shipped 520ST computers in a 1040 box with a built-in single-sided disk drive and RF modulator. Price is the same as a 520ST with an external drive. Oddly, this configuration is designated both 520STFM and 1040STFM. By the way, don't buy one intending to add memory chips and make it into a cheap 1040; the motherboard is wave soldered, and all the chip mounting holes are filled with solder.

Having inherited a huge inventory of 5¼" 1050 floppy drives, until recently Atari hadn't faced up to the problem of manufacturing more of them. But about to run out, Atari has decided to offer a double-sided drive (the XF551) for the 8-bit line.

One problem: The current Atari DOS doesn't recognize the second side. So Bill Wilkinson of 8-bit Basic fame has been hired by Atari to write a new DOS. We can't quite see why Atari didn't just buy some of those nice sleek Indus drives; it seems rather late in the product life cycle for a new drive and another new DOS, but who knows?

One is in production and more are coming: little black boxes that will let you switch your ST between a monochrome, and RGB or composite video monitor without unplugging and restarting. Projected prices are in the $30-50 range. Look for units from Practical Solutions, Wuztek, and others.

Migraph has been showing their soon-to-be-released *M/CADD* package at several Atari fairs to rave comments. One aerospace engineer told me that he thinks it runs rings around *AutoCad*, a $2599 package for the IBM PC AT and even beats a number of dedicated CAD systems. His only problem is its low price. "What procurement manager is going to take me seriously when I tell him the computer and software *together* cost less than $2000?"

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EasyCAD	DAC Easy Accounting	BPI Accounting	Turbo Pascal
GW Basic	Managing Your Money	Silvia Porter's Series	pfs:Professional File
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And Hundreds More!

pc-ditto is a software-only utility which taps 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
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- o optionally boots DOS from hard disk
- o parallel and serial ports fully supported
- o supports 3.5-inch 720K format, 360K single-sided format, and 5.25-inch 40-track formats

System requirements:

- o IBM PC-DOS or Compaq MS-DOS version 3.2 or above recommended
- o ATARI COLOR MONITOR (Atari mono monitor support will be released this Fall)
- o optional 5.25-inch drive is required to use 5.25-inch disks
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Michael Case of Gillette, NJ, ***was recently arrested for firing eight shots into his IBM PC and Princeton Graphics monitor.***

And you thought 5Mb was a lot. Five years ago, I couldn't imagine filling up a 5Mb hard disk and today my 20Mb Atari drive is overflowing. But help is on the way. Supra is now shipping 20, 30 and 60Mb drives and have been showing—believe it or not—a 250Mb drive! They're not alone. ICD has been showing an innocent looking box with two 30Mb drives in it. Actually, at the moment they are shipping only a 20Mb unit, but it has multiple SCSI and DMA ports and a built-in clock. A 30Mb, dual 20Mb, and the dual 30Mb units are scheduled for shipment in late '87/early '88.

Speaking of disk drives, Supra also has been showing a nifty 10Mb removable floppy drive. With an 80 ms average seek time, the $899 FD-10 is about 25% slower than a standard 20Mb hard disk, but users will save minutes, if not hours, not having to do backups.

Looking for inexpensive public domain software? Here are four organizations that have extensive ST disk libraries for $3.50 to $5.00 per disk:

ST X-Press
P.O. Box 2383
La Habra, CA 90632
(213) 691-8000

Brad Roltgen Enterprises
719 E. Minarets
Fresno, CA 93710
(209) 432-2159

The King's Domain
P.O. Box 609-B
Graton, CA 95444

CN Library
122 N. Johnson Rd.
Sterling, VA 22170

And for you 8-bit owners, WAACE has a terrific disk library for a flat $5.00 per disk. It is being handled by the Northern Virginia Atari Users' Group:

Novatari
c/o Alan Friedman
5951 Heritage Square Dr.
Burke, VA 22015

Bungie cords not included. At the recent Atari fair in Glendale, CA, 14-year-old Bret Leduc of Burbank won the grand doorprize, an Atari 1040ST system. One problem: Bret's father had brought him to the fair—on his motorcycle.

If you're ever at dinner with some Atari folks and get hit in the head with a flying crouton, you might want to pay close attention to the position of Neil Harris's hands. One piece of advice: don't fight back like Gerry "Rad Moose" Humphrey did in Allentown. We hear that before long, bowls of croutons were flying every which way and the group was unceremoniously asked to leave the restaurant.

Things from which we've protected you department. How about a handy digital clock with alarm and timer that attaches right on your computer, monitor, or disk drive with a strong built-in magnet? Just set the timer and see how long it takes to wipe out all your disks. And then there was the article describing how to re-ink your printer ribbons by drilling holes in the ribbon cartridge and pouring in a mixture of stamp pad ink and glycerine. Just don't tip the cartridge when installing in the printer. Yucko.

It could only happen to an IBM PC department. Michael Case, 35, of Gillette, NJ, was recently arrested for firing eight shots into his IBM PC and Princeton Graphics monitor. Neighbors called the cops, and when they arrived they found the computer and monitor completely blown apart. The officer on the scene said the .44 Magnum with hollow point (dum-dum) bullets that Case used was "quite a lot of firepower for the job. It's a pretty big gun for shooting a computer." Case was surprised when police arrested him and couldn't understand why he couldn't shoot his own computer. However, police charged him with recklessly creating a risk, discharging a firearm in a restricted area, unlawful possession of a gun without a permit, possession of illegal bullets, and using a firearm against the property of another (four bullets went into the wall and he didn't own the house). ■

Seen at the Glendale Atari Fair.

John Tarpinian, president of ACENET, with 14-year-old Bret Leduc, winner of the Atari ST door prize at the Atari fair in Glendale, CA.

Liz Mitchell demonstrates Migraph's Easy Draw.

The Atari exhibit at the show was a busy place.

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

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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**

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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.

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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.

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Companies to Watch

The publisher talks to five Atari developers about their products and problems

By DAVID H. AHL

We recently visited several Atari hardware and software developers on the West Coast to get a first-hand look at their newest products. Aside from their concerns about piracy in the Atari market (covered elsewhere in this issue), most of them were positive about their involvement with the machines that offer Power Without the Price.

Optimized Systems Software

After successfully marketing Personal Pascal, OSS made the mistake of announcing version 2.0 somewhat before it was ready for delivery—a common occurrence in the Atari community. As a result, potential customers for the current product held off buying until the new version was available. The new version is finally shipping, and the folks at OSS can breathe a little easier now that cash is flowing again.

What does the future hold for OSS? Many things. They are currently evaluating a wide range of software packages from Europe, mainly Germany and England, including—believe it or not—a new Basic. Apparently the major virtue of this Basic is that it can compile GFA Basic programs, giving them added speed at run time.

OSS, recognizing that Atari owners are looking for maximum value per dollar, has introduced a line of no frills $20 software packages called Bareware. These packages are a level above shareware, but don't have the fancy (read, expensive) packaging and appearance of much commercial software. Two Bareware packages are now out: *QuikStart and OverDrive*, a Ramdisk utility, and *ShortCut*, a desk accessory that allows printing and copying of files from within other GEM programs.

Logical Design Works

Logical Design Works was one of the first companies to introduce an alternative Basic for the ST. Version 2.0 of LDW Basic, which offers many improvements over the original version, has just been released. Specifically, it has more than 50 statements to access GEM, so you don't have to use PEEKS and POKES. It can also compile any program written in ST Basic and it is extremely fast (for certain jobs as much as 50 times faster than ST Basic). You'll find a complete review of LDW Basic 2.0 soon in *Atari Explorer*.

Rena Tessler also gave me a sneak preview of *LDW Spreadsheet*. It has all the features of Lotus *1-2-3* and makes excellent use of the GEM environment. Scheduled for release in February, it looks like the ST spreadsheet for which we've all been waiting.

Although it has been out for a while, I confess I hadn't previously taken a close look at *Vegas Gambler*. I have now rectified that oversight and can say that the graphics are truly outstanding; the cards looks like real cards, the roulette wheel looks as if it is spinning, and the slot machine looks exactly like a real Vegas video slot. No wonder it is selling so well.

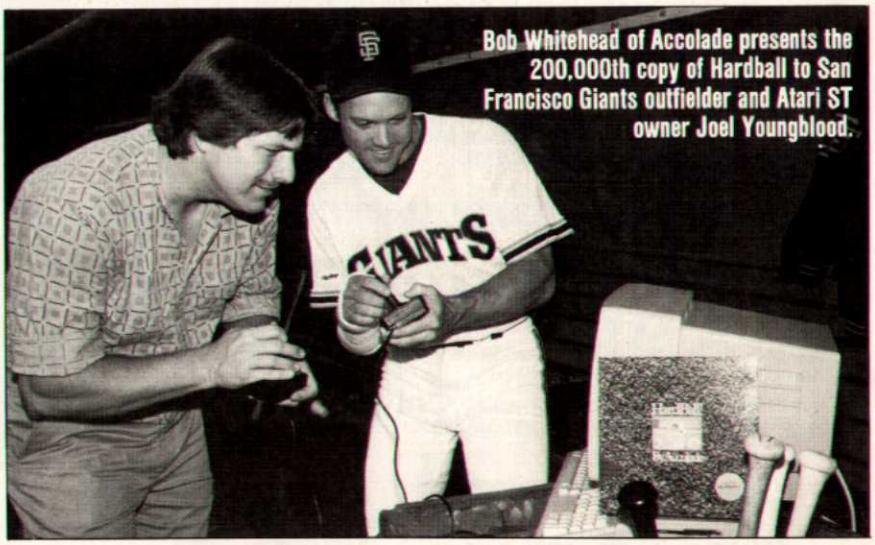
Coming soon from LDW: Backgammon and several new arcade-type action games.

Accolade

Although we tend to think of it as one of the "old established" companies, Accolade was formed just three years ago when Alan Miller and Bob Whitehead broke away from Activision and started their own company.

In October, just over two years after the first Accolade product was shipped, Bob Whitehead presented the 200,000th copy of the company's best-selling baseball simulation, *Hardball*, to San Francisco Giants outfielder and Atari ST owner Joel Youngblood, underscoring the steady growth and expansion the company has experienced from the beginning.

On a recent visit, Alan Miller showed me Accolade's newest releases for the ST. *Pinball Wizard* is a construction set type of game that lets you give the different bumpers, pathways, and obstacles individual characteristics. De-



Bob Whitehead of Accolade presents the 200,000th copy of Hardball to San Francisco Giants outfielder and Atari ST owner Joel Youngblood.

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signed by Benoit Maumiel of Infogrammes in France, the game, says Alan "is one of the first truly advanced games to reach the U.S. from Europe."

Test Drive is another new game. This one lets you drive one of five hot cars along a winding cliffside road. No banked test track this; you have a jagged rock face on one side and a sheer drop on the other. After watching Alan drive his Lamborghini along the road effortlessly, I tried taking a Lotus Turbo Esprit along the same route with predictably disastrous results.

Navarone Industries

Chuck Humphrey, the moving force behind Navarone, is a man with persistence—lots of it. Chuck's first product in the personal computer market was a cartridge expander for the TI 99/4. He introduced it just about the time TI decided to withdraw the machine from the market. So he decided to make a similar product for the Commodore 64. It was bad enough that two other companies had the same idea, but to make matters worse, Chuck decided to advertise his products with expensive four-color ads on the back cover of *Ahoy*, a magazine that had about as much credibility as Richard Nixon. Nevertheless, he sold more than 20,000 units.

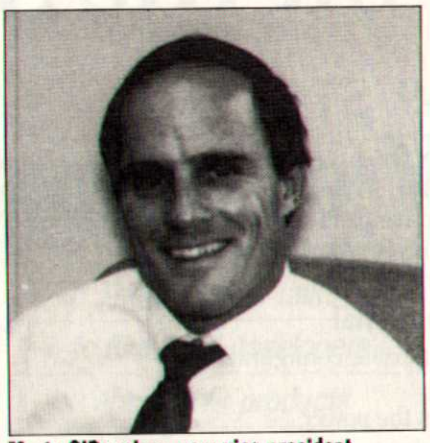
Now Navarone is in the ST market with four rather interesting products—a low-end video digitizer; an inexpensive but capable sound digitizer; a battery powered clock calendar, which I find indispensable; and a flexible, professional image scanner, which is reviewed elsewhere in this issue.

By the way, sharing the suite of offices with Navarone is Tri-Media Creative Services, the graphic arts firm that produces most of Atari's software packaging. Interestingly, all of the packages and instruction booklets are produced on an ST using *Publishing Partner*. Macintosh, move over.

Strategic Simulations

Eight years ago when I first met Joel Billings, he was sitting in a booth at the West Coast Computer Faire selling his first computer game, *Computer Bismarck*, along with T-shirts reading, "I sank the Bismarck." I still have the T-shirt, and Joel has a multi-million dollar leading producer of computer strategy and war games.

Although he has experimented with other kinds of games over the years, Joel has wisely concentrated the efforts of his company on wargames. And if one game is successful, he follows up with another, and another. From one Civil War battle, for example, has come an entire series: *Gettysburg*, *Chickamauga*, *Antietam*, and now *Shiloh*.



Marty O'Donohue, new vice president of marketing for Epyx.

SSI has also chosen to stick with computers that other manufacturers have abandoned—most notably the Atari 8-bit series. The company's two newest games for Atari 8-bits are *Shiloh* and *Eternal Dagger*.

For those who think they have a pretty good feel for politics, SSI has a contest going (with $1988 in prizes) to predict who will be the two presidential candidates in 1988 and how many electoral votes each one will get. If you need some help, you can run your own simulated election with SSI's new 1988 version of *President Elect*.

Epyx

Like all software games publishers, Epyx has had some ups and downs. However, unlike some other publishers, Epyx has installed some very sophisticated financial control systems. So while things were getting out of hand for several other manufacturers, Epyx was quietly making money and expanding.

When I visited their new facilities in Redwood City, I noted makeshift signs on many doors and walls saying "4: The Magic Number" or "4: The Number Whose Time Has Come." Marty O'Donohue, vice president of marketing, explained that the signs referred to Epyx's first $4 million month. Not bad!

Marty expects that 1987 will turn out to be a banner year for Epyx: "California Games is shaping up as a mega-hit, the Street Sports series is doing extremely well, and our joystick seems to have taken the market by storm."

Sub Battle is the first of a new generation of more serious games aimed at a somewhat older player than Epyx's typical 10- to 18-year-old customer. *Print Magic* is a graphics and text poster and card maker, and *Create-A-Calendar* does just what the title suggests.

One unfortunate setback for Epyx came in court a few months ago when the company was ordered to withdraw its Karate game from the market, because under the new "look and feel" doctrine, it too closely resembled a competitive game (which was out first). ■

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Recent releases of hardware and software for Atari 8-bit and ST computers

New Products

Monochrome Digitizer for ST

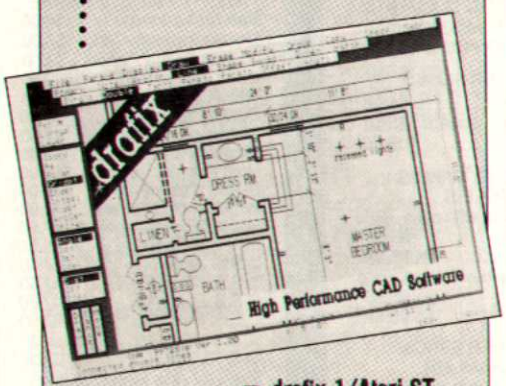
Digital Vision announces a monochrome-only version of its Computereyes video digitizer for the Atari ST. The hardware/software package connects between the cartridge port of the computer and any standard video source (video camera, VCR, videodisc player, etc.).

Under mouse-driven software control, the video signal is scanned and images captured into the graphics memory of the computer. Capture time is six seconds in low-res 16-intensity level mode, 12 seconds in medium-res 4-level mode, and 24 seconds in 640×400 hi-res mode.

Once acquired, images can be adjusted or fine-tuned using the software to obtain the desired effect and saved in *Degas*, *Degas* Compressed, or *NeoChrome* compatible files. The monochrome package sells for $149.95.

Digital Vision, Inc., 66 Eastern Ave., Dedham, MA 02026, (617) 329-5400.

PRODUCTIVITY SOFTWARE



■ drafix 1/Atari ST

Foresight Resources has introduced *drafix 1/Atari ST*, a computer aided design and drafting program previously available only for IBM compatible computers. It offers comprehensive entity drawing and editing facilities, advanced snap, grid and object snap drawing aids, multiple fonts, crosshatching, an automatic dimensioning system, and symbol library management. *drafix 1/Atari ST* runs on Atari 520 and 1040ST computers in either monochrome or color and is compatible with a wide variety of digitizers, printers, and plotters. $195.

Foresight Resources Corp., 932 Massachusetts, Lawrence, KS 66044, (913) 841-1121.

ENTERTAINMENT SOFTWARE

Ace of Aces, an aerial combat simulator from **Accolade**, is now available for the Atari 800. The game offers four different air battles—an air battle with Nazi bombers on their way to targets in the UK, an attempt to eliminate VI rockets in mid-flight before they reach British soil, a confrontation with U-boats, and a raid against enemy trains carrying supplies and POWs—each of which requires special weapons and battle and navigation skills. $29.95.

Accolade, Inc., 20813 Stevens Creek Blvd., Cupertino, CA 95014, (408) 446-5757.

Artworx has released two new female data disks for its Atari ST *Strip Poker* program. Data Disk #4 features Dawn and Crystal, and Data Disk #5, Cynthia and Janice. $19.95 each.

Artworx Software Company, 1844 Penfield Rd., Penfield, NY 14526, (800) 828-6573, (716) 385-6120.

Three-Sixty has announced *Dark Castle*, for the Atari ST. Set in medieval times, the game features a hero who must fight his way through 14 different rooms of increasing difficulty against plague-carrying rats, attacking bats, and a fire-breathing dragon. He must also escape the clutches of a torturer and the spells of a diabolical wizard in his quest to find and slay the Black Knight. $39.95.

Three-Sixty Incorporated, 2105 S. Bascom Ave., Ste. 290, Campbell, CA 95008, (408) 879-9144.

Firebird has released *The Advanced OCP Art Studio* for the Atari ST, a graphics program that provides 16 pens, 8 random sprays, and 16 user-definable brushes coupled with three levels of magnification. In addition, windows can be inverted, cut and pasted, enlarged, reduced, squashed, stretched, flipped, and rotated. Text capabilities include a font editor and nine character sizes. $44.95.

Tracker, also for the ST, is a game that gives the player simultaneous control of eight Skimmer craft with the objective of wiping out marauding hordes of renegade Cycloids. Regardless of how cunning the player's strategy may be, the Cycloids will try to match it and remember the player's tactics, preventing him from using the same strategy successfully a second time. $44.95.

Knight Orc, a three-part illustrated adventure game from Firebird, casts the gamer as an oppressed Orc in a magical world. Humans have been persecuting Orcs for generations, and this game provides an opportunity for Orcs to get even. $44.95,

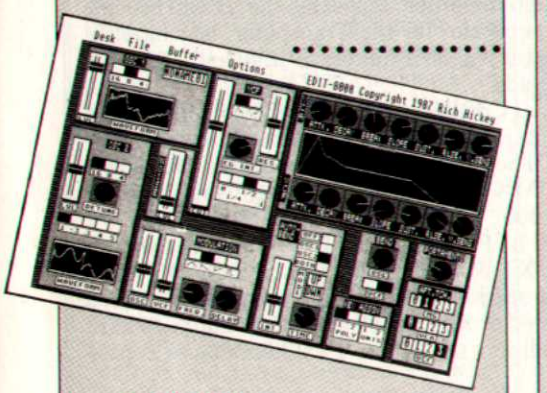
Firebird Licensees, 71 North Franklin Tpk., Waldwick, NJ 07463, (201) 444-5700.

UTILITIES

MichTron announces the release of *TuneUp*, a floppy and hard disk optimizer for the Atari ST. The program rewrites files on a hard disk to contiguous blocks and moves free space into one section. *TuneUp* also offers utilities to check disk statistics (including the size of the disk and its fragmentation percentage), list the contents of a disk, and run a consistency check. $49.95.

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

MUSIC SOFTWARE



■ Edit-8000

Edit-8000 from **Savant Audio** is a graphically oriented editor/librarian/patch creator for the Atari ST and Korg DW/EX8000 series synths. The program allows parameters to be adjusted by moving "faders" and "knobs" and pressing "buttons." All waveforms and parameters are updated in real time.

Features include a built-in mini-sequencer, merge patches, MIDI thru, eight banks in memory, numeric edit/printout, and save and load banks/patches/keys. The package includes a bank/patch loading desk accessory and 500 patches. $79.95.

Savant Audio, 2140 Bellmore Ave., Bellmore, NY 11710, (517) 826-6336.

SYSTEMS SOFTWARE

MichTron announces the release of *The GFA Basic Companion*, a dedicated RCS package designed to help users of GFA Basic create radio button boxes, dialog boxes, help text boxes, sliders, error boxes, and more. Interested users can download a demonstration of the product from the Compuserve Atari 16 libraries or from the Genie MichTron roundtable, or they can send $5 to MichTron for a demo disk (specify color or monochrome). The complete *Companion* sells for $49.95.

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

Metacomco announces the New Pascal 2 Development System for the Atari ST, which replaces MMC Pascal v. 1.35. The new package offers single- and double-precision floating point arithmetic, full 32-bit pointers, sequential and random access files, dynamic strings, conditional compilation and separate compilation, bitwise integer operations, OTHERWISE in CASE statements, I/O error handling, and binary, decimal, octal and hexadecimal integer and character constants. Pascal 2 also includes full GEM AES, VDI, GEMDOS, BIOS, and XBIOS libraries and many other features. $99.95. Upgrades are available to registered users for $62.

Metacomco, 26 Portland Sq., Bristol, BS2 8RZ, UK, 44-272-428781.

Memocom has introduced a universal cross-development kit for the Atari 520, 1040, and Mega ST. The kit includes a table-driven cross assembler, source/text editor, communications software, and Memulator II in-circuit EPROM emulator. The cross assembler includes tables and sample source programs for the following processors: 64180, 6502, Z80, 68HC11, 8085, 68000, 8086, 8088, 8051, Z8, 6801/3, 8048, 6809, 3870, 8096, 6805, 7000, SUPER 8, 68916, and 40C50. $575.

Memocom, 1920 Arbor Creek Dr., Carrollton, TX 75010, (214) 446-9906.

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DisKey is designed to eliminate the need for adhesive-backed write-protect tabs. The plastic key is inserted into the left side of a 5¼" disk drive opening above the floppy disk where it snaps into place, protecting the disk in the drive from accidental damage.

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CroResearch, P.O. Box 129, Lyons, CO 80540, (303) 823-5088.

Computer Art Calendar

The Digital Daydreams calendar features graphics created on several computers, including the Atari ST. Along with the graphics, the calendar includes information on the artists, computer trivia, and step-saving hints for the computerist. Digital Daydreams retails for $10.95.

Publishing Ink, 521 State St., Glendale, CA 91203, (818) 500-7857.

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Atari Announces New Products at Comdex

Using the theme "Connectivity, Solutions, and Technology," Atari Corp. announced several new products at Fall Comdex in November.

New technology was represented by Abaq, a high-performance workstation based on a "Transputer" chip that is said to run ten times faster than a PC AT and five times faster than a 68020 with math co-processor. The Transputer, designed by Inmos, a U.K. company, is a very fast 32-bit RISC (Reduced Instruction Set Chip) microprocessor capable of working in parallel with other Transputer chips.

The Transputer workstation is also being designed in the U.K. by Perihelion Ltd. Although Tom King of Perihelion wrote Amiga DOS for Commodore he has said that Helios, the operating system for the Transputer system, will be quite different. Specifically, although it will have MS-DOS compatible files, it will not be like MS-DOS or Unix. As to what Helios will be as opposed to what it won't be, we'll just have to wait and see.

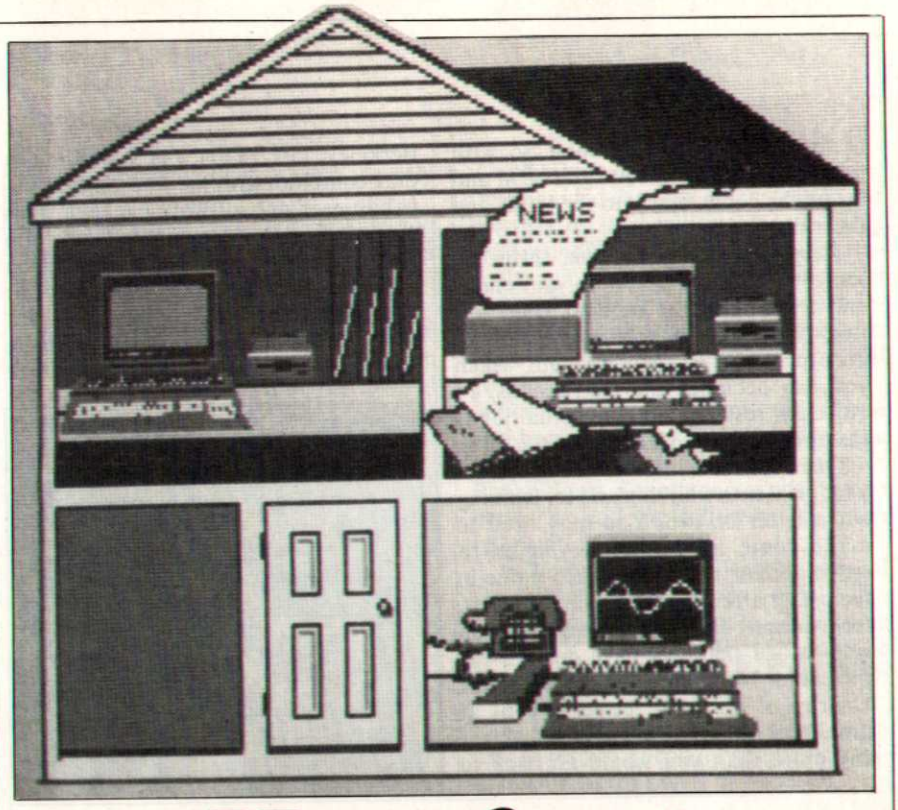
The Transputer-based workstation itself will have a high-performance graphics subsystem with 1024 × 768 pixel resolution and a palette of 4096 colors. Drawing will be hardware-assisted by a custom blitter array, making genuine animation possible at very high resolution. Basically, the ST will become an input/output processor for the Transputer, leaving open the possibility that it will be available to 1040 and Mega ST owners as an upgrade.

Also on display at Comdex was a CD (compact disk) player capable of both playing musical CD disks and reading CD-ROM data disks. The CD-ROM is supported by a Mega- and ST-compatible DMA interface and will retail "in early 1988 for well under $1000."

Atari expanded its PC-compatible offerings with two new models—the PC/XT-compatible PC2 and the PC/AT-compatible PC3. Both support EGA graphics and will be offered with a choice of 3½" or 5¼" floppy disk drives and with hard disk drives. In addition, the PC2 and PC3 both boast expansion slots.

Addressing the issue of "connectivity," Atari introduced a local area network (LAN) system that communicates at 1 megabit per second using the IBM/Novell NETBIOS protocol and at 250K bits per second over Appletalk. The network is called "Moses PromiseLAN" (no, we're not kidding).

The Atari Mega computers presented a variety of business solutions. Desktop publishing was represented by the Atari SLM804 Laser Printer and by G.O. Graphics' *Deskset*, a CompuGraphic-compatible program that will be marketed by Atari. Other solutions on display were word processing and CAD programs for the ST and Mega. ■



Homefront

From uni-user to power-user:

How to break the single-use computing habit

By ROXANE FARMANFARMAIAN

Have you fallen into a rut? Are you limiting your marvelously capable, many faceted Atari to word processing? Or perhaps checking in with the guys on CompuServe or Genie CB? Or maybe you use it just to play games (They really are educational, right?).

Single-use computing is a waste. It is also one of the most difficult ruts to break out of. You tend to fall into a groove with a computer—it does its thing, you do yours, and it would seem, you would both rather fight than switch.

Not so, of course, as far as your Atari is concerned. All sorts of untapped possibilities lie unmastered beneath its innocent-looking keyboard. The problem is that it takes some effort and a genuine need on your part to become a multifaceted-user after being a uni-user for months or even years.

Make no mistake about it, it takes creative energy to make the change. Yet, to let the capabilities of your computer go unexplored is to squander the power of your Atari, taking advantage of only a fraction of its worth. Admit with me, then, that it's time to diversify.

There are a few things to consider first, however. It bears repeating that the computer will not make you something you are not. It won't make you organized if you are fundamentally a messy person, and it won't make you an accomplished musician if you are tone deaf. So don't embark on a fool's errand.

Set yourself up to succeed. Choose something you already do (such as sending material to people through the mail) or really want to do and know you have a flair for (such as experimenting with graphics), or don't like to do but have to (pay bills, for example).

Once you have zeroed in on what would make an obvious—and orderly—step into a new area of computer activity, start preparing. Buy the appropriate software. (Go ahead, spend the money; it's a commitment to a good cause.) And begin to pay attention to the way you do the job manually, if your plan is to computerize a task you are already doing.

Observe, for example, the process you use to create your budget or calculate your tax liability; or how long you spend on correspondence; or when and how you play games or do projects with the kids. This type of observation will give you a blueprint to follow as you make the transition from pencil and paper to keyboard.

Upgrading your skills (and making your investment in your Atari pay off even more handsomely than it already is) can be done in a thousand ways. Let's look at three:

- Adding mail merge to your word processing abilities so you can send out mailings without re-typing all those names and addresses each time.
- Publishing, either solo or with the kids.
- Using telecommunications to acquire lots of information quickly and inexpensively.

The buzzphrase in all cases: Make it easy, make it necessary, and make it fun.

Word Processing Expansion

To make mail merge worthwhile, you must have a need to send the same letter to a whole bunch of people. You must have a list, and the letter you send must be suitable for computer-generation. Most business, community, and school lists fulfill these criteria. Holiday card lists probably don't (most people want them to be more personal), though change-of-address lists are ideal.

Don't start with a list that is too long, and allow yourself plenty of time to effect the conversion. If you use the same list again, it will turn out your correspondence in a jiffy and save you lots of time. The first time, however, you will have to type in all the data and learn the technique, so procrastination will only encourage you to revert to your old ways.

First off, compose your letter on your word processor. Then to be sure you don't embarrass yourself by sending out multiple copies of a letter with spelling errors in it, use a spell checker (some word processing packages have them built in) and proofread carefully to make sure everything is as you want it.

Whatever mail merge software you choose, you will have to match codes in your mailing list with codes you insert in the letter. And, much like an appliance that has so many bells and whistles that a part is bound to break, a complex mail merge program can make you wish for the comparatively pleasant drudgery of hand-typing letters and envelopes. So keep it simple.

If you can, arrange to have a computer literate friend or neighbor (or local high school hacker) sit down with you the first time through. Remember, this is supposed to be a pleasant transition to broader computer activity—not a test

of nerves or keyboard stamina. So, with your guru at your elbow, go ahead and insert the codes first into the letter and then into the list.

(If you are on your own, throw on some music, put a pillow on your chair, and crack open the manual. You will find that a relaxed atmosphere contributes markedly to the ease with which you can decipher the instructions. In any case, rest assured, the actual job is easier done than explained.)

Once you have inserted the codes, set your printer to whirring and try running out a letter or two. You may need to make some adjustments—an extra space here or there after each name in the list, or after the "Dear" in the letter, for example. But, all of a sudden, you will realize that you have crossed the threshold. Never again will you run off a series of identical letters one at at time, making small changes in each—any more than you would go back to pounding your typewriter after word processing on your Atari.

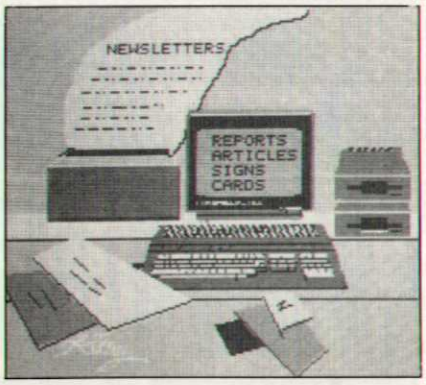
Desktop publishing can be the source of newsletters and business cards involving sophisticated layouts, graphics, and lettering.

Taking the Plunge into Publishing

Desktop publishing adds graphics to the word processing equation, which makes it a great project to do with kids. At its simplest, computer publishing can generate notepaper, letterhead stationery, posters, and banners—in quantity. At its most elaborate, it can be the source of newsletters and business cards involving sophisticated layouts, graphics, and lettering.

Before you start, figure out exactly what you need to accomplish and why. The purpose is every bit as important as the commitment. Plan, for example, to help your child create a Valentine for each of his or her classmates. Or make posters and flyers for a tag sale. Or write a thank you note embellished with appropriate graphics for everyone who gave your family a present during the holidays.

Start with a program such as *Print Shop* from Broderbund (17 Paul Dr., San Rafael, CA 94903, (415) 479-1170) or *Print Master* from Unison World (2150 Shattuck Ave., Ste. 902, Berkeley, CA 94704, (415) 848-6666) that combines graphic and textual capabilities in one software package. This type of all-in-one program will help you get the hang of publishing production without blocking your creativity or dampening the kids' enthusiasm. Not only are the instructions clear, but the programs can help you learn what size type to choose; how borders work; how graphics can fit in, around, and between words; and how to place your work on fanfold paper so your card, banner, or flyer looks the way you want it to. The supplemental graphics libraries that accompany such software packages can extend your range of options and the life of your project almost indefinitely.



Eventually, however, you will want to graduate to more complex page layout and higher quality graphics if you find that your interest and needs lie in this corner. For ST owners, these capabilities can be found in such programs as *Easy Draw* from Migraph (720 S. 333, Ste. 201, Federal Way, WA 98003, (206) 838-4677), *Publishing Partner* from SoftLogik Corp. (4129 Baumgartner, St. Louis, MO 63129, (314) 894-8608), and *Fleet Street Publisher* from Spectrum Holobyte (2061 Challenger Dr., Alameda, CA 94501, (415) 522-3584). These programs offer best results when used in conjunction with a graphics program and, ideally, a laser printer.

Before you set off on the road to desktop publishing madness, set aside a large block of time for creating your first piece. If you allot plenty of time—maybe even several days—to the task of becoming familiar with the program and trying a variety of layouts, your investment will be richly rewarded—and you will stand a better chance of retaining your sanity.

You will first compose your text on your word processor and store it on a data disk. Then you will want to create the graphic elements—charts, illustrations, filler art, and perhaps, a logo—and store them on the same disk. Next, you will create page formats with columns, headlines, subheads, and even column runover, perhaps. Finally, you will pour the text and graphics material from your data disk into the page layout you have set up.

Depending on how good your format is, you will probably have to fiddle with the various elements, sizing them up and down, changing fonts, scrapping or adding art, and trying out new structural designs. In the end, all the elements should fit snugly together like a miraculous Chinese puzzle.

Desktop publishing can turn into a very time-consuming activity, absorbing hours and hours of your life as you experiment and seek perfection. If you aren't generous with your time during the initial sitting (or series of sittings), you will become frustrated by the clumsiness of your creation and the seemingly impossible task of juggling all the pieces into a perfect geometric unit—and you will be tempted to abandon the project early on.

Like golf, desktop publishing can seem difficult and overwhelming on first attempt, but it is hard to find a single person who is not smitten by its drama once he masters the basics.

As with mail merge, the key here is Keep It Simple. Don't start out with plans for anything too long or complicated. A single-page newsletter is a much better first project than a facsimile of *The New York Times*.

If you have a laser printer, you can turn out typeset-quality documents. A laser can be a double-edged sword, however. On the plus side, it enables you to create a polished piece of work that slips soundlessly from the printer.

On the down side, it can be quite a challenge to figure out how a laser printer works with your software and how to tap into its typographic riches. Mastering laser printing will take some time, but the rewards will make it all worthwhile: glossily perfect output that you can change on a moment's notice, rather than having to wait days for galleys from your typesetter.

Tapping Telecommunications

On-line CB is a source of entertainment for many devoted Atarians, but what about the rest of us who don't exactly get warm fuzzies from the keyboard? Is serious telecommunication beyond our reach? Or is it much ado about nothing—a lot of useless techno-hype?

No, no, and no. There is more to telecommunicating than CB. In fact, veteran telecommunicators will tell you that it is actually exhilarating to see those first lines appear on your screen, emanating from an unseen mainframe many miles away.

Telecommunications connects you to other people and other organizations via computer link. If you have a computer at work and one at home, for example (and as long as each has a modem and telecommunications software, they don't even need to be the same type), you can call one up with the other and send messages or documents between them. That means you can work on the same project at home and at the office without lugging it back and forth in your briefcase or, worse, having to re-key changes and additions that you made at one place into the computer at the other.

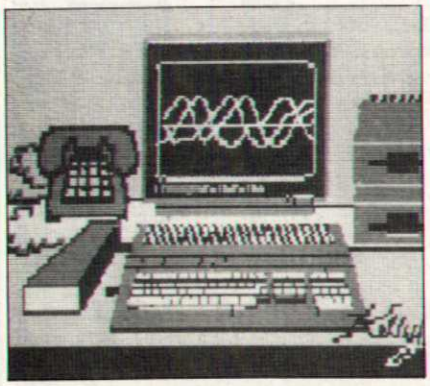
Another option: tapping into electronic bulletin boards around the country that provide a range of information and activities from the latest baseball stats to group novel writing or programming projects.

Third, you can join an information service such as CompuServe or Genie. Depending on which service you choose, you can send messages to remote mailboxes, join special interest groups (SIGs) such as the Work-at-Home SIG on CompuServe, purchase travel tickets or merchandise, check on the performance of your investments, and many more things you never dreamed possible. To become a member, you pay a yearly membership fee and a sliding hourly usage rate depending on what time of day you log on—plus applicable telephone charges.

Finally, there are on-line university networks that offer courses and even degree programs at both the bachelor's and master's level.

As you determine where your greatest need—and interest—in telecommunications lie, ask friends and colleagues how they use it. That way you can gauge whether your expectations are realistic. Telecommunications can be deceiving; although it is very effective in some ways (and lots of fun to use), the new user's view of it often differs substantially from what it really delivers.

Once you have focused on how you are going to use it, make sure you obtain a serviceable modem and telecommunications software (often they come packaged together, but not always). Choose the simplest, easiest-to-use program you can find. *Flash* from Antic (544



Second St., San Francisco, CA 94107, (415) 957- 0886) is one of several good ones for the ST. The most popular telecommunications program for 8-bit Atari computers is Express, a public domain program that can be downloaded from CompuServe. A version of Express designed especially for Atari's SX212 modem is currently being developed for distribution by Atari Corp.

When starting out, lasso your mentor once again as a safety net. If you can't find a helpful hacker (don't forget to look in your local user group for one), pick up a step-by-step telecommunications primer for bug busting and problem solving. And be sure that the store from which you buy modem, software, or both has a knowledgeable person on staff to answer questions when you get stuck. That way at least you'll have a calm voice at the other end of the phone when you reach the breaking point and are ready to put the Atari experience forever behind you and head for Peru.

This talk of preparation is not designed to be off-putting. But getting started in telecommunications is serious business, like learning to ride a bicycle. It takes some practice to get the hang of it, and taking on the project for the first time unaided can lead to frustration. At the very least, it will involve checking parity, duplex, and baud rate—all rather foreign ideas at first. Yet, once you and your computer hit your stride, telecommunicating will be one of the best, most exhilarating experiences you will ever have together.

For more information and phone numbers of bulletin boards around the nation, pick up a copy of the Computer Phone Book. To join one of the on-line networks, call the following for more information:

- CompuServe, the largest general interest network. (800) 848-8990.
- Connected Education, an on-line university network affiliated with the New School in New York City. (212) 549-6509.
- Dialog Information Services, a research resource good for small businesses. (800) 3-DIALOG.

***Veteran telecommunicators** will tell you that it is actually exhilarating to see those first lines appear on your screen, emanating from an unseen mainframe many miles away.*

- Dow Jones News/Retrieval, a financial network. (800) 345-8500.
- Genie, a new general interest service particularly popular with Atari owners. (800) 638-9636.
- MCI Mail, an electronic mail network. (202) 872-1600.
- Delphi, another general interest network. (800) 544-4005.
- The Source, likewise, a general interest network. (800) 336-3366.

Get a feel for each of the networks when you receive the information, and choose the one that fits your needs best. Want to trade stocks on-line, for example? Read all about CompuServe's and Dow Jones's brokerage services, then consider them against the backdrop of the other services each offers. Most of the networks have a trial offer that allows you to check them out before forking over the year's membership fees. Try a few; then go for it!

In fact, going for it is the moral of this whole story. Define your needs so that you know your time will be well spent. Figure out what your Atari can do for you in exchange for only a little more effort on your part, and bingo! More and happier computing. ■

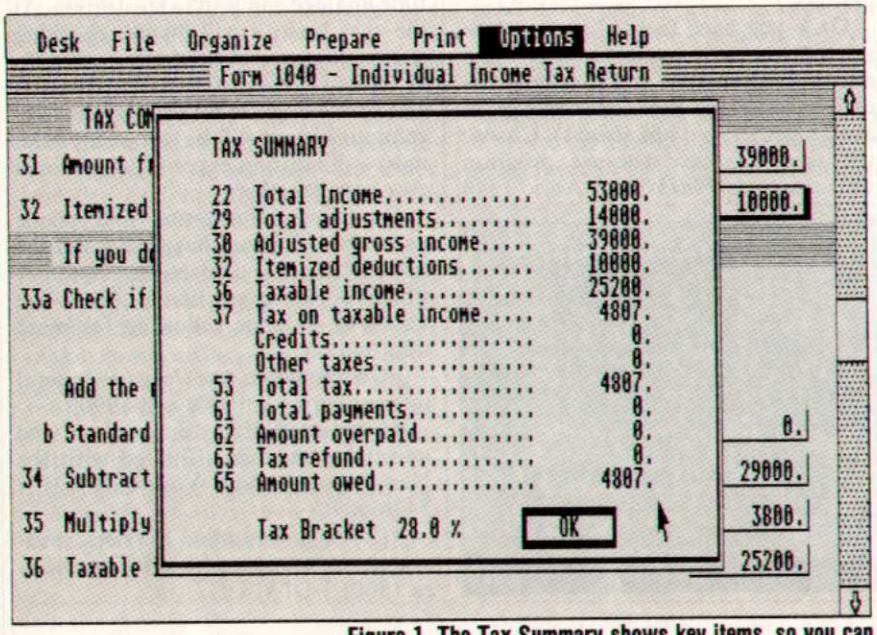


Figure 1. The Tax Summary shows key items, so you can immediately see the effect of any specific item.

Bottom Line

Double Eagle Software releases The Tax Advantage, a comprehensive tax planning and preparation package for all Ataris

The Tax Advantage

System: Atari ST and 8-bit
Price: $59.95
Summary: Federal income tax preparation and planning package; comprehensive and easy to use.
Manufacturer:
Double Eagle Software
2210 Wilshire Blvd.
Suite 875
Santa Monica, CA 90403
(800) 443-0100 x315 (orders)
(213) 459-9748

The Tax Advantage is a tax planning and preparation package for your personal federal income tax. It follows the federal tax forms line for line, but all calculations are done for you and data is passed automatically between the forms. It computes your tax liability continuously as each new entry is made, so you can see how each item affects your overall tax picture.

You can itemize any line that needs more than one entry—wages or charitable deductions, for example—and print out all supporting statements as well as the tax forms themselves to submit to the IRS. All *Tax Advantage* printouts have IRS approval.

The 1987 edition of *The Tax Advantage*—available in mid-December 1987—is completely up-to-date, including all the new Tax Reform changes and forms. For example, it includes all the new limitations on medical expenses, personal interest, entertainment expenses, miscellaneous deductions, and rental losses. It also includes the changes on passive and non-passive activities on Schedule E, the alternative tax calculation on Schedule D, and the meal and entertainment expenses on Schedule C.

The Tax Advantage handles the 12 most used schedules and forms, specifically Form 1040, Schedules A-F and SE, and Forms 2106 (Employee Business Expense for three separate businesses), 2441 (Child and Dependent Care), 4562 (Depreciation and Amortization), and 6251 (Alternative Minimum Tax).

The Tax Advantage is not a new program; in fact it has been a best seller in the IBM PC and Apple markets for five years. What is new is its availability for Atari ST and 8-bit computers and the fact that it is now published only by Double Eagle Software, Inc. (it was previously licensed to another publisher).

Using The Tax Advantage

The Tax Advantage is not copy protected and can either be booted from the furnished floppy disk or loaded onto a hard disk. It has not just been ported over to the Atari machines from the IBM PC version; rather each individual version has been written to take advantage of the specific hardware and recognize its limitations.

The ST version, for example, features pull-down menus and mouse control, while the 8-bit version is adjusted to a 40-column screen. Each version has its own manual, although the versions for keyboard-oriented computers (Atari 8-bit, IBM PC, Apple II, and C64) are similar enough to be combined into one manual. To print out IRS forms with 8-bit computers, you will need an 80-column printer, but the program is still usable—and useful—without one.

The program and manual are very clear and take you step by step through preparing your forms. Typically, you would start by filling out your taxpayer information (name, social security number), filing status, and exemptions, and then jump into Form 1040.

Naturally, much of the information can not be entered into Form 1040 (deductions, capital gains, etc.) immediately, but you may wish to enter ballpark numbers from your 1986 tax return just to give you an idea where you stand. Any information entered later on the supplemental schedules and forms will automatically override and replace your earlier estimates.

As you enter data, you can jump to the Tax Summary item on the Options

By DAVID H. AHL

The 1987 edition of *The Tax Advantage* is completely up-to-date, including all the new Tax Reform changes and forms.

Menu at any time. This summary (Figure 1) shows key items, such as total income, adjustments, taxable income, credits, payments, and your refund or amount owed, so you immediately see the effect of any specific item. This feature, unfortunately, is available only in the ST version; 8-bit users must bring up Form 1040 to see the effect of new items. My only criticism of this feature (on the ST) is that I would like to have the Tax Summary stay on the screen while items are changed, rather than having to open and close the window to see the effect of each change.

Itemized Entries

On any line on which you want to make more than one entry, you may itemize. Itemizing allows you to list entries separately, rather than as a lump sum. An itemized total automatically overrides previous entries on a line.

A separate 50-item file is opened for each entry that you itemize, so it is important to avoid itemizations with only two or three entries or you will soon use up the space on your disk (hard disk owners need not worry about this). An I appears next to each itemized entry to remind you that the detail for that entry is contained in a separate file.

Entries for each schedule and form are made in the same way—that is, by entering a figure and moving from item to item with the mouse or arrow keys (ST) or the U and D keys (8-bit).

Tax Advantage automatically readjusts your totals and computes your new tax after every entry. It selects the correct tax computation method (Tax Table, Tax Rate Schedule), but it will not compute Alternative Minimum Tax unless you tell it to do so.

When you have entered all the data and are satisfied that all is correct, *The Tax Advantage* will print either draft forms or actual IRS-approved tax forms. You don't have to feed actual IRS forms into your printer; the program will produce each form in a format acceptable to the IRS.

Tax Planning

The tax planning function of the program allows you the option of temporarily changing numbers to see what the tax consequences are. In the ST version, this is done from the Option menu, while in the 8-bit version it is done by pressing Control-X (for several changes) or O (for a single override); in either case, you can then enter your changes and examine the effect.

The documentation for *The Tax Advantage* clearly has benefitted from five years of use, feedback, and revision. It is outstanding. The manual is well-organized, clearly written, and nicely typeset, and has lots of examples and a good index.

Naturally a package like this can't offer all of the nearly 100 tax forms available for individuals. For example, it was missing five forms that I have needed in the past—specifically, Schedule G (Income Averaging), Form 2210 (Underpayment of Estimated Tax), Form 4797 (Sale of Business Property), Form 4952 (Investment Interest Expense Deduction), and Form 6252 (Installment Sale Income). Of these, I would certainly like to see Income Averaging in future releases of the product.

Nevertheless, *The Tax Advantage* will undoubtedly satisfy the majority of individual taxpayers. If you have graduated from the short form, *The Tax Advantage* will almost certainly offer savings in time, effort, frustration, and money on your 1987 income taxes. ■

Phil Conchshell awoke one morning to find he had been transformed into a No. 2 pencil.

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Antic Publishing, Inc.
An Information Technology Company

DBasic

A drag racing Basic for the ST

DBasic

System: Atari ST
Price: $39.95
Summary: Blindingly fast Basic. Bypasses GEM, TOS, windows, and mouse.
Manufacturer:
DTack Grounded, Inc.
1570 Pacheco B-7
Santa Fe, NM 87504

No, the D in DBasic does not stand for drag racing, but it might as well. Not only is DBasic one of the fastest Basics available for the Atari ST, but it handily beats nearly every other micro- and mini-computer Basic on the market.

What the D does stand for is the name of the company that makes the product, DTack Grounded, which in turn refers to the fact that the 68000 microprocessor runs at its maximum speed when a certain pin, called DTack, is grounded.

What is DBasic?

Unlike so many other Basics, DBasic is not just another rehash or variation on Microsoft Basic, nor does it follow the popular approach of gaining speed by compiling source code written using a word processor or some other interpreted Basic. No, DBasic is different from the top down.

First of all, DBasic is a self-contained programming environment which includes the language itself, the operating system, and the BIOS (basic input/output system). Thus, it does not operate under TOS or GEM; nor does it use windows or the mouse, standard formatted disks, or built-in functions or reference libraries.

DBasic is written entirely in 68000 assembly language and thus is both faster and more memory-efficient than most other versions of Basic. The only faster Basic for the ST is LDW Compiled Basic. DBasic is faster than both GFA interpreted and compiled Basic, Fast Basic, ST Basic (by a reported average factor of 20 times), Philon Basic, and Softworks Basic.

DBasic is what is known as an *incremental compiler*. What this means is that you can interact with DBasic just as you would with a Basic interpreter (such as Microsoft Basic or Atari 8-bit Basic). As you enter lines of code, DBasic checks syntax and immediately reports problems. When you run bits of code for testing, DBasic furnishes error messages—in English even. But because DBasic compiles each line of code as it is entered, you get all the speed of a compiler.

In vogue today are versions of Basic that do not require line numbers. DBasic is not in vogue. It requires line numbers, and, consequently, permits multiple statements on each line. Microsoft Basic programmers will feel right at home.

Unlike virtually any other Basic in the world, DBasic has no reserved words. If you want to name a variable LOAD or PRINT, DBasic won't complain. Actually, using LOAD or PRINT would be a bit foolish, but I have often gotten in trouble using seemingly sensible names like SEND, MINT, and TON for variables, because they contain reserved words.

The reason DBasic has no reserved words is that it looks at the position of a word in a statement to determine its meaning. Thus, all commands and functions must be separated by spaces and typed in upper-case. Other than that, anything goes.

Another reason DBasic is so fast, and something of which you must be aware when programming, is that it uses two distinct types of numeric data, integer and floating point. In DBasic, variables must be one or the other and cannot be used in mixed calculations unless one type is specifically changed, using a function, to match the other.

As with other Basics, string elements are also included as a data type. Strings are consistent with Microsoft convention, i.e., a string dimension refers to the number of strings in an array, not the number of characters in the string as it does in Atari 8-bit Basic. A string can be up to 255 bytes in length.

Unlike other Basics, DBasic allows

By DAVID H. AHL

you to PEEK at or POKE into memory almost anything—bytes, words, strings, or entire arrays. This leads to some amazing possibilities—particularly in graphics animation and file handling.

One other area in which DBasic differs from its competitors is in disk input/output. DBasic formats disks into staggered sectors for faster reading and writing (about 1.85 times the transfer rate of standard TOS) and, as a byproduct, stores about 10% more data on a disk than TOS.

How Is DBasic To Use?

Given all the differences between DBasic and most other versions, using it is surprisingly easy. As a long-time Microsoft Basic programmer, I had no trouble putting spaces around commands or typing them in upper-case.

The biggest problem I had at first was remembering the silly minor differences, such as using a semicolon to abbreviate REM instead of an apostrophe. I also had trouble remembering which variables were integer and which were floating point and frequently forgot the FIX and FLT (float) functions. But perhaps worst of all was remembering to use brackets to enclose variable dimensions and parentheses to enclose function arguments.

DBasic is also very picky about how you exit a FOR loop. In Microsoft Basic, you can exit prematurely and continue with the program. While DBasic will let you do that a few times, pretty soon the FOR loop stack counter overflows and you get the cryptic error message, "Too many FOR-NEXT loops about Line 190." Well, it doesn't really mean too many FOR-NEXT loops; it just means the FOR-NEXT stack has spilled over.

The manual suggests a method for gracefully exiting, but I found that the crude approach of simply setting the index variable to the highest value in the loop upon exiting worked just fine.

One interesting command I found myself using quite frequently was COLLECT. What this does is clear and reconstruct the symbol tables by recompiling the entire program; in other words it collects the garbage left over after a long editing session, reclaims the memory space, and starts over.

One major criticism I have of DBasic is that it does not support hard disk files. While it is much faster than other programs in its floppy disk I/O, I just plain don't use floppy disks more than once—to load the program onto my hard drive. Another hardware feature not supported by DBasic is sound—not so much as a BEEP. I was also disappointed that DBasic does not have PRINT USING or any substitute method of producing pretty formatted output.

Unlike so many other Basics, DBasic is not just another rehash or variation on Microsoft Basic.

Documentation

The 281-page manual is a mixed bag. The 184-page reference section, which explains each command and function, is just fine and contains lots of examples, notes, and cautions for virtually every statement.

However, the first 96 pages ramble about, mixing tutorial material (excellent), sales pitches for DBasic (not needed), excruciating detail about tables and arrays (aaarrrrggh), and occasional core dumps of author Hal Hardenbergh's philosophy (sigh). There is no index, and the table of contents is not an adequate substitute.

Is DBasic For You?

You will like DBasic if you want blinding speed, if you like Microsoft Basic, if you are willing to experiment, and if you are an independent thinker. You will not like DBasic if you need to manipulate files on hard disk, if you like windows and mice, if you want easily formatted output, if you need handholding and support, or if you like unnumbered Pascal-type program structure. As for me, I like it. ■

An Unusual Marketing Strategy That Didn't Work

When the folks at DTack Grounded finally finished up their new Basic, they realized they had quite a problem. ST Basic was being given away with the computer. Never mind that it was slow and cumbersome; it was free. GFA Basic was much better and, although not free, had been out for a while and was well on its way to becoming a second ST standard. In addition, LDW had a pretty good Basic on the market which, in its compiled version, was actually faster than DBasic.

Faced with the prospect of becoming just another me-too product in an already crowded market, Hal Hardenbergh of DTack Grounded decided on a most unusual strategy. He would give away the software and charge for the manual. So every user group in the country was sent a master disk, 64 disk labels, and 10 manuals. The cover letter suggested that the user group distribute DBasic as widely as possible.

Hardenbergh believed that people would prefer the new Basic and would be happy to lay out 40 bucks—about half of what the other Basics on the market cost—for a manual. Unfortunately, he failed to reckon with four factors.

First, so much Atari ST software comes with poor documentation that the people who received DBasic were reluctant to lay out $40 for a manual of perhaps dubious quality. Second, many ST owners were just plain too cheap to buy the manual and were willing to struggle along without documentation or borrow a copy from a friend. (Those ten copies to each user group went a long way.)

Third, only about 15% of all ST owners belong to a user group, so the strategy missed 85% of the potential market. And fourth, dealers had no incentive to stock and sell DBasic.

Hence, after the initial barrage of publicity, without advertising or retail presence, DBasic would be overlooked by new ST owners who would end up buying one of the Basics stocked in the store from which they purchased the computer.

So, a piece of advice to Hal: shrink wrap some disks and manuals and start shipping them out to dealers. Do some advertising and sell some copies through the mail. Then maybe DBasic will perform as well in the market as it does on the ST. ■

Reviews of Guitar Wizard and Dr. T's MIDI Recording Studio and a look at things to come

Sound Chip

By STUART DUDLEY DIMOND III

This issue, we take a look at two products for the Atari musician—one for 800 XL/XE users and one for ST users.

Guitar Wizard

The computer revolution that has radically changed the life of the keyboard musician has, for the most part, left the guitar players of the world untouched. Baudville has improved this situation by introducing *Guitar Wizard*, and while it won't play your guitar for you, the program will help expand your musical horizons and stimulate your creativity.

Why Learn Scales and Chords?

Melody and harmony, the basic materials of music, are derived from *scales* and *chords*. Two notes of different pitch (or frequency) are said to be separated by an *interval*. A scale is a fixed pattern of intervals played sequentially in time and a chord is a subset of those intervals played simultaneously.

The most common chord in music is the *major* chord, which is made up of the first, third, and fifth notes of a major scale played together. The first tone of the chord is also referred to as the *root* of the chord. By combining intervals in many different patterns, a great variety of scales and chords have been invented. Given enough skill, it is possible to take these simple materials and make everything from songs to symphonies.

Guitar Wizard is a learning tool that will broaden your musical vocabulary by presenting a wide variety of chords and scales in easily understood fretboard representation. Even the beginning guitarist who can't read music will have no trouble interpreting the information this program makes available to him.

Scales and chords may be shown according to the fingers placed on the strings to play the notes; by interval markers showing which string plays the root, the third, the fifth, and upwards for more complex chords; or by the notes of the chord shown on the strings.

This copy-protected program boots to show the menu that allows you to select Chord Wizard, Scale Wizard, Fretboard Wizard, or Improvisation Wizard. All commands are made by menu selections using the arrow and Return keys of your Atari, or with the joystick and fire button. A print command makes it possible to print your favorite scales and chords for use when practicing.

Chord Wizard

Chord Wizard is your basic guitar instructor, presenting 32 chords on the guitar in standard tuning. This may not seem like a lot, but consider, you can display these chords for each of 12 possible roots, in many positions on the neck, up to the 15th fret. Multiply these possibilities by the fact that you can display them notated according to fingering, intervals, or notes. This program puts more chords at your fingertips than most professional players ever use.

Start by learning the major and minor chords on all possible roots in the lowest position on the guitar. When you have mastered those, learn them in higher positions up the neck. The more complicated chords are the flavoring you will add later, as you become more sophisticated. This section of the program is also of use in arranging for guitar. You can work your way through the chords of a song, looking for the positions that will leave the notes of the melody on the top strings so they can be heard.

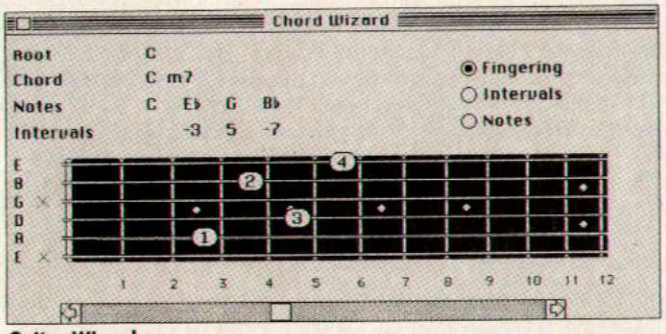
Scale Wizard

Scale Wizard presents 19 scales in a manner similar to Chord Wizard. Whether your taste is rock, country, jazz, or classical, you will find a scale to spice up your musical life. The selection includes not only the familiar major and minor scales, but also blues scales, pentatonic scales, and modal scales.

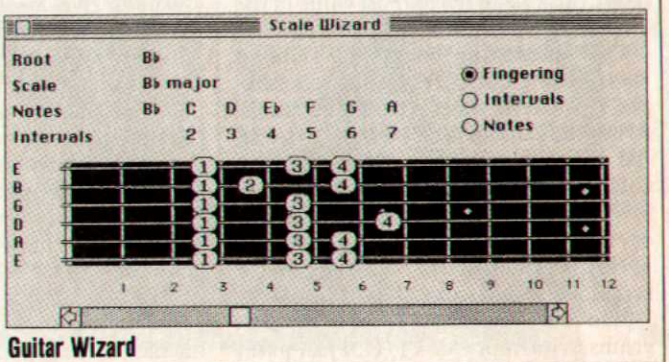
Learning these scales gives you a starting point for creating melodies with new and different flavors. Practicing a different scale pattern each day in all the possible keys, will give you necessary musical exercise, while cutting down on the boredom inherent in just playing major and minor scales.

Fretboard Wizard

Fretboard Wizard allows you to explore the world of altered tunings. Changing the tuning of the guitar opens new vistas by making it easier to play exotic scales and chords. Select a scale or chord, then change the tuning of the strings and watch how the fingerings

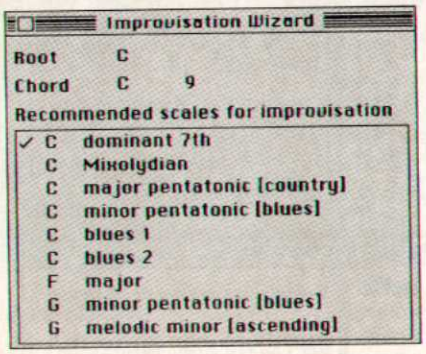


Guitar Wizard



Guitar Wizard

Improvisation is now a lost art among classical musicians, but still an essential skill for jazz and rock players.



Guitar Wizard

Guitar Wizard

System: Atari 800 XL/XE
Price: $29.95
Summary: Ideal for beginning and intermediate guitar players and for non-players who wish to arrange for guitar.
Manufacturer:
Baudville, Inc.
1001 Medical Park Dr. S.E.
Grand Rapids, MI 49506
(616) 957-3036

change. This can make a difficult song easier to play and encourage you to use melodic patterns you have never tried before.

Improvisation Wizard

In the days of Mozart and Beethoven, any adequately trained musician was prepared to improvise. This is now a lost art among classical musicians, but still an essential skill for jazz and rock players. Improvisation Wizard will encourage you to explore the musical universe.

You select a root note and a chord, and you are given a list of scales to use in improvising in relation to the chord. Every day, pick a new chord on a different root and spend some time improvising with the suggested scales. You may not be the next George Benson or Eddie Van Halen, but you will certainly have a lot of fun.

The documentation for this program is short but clear. The basic musical concepts needed to use the program are presented as a Primer on Fretboard Harmony in the program instructions. *Guitar Wizard* is not a substitute for having a teacher but a resource from which you can draw on a large body of musical knowledge.

The real value of this program lies in practicing with it regularly to develop your ear and help you judge the musical worth of the results you produce. If you are serious about music, this program is well worth the price, and even if you aren't it is a lot of fun.

Dr.T's MIDI Recording Studio

Thanks to Jack Tramiel's clever decision to include a MIDI port on all Atari ST computers, we musicians are the beneficiaries of a flood of powerful music software. *Dr. T's MIDI Recording Studio* is an example of the versatile tools being created to make our musical lives easier. It is a member of a complete line of software created by musicians for musicians.

MIDI Recording Studio is an eight-track sequencer program, the operation of which is similar to that of an eight-track tape recorder. When setting up your system to use the program, carefully follow the instructions for making connections between your synthesizer and your ST. The MIDI ports are optically coupled, and you are unlikely to hurt device, but there are so many individual peculiarities among pieces of MIDI equipment that you can become very frustrated if your hook-up is wrong.

The Play/Record Screen

This copy-protected program boots to display a title screen, then switches to the Play/Record control screen. The top of the screen contains eight sections—corresponding to the eight recording tracks—labeled with track, name, and status. The program boots want to attend to several things before you start recording.

In the lower left-hand corner a label says: CLOCK: 120 BEATS/MINUTE. This is a fine tempo for a dance

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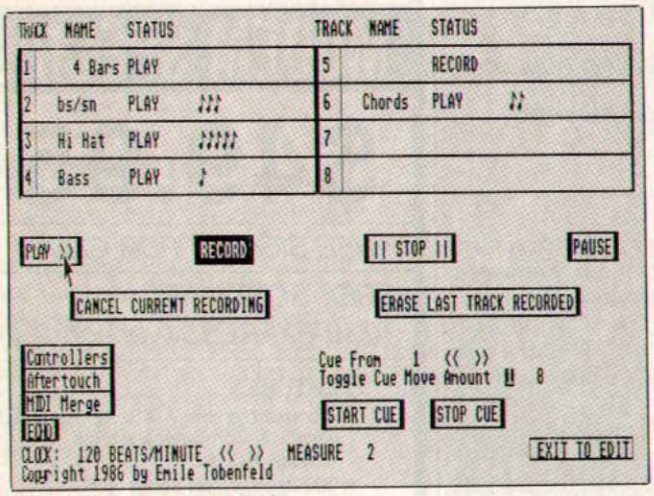
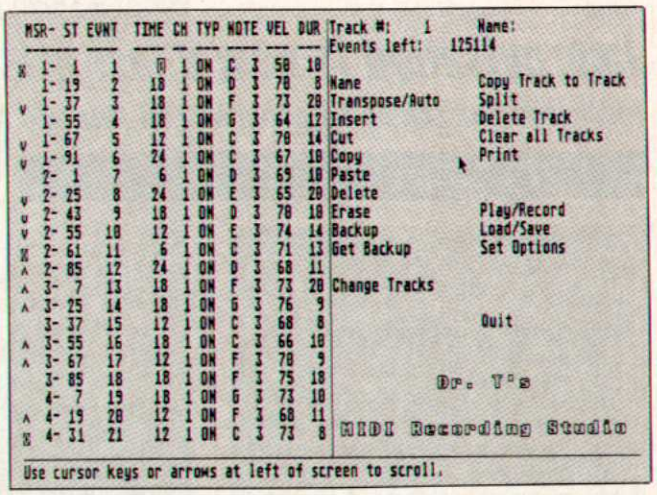


Dr. T's MIDI Recording Studio



Dr. T's MIDI Recording Studio

track but too fast for a love song. Set the tempo appropriately for your music, using the arrows to the right of the label. The program outputs a metronome beep on each beat as you start recording, but if you are like me, you will probably want to use the CountIn feature on the Set Options menu to set up a number of beats to be played before you start to record.

The only characteristics of the program I found bothersome pertain to the recording function. I have spent a lot of time in the recording studio, most of which has been spent in preparation or in monitoring already recorded material. It seems undesirable to me that the Play/Record screen always comes up ready to record. I would prefer to have the system record only when I have specifically told it to.

The second item merely requires caution. You must make your first track the length you will want your entire song to be. It is as if you are cutting a piece of tape the length of the first track and no other track can be longer. This is not a real problem, because you can always lengthen the first track by editing or adding on, but it might be annoying if you really start cooking on another track and find you have to stop because you have exceeded the length of the first track. You must also remember that because the MIDI timing information is relative to the beginning of a track, you must start recording from the first measure with each track you lay down.

MIDI Merge and Echo are two features that are quite useful if you are using a MIDI controller that is separate from your synthesizer. If you turn on MIDI Merge, any information that comes in through the MIDI In port will be retransmitted through the MIDI Out port. By selecting Echo it is possible to receive information on one MIDI channel and have it retransmitted on another.

Playback is just like playing a tape. If you wish, you can mute any combination of tracks so you can concentrate on a particular part. The Cue feature lets you set a point other than the beginning to start your playback.

The Edit Screen

The Edit Screen will impress upon you just how much information a skilled musical performer generates. Here, every event on every track can be viewed and modified. It is possible to edit or remove individual events and to create new ones.

Two modes exist for removing events or sections from a track—delete and erase. Delete is like taking a splicing block and cutting a section out of a tape; erase simply removes an event without changing the location of the events that follow. It is possible to create performances directly on the edit screen without ever using a musical keyboard—a feature that will welcomed by those without keyboard skills and by the physically limited.

There is also a group of powerful global editing commands that make it easy to change large amounts of data at once. The pitch of every note can changed by using the Transpose command. Compress/Expand can be used to lengthen or shorten an entire track proportionally. Duration can be used to alter the length of time the notes sound. If your keyboard lacks velocity sensing, you can use the velocity scaling feature to add expression to a track after it is

MIDI Recording Studio

System: Atari ST and MIDI equipped Synthesizer
Price: $39
Summary: A good entry-level sequencer with enough power and features for serious music making.
Manufacturer:
Dr. T's Music Software
66 Louise Rd.
Chestnut Hill, MA
(617) 244-6954

A Look at Things to Come

The world of MIDI can be costly and confusing. In the coming months, this column will address both the positive and negative aspects of MIDI. We will attempt to expose some of the widespread misunderstandings about MIDI and examine in detail the various kinds of sythesizers and their applications. MIDI manufacturers, musicians, producers, and recording engineers will be interviewed in an effort to bring you closer to the system best suited to your needs.

We also plan to include MIDI programs in several languages, tips on the correct way to map MIDI routing systems, and do-it-yourself projects to teach you such useful techniques as building and installing MIDI ports in your XL or XE computer.—***Morton Wilde***

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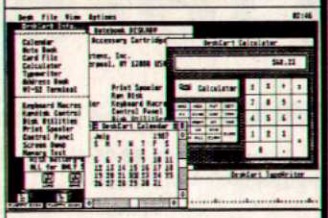

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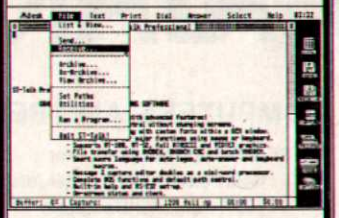

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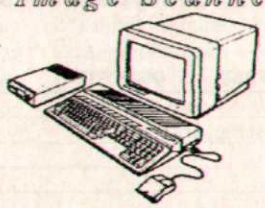

What Is IMG Scan?

IMG Scan is a simple, inexpensive device which turns your dot matrix printer into an image scanner allowing you to scan any page that can be put into your printer! Keeping in line with Atari's power without the price philosophy, IMG Scan finally makes image scanning simple and affordable. This brings powerful graphic capabilities to desktop publishing, image processing, and graphic art applications on the Atari ST! At $99.95, the IMG Scan opens doors that were closed by expensive and inferior video digitizers.

This entire brochure was created on an Atari ST using a desktop publishing program and IMG Scan. All images and line drawings were reproduced with IMG Scan, imported into the desktop publishing program, and printed on an Apple Laserwriter. This is how easy IMG Scan is to use.

SEYMOR-RADIX
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fig 2. This image was scanned from an original cover removed from *Vanity Fair* magazine with IMG Scan and printed on an Apple LaserWriter.

How It Works

The operation of IMG Scan is very straight forward. A small cartridge (approx: 1.6" X 1.9") plugs into the Atari St's cartridge port and is connected to the printer's head via a thin, flexible image cable. This image cable can be attached most anywhere on the print head using nothing more than a piece of adhesive tape. The user is at option to use any method he may come up with to mount the cable, but is not encumbered by an inflexible mounting bracket. This is one reason that IMG Scan can be made to work on most any printer. With the image cable attached to the print head, the printer is controlled by the IMG Scan driver software. The software can be set for sizing the scanned image among 20 different levels of magnification or reduction. Since 256 gray levels are recorded, and the ST is capable of displaying only 16 colors at a time, the contrast of individual gray level ranges can easily be adjusted and assigned to color palette positions. The image may then be colorized or saved to disk etc.

Applications

IMG Scan is an indispensible tool in desktop publishing. It is very useful in things like adding photographs, charts, clip art, line art, or anything that can be scanned, to newsletters, business cards, letter heads, etc. You could for example, put your own picture on your own letterhead! Also it can be used to create a computerized photo album. Send pictures of family and friends over the phone lines. And of course, IMG Scan is perfect for use with art programs to enhance your art creations.

fig 1. This image was scanned from a photocopy of a *National Geographic* cover with IMG Scan and printed on an Apple LaserWriter.

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recorded. Cut, copy, and paste commands function like a musical word processor to move or duplicate sections of music.

Quantization

A program like *MIDI Recording Studio* generates a clock by which it times the occurrence of the notes being recorded. One of the really excellent areas of flexibility in this program lies in the wide range of control you are given over this aspect of its operation.

The program boots with standard values of 96 clock ticks per measure—24 ticks per quarter note. This is fine for many applications, but an expressive player will probably find his music losing a lot of subtle nuance at this setting.

Activating Set Options on the edit screen brings up a menu that allows as many as 999 ticks in a measure—as many as 384 ticks in a beat—and permits the tempo to be set with greater precision than the arrows on the Play/Record screen allow. By adjusting the number of ticks per measure in relation to the number per beat, time signatures other than 4/4 common time can be accommodated.

Along with this control of the clock comes a quantization command that makes corrections in the timing of events by moving them to the nearest multiple of a timing interval you specify. This can be useful for cleaning up loose spots in your timing, but if used too much, it can sap the liveliness from your performance. Included on the program disk is a Bach Two-Part Invention that is an example of just how dead perfectly played music can sound.

MIDI Recording Studio is a good value for the money. You might sneer at the limits of eight tracks, but remember that the classic *Switched On Bach* album was produced on an eight-track recorder.

Given the application of musical knowledge and intelligence, fine results are possible with this software, an ST, and a moderately priced synthesizer. This package is also upward compatible with Dr. T's Keyboard Controlled Studio, so effort spent generating song files with this program will not be wasted if you decide to upgrade later. ■

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Sesame Street games for preschoolers

Atari Classroom

By JOYCE WORLEY

Moppets love Muppets. Jim Henson's adorable creations have been wowing them down on Sesame Street since education came to television. They are about as recognizable to youngsters as Santa Claus, and almost as well liked, so they make perfect tutors for preschoolers.

The Sesame Street kideo programs, designed by Children's Television Workshop and originally published by CBS Software, are natural child-pleasers. They have been re-released by Hi Tech Expessions, a company best known for its line of greeting card software, and re-priced to please parents as well.

The three programs available for Atari 8-bit systems are suitable for tots from 3 to 6 years old. On each, the familiar Muppets entertain and teach junior computerists a variety of rudimentary skills. The educational message is very low-key; these programs are not intended for use use as high-pressure, high-achievement tutorials. Instead, the beloved Muppets deliver a small dose of learning—charmingly and pleasantly. And if you think about it, that's not half bad!

Ernie's Magic Shapes

Ernie takes the stage to help tots master simple shape identification puzzles in this extremely easy game for young computerists. The little Muppet, resplendent in top hat and magician's cape, waves his wand and, pow!, a shape appears in the air above his head. He then turns to face the table next to him on the screen and with another wave of the wand makes a shape appear there. Are the two objects the same shape and color? If not, the down arrow makes the mismatch disappear.

Ernie keeps zapping new shapes onto the table until the correct one appears. If the match is correct, the up arrow makes Ernie nod his head happily, then zap the shape on the table again to move it up beside its mate in the air.

Next Ernie's magic bunny puts in an appearance, hopping happily around the stage until the child goes on to a new shape-matching challenge.

There are six levels of play. The easiest setting features circles, squares, triangles, and other geometric shapes, presented one at a time. At the highest difficulty setting, Ernie magically produces more complex pictures, such as a locomotive made of circles, triangles, rectangles, and squares. He then conjures up a simple shape—such as a triangle—and asks the child if that shape is part of the picture.

The youngster must pick out the different elements to reconstruct the object. As each part is correctly identified, it is placed in its appropriate position, until the item is reassembled from these geometric bits and pieces. Though level six does not represent an enormous challenge, it is significantly more difficult than level one and helps children to see how a number of components can combine to make a new shape.

Big Bird's Special Delivery

The Post Office eagle had better move over; Big Bird and Little Bird are getting into the delivery business—at least on Sesame Street. The two Muppets have a stack of packages to deliver to the merchants and need help from the nursery school set to get each box to its destination.

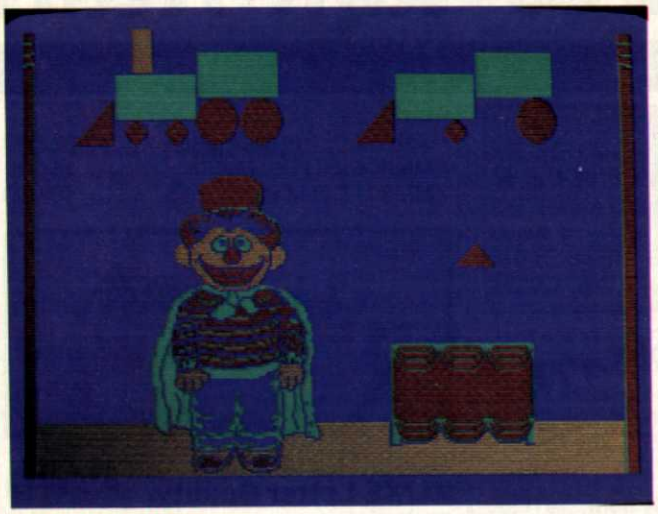
Big Bird's Special Delivery is more difficult than *Ernie's Magic Shapes*. Both are matching games, but *Big Bird* progresses beyond shape and color identification, asking the child first to pair items, then to recognize classes of objects.

This is a heavy concept for preschoolers. Even though the game itself is very easy and the control system, baby-simple, toddlers need a lot of parental guidance to master this one. There are even—horrors!—printed instructions onscreen for the player. Fortunately, once he or she knows how to play the game, the child can ignore the text.

The two winged deliverymen have parcels for the businesses on the playscreen. In each window the smiling proprietor waits for the day's delivery of goods. A picture above the store represents that business—an apple for the fruit market, a lollipop for the candy store, a firetruck for the auto shop, or an article of clothing for the haberdasher.

Big Bird, looking remarkably Muppet-like, appears with a parcel and hands it to Little Bird. Big Bird leaves, and the small messenger must examine the picture on the parcel and hop to the right shop.

The program offers two separate games, which differ dramatically in difficulty. The Same Game presents the delivery bird with parcels that exactly match the pictures over the stores—for



Ernie's Magic Shapes

Astro Grover

example, an apple to deliver to the apple shop and a shirt for the shirt store.

Find the Right Kind is an entirely different kettle of fish In this stumper, the preschooler must match categories. A parcel marked with an apple must be delivered to the fruit stand, which is identified by a banana. A crate marked with a cow goes to the livestock store, which is identified with a duck.

Matching apples and bananas is not much of a stretch, even for a small child, but pairing cows and ducks requires much more sophisticated thinking.

The mechanics of play won't tax anyone's coordination. The left and right arrows move Little Bird back and forth in front of the stores, and the up arrow delivers the package to the business the flighty mailbird is facing. A correct delivery earns a happy nod from the proprietor.

If the package is taken to the wrong address, the storekeeper shakes his head, and Little Bird waits to be moved to another shop. When a delivery is completed, the Return key recalls Big Bird with another package.

Categorization of objects is a difficult concept, and this program definitely offers a head start to young learners. Children can play the easy version of the game alone, once parents have explained that they can simply ignore the words on the screen.

The complicated game, however, just cries out for parental involvement to help kids learn this necessary skill.

Astro-Grover

Astro-Grover is the most sophisticated of the three Sesame Street titles for the Atari. Like the others, this one is recommended for kids aged 3 to 6, but I suspect that even older kids might enjoy it.

The easiest of the five games on the disk is a straightforward counting game. Zips, alien visitors from another planet, soar over a darkened city in their spacecraft and eventually pour out of the craft and float in the air. The child counts the number of Zips and presses that number on the keyboard. Each wrong answer makes the smiling moon shake his head, but the child can try as many times as necessary to get the correct number.

When the correct total is entered, the Zips illuminate one of the gingerbread brownstones on the block. Five correct answers light up the entire block. Astro-Grover then comes out and dances in the sky, ending the round.

The second game is another counter. The Zips' spaceship is ready to go back into orbit, but before it can blast off, the child must find the right number of Zips to board.

The ship has a number on its side. A press of the up arrow beams a light into the sky, illuminating one sector. If the correct number of Zips are caught in the glare, they are loaded onto the ship. Otherwise, the child must redirect the beam until he catches the right number of aliens. Each match moves the ship up the screen a few inches, and three correct totals send it into space.

Level three presents a group of Zips to be counted, then another, and the child must add the two groups. The sums are all one-digit numbers, making very simple addition for beginners. Level four presents a group of aliens, then takes some away, in primary level subtraction. Level five presents a sum and asks the child to find the numbers which, added together, make that total.

Astro-Grover has the most pleasing graphics of the three Sesame Street programs. The little spaceship, with its load of Zips, is clever and recognizable. The city is pretty as a brownstone block party, and the simple counting, adding, and subtracting games are rewarded by clever animations that should charm parent and child alike.

The Muppets in all three programs are well-rendered; the children with whom I played recognized every one instantly. Musical accompaniment brightens the play sessions, and colorful action makes learning pleasant.

The kids enjoyed these titles, especially in a group setting, and liked showing me how quickly they could complete each challenge. Although the programs do not keep score, the kids enjoyed keeping track of how well they were doing, especially in the higher level, more complex games.

Young computerists get a lot of value out of programs designed especially for them, and the Sesame Street titles make charming learning for preschoolers. At their simplest levels, they are bright and amusing. At their best, kids gain valuable pre-primary school tutoring from their Sesame Street buddies. ■

Sesame Street Games

System: Atari 8-bit
Price: $9.95
Age Range: 3 to 6
Summary: Muppets help kids learn basic skills
Manufacturer:
Hi Tech Expressions
1700 NW 65th Ave.
Suite 9
Plantation, FL 33313
(305) 584-6386

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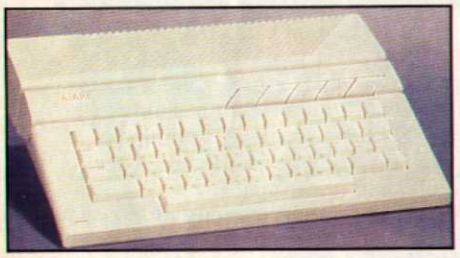

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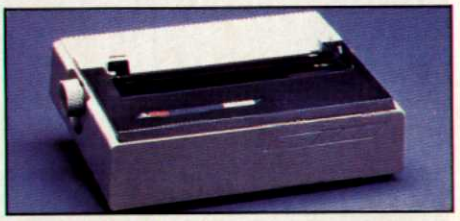

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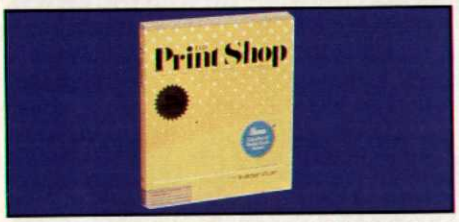

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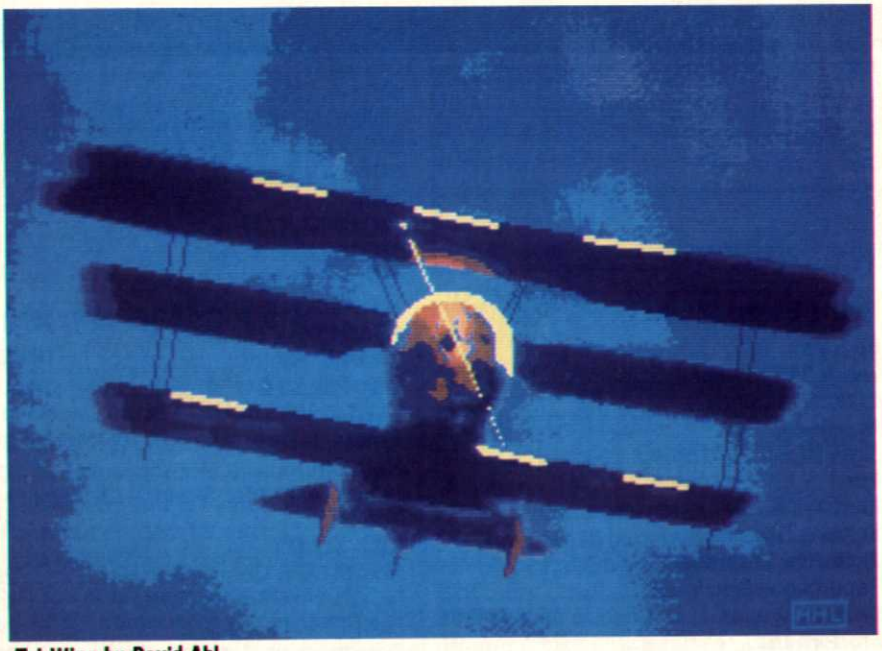
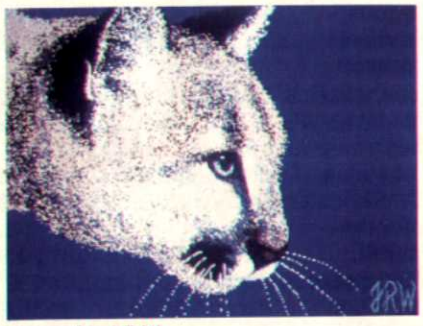
Take Aim by David Ahl and Computereyes



Tri-Wing by David Ahl

Bull by J. Turner



Cougar by J.R.W.

Cat by David Ahl and Computereyes

Graphics Gallery

Woman from a painting by Vermeer

For this, our first ST Graphics Gallery, we have chosen a selection of images that we picked up at various user group shows. Unfortunately, we don't know who some of the authors are, and we ask them to step forward to take a bow (and a reward in the form of a one-year subscription to *Atari Explorer*).

In the future, ST Graphics Gallery will consist of images submitted by readers. The person submitting the best image each issue will receive a three-year subscription (or extension) to Atari Explorer and the runners up will receive one-year subscriptions or extensions. Everyone who submits an image will receive *ten* original images in return.

All images must be submittted 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 envelope with 39 cents postage on it for the return of your disk. We will return your disk with ten additional images on it in the format of your choice.

You 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."

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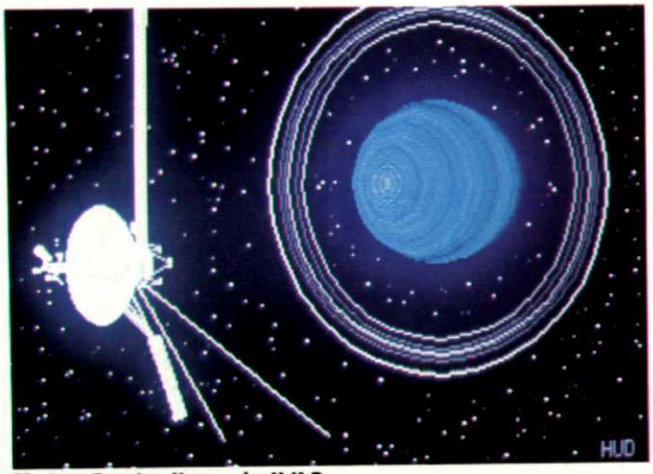


Mariner Passing Uranus by H.U.D

Rio by M.M.

Countach by D.G.B.

George Washington by David Ahl and Computereyes

Will Piracy Kill Atari?

A specter is haunting Atari—the specter of piracy. All the powers of the Atari market must enter into a holy alliance to hunt down and exorcise this specter: programmer and publisher, user and editor, Atari employees and Federal agents. For piracy threatens to drain the lifeblood of the Atari community.

If you think the foregoing paraphrase of Karl Marx overstates the case, you are dead wrong. And if you fail to do your part to change the situation, you are hastening the day when there will be no Atari software market for pirates to exploit.

An Innocent Beginning

Software piracy dates back virtually to the dawn of programming. It wasn't long, for example, after the original Microsoft Basic was introduced that some members of the Homebrew Computer Club made copies of the punched paper tape on which the language was sold and shared them with other members.

Back then, however, the legality of such actions was open to question. At the time, software, unlike other intellectual works, was not protected by copyright law. The prevailing "hacker ethic" held that software, like other forms of computer information, should be shared and distributed freely. Software publishers and computer users fought bitterly until 1980 when Congress added a provision defining computer programs to Section 117 of the 1976 Copyright Act. Programmers cheered, users grumbled, and piracy became illegal.

By OWEN LINZMAYER

Please note that not all software copying is piracy. The law allows users to make back-up copies for archival purposes. Piracy, in contrast, is the intentional duplication of software to be passed along to a third party without the copyright holder's consent. Whether you give the program away or offer it for sale, you are committing piracy and breaking the law. Yes, you risk fines and a jail sentence each time you make an illegal copy.

The issue of piracy is especially important right now, because many excellent programmers are expressing concern about the rampant pirating that makes it increasingly difficult for them to justify writing programs for Atari computers. Unable to recover the cost of developing their software packages, many programmers have simply decided to move on to greener (or bluer) pastures and leave the Atari market to those with greater intestinal fortitude.

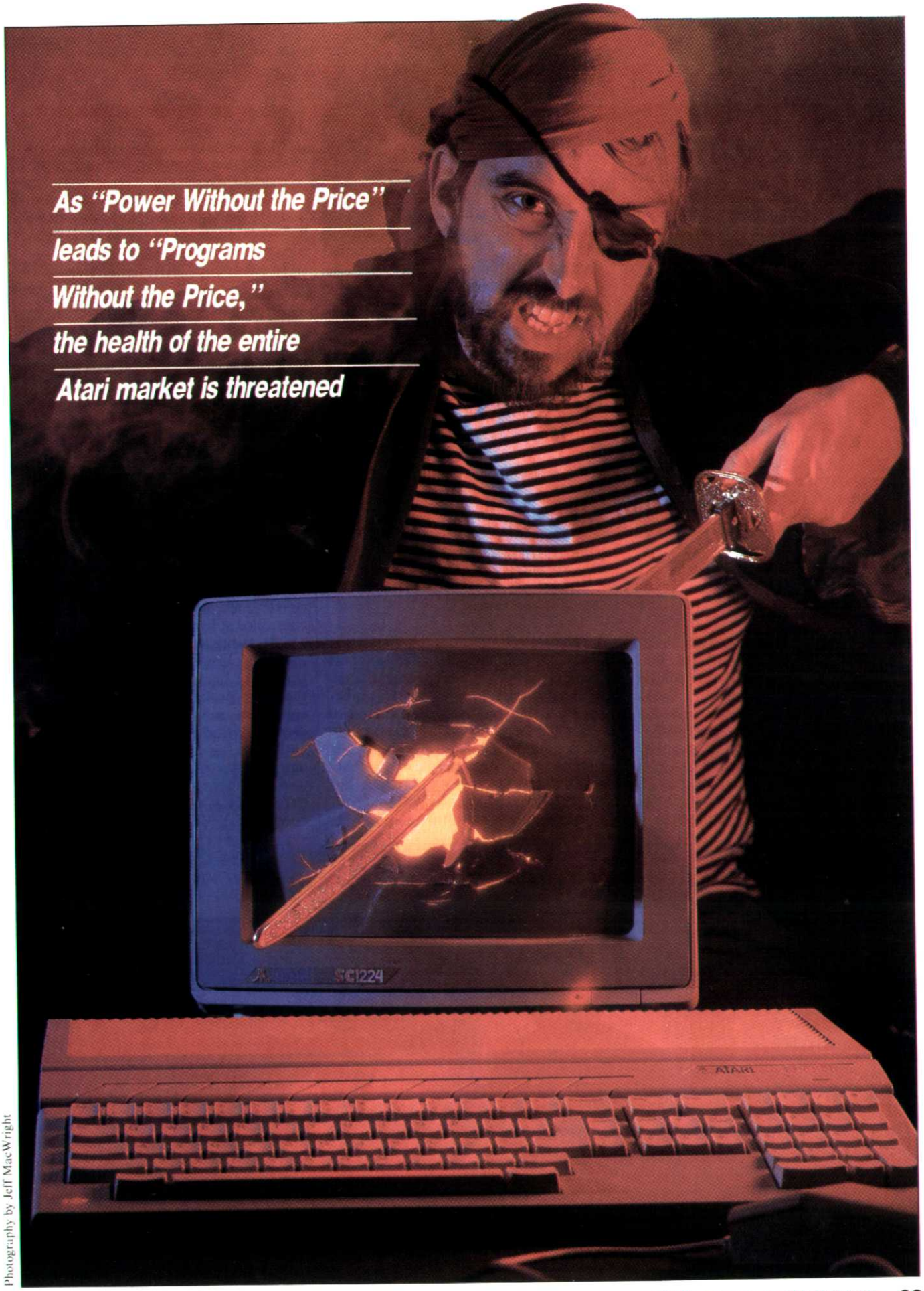
What Is at Stake?

Software firms claim to lose hundreds of millions of dollars annually due to piracy. These estimates can be deceiving, however. If publishers count every illegitimate copy as a lost sale, then the figures they provide are seriously inflated.

Economists define a market as a group with the willingness and ability to purchase a good or service. Few users of pirated software have both the willingness and the ability to purchase the packages they steal, so many fail to qualify as part of a legitimate market. It is the people who decide to pirate a program rather than buy it who have made a conscious decision to steal from the software firm. But whether a person's use of a program for which he did not pay qualifies the cost of that program for inclusion in piracy statistics or not, the name by which we call him remains the same—*pirate*.

Pirates like to think of software firms as huge companies that can absorb losses painlessly. Sadly, however, the truth is that pirates are stealing from hard-working individuals—people, not faceless behemoths. Most Atari software publishers are small companies operating on small margins out of cramped quarters, not fancy corporate headquarters.

The small size of these companies



Photography by Jeff MacWright

makes even the most casual piracy particularly excruciating. Next time you contemplate ripping-off a program, imagine the programmer's banker rubbing his hands in anticipation of foreclosing on the mortgage, or better yet, imagine little Junior asking Mom why he can't get a new pair of sneakers for school. How would you feel if it was possible for anyone with a Happy disk drive modification to tap into your employer's payroll file and take a few dollars out of your paycheck?

Piracy hurts everyone in the Atari community, not just software publishers and programmers. As a registered owner of a software package, you harm yourself when you give a friend a copy of your favorite program. By denying the publisher the opportunity to realize a profit on your purchase, you decrease the resources with which the firm can support your package. In addition, you diminish the company's motivation to continue producing software for your system.

Followed to its logical conclusion, this scenario ends with bankruptcy for the company and frustration for you, as you tire of your pirated programs and watch enviously the impressive new products being introduced for other computer systems. And that conclusion gets closer every day.

Why Atari?

Piracy is certainly not unique to the Atari market, but several factors exacerbate the situation in that market. The members of the Atari community are extremely active, participating in bulletin boards, contributing to newsletters, and combining to form user groups. This makes the dissemination of information very easy—which is good. The downside, from a software publisher's point of view, is that the existence of this cohesive network of Atari owners also facilitates the distribution of illicit copies of programs.

Another factor is, ironically, the Tramiels' promise of "Power Without the Price," which has attracted a great many bargain hunters in search of powerful computers. When these people begin to shop for software, they expect to find more bargains, and in fact, many Atari programs do cost less than their Apple and IBM counterparts. But bargain hunting carried to extremes has begun to take a disastrous toll; unfortunately, Atarians often turn to piracy as a way to get "Programs Without the Price."

Moreover, publishers often cite the existence of extremely effective disk duplicating software, such as Microdaft's *Chipmunk* (see sidebar), and hardware, such as the infamous Happy disk drive modification, as a factor in their decision not to produce Atari titles.

In our opinion, disk duplicating technology is a necessary evil of sorts—like rolling papers, for example. Sure, there are people who actually roll their own tobacco cigarettes, but most people who buy a pack of Zig-Zags at their local convenience store intend to twist up controlled substances. The same is true for disk duplicating packages. While many people use these products to make legitimate backups for their own use, there are probably just as many who copy commercial programs with the express intention of getting something for nothing. Like many other products in our society, commercial disk duplication packages serve a valid purpose, but their power can quickly be turned from good to ill.

The "hacker ethic" held that software, like other forms of computer information, should be shared and distributed freely.

A Gallery of Atari Software Pirates

Age: 62
Occupation: Consulting Engineer
Annual Income: $100,000
Reason for Piracy: "So much software is junk that I can't see paying for it if I don't have to."

Age: 32
Occupation: Painter
Annual Income: $18,000
Reason for Piracy: "On my earnings, I can barely support my wife and kids, much less my computer."

Age: 19
Occupation: Student
Annual Income: $2,000
Reason for Piracy: "Everybody does it."

Age: 48
Occupation: Writer
Annual Income: $65,000
Reason for Piracy: "I don't use the packages; I just collect them."

Who Are the Pirates?

There are really only two kinds of pirates: personal and professional. The professional pirate makes money by illegally distributing copyrighted material. This can be done either by selling duplicated programs outright or by requiring a membership fee to join a pirate bulletin board or "rental club."

While he may hide behind the pretense of striking back at unscrupulous software publishers, the professional pirate's only motive is to make a quick buck at the expense of hard-working programmers, publishers, and dealers. Professional pirates are a scourge and have no legitimate purpose; they are fences trafficking in stolen goods. Please, for everyone's sake, don't patronize these unscrupulous individuals.

The personal pirate is much more common than the professional, and as such, is of much greater concern to software publishers. The personal pirate is not interested in monetary gain, just software enrichment. He wants good, commercial-quality programs but is either unwilling or unable to purchase them legitimately.

Unlike the professional pirate, who must operate in the open to some extent, the personal pirate can accumulate a vast library of pilfered programs with little risk of detection. For this reason, it is doubtful that personal piracy will ever be completely eradicated. The only hope of publishers, programmers, and legitimate users is to educate these people to the harm they are doing to the entire Atari community.

Dry Well

He was an eight-bit hacker
And he knew it all by heart,
He never met a program
That he couldn't take apart.

They could lock it, they could hide it,
It mattered not a whit;
It might take a little effort
But he destroyed it bit by bit.

Oh, he never had a lesson,
So who's to say he was to blame,
Yet his knowledge was ferocious
And his attitude the same.

We could write our code in Basic
In source code or in C . . .
He just chuckled while he cracked it
And he cracked them one, two, three.

But it seem's he has a problem
And his hobby's off the track,
For he stole so many programs
That there's no more code to crack.

Don't you think it's kind of funny
Though he found the mother lode,
He expended all that effort
Yet he never wrote the code?

Not one program did he publish
Though he knew it every bit;
Wanted just to keep on hacking
So we all could benefit.

He hated "freeware" with a passion
And his manner would get gruff
When he saw they wrote a program
And didn't try to hide the stuff.

Well, I don't know just how you see it
But here's the way it seems to me,
I'm sure that all you programmers
Who've labored hard, agree.

That this guy was really selfish
As he robbed our daily bread
I wonder if he's sorry that
His golden goose is dead!

—Dale Bryant

Reprinted with permission from the Sep/Oct 1987 SBACE Gazette.

Why Copy Software?

Many people justify piracy by claiming that they are "test driving" the software in an attempt to make a more informed buying decision. If this were the case, we could see little harm in the practice, but in reality, the temptation is too great for most people. Once the disk is in hand, why spend the money for another copy if you like it or bother to erase it if you don't? It's a thin line between test drive and grand theft.

There are numerous alternatives to the so-called "test drive": many software firms offer handicapped demo disks at reasonable prices, magazines routinely rate and review software products, computer stores will often

Age: 53
Occupation: Corporate executive
Annual Income: $125,000
Reason for Piracy: "It's too much trouble to go through our purchasing department."

Age: 35
Occupation: Teacher
Annual Income: $32,000
Reason for Piracy: "I use the programs for the good of my students."

Age: 30
Occupation: Minister
Annual Income: $35,000
Reason for Piracy: "It saves the church money that can be better spent on the Lord's work."

Age: 68
Occupation: Grandmother
Annual Income: $22,000
Reason for Piracy: "My daughter can't afford to buy programs for the computer we gave the kids last year."

The Rodent Turns

Chipmunk author distributes copy-protected programs

We recently had an opportunity to chat with Eli Tomlinson, president of Microdaft and author of *Chipmunk*, an 8-bit disk duplicating package that not only allows the user to back up protected software but removes the protection altogether.

"I guess you could say that I was inspired to write *Chipmunk* out of a curiosity about how copy protection works," explains the 20-year old Eli. Defeating software locks was originally just an intellectual challenge, but after cracking several schemes, Eli realized that his efforts had yielded a viable product. "I had seen similar disk duplicating packages for the IBM PC and Commodore, so I thought, 'Why not market an Atari version?' "

After studying business administration at Rutgers University for two years, Eli formed Microdaft and released the original version of *Chipmunk* in 1986. Since then, he has sold over 1000 copies of *Chipmunk* and continues to update the product with parameters for copying the most popular new software titles. *Chipmunk* retails for $34.95, and registered owners can upgrade to the latest version (currently 3.0) at any time for $14.95.

Eli admits that some of his customers may well be pirates, but he thinks that the majority are honest people trying to protect their software investment. In case you were wondering, *Chipmunk* is distributed in unprotected format. "I thought it would be hypocritical to protect a back-up program," explains Eli. Ironically, Eli says that unscrupulous competitors have stolen the *Chipmunk* DATA statements that contain the copy parameters (the heart of the program) and brazenly sold repackaged versions under different names. As if this weren't bad enough, he complains, the ads for these rip-off products warn "Don't Be Fooled By Imitations."

For the record, Microdaft's two latest 8-bit entertainment releases, *Dropzone* and *Solar Star*, are both copy-protected. Eli sheepishly admits that *Chipmunk* can't crack the code on these disks. ■

provide hands-on demonstrations, and the same friend you might ask for a copy of the program should be more than willing to make a detailed recommendation instead.

Another excuse for pirating programs is that software companies are charging exorbitant prices, reaping obscene profits and, in effect, *deserve* to be ripped off. This is the pirates' weakest argument.

See if you can follow me. I have always coveted my neighbor's BMW, but the lofty price tag of this engineering marvel has always been enough to dampen my enthusiasm for the purchase of a 633csi. Does the fact that the manufacturer makes big bucks on every sale entitle me to hot-wire a Black Forest Beauty and drive off into the sunset? Of course not!

The same is true for software. If you think a package is over-priced, don't buy it—and don't copy it. Instead, write a thoughtful letter to the publisher explaining your point of view. Faced with sufficient consumer pressure, the firm may be willing to re-examine its price positioning and drop its profit margin somewhat to stimulate sales. Alternatively, faced with increasing piracy, the firm may re-examine its market position and abandon Atari machines altogether.

Many people simply don't understand that copying software is wrong, because, they reason, they are not denying someone else the use of that product. The argument is as follows: "If I sneak a program out of my user group library without checking it out, then that package can't be borrowed by other members and I have stolen it. However, if I duplicate the program and return it to the shelf, who have I harmed?"

The answer, quite clearly, is that you have harmed the software publisher, who relies upon sales to recoup the money he has invested in the development of the program, and the programmer, whose royalties are based on sales of his product. The issue is not whether it is easy to copy a disk (it is), but rather, that it is a violation of copyright law and patently illegal. The copyright laws protect the program, not the medium on which it is distributed.

Unlike the professional pirate, ***who must operate in the open to some extent, the personal pirate can accumulate a vast library of pilfered programs with little risk of detection.***

Computer enthusiasts see defeating copy-protection schemes as an intellectual challenge. Software firms assert that doing so is akin to picking the lock on the front door of a house. We disagree. The difference is that when you defeat a protection scheme you are not violating anyone's privacy, nor are you gaining access to anything you don't already own. Furthermore, the process of cracking a copy-protection scheme can be highly educational, exposing the subtle nuances of disk operations.

In our opinion, if you purchase a software package that is copy-protected, you are, as a matter of principal, entitled to attempt to break the protection scheme. However, if in trying to do so you harm the original, don't expect a replacement copy from the publisher. If you are successful in cracking the protection scheme, the resulting liberated

disk can legally be copied for your own use on a single machine at any one time. But the fact that you have cracked the code does not entitle you to give a copy to a friend.

There are many legitimate reasons for copying software. The most obvious is to make a backup for use if something goes wrong with the original disk. This is a common and accepted practice—one that many software publishers advise.

Another valid reason to copy a program is to relocate it to a more convenient medium. For instance, if you buy a hard disk drive, you will probably want to transfer the programs on all of your floppies to the large volume. Similarly, your system may support a RAMdisk from which you may want to run frequently used applications to increase productivity. There is no reason why a registered owner of a program should not be allowed to use it in whatever form best suits his needs; yet software publishers continue to frustrate users by copy-protecting their packages to ward off pirates. Again, legitimate users suffer because others cannot be trusted.

Shareware vs. Public Domain Software

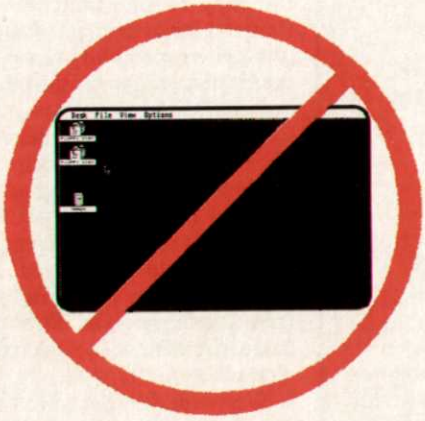
Some software companies actually encourage you to make copies of their programs and give them to as many people as possible. These programs are called shareware. Shareware programs are often posted on bulletin board systems for free downloading; most are utilities too small to be sold commercially through traditional channels and too useful to be kept to oneself.

Shareware publishers hope that after using a product, you will like it so much that you will voluntarily register your copy. Typically this involves sending a monetary "donation" to the publisher, in return for which you become a registered owner and receive official documentation and product updates.

Publishers retain the rights to shareware products and are the only ones who may offer them for sale. As a user, you are morally, but not legally, obligated to pay for shareware. We think shareware is a noble effort crippled by an immature market.

Public domain software consists of programs written by individuals who have relinquished their rights to their work. Public domain programs literally belong to the public, not the programmer. These programs may be duplicated and modified freely without concern for copyright laws.

Don't think that just because nobody owns them public domain programs aren't offered for sale. There exists a vast array of software libraries that sell public domain programs for the cost of the disk plus a small handling fee. There is nothing wrong with this practice, but an enterprising user can almost always save even the handling fee by investigating other sources. ■



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What Can Publishers Do?

Software publishers have been extremely myopic in their attempt to combat piracy; as a result, the issues of copy protection and piracy are hopelessly intertwined. Publishers must come to the realization that when a pirate copies a disk, all he gets is the program. Instead of viewing their business as selling programs, publishers should begin to think of it as selling software packages. The complete package should consist of equal measures of quality software, good documentation, and willing support.

If they are going to win the confidence and respect of consumers, publishers must release only high quality products. In the early years of home computing, firms were often more concerned about getting a product to market than making sure the program was bug-free. Quality was often compromised for expediency. In recent years some of the same problems have resurfaced in the ST market as publishers rushed software to dealers' shelves before it was completely debugged and documented, but things seem to be improving as the market matures.

In addition to being bug-free, the quality software that users have a right to expect should be easy-to-use. We are not talking about simplified commands; we are advocating flexible products that can be configured by the consumer for convenient use on his system. We would rather see development money spent on the software and documentation than investing in the newest protection technology.

There was a time when distributing software with copy protection was justifiable and acceptable. Even though they were forced to resort to implementing copy-protection schemes, some publishers tried valiantly to reduce the inconvenience to the user by offering a second disk for a nominal fee, distributing two disks in a single package, or allowing copies to be made that require a key disk. However, with the growing popularity of mass storage devices such as hard disks and RAM drives, we submit that the time has come to say good-bye to copy protection on productivity applications.

The second ingredient in the recipe for software success, documentation, is often the most neglected aspect of the product development process. This is a grave error—especially in the ST market. Thanks to the desktop metaphor of GEM, most ST products are relatively simple to operate, and astute users can

A Copier That Doesn't

I must admit at the outset that I don't have a particularly warm feeling about copier programs. Ostensibly, they are used to back up software packages so that if a valuable disk is ruined by dirt, power surge, or excessive use, you do not find yourself up the proverbial creek. However, all too often, such programs are used by people who defraud program authors and publishers by pirating protected disks.

On the other hand, I confess to regularly having had short-term, but quite fanatic addictions to certain games. Several years ago, I was hopelessly addicted to *Jump Man*, and when the disk finally died from overuse, I spent a traumatic few weeks waiting for a replacement from Epyx.

Even worse was the time my *VisiCalc* disk got zapped and I was unable to run financial projections for my business for several weeks. And today, with more than 70 vital spread sheet files on hard disk, I wish I could copy my Lotus *1-2-3* program onto the same hard drive.

Situations like these make me realize that a copier program has a legitimate place in the software library of the law-abiding user. So when *A-Copier* from MegaSoft arrived, I decided to use it to transfer to my hard disk several games that were getting a lot of use (*Shanghai* from Activision and *Plutos* from Mindscape).

The documentation for *A-Copier*—about 2½ single-spaced pages—is on the disk in a READ.ME file. Typographical errors notwithstanding, the instructions are clear and concise.

A-Copier makes three kinds of copies—a normal sector copy, a normal sector copy with formatting, and a nibble copy. In all modes, the program will copy from drive A to drive A, A to B, B to A, or B to B. Unfortunately, it will not copy at different step rates to compensate for slight speed variations in non-Atari disk drives.

The main difference between the first two modes (which are intended for use with unprotected disks) and the copy routine built into TOS is that *A-Copier* is much faster. Also, *A-Copier* reports any errors encountered and makes multiple copies automatically.

The third mode, nibble copy, simply reads and writes each of the 79 (or 81) tracks, one at a time. It has no options, and it either works or it doesn't. In the case of *Shanghai* and *Plutos*, it didn't. So I tried *A-Copier* on some older programs (*Hacker* from Activision and *Silent Service* from MicroProse) and found that it worked correctly.

We are told by MegaSoft that new versions are being released on a regular basis. But depending on the price of the software you want to copy, you might find it more reasonable to buy a duplicate from the publisher if and when you need it than to buy an updated copy of *A-Copier*. Furthermore, I find the inability of *A-Copier* to back up to a hard disk an unacceptable limitation.

If speedy copying and formatting of unprotected disks or backing up of older disks is important to you, you might find *A-Copier* worthwhile. But if you want to back up newer programs or transfer programs to a hard disk, save your money.—***DHA***

A Copier

System: Atari ST
Price: $39.95
Summary: Speedy floppy disk copy program to back up some, but not all, protected software.
Manufacturer:
MegaSoft Ltd.
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get by without a manual. This makes ST programs particularly inviting targets for piracy.

The trick is to make people want to own the manual because it provides greater understanding of the features and makes the program more useful. Illustrations and step-by-step examples should be used generously, and the entire effort should be edited and proofed by a competent editor. Consumers want to feel that they are getting their money's worth, and user guides consisting of a few poorly photocopied pages just don't cut it anymore.

Documentation that enhances or works as an integral part of the product goes a long way toward reducing the motivation to pirate. The folks at Infocom figured this out long ago and have been enhancing their adventure programs with packages of clever goodies for years

Finally, to reduce the appeal of piracy, publishers should entice consumers with unsurpassed customer support for registered owners. Too often the user is left completely to his own devices once a purchase is made. To many people, the comfort of knowing that technical assistance is only a phone call away is worth a great deal—often more than the price of the program.

Company newsletters are another excellent way to provide after-sale support. By including news of product updates, announcements of new products, suggestions for novel applications, question and answer sections for sophisticated packages, and so on, publishers can increase customer loyalty and reduce the desire to pirate.

What Can You Do?

If you are asked to pirate a program, resist the temptation and, to borrow a phrase from our First Lady, "Just say no." We know how difficult it is to tell a friend that he can't have a copy of that new package you've been bragging about, but if the program is so good, give him a demo and let him buy his own. After all, why should he get a free copy after you spent your money to purchase the original? Wouldn't that qualify you for the Chump of the Year award?

As we explained earlier, most Atari software publishers are small operations and as such are extremely responsive to feedback they receive from their customers. If you feel strongly about copy protection, let the firms whose software you admire know of your distaste for these schemes. Open a dialogue by writing a letter. Conversely, support the brave companies that sell only unprotected software as a matter of policy. They trust you and deserve your respect in return.

If you are aware of any pirate activities, you owe it to yourself and your fellow Atari users to inform the Software Publishers Association as well as the firms whose products are being distributed illegally. For a while last year, Gordon Monnier of MichTron was offering his company's products as a bounty to anyone who turned in a certain number of pirate bulletin boards.

While MichTron's approach isn't typical, all software publishers appreciate your help in stemming the loss of sales caused by piracy. If you have any useful information, contact the Software Publishers Association, 1101 Connecticut Ave., N.W., Ste. 901, Washington, DC 20036. ■

A Publisher's Views

Neil Larson tells why his company has abandoned the Atari market

While doing research for this article, we spoke with several software publishers who admitted that they were discontinuing development of software for Atari computers as a direct result of piracy. However, because most still have Atari products on the market, they were loathe to make their statements for the record. One exception was Neil Larson, author of *MaxThink*, the idea processor, and president of MaxThink, the company.

Neil spent $40,000 and a year of his life developing *MaxThink* for the IBM PC. Since the program was released in 1984 the company has grown to eight employees and reports just under $1 million in annual sales.

Based on the success of *MaxThink* for the IBM, Neil decided to port the program over to the Macintosh and Atari ST computers. Even though the ST version of *MaxThink* sold for $59 (the PC and Mac versions cost $30 more), sales have been so poor—apparently due to piracy—that Neil has decided to withdraw from the Atari market altogether.

"When Atari released the ST, they aimed at a different market segment by keeping the price low relative to Macs and PCs. This appealled to counter-culture people who don't necessarily value property rights as much," Neil told us. He then recalled the time he demonstrated *MaxThink* at an Atari user group. The members yawned, saying, "We've seen this before. Heck, its been on bulletin boards for months."

Neil thinks that the bulletin boards contribute greatly to the spread of piracy. "Atarians are loyal to their bulletin boards," he says, "and they post pirated software as a way of winning friends. The Macintosh [which has a piracy problem, but one that is not nearly as bad as the ST's], on the other hand, has its own cult following among supercilious yuppies who pirate in the name of religion."

Instead of resorting to copy protection, Neil updates his program frequently. He "pushes technology to make old versions of *MaxThink* obsolete every six months."

In the IBM market, Neil has managed to develop a strong personality for his company and its products. This was accomplished by emphasizing the smallness of his operation to elicit sympathy and by charging a low price to build loyalty. In the future, he plans to pursue markets that will look out for software publishers' interests, such as the Federal government, which enforces a policy of firing anyone caught with pirated programs.

Before giving his hand to software, Neil was in the diamond business. "When a diamond dealer misrepresents his goods, or rips you off in some way, it is customary to politely say 'That diamond is not for me' and then never do business with that individual again." After his painful venture into the ST market, Neil is ready to call it quits. To paraphrase the diamond industry axiom, "That machine is not for him."

Neil believes that the popularity of emulators such as *PC-Ditto* and Magic Sac indicates that "the ST is becoming an orphan machine for which fewer and fewer companies will develop new products," unless something his done to stop software piracy right now. ■

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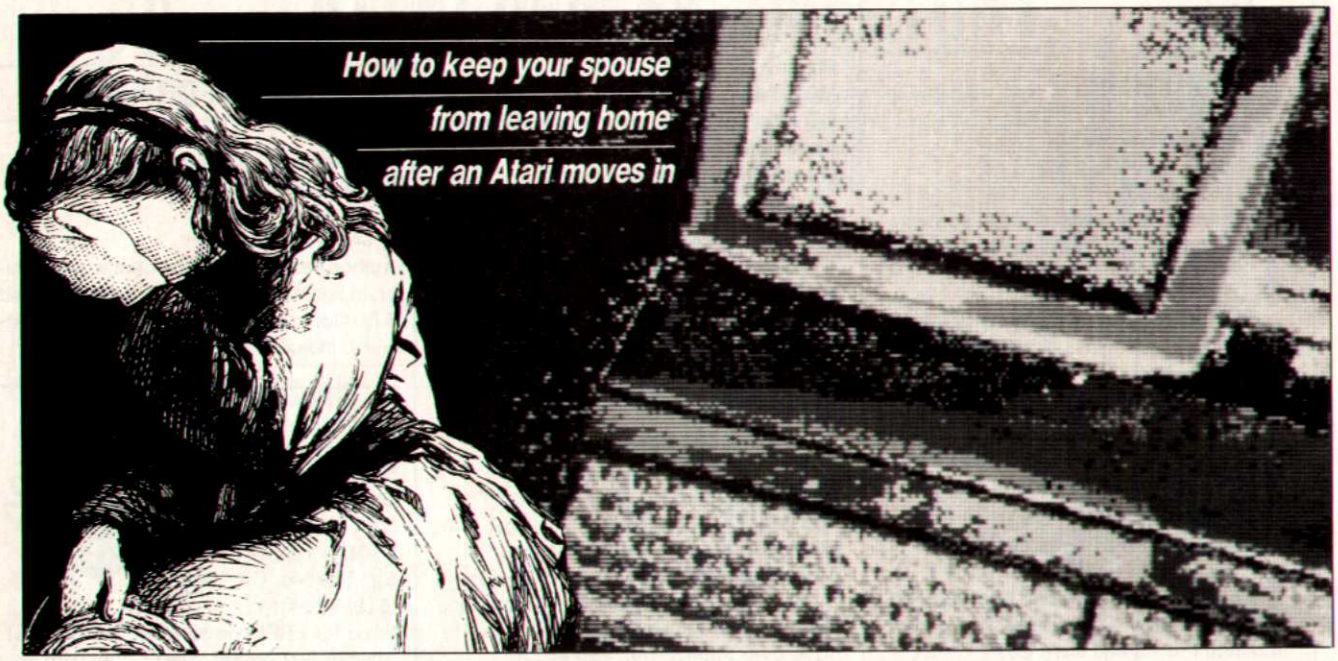


Avoiding Computer Widowhood

Many thousands of people have already received or are about to receive Atari computers as holiday gifts. Many of them have received their new computers from unsuspecting spouses—husbands and wives who remain blissfully unaware that married life may never be the same.

Take, for example, a couple my wife and I know who acquired an Atari not long after we did. CE (for Computer Enthusiast) is, if anything, more intoxicated by the possibilities computers offer than I am. Modems, music programs, greeting cards—it's all grist for his mill.

As there are only 24 hours in each day, and as CE has to toil for his livelihood during most of the daylight ones, however, he has been know to start a session with his Atari in the early evening and not finish until three or four in the morning.

This does not sit particularly well with LS, his Loyal (or should that be Long-suffering?) Spouse, who labors under the apprehension that the reason they married was to be able to spend more time together.

When you come to know two people well, you also come to share, to some extent, their dilemmas. So Bonnie (my own long-suffering spouse) and I have had a fair number of discussions with CE and LS, in most of the possible combinations (one of us with them, one of them with us, and so on), on the subject of how a couple can acquire a computer without losing—or damaging—a marriage. In the process, we have formulated some rough-and-ready principles that we want to pass on in hopes of helping others to integrate computers into their relationships.

Bibliography

Let's begin with a short bibliography. If the amount of time one of you spends at the computer is a source of conflict between you and another person, you may find *The Intimate Enemy* by George F. Bach to be useful reading. Bach sets forth a procedure by which two people can argue and reach a result that is, at the minimum, acceptable to both.

You don't have to adhere exactly to Bach's scheme to benefit from his book, however. The point is that if you operate according to a set of ground rules, rather than letting your disagreements grow broader, get out of control, and last too long, you can narrow their scope, concentrate on the most crucial aspects, and ultimately achieve a solution that both of you can live with.

In a more general way, the first 181 pages of *The Road Less Traveled* by M. Scott Peck are valuable for the emphasis they place on the art of balance—an art that anyone who hopes to do justice to both a spouse and an Atari will surely need to master—and the disciplines they propose for mastering it. (The second half of Peck's book unfortunately degenerates into drivel, but that does not invalidate what he has to say prior to the midpoint.)

With that introduction, I offer the following suggestions that may prove useful to couples of which one member is a CE and the other, an LS.

For the CE

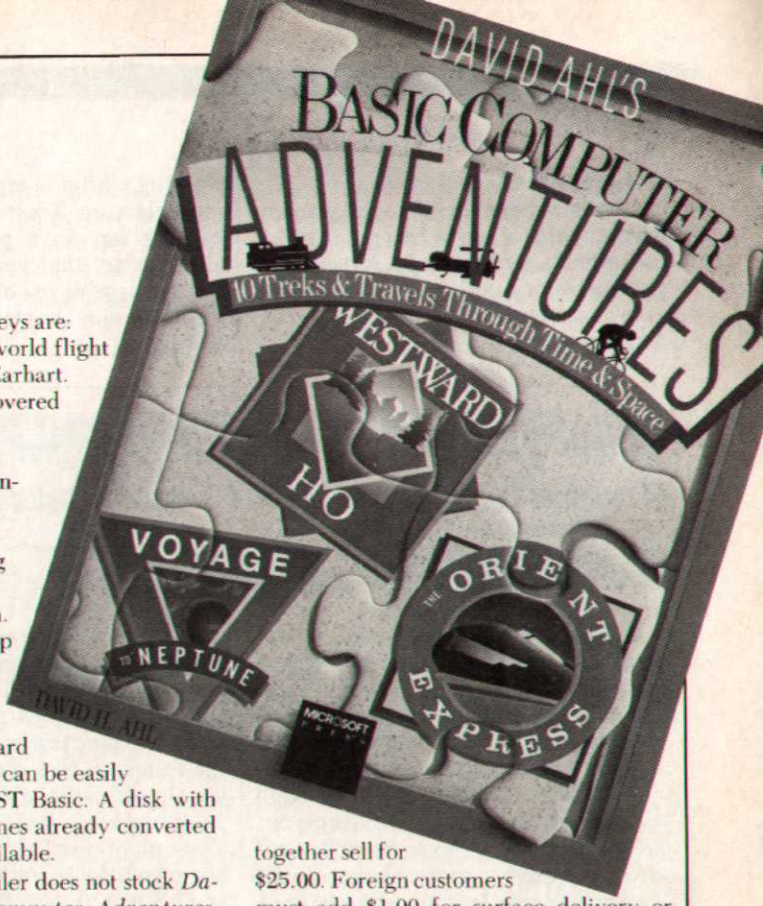
• **Listen.** Another way of saying the same thing: take your partner seriously, especially his or her grievances. It is tempting to do nothing when confronted with such grievances, on the assumption that the storm will sooner or later blow over and you won't have to take time for A Serious Discussion, won't have to make any concessions, and so on.

Men, in my experience, are particularly susceptible to this temptation. If you yield to it, however, you run a serious risk of winning the battle but losing the war (see Peck's argument on defer-

By FRANK KOFSKY

David Ahl's

Basic Computer Adventures



"Starting from Venice in the year 1271, you travel by sailing ship to Armenia, whence you set out on a 6000-mile trek over the Silk Road to the court of the Great Kublai Khan in Shang-tu, Cathay. You have clothing, balms, and unguents that you brought from Venice, but you must barter for camels, food, and other supplies in Armenia."

Thus begins the computer simulation of the journey of Marco Polo, in which you, with the help of a personal computer, become the leader of a group of merchants on a most unusual business trip. On the way, you must deal with many hazards and problems: injured camels, sandstorms, bad water, marauding animals, and savage bandits. In addition, you must make wise decisions about trading jewels for food, clothing, crossbow arrows, and medicine.

Marco Polo is just one of 10 realistic and accurate computer journeys in the big 272-page book, *Basic Computer Adventures*. Each simulation is accompanied by a story of the actual historical journey, a map, a Basic program, and a detailed explanation of the program.

Some of the journeys are:

- The round-the-world flight attempt of Amelia Earhart.
- A treacherous covered wagon trek over the Oregon Trail.
- A dangerous turn-of-the-century automobile race.
- A day delivering packages using the N.Y. Subway system.
- A mysterious trip on the famous Orient Express.

The programs are written in standard Microsoft Basic and can be easily converted to Atari ST Basic. A disk with eight of the ten games already converted to the ST is also available.

If your local retailer does not stock *David Ahl's Basic Computer Adventures*, you can order the book directly for $10.00 postpaid. The Atari ST disk (available only by direct order) costs $15.00; book and disk together sell for $25.00. Foreign customers must add $1.00 for surface delivery or $5.00 for air. Send payment by check or M.O. in U.S. funds to David Ahl, 12 Indian Head Road, Morristown, NJ 07960.

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ring gratification).

I could not even begin to tell you how many divorces I have observed in which the woman, after 10, 15, or even 25 years of having both her wishes and her grievances ignored, simply gets fed up and leaves.

working with a computer give you the most pleasure. Trust LS enough to take him or her into your confidence. Chances are that your partner doesn't want to deprive you of your fun, but just wants to enjoy the pleasure of your company.

Show yourself willing to *do the hard work required to hammer out a compromise that is mutually satisfactory.*

• **Make your word as good a your bond.** If you have worked out an arrangement with your LS, stick to it. You may think that once you have arrived at an agreement, your difficulties are over. In fact, they are just beginning. Now you have to marshal enough strength of character to hold up your end of the bargain—even when it is not particularly easy or convenient to do so.

• **Show yourself willing to do the hard work** (another of Peck's disciplines) required to hammer out a compromise that is mutually satisfactory. If LS should happen to pick the Worst Possible Moment to begin a discussion of your inclination to glue your face to the screen of a monitor for hours on end, don't counter by attacking your mate for being selfish and inconsiderate.

A more productive response is to explain that it is difficult for you to discuss the matter right now, emphasizing that you will be happy to talk about it later. Then propose a date and time for that discussion. When that time comes, be sure that you make yourself available; taking the initiative is better still.

Along the same lines, avoid assuming an all-or-nothing position. If LS proposes an arrangement that you think is unfair, don't just abandon the negotiations. Instead, suggest some concrete changes that will make the proposed arrangement more equitable from your perspective.

• **Be honest and objective**—yet another of Peck's disciplines—especially about yourself and your motives. Don't, for example, hide behind the excuse that you "have some work that you *have to* do" on the computer. Instead, be truthful with yourself and LS by admitting that you derive considerable enjoyment from the time you spend at the computer.

You may even want to use this article to initiate a discussion, during which you can explain to LS what aspects of

• **Don't make the mistake** of thinking that all your problems will be solved if you can just interest LS in your Atari. It won't work, for the simple reason that if you have come to the point of discussing the computer as a source of friction in your lives, LS probably resents the computer and views it as a dangerous rival. You might just as well try bringing home your lover in the hope that lover and LS will become good friends.

For the LS

• **Don't nag and don't whine.** Discussions that begin with sweeping generalizations—"You *never* spend *any* time with me any more," is a good example—are unlikely to end with reasonable compromises.

• Likewise, **be specific**. Rather than formulating a catch-all indictment that denigrates CE's taste, relatives, intelligence, personal habits, etc.—a barrage that will only net you repayment in kind—present your partner with a detailed analysis. "Look," you might say, "here is how we have spent our evenings during the last two weeks," presenting CE with a written accounting that establishes your point irrefutably.

This approach avoids the unnecessary hurt feelings that a generalized assault invariably produces and demonstrates your seriousness of purpose and the fact that you have done your homework. Caught, albeit gently, dead to rights, CE will have a hard time ducking your invitation to discuss the situation.

• **The same approach** should apply to reaching a solution. You are much more likely to get a measure of satisfaction by suggesting—specifically—that the two of you reserve certain times to be with each other than you are by telling CE—generally—that you want to spend more time together.

A general proposal invites a general rejection. A specific proposal, on the other hand, tends to draw the other person into a consideration of the relatively minor details of a solution that is already acceptable to you. In other words, your battle is half-won, if you can focus the discussion on the details of the agreement that you hope to reach.

• **Be willing to compromise**—but be persistent. If CE doesn't want to talk about this issue when you first bring it up, ask when it would be more convenient to do so—and make sure that you get a date and time before you agree to drop the subject for the time being.

If CE doesn't like the first proposal you present, ask for suggestions. Then feel free to make a counter-offer, and so on. If you are serious about the need for change, you must make CE understand that you are simply not willing to settle for less than a situation that you can both tolerate, even if it doesn't give complete satifaction to either one.

• **Because you are the one who seeks to initiate** a change, it will probably be up to you, especially at the outset, to see that your new arrangement is honored in deed as well as word. This isn't fair; but then, as Jimmy Carter once observed, life is not fair.

Don't fall into the trap of believing that just because the two of you have worked out an agreement it will be self-enforcing. The statute books are replete with laws that were enacted and then left to their own devices (55 mph, anyone?). Your agreement will suffer the same fate, unless you work to see that it is enforced.

CE was obviously content with the status quo, and given half a chance, would probably be delighted to return to it. It is your task, therefore, to ensure that he or she does not get that half a chance.

If, moreover, you do not apply continual gentle-but-firm pressure on your partner to keep the bargain, you can be sure that CE will quickly conclude that your grievance must not have been too serious in the first place. Once that happens, the likelihood that you will be able to get him or her to pay attention to this or any other complaint is drastically reduced.

For CE and LS

Don't be afraid to carry on your discussion in front of good friends whom both of you trust. The presence of others will compel you to be on your best (most rational) argument behavior—adhering to reason, avoiding gratuitous personal attacks, and the like.

Your friends need not act as referees; their mere presence should suffice to keep both of you on your toes, thus en-

suring that your discussion is focused and productive.

These suggestions, of course, are meant only to provide a starting point. Every couple will evolve its own particular style for resolving disagreements—regardless of whether the subject is computers or something else. What is important is not the precise nature of the guidelines that you set up, but rather the fact that the two of you have considered, discussed, and agreed to be governed by them.

If they are to work, your guidelines must be acceptable to both parties, and both parties must pledge in advance to abide by them. No procedure under the sun will enable you to resolve your differences in a mutually satisfactory way, unless both of you are acting in good faith—for that there is no substitute. ■

Computers Are Fun

True confessions of a man who bought an Atari to process words

If you have had your Atari for a while you already know what thousands of new users are about to find out: Computers are fun. This bit of information is not usually widely broadcast. Indeed, aside from reviews of game software, I don't remember ever seeing an article that discussed the use of a computer simply for having fun.

All of which is understandable, when you think about it. The companies that manufacture computers sell them primarily on the basis of improving employee productivity, reducing expenses, and so on. You would hardly expect a firm to tell prospective buyers that those same employees will enjoy themselves more if they fool around on the computers we make rather than those produced by our competitors. (Doesn't the prevalence of this kind of thinking explain why the same investors who can barely contain their enthusiasm when the stock of a business software manufacturer is offered to the public react with fear and trembling when a publisher of games or educational programs brings its stock to market?)

The identical logic rubs off on the person who buys a computer for use in his home. Because the expense is relatively great, he feels he must justify the purchase—especially if he has a wife and/or children.

The larger the family, the more necessary the justification. Children always need (or at least want) new clothes; furniture is always in need of replacement; the car almost always requires service. And you, you selfish swine, are thinking about spending all that money on a *toy* for yourself. What nerve!

Hence, discussions about computers are usually conducted in sober tones. And yet, the fun remains; you just don't hear much about it.

I, too, was a skeptic, and the realization that computers provide marvelous opportunities for having fun took a while to sink into my head. I bought a computer primarily for what I consider a negative reason—using one, I hoped, would reduce the work and tedium of writing—not because I would actually enjoy writing with it, which would have been a positive reason.

I suspect that many other people would likewise find it difficult to rationalize the purchase of so expensive an item on the grounds that it might simply enable them to have a good time.

***I bought** a computer primarily for what I consider a negative reason.*

It would be too much to say that writing has suddenly become an orgy of pleasure since I acquired my Atari ST—such is the stuff of Madison Avenue fantasies, not reality. The computer does make the writing go faster, and heaven knows I appreciate the immeasurable convenience of making revisions on a screen rather than a piece of paper (when was the last time you wore a hole in your monitor with an eraser?). Still, writing is inherently a painful, solitary process that takes all the energy and concentration one can muster. It can be called many things, but *fun* is not one of them.

So, whence comes the enjoyment that I spoke of earlier? Everyone, of course, will answer this question in a different way. For some, the reason will be simple and straightforward: games and entertainment software. But I own a grand total of a single game and haven't even looked at it in months. For me, therefore, the answer lies elsewhere.

I have concluded that what appeals to me most about working with the computer is the power that it puts in my hands. Things that before I could never do—never even *consider* doing—I can now accomplish routinely. And although some of the games I have seen are truly impressive, there isn't one that can impart the sense of being able to control a part of my world that that I get from even such mundane operations as, say, moving or renaming a file.

Please don't misunderstand. If you derive enjoyment from games, I would be the last to deny it to you. But for me, pleasure comes from a different source—from being able to arrange things just as I wish and to make things happen as I have visualized. Where others may be excited by a simulated excursion beneath the sea or to another planet, I am thrilled to find a desk accessory or utility that will add to my ability to shape the contours of my personal microcosm.

Thus, the program that in some respects gives me the greatest satisfaction is one that has nothing whatsoever to do with writing—*Degas Elite*. Here I must tell you that I am in the unfortunate position of being sufficiently artistic to have had some success as a professional landscape photographer while possessing virtually no talent whatsoever for drawing or painting.

Degas is, therefore, an extremely welcome addition to my software library, for with it I can use the computer to transfer my graphic ideas to paper—a feat I have never before been able to achieve.

I will not pretend that the process is an easy one, for I am just as clumsy with a mouse as I am with pencil, paper, and eraser. But with *Degas*, if I persevere, I ultimately get the design I have in mind. I may have to proceed on a pixel-by-pixel basis; it may take me hours to complete the task; I may be stiff and exhausted when I am done—but I am exhilarated nonetheless. I have done what I set out to do. And what can compare with the exhilaration of *that*? ■

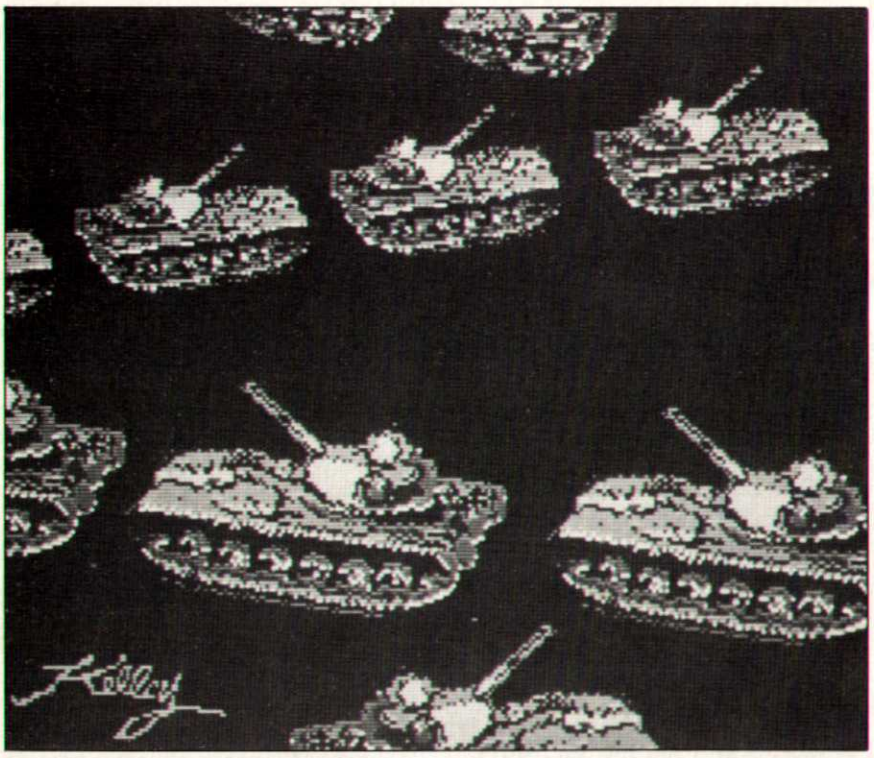

Illustration by Peter Kelley with ComputerEyes and Degas Elite.

World War II Simulations

8-bit Atari computers contribute to the growing popularity of electronic wargaming

By ARNIE KATZ and BILL KUNKEL

Home computers like those in the Atari family have helped military simulations reach new heights of popularity in recent years. Although millions enjoy non-electronic wargaming, the drawbacks of board games and miniature soldiers limit their popularity to hardcorps devotees. In recent years, however, computers have overcome most of the technical and procedural problems that bedevil non-electronic military simulations, including:

- Voluminous documentation. Some battle board games have more than 100 pages of rules in microscopic type. Computer wargames transfer most of the record keeping and other details to the machine, so a small folder is all most compu-warriors need to get started.
- Lengthy setup. It takes time to position hundreds of unit counters in a non-electronic wargame. Most computer programs automatically set up complicated scenarios.
- Complex "housekeeping" during combat. Sifting through piles of stacked units to determine combat odds, line-of-sight, and the effect of terrain and other factors chews up huge hunks of time. The computer can calculate combat odds and report the results of a fight in seconds.
- Scarcity of opposition. It isn't always easy for an armchair general to find a human opponent of approximately equal ability who also likes the same kind of wargames. A study of military simulation boardgamers showed that most such games were used—"played" is too strong a word—solitaire. Most computer battle programs are equipped with a robot adversary, and frequently, the player has the option of adjusting the skill level of the computerized commander.

Fighting the "Good War"

No American war, even the Revolution, drew greater civilian support than World War II. More than four decades after the last shot was fired in the struggle against fascism, the Second World War remains the most popular subject for computer wargames by an overwhelming margin. Here is a rundown of the very best of these games for Atari 8-bit computer owners.

Decision in the Desert and *Crusade in Europe*, both from MicroProse, are great for novices. They both use a joystick-activated command system, which quickly moves and fires units in accelerated real time. Ed Bever and Sid Meier, co-authors of these action-strategy programs, combine historical accuracy with playability in their award-winning wargames.

Decision in the Desert ($39.95), an operational level simulation, brings the North African campaign to the computer gaming screen. In the five scenarios, the commanders continuously issue orders to the units, which execute them as game-time passes. An excellent manual provides analyses of the individual battles and explains the basis for "what if?" variations in troop disposition.

Crusade in Europe ($39.95) focuses on the Allied invasion of France in June 1944 and its immediate aftermath. Fighting on the beaches is intense, and the mounting tension on both sides as the landing force tries to force a breakout from Normandy makes this an especially exciting subject for a simulation.

Veterans of board wargames may prefer SSI's more traditional approach to military simulations. This West Coast company's titles are the electronic counterparts of the board games produced by Avalon Hill, TSR, and Game Designers Workshop.

Battle for Normandy ($39.95), like *Decision in the Desert*, covers the invasion of France and subsequent struggle against the entrenched German defenders. *Knights of the Desert* ($39.95), similarly, is an alternative treatment of the North African campaign in 1941-42. That is not as redundant as it might sound to some non-wargamers. Each title emphasizes different aspects of the

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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**.

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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.

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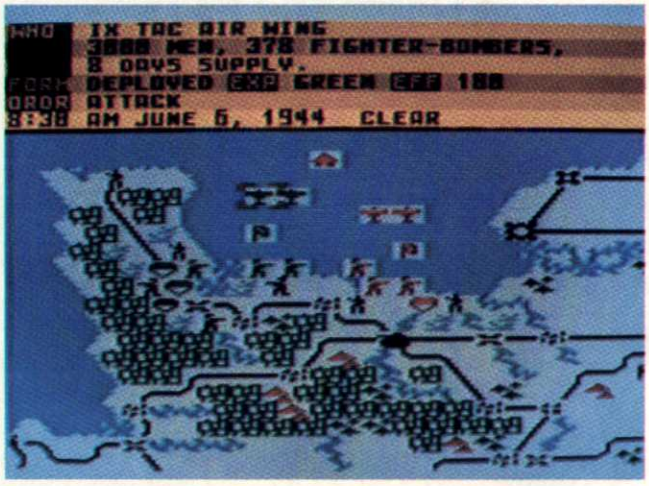
Decision in the Desert.



Crusade in Europe.

conflicts, so an avid compu-militarist might well want to have both of them in his software library.

One of the biggest drawing cards for World War II games is the extensive use of tanks. For some reason, the armored fighting vehicle (AFV) is many players' favorite weapons system.

Panzer Grenadier ($39.95) from SSI puts the gamer in command of a regiment of Hitler's elite mechanized troops. The Russians on the Eastern Front provide the opposition in this introductory level contest by prolific author Roger Damon.

A more detailed simulation of WWII tactical armored combat is *Kampfgruppe* ($59.95) by Gary Grigsby for SSI. It deals with action on the Eastern Front and presents a demanding challenge for even experienced military simulation fans.

Grigsby is also responsible for a huge division-level simulation of the entire Eastern Front campaign, *War in Russia* ($79.95) from SSI. Not for the military dilettante, this program is the supreme test of strategizing skill.

Guderian ($30)from Avalon Hill uses a joystick-activated command control system to present armored battles in Central Russia. The German drive on Moscow furnishes an incredible array of opportunities to develop strategies "on the fly" as these two mighty armies pound each other relentlessly. A solitaire option permits the player to take either side against a robot opponent.

Variations on the Theme

Computer Ambush ($59.95) from SSI offers a distinct change of pace from other land war titles, because it concentrates on the activities of individual soldiers rather than the clash of regiments, divisions, or even whole armies.

Designers Ed Williger and John Lyon present a dozen scenarios, which put combat under the microscope. Each unit represents a single soldier's abilities and frailties. Players move troopers individually and then watch the results unfold on the map playfield.

Computer Ambush is no snap to play. The simulation is very detailed, and the order-entry phases can drag on quite a while when the gamer is guiding a full squad. The graphics can best be described as drab, but the premise of the game atones for its lack of graphic inspiration.

Field of Fire ($39.95) by Roger Damon for SSI follows Easy Company of the U.S. Army's 1st Infantry Division through eight World War II battles. The player can re-fight famous engage-

In Defense of Wargaming

Military simulations have been controversial since Charles Roberts created "Tactics" in the mid-1950s. Even today, many avid computer gamers have yet to add a wargame to their library. Misconceptions often die hard, and a fairly unpleasant one has dogged military simulations for more than 30 years.

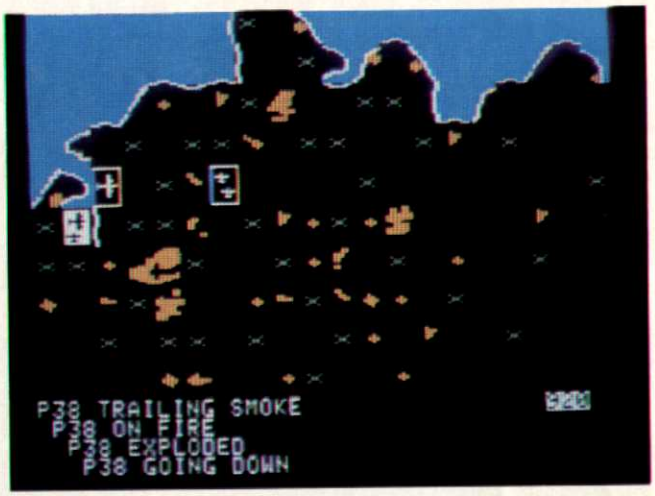
Games with a martial theme date back to chess, but pre-"Tactics" wargames were abstract. No one claims that the Knight realistically represents the movement and firepower of cavalry, for example. Chess embodies the principles of warfare, but does not apply them to specific situations and actual forces. In contrast, most military simulations published in the last three decades reproduce specific battles and campaigns with as much fidelity as possible.

Some people confuse this realism with reality. When an armchair general loses three divisions in a botched attack, they grieve over the wholesale loss of human life. Yet the cardboard unit marker is no more real than a carved ivory Bishop, and few players hold high Mass when one of those falls to the rival Queen.

Wargamers are interested in the strategic and tactical problems posed by military conflict, not the carnage. In fact, many of those who protested the involvement of the U.S. in Viet Nam enjoy the intellectual stimulation of a finely crafted military simulation.

If anything, wargames pound home the futility of armed conflict. The insight into warfare gained in the course of solving intricate tactical and strategic problems leads most military simulation fans to believe that it would be a better world if military conflict never left the computer screen or tabletop. ■

Panzer Grenadier.



USAAF.

ments from the North African and European theatres against German opposition.

The battles, described in full detail in the fine documentation, take place on a variety of terrain, which gives *Field of Fire* pleasing diversity. The short scenarios make this one a fairly good introduction to computer wargames.

Carrier Force ($59.95), also from SSI, is actually four games in one. It simulates a quartet of naval battles between the United States and Japan in exhaustive detail. Every ship and plane that took part in each engagement is represented on the screen. This one is definitely not for the uninitiated, but closet admirals are sure to become *Carrier Force* addicts.

Warship ($59.95) from Strategic Simulations covers sea battles between the American and Japanese fleets in 1941-1945. Although the graphics are a little sparse, this is another triumph for Gary Grigsby.

Although there are four prepared scenarios—Guadalcanal I and II, Empress Augusta Bay, and San Bernardino—the real meat is the naval wargame construction kit that is included with *Warship*. The computerist can define the following parameters in customized scenarios: battle area (open sea, Sava Sound, or custom map), time and date of battle, game length, visibility level, air control over battle area, damage control levels, type of action (Japanese or Allied transport, bombardment, or battleline), large or small battle, and fleet composition. If desired, the computer can select the ships. Picking ships manually gives the gamer the ability to set up many "what if?" situations.

The computer can command either side against a human foe. And it is possible to handicap either side with a 10-20% strength reduction, which makes it easy to have an even struggle between two human commanders of unequal experience.

Despite its many options, *Warship* is easy to learn. Even a novice will fall into the rhythm by the end of the first round of play. *Warship* is an excellent strategy game, and because of its "open-ended" construction module, is likely to stay fresh through dozens of play sessions.

Gary Grigsby proves himself a master at simulating all forms of modern warfare with *USAAF* ($59.95) from SSI. The subject of this one is the Allied daylight bombing raids on European industrial targets by the U.S. Army Air Force.

So whether the 8-bit Atari owner wants to re-fight battles on land, in the air, or on the high seas, there is a game ready to fill the bill. Military simulations require a little study before playing, but they offer an intellectual challenge unrivaled by any other type of computer game. ■

Where to Find the Wargames

Avalon Hill Game Company
4517 Harford Rd.
Baltimore, MD 21214
(301) 254-9200

MicroProse Software, Inc.
120 Lakefront Dr.
Hunt Valley, MD 21030
(301) 771-1151

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

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(308)234-6250 M-SAT 11AM-7PM-CST
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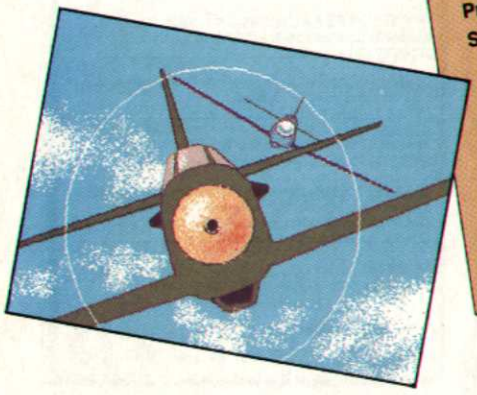
EI/O Products releases a graphics tablet to facilitate graphics entry on the ST

ARTablet

Graphics by Bob Southee of EI/O.

ARTablet

System: Atari ST
Price: 6″×9″, $395; 12″×18″, $877
Summary: A professional alternative to mouse-drawing in graphics and CAD packages.
Manufacturer:
EI/O Products
1559 Rockville Pike
Rockville, MD 20852
(301) 869-5984



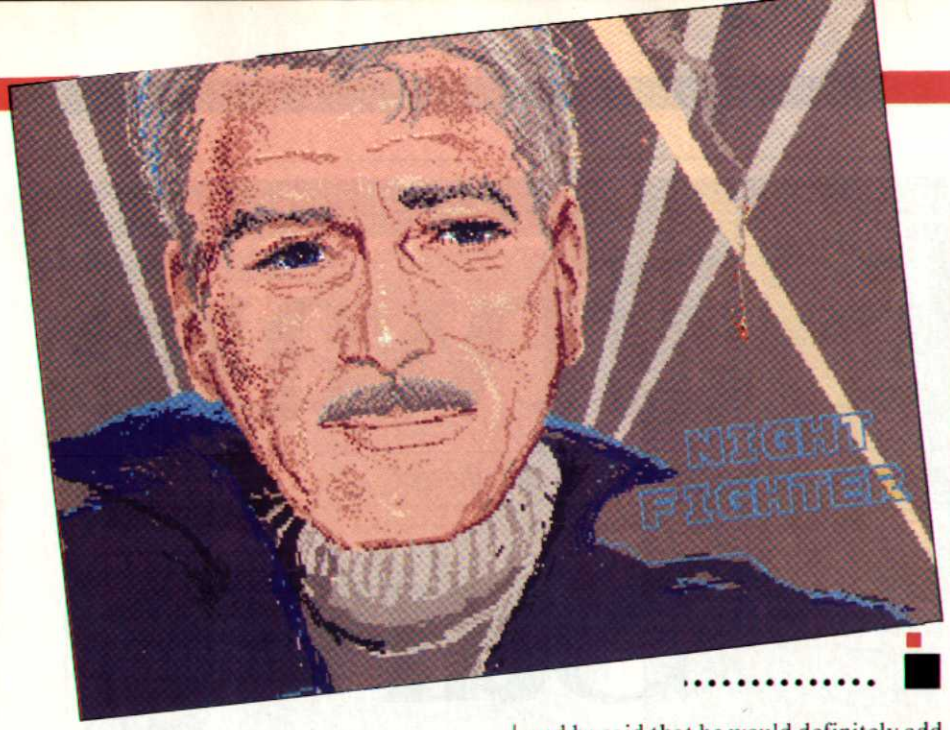
Recently, I was using Antic's *CAD-3D 2.0* and having a terrible time creating objects from the routines provided with the program. Basically, I was having trouble defining the points of the object, especially when dealing with curved surfaces.

Likewise, I have found that drawing with a mouse as required by many paint programs can be very difficult—not to mention imprecise. The solution to all of these problems is a *graphics tablet*, a peripheral that allows you to enter designs and data by drawing or tracing with an electronic pen, or in the case of point-by-point entry (as required with CAD programs), with a mouse-like "puck."

One of the first such devices for the ST has been released by a Washington, D.C.-based company called EI/O (Electronic Input/Output) Products. Their ARTablet comes in two sizes—6″×9″ and 12″×18″—and includes the software necessary to make the tablet communicate with the computer.

The sturdy plastic tablet itself was first designed for use with IBM PCs by Summagraphics, a Connecticut firm with a well-established reputation for

By ANDY EDDY



quality computer graphics hardware. The larger tablet comes with both a pen and a puck, while its little brother comes with just the pen, offering the puck as an option for an additional $90. A cable terminating in a modular plug attaches the pen or puck to the underside of the table, so switching from one input device to the other takes only seconds.

Getting Started

The tablet is very easy to use: you simply attach the cable from the tablet to the modem port on the back of your ST, plug the power supply for the tablet into an AC outlet, and place a copy of EI/O's installation accessory on your boot disk. When you boot up the system, you just click on the ARTablet heading under the Desk selection on the menu bar, click on the Install button, and you're done.

The only improvement I could wish for is a way to set up a configuration file for a boot disk that you know you will be using with the tablet. It would be so convenient simply to boot from your *Degas* or *NeoChrome* disk and have immediate use of the tablet.

I discussed this suggestion with Jeff Siegel, one of the creators of ARTablet, and he said that he would definitely add the feature—one he had already considered—to the first software upgrade he releases, which may well be out by the time you read this.

Using the Tablet

After the tablet is installed on your ST system, you will probably need to spend some time just becoming accustomed to working with the tablet.

The first thing you will notice is that, although the pen or puck does not have to touch the tablet, it must be held close enough to be read by the tablet. The magnetic field that emanates from the tip of the pen or the puck can be read as far as ½" away—a very nice feature that allows you to trace material from a book, magazine, or other bulky source without cutting the original.

At first, I was so enamored of this ability to draw above the surface of the tablet, that I frequently forgot to observe the ½" limit, but the lack of corresponding movement by the mouse pointer on the screen soon brought me back to reality.

When used with a drawing program, the ARTablet is invaluable. In testing it with *Degas Elite*, I found the difference between drawing with the mouse and drawing with the electronic pen comparable to the difference I would expect to notice if I tried drawing with a regular pen after drawing a picture with a brick. As Siegel suggested to me, try signing your name with the mouse, then do the same thing with the ARTablet pen. You will notice quite a dramatic difference. The pen fits your hand more comfortably and is very easy to manipulate.

Unfortunately, there is more to using any graphics package than just drawing. You must pull down menus, choose file names from the item selector, respond to and answer dialogs and alerts, etc. This requires that either the mouse be left enabled or the tablet assume all the responsibilities of the mouse.

With the ARTablet, both of these choices are available. The only trouble comes when you have to double-click the pen to, say, activate a program from the desktop. At standard parameters, the ST often does not pick up the double-click of the pen as it would the double-click of the mouse. The problem is solved by resetting the mouse-click read rate on the Control Panel and saving the desktop on disk to lock in that value for future sessions.

There is also a button on the shaft of the pen that EI/O has programmed to mimic the right mouse button, which is especially helpful when flipping between screens in *Degas*, for example. The puck is similarly equipped.

All this means that you can use the ARTablet without ever picking up the mouse. If, however, you prefer the mouse for certain operations, you will find that it remains active and unaffected by the installation software. The only problem is that there may not be sufficient room on your desk for both tablet and mouse.

The tablet does an excellent job of reading data entered via pen or puck quickly and accurately. If you draw too quickly, you will notice that some arcs flatten out, but this happens only when you draw at a very rapid rate, and I do not consider it a significant drawback. In general, between the software that EI/O has written and the tablet itself, you will discover very few shortcomings and a great many advantages.

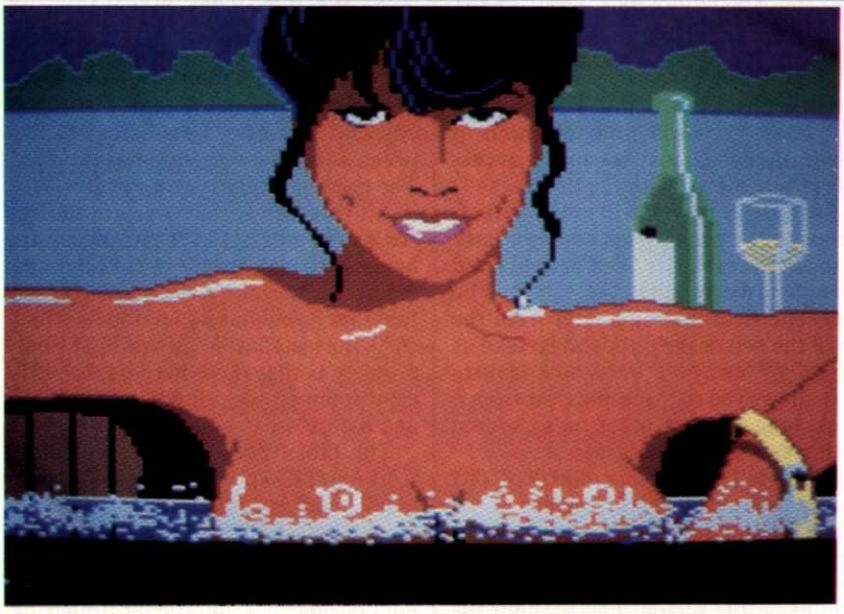
If you are serious about computer graphics, the ARTablet will be a useful, professional addition to your computer system. It is an efficient and reasonably inexpensive brush that will help you make ever-better use of the palette and canvas that come packed in your ST. ■

***The magnetic field** that emanates from the tip of the pen can be read as far as ½" away—a very nice feature that allows you to trace material from a book or magazine without cutting the original.*

Software Survey

An assortment of game software packages to suit every taste—or lack thereof

Leisure Suit Larry



PLAYABILITY

CHALLENGE

ADDICTIVENESS

GRAPHICS

EASE OF LEARNING

System: Atari ST (color or monochrome)
Price: $39.95
Summary: Funny adventure romp into the seamy side of life
Manufacturer:
Sierra On-Line
P.O. Box 485
Coarsegold, CA
93614
(209) 683-6858

Gamers who enjoy the risqué side of life will have a ball with Sierra On-Line's latest animated adventure, *Leisure Suit Larry In The Land Of The Lounge Lizards*. Be warned, however, that it is an adults-only contest, due to its subject matter and graphic (and I do mean *graphic*) portrayal of life in Lost Wages, the town where Larry attempts to, ahem . . . well, uh . . . lose his innocence.

Reminiscent of previous "mature audience" adventures like Sierra's *Softporn* and most recently, Infocom's *Leather Goddesses of Phobos*, *Leisure Suit Larry* is a wild romp through barrooms and boudoirs. To ensure that under-aged gamers are barred from this frisky frolic, Sierra opens the game with a short trivia quiz that challenges you to answer five questions that Sierra feels will stump younger players. It will no doubt weed out some, but by no means all, youthful players, so parents, beware.

Once you pass the test, you find Larry in front of Lefty's Bar, a seedy joint that marks the start of your journey. This is not a difficult game, but one that will keep you in stitches. It will also get you thinking in strange, twisted ways; it's hard to be "normal" when surrounded by pimps, hookers, drunks, and hot tubs.

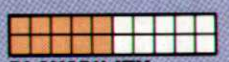
Along the way you pick up required items, as well as clues from other characters. As in Sierra's other animated, graphic adventures, you control Larry with joystick, mouse, and/or keyboard—a very simple, no-nonsense method of navigation that doesn't involve as much thought as straight text adventures. And the puzzles are still there to test your intuition, though I would rate it between beginner and intermediate in difficulty.

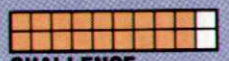
I mentioned in the November/December issue of *Explorer* that I considered *Goldrunner* to be the best game released in 1987; *Leisure Suit Larry* has my vote for most hilarious.

Now, if you'll excuse me, I've got some detective work to do. You see, there's this string bikini that's lost its owner and I know it'll be a heap of work to find her!

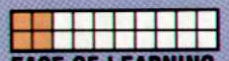
—***Andy Eddy***

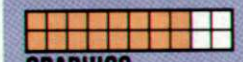
Barbarian


PLAYABILITY


CHALLENGE

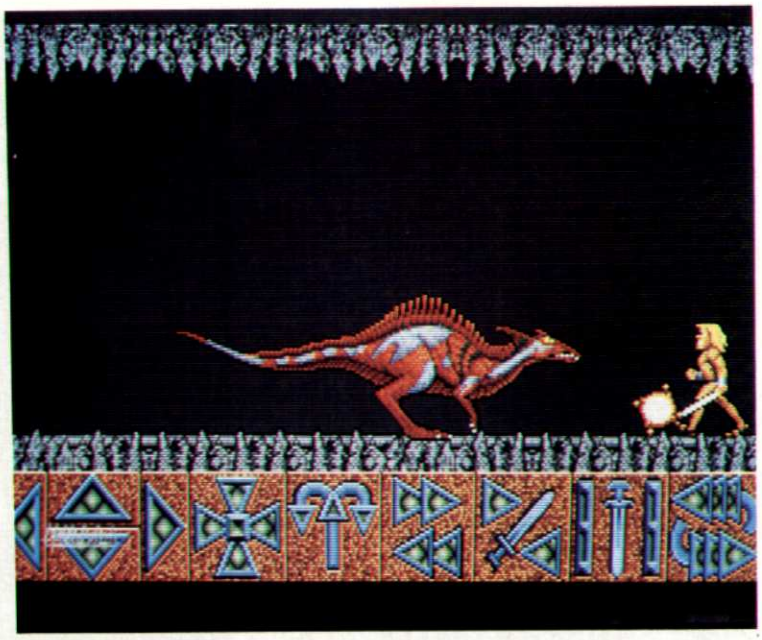
ADDICTIVENESS


EASE OF LEARNING


GRAPHICS

System: Atari ST
Price: $39.95
Summary: Frustrating graphic/arcade adventure
Manufacturer:
Psygnosis Limited
Liverpool, England
Distributor:
Computer Software Services
129 Sherman St.
Cambridge, MA 02140
(617) 876-2505

495-A Busse Rd.
Elk Grove Village, IL
60007
(312) 439-4444



Gosh this game looks good! It even looks good just sitting on the game shelf—with that Roger Dean cover artwork and all. Unfortunately, there is a chance that you will find the appeal of the game limited to the packaging.

Dean did a great job with Yes album covers, and the group did an equally good job of putting outstanding music on the vinyl that came with them. But Dean probably isn't real pleased, if he cares, with the disk that comes with his fine rendition of the *Barbarian* cover.

The 14-page booklet that comes with the game tells the tale that puts our hero, Hegor ("the most famous dragonslayer of them all"), in the marsh where the game starts. There are even a couple of clues within the text to help solve some of the puzzles he will encounter.

His task is to destroy the evil beast Vulcuran, who does the bidding of Necron, a man who turns out to be the hero's uncle.

But that's enough history, except to say that playing the game is about as enjoyable as sitting through a high school history lesson.

The instructions tell you that the game system can be implemented with keyboard, mouse, or joystick controls. But anyone who figures out how to survive in this game using the joystick is a bigger hero than Hegor.

The temptation is to use the mouse because of the attractive strip of icons across the bottom of the screen. Using these makes Hegor move left, right, up, and down. You can also make him stop, run, jump, attack, defend, flee (always a good choice), and pick up, drop, or use an object. The last three choices require two clicks of the mouse button to implement.

Actually the keyboard is the best choice. Any of the above actions can be accomplished with a single stroke, and all but moving left, right, up, and down offer a choice of two keys.

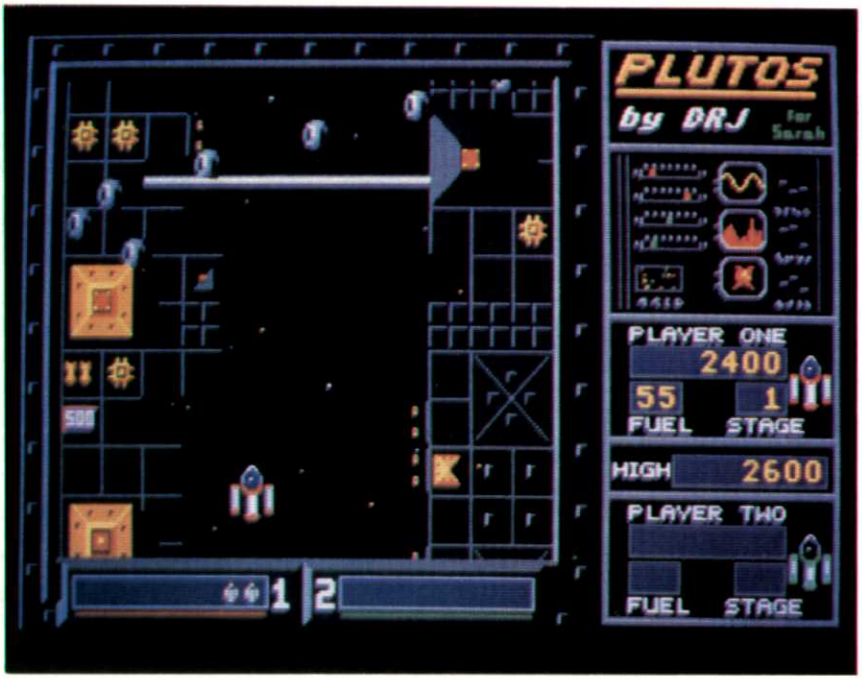
Even after figuring out a comfortable system of movement, the game is extremely difficult. The first five times I played the game, each try lasted less than four minutes and in one case less than two. It is so difficult to get started in *Barbarian* that all but the most experienced and tenacious adventurers will probably give up in frustration.

I kept going back just because the game looked so good. What the heck; I've always been a sucker for a pretty face.—***Rick Teverbaugh***

Mr. Atherton can't speak with you now; he's in combat.

Plutos

System: Atari ST (color)
Price: $29.95
Summary: Colorful scrolling space shoot-out
Manufacturer:
Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
(312) 480-7667



Since shortly after the introduction of Pong, scrolling arcade games—from *Caverns of Mars* to *Goldrunner*—have been the *sine qua non* of entertainment software for Atari computers. *Plutos*, a new arcade contest from Mindscape, breaks no new ground, and though it doesn't offer that much in the way of freshness, it is an ample test of nerves and skill.

With joystick in hand, you can move your spaceship anywhere on the screen, which is good, because you need every bit of space you can find to dodge the missiles and spacecraft that the program throws your way. The challenge is very intense; with each succeeding level, you face more and more opposition.

Golden Path

System: Atari ST
Price: $44.95
Summary: Graphic adventure with a high frustration level.
Manufacturer:
Firebird Licensees
P.O. Box 49
Ramsey, NJ 07446
(201) 934-7373

Software of all types is becoming easier to use, and the graphics included with most packages are becoming more impressive—almost by the day. Unfortunately, *Golden Path* scores well on only one of these measures.

The story line of the game is drawn loosely from Chinese mythology and follows the story line of a 22-page novella by Kim Whitmore. That seems to be the current trend in adventure game documentation—to include a brief story as justification for the existence of the game. On the whole, I'd rather be reading Stephen King.

Since *Golden Path* is mostly graphics, only sparsely dotted with text, the quality of the screens is very important. In that area, *Golden Path* gets good marks. The scenes are well-drawn and cleverly animated, with about 75% of the main screen display devoted to a depiction of the area your character is

The two-player mode offers an interesting twist: both players are in the playfield simultaneously, fighting off the horde in tandem but competing with each other for fuel pods and points.

One of the things that makes a game a hit with users is a skillful manipulation of speed and degree of challenge that dangles victory just beyond the player's reach, so that additional practice takes him to a new level, where success once again eludes him for a while.

It's a fine line—one that *Plutos* crosses somewhat maladroitly. By increasing the number of missiles homing in on you with each level, the programmer ensures that you will eventually hit a plateau—one from which it is very difficult to escape. At that point, discouragement sets in and enjoyment diminishes.

My only other complaint is that extraneous graphics occupy space on the screen that might have been used to increase the size of the playfield.

With those two exceptions, I found *Plutos* to be a well-conceived program with good use of color and movement. I recommend it—especially to *very* experienced joystick jockeys—but worry that it won't hold the interest of the average player. ***—Andy Eddy***

System: Atari 8-bit and ST
Price: $9.99; $19.99
Summary: Karate competition with an adventuresome twist
Manufacturer:
Mastertronic
711 W. 17th St.
Unit G-9
Costa Mesa, CA 92627
(714) 631-1001

Ninja Mission

I'm not sure whether Chuck Norris is to blame or not, but karate has become a popular theme in game software. Not to be outdone by the likes of Epyx and MichTron, Mastertonic has released *Ninja Mission*.

In it, your highly-trained warrior must work through a five-tiered temple, each room of which may house up to five adversaries. The game adds elements of adventure in the form of weapons—like throwing stars and daggers—that you can use in battle.

You must also search for seven jade statuettes, valuable trinkets that have been stolen by your evil adversary Akuma. With each one you find, your character gets a figurative shot in the arm—extra energy displayed on the energy bar. This is your primary objective, because if this energy indicator drops to zero, your quest is over due to a death in the family—your own!

Once you acquire all the figurines, you must face the final test in the uppermost room of the temple. If you are successful in that, you have to retrace your steps past a new team of enemies to your point of entry on the first floor.

Unfortunately, if you do complete the entire assignment (which is difficult, to say the least), there is no reward—no fanfare or fireworks—and I found that pretty disappointing.

Other than that and a little tedium in the overall concept, the game is well programmed—virtually identical in both versions, with an obvious graphic edge going to the ST—with ample control over your character's movements and parries with the joystick. Mastertronic, as we noted in the Summer issue, is a company for Atari users to watch. They show a lot of promise.

—Andy Eddy

exploring.

There are 45 different screens to be covered. That might seem like a lot, but it really isn't, because the game gives you very little time to look around, enjoy the view, and experiment with the surroundings.

Dawdle too long in one spot and a gremlin will attack your character and diminish his life force. This "feature" is a real menace to novice gamers and detracts from the overall playability of the game.

A positive feature of the game is a book of lore that can be consulted each time a new screen appears. This is a much better idea than printing hints within the documentation. Consulting the rule book at each new turn is distracting and diminishes player involvement.

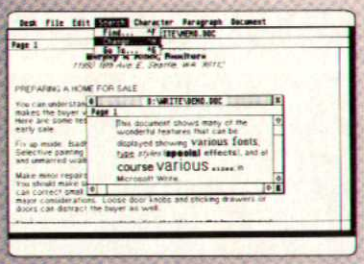
Also handy is a display in the lower right-hand corner which is really a mini view of the main screen with the various paths available to the adventurer outlined. Your on-screen persona in this game is a white-bearded wise man who is schooled in the martial arts—which turns out to be a good thing because you won't find many weapons for slaying dragons or taking on thieves.

What is probably most disappointing about the game is the way it makes use of the mouse during play. By moving the cursor to a point on the screen and pressing the left mouse button, you can make your character walk toward the cursor. No problem there.

But to pick up or put down an object, you must hit the left mouse button while the cursor is on the character's body. To use an object, you place the cursor over the body and press the right button. To punch an opponent, you simply click the right button, but to kick an opponent you must have the cursor over the body before you hit the right button. Of course, at that point, your hands must be empty or that last button push will cause the object being carried to be used.

Sound confusing? Add the pressure of wanting to get something done and get off the screen before the gremlin attacks, and you reach a frustration level that many gamers will find unpleasant.

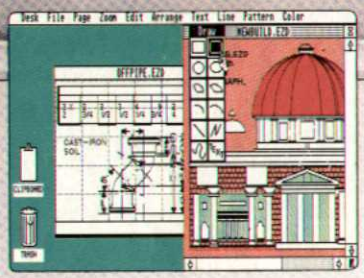
The story line for *Golden Path* is interesting enough, and the game is reasonably enjoyable for experienced adventurers. But in many ways the overall product falls short of the standards gamers have come to expect from this British company. ***—Rick Teverbaugh***



Word Processing

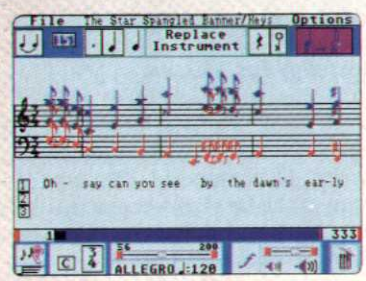
The ST features familiar icons, spectacular graphics, mouse control windows, drop-down menus and on-screen directions for ease of use.

The ST transfers data at 1.33 megabytes per second. Which means it could transfer the entire works of Shakespeare in less time than it takes to read this ad.

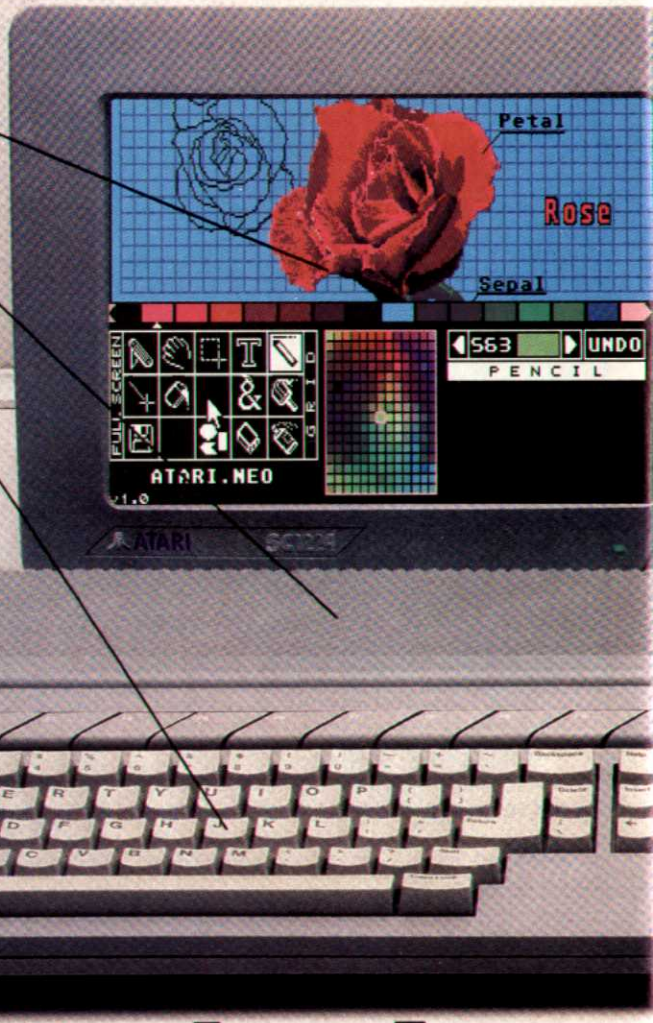


Graphics & Design

The ST keyboard is identical to that of standard data terminals, so it's already familiar.



Music Composition



Introducing technology

Finally, there's a personal computer that not only solves problems like other computers, but also solves the one problem other computers created. Affordability.

Introducing the ST™ Computers from Atari: The 520ST™ with a 512K memory and the 1040ST™ with a full megabyte. The ST was designed utilizing the most recent breakthroughs in semiconductor technology, producing a PC that does more tasks with fewer parts.

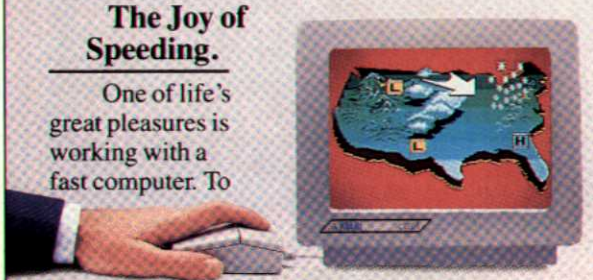
Which means it costs less to make. And less to buy.

The Joy of Speeding.

One of life's great pleasures is working with a fast computer. To bring the ST up to speed, Atari starts with the Motorola 68000 chip—the same "brain" you'll find in the Macintosh.™ Then, Atari adds the extra oomph of four exclusive chips—specially designed to handle several functions simultaneously. (Other PCs limp along handling one function at a time).

This results in making the ST much faster in the computing process. Faster in moving data within the system. Faster in getting information to the screen.

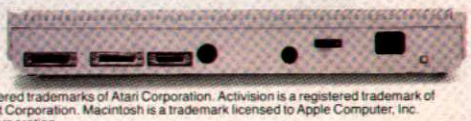
So now, you can run programs like word processing, database management, and financial planning with more zip and efficiency than ever before. A nice feeling.



Compare Our Components.

A computer is only the sum of its components. So we made each one better. Look at the layout of the ST keyboard, for example. You get a full numeric keypad. Plus a cursor control keypad with editing keys. Plus 10 programmable function keys. Now add the mouse and consider the options.

The monochrome monitor is a beauty. Taking its broad bandwidth signal from the ST's exclusive video chip, it displays a resolution of 640 × 400 pixels. This gives you razor-sharp, jitter-free text display for word processing and CAD work (very easy on the eyes). Or, for stunning color images, add the RGB color



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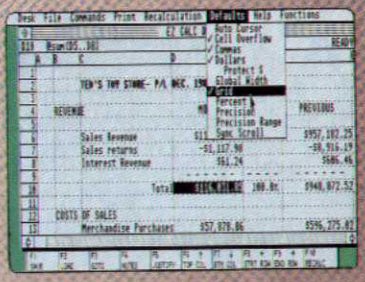
The ST includes a three-voice sound chip with a range from 30 to beyond 20,000 Hertz. The Amiga™ and Macintosh are limited to a maximum of 7,000 Hertz.

The ST works with a wide range of IBM® compatible printers. Including laser printers and plotters.

The easy-to-read manual will have you working on your ST in minutes.

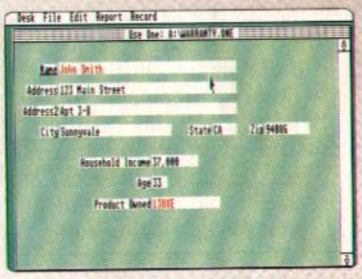
You can use command keys, or a mouse. It's your choice.

The 3-1/2 inch encased disk is more durable and easier to work with than the standard 5-1/4 inch floppy.



Spreadsheets

Entertainment

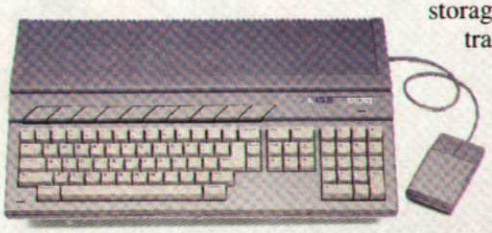


Database Management

so advanced, it's affordable.

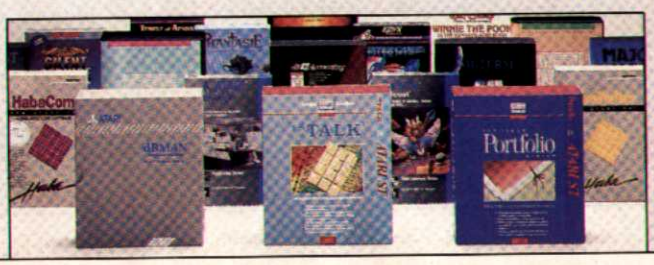
monitor. No interface board needed. Just plug it in. (Try doing that with a Mac!)

You get an external disk drive with the 520ST. An internal, double-sided disk drive with the 1040ST. Both have a disk speed many times faster than previous PCs. And they're blissfully quiet.



Plus, many of the costly peripherals you have to add on with other PCs are already built into an ST. Like the built-in MIDI (musical synthesizer interface) port. And the industry-standard printer port and modem port. And for even more memory, a port for the SH204™ hard disk drive, with twenty megabytes of storage and the fastest transfer rate in the industry.

With hundreds of software programs already available, an ST can grow with your imagination, or your business. Companies like Microsoft,® Spinnaker,® Activision® and more are continually making contributions to the ST software library. And some popular programs originally designed for other computers are actually being upgraded to take full advantage of the ST's capabilities!



The Price of Power.

Best of all, the cost of an ST is so low, it may come as something of a shock. The 520ST sells for under $800, including monochrome monitor.* The 1040ST, with a full megabyte of memory, for under $1,000. That's less than one dollar a Kbyte.

So now, you don't have to be rich to be powerful.

To see why Infoworld called the ST "The best hardware value of the year" check it out at your Atari dealer. For the one nearest you, call 1 408-745-2367. 9AM-5PM Mon.-Fri., Pacific Time.

*RGB color monitor, $200 additional.

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Tass Times in Tonetown

System: Atari ST
Price: $39.95
Summary: Adventure into strangeness
Manufacturer:
Activision
2350 Bayshore Pky.
Mountain View, CA 94039
(415) 960-0410

Are you ultratone? Would you know tass times if you had them? Do you have enough guitar picks for a dyecut? And what happened to cool ol' Gramps? By the time you finish playing Activision's *Tass Times In Tonetown*, you will be able to answer these and other equally important questions.

Created by the same programming group that was responsible for *Mindshadow* and *Borrowed Time*, *Tass Times* is a graphic adventure that offers more than its share of fun and excitement. Oh, and did I mention strangeness? At the start, you take a leap into the future in one of Gramps's inventions—a leap into a very bizarre world. How about guitar picks for currency?

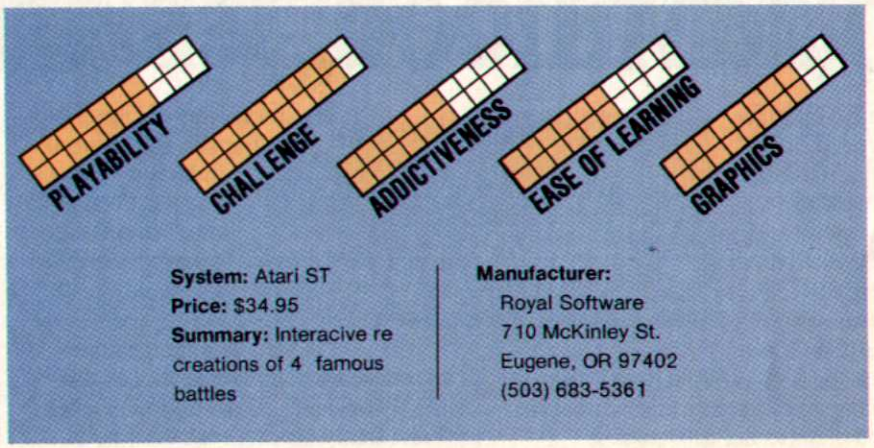
The user interface, which allows mouse control over most of the affair, has been improved over the previously mentioned titles. Choosing the icon that shows a hand picking up an item will do just that to the next object clicked on. As simply, there are other icons for talking to characters, hitting objects, and most other common actions.

Graphically, the display window shows the colorful panorama surrounding your character and occasionally offers clues to your predicament. You'll see some strange sights along the way; nothing other than the pictures they give you could prepare you for the pandemonium you'll live through as you search for Gramps.

I don't want to spoil any of the enjoyment of discovery, both within the game and from the props that come with it, so suffice it to say that "tass" is today's "totally awesome," and you'd better get tass fast to pass through this one!

—***Andy Eddy***

Great Battles



System: Atari ST
Price: $34.95
Summary: Interacive re creations of 4 famous battles

Manufacturer:
Royal Software
710 McKinley St.
Eugene, OR 97402
(503) 683-5361

Reproducing some of history's most famous battlefields on *NeoChrome* screens, *Great Battles* lets you maneuver the actual troop configurations as you attempt to change the course of history. These classics—Waterloo, Austerlitz, Shiloh and Gettysburg—occurred between the years 1789 and 1865 in the days when nose-to-nose fighting was the rule, and troop placement was *very* important.

The program runs under GEM, and the mouse handles manipulating the cursor easily, which in turn makes moving troops and controlling artillery fire a snap. GEM menu headings are also strongly supported here, containing option after option for altering the combat scenario itself. These options include varying reinforcements, choosing which sides you and the computer play, and optional rules that pertain to certain idiosyncrasies of the actual battle. In the Austerlitz scrap, for example, this option allows for the possibility of frozen ponds cracking underfoot when troops cross that hex.

The sound and visual effects also make this more interesting than most war games. You hear sounds of battle and even see who is firing on whom as you watch the "blips" that accompany the audible blasts. And whenever you click on a unit, pertinent information, including number of men and level of morale, appears to help you plot your strategy.

I've never been one for classic war games, just as I was never one for sitting through history class in school, but the ease of playing Royal's *Great Battles* makes it a less onerous chore than I would have expected. If I keep this up, maybe I'll remember who fought in which war, and perhaps then my high school history teacher will finally pass me.

—***Andy Eddy***

System: Atari ST
Price: $39.95
Summary: Eight-in-one word play puzzler
Manufacturer:
Infocom
125 Cambridge Park Dr.
Cambridge, MA 02140
(617) 576-3190

PLAYABILITY

CHALLENGE

ADDICTIVENESS

EASE OF LEARNING

Nord And Bert Couldn't Make Head Or Tail Of It

Are you the type who thinks that all earthquakes are San Andreas' fault? Do you ask a light why? when someone tells a white lie? If you're sure you know the right Wright and which witch is which, then Infocom's *Nord and Bert Couldn't Make Head Or Tail Of It* is for you.

This one breaks the Infocom mold; true, it is a text adventure, but this one is *very* different. First, its focus is on the funny bone. You must know what spoonerisms and homonyms are, so you can turn a *whirligig* into a *girlie wig* (an example of a spoonerism) and transform a *tale* into a *tail* (its homonym). Instead of just finding items along your path, in this game you have to manipulate them linguistically into the form that will do you the most good.

You will also need to fill your bag of tricks with cliches, something younger players may have some trouble with, because some of the sayings are a bit dated. But Infocom provides a back door. Normally, you have to buy a separate hint book to get clues along your travels, but *Nord And Bert* has the hints built in. All you need to do is type HINT at any prompt to get an index of clues, progressively revealed by hitting the return key. Yes, you need to doctor up plenty of patients . . . oops, I mean, patience to succeed.

Finally, this story varies from standard adventures in its layout: an octet of short vignettes, seven of which are accessed from the opening menu. The eighth can be entered only after you finish the other seven and acquire the necessary passwords. It is slightly easier to move about with this format also. No compass directions or maps are needed; you just enter the location from the list at the top of the screen.

Nord And Bert is a laugh and a half, bound to bring a chuckle to your tulips. For lovers of word play, the game is a goofy alternative to run of the mill entertainment software, a category in which the search for a quality product can give you a tough rhyme . . . oh, never mind.

—Andy Eddy

Lurking Horror

PLAYABILITY

CHALLENGE

ADDICTIVENESS

EASE OF LEARNING

System: Atari 400/800/XL/XE; Atari ST
Price: $34.95; $39.95
Summary: Text adventure aimed at sci-fi fans
Manufacturer:
Infocom
125 Cambridge Park Dr.
Cambridge, MA 02140
(617) 576-3190

The popularity of Stephen King's novels today attests to the American reader's appetite for thrills and chills. With that in mind, it would seem safe to assume that computer games with horror themes would enjoy similar currency.

Infocom, ever the company to bitmap their characters into strangely diverse situations, and their popular adventure game creator Dave Leibling (best known as the coauthor of the *Zork* series) have produced a real look-over-your-shoulder tale in *Lurking Horror*.

Advertised as a game for fans of King and H.P. Lovecraft, it takes your character, a nerdy student at George Underwood Edwards Tech (known as GUE or "Gooey" Tech to its residents) on a quest that leads him through the darkest recesses of the school.

When you boot-up *Lurking Horror*, you're told that you have a Classics paper due the next day, so you head down to the computer center to finish the writing assignment that is saved on the school's mainframe system. But your attempt to review what you have written so far reveals only indecipherable text and strange graphics in place of your report.

Suddenly, you find yourself standing near a stone altar in the midst of a baying crowd in the presence of a gruesome creature. When you come to, you are back at the computer terminal, chalking up your strange visit to fatigue from overwork.

You enlist the help of a hacker, who tells you that some students' files have been accidentally switched with papers from the university's Department of Alchemy, a bit of news that sets the mood for what is to come. To further complicate things, a blizzard strands you in the cluster of strange buildings, and as you explore them, you find tunnels, trapdoors, and disturbingly few fellow humans.

As in most adventures, you will find your share of puzzles and dead-ends, but be prepared for large doses of witchcraft and the occult along the way.

Once again, Infocom has produced a high quality program; just when you think that they might have reached a plateau with their gameware, they bring out something fresh. Hey, you can't argue with consistency.

—Andy Eddy

Make Your Own Awards

AwardWare and Certificate Maker:

Two programs to help you recognize achievements of all kinds

What we have here sounds a lot like the opening of a Charles Dickens novel . . . Both of the programs reviewed here accomplish the same general purpose and both do what they do very well. But that's about where the comparison ends.

The programs run on different machines, cost vastly different amounts of money, and have such varied capabilities to make them look almost like apples and oranges in the same bin. But because their purposes are similar, we will pinch and prod them in the same places in an attempt to help you decide if one of them can be useful to you.

AwardWare

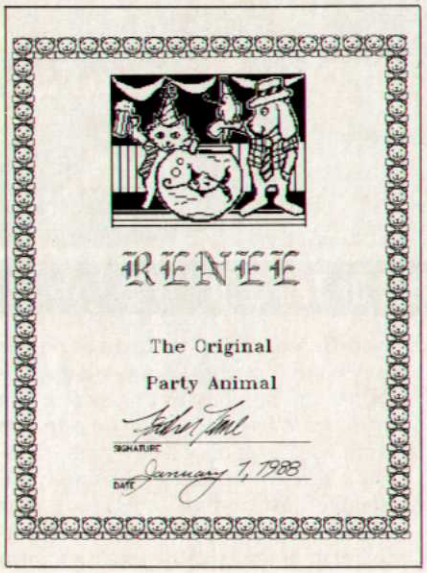
Let's start with *AwardWare*, a program that gets quite a bit accomplished despite its low price tag. It offers 60 different award formats and a few other templates for creating checks, tickets, coupons, ribbons, and even a paper key to the city.

The program runs smoothly, but like most low-end offerings, it places a few inconveniences in your path. The most obvious of these is the way you choose the typeface, size of type, type of award, and layout for your award; you can't picked them from the screen simply by typing in a key word or number. Instead, you must execute a combination of keystrokes and scroll through all of the available choices before choosing the one you desire.

Another common problem that *AwardWare* shares with many other budget programs is poor documentation. Good writers must be expensive, because they seem to be the first people left off the payroll when a company tries to create an inexpensive product.

The manual is 28 pages, but I had to read through it three times to satisfy myself that there was no way to save an award on disk without first printing it. Does that make sense to you? Figuring out how to make the program work with your printer is also mostly trial and error.

But *AwardWare* has several good points. There are five different typefaces, 20 different borders, and 25 graphics—a hefty assortment. It also allows you to create an AwardDisk. After saving an award by printing it, you save it on a blank disk, and then send it to the person you want to receive the award. If he has an Atari 8-bit computer he can look at the award and print it as often as he wants.



Hi Tech Expressions has promised more graphics packages for use with *AwardWare* in the future. If the price to expand is as reasonable as the price of this initial offering, *AwardWare* will continue to be one of the top bargains on the software shelf.

Certificate Maker

Certificate Maker is a completely different kind of bargain. It is difficult to label a program as perfect, so I'll stop just short of that here. But with this program I printed a delightful certificate about 10 minutes after breaking into the package and without reading more than five or six pages of the manual.

Let that not serve as an indicator of the level of sophistication of the program, however. *Certificate Maker* does everything you could ask of such a program—and some things that will surprise and astound you.

Certificate Maker offers five fonts in two sizes, so it is not much better than *AwardWare* in that regard. But it also gives you 24 borders and 220 award formats from which to choose, and that's just on the disks that come with the program. On the companion disk, which has already been released, you will find 24 more borders and 105 more certificates.

Some of the awards are generic and can be used with text to say just about anything. Most are already dotted with appropriate graphics and need only the text to make them ready for presentation.

Just to give some of the flavor of the program, here are some representative titles: Couch Potato Award, Back Seat Driver Award, Most Valuable Member and Least Valuable Member, Dead Carp Award, Diploma, Certificate of Wedded Bliss, and even a Master Certificate Maker Award (how's that for ingenuity?).

Using the mouse, it is easy to point to

AwardWare

System: Atari XL/XE
Price: $14.95
Summary: Bargain priced award-making program
Manufacturer:
Hi Tech Expressions
1700 NW 65th Ave.
Suite 9
Plantation, FL 33313
(305) 584-6386

***AwardWare** offers five different typefaces, 20 different borders, and 25 graphics.*

By RICK TEVERBAUGH

Certificate Maker

System: Atari ST
Price: $49.95
Summary: Versatile program to create all types of certificates and awards
Manufacturer:
Springboard Software Inc.
7808 Creekridge Circle
Minneapolis, MN 55435
(612) 944-3912

Certificate Maker does everything you could ask of such a program—and some things that will surprise and astound.

the part of the certificate on which you want to work, click, and go to work. There is virtually nothing to memorize; everything works with pull-down menus. The only time you will have to refer to the documentation once you get going is to look up the number of the certificate you want.

You will be pleasantly surprised at the number of uses you will find for this program. It is perfect for personalizing birthday and anniversary greetings, obviously. But it can also be used in more inventive ways.

For example, a while back I wanted to send out party invitations for a little get-together. Instead of going to the card shop and getting some ordinary, antiseptic invites, I called up the Party Animal Award and fashioned my own. Not only was the party something people talked about for quite a while, but almost everybody remembers the date, time, and place because of the novel way in which they were invited to the shindig.

Given the price and machine considerations of these two programs, I feel quite safe in giving a recommendation to both. If I had both machines at my disposal, my preference, even considering the price, would be *Certificate Maker* for its versatility and sense of humor. ■

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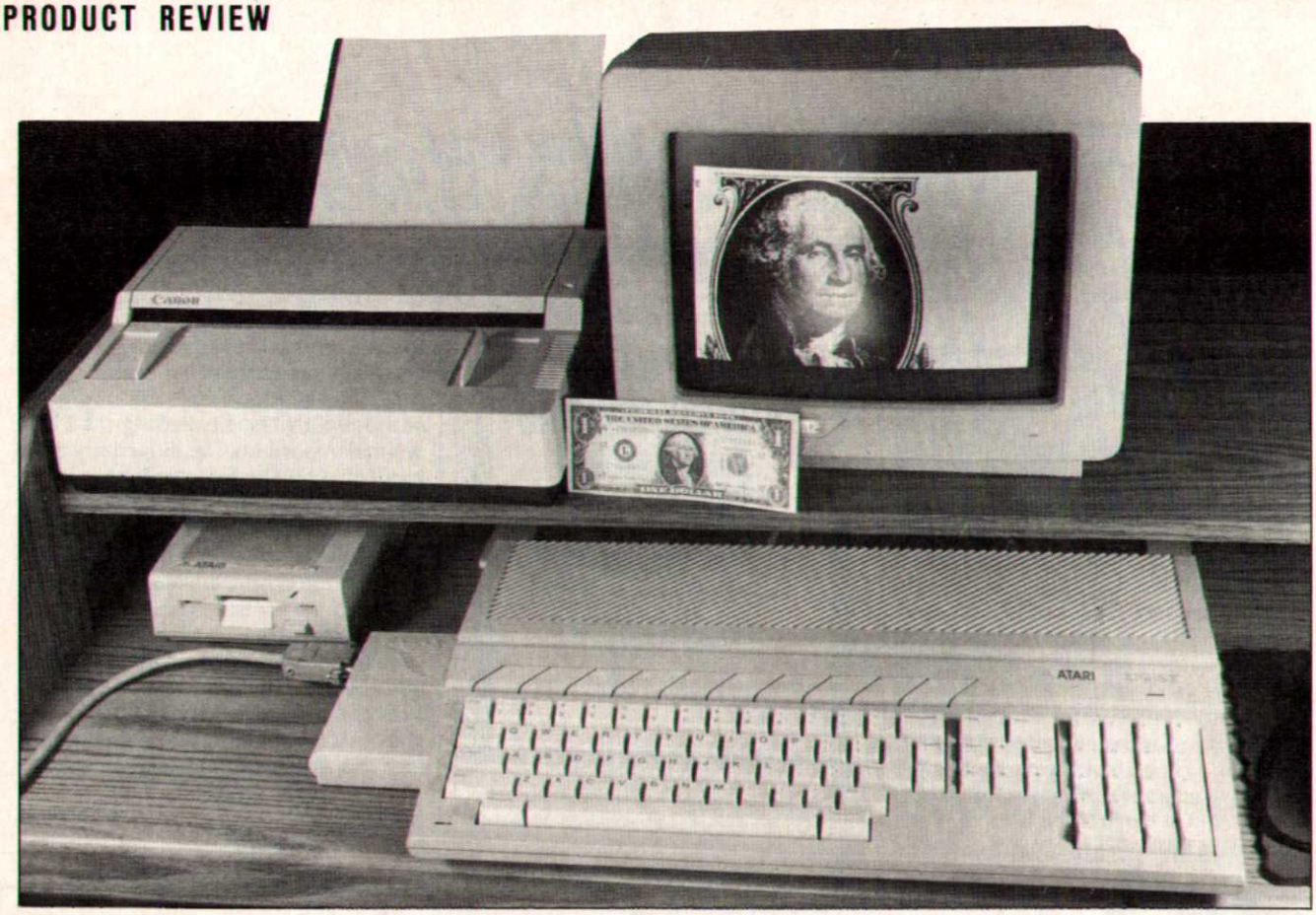


Photo by B. & F. Kofsky.

ST Scan

An introduction to scanning and a review of an indispensable adjunct to your desktop publishing applications

ST Scan does its stuff. The Canon IX-12 copier is to the left of the monitor, a page sitting in the output bin after having been scanned. A comparison of the image on the screen with the dollar bill below it illustrates the amount of magnification that occurs when a picture is scanned at 300 dpi.

ST Scan, the Introduction to the Instruction Manual that accompanies the package tells us, "is the most powerful input device available for the Atari ST computer."

Hmmmmm. Unqualified generalizations and unrestrained hyperbole always make me a bit nervous. Left to my druthers, I would prefer not to take such a sharp saw to the limb onto which I have just crawled out.

And yet . . . and yet. For all my skepticism, I am unable to come up with any device, input or otherwise, with which to challenge Navarone's claim for ST Scan. But even if we might want to debate the "most," we can certainly agree that powerful it is.

What's more, its arrival on the scene—hard on the heels of two desktop publishing packages and with *WordPerfect* breathing down its neck—is just one further confirmation that the Atari ST is a microcomputer to be reckoned with.

Why Scanning Is a Necessity

The significance of ST Scan extends far beyond the fact that one company has invested a substantial amount of money in it. Put it this way: one of the things that must be available for a machine before that machine can be considered a contender in the highly competitive desktop publishing sweepstakes or a machine suitable for office (as well as home) use is a scanner.

Why? As a historian, I prefer to answer the question by describing a scanner as a window onto history. With such a device, that is to say, if a picture can be reproduced on a printed page, it can also be incorporated into any document—a letter, a thesis, a poster—that you might care to produce. I find such a concept so dizzying, so dazzling that I

By FRANK KOFSKY

always have to take a moment to regain my bearings after tossing it around in my brain.

Heretofore, if you wanted, say, the countenance of Mona Lisa or Whistler's Mother to grace your polo team's newsletter, your only option was to present a printer with a *paste-up* of your publication, together with the pictures to be incorporated into it. It would be up to the printer to do the rest.

Now, however, you can handle the entire process yourself, from stem to stern, alpha to omega. By sampling a picture at a density (usually stated in dots per inch or dpi) that you select and transmitting the resultant information to your computer, the scanner supplies the illustrations of your choice. The desktop publishing software then helps you arrange them and your text in such a way that a laser printer (or, better yet, a phototypesetter) can turn out your publication almost exactly as you have envisioned it.

Scanning Printed Documents

But that is only part of the way in which a scanner opens a window onto history. Suppose, for the sake of concreteness, that a large law firm decides it wants to make the transition from typewriters to computers. When the computers arrive, there will be legal briefs in all stages of completion. Some will have been submitted to the courts; others will be making the transition from draft to final form; still others will only just have been started.

How, without hiring several new employees or asking the present ones to work long overtime hours, can all of these documents ever be put into machine-readable form? The answer, it turns out, is quite simple, at least in theory—*optical character recognition* (OCR).

Just as it can be used to capture a picture, the scanner can be used to capture a typed or printed document, provided that the typeface is of a kind that the software can recognize. The software here serves to transform the information that the scanner takes from the document into a file that can be imported into a word processing program for editing, merging, etc.

Ideally, then, a scanner should be able to treat pictures as pictures, text as text. ST Scan gets us a bit more than halfway to that goal: it can scan both photographs and line art, but, at the moment, it cannot deal with text. I emphasize *at the moment*, however, because, Chuck Humphrey, president of Navarone Industries, has hinted to me that such a program is in the works.

ST Scan: The Hardware

With those basics out of the way, let's have a look at ST Scan in operation. The ST Scan package consists of seven components: a Canon IX-12 scanner, two cables, an interface device that plugs into the ST cartridge port, an unprotected disk, and a pair of instruction manuals—one for the Canon and one for the program.

Setting up and becoming familiar with the system is simplicity itself (even for a comparative klutz like me), taking only a few minutes at most, which is a good thing, because the instruction manual for the program is barely adequate and that for the scanner, besides being overwhelmingly technical and largely incomprehensible, is almost entirely irrelevant.

You begin by inserting the interface device in the cartridge port and connecting the device to the scanner with a cable. You then format two disks and copy the ST Scan program onto one of them, reserving the other for the sizable files that scanning pictures invariably generates.

ST Scan

System: Atari ST (monochrome monitor and 1Mb of memory recommended)
Price: $1,239.
Summary: A truly indispensable and relatively inexpensive device for desktop publishing applications.
Manufacturer:
Navarone Industries, Inc.
1043 Stierlin Rd., Suite 201
Mountain View, CA 94040
(800) 624-6545
(800) 654-2821 (in CA)

Before moving on to a discussion of the scanning procedures, however, some comments on the hardware are probably in order. Although the manual states that ST Scan will work with a 520ST and a color monitor, it is, according to Chuck Humphrey, designed to give best results with a monochrome monitor and a computer with 1Mb or more of memory, both of which make it easier to work with the enormous files that result from scanning a picture at 300 dots per inch (dpi), the highest resolution that a laser printer can attain. Scanning a picture 8″ × 10″ at 300 dpi, for example, spawns an uncondensed data file of almost a megabyte, as the calculation in Table 1 shows:

At least two implications flow directly from this calculation. First of all, to scan anything approaching a full-page picture at 300 dpi, you must have at your disposal more memory than an unmodified 520ST contains.

Second, consider the size screen that will be required to display—which is to say, work with—such a picture. Although ST Scan can "read" a picture at 300 dpi, a monochrome monitor can display only about 72 dots or pixels per inch, and that figure is lower still for a color monitor. Hence a picture 1″ wide scanned at 300 dpi will appear more than 4″ wide on the screen (300/72=4.17″), and the 80-square-inch picture that we considered in the above calculation will have screen dimensions greater than 32″ × 40″.

Put another way, it would take 32 SM124 monochrome monitors, in an array four across and eight down, to display the entire picture. In practice, of course, we are restricted to a single monitor and the use of scroll bars to view any picture.

Obviously, the lower the resolution of the monitor, the larger will be the dimensions of the image produced by the scanning process and the more difficult it will be to work with, hence the superiority of a monochrome monitor in conjunction with such a program.

More on Hardware

One other comment regarding hardware. Although the Canon IX-12 is a marvelous contraption, it does not pretend to be the last word in scanners. It is, to begin with, a sheet-fed, as opposed to a flat-bed, device.

What this means, among other

Table 1.

Bytes per line=300 dpi * 8″/8 dots per byte=300
Number of lines=300 dpi * 10″=3000
Total bytes=bytes per line * number of lines=900,000

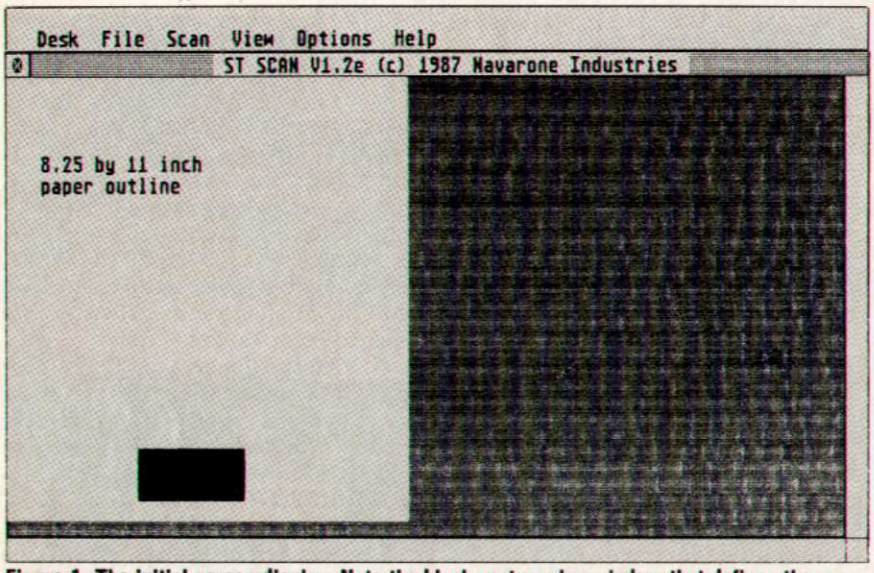


Figure 1. The initial screen display. Note the black rectangular window that defines the area to be scanned.

things, is that instead of placing your original page face down on a piece of glass to be scanned, that page is pulled through the machine mechanically, opening the door to all manner of mishaps.

If you are unwilling to risk having your picture damaged by the scanner—always a possibility if it is small and a virtual certainty (owing to Murphy's Law) if it is valuable or irreplaceable—you probably will want to enclose it between two clear plastic sheets. Well and good, but do bear in mind that the reflection from the plastic covering the picture is at least theoretically capable of degrading the quality of the scanned image.

A flat-bed machine will allow you to scan directly from a book, but its sheet-fed sibling obviously will not, thus requiring you to go through the intermediate and conceivably image-degrading step of photocopying the material you intend to scan.

I mention the foregoing considerations not because I attach great weight to them—I do not—but because I prefer not to have any reader misled, even by omission, by something I have written. For myself, I am entirely willing to overlook these putative shortcomings of the IX-12.

Even though this unit is relatively expensive as peripheral devices for the Atari ST go, it is cheap by comparison with virtually any other full-fledged scanner available today. As you will soon learn if you begin shopping for one, there is hardly a scanner-and-software package to be found for less than $2000, and the majority cost $2500 or more.

For my money—and let me make it clear that my money is, indeed, involved, inasmuch as I have already purchased ST Scan for my own use—the IX-12 is a great bargain, one well described by the slogan "power without the price."

Scanning Mode and Format

Having set up ST Scan, we are ready to examine how it goes about its business. Double-clicking STScan.PRG brings a split screen to the monitor (see Figure 1). On the left side is a white rectangle, somewhere within whose boundaries is a solid black rectangle. The former represents an 8.25″ × 11″ page; the latter is a "window" that you can move around on the page, changing its size at will.

To begin, you first open the Options menu and click on Scanner, which offers three choices: scanner resolution (75, 150, 200, or 300 dpi), contrast (light, normal, dark), and scanning method (Halftone for photographs, Line art for all other pictures).

ST Scan offers these two scanning modes because there is a difference between the continuous tonal spectrum of a photograph and the discrete or discontinuous spectrum of most line art. The former extends from purest white at one end to purest black at the other and usually encompasses several shades of grey in between; the latter normally consists of only two tones, black and white.

To approximate the grey tones of a photograph, the scanner and the computer, both of which are restricted to working with black and white pixels, must have a routine (algorithm) for arranging these black and white pixels to create the illusion of several different tones of grey. (Such an algorithm is not, of course, necessary for two-tone line art.)

The process of interspersing black and white pixels so as to simulate grey tones is known as *dithering*. No two scanner-software combinations will necessarily dither in the same fashion nor distinguish the same number of distinct grey tones. The IX-12 is capable of differentiating 32 shades of grey, a figure that seems to be the current de facto standard for the industry.

After choosing your scanning mode, you return to the Options menu and select Format. Here you have three more choices: *Degas*, GEM .IMG, and Postscript.. In reality, however, your choice is determined by the size of the image you want scanned and what you want to do with it.

If, you intend to use a non-Postscript output device or program, you must estimate the size of the image and calculate roughly the number of bytes it will contain. This you must do because the *Degas* format is unable to accept a file larger than 32,000 bytes.

So if, for example, you want to scan at 300 dpi, your image can measure no more than 8.53 square inches, and the ratio of length to width must approximate that of the screen—1.6 to 1. Not exactly huge, is it, when you consider that there are 90.75 square inches in the 8.25″ × 11″ page that ST Scan can handle. In any event, unless you plan to print your image with a Postscript device or are willing to limit yourself to scanning an area smaller than 8.5 square inches, you have no choice but to select the .IMG format.

Scanner Densities, Printout Densities

"Ah, but can't I use the *Degas* format for my image if I scan at a lower density?" you ask. "After all, the best density of which my dot matrix printer is capable is less than 200 dpi. Why should I scan at 300 dpi if that restricts me to such a small picture?"

Very good! Clearly, you have been paying careful attention. Yes, of course you can scan at a lower density, but in most cases you won't want to. In point of fact, the lower the density of the output, the more important it is to scan at the

Figure 2. Photograph of John Coltrane scanned at 300 dpi (top), 200 dpi, 150 dpi, and 75 dpi and printed at 180 dpi on a 24-pin dot matrix printer.

highest possible density.

I like to have something to think about while I fall asleep, so I spent several nights wrestling with this question. I finally decided to do the sensible thing and approach the matter empirically, by scanning the same picture at the four densities the IX-12 offers and printing each scan at 180 dpi (triple density) on an Epson LQ-1000 dot matrix printer.

To be thorough, I did this twice—once with a photograph of musical artist John Coltrane, scanned using the halftone mode and once with an engraved portrait of George Washington, taken from a familiar contemporary artifact and scanned using the line-art mode. As Figures 2 and 3 show, the higher the resolution of the initial scan, the higher the resolution of the ultimate printout, no matter what scanning mode is used nor what resolution the printing device can achieve.

Therefore, most of the time you will end up scanning in the .IMG format at 300 dpi. Does that mean you will be unable use programs that accept pictures only in the *Degas* format? Not at all. ST Scan contains an auxiliary program that can recast a large .IMG file into an ordered collection of *Degas* files, each containing 32,000 bytes. More on that later.

Meanwhile, let's turn our attention to completing your first scan. To proceed, you open the Scan menu and select the Full Page option. A prompt box then instructs you to insert your page into the scanner. About 12 seconds later, a *very* schematic representation of the page comes onto the screen.

Completing the Scan

Now the true fun begins, as you focus on the portion of the page you want to have scanned. You first drag the rectangular black window to the desired position on the page; the window remains rectangular, but it can be any size you desire, so long as the number of bytes in the area beneath it does not exceed the amount of available memory in the computer.

Once you are satisfied with the position and dimensions of the window, you return to the Scan menu, select the Window option, insert the page into the scanner, and initiate the scan. After a few seconds, the screen displays the upper-left portion of the area under the window. To see the remainder, you must use the scroll bars to move over the scanned image (as I have done in Figure 4).

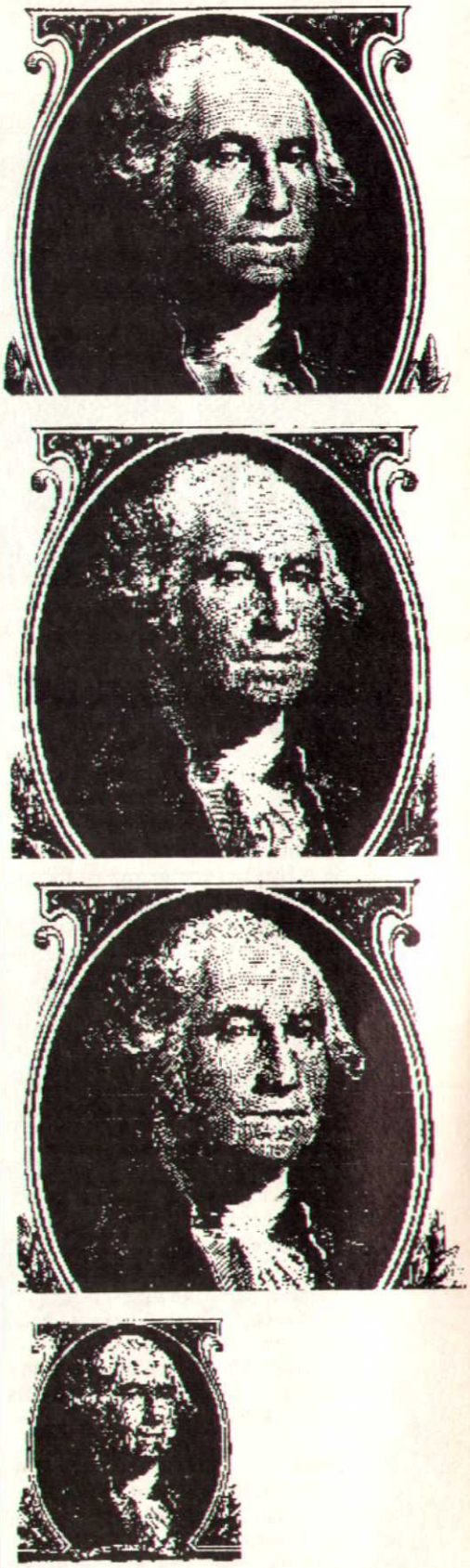


Figure 3. Portion of a dollar bill scanned at four densities (300 dpi to 75 dpi) and printed at 180 dpi on a 24-pin dot matrix printer.

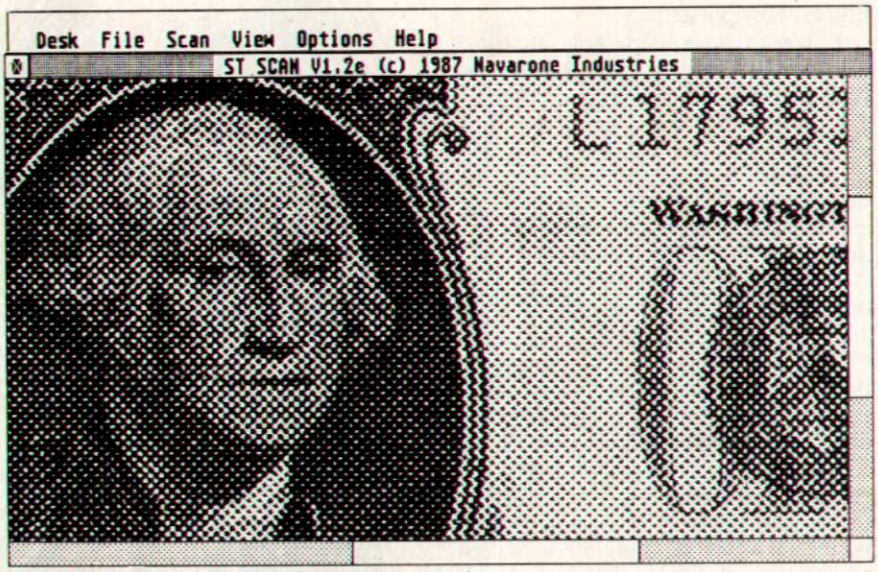


Figure 4. Portion of a dollar bill scanned at 300 dpi.

Should it turn out that you have not sized, shaped, or positioned the window correctly, you merely open the View menu, select the Full Page option, make the necessary alterations in the window, and re-scan.

And that's all there is to it. In two or three minutes, you have accomplished what it has taken me many words and countless hours to describe.

Still, although the sequence does not take long to master, two aspects of the program do detract from its convenience. The first is the lack of a magnification or zoom mode. Most of the time, I suspect, the size of the picture to be scanned will be less than a full page. That being so, Navarone would do well to emulate the practice of most desktop publishing programs and provide ST Scan with a range of full-page magnifications, making it easier to position the window correctly the first time and cutting down on the necessity for repeated rescans.

Along the same lines, users should also be able to get a rough view of the complete contents of the window on a single screen. The object, again, would be to facilitate placing the window exactly where you want it.

Now What?

Once the scan has been executed to your satisfaction, the obvious question is: what do you *do* with it? In the simplest possible case, which is probably also the least frequent one, if you have scanned the image in the Postscript format, you can send it directly to a Postscript printing device from the GEM desktop. Figures 5 and 6 illustrate the output obtainable when a picture scanned at 300 dpi is reproduced at the same density by a laster printer.

Perhaps somewhat more likely is the possibility that you will use the picture

Figure 5. Photograph scanned at 300 dpi and printed at the same density on a laser printer.

in conjunction with another program. In that event, you simply save the picture and route it to the appropriate disk.

Many other programs, however, require that a picture file be delivered in *Degas* rather than .IMG format. For that contingency, ST Scan has a handy ancillary program, CONVERT.PRG, that transforms an .IMG file into one or more *Degas* files.

Recall from our previous discussion that you cannot directly scan an image with more than 32,000 bytes using the *Degas* format. CONVERT enables you to overcome that limitation by scanning a larger image in the .IMG format, then breaking it into a series of *Degas* files.

Upon completion of this rather time-consuming process, which requires about a minute per 100,000 bytes, you can use the new *Degas* files in any program that accepts pictures in that format.

CONVERT also runs in reverse, allowing you to reconstitute your original .IMG file from its component *Degas* progeny. In all, a useful, well-designed feature. Adding the ability to transform .IMG files into *compressed Degas* files (with the extender .PC?) to conserve disk space would make it even more so, as that would allow you to save the scanned image of a full-page photograph on a single floppy disk.

The Editing Options

It would be a wonderful world indeed if you could always use images in other programs just as the scanner presented them on the monitor screen. In most cases, however, you will probably want to do some editing.

No sooner do you turn your attention to this topic than you become aware of just how powerful a tool ST Scan is. The truth of the matter is that ST Scan has far outstripped any currently available graphics software for the Atari ST, simply because no existing program permits you to work with the enormous graphics files it can generate.

Meanwhile, let us explore the options that you do have. ST Scan itself contains ScanEdit.ACC, a desk accessory that allows you to edit images one pixel at a time in eight-power magnification. Unfortunately, as it stands, this feature is all but useless, especially for scanned photographs.

Suppose, for example, that you want to edit the scanned image of the photograph of John Coltrane to remove the microphone, boom stand, cable, etc. from the picture. Because a variety of shades of grey form the background for these items, it won't suffice merely to paint over it with black pixels. But if you attempt to use the magnification mode of ScanEdit to do the editing, you are almost immediately overwhelmed.

With line art you have large blocks of solid black or solid white; here, in contrast, what you encounter (as Figure 7 demonstrates) are intersections of dif-

Figure 6. Portion of dollar bill scanned at 300 dpi and printed at the same density on a laser printer.

ferent shades of grey, each represented by its own dithering pattern. As a result, there are few if any "landmarks" to help you find your way about the image once you are in magnification mode.

The author(s) of ScanEdit would have been better off using the approach Tom Hudson employed in *Degas Elite*, displaying the unmagnified image on half of the screen and the magnified portion on the other half. When I remarked on this point to Chuck Humphrey, he stated that the next version of ST Scan would include a marker of some sort to indicate what part of the image was being edited in magnification mode.

Editing in Degas Elite?

Mention of *Degas Elite* brings us to the next option. Rather than attempting to use the primitive editing features of ST Scan, you might choose to scan the picture of John Coltrane in the .IMG format, run the scanned image through the CONVERT program, and then edit the individual *Degas* files.

The problem with this line of attack is that the areas of the picture that you want to edit may be in several different *Degas* files. If you make changes at the edges of two adjacent files, how can you be sure that there will be a smooth fit when you reassemble the files? Answer: you can't.

The instruction manual for ST Scan mentions a couple of programs, *ST LaserPaint* and a revised version of Migraph's *Easy Draw* with Supercharger, in this connection. *LaserPaint*, it seems is not now and may never be on the market.

From conversations with people at Migraph, I surmise that the next incarnation of *Easy Draw* promises certain features that can be used to edit an image produced by programs such as ST Scan. More than that, I cannot say. The program was due to be shipped sometime in September, but as we all know, products do not always come market exactly on schedule. Check with Migraph or your dealer for more information.

What We Need; What We've Got

The enjoyable thing about not being a programmer is that it gives you license to speculate—even, on occasion, to dream. Not being burdened by knowledge of what is and isn't possible, I will make some suggestions for the kind of program that ST Scan needs to make full use of its capabilities. The most elementary requirement, of course, is that it be able to manage files of several hundred thousand bytes without getting indigestion.

Next, it must have the ability to put on the screen a rough representation of at least one-quarter, and preferably more, of the scanned image, regardless of size.

Third, you should be able to define a segment of the image for editing, and this segment should then appear on half of the screen at a magnification that would depend on the size of the segment (the larger the segment, the lower the degree of magnification); the other half of the screen should display the effects of the changes you make as you make them.

And, finally, the program should allow you to manipulate the components of the image as objects—rather than working on them only on a pixel-by-pixel basis—when in magnification mode.

In the interim, however, I am hardly going to shroud myself in mourning garments—for even now there are too many rewarding ways of putting ST Scan to work for me to lose precious moments pining for that which does not exist.

If I admit to being infatuated with ST Scan, I must add in the same breath it is an infatuation that intimacy has not diminished. Before I acquired it, I was debating whether my next purchase should be one of the cheaper laser printers, a larger monitor, or ST Scan. Since purchasing the scanner, I have never had cause to regret my choice.

You can, after all, always beg, borrow, or rent time on a laser printer, and I'm still finding my SM124 monitor to be eminently serviceable. But a *scanner*? For that, I know of no substitute.

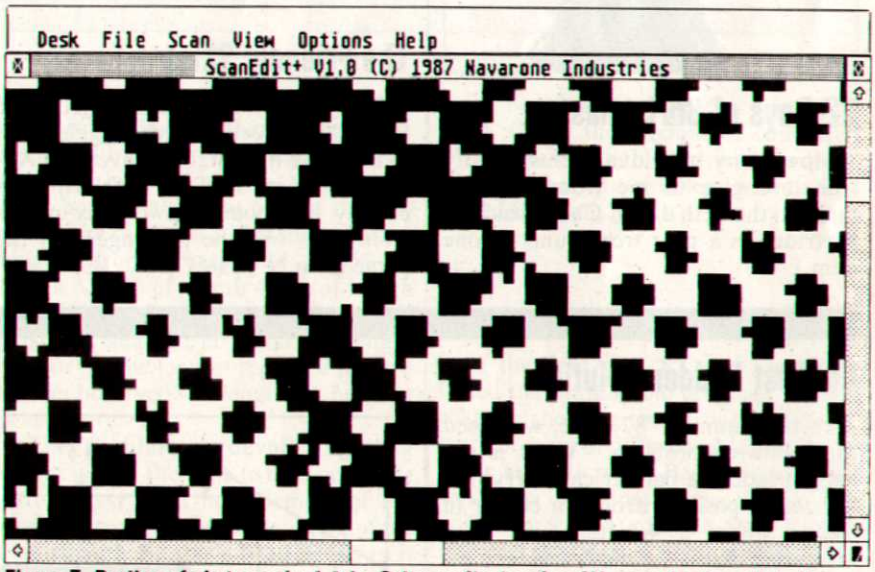


Figure 7. Portion of photograph of John Coltrane displayed at 8X magnification. Note the diagonal intersection of two different dithering patterns—representing two shades of grey—slightly to the right of center.

My hunch, moreover, is that Atari's management is equally overjoyed at the timely arrival of ST Scan. For more, perhaps, than any other single product that has appeared to date, the mere existence of a piece of equipment such as ST Scan proclaims that the Atari ST has come of age. ■

Puzzles & Problems

By DAVID H. AHL

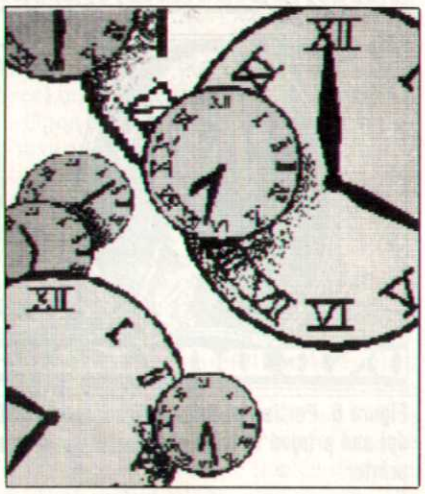
Because we have so many solutions and programs from previous issues to present, there are only four new problems this issue, all of which are reasonably simple. Answers are on page 81.

12 Days of Christmas

How many individual items did my true love give to me from the first through the 12th day of Christmas? (A partridge in a pear tree counts as one item.)

The Friendly Skies

Every hour on the hour a jet plane leaves New York for Los Angeles and, at the same instant, one leaves Los Angeles for New York. If each trip lasts exactly five hours, how many planes from L.A. will the passengers on the plane from N.Y. see?



Stopped Clock

Every day, the caretaker at Hadden Hall sets the old grandfather clock precisely at noon. But it does not run well; in fact, the probability that it will stop is 10% per hour. At midnight, what is the probability that the hour hand will point below the horizontal?

No Remainder

There is only one number, apart from 1, which divides exactly into all of these numbers:

163231 152057 135749

What is it?

Longest Ladder Solution

In the Summer '87 issue, we posed the following problem. "What is the longest ladder a painter can carry in a horizontal position around a corner in Genoa where a 4-meter wide alley meets one that is 2.5 meters wide?"

Using the diagram below, we wrote a short program to solve the problem by successive approximation. However, Hy Yuster of East Brunswick, NJ, reasoned that there must be a direct solution. By using our equation for L (L = 4/cosA + 2.5/sinA) and the fact that one can solve for A when L is at its minimum value, Hy used differential calculus and a Pascal program to solve the problem.

His derivation is shown in Figure 1.

Now you can solve the problem simply by writing a program to solve for A (equals the arctan of the cube root of 2.5/4) and substitute it in the original equation for ladder length. The answer is as we published, 9.10977 meters.

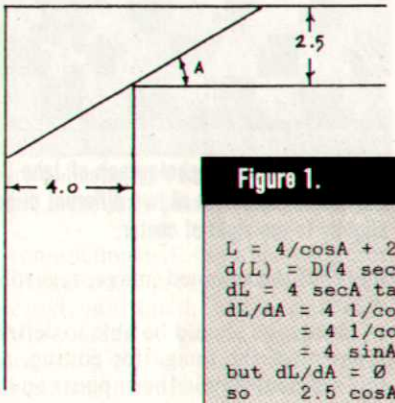


Figure 1.

```
L = 4/cosA + 2.5/sinA = 4 secA + 2.5 cscA
d(L) = D(4 secA + 2.5 cscA)
dL = 4 secA tanA dA - 2.5 cscA cotA dA
dL/dA = 4 1/cosA tanA - 2.5 1/sinA cotA
      = 4 1/cosA sinA/cosA - 2.5 1/sinA cosA/sinA
      = 4 sinA/(cosA)^2 - 2.5 cosA/(sinA)^2
but dL/dA = Ø
so    2.5 cosA/(sinA)^2 = 4 sinA/(cosA)^2
      2.5/4 = sinA/(cosA)^2 (sinA)^2/cosA
      (tanA)^3 = 2.5/4
finally   A = arctan(Ø.625 ^ 1/3)
```

Lucky 6

Another problem in the Summer issue was Lucky 6 in which we presented the first four numbers in a sequence and asked for programs to generate the 6th, 60th, and 600th number in the sequence. The first four numbers were:

1 2 3 4 5 6
1 2 3 4 6 5
1 2 3 5 4 6
1 2 3 5 6 4

We received a mailbag full of programs, the majority of which were wrong. Indeed, many would not even generate the first four numbers listed above correctly!

A very straightforward (correct) program was submitted by Robert Mueller of Kettering, OH. It runs in both 8-bit and ST Basic and prints the sequence number and value of each element, two elements per line (Listing 1). Very nice!

A somewhat more elegant solution was received from Sangit Parvat of The Netherlands (Listing 2). Although written on an 8-bit computer, it also runs in ST Basic. It computes the elements as string values and converts them to numbers when printing (Line 90).

Oh, yes, the 6th element is 123654, the 60th is 143652, and the 600th is 564321.

Listing 1.

```
10 N=1
20 FOR A=1 TO 6
30 FOR B=1 TO 6:IF B=A THEN 140
40 FOR C=1 TO 6:IF C=A OR C=B THEN 130
50 FOR D=1 TO 6:IF D=A OR D=B OR D=C THEN 120
60 E=0:REM  FIND E AND F
70 FOR K=1 TO 6:IF K=1 OR K=B OR K=C OR K=D THEN 100
80 IF E=0 THEN E=K:GOTO 100
90 F=K:POP:GOTO 110
100 NEXT K
110 PRINT N,A;B;C;D;E;F,N+1,A;B;C;D;F;E:N=N+2
120 NEXT D
130 NEXT C
140 NEXT B
150 NEXT A
```

Listing 2.

```
10 DIM A(6):Q=6:I=1:C=0
20 J=C+1:IF J>6 THEN 110
30 A(I)=J:FOR M=0 TO I-1
40 IF A(I)=A(M) THEN C=J:GOTO 20
50 NEXT M
60 I=I+1:IF I>Q THEN 80
70 C=0:GOTO 20
80 FOR N=1 TO Q
90 PRINT CHR$(A(N)+48);:NEXT N
100 PRINT ",";:I=Q:GOTO 120
110 I=I-1:IF I=0 THEN PRINT "DONE":END
120 C=A(I):GOTO 20
```

Good and Bad Juice

The answer given in the Summer issue was incorrect in that it did not take into account that one glass of bad juice had already been drunk at the time the mixing process started. Thus, line 20 of the program should read FOR I=1 TO 7 and the answer should be 0.647, not 0.523. Sorry!

Flagstone Walk

This problem, also in the Summer issue, generated by far the most correspondence. Art Matz of Reading, OH, improved on our program substantially by changing variable I to a string (I$) and changing the comparisons from one digit to 100-character strings. With these changes, the program produced a 400-stone sequence in 15 minutes as compared to 12 hours taken by the original program.

However, the real prize goes to Roger Scott Lumsden of Toronto for his APL solution. Roger tried a number of strategies for selecting each successive number in the chain and eventually settled on simply using a random number not equal to the last number in the chain. Using that strategy, he examined pattern lengths and found, as would, perhaps, be expected, that 60% of the patterns were of length 2. But then, pattern lengths drop substantially to 16% of length 3, 17% of length 4, 2% of length 6, and 5% of length 8 or greater. Surprisingly, there are no patterns of length 5, 7, or 9. The longest repeated pattern he ever observed was length 18, but that is very rare.

The problem in developing long chains is that the time to do a complete pattern test for a new element of the chain is proportional to the square of the chain length. So above 1000 elements, it takes more than 30 seconds to add just one new element.

However, because repeat patterns seem to be much shorter, Roger wrote his program to check patterns only up to length 64 (3.5 times his longest observed repeat pattern). Doing that cuts the test time to a constant after the walk gets to be 128 stones long, and you can keep going more-or-less indefinitely.

Roger included a pattern of 1024 stones, but there is little reason to believe that is the upper limit. In fact, it is quite possible that there is no upper limit. Given the amount of computer time necessary to find out, it is also quite possible that this problem will go unsolved for many years.

Marco Polo

In the Sept/Oct '87 issue, we published the Marco Polo program, noting that the shooting timer routine did not work because of differences between ST Basic and Microsoft Basic. Slawo Wesolkowski of Sydney, Nova Scotia, has come up with a solution that simply PEEKs at the internal timer pointer. This pointer is at an absolute location of 1123 (decimal), so the command PEEK(1123) will yield the time in seconds since the computer was turned on.

So, to put the shooting timer in the Marco Polo program you simply change three lines:

```
3640 S1=PEEK(1123) : 'Start timer
3680 S2=PEEK(1123) : 'End timer
3690 SR=S2-S1-HX : RETURN
```

To clean up the listing, you should also eliminate line 3695 which now serves no useful purpose.

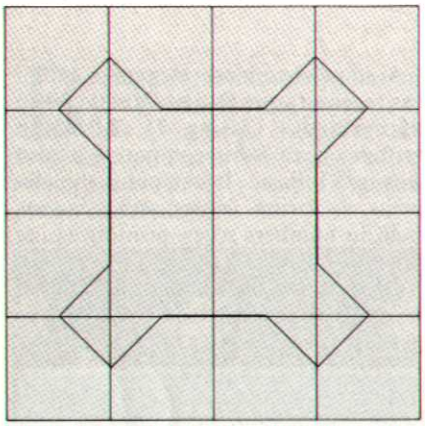


Figure 1. Geometric construction of a first order Sierpinski curve.

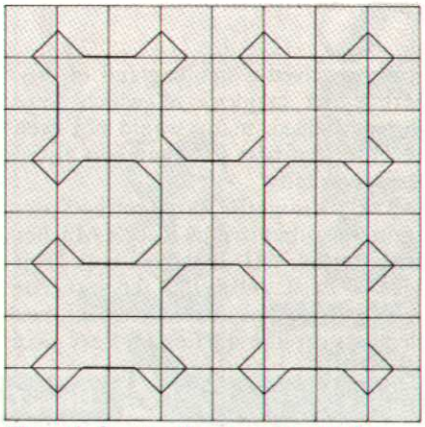


Figure 2. Construction of a second order Sierpinski curve.

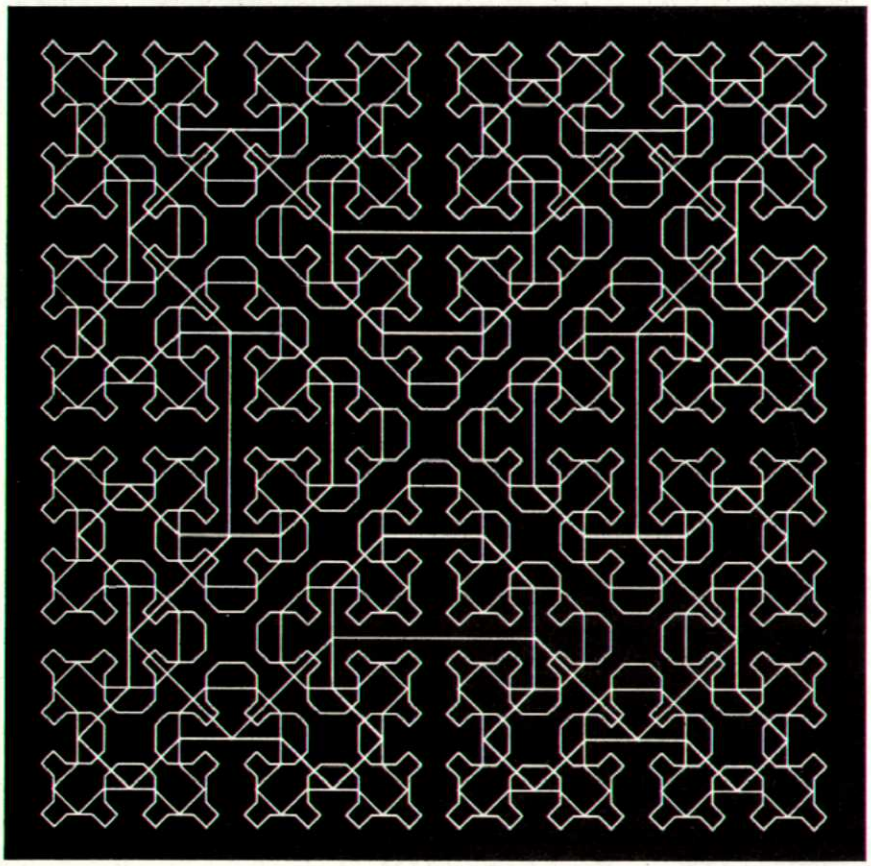


Figure 3. Plot of first through fourth order Sierpinski curves as produced by the program in Listing 1.

Try This!

Use this program to draw the wonderful curves of Waclaw Sierpinski on your Atari

Sometime in the 1700's, mathematicians described the word "curve" more precisely than had been done previously by defining a curve as the loci of points that satisfy equations which are continuous functions. Unfortunately, this more precise definition led to some odd problems.

If a curve describes a continuous function, it certainly ought to be possible to draw a tangent to any point on the curve. However, by the mid-1800's, mathematicians began to find strange, new curves that met the definition of a curve, but that had no unique tangent at any point.

One of the most famous such curves was one described in 1890 by Giuseppe Peano. This Italian logician showed how a single point, moving continuously over a square, could pass at least once through every point on the surface of the square and its boundary. Peano's curve is a legitimate diagram of a continuous function, yet nowhere on it can a unique tangent be drawn, because at no instant can one specify the direction in which the point is moving.

A more modern version of this problem is trying to measure the location and speed of an electron; if you measure its speed, you can't tell its location, and if you pinpoint its location, you can't measure its speed.

It wasn't long after Peano's discovery that logicians proposed other curves with similar properties. Two of the most interesting—in part, because they can be drawn and studied—are the curves devised by David Hilbert and Waclaw

By DAVID H. AHL

Sierpinski. The basic Hilbert curve is constructed by drawing a line around three sides of a square, changing direction, and repeating the process over and over again. The result looks a bit like an Arabic mosaic.

The Sierpinski curve is similar, but includes two additional lines drawn at an angle of 45 degrees to the basic square. The construction of a basic (first order) closed Sierpinski curve is shown in Figure 1; a second order curve is shown in Figure 2.

An interesting problem for computer enthusiasts is to find the area bounded by the Sierpinski curve at its upper limit. From Figure 1, we can see that of the 16 smaller squares, a first order Sierpinski curve occupies four squares completely plus 12 one-eighths, or a total of $^{11}/_{32}$ of the total.

Looking at Figure 2, we see that one-quarter of the second order curve occupies the same area as the first order curve plus $^{7}/_{8}$ of the corner square, or $^{11}/_{32}$ plus $^{7}/_{8}$ of $^{1}/_{16}$, which equals $^{51}/_{128}$.

If we generalize this progression, we find that the denominator of each new term is four times the previous denominator. Each numerator is four times the previous numerator plus 7. Thus, the first few terms of the series are as shown in Table 1.

I leave it up to you to write a short program to determine the area bounded by the "upper limit" Sierpinski curve.

An interesting problem for ***computer enthusiasts is to find the area bounded by the Sierpinski curve at its upper limit.***

Table 1.

11	51	211	851	3411	13651
32	128	512	2048	8192	32768

This area should be expressed as a fraction if possible.

The program in Listing 1 will trace out a first, second, third, and fourth order Sierpinski curve on the display of an 8-bit Atari computer. After tracing out the four curves, the program then "erases" them in order (by tracing them out a second time in the background color). If you want the program to run continuously, change Line 90 to F=0:GOTO 30.

It is not difficult to modify this program to run on an ST; only a few definitional lines at the beginning and the subroutine at Line 800 must be changed. We leave it as a challenge to readers to do this. ■

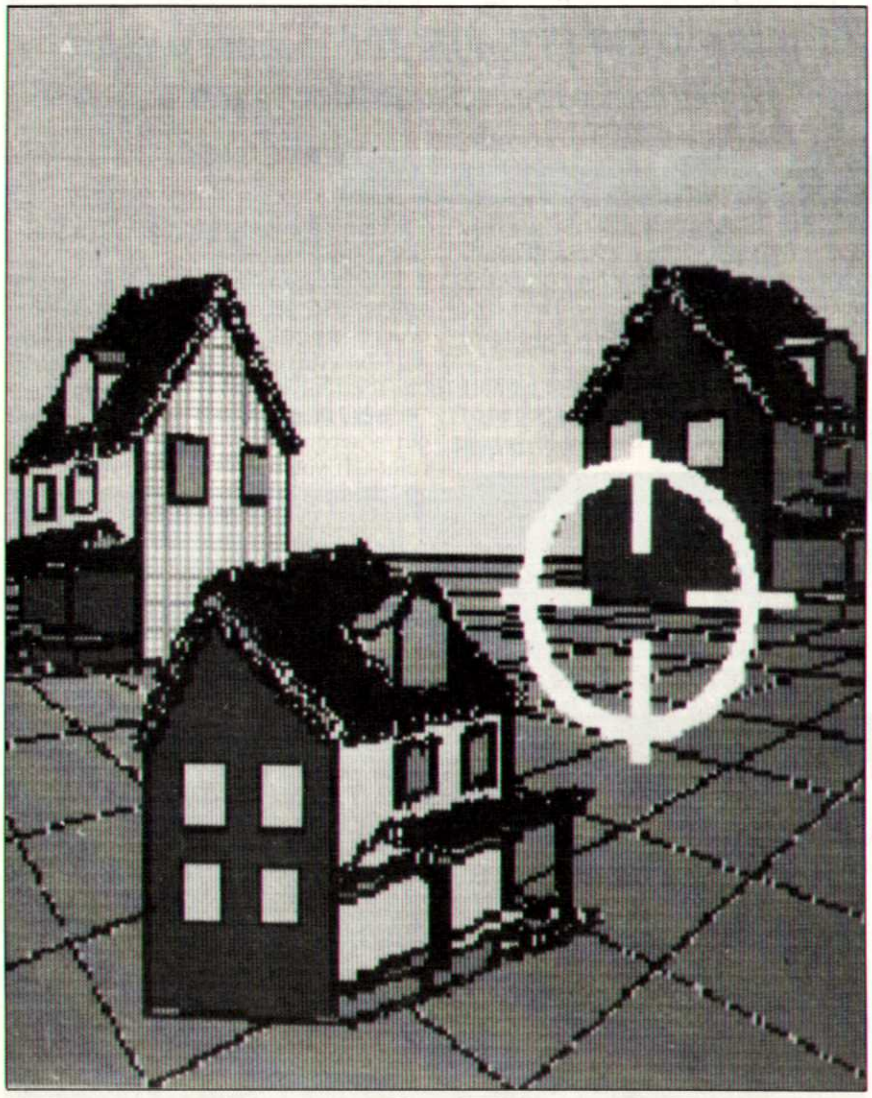
SIERPINSKI CURVE

ATARI KEY

- Any Atari 8-bit
- Atari Basic

(Hint: ST Basic requires changes in Lines 25, 40, 50, 80, and 800.)

```
10 REM SIERPINSKI CURVES PROGRAM
15 REM BY DAVID H. AHL (C) 1984
20 DIM ST(5):F=0
25 GRAPHICS 7+16:SETCOLOR 0,3,8
30 FOR Z=1 TO 4
35 C=C+1:IF C>3 THEN C=1
40 COLOR C
50 IF F=1 THEN COLOR 0
60 GOSUB 100
70 NEXT Z
80 IF F=0 THEN COLOR 0:F=1:GOTO 30
90 END
100 H0=96:H=H0/4:X=3.3*H:Y=3*H:I=0
110 I=I+1:X=X-H:H=H/2:Y=Y+H
120 IF I<Z THEN GOTO 110
130 PS=I:GOSUB 600
140 GOSUB 200:A=H:B=-H:GOSUB 800
150 GOSUB 300:A=-H:B=-H:GOSUB 800
160 GOSUB 400:A=-H:B=H:GOSUB 800
170 GOSUB 500:A=H:B=H:GOSUB 800
180 GOSUB 700:RETURN
200 IF TP<=0 THEN RETURN
220 PS=TP-1:GOSUB 600
230 GOSUB 200:A=H:B=-H:GOSUB 800
240 GOSUB 300:A=2*H:B=0:GOSUB 800
250 GOSUB 500:A=H:B=H:GOSUB 800
260 GOSUB 200
270 GOSUB 700:RETURN
300 IF TP<=0 THEN RETURN
320 PS=TP-1:GOSUB 600
330 GOSUB 300:A=-H:B=-H:GOSUB 800
340 GOSUB 400:A=0:B=-2*H:GOSUB 800
350 GOSUB 200:A=H:B=-H:GOSUB 800
360 GOSUB 300
370 GOSUB 700:RETURN
400 IF TP<=0 THEN RETURN
420 PS=TP-1:GOSUB 600
430 GOSUB 400:A=-H:B=H:GOSUB 800
440 GOSUB 500:A=-2*H:B=0:GOSUB 800
450 GOSUB 300:A=-H:B=-H:GOSUB 800
460 GOSUB 400
470 GOSUB 700:RETURN
500 IF TP<=0 THEN RETURN
520 PS=TP-1:GOSUB 600
530 GOSUB 500:A=H:B=H:GOSUB 800
540 GOSUB 200:A=0:B=2*H:GOSUB 800
550 GOSUB 400:A=-H:B=H:GOSUB 800
560 GOSUB 500
570 GOSUB 700:RETURN
600 SP=SP+1:ST(SP)=PS:TP=PS:RETURN
700 SP=SP-1:TP=ST(SP):RETURN
800 PLOT X,Y:DRAWTO X+A,Y+B
820 X=X+A:Y=Y+B:RETURN
```



Puzzles & Problems

Solution to the Vicious Neighbor Problem Revisited

In the September/October 1987 issue of *Atari Explorer*, we posed the Vicious Neighbor problem as follows:

If 1000 riflemen are distributed at random in a level one-mile square area and, at a signal, each one shoots and kills his nearest neighbor, how many riflemen will be left alive? The more general form of the problem places N riflemen on any rectangular plane area; expressed as a percentage, the answer will be the same in either case.

We published the correct answer but challenged readers to write a program to solve the problem. We received an excellent solution written for an Atari 800 from Arthur Matz of Reading, OH (see Listing 1). His explanation of the program follows:

In writing this program, my biggest concern was speed. Because there are 1000 riflemen and the program must figure out where each on will shoot, one million comparisons must be made. The program ran for four hours and ten minutes. The simulated result of the program was 289 alive, 459 shot once, 215 shot twice, and 37 shot three times.

I added a timer routine for use in tailoring the program for the quickest code. I tested how long it would take to determine who the first rifleman would kill and then estimated how long the program would run by multiplying the result by 1000.

Following is a description of the program:

Line 5 turns off the screen to speed up the program. My timer routine estimates that without turning off the screen, the program would run for six hours (46% slower).

Line 10 sets up 1000 x and y coordinates, shot counters (STAT), and ten counters to determine how many were shot zero to ten times.

Line 20 randomly selects the coordinates for all 1000 riflemen and zeroes out their shot counters.

Line 25 sets the timer bytes to zero to start the timer.

Lines 30 and 230 are the start and end of the loop that determines who each rifleman shoots.

Line 50 initializes the variable HDIST, which keeps track of the closest distance, to 2000, which is more than the furthest distance.

Lines 70 and 200 are the start and end of the loop that determines the distance from the current rifleman to all other riflemen.

Lines 73 and 74 calculate the x and y coordinate distances between two riflemen. If either distance is longer than the current shortest distance, the program branches to the end of the loop. Even though these IF statements are not, strictly speaking, necessary, without them the program would run 770% slower, taking close to 34 hours to run. So it is evident that calculating the actual distance is time-consuming and should be bypassed if possible.

Line 75 checks to see if both riflemen under consideration are the same.

Line 80 calculates the actual distance between the two men, and if it is less than the distance to any previous man,

saves both the distance and the rifleman number.

Line 210 adds 1 to the shot count of the closest rifleman.

Line 220 displays who shot whom.

Line 221 turns the screen back off if it was turned on in line 1000.

Line 222 checks to see if the user is pressing the Option key, thereby branching to Line 1000 (which turns the screen on and gives time info).

Line 235 turns the screen back on for good.

Line 240 zeroes out the counters to accumulate how many were shot zero to ten times.

Lines 250 to 270 calculate the number of riflemen shot zero to ten times.

Lines 280 to 300 display the number of riflemen shot zero to ten times.

Line 304 sets PL to 1000 so the timer routine will provide the proper stats.

Line 305 performs the timer routine for the final time stats.

Lines 1000 to 1060 turn the screen back on and display the time stats. ■

Listing 1.

```
5 POKE 559,0
10 DIM X(1000),Y(1000),STAT(1000),CNT(10)
20 FOR PL=1 TO 1000:X(PL)=RND(1)*1000:Y(PL)=RND(1)*1000:STAT(PL)
   =0:NEXT PL
25 POKE 20,0:POKE 19,0:POKE 18,0
30 FOR PL=1 TO 1000
50 HDIST=2000
70 FOR PL1=1 TO 1000
73 XD=ABS(X(PL)-X(PL1)):IF XD>HDIST THEN 200
74 YD=ABS(Y(PL)-Y(PL1)):IF YD>HDIST THEN 200
75 IF PL=PL1 THEN 200
80 DIST=SQR(XD*XD+YD*YD):IF DIST<HDIST THEN HDIST=DIST:HPL=PL1
200 NEXT PL1
210 STAT(HPL)=STAT(HPL)+1
220 ? "RIFLEMAN NO. ";PL;" SHOT NO. ";HPL
221 POKE 559,0
222 IF PEEK(53279)=3 THEN GOSUB 1000
230 NEXT PL
235 POKE 559,34
240 FOR PL=0 TO 10:CNT(PL)=0:NEXT PL
250 FOR PL=1 TO 1000
260 CNT(STAT(PL))=CNT(STAT(PL))+1
270 NEXT PL
280 FOR PL=0 TO 10
290 ? CNT(PL);" RIFLEMEN WERE SHOT ";PL;" TIMES"
300 NEXT PL
304 PL=1000
305 GOSUB 1000
310 END
1000 POKE 559,34
1010 SECONDS=(PEEK(20)+PEEK(19)*256+PEEK(18)*256*256)/60
1020 AVGSEC=SECONDS/PL:HOURS=SECONDS/3600:HRSLEFT=(AVGSEC*1000
     /3600-HOURS)
1030 ? "AVG SECONDS PER SHOT IS ";AVGSEC
1040 ? "DURATION HOURS IS ";HOURS
1050 ? "ESTIMATED HOURS LEFT IS ";HRSLEFT
1060 RETURN
```


More Basic Computer Games

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More Basic Computer Games is a collection of 84 outstanding games which originally appeared on the pages of *Creative Computing* magazine. Written in Microsoft Basic, they will run directly in ST Basic. About half will run directly in 8-bit Basic, while the rest will require some conversion.

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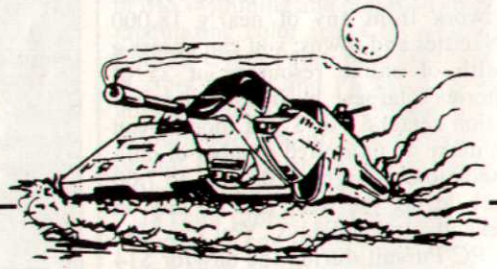
In the book, you'll also find Bobstones, the game played in *Watership Down*, the original versions of Dodge 'Em and Eliza, and Edward de Bono's sensational L Game.

More Basic Computer Games sells for $7.95 in bookstores everywhere. However, we have a small quantity with an older cover that we're selling for just US$5.00 postpaid (Canada and foreign, add $1.00 postage). Payment in advance by check or M.O. please. Send your order to Creative Closeouts, 12 Indian Head Road, Morristown, NJ 07960.



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by Walter Bright & Mark Baldwin

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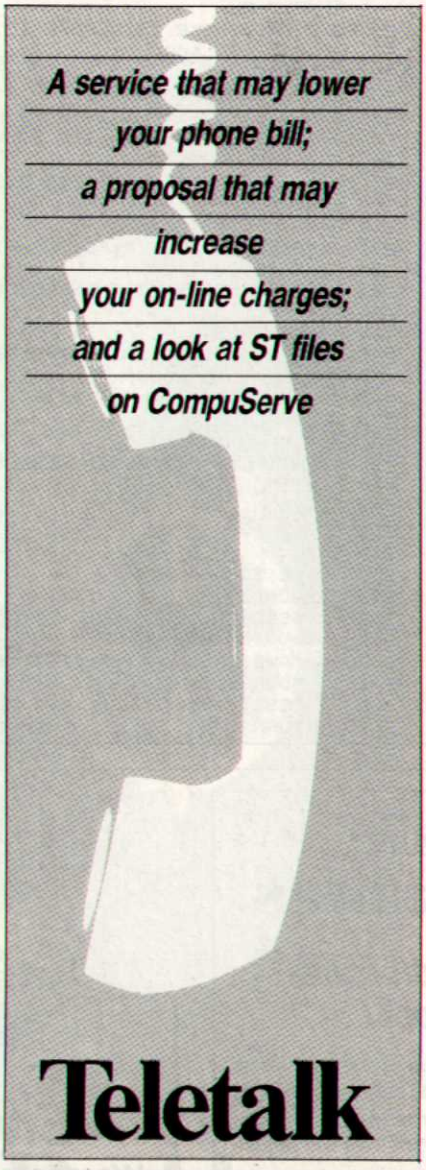
A service that may lower your phone bill; a proposal that may increase your on-line charges; and a look at ST files on CompuServe



Teletalk

By JOHN J. ANDERSON

Greetings, telecommunicators. This month we will have a look at PC Pursuit, examine the FCC's attempt to surcharge online time, and present an update on ST files available on CompuServe.

Before we begin, however, we should mention that the Atari SX212 modem is now shipping. It is an extremely inexpensive ($99.95), high quality 1200 baud modem designed specifically for your Atari computer. It removes any last vestige of an excuse you may have to run at 300 baud. If you are at all interested in an ongoing commitment to telecommunications, do yourself a favor and move up to 1200 baud. We guarantee you'll be glad you did.

Pursuing PC Pursuit

Telenet's PC Pursuit is a long distance PC-to-PC communications service. As opposed to an actual information service, such as Delphi or Genie, the PC Pursuit Network allows you to access individual bulletin boards and other personal computers in serviced cities across the country—at a substantially reduced rate.

By placing a local call to the Telenet Network from any of nearly 18,000 U.S. cities and towns, you can access a wealth of online resources in 25 of America's largest business and information centers. For $25 a month, you can make an unlimited number of data connections at night (6:00 p.m. to 7:00 a.m.) during the week and all day on weekends and holidays. You can also use PC Pursuit during the day for $14 an hour. Sure, it sounds high, but that is less than half the cost of standard long distance dialing.

PC Pursuit can save you up to 75% on your long distance data calls. And you don't sacrifice quality in the process—the service provides superior transmission, routing your call over the Telenet Public Data Network, a net that is accurate and reliable, 24 hours a day.

Currently, computer resources are accessible in the following 25 cities via PC Pursuit:

404 Atlanta
617 Boston
312 Chicago
216 Cleveland
214 Dallas
303 Denver
313 Detroit
818 Glendale
713 Houston
213 Los Angeles
305 Miami
414 Milwaukee
612 Minneapolis
201 Newark
212 New York
602 Phoenix
215 Philadelphia
503 Portland
919 Research Triangle
801 Salt Lake City
415 San Francisco
408 San Jose
206 Seattle
202 Washington, DC
813 Tampa

Using the service, you can do the following:

- Transfer files, including spreadsheets, word processing documents, and graphics to business associates.
- Upload and download public domain software from bulletin board systems in each PC Pursuit city.
- Correspond with friends who have communicating PCs.
- Access valuable business information and databases for research.
- Shop and advertise in electronic catalogs.

All PC Pursuit charges are billed directly to your MasterCard, Visa, or American Express account. In addition to the monthly bill, there is a one-time $25 sign-up and registration fee.

For more information, call (800)TELENET (voice connection). Or you can call (703) 689-3561 (data connection) to reach the PC Pursuit Information BBS. There you can read a brief introduction to Telenet's PC Pursuit; learn where to call for more information, either by modem or voice; and, if you choose, register for the service. Be forewarned, however: it will take seven to ten days to process your request.

For an up-to-date listing of Telenet local access numbers call (800) 424-9494 (data connection). Call at 7 bits, even parity, 1 stop bit, and enter three carriage returns upon connect. Then enter your area code and local exchange. At the @ prompt, type:

MAIL<cr>
USERNAME: Phones
PASSWORD: Phones

ST users on PC Pursuit have found that access to three more area codes in heavily-populated areas is also possible, providing access to 50 more Atari 8- and 16-bit bulletin boards. In the 212 area code (New York City), you can access the 718 area code (Brooklyn and Queens) as follows:

ATZ<cr>
<control-e><cr>

At the HELLO, I'M READY prompt, type:

D<cr>

At the NUMBER? prompt, type:

1 718 <number>

Not all 718 numbers are available through this method, but many are.

From the 202 (Washington DC) area code, you can also access 301 (Maryland) and 703 (Northern Virginia). Just dial as if you were dialing through the 202 area code. A "feature" in the regional exchange system will allow your call to go through just as if it were directly to that area code.

The only real caveat we will offer for the PC Pursuit system is "heavy hackers beware." With a $25 maximum

charge, you might find yourself logging hundreds of hours a month online. Please remember to eat regularly from all four food groups, bathe when you get a chance, and socialize with others in person once in a while if only for practice.

FCC Proposes Surcharge

In a "Notice of Proposed Rule Making" released several months ago, the Federal Communications Commission recommended that companies using local telephone exchanges to provide interstate access to "enhanced services" be assessed an access charge. These "enhanced service providers" include companies such as CompuServe, Telenet, Tymnet, and all other services that provide computer-based communications, information retrieval, and network services.

Such companies would be charged as much as $5 an hour each time one of their customers used a local telephone exchange to access an interstate data communications network. As of this writing, the new rate structure was set to take effect January 1, 1988.

The FCC had originally "exempted" enhanced service providers from this charge because of concerns that an access fee would increase operating costs too sharply and threaten their economic viability. Now, according to the FCC proposal, that exemption is no longer appropriate, and these companies must pay more of the cost of providing local telephone exchanges.

It would be very unrealistic to assume that these added costs would not be passed on very quickly to consumers—consumers who are already paying a monthly fee for local telephone service, which the FCC says may legally be increased twice by April 1989.

On a larger scale, the proposed fee could stunt the growth of the fledgling information service industry. Current users might suddenly find their favorite services priced beyond reach; prospective users might decide against subscribing on the basis of cost alone.

The impact would be particularly severe on educational and other non-profit institutions that rely heavily on affordable access to online information. With the market for online services so curtailed, the steady growth and competition that have characterized this young industry would be stifled.

The industry association for computer software and services, ADAPSO, has sharply criticized the proposal, claiming that it "would have devastating effect on the U.S. computer services industry while severely and unnecessarily increasing costs to users of data processing services."

You've heard the phrase before: write your congressman.

If you are at all interested in an ongoing commitment to telecommunications, do yourself a favor and move up to 1200 baud.

What's New on CompuServe

It has been a while since we have looked through the data library coffers of the Atari ST Forum on CompuServe (type GO Atari16<cr>). Here's a look at the cream of the latest uploads there.

In Data Library 6 (Sound/Music):

•GFAPIA.ARC/binary. This program allows you to play an ST "piano" using the mouse. It has a replay mode with selectable speed. Songs can also be saved to disk. The program is written and compiled in GFA Basic with a monochrome monitor.

•TXLBR2.ARC/binary. This is a much improved version of TXLIBR.ARC, which was uploaded previously. It is a fully GEM-based Librarian/Editor for the Yamaha TX81Z synthesizer. The new version features improved error detection, drastic action confirmation, random patch generation, and MIDI-thru in the edit screen. Also included are two banks of random patches.

In Data Library 13 (Animation/Demos/Neo):

•RUBER.ARC/binary. OK, animation fans, here's something you've never seen on an Atari computer before. Darrel Anderson has created a rubber-necked creature with *CAD-3D 2.0*, using the splined-object abilities of the Cyber Control. An amazing demo. Requires the *Cyber Studio Animator* or ANIMATE2.PRG, available online.

•ANIGSE.ARC/binary. An *Aegis Animator* script by Jim Kent, the main author of *Aegis Animator ST*. A school of fish swimming and plants waving in a modulating color sea. Cels painted in Flicker/Cyber Paint. Backdrop painted in *NeoChrome* and Flicker with polygons pasted on in the *Animator*. Color monitor only, requires *Aegis Animator* or the PD Player, which is available online.

In Data Library 3 (Utilities):

•SUPBT2.ARC/binary. Version 2.0 of Super Boot adds the ability to show a welcome screen (from a .TNY picture), disable keyclick, speed up disk access, and fix a bug in setting the date/time. Also includes a new mouse-driven configuration and better documentation. Other features: Set date/time, choose which accessories and autoboot programs to load in, select any DESKTOP.INF, set write verify on/off, and more. Should work on any color or monochrome ST from any boot disk. Untested in monochrome at press time.

•FORMAT.ARC/binary. A revamp of the popular FORMAT11.ACC, this floppy disk formatter utility is unlike others because it can initialize each track with 11 reliable sectors. Single-sided disks come up with 456,704 bytes available to the user, while double-sided disks have 923,648. This version works under GEM and allows user selection of tracks (80-83) and sectors per track (9-11).

Talk to you next time. Meanwhile, keep on downloading! ■

Puzzles & Problems Answers

Problems are on page 74.

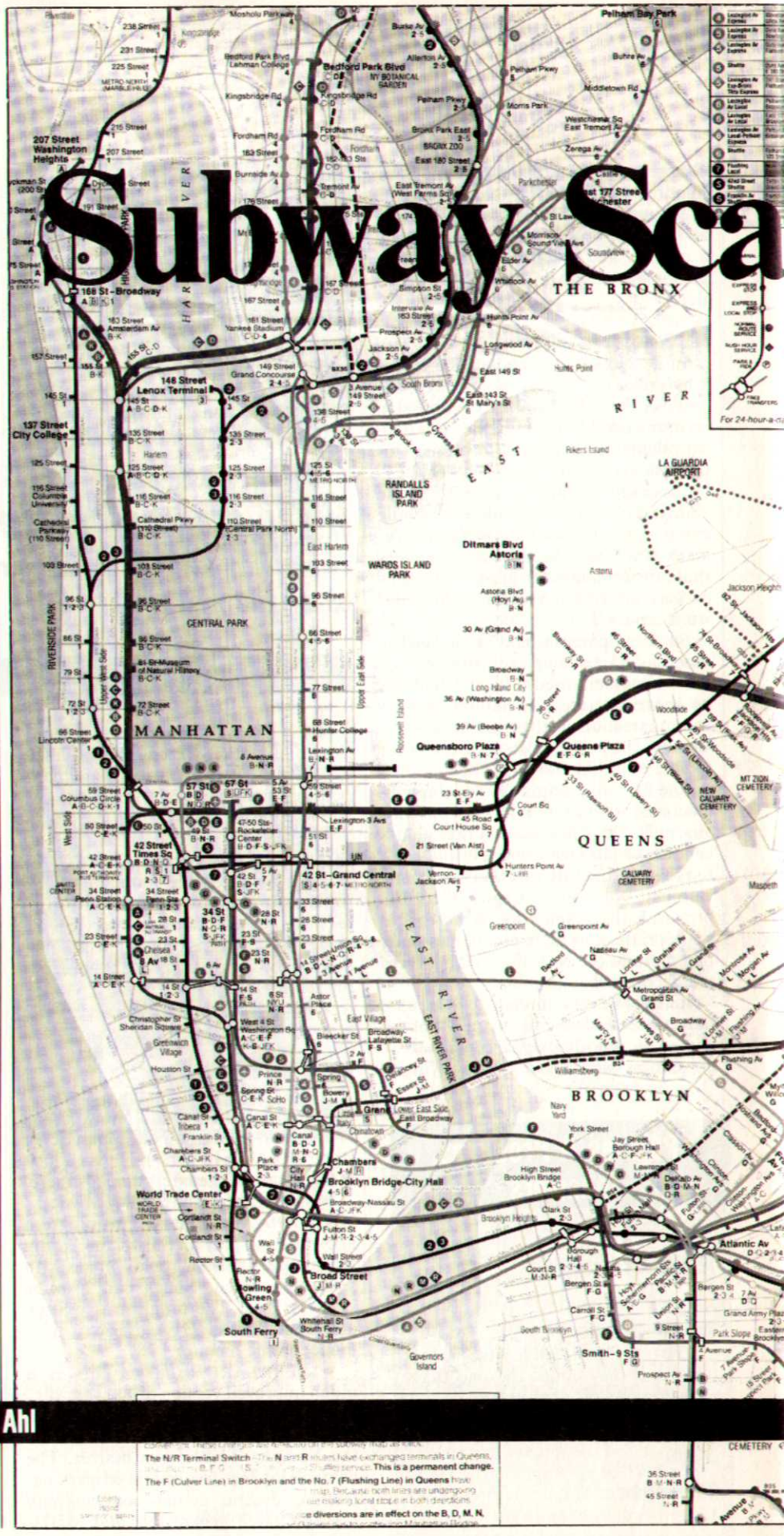
12 Days of Christmas
364

The Friendly Skies
The passengers will see five planes (or six, if they count the one that is just taking off as they land).

Stopped Clock
34.2%

No Remainder
151

Subway Sca



THE GAME

In Subway Scavenger, you are a messenger hired to pick up and deliver packages all over New York City. Starting at 9:00 a.m., your log will show five deliveries and five pickups. You start from your office in the Port Authority Bus Terminal at 8th Avenue and 42nd Street and work until quitting time.

During the course of your day, you face typical New York subway hazards—stuck doors, track fires, and unsavory characters—but the clock is your biggest enemy. The following rules govern your progress through your delivery schedule:

- When you arrive at a station on foot, you are told which trains stop at that station. You buy a token for $1.00 and board whichever train you wish.
- At each station, you can either get off or stay on. If you get off, you can then take another train (if the station is an interchange point) or make a delivery or pickup (if the station is within walking distance of your destination). Remember that express trains don't stop at all stations. The following clues should help non-New Yorkers:

★ Brooklyn Academy of Music is abbreviated BAM.

★ Rockaway Boulevard in Woodhaven (Queens) is on the A Train line.

★ Harlem is serviced by the A, B, and D Lines.

★ The World Trade Center is an easy walk from Chambers Street.

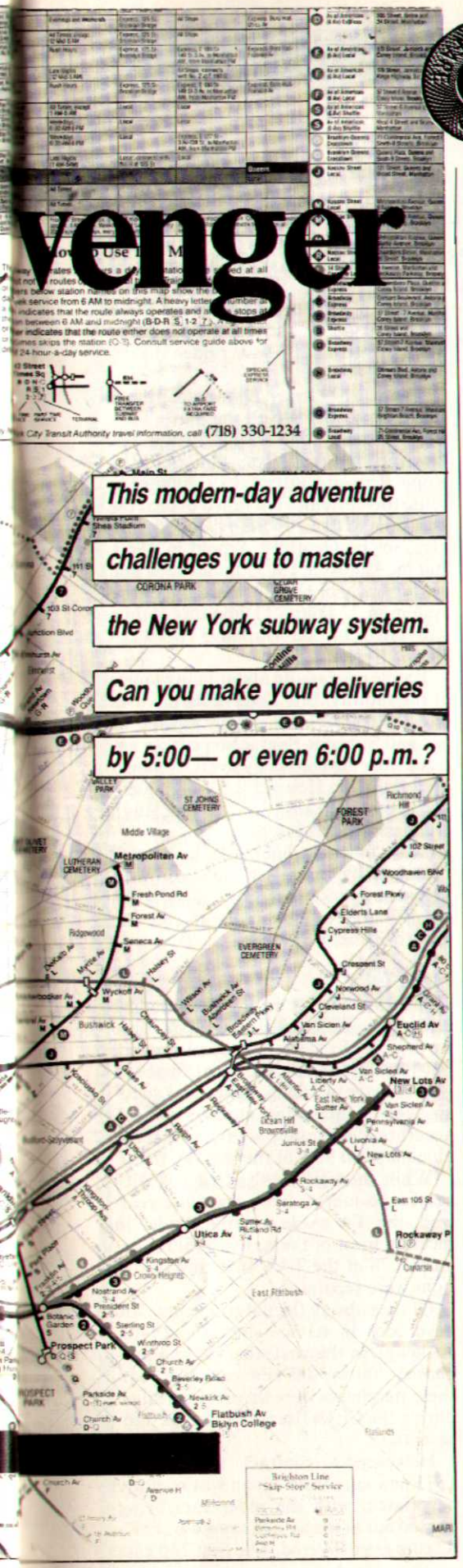
★ The New York Stock Exchange is an easy walk from Wall Street.

★ Grand Street and Canal Street run through Chinatown.

If you do not have a NY Subway Map, you should probably make your own as you play the game the first few times. Note the stops on each line and which stations can be used as transfer points.

By the time you complete a few games of Subway Scavenger, you will feel like a native New Yorker—and probably be qualified for a high-paying job as a subway courier. Write if you get work!

By David H. Ahl



THE STORY

The first underground subway system in the world went into service in London, England, in 1863. Other early subway systems include those of Glasgow (1886), Budapest (1896), Boston (the first in the United States, 1898), Paris (1900), Berlin (1902), New York (1904), Madrid (1919), Tokyo (1927), Moscow (1935) and Chicago (1943). Toronto's subway, completed in 1954, was the first in Canada.

Some subways consist of only a single line, but most, such as the Metropolitain in Paris, the New York Subway System, and the London Underground, are networks. By far the largest underground transportation system in the world is that of New York City, which includes 230 route miles of track and 465 stations. But development of the system did not occur quickly or easily.

As immigrants poured into New York in the early 1800s, the City grew so fast that street congestion soon became a major problem for pedestrians and drivers of horse-drawn wagons, omnibuses, and carriages. As a result, several mass-transit systems were proposed for New York City, with a subway suggested as early as 1864. However, it was an elevated railway that got the approval of both backers and politicians, and the first one, a cable-operated affair along Ninth Avenue, went into operation on February 14, 1870.

The cable frequently broke, disrupting service, so, on October 27, 1871, the line installed a steam locomotive to pull the cars. At the same time, a passing track was built in the center of the line enabling trains to run in two directions. Running time over the entire route from Dey Street (near the Battery at the southern tip of Manhattan) to 29th Street was 28 minutes.

The success of this line—more than 5000 fares daily—convinced a legion of skeptics that the "el" was the panacea for all of Manhattan's street-level traffic problems, and for the next 20 years the els spread like cucumber vines all over the City.

A Better Idea

The disadvantage of the elevated railways was that they were noisy, smelly, dirty, and a detriment to the neighborhoods over which they rolled. An inventor, Frank J. Sprague, had a solution: electricity. Sprague had built an experimental electric car, which had won the attention of Jay Gould, the great New York railroad financier, and finally persuaded Gould to take a ride in his experimental car.

Anxious to show it off, Sprague enthusiastically yanked the controller to set the train in motion. But he pulled the controller too abruptly, and a fuse blew. The noise, which sounded like a bomb exploding, completely unnerved Gould, who instantly abandoned all interest in electric traction. Sprague was forced to look elsewhere for backing.

"Elsewhere" turned out to be Chicago, IL, Richmond, IN and St. Joseph, MO. Sprague's electrified, multiple-unit trains worked so well in these cities that in 1898 Brooklyn's steam-operated els began converting to electricity, and by 1903 all of New York's els were re-equipped with Sprague locomotives.

More important, electric locomotives opened the possibility of building underground railways in Manhattan, an idea that had previously been dismissed because of the danger of smoke and steam in long underground runs.

Ground was broken in March 1900 for the first underground line in New York, a five-mile run from City Hall downtown up the East Side to Grand Central Terminal at 42nd Street.

Rather than using the London and Glasgow method of boring an underground tunnel, New York's planners chose the open-trench approach that had been employed successfully in Budapest. Using this approach, a huge, deep trench was cut; a roof was made of steel girders; and fill and paving were added above the roof.

While this method was infinitely cheaper, easier, and faster than boring a tunnel, it was not popular with shopkeepers who wondered if the din and disruption would ever end. Eventually it did, and the first subway was put into service on October 27, 1904.

By this time, the promoters had vastly extended their plans, and the line, the Interborough Rapid Transit (IRT), extended from City Hall to 145th Street and Broadway in upper Manhattan. The length of the route was 13½ miles, and the travel time was 26 minutes.

Extensions and other lines were soon opened to meet increasing public demand for service. By 1912, a tunnel to Brooklyn was opened, and a few years

later, another took trains under the Harlem River to the Bronx.

Meanwhile, the directors of the Brooklyn Rapid Transit (BRT) Company, a holding company that owned several els in Brooklyn, were enviously watching the success of the IRT. To grab a piece of the subway pie, they proposed to the city an ambitious plan to build a new subway from lower Manhattan up Broadway to the Queensboro Bridge, connecting it with tunnnels to both Brooklyn and Staten Island.

The directors of the IRT and the newly-formed Hudson-Manhattan Tubes Company weren't happy about this, particularly when the City announced a splitting of the routes in what became known as "the Dual (IRT-BRT) Contracts." The BRT (later the BMT) benefitted the most, getting 87.8 route miles all over Manhattan, Queens, and Brooklyn. The tunnel to Staten Island, incidentally, was never built.

The third big line to be built was the Independent Subway (IND), which was City-owned and operated right from the start. Although known for years as simply the Eighth Avenue subway, that was a misnomer because the IND actually encompassed six basic routes: Washington Heights, Bronx-Grand Concourse, Coney Island, Queens-Manhattan, Sixth Avenue-Houston Street, and Brooklyn-Queens Crosstown. A seventh was added in 1939 to service the World's Fair at Flushing Meadow.

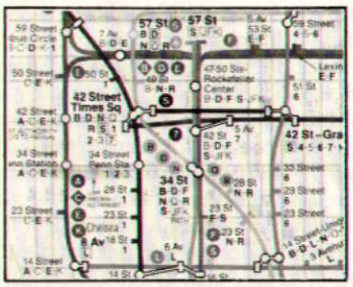
Unlike the Victorian IRT with its mosaic-decorated stations or the BMT with its flamboyant rolling stock, the IND was a no-nonsense, modern line with bright, spacious stations, well-engineered cars, and speedy express runs.

The TA Is Born

In June 1940, New York City purchased the privately-owned IRT and BMT and combined them with the IND under the jurisdiction of the New York Transit Authority (TA). Today more than 6100 cars, connected in trains of from 3 to 12 units, operate day and night over 27 routes and make nearly 6400 trips on an average weekday. The lines use 12 bridges and 11 underwater tunnels and carry approximately one billion passengers per year.

In 1978, the New York City Transit Authority became a subsidiary of the Metropolitan Transportation Authority (MTA), the nation's largest transportation system.

MTA vehicles carry nearly two billion riders per year—6.3 million on an average weekday, or 57% of the population in its operating area. This exceeds the combined ridership of the systems of Chicago, Boston, and Philadelphia—the second, third, and fourth largest people movers in the country. With nearly 8000 rail cars, the MTA has a train fleet larger than all of America's other rapid-transit and commuter railroads combined. The New York TA is charged with the operation of the subway system and surface bus fleet. The subway system alone employs nearly 28,000 workers and operates its own police department. Although accidents, track fires, delays, and crime regularly make the nightly news, the TA steadfastly maintains that the subway is actually one of the fastest and safest ways to travel around the city.



Rebecca Morris was the first woman to ride every inch of track from Brooklyn to the Bronx, from Queens to Manhattan, in one marathon odyssey.

Believe It Or Not

Just ask Rebecca Morris. Hailing from Youngstown, OH, with degrees in library science and English literature, Rebecca is not the sort of a person you would expect to find in the record books—particularly not for being the first woman to ride every inch of track from Brooklyn to the Bronx, from Queens to Manhattan, in one marathon odyssey. But, in the fall of 1973, she did just that—on 67 trains in 26 hours and 36 minutes.

Herman Rinke was the first person to tour the entire system for a single 5-cent fare. In 1940, just days before the three lines were unified under TA control, he rode for 25 hours. Since that day, more than 70 other people—recorded in an unofficial file at the TA Public Relations Department—have ridden the entire system.

The 1961 subway map notes that a Flushing youth rode all the routes for a single token in 25 hours and 36 minutes. On April Fool's Day of 1966, the MIT Rapid Transit Club used a computer to route their attempt but failed to beat the best time to date, 24 hours and 56 minutes, set by Geoffrey Arnold in 1963. But on August 3, 1967, James Law and six high school buddies rode the entire system in 22 hours, 11 minutes, a time still cited in the *Guinness Book of World Records*.

People are fanatic about many facets of the subway. Bob Leon takes pictures of every transit nook and cranny. Howard and Suzanne Samuelson run an antique store devoted exclusively to transit material. Don Howard is a walking encyclopedia of transit lore, as are Hugh Dunne and Stan Fischler.

Most of these hobbyists look back nostalgically to earlier days—days of kerosene marker lanterns, days when people came to New York to ride the IRT, days before graffiti.

The TA Today

In 1985, the TA set a goal of having 28% of the cars clean and graffiti-free by the end of the year. They succeeded, but just barely. Another goal for 1985 was to have working lights and loudspeakers, functioning climate control, accurate destination signs, and readable maps on 90% of the subway fleet.

While these goals—particularly with respect to maps—were not quite realized, the TA made notable strides in meeting most of them. In 1985, for example, 78 of the TA's 465 subway stations were repainted.

Of the subway fleet of 6125 cars, 760 have been in service since the 1940s. Although in the past, the TA had purchased 200 to 400 new cars per year, these purchases were severely curtailed during the City's fiscal crisis in the mid-seventies.

However, a contract to purchase 1375 new cars from Japan was recently negotiated, with the older cars being phased out as the new Japanese-built R-62 cars are delivered. The first 260 cars

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were delivered under this contract in 1984, and they will continue to be delivered at the rate of roughly 250 per year through 1988.

When the subway first opened in 1904, the fare was a nickel, which was a relatively large amount at the turn of the century. But, the fare remained constant for over 50 years, and by 1956 the 5-cent fare was a real bargain. In contrast, over the next 30 years the fare was raised eight times until it reached its current level of $1.

As the fare has increased, so has the number of people who try to beat it by putting slugs in the turnstiles. Indeed, as of the end of 1985, the TA was collecting more than 13,000 slugs per day, resulting in a financial loss of almost $3 million per year.

In an attempt to thwart cheaters, the TA has changed the design of the token to one with a stainless-steel center that looks like a "bull's-eye," an apt name as they are targeted at slug users. In mid-1986, all 2600 turnstiles at 749 entry locations were changed to accept only the new token.

The next time you are in New York, ride the subway. There is no better or faster way to get around—and after you master Subway Scavenger you'll really know how to do it.

Bibliography

Annual Report (1984). Metropolitan Transportation Authority, 347 Madison Ave., New York, NY 10017.

Fischler, Stan. *Uptown, Downtown.* New York: Hawthorne Books, 1976.

New York City Subway Map (Spring 1985). New York City Transit Authority, 370 Jay St., Brooklyn, NY 11201. (Note: If you request a subway map, include a #10 business-size self-addressed, stamped envelope.)

The Program

At first glance, the Subway Scavenger program may look quite complicated, because of both its length and the complexity of many program statements. In fact, the program is shorter than it seems and is relatively easy to understand—as well as being exceptionally versatile and powerful.

The versatility and power of the program stem from its general framework, which could be used to represent almost any kind of system with intersecting nodes. In this particular version, the framework is used to represent the New York City Subway System. However, it could just as easily accept data from any other subway (London, Tokyo, Moscow, San Francisco, etc.), train (Amtrak, BritRail, etc.), bus, or, for that matter, pedestrian system (Disneyland, a large building, manufacturing plant, etc.).

It could even be used to model a mixed-mode system like a university with foot, auto, and bus transportation. Nor is the framework limited to transportation problems; it could also be used to simulate electronic-message traffic over a data network or a mixed system using voice, data, and manual transmission of messages.

While the Subway Scavenger program is more than 570 lines long, more than 300 of them are DATA statements. Thus the program itself is of modest length. Indeed, when the player instructions, prompts, and minor subroutines are stripped out, the main program is only about 80 lines long.

Before learning more about the program itself, it is important for you to become familiar with the three main types of data. First are the data about the nodes of the system, in this case the subway stations. To each node (or station) we must assign a number (STA), and we probably want to give it a name as well (STATION$(STA)). We must also know how many transportation routes (subway lines) intersect the node (STANU(STA)) and which ones they are (STATR(STA,n)).

Second, to each line of transportation, we must assign a number (TR) and possibly a name (TRAIN$(TR)). In addition, we must know how many nodes it intersects (TRSTOP(TR)) and which ones they are (TRSTA(TR,n)). For convenience, we may also want to know the starting and ending point, so we can differentiate point-to-point routes from circular or continuous ones. In fact, the New York Subway System has only point-to-point routes, unlike the London Underground which has a mixture of circular and point-to-point routes.

Third, once the system is described, we must know what is to be transmitted (in this case, packages carried by a human being). To each package, we must assign a number (PKG) and, optionally, a name (PKGDES$(PKG)). We must also know where it is coming from and where it is going in terms of the nodes of the system (PKGSTA(PKG,n)).

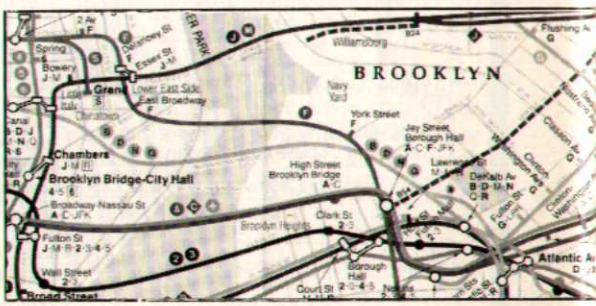
We don't really care which subway line it is carried on as long as it reaches its destination. In some cases, the building to which a package is to be delivered can be reached from more than one subway station. Naturally, it is usually preferable to use the closest station, because you spend less time walking. However, in some cases it is more efficient to walk a few extra blocks if you can reach a destination without having to ride out of your way to a station at which you can transfer to a closer line.

The main program consists of six major sections. The first one, "Arrive at station," (Lines 340-510) prints the name of the station at which you have arrived and the names of the trains that stop there. You can arrive on foot or by train. If you arrive on a train and that station is the end of the line, you must get off.

Otherwise, you can choose to get off or stay on the train.

If you get off the train, you must decide what to do next: make a pick-up, make a delivery, check your logbook, or catch another train. If you decide to

***MTA vehicles** carry nearly two billion riders per year—6.3 million on an average weekday—or 57% of the population in its operating area.*



catch another train, the program branches to the "Trains coming" section (lines 530-670). Line 550 picks a random train to arrive at the station:

```
550 RN=INT(1+STANU(STA)*RND(1))
```

Recall that STANU(STA) is the number of trains that stop at a particular station; thus, RN will be an integer between 1 and STANU(STA). In Line 560, RN is used as the argument of STATR(STA,RN) to recover the actual number of the train:

```
560 TR=STATR(STA,RN)
```

The next two lines check to see if the current station (STA) is at one end of the line or the other for train TR. If so, that station is eliminated as a possible destination for train TR. Otherwise, train TR could have as its destination either end of the line (selected in Line 590). If you decide to board a particular train, the routine in Lines 640-660 performs the important function of determining just where that train is along its route.

This may sound unnecessary; after all, the program knows you are at station STA. However, station STA may be the fourth stop for train 1 and the twelfth stop for train 2, and so on; it is this index value that is determined by Lines 640-660:

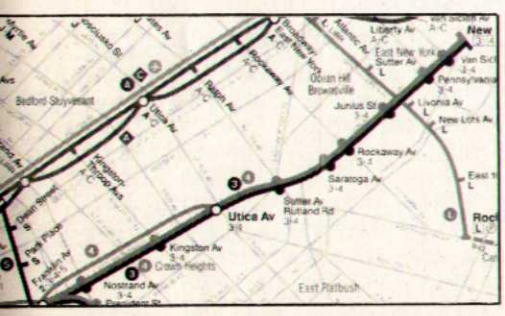
```
640 FOR I=1 TO TRSTOP(TR)
650 IF TRSTA(TR,1)<>STA THEN NEXT I
660 TRSTX=I
```

First, Line 640 iterates through all the possible stops for train TR. In the data, these are station numbers. Line 650 compares each station number (TRSTA(TR,I)) with the current station STA and, if a match is not found, goes on to the next one. When a match is found, Line 660 assigns the index value I to the train station identification index TRSTX.

Next, the "Train travel" routine (Lines 690-730) adds or subtracts one from TRSTX depending upon which way you are traveling, and determines what the next station will be. This routine also calls the "Trip hazards" subroutine (Lines 1210-1500) which deals with sticky doors, muggers, track fires, and so on. After determining the next station, the program simply branches back to the "Arrive at station" section.

If you decide to make a pickup or delivery at a given station, the routine at Lines 750-880 determines whether or not that is a valid option. (Has it been made already? Is your destination close enough to the station?)

The subsequent routines simply update your logbook and check to see if all the pickups and deliveries have been made. If more deliveries remain, a list of nearby subway stations is displayed, and you must walk to one of them.



PROGRAM VARIABLES

A	Answer to input query (most often logbook no.)
A$	Answer to input query, string
B	Answer to query about station to walk to
DELTOT	Total number of deliveries completed
DES	Train destination (1=north or west end of line, 2=south or east end of line)
DORP(n)	Delivery or pickup flag (n=package no.) (0=open, 1=delivery, 3=pickup, 4=done) Hours, for printing
H$, HP, HR	Temporary iteration variable
I	Temporary iteration variable
J	Temporary shuffling variable
K	Highest entry in logbook to date
LGMAX	Logbook number (n=package no.)
LGPKG(n)	Lunch indicator (0=no lunch, 1=had lunch)
LUN MIN	Minutes of elapsed time from start
MN	Minutes, for printing
PERS	Person indicator (0=on foot, 1=on train)
PKGDES$(n)	Package destination name (n=package no.)
PKGSTA(n,s)	Subway stations near package destination (n=package no., s=station no.)
PKSTDS(n,s)	Distance from package destination to subway station (n=package no., s=station no.)
PKSTNU(n)	Number of stations near package destination (n=package no.)
PN(n)	Package number
PRLG	Line printer indicator (0=off, 1=on)
PS	Total packages
RN	Random number
STA	Station number
STANU(s)	Number of trains that stop at station (s=station no.)
STATION$(s)	Station name (s=station no.)
STATR(s,t)	Trains that stop at station (s=station no., t=train no.)
STNS	Total stations
TK	Token indicator (0=company money, 1=own money)
TKMAX	Maximum amount of money available for tokens
TM	Maximum minutes to play (480 hard, 540 easier)
TM$	Maximum time to play (5:00 hard, 6:00 easier)
TOKEN	Number of tokens used
TR	Train number
TRDES$(t,2)	Stations at each end of a line
TRAIN$(t)	Train name (t=train no.)
TRNS	Total trains
TRSTA(t,p)	Stations that train stops at (t=train no., p=stop no.)
TRSTOP(t)	Number of stops made by train (t=train no.)
TRSTX	Train station index
TRX	Train heading (1=south or east, -1=north or west)
X$	Temporary string variable

Throughout the program, two "costs" are assigned. First is the cost of tokens ($1.00 each), which is added each time you arrive at a station on foot to take a train (subroutine at Lines 1100-1190). If you run out of money, the game ends.

The second cost is time. Activities and events that take time are travel (two to three minutes between stations, Line 720), waiting (one minute per train, Line 610), walking and delivery (two minutes per block, six minutes per delivery, Line 910), delays due to malfunctioning doors (Line 1250) and track fires (Line 1480), and lunch (Line 5210). If the total time exceeds eight hours (or nine hours in the easier version), your day has ended at 5:00 p.m. (or 6:00 p.m.), no more deliveries can be made, and the game ends.

The subroutine in Lines 5560-5650 shuffles the list of packages. You should note that in addition to shuffling a list of integers (PN(n)), this program shuffles four other variables that are associated with the list (package names, destinations, etc.). Thus, we see that shuffling can be a general function that is not limited to a list of integers.

The framework of the program could easily be used to model any other subway, train, bus, or pedestrian system.

Save Time Typing

If you don't have time to type in the Subway program, I will furnish the program on a single sided 3.5″ disk readable on either a 520 ST or 1040 ST for $5.00 postpaid. Also, if you wish to purchase the book *Basic Computer Adventures* which includes Subway Scavenger and nine other travel adventure simulations (Westward Ho, Amelia Earhart, Appalachian Trail, Marco Polo, Orient Express, and others) in Microsoft Basic (reasonably easily converted to ST Basic), it sells for $10.00.

To order the disk, book, or both, send your check or money order (no credit card, COD, or billed orders) to David Ahl, 12 Indian Head Rd., Morristown, NJ 07960. ■

SAMPLE OUTPUT

```
Trains that stop at this station
     A - 8 Av Express
     E - 8 Av Local

Time 09:00
Here comes the E - 8 Av Local train to World Trade Center
Do you want to get on? Y
You are on the E - 8 Av Local train to World Trade Center
One of the car doors refuses to close and the train can't move.
You're stuck here for 3 minutes.

Time 09:07
You have arrived at 34 St/Penn Station station.
Trains that stop at this station:
     A - 8 Av Express
     E - 8 Av Local
Do you want to get off? N
You are on the E - 8 Av Local train to World Trade Center
```

```
                Delivery - Pick up Log
2  Delivery      West Side Tennis Club, Forest Hills
3  Delivery      Windows on the World, World Trade Center
4  Delivery      Metropolitan Museum of Art
6  Pick-up       Press Room, Yankee Stadium
7  Pick-up       George Washington Bridge Bus Terminal
8  Pick-up       Brooklyn Academy of Music
9  Pick-up       Computer Education Dept, Columbia Univ.
10 Pick-up       Registrar, Brooklyn College, Flatbush
                 NY Botanical Gardens

          Press any key to continue.
```

```
You are on the 2 - 7th Av Express train to Flatbush Av/Bklyn College
Some real unsavory types are whooping it up in the car across from
your seat.  Do you want to move to another car? N
They look at you and try to bait you, but you avoid them.

Time 09:43
You have arrived at Bdwy/Nassau St/Fulton St (Manhattan) station.
Trains that stop at this station:
     A - 8 Av Express
     2 - 7th Av Express
     4 - Lexington Av Express
Do you want to get off? N
```

```
Time 01:58
You have arrived at 116 St/Bdwy/Columbia Univ station.
Trains that stop at this station:
     1 - Bdwy-7th Av Local
Do you want to get off? Y
Do you want to:
     Make a pickup (P)
     Make a delivery (D)
     Check your logbook (C)
     Get another train (T)
Your choice please (P, D, C, or T)? P
Which pickup do you want to make (by Logbook number)? 8
That pickup is at Computer Education Dept, Columbia Univ.
   which is 2 blocks from here.  Off you go.
You pick up a package and log it in as no. 15
The address on it is Borough Hall, Brooklyn

From here you can walk to the following subway stations:
    1 -- 116 St/Bdwy/Columbia Univ
    2 -- 110 St/Cathedral Pkwy
Which station do you want to go to (by number)? 1
```

```
So sorry, it is after 6:00pm and the places to which
you want to go to will be closed.

You made it to 14 locations, but
your log still shows the following items:
```

SUBWAY SCAVENGER

ATARI KEY

- Any Atari ST Computer
- ST Basic

Notice

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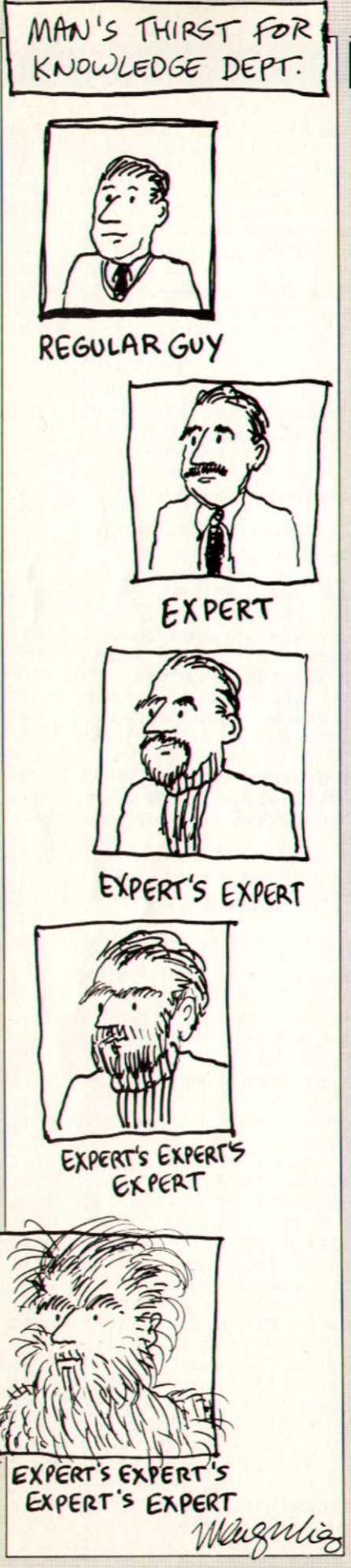
The program may be used for your personal entertainment, but may not be distributed by user groups or uploaded to bulletin board systems or other on-line services.

```
100   CLEAR : CLEARW 2 : FULLW 2 : RESTORE
110   GOTOXY 0,5 : X$="Subway Scavenger" : GOSUB 5530
120   PRINT : PRINT : X$="(c) by David H. Ahl, 1986" : GOSUB 5530
130   PRINT : PRINT : PRINT : GOSUB 5500 : GOSUB 1650
140   PRINT : X$="(Initializing data -- please be patient)" : GOSUB 5530
150   DIM PN(20),PKGDES$(20),PKSTNU(20),PKGSTA(20,5),PKSTDS(20,5),LGPKG(20)
160   DIM DORP(20),STATION$(300),STANU(300),STATR(300,6)
170   DIM TRAIN$(12),TRSTOP(12),TRSTA(12,50),TRDES$(12,2),DUM(20)
180   PS=20 : STNS=264 : TRNS =11 : 'For reading data: packages, stations, train
190   LGMAX=10 : TKMAX=20 : 'Packages to start
200   GOSUB 1780 : GOSUB 2050 : GOSUB 4760 : 'Read data into variables
210   RANDOMIZE PEEK(1123)
220   GOSUB 5560 : STA=21 : 'Starting station
230   PRINT : FOR I=1 TO 20 : DORP(I)=0 : NEXT I
240   INPUT "Do you want to be able to deliver after 5:00pm (easier)";A$
250   GOSUB 5300 : IF A$="Y" THEN TM=540 : TM$="6:00" : GOTO 270
260   TM=480 : TM$="5:00"
270   FOR I=1 TO 5 : 'Information about deliveries
280   DORP(I)=1 : NEXT I
290   FOR I=6 TO 10 : 'Information about pick-ups
300   DORP(I)=2 : NEXT I
310   PRINT : PRINT "You may want to print or copy this log for later reference.
320   GOSUB 5390 : 'Print package log
330   '
340   'Arrive at station routine
350   GOSUB 5140 : 'Print time
360   PRINT "You have arrived at " STATION$(STA) " station."
370   PRINT "Trains that stop at this station:"
380   FOR I=1 TO STANU(STA)
390   PRINT "      " TRAIN$(STATR(STA,I)) : NEXT I
400   IF PERS=0 THEN GOSUB 1100 : GOTO 530 : 'If on foot, buy token
410   IF STA<>TRSTA(TR,1) AND STA<>TRSTA(TR,TRSTOP(TR)) THEN 430
420   PRINT "End of the line.  You'll have to get off." : GOTO 450
430   INPUT "Do you want to get off";A$ : GOSUB 5300
440   IF A$="N" THEN 690 : 'If want to stay on train, branch to train travel
450   PERS=0 : PRINT "Do you want to:" : PRINT "      Make a pickup (P)"
460   PRINT "      Make a delivery (D)" : PRINT "      Check your logbook (C)"
470   PRINT "      Get another train (T)"
480   INPUT "Your choice please (P, D, C, or T)";A$
490   GOSUB 5350 : IF A$="P" OR A$="D" THEN 750 ELSE IF A$="T" THEN 530
500   IF A$="C" THEN GOSUB 5390 : GOTO 450
510   INPUT "Not a valid choice.  Enter P, D, C, or T please.";A$ : GOTO 490
520   '
530   'Trains coming routine
540   GOSUB 5140 : 'Print time
550   RN=INT(1+STANU(STA)*RND(1)) : 'Which train is coming?
560   TR=STATR(STA,RN)
570   IF STA=TRSTA(TR,1) THEN DES=2 : GOTO 600 : 'At one end of line?
580   IF STA=TRSTA(TR,TRSTOP(TR)) THEN DES=1 : GOTO 600 : 'or the other?
590   DES=INT(1+2*RND(1)) : 'Destination?
600   PRINT "Here comes the " TRAIN$(TR) " train to " TRDES$(TR,DES)
610   MIN=MIN+1
620   INPUT "Do you want to get on";A$ : GOSUB 5300
630   IF A$="N" THEN 550 : 'If don't get on train, wait for next one
640   FOR I=1 TO TRSTOP(TR) : 'Find out where train is
650   IF TRSTA(TR,I)=STA THEN 660
655   NEXT I : PRINT "Train station error at Line 650."
660   TRSTX=I : 'Train station identification index
670   IF DES=1 THEN TRX=-1 ELSE TRX=1
680   '
690   'Train travel routine
```

```
700   PERS=1 : PRINT "You are on the " TRAIN$(TR) " train to " TRDES$(TR,DES)
710   GOSUB 1210 : 'Possible trip hazards
720   TRSTX=TRSTX+TRX : STA=TRSTA(TR,TRSTX) : MIN=MIN+INT(2+1.3*RND(1))
730   GOTO 340 : 'Go to next station routine
740   '
750   'Pickup and delivery routine
760   IF A$="P" THEN X$="pickup" ELSE X$="delivery"
770   PRINT "Which " X$; : INPUT " do you want to make (by Logbook number)";A
780   IF DORP(A)<>0 THEN 820
790   INPUT "That number seems to be in error.  Want to check your logbook";A$
800   GOSUB 5300 : IF A$="Y" THEN GOSUB 5390
810   GOTO 450
820   PRINT "That " X$ " is at " PKGDES$(A)
830   FOR I=1 TO PKSTNU(A)
840   IF PKGSTA(A,I)=STA THEN 870
850   NEXT I : PRINT "which is too far to walk from this station."
860   PRINT "Perhaps you should try something else." : GOTO 450
870   IF PKSTDS(A,I)>1 THEN X$="s" ELSE X$=""
880   PRINT "   which is" PKSTDS(A,I) "block" X$ " from here.  Off you go."
890   '
900   'Successful pickup or delivery
910   MIN=MIN+2*PKSTDS(A,I)+6 : 'Add to time (2 min per block, 6 at destination)
920   DELTOT=DELTOT+1 : IF DORP(A)=2 THEN 950 : 'Is this a pick-up?
930   PRINT : PRINT "You find someone to sign for the package."
940   DORP(A)=0 : GOTO 990 : 'Mark delivery completed
950   LGMAX=LGMAX+1 : PRINT "You pick up a package and log it in as no." LGMAX
960   PRINT "The address on it is " PKGDES$(LGMAX)
970   DORP(A)=0 : DORP(LGMAX)=1 : GOTO 1020
980   '
990   'Check if all pickups and deliveries made
1000  IF DELTOT=15 THEN 1580 : 'Have all deliveries been made?
1010  IF PKSTNU(A)=1 THEN X$="" ELSE X$="s"
1020  PRINT: PRINT "From here you can walk to the following subway station" X$":'
1030  IF PKSTNU(A)=1 THEN PRINT "    " STATION$(PKGSTA(A,1)) : GOTO 340
1040  FOR I=1 TO PKSTNU(A) : 'Iterate through possible stations
1050  PRINT "   " I "-- " STATION$(PKGSTA(A,I)) : NEXT I
1060  INPUT "Which station do you want to go to (by number)";B
1070  IF B<1 OR B>PKSTNU(A) THEN PRINT "Not a valid response." : GOTO 1060
1080  STA=PKGSTA(A,B) : MIN=MIN+3+PKSTDS(A,B) : GOTO 340
1090  '
1100  'Buy token subroutine
1110  TOKEN=TOKEN+1 : IF TOKEN<=TKMAX THEN 1190
1120  PRINT : PRINT "You have spent the entire $20 your boss gave you on tokens."
1130  IF TK=0 THEN 1150 : 'Used own money yet?
1140  PRINT "Moreover, you have used up your own money as well." : GOTO 1520
1150  TK=1 :INPUT "Do you want to buy tokens with your own money";A$ : GOSUB 5300
1160  IF A$="N" THEN PRINT "Okay, that's it then." : GOTO 1520
1170  RN=INT(300+600*RND(1))/100 : PRINT "You have exactly $" RN;
1180  PRINT "so you can buy" INT(RN) "more tokens." : TKMAX=TKMAX+INT(RN)
1190  RETURN
1200  '
1210  'Trip hazards subroutine
1220  'Door refuses to close
1230  IF RND(1)>.05 THEN 1290 : '5% chance of a sticky door
1240  PRINT "One of the car doors refuses to close and the train can't move."
1250  RN=INT(1+2.5*RND(1)) : MIN=MIN+RN : IF RN>1 THEN X$="s" ELSE X$=""
1260  PRINT "You're stuck here for" RN "minute" X$ "."
1270  '
1280  'Possible mugging
1290  IF RND(1)>.35 THEN 1430 : '35-65 chance of mugging or fire on the tracks
1300  IF RND(1)>.05 THEN RETURN : '5% chance of tough characters
1310  PRINT "Some real unsavory types are whooping it up in the car across from"
1320  INPUT "your seat.  Do you want to move to another car"; A$ : GOSUB 5300
1330  IF A$="Y" THEN IF RND(1)>.05 THEN 1350 ELSE GOTO 1370
1340  IF RND(1)>.05 THEN 1360 ELSE GOTO 1380
1350  PRINT "They jeer at you but let you pass.  All is okay...for now." : RETURN
1360  PRINT "They look at you and try to bait you, but you avoid them." : RETURN
1370  PRINT "Uh oh.  Two of them get up and block your way."
1380  PRINT "Oh my, oh my.  They're all moving to surround you."
1390  PRINT "They pull knives and demand your money." : GOSUB 5470
1400  PRINT "You, deciding that discretion is the better part of valor, give"
```

```
1410  PRINT "them all your money and call it quits for the day." : GOTO 1520
1420  '
1430  'Fire on the track
1440  IF RND(1)>8.000001E-03 THEN RETURN : '0.8% chance of fire on the tracks
1450  PRINT "Uh oh.  The train is slowing down and seems to be stopping."
1460  GOSUB 5470 : PRINT "You're stuck here in the tunnel." : GOSUB 5470
1470  PRINT "A trainman finally comes through and announces, 'It's just a"
1480  RN=INT(10+35*RND(1)) : MIN=MIN+RN
1490  PRINT "fire on the tracks folks.  We'll be underway in a few minutes.'"
1500  PRINT "In fact, the delay is more like" RN "minutes!" : RETURN
1510  '
1520  'End of game routine
1530  IF DELTOT=15 THEN 1580 : 'Were all deliveries made?
1540  PRINT : PRINT "You made it to" DELTOT "locations, but"
1550  PRINT "your log still shows the following items:" : GOSUB 5390
1560  GOSUB 5250 : PRINT "Perhaps you'll be able to do better tomorrow."
1570  GOTO 1610
1580  GOSUB 5250 : PRINT :PRINT TAB(25) "CONGRATULATIONS !" : PRINT
1590  PRINT "You made all your deliveries and pick-ups successfully in the"
1600  PRINT "largest city in the world.  Very good!"
1610  PRINT "You used $" TOKEN " for tokens."
1620  PRINT : INPUT "Would you like to try again";A$ : GOSUB 5300
1630  IF A$<>"Y" THEN END ELSE CLEAR : RESTORE : GOTO 100
1640  '
1650  CLEARW 2 : X$="Subway Scavenger" : GOSUB 5530 : PRINT : PRINT
1660  PRINT "     You have a job with a messenger/courier service located in"
1670  PRINT "mid-town Manhattan.  Today, you have five packages to deliver and"
1680  PRINT "five packages to pick up for delivery to other locations in the"
1690  PRINT "city.  So, in total you must visit 15 different locations." : PRINT
1700  PRINT "     You can use 264 stations of the New York Subway System which"
1710  PRINT "are serviced by the following 11 trains: A, B, CG, D, E, F, N, 1,"
1720  PRINT "2, 4, and 7." : PRINT
1730  PRINT "     You must complete all your deliveries and pickups by 5:00 pm."
1740  PRINT "Your boss has given you $20 for tokens (which will allow for a few"
1750  PRINT "wrong trains).  Any money which you don't use on tokens is yours to"
1760  PRINT "keep.  Good luck!  (You'll need it.)" : RETURN
1770  '
1780  'Subroutine to read data about package deliveries
1790  FOR I=1 TO PS
1800  READ PN(I),PKGDES$(I),PKSTNU(I)
1810  FOR J=1 TO PKSTNU(I)
1820  READ PKGSTA(I,J),PKSTDS(I,J)
1830  NEXT J : NEXT I : RETURN
1840  DATA 1,"Curator, Museum of Natural History",1,17,1
1850  DATA 2,"George Washington Bridge Bus Terminal",1,5,1
1860  DATA 3,"West Side Tennis Club, Forest Hills",1,75,4
1870  DATA 4,"Nathan's at Coney Island Amusement Park",1,95,2
1880  DATA 5,"Atari Repair Co., Rockaway Blvd, Woodhaven",3,50,1,49,9,51,9
1890  DATA 6,"Apollo Theater, 125th St, Harlem",2,11,1,12,9
1900  DATA 7,"Met's Dugout, Shea Stadium",1,260,3
1910  DATA 8,"Press Room, Yankee Stadium",1,246,3
1920  DATA 9,"Lion Keeper, Bronx Zoo",2,204,5,205,8
1930  DATA 10,"Borough Hall, Brooklyn",2,32,1,221,2
1940  DATA 11,"Brooklyn Academy of Music",1,67,2
1950  DATA 12,"Registrar, Brooklyn College, Flatbush",1,234,1
1960  DATA 13,"Computer Science Dept, NYU, Washington Sq",1,25,3
1970  DATA 14,"NY Botanical Gardens",1,55,4
1980  DATA 15,"Windows on the World, World Trade Center",3,29,1,28,5,191,1
1990  DATA 16,"Metropolitan Museum of Art",1,249,1
2000  DATA 17,"Computer Education Dept, Columbia Univ.",2,174,2,175,8
2010  DATA 18,"Alice Tully Hall, Lincoln Center",1,181,2
2020  DATA 19,"New York Stock Exchange",2,219,2,252,2
2030  DATA 20,"Lin Chows, Mott St, Chinatown",2,65,4,146,4
2040  '
2050  'Subroutine to read data about subway stations
2060  FOR I=1 TO STNS : 'STNS = number of subway stations
2070  READ STA, STATION$(I), STANU(I)
2080  FOR J=1 TO STANU(I)
2090  READ STATR(I,J) : 'Read train numbers that stop at station
2100  NEXT J : NEXT I : RETURN
2110  DATA 1,"207 St/Bdwy/Wash Hts (Manhattan)",1,1
```



SUBWAY SCAVENGER

```
2120  DATA 2,"Dyckman St/Bdwy",1,1
2130  DATA 3,"190 St/Ft Wash Av",1,1
2140  DATA 4,"181 St/Ft Wash Av",1,1
2150  DATA 5,"175 St/GW Bridge",1,1
2160  DATA 6,"168 St/Bdwy (Manhattan)",3,1,3,6
2170  DATA 7,"163 St/Amsterdam Av",1,3
2180  DATA 8,"155 St/St Nicholas Av",1,3
2190  DATA 9,"145 St/St Nicholas Av",3,1,3,4
2200  DATA 10,"135 St/St Nicholas Av",1,3
2210  DATA 11,"125 St/St Nicholas Av",3,1,3,4
2220  DATA 12,"116 St/8 Av",1,3
2230  DATA 13,"110 St/Cathedral Pkwy",1,3
2240  DATA 14,"103 St/Central Pk W",1,3
2250  DATA 15,"96 St/Central Pk W",1,3
2260  DATA 16,"86 St/Central Pk W",1,3
2270  DATA 17,"81 St/Museum Natl History",1,3
2280  DATA 18,"72 St/Central Pk W",1,3
2290  DATA 19,"59 St/Columbus Circle",4,1,3,4,6
2300  DATA 20,"50 St/8 Av",1,2
2310  DATA 21,"42 St/8 Av",2,1,2
2320  DATA 22,"34 St/Penn Station",2,1,2
2330  DATA 23,"23 St/8 Av",1,2
2340  DATA 24,"14 St/8 Av",2,1,2
2350  DATA 25,"W 4 St/Washington Sq",5,1,2,3,4,5
2360  DATA 26,"Spring St/6 Av",1,2
2370  DATA 27,"Canal St/6 Av",2,1,2
2380  DATA 28,"Chambers St/Church St",3,1,2,7
2390  DATA 29,"World Trade Center",1,2
2400  DATA 30,"Bdwy/Nassau St/Fulton St (Manhattan)",3,1,7,8
2410  DATA 31,"High St/Brooklyn Br (Bklyn)",1,1
2420  DATA 32,"Jay St/Borough Hall",2,1,5
2430  DATA 33,"Hoyt St",2,1,11
2440  DATA 34,"Lafayette Av",1,11
2450  DATA 35,"Clinton Av",1,11
2460  DATA 36,"Franklin Av",1,11
2470  DATA 37,"Nostrand Av",1,1
2480  DATA 38,"Kingston Av",1,11
2490  DATA 39,"Utica Av",1,1
2500  DATA 40,"Ralph Av",1,11
2510  DATA 41,"Rockaway Av",1,11
2520  DATA 42,"Bdwy, E NY",1,11
2530  DATA 43,"Liberty Av",1,11
2540  DATA 44,"Van Sicien Av",1,11
2550  DATA 45,"Shepherd Av",1,11
2560  DATA 46,"Euclid Av",1,1
2570  DATA 47,"Grant Av (Brooklyn)",1,1
2580  DATA 48,"80 St/Liberty Av (Queens)",1,1
2590  DATA 49,"88 St/Liberty Av",1,1
2600  DATA 50,"Rockaway Blvd",1,1
2610  DATA 51,"104 St/Liberty Av",1,1
2620  DATA 52,"111 St/Liberty Av",1,1
2630  DATA 53,"Lefferts Blvd (Queens)",1,1
2640  DATA 54,"205 St/Bainbridge Av (Bronx)",1,4
2650  DATA 55,"Bedford Pk Blvd (NY Botanical Garden)",1,4
2660  DATA 56,"Kingsbridge Rd",1,4
2670  DATA 57,"Fordham Rd",1,4
2680  DATA 58,"Tremont Av",1,4
2690  DATA 59,"47-50 St/Rockefeller Center",3,3,4,5
2700  DATA 60,"42 St/Av Americas",4,3,4,5,9
2710  DATA 61,"34 St/Herald Sq",4,3,4,5,10
2720  DATA 62,"23 St/Av Americas",1,5
2730  DATA 63,"14 St/Av Americas",3,5,6,7
2740  DATA 64,"Bdwy/Lafayette St",4,3,4,5,8
2750  DATA 65,"Grand St (Manhattan)",2,3,4
2760  DATA 66,"DeKalb Av/Flatbush Av (Bklyn)",2,4,10
2770  DATA 67,"Atlantic Av/Pacific St/BAM",5,3,4,7,8,10
2780  DATA 68,"179 St/Hillside Av (Queens)",2,2,5
2790  DATA 69,"169 St",1,2
2800  DATA 70,"Parsons Blvd",2,2,5
2810  DATA 71,"Sutphin Av",1,2
2820  DATA 72,"Van Wyck Blvd",1,2
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SUBWAY SCAVENGER

```
2830  DATA 73,"Union Tpk",2,2,5
2840  DATA 74,"75 Av",1,2
2850  DATA 75,"71 Av/Continental Av/Forest Hills",4,
      2,5,10,11
2860  DATA 76,"Roosevelt Av",5,2,5,9,10,11
2870  DATA 77,"Queens Plaza",4,2,5,10,11
2880  DATA 78,"23 St/Ely Av (Queens)",2,2,5
2890  DATA 79,"Lexington Av (Manhattan)",2,2,5
2900  DATA 80,"5th Av/53 St",2,2,5
2910  DATA 81,"7th Av/53 St",3,2,3,4
2920  DATA 82,"36 St/4 Av",2,3,10
2930  DATA 83,"9 Av/39 St",1,3
2940  DATA 84,"Ft Hamilton Pky",1,3
2950  DATA 85,"50 St/New Utrecht Av",1,3
2960  DATA 86,"55 St/New Utrecht Av",1,3
2970  DATA 87,"62 St/New Utrecht Av",2,3,10
2980  DATA 88,"71 St/New Utrecht Av",1,3
2990  DATA 89,"79 St/New Utrecht Av",1,3
3000  DATA 90,"18 Av/New Utrecht Av",1,3
3010  DATA 91,"20 Av/86 St",1,3
3020  DATA 92,"Bay Pky/86 St",1,3
3030  DATA 93,"25 Av/86 St",1,3
3040  DATA 94,"Bay 50 St",1,3
3050  DATA 95,"Coney Island/Surf Av (Bklyn)",4,3,4,5,10
3060  DATA 96,"67 Av/Queens Blvd",2,10,11
3070  DATA 97,"63 Dr/Queens Blvd",2,10,11
3080  DATA 98,"Woodhaven Blvd",2,10,11
3090  DATA 99,"Grand Av/Queens Blvd",2,10,11
3100  DATA 100,"Elmhurst Av",2,10,11
3110  DATA 101,"65 St/Bdwy",2,10,11
3120  DATA 102,"Northern Blvd",2,10,11
3130  DATA 103,"46 St/Bdwy",2,10,11
3140  DATA 104,"Steinway St",2,10,11
3150  DATA 105,"2 Av/Houston St",1,5
3160  DATA 106,"Delancey St",1,5
3170  DATA 107,"East Bdwy (Manhattan)",1,5
3180  DATA 108,"York St/Jay St (Brooklyn)",1,5
3190  DATA 109,"Bergen St",2,5,11
3200  DATA 110,"Carroll St",2,5,11
3210  DATA 111,"Smith St",2,5,11
3220  DATA 112,"4 Av/9 St",2,5,10
3230  DATA 113,"7 Av/9 St",1,5
3240  DATA 114,"15 St/Prospect Park",1,5
3250  DATA 115,"Ft Hamilton Pwy",1,5
3260  DATA 116,"Church Av",1,5
3270  DATA 117,"Ditmas Av",1,5
3280  DATA 118,"18 Av/McDonald Av",1,5
3290  DATA 119,"Kings Hwy",1,5
3300  DATA 120,"Avenue U",1,5
3310  DATA 121,"Avenue X",1,5
3320  DATA 122,"Neptune Av",1,5
3330  DATA 123,"W 8th/NY Aquarium",1,5
3340  DATA 124,"7 Av/Flatbush Av",1,4
3350  DATA 125,"Prospect Park",1,4
3360  DATA 126,"Church Av/E 18 St",1,4
3370  DATA 127,"Newkirk Av",1,4
3380  DATA 128,"Kings Hwy/E 16 St",1,4
3390  DATA 129,"Sheepshead Bay",1,4
3400  DATA 130,"Brighton Beach",1,4
3410  DATA 131,"Court Square",1,11
3420  DATA 132,"21 St/Jackson Av (Queens)",1,11
3430  DATA 133,"Greenpoint Av (Bklyn)",1,11
3440  DATA 134,"Nassau Av",1,11
3450  DATA 135,"Metropolitan Av",1,11
3460  DATA 136,"Broadway/Union Av",1,11
3470  DATA 137,"Flushing-Marcy Avs",1,11
3480  DATA 138,"Myrtle-Willoughby Avs",1,11
3490  DATA 139,"Bedford-Nostrand Avs",1,11
3500  DATA 140,"36 St/Northern Blvd",2,10,11
3510  DATA 141,"Lexington Av/59-60 Sts (Manhattan)",2,8,10
3520  DATA 142,"5th Av/59-60 Sts",1,10
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INDEX TO ADVERTISERS

Academy Software	67
Alpha Systems	11
American Techna-Vision	15
Antic	23
Astra Systems	6
Atari Bonanza	27,30-31
Atari Explorer	53
Atari Corp.	62-63
Avant-Garde Systems	9
Computer Adventures	49
Celebrity Cookbook	7
Computer Fenestrations	43
Computer Games+	2
Computer Mail Order	34-35
Computer Success	49
Dealer Directory	46-47
Draper Software	67
I.B. Computers	18
Interstel	79
LC Technologies	Cover 3
Microware	13
Migraph	5
MichTron	Cover 4
Morgan Communications	18
Navarone	1
No Frills Software	55
QMI	29
Seymor-Radix	29
Terrific Corp.	43
Virtusonics	Cover 2

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3530  DATA 143,"57 St/7 Av",1,10
3540  DATA 144,"Times Sq/42 St/Bdwy",4,6,7,9,10
3550  DATA 145,"Union Sq/14 St",2,8,10
3560  DATA 146,"Canal St/Bdwy (Manhattan)",1,10
3570  DATA 147,"Union St/4 Av",1,10
3580  DATA 148,"Prospect Av",1,10
3590  DATA 149,"25 St/4 Av",1,10
3600  DATA 150,"45 St/4 Av",1,10
3610  DATA 151,"53 St/4 Av",1,10
3620  DATA 152,"59 St/4 Av",1,10
3630  DATA 153,"8 Av/62 St",1,10
3640  DATA 154,"Ft Hamilton Pwy",1,10
3650  DATA 155,"18 Av/64 St",1,10
3660  DATA 156,"20 Av/64 St",1,10
3670  DATA 157,"Bay Pwy/Av O",1,10
3680  DATA 158,"Kings Hwy/W 7 St",1,10
3690  DATA 159,"Avenue U/W 7 St",1,10
3700  DATA 160,"86 St/W 7 St",1,10
3710  DATA 161,"242 St/Van Cortlandt Park",1,6
3720  DATA 162,"238 St/Bdwy",1,6
3730  DATA 163,"231 St/Bdwy (Bronx)",1,6
3740  DATA 164,"225 St/Bdwy (Manhattan)",1,6
3750  DATA 165,"215 St/10 Av",1,6
3760  DATA 166,"207 St/10 Av",1,6
3770  DATA 167,"Dyckman Av",1,6
3780  DATA 168,"191 St/St Nicholas Av",1,6
3790  DATA 169,"181 St/St Nicholas Av",1,6
3800  DATA 170,"157 St/Bdwy",1,6
3810  DATA 171,"145 St/Bdwy",1,6
3820  DATA 172,"137 St/Bdwy",1,6
3830  DATA 173,"125 St/Bdwy",1,6
3840  DATA 174,"116 St/Bdwy/Columbia Univ",1,6
3850  DATA 175,"110 St/Cathedral Pkwy",1,6
3860  DATA 176,"103 St/Bdwy",1,6
3870  DATA 177,"96 St/Bdwy",2,6,7
3880  DATA 178,"86 St/Bdwy",1,6
3890  DATA 179,"79 St/Bdwy",1,6
3900  DATA 180,"72 St/Bdwy",2,6,7
3910  DATA 181,"66 St/Bdwy/Lincoln Center",1,6
3920  DATA 182,"50 St/Bdwy",1,6
3930  DATA 183,"Penn Station/34 St/7 Av",2,6,7
3940  DATA 184,"28 St/7 Av",1,6
3950  DATA 185,"23 St/7 Av",1,6
3960  DATA 186,"18 St/7 Av",1,6
3970  DATA 187,"Christopher St",1,6
3980  DATA 188,"Houston St",1,6
3990  DATA 189,"Canal & Varick Sts",1,6
4000  DATA 190,"Franklin St",1,6
4010  DATA 191,"Chambers St/W Bdwy",2,6,7
4020  DATA 192,"Cortlandt St/World Trade Center",1,6
4030  DATA 193,"Rector St/Greenwich St",1,6
4040  DATA 194,"South Ferry/Battery Park",1,6
4050  DATA 195,"241 St/White Plains Rd (Bronx)",1,7
4060  DATA 196,"238 St/White Plains Rd",1,7
4070  DATA 197,"233 St/White Plains Rd",1,7
4080  DATA 198,"225 St/White Plains Rd",1,7
4090  DATA 199,"219 St/White Plains Rd",1,7
4100  DATA 200,"Gun Hill Rd/White Plains Rd",1,7
4110  DATA 201,"Burke Av/White Plains Rd",1,7
4120  DATA 202,"Allerton Av/White Plains Rd",1,7
4130  DATA 203,"Pelham Pkwy/White Plains Rd",1,7
4140  DATA 204,"Bronx Pk E/White Plains Rd",1,7
4150  DATA 205,"E 180 St/Bronx Zoo",1,7
4160  DATA 206,"E Tremont Av/Boston Rd",1,7
4170  DATA 207,"174 St/Southern Blvd",1,7
4180  DATA 208,"Freeman St",1,7
4190  DATA 209,"Simpson St",1,7
4200  DATA 210,"Intervale Av",1,7
4210  DATA 211,"Prospect Av",1,7
4220  DATA 212,"Jackson Av",1,7
4230  DATA 213,"3 Av/149 St",1,7
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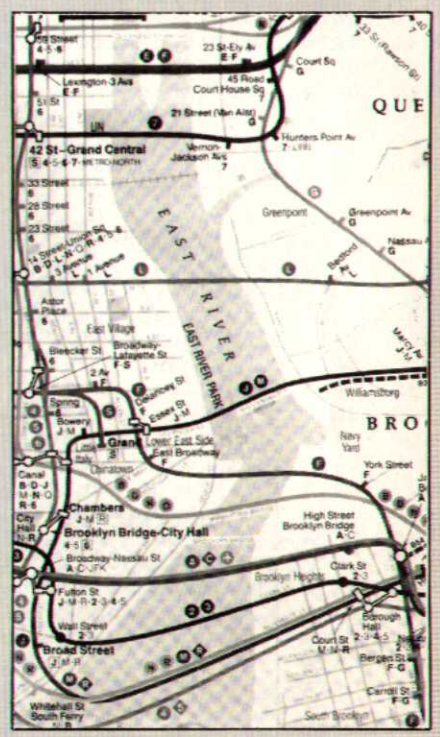
***In some** cases, the building to which the package is to be delivered can be reached from more than one subway station.*



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4240  DATA 214,"149 St/Grand Concourse (Bronx)",2,7,8
4250  DATA 215,"135 St/Lenox Av (Manhattan)",1,7
4260  DATA 216,"125 St/Lenox Av",1,7
4270  DATA 217,"116 St/Lenox Av",1,7
4280  DATA 218,"110 St/Lenox Av",1,7
4290  DATA 219,"Wall St (Manhattan)",1,7
4300  DATA 220,"Clark St (Brooklyn)",1,7
4310  DATA 221,"Borough Hall/Court St (Bklyn)",2,7,8
4320  DATA 222,"Hoyt St/Fulton St",1,7
4330  DATA 223,"Nevins St",2,7,8
4340  DATA 224,"Bergen St",1,7
4350  DATA 225,"Grand Army Plaza, Prospect Park",1,7
4360  DATA 226,"Eastern Pkwy/Brooklyn Museum",1,7
4370  DATA 227,"Franklin Av/Eastern Pkwy",1,7
4380  DATA 228,"President St",1,7
4390  DATA 229,"Sterling St/Nostrand Av",1,7
4400  DATA 230,"Winthrop St/Nostrand Av",1,7
4410  DATA 231,"Church Av/Nostrand Av",1,7
4420  DATA 232,"Beverley Rd/Nostrand Av",1,7
4430  DATA 233,"Newkirk Av/Nostrand Av",1,7
4440  DATA 234,"Flatbush Av/Bklyn College",1,7
4450  DATA 235,"Woodlawn/Jerome Av (Bronx)",1,8
4460  DATA 236,"Mosholu Pkwy",1,8
4470  DATA 237,"Bedford Park Blvd",1,8
4480  DATA 238,"Kingsbridge Rd",1,8
4490  DATA 239,"Fordham Rd/Jerome Av",1,8
4500  DATA 240,"183 St/Jerome Av",1,8
4510  DATA 241,"Burnside Av/Jerome Av",1,8
4520  DATA 242,"176 St/Jerome Av",1,8
4530  DATA 243,"Mt Eden Av/Jerome Av",1,8
4540  DATA 244,"170 St/Jerome Av",1,8
4550  DATA 245,"167 St/River Av",1,8
4560  DATA 246,"161 St/Yankee Stadium (Bronx)",2,4,8
4570  DATA 247,"",1,11
4580  DATA 248,"125 St/Lexington Av (Manhattan)",1,8
4590  DATA 249,"86 St/Lexington Av/Metropolitan Museum",1,8
4600  DATA 250,"42 St/Grand Central Sta",2,8,9
4610  DATA 251,"Bklyn Bridge/Worth St",1,8
4620  DATA 252,"Wall St/Bdwy",1,8
4630  DATA 253,"Bowling Green (Manhattan)",1,8
4640  DATA 254,"Nostrand Av/Eastern Pkwy",1,8
4650  DATA 255,"Rockaway Av/Livonia Av",1,8
4660  DATA 256,"New Lots Av (Brooklyn)",1,8
4670  DATA 257,"Queensboro Plaza (Queens)",1,9
4680  DATA 258,"61 St/Roosevelt Av",1,9
4690  DATA 259,"Junction Blvd",1,9
4700  DATA 260,"Willets Point/Shea Stadium",1,9
4710  DATA 261,"Main St/Flushing (Queens)",1,9
4720  DATA 262,"Classon Av",1,11
4730  DATA 263,"Clinton-Washington Avs",1,11
4740  DATA 264,"Fulton St/Lafayette Av",1,11
4750  '
4760  'Subroutine to read data about subway trains
4770  FOR I=1 TO TRNS : 'TRNS = number of subway trains
4780  READ TR, TRAIN$(I), TRSTOP(I)
4790  FOR J=1 TO TRSTOP(I)
4800  READ TRSTA(I,J) : 'Read station numbers for a train
4810  NEXT J
4820  TRDES$(TR,1)=STATION$(TRSTA(TR,1)) : 'Station name at north or west end
4830  TRDES$(TR,2)=STATION$(TRSTA(TR,TRSTOP(TR))) : 'Station at south or east end
4840  NEXT I : RETURN
4850  DATA 1,"A - 8 Av Express",29,1,2,3,4,5,6,9,11,19,21,22,24,25,27,28
4860  DATA 30,31,32,33,37,39,46,47,48,49,50,51,52,53
4870  DATA 2,"E - 8 Av Local",24,68,69,70,71,72,73,74,75,76,77,78,79,80,81,20,21
4880  DATA 22,23,24,25,26,27,28,29
4890  DATA 3,"B - Av Americas Express",36,6,7,8,9,10,11,12,13,14,15,16,17,18
4900  DATA 19,81,59,60,61,25,64,65,67,82,83,84,85,86,87,88,89,90,91,92,93,94,95
4910  DATA 4,"D - Av Americas Express",26,54,55,56,57,58,246,9,11,19,81,59,60
4920  DATA 61,25,64,65,66,67,124,125,126,127,128,129,130,95
4930  DATA 5,"F - Av Americas Local",37,68,70,73,75,76,77,78,79,80
4940  DATA 59,60,61,62,63,25,64,105,106,107,108,32,109,110
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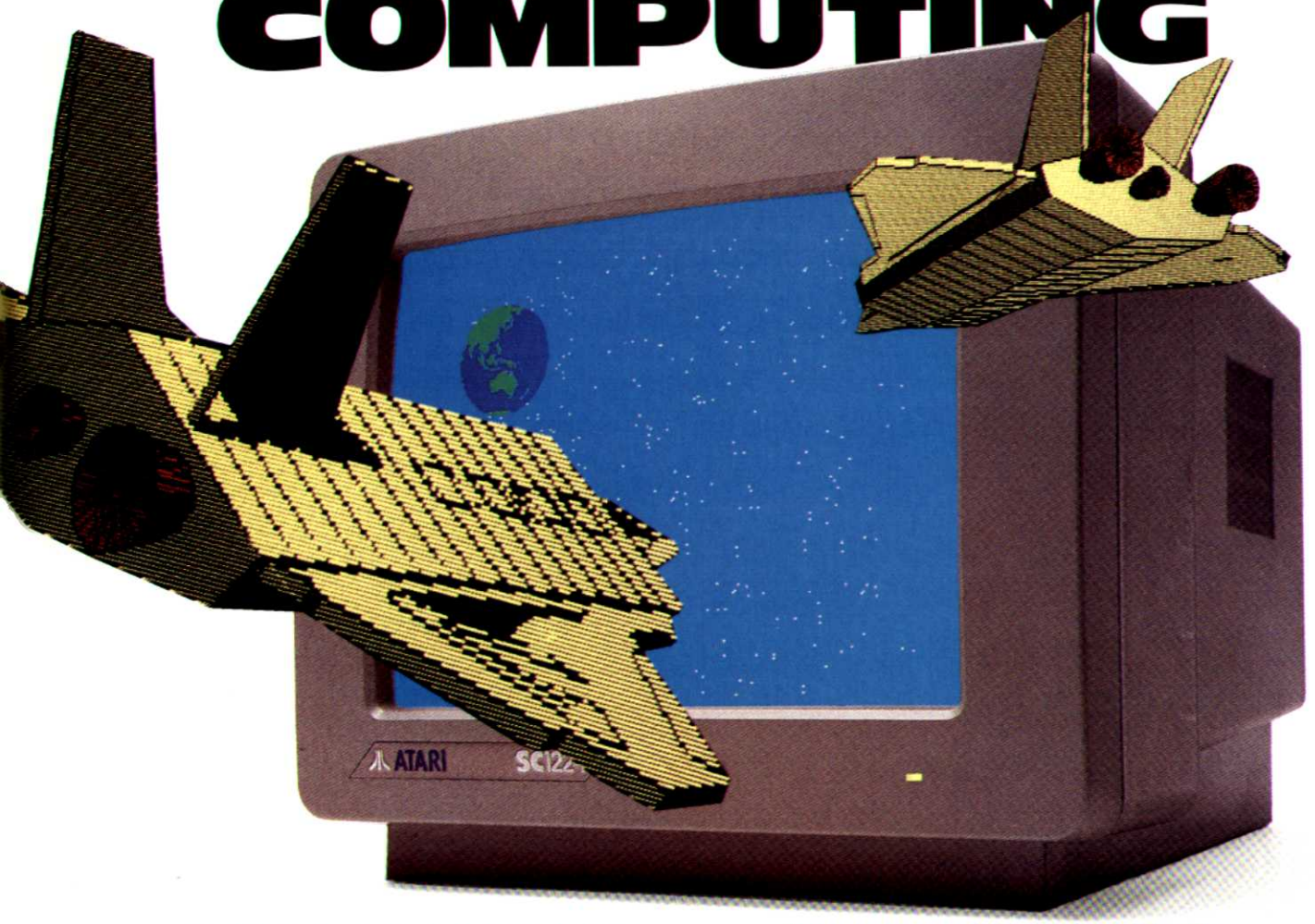
4950  DATA 111,112,113,114,115,116,117,118,119,120,121,122,123,95
4960  DATA 6,"1 - Bdwy-7th Av Local",38,161,162,163,164,165,166,167,168,169,6
4970  DATA 170,171,172,173,174,175,176,177,178,179,180,181,19,182,144,183,184
4980  DATA 185,186,63,187,188,189,190,191,192,193,194
4990  DATA 7,"2 - 7th Av Express",49,195,196,197,198,199,200,201,202,203,204
5000  DATA 205,206,207,208,209,210,211,212,213,214,215,216,217,218,177,180,144
5010  DATA 183,63,191,28,30,219,220,221,222,223,67,224,225,226,227,228,229,230
5020  DATA 231,232,233,234
5030  DATA 8,"4 - Lexington Av Express",29,235,236,237,238,239,240,241,242,243
5040  DATA 244,245,246,214,248,249,141,250,145,64,251,30,252,253,221,223,67,254
5050  DATA 255,256
5060  DATA 9,"7 - Flushing Express",9,144,60,250,257,258,76,259,260,261
5070  DATA 10,"N - Broadway Express",40,75,96,97,98,99,100,76,101,102,103,104
5080  DATA 140,77,141,142,143,144,61,145,146,66,67,147,112,148,149,82,150,151
5090  DATA 152,153,154,87,155,156,157,158,159,160,95
5100  DATA 11,"CG - Bklyn/Queens Crosstown",29,75,96,97,98,99,100,76,101,102,
5110  DATA 103,104,140,77,131,132,133,134,135,136,137,138,139,262,263,264,33,
5120  DATA 109,110,111
5130  '
5140  'Subroutine to check for lunch and end of workday
5150  IF MIN>TM THEN 5220 : 'After 5 pm?
5160  GOSUB 5250
5170  IF LUN=1 THEN RETURN : 'Had lunch already?
5180  IF MIN<180 THEN RETURN : 'Before 12 noon?
5190  IF PERS=1 THEN RETURN : 'On a train?
5200  PRINT : PRINT "Time for a lunch break.  Chili dog and cola.  Burp!"
5210  PRINT : MIN=MIN+INT(24+20*RND(1)) : LUN=1 : RETURN
5220  PRINT : PRINT "So sorry, it is after " TM$ "pm and the places to which"
5230  PRINT "you want to go to will be closed." : GOTO 1520
5240  '
5250  'Subroutine to print the time
5260  HR=INT(MIN/60) : MN=MIN-60*HR : IF HR<4 THEN HP=9+HR ELSE HP=HR-3
5270  HP=100*HP+MN +10000 : H$=STR$(HP)
5280  PRINT : PRINT "Time " MID$(H$,3,2) ":" RIGHT$(H$,2) : RETURN
5290  '
5300  'Subroutine to read yes/no answer
5310  IF A$="" THEN A$="Y" : RETURN
5320  GOSUB 5350 : IF A$="Y" OR A$="N" THEN RETURN
5330  INPUT "Don't understand your answer.  Enter 'Y' or 'N' please";A$:GOTO 5320
5340  '
5350  'Subroutine to read first letter of answer
5360  A$=LEFT$(A$,1) : IF A$>="A" AND A$<="Z" THEN RETURN
5370  A$=CHR$(ASC(A$)-32) : RETURN
5380  '
5390  'Subroutine to print delivery/pick-up log
5400  PRINT : PRINT TAB(20) "Delivery - Pick-up Log" : PRINT
5410  FOR I=1 TO 15
5420  IF DORP(I)=0 OR DORP(I)=3 THEN 5450
5430  IF DORP(I)=1 THEN X$="Delivery" ELSE X$="Pick-up"
5440  PRINT I,X$,PKGDES$(I)
5450  NEXT I : PRINT : GOSUB 5500 : RETURN
5460  '
5470  'Subroutine to make a short pause
5480  FOR I=1 TO 1200 : NEXT I : RETURN
5490  '
5500  X$="Press the spacebar to continue." : GOSUB 5530
5510  WHILE INP(2)=0 : WEND : PRINT : RETURN
5520  '
5530  'Subroutine to print centered lines
5540  PRINT TAB((70-LEN(X$))/2) X$; : RETURN
5550  '
5560  'Subroutine to shuffle the list of packages
5570  FOR I=1 TO PS : DUM(I)=I : NEXT I
5580  FOR I=1 TO PS-1
5590  K=I+INT((PS+1-I)*RND(1)) : J=PN(I) : PN(I)=PN(K) : PN(K)=J
5600  X$=PKGDES$(I) : PKGDES$(I)=PKGDES$(K) : PKGDES$(K)=X$
5610  A=PKSTNU(I) : PKSTNU(I)=PKSTNU(K) : PKSTNU(K)=A
5620  FOR J=1 TO 3
5630  A=PKGSTA(I,J) : PKGSTA(I,J)=PKGSTA(K,J) : PKGSTA(K,J)=A
5640  A=PKSTDS(I,J) : PKSTDS(I,J)=PKSTDS(K,J) : PKSTDS(K,J)=A
5650  NEXT J : NEXT I : RETURN
```

3D STEREOSCOPIC COMPUTING



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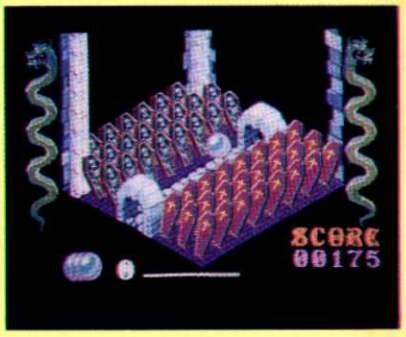

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