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Computer Arts and Sciences

ATARI CONNECTIONTM

SUMMER 1984

THE HOME

COMPUTER MAGAZINE

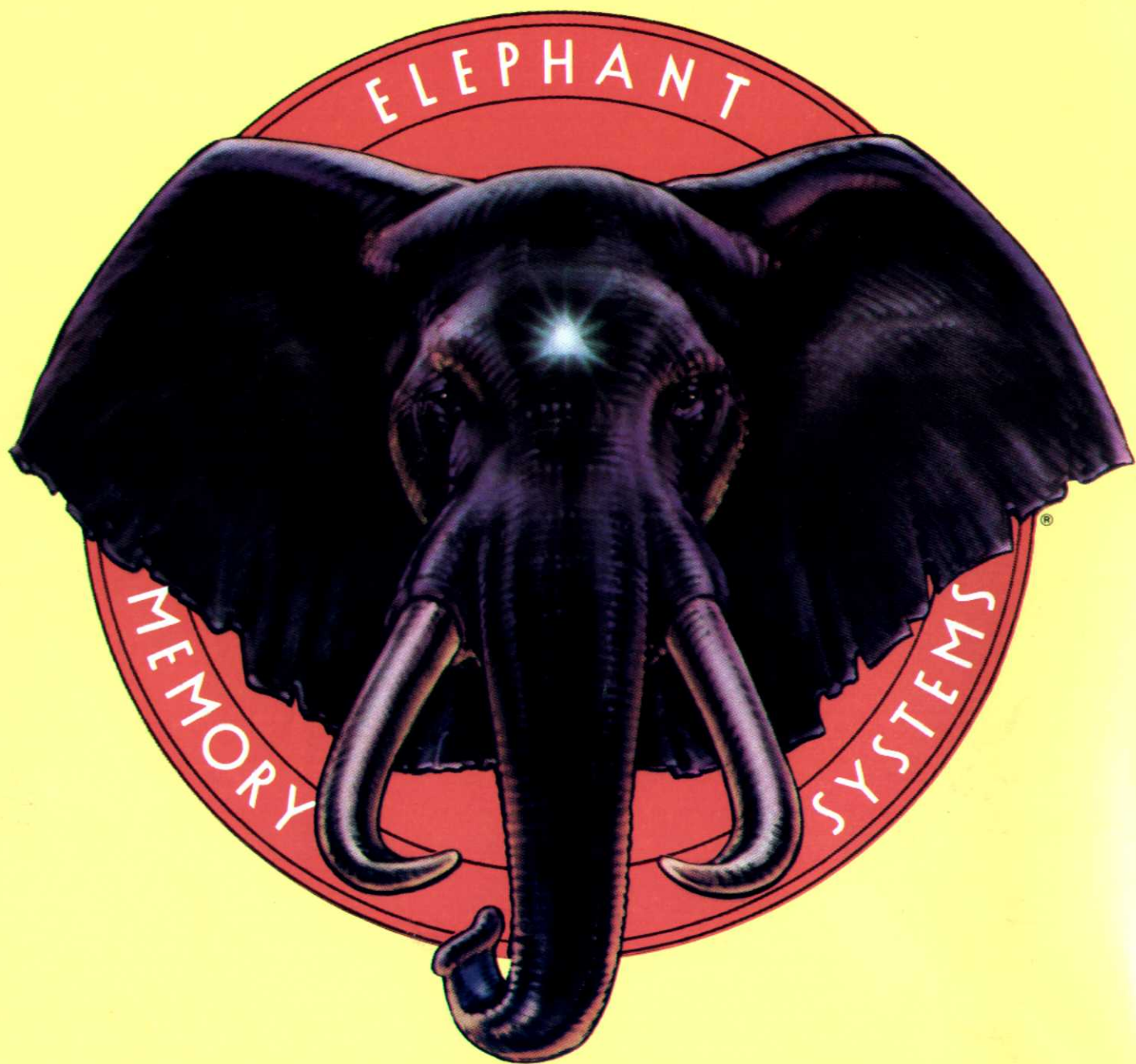
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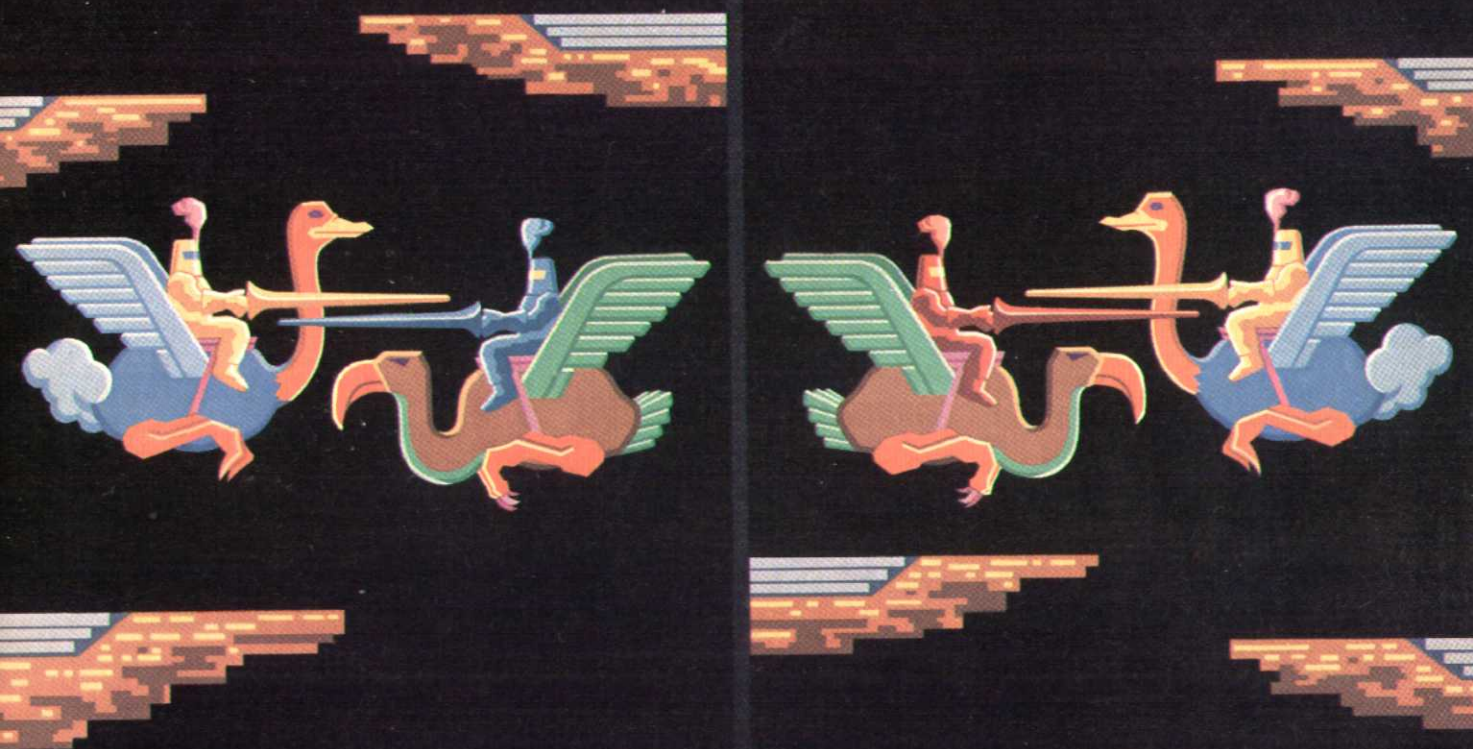


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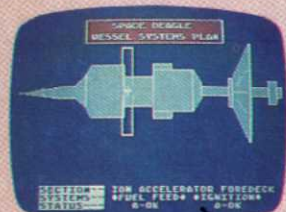
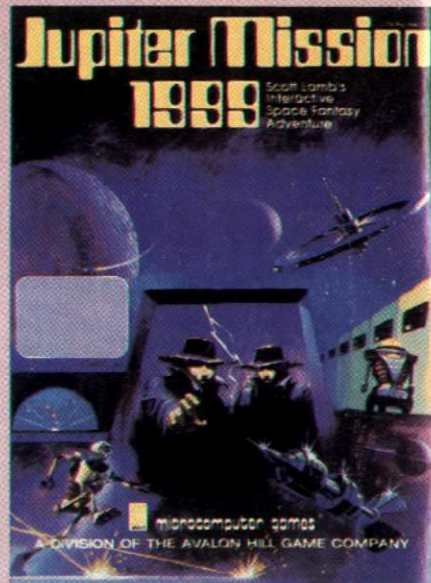
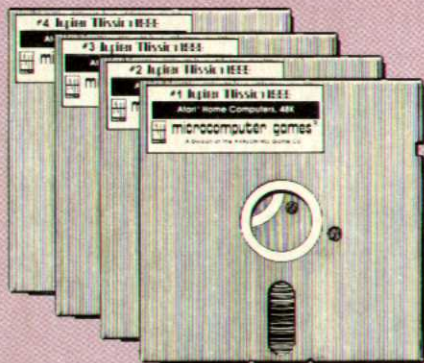
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Science Lab Display:
Jupiter system diagramatic

RRRING!!! RRRING!!! RRRING!!!

Too early on a chilly January morning, I was jarred awake by the noxious blaring of my traitorous doorbell. As I moved to accost the unknown aggressor, with the full force of semi-conscious wrath, I pulled on my robe and lost my dignity to the pain of a stubbed toe. Now fully awake, I opened the door, prepared to educate the mysterious interloper on the meaning of manners. My determination to this end was somewhat shattered when I saw two large men clad in long overcoats and wide-brimmed hats. Instinctively, I tried to slam the door. My retreat to safety was denied by the advance of the strangers. Before I could protest their entry, my vision was drawn to the shining silver badges that hung from their now unfolded wallets. They were government agents.

Hesitantly, trying to remember any crimes that I had ever committed, I invited them into my home. At their request, I produced my driver's license and other forms of identification. After examining these credentials, they asked me to pack a bag for an extended journey. After some protest and argument, I was made to understand that my options in this matter were less than limited. My country needs me, they said—with the clear implication that either I pack and dress or I take an extended journey in my robe.

This is how my adventure began. From my cold apartment, I was taken to a towering vehicle for an emergency mission to Jupiter. My very life on the line and, possibly, the survival of the planet Earth as well, and only God knows what other kind of perils await.

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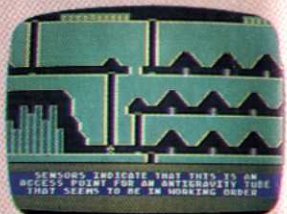
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Porthole View
of Jupiter and a moon



Lander Approach Display:
note descending spaceship



Exploring an
Alien Complex



Exploring an
Alien Space Station



Joystick required

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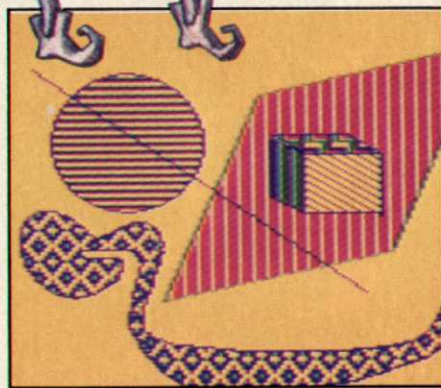
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Via Video background by Russell
Brown

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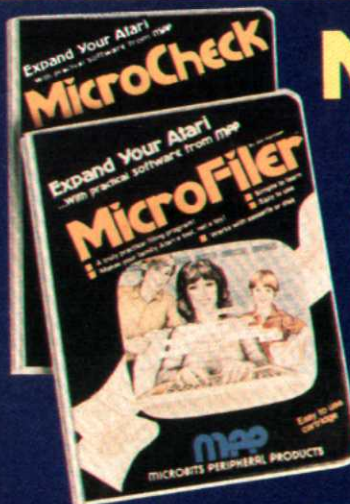
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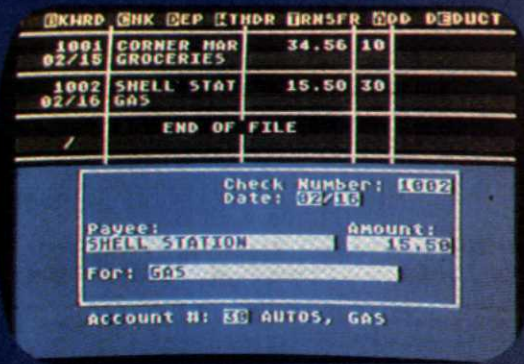
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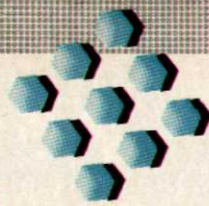


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Where Art Meets Science



YOU'VE NEVER BEEN able to even doodle. Color confuses you—friends or partners have to tell you purple goes with yellow and stripes go with solids. You're ashamed to show the photos you took on vacation and selecting posters in a print shop is a major trauma. Art is not your thing.

As a bona fide "Techie," you wanted a computer since day one. You were the first on your block to get one when they cost more than you could afford. You slogged through early drafts of "Tech Users' Notes," printed in dot-matrix. You are a founding member of the first users' group in town. You taught yourself and the kids BASIC. One of your utility programs, "Integer Edit," is a standard freebie on the users' groups network. But no one's had the heart to tell you the background screen of Nerd Green and the Techie Blue text causes migraine headaches.

Or, you, the "Artist," understand modern art but can't hook up a stereo. You call the power company when you blow a fuse or circuit breaker. Self-service gas stations are avoided like the plague. Math confuses you—if you don't know "X" how can you ever hope to get the value of "Y"? Binomial to you is some new kind of sexual preference.

But you could draw ducks that looked like ducks as early as kindergarten. You managed to arrange your Crayolas in "spectrum order" and have always understood that red goes with green, blue with orange and green with purple. You bought your computer when the price fell within your "artist's budget." You immediately grasped the concept of electronic cutting and pasting with a word processor—but you were a slow learner, refused to read the incomprehensible manual and sent dozens of pages into "cosmic memory" before finally "getting it."

Both of you are aliens in opposite worlds—the worlds of art and science. But you share a common bond: you both have home computers.

And now you both write programs, and actively use your home computers. Granted, you, the Techie, write much more sophisticated code, but you're puzzled by "software screen design" and storyboards, and are at a loss about why no one understands your documentation—how to use the program. And you, the Artist, write programs that elicit laughter among your Techie friends and evoke severe tutorials when they try to debug them. But you do find yourself in demand when it comes to designing a character or screen for someone's hottest new game. Art and Science—two opposite forces—have met at the twain. The result is, not surprisingly, synergistic—computer science has become more "artistic," and art has become more "technical."

The differences in outlook and viewpoint of the Artist and the Techie can be bridged by the computer. Whole areas of human personal development that went individually unchallenged can be put to use for new and truly innovative work and creations.

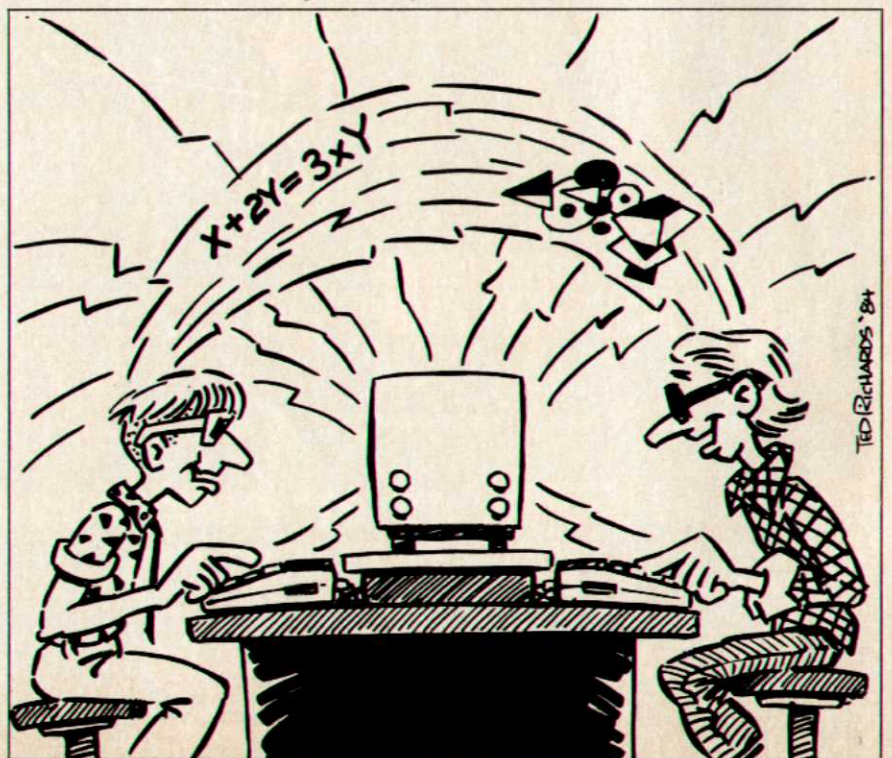
This is a far-reaching develop-

ment. It turns us away from the arid cul-de-sac of increasing technical specialization onto a more rounded, humanistic path. It's almost a bifocal viewpoint allowing more than a single subjective vision toward creative endeavor. What we see from this is that computers are changing and enriching our very nature. Our right brain and left brain are getting to know each other better.

* * *

I've been somewhat reluctant to write a traditional "Editor's Page" column—I never read them in other magazines—but ATARI CONNECTION magazine is now celebrating its fourth year of publication. And, as some of you longtime subscribers have observed, we have evolved somewhat from our original form as an "in-house" promotional publication to a legitimate newsstand quarterly magazine, replete with commercial advertising. Our editorial package we feel is adventurous, informative and, at times, even humorous—something I personally find lacking in our "competition." We have tried to bring diverse sensibilities to a forum that is usually considered purely technical. ATARI CONNECTION magazine, like the computers we cover, has served as a meeting place for two human aspirations: Art and Science. □

—TED RICHARDS



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A Star is Born

I would like to take a moment to tell you how great I think Atari computers are. I first looked at a Commodore 64. The appearance is not as good as that of the Atari 800XL. And the print quality of the Commodore printer was not as good as the type-written look of the Atari 1027 printer. The Coleco Adam is too bulky and its printer is so noisy it's impossible *not* to disturb someone who's sleeping. I found only a few programs for the Adam compared to more than 2,000 for Atari computers. Next I looked at the TRS-80 Color Computer 2. Again the printer was loud and the print quality terrible. I now own an Atari 800XL computer, Atari 1050 disk drive and Atari 1027 printer.

My disk drive came with DOS 2. How can I get a copy of DOS 3? Also, I own *AtariWriter*. Where do I find *Atspeller for AtariWriter* or another spelling-checker program?

Scott Litman
Fairfax, Virginia

Those who purchased Atari 1050 disk drives with DOS 2 may now receive a free copy of DOS 3 by writing:

Atari Product Support
1312 Crossman Ave.
P.O. Box 61657
Sunnyvale, CA 94080

Be sure to include the serial number of your disk drive. An upgraded version of Atspeller for AtariWriter is now available as a mainline product—the Atari Proofreader, see Steve Young's review, page 52.

Pac Person

You mentioned Demo Pac #3 has a real-time clock. But I don't know how many Demo Pacs there are, how much they cost, or where to get them.

Edward Solar
Berlin, New Hampshire

There are currently 12 Demo Pacs available, put together by the talented (and patient) people in Product Support. They cover all sorts of topics, especially areas that get a lot of consumer calls. The Demo Pacs are free. There are also Technical User Notes for the computers for \$29.95

plus tax, and an XL addendum for \$4.95 plus tax. You can get them by writing to Atari Product Support at the above address.

Foreign Aid

I lead a users' group and we have just seen your magazine. It is fantastic. In New Zealand we suffer from a poor supply of Atari products. Atari books and software are hard to find and too expensive for most users. We need access to information and contact with other people who can help us enjoy Atari computers. Help. The bug that bytes has got us.

P.A. Cormack
Huntly, New Zealand

We have forwarded your letter to the distributor to New Zealand—the Monaco Group in Auckland—who is anxious to help. For a complete list of users' groups in New Zealand and Australia, write to Atari Users' Group Support at P.O. Box 427, Sunnyvale, CA 94088. For answers to technical questions you can't get locally, write to the Product Support group at the address above. The toll-free lines don't work overseas, but you can call (408) 745-2820 or (408) 745-4851.

Back to BASICS

I have been taking a programming course, but it is entirely on Radio Shack TRS-80. The two BASIC's are so close that I can transfer all I've learned to my Atari computer. However, the instructor includes a line every so often that has CLS for clearing the screen in the middle of the program. Is there such a command for ATARI BASIC and how do I implement it?

Rodney G. Marburger
Kerrville, Texas

The command is: PRINT CHR \$(125).

Funny You Should Ask

How do I go about obtaining programs from Atari Program Exchange (APX)?

Arty Carroll
Sunset, Louisiana

The APX operations went through some changes in April. Manufacturing was closed down, but the basic

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concept of APX—evaluation of user-designed software—remains. On all but 20 titles, rights were returned to the original authors. The 20 remaining products developed into main-line Atari products, and will be available through your local retailer. Many APX products are still available through Atari Customer Service (800 538-8543; in California 800 672-1404) and some local retailers; supplies are limited, and some titles are already sold out.

Dr. Wacko's Diagnosis

In the Fall 1983 issue, Dr. Wacko lists all the colors of the Atari Computer. He wrote that there are three types of red color. With my Atari 800, I can only display two: hot-red (32) and red-orange (48). When I poke a 64, I get purple. Is Dr. Wacko wrong, or is my Atari 800 wrong?

Pieter Bulcke
Jubail, Saudi Arabia

Dr. Wacko reports that your TV color is merely out of adjustment. Dr.

Wacko knows that you have to POKE 99 to get Petunia's favorite color, pugnacious purple. He suggests that you make sure you're in Graphics O, then POKE 710, 99. Adjust your TV color tuner to purple, then when you poke 64, you'll get red.

Monitoring the Situation

I bought an Atari 800 computer, a BMC Color Monitor and an Atari CX89 color monitor cable.

Everything was hooked up according to the instructions, but no color. It's all black and white. I took the monitor back to the dealer, but they didn't find anything wrong. The dealer told me to adjust the color knobs until the color shows up. Still nothing. I called Atari's toll-free number and they couldn't help me.

C. Ho
San Francisco, California

Product Support reports that there are two kinds of monitors: RGB, not-compatible; and Composite Video Monitor, which is. You should deter-

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mine if your monitor is the right kind. Meanwhile, we've forwarded your letter to one of Atari's product specialists who will see if you're still having trouble.

Graphic Details

I have an Atari 800 computer with an Epson FX80 printer. Every time I print graphics, it prints sideways instead of top to bottom. I wanted to use Graphics 8 because of the detail. Is there any way to make the printer print from top to bottom, using Graphics 8?

William R. Batchelor

APO

New York

The problem lies in your software. Since you're not using Atari products, you need to contact the software manufacturer for specific corrections needed. The Graphics mode doesn't need changes.

When I'm working with Graphics Mode 8, I can only use one color. Is it possible to use more than one? If so, which is the easiest way?

Dylan Hursch

Dayton, Ohio

There is no easy way. Graphics 8 only has one color, with two luminances (that means two hues of the same color). Dr. Wacko says that to make other colors with Graphics 8 is an extremely tedious process involving artifacting and turning on every other pixel.

Accident of Nature

Please see your illustration on page 48 of the Spring 1984 issue. That's not Charles Darwin; that's Walt Whitman. The two have little in common, except the century in which they lived and their interest in sex—the poet's sensual, the scientist's sexual.

A little too much fun on the Beagle...

Lawrence Walker

Austin, Texas

It seems our artist took to heart "the interaction between chance and necessity" described in the article. A perhaps too-successful illustration of Darwin's argument that one species can change into another. □

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NEWS

HOME COMPUTER

Edited by Elizabeth Metzger

ATARI GOES TO THE OLYMPICS

TWELVE THOUSAND ATHLETES, eight thousand members of the press, and close to five million spectators will converge on Los Angeles for the 1984 Olympics, July 28. Atari has plans to be there as well. As a major sponsor of the Games, Atari is providing the official home computers, home video games, and coin-operated video games for the 1984 Olympic Games.

In addition, Atari is sponsoring the U.S. Women's Volleyball Team, supplying not only support funds but also an Atari 1200XL computer—which, says Marlon Sano, assistant coach for the team, is in use both at the team's training site in Southern California and on tour.

Explained Sano, "The computer records statistics about the team's performance, such as hitting and



Contenders: Flo Hyman (left) and Laurie Flachmeir of the U.S. Women's Volleyball Team go for the gold.

passing percentages, during practice and matches. And we also use the computer in the office for maintaining records." And, of course, it serves as well for playing Atari video games.

Atari's commitment to vol-

leyball extends beyond backing an Olympic team—the company also underwrites Youth Volleyball Clinics throughout Southern California. In 1983, over 2200 kids attended the clinics.

Last September, 11 Atari

coin-op video games were sent to Yugoslavia as entertainment for the ABC staff during the Winter Games; additional games will be put in ABC's International Broadcast Center in Los Angeles for the use of press personnel during the 1984 Olympics. And Atari video games and computer systems have been donated to both the U.S. Olympic Committee and the L.A. Olympic Organizing Committee.

Reporters and administrators won't be the only ones racking up points on video games; athletes will have their chance as well. Atari will be placing coin-op games in all the Olympic Villages for players from around the world to use for relaxation. Said Lindsay Chaney, Deputy Press Secretary of the L.A. Olympic Organizing Committee, "We're not sure yet whether the Games will be housed directly in athletes' dormitories or in a special game room. But we are quite sure they'll be played."

—MARINA HIRSCH

THERAPEUTIC USES FOR THE ATARI COMPUTER

THESE DAYS, Fred Balko isn't doing a lot of the things he used to, but he is burning up his Atari computer keyboard writing programs. Confined to a wheelchair since 1980, after being stricken with the muscle-paralyzing Guillian-Barre syndrome, he turned to computers two years ago as "something to pass the time." Balko had been setting up mobile radio districts near his home in up-

state New York after retiring from the Air Force.

The syndrome causes lack of motor coordination, and the father of four was unable to continue working. Like many disabled people, Balko had a lot of hours to fill but wanted to do something other than watch TV. He says working with his Atari 400, 800 and 1200XL computers creates goals and makes him feel like he's "not a total loss." It also allows him now

to stretch and flex his finger, hand and arm muscles while working the keyboards and peripherals.

Most of Balko's programs are applications for communications, such as an "Intermodulation" program for comparing radio frequencies, a task which takes hours to do manually, but only a few minutes on his computer. He has also written what he calls his "Calcu-filer" program for doing cal-

culations and electronic equations at the same time.

Balko recommends computer use to other physically disabled people, because it would allow them to work mentally and give them a chance to be creatively constructive—sometimes out of necessity. As he put it, once he became strong enough to use the computer on his own, "I made the programs do all the heavy work for me." —MYRNA RAE JOHNSON



Gee whiz kid: An industrial robot arm on display at "Chips and Changes."

CHIPS BRING CHANGE

THE FIRST MAJOR exhibition exploring the technology and social impact of the computer chip, "Chips and Changes," is making its way around the country. Produced by the Association of Science-Technology Centers (ASTC), and supported by Warner Communications Foundation/Atari, Inc., the exhibit combines interactive computerized exhibits, robotics, hands-on demonstrations, images and text. It features chip-based devices in the health field, "smart tools," robots, games and applications demonstrating the relationship between technology and social change.

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| Portland, Oregon | June 9-Aug. 5, 1984 |
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| Chicago, Illinois | Jan. 26-Mar. 24, 1985 |
| Museum of Science and Industry | |
| Richmond, Virginia | April 13-June 9, 1985 |
| Science Museum of Virginia | |
| Boston, Massachusetts | June 29-Aug. 25, 1985 |
| Museum of Science | |
| Philadelphia, Pennsylvania | Sept. 14-Nov. 10, 1985 |
| Franklin Institute Science Museum | |
| Durham, North Carolina | Nov. 30-Jan. 26, 1986 |
| North Carolina Museum of Science | |

For more details, contact ASTC, 1413 K St., N.W., Washington, D.C. Call (202) 371-1171.

"Micros in Education"

IF YOU'RE AN educator and you happened to miss the annual Microcomputers in Education Conferences, presented each March by Arizona State University's College of Education, you can order a copy of the last three years' proceedings. Send your orders to Micro-computer Research Clinic, College of Education, Arizona State University, Payne Hall B203, Tempe, AZ 85287. The cost for either the 1984 or 1983 proceedings is \$20, and for the 1982, \$15. Add \$5 for purchase orders.

PETER GABRIEL'S ROCK COMPUTER

ROCK ARTIST Peter Gabriel, formerly a driving force behind Genesis, is now breaking new ground on his own—with the creative help of an Atari computer.

Gabriel is using the Atari computer to regulate sound levels in the recording studio. He is also developing a laser light show for live performances and producing video visual effects with Atari technology.

Assisting Gabriel is Innovation, a Los Angeles-based high-tech entertainment company whose special-effects credits include *Star Wars*, *Firefox* and *Never Say Never Again*. With the help of a dozen Atari 1200XL and 800XL computers, Innovation founders John Dykstra and Dann Bowley have produced videos for guitarist Al

DiMiola and heavy metal group Missing Persons and are now involved with the new show for Laserium, a laser cosmic concert series that will tour worldwide next year. In the coming months Gabriel and Innovation will incorporate the Atari computer's creative capabilities in another video album and a feature film.

Bowley calls the Atari the "best little computer that mankind has produced," and Gabriel seems to agree; he has installed an Atari 800 in the recording studio at his home in Bath, England. On Gabriel's American tour later this year, Atari computers will control the laser light show which combines computer-generated graphics with onstage camera work. —SCOTT BADLER

MARVEL COMICS GOES HIGH-TECH

FOR 30 YEARS Marvel Comics' introspective super heroes have been entertaining kids of all ages. Now those timeless characters have been brought into the computer age by Scott Adams, an advocate for the fantasy-minded. His Florida software company, Adventure International (A.I.), is producing 12 adventure games featuring Marvel super heroes. Called Questprobe, the series—games from A.I. and special-edition Marvel comics—will be released every three months for three years.

The first episode, just out,

features Doctor Strange and the Incredible Hulk.

Adams was one of the originators of home-computer adventure games (stories, originally all text but lately including graphics, in which the player's choices determine the subsequent action); he continues to be a major figure in the field. Marvel, the largest comics company in the world, turned to its popular writer/artist, John Byrne, to create the series concept and the legendary Johnny Romita will be penning much of the comic-book art.

The software and comics will be sold separately or together at both software and comic-book outlets.

—STEVE ENGLEHART

Available in cassette and diskette format. Requires 16K RAM. Suggested retail price: \$19.95 per game.



CUSHY WAY TO FIND ANSWERS

The Guide to Computer Periodicals

T IRED OF THUMBING through computer magazines, looking for that good tutorial on disk diagnostics that you saw in...now which magazine was that?

Valley Soft's *Soft Finder* will know what you're looking for. And where it can be found. Created by Jim Carr of Corvallis, Oregon, it's an article index of selected computer magazines and newsletters, updated every few months, for the Atari 400, 800 and 1200XL computers.

To produce *Soft Finder*, Carr uses an Atari 800 computer and Atari 810 disk drive, along with a Centronics 737-1 printer and a Microbits MMP-110 inter-

face. He writes his data bases in ATARI BASIC, and uses Atari Assembler/Editor for his text editor. *Atari Writer* does the word processing.

The *Soft Finder* index is similar to the periodical reference guides found in public libraries. Articles are grouped by subjects in categories like Education, Books, Hardware, Programming Languages, Disk, Operating Systems, etc.

Individual article listings include subject keywords, a brief content description, information type codes, periodical code, date of publication, and page number. Entries are given with coded

abbreviations like the ever-classic: "ARCHIMEDES SPIRAL. Display or print the classical 3-D 'hat' figure. abl ALG #7-82 p 60." This is loosely translated as an ATARI BASIC program for the Archimedes Spiral that was printed in *ANALOG Computing* #7, 1982.

So now, what was that article? Silly you. It's "DIAGNOSTIC, DISK CHECKER. Traces through sector chain looking for broken links or bad file number. tut, abl CRC May-82 p 86."

—MYRNA RAE JOHNSON
Soft Finder sells for \$6, and can be ordered from: Valley Soft, 2660 SW DeArmond, Corvallis, OR 97333.

Electronic Security

Making Crime Obsolete

I MAGINE a computer system, a car stereo, a TV or any other microprocessor-based device, operating only for you through a personal code number. International Electronic Technology (IET) of Far Rockaway, New York, has a patent pending for a device designed to do just that.

The Kaish Circuit Lockout System, when incorporated into the manufacture of any electronic devices using microprocessors, will provide the anti-theft protection of a personally programmed code

to make it operational.

The Kaish Circuit Lockout System was designed by Norman Kaish, who founded IET as a think tank of electronics engineers to "apply the latest electronic technology in new and meaningful ways." Kaish claims that his anti-theft system will effectively eliminate the resale market for stolen electronic equipment.

The lockout consists of theft-detection circuits and a microprocessor integrated with the control or computational systems of the protected equipment. The microprocessor uses a three-tier coding hierarchy of factory, access and personal codes. The built-in factory code programs a user-access code. When you buy the protected product, the access

code will be included on a tag or in the operator's manual. After entering this access code, you can create a personal code that will replace the access code. You may change the personal code at any time. The theft circuit is activated by various disruptions like disconnecting the plug from a wall outlet, cutting wires or removing a power plug. Once the theft circuits are activated, the device will not operate again until the personal code has been entered, usually through one or more push-button switches.

Since the theft protection provided by the Kaish Circuit Lockout is "an integral part of the operation of the equipment, bypassing it is impossible," according to IET. It would take a mainframe computer 34,000 years to break the factory code by trying every possible combination. IET estimates that the added cost of the chip would be less than \$5, about one percent of the manufacturing cost of the typical electronic device to be protected. —JOHN CLARK

For more information contact Daniel S. Roher, International Electronic Technology Corporation, 1931 Mott Ave., Far Rockaway, NY 11691.

GETTING LOOSE

Relaxing Software Fights Stress

T HE TIME IS 8:30 a.m. I'm sitting in a darkened room staring at a jagged line on a monitor. A special sensor band is strapped on my head, and a set of phones rests on my ears. A voice asks me to take a deep breath, then to let my breath out slowly. Very slowly.

No, I'm not dreaming. I'm testing *Relax*, a new software program from Synapse. Using biosensory technology, *Relax* allows me to monitor my stress levels by graphically representing my muscle tension on a "Relax Graph."

Here's how it works: A headband with three tiny sensors measures electrical activity in my muscles. When I'm tense, electrical activity is high. When I'm relaxed, this activity decreases. All of this is shown to me by a graph on a computer monitor. I can even print out this graph for future reference.

Three additional visuals—a kaleidoscope whose patterns change, a face that changes expression, and a balloon that floats up or downward—reflect how relaxed or tense I am.

Through a control unit I can determine the sampling rate I want to use. A fast sample helps me see my unconscious reactions to stressful stimuli, while a slower rate gives me a more general index of relaxation.

Relax can teach me how to reduce stress. To help me along, the program includes an audio tape with a series of relaxation exercises and meditative techniques, and a 100-page workbook that guides me through the program and outlines a stress-reduction plan.

Relax is available on disk and cassette for all Atari computers. Requires 16K RAM. Suggested retail price: \$99.95.



Norman Kaish testing his theft-detection circuitry.

SELF-PUBLISHING BRINGS REWARDS



for printing. But six years ago, when the then 27-year-old Bates wrote *The Computer Cookbook* in his basement in Berkeley, things weren't looking so rosy.

"I showed it around to a lot of New York publishers in 1978 and 1979," Bates recalls. "They felt home computers were just a fad like CB radios and would be dead in six months." Undeterred, Bates published the book himself in 1979 and sold it through the mail.

The title comes from the early days of computing, when technical manuals for integrated circuits were known as cookbooks. According to Bates, his book is more like an encyclopedia or sourcebook. "I put in things I wanted to see that I felt

might otherwise not be in print," he says, "such as sections on microprocessors for the handicapped, computers and the law, health issues."

Bates produced this latest edition of his book himself—an arrangement between author and publisher that may well become more common in the future, as technology streamlines the book production process. "I sent the manuscript to the typesetter by modem," Bates explains, "and produced camera-ready boards." Working with book designer Ina Salt, Bates completed in three months what he says would have taken a publishing company nine months to do.

The money saved was spent on artwork; as a result, the coming edition of his

book will, according to Bates, be 'infinitely better' than previous editions.

With royalties for *The Computer Cookbook* in excess of \$100,000 a year, Bates could take it easy. Instead, he's left Berkeley for New York City, where he's developing software, researching via on-line systems, and corresponding through electronic mail. He has a ten megabyte hard disk, with four or five megabytes of notes; there's also an Atari 400 computer, for using Chemical Bank's homebanking service, Pronto, and playing *Pac-Man*.

—MARINA HIRSCH

The 1984/85 edition of The Computer Cookbook is available in paperback. Projected price: \$14.95.

ONE OF THE highest-paid computer writers in the country is about to earn a little more. In the largest computer book publishing deal ever made by one author, William Bates recently sold Doubleday & Company the rights to *The Computer Cookbook*, for \$105,000.

Doubleday's edition of *The Computer Cookbook* will mark the book's fourth ma-

HOT OFF THE PRESS

SUMMER MAY BE the season for swimming and surfing, but it's also the time to catch up on your reading. Here is just a sampling of some new microcomputer books, hot off the presses:

- **The Atari User's Encyclopedia**, by Gary Phillips and Jerry White, is published by The Book Company, a division of Arrays, Inc. It includes thousands of brief, easy-to-read entries collected and collated from a number of sources—books, manuals, software documentation, club newsletters, magazines, and technical references. With an emphasis on programming in ATARI BASIC, this book is perfect for users who are ready to move beyond games. Each entry is referenced and cross-referenced. Beginners will find the "Beginner's Tutorial," a step-by-step guide for beginning programmers particularly helpful.

- **The Book of Atari Software 1984**, edited by Jeffrey Stanton, Robert P. Wells,

Sandra Rockowansky, and Michael Mellin, is also published by The Book Company. Scheduled to be updated yearly, it is a concise source that describes, evaluates, and rates hundreds of the most popular Atari entertainment, business, education and utility programs. It also includes a current list of Atari software vendors.

The price for each of these gems is \$19.95 (paper).

- From Howard W. Sams & Co., Inc. comes Don Lancast-

er's **Micro Cookbook, Volume 2**. Part of a series on microprocessors and microcomputers, this book offers a comprehensive introduction to machine-language programming, using a group of "discovery modules." Virtually all available operating codes are explored, as are the details of flowcharting, testing individual bits, creating text messages and using files, subroutines, and interrupts. The price is \$15.95 (paper).



SOFTWARE GETS NUMBERED

THE MOVE IS ON to catalog and number U.S. software products and make searching for specific titles easier.

As in the ISBN system—the book and periodical numbering standard developed in the 1960s—products will be identified in code by software manufacturers. The code number and title will be listed in a retailer reference guide and a consumer-accessible data base which will tell you who the manufacturer is, how to get the product, and other information like computer-compatibility, minimum memory requirements, and

software format.

Due to the profusion of similar software titles and manufacturer names, a few indexing companies have already come up with their own versions of software cataloging. The Library of Congress' American National Standards Committee (ANSC) took the hint and in April 1983 formed a subcommittee, the National Information Standards Organization, to study the problems and develop a numbering system.

Having come to agreement on the numbering format, the committee has to

submit the draft standard to public review. The draft will go to manufacturers, retailers, users' groups—anyone who will have to use the system. Once all comments have been reviewed, the draft goes to the ANSC.

Implementation of this nationwide numbering system is expected by early next year. Software manufacturers and retailers can get more information on the subcommittee by calling: Sandy Paul (Chairperson) at (212) 675-7804 or Pat Harris (Executive Administrator) at (301) 921-3241.

—MYRNA RAE JOHNSON

PLATO

The Product and the People Behind It

by Paula Polley

They said it couldn't be done. They said you couldn't take main-frame technology as advanced as that in Control Data's Plato—the world's most extensive computer-based instructional system—and access it with a home computer. And even if you could, they said, you still couldn't make an everyday television screen perform like the Plato terminal.

But through the technical genius of one Atari engineer and the professional expertise of Atari Learning Systems educators, Atari has done it. They've created an 8K cartridge that will allow any Atari home computerist to experience Plato!

It looks like any other Atari cartridge. But this little bundle of silicon can bring you over 8,000 hours of lessons—from Control Data main-frame computers—on a staggering variety of subjects (see sidebar).

With over 15 years of research and development behind it, Plato serves as an example of what can be achieved through the combined cooperation of universities, business and government. The system originally was a research project in the Coordinated Science Laboratories at the University of Illinois. Its development has been supported by the National Science Foundation,

the state of Illinois and other government agencies, as well as by Control Data Corporation.

No other computer-based education system can provide such uniformly high-quality education and training to so many people. Because Plato is generated via telecommunications services, it can meet the needs of students studying entirely different subjects at a wide range of levels. It's a total learning environment that's self-paced, interactive, flexible and friendly. So students and trainees enjoy the optimum in fast and effective progress. Plato computer-based education has been available to the public since 1976 and is now being used in business, industry and government, colleges and universities, vocational and technical institutions, as well as in elementary and high schools.

As uniquely powerful as the system is, however, it had one major drawback: you needed a special Control Data terminal to access its incredible database. It was too expensive for general home use. Until now.

Atari is the first micro-computer company to develop a cartridge that allows the Plato system to be accessed on a TV. or monitor. So now one of the world's most sophisticated computer networks, developed at a



Dorothy Deringer: "A tradition of research and development."

total cost of more than a billion dollars, has the potential to reach home computerists worldwide.

Atari hardware technology is part of the reason for this breakthrough. But Atari has another very special advantage: its people. Both engineer Vince Wu and Vice President Dorothy Deringer of Atari Learning Systems have long-standing technical and creative involvement with the development of Control Data's Plato. As early as 1969, Wu worked at the University of Illinois Plato laboratory where he did his post-graduate work in mathematics. He was technical manager for the development of the French language project, and later for the elementary math program. By the time he left the program in 1979 he had worked in the University of Illinois medical computing laboratory and had supervised the nationwide installation and ongoing operations of 80 Plato terminals.

While Wu was working for the University of Illinois, Dorothy Deringer was in a position to implement another side of Plato's phenomenal success: in the early '70s she was a program director for the National Science Foundation.

"My group was responsible for several grants and a contract to Plato which eventually totalled nearly eight million dollars," she recalls. "The National Science Foun-

Vince Wu: "I thought of it one morning during my hour-long commute."



PHOTOGRAPH BY RANDI ROHDE

dation supported this project, with the approval of Congress, as a proof-of-concept demonstration of a highly innovative use of computers in education. At the time it was one of the largest government investments in computers in education."

"When I first came to Atari," Wu tells, "there was already an early version of the Plato cartridge. But because Plato displays 64 characters per line and Atari normally displays only 40, this early version required the user to scroll horizontally across the screen to read the entire Plato display. It was like watching a baseball game through a keyhole."

Wu pushed Atari technology to display all 64 characters on the screen at one time. "But it didn't look good," he says. "The letters were fuzzy."

"One day I left the system on while I was at a long meeting. When I returned the image was clearer. The computer had gone into the attract mode and the color and luminance changed to the right point where the legibility was totally enhanced. It was serendipity."

Another feature that Wu brought to the Atari version of Plato is a zoom function that uses the Atari

joystick controller. By pressing the fire button, the Plato user can zoom in on a 32 percent area of the screen and then scroll—in zoom mode—to other parts of the screen. This is particularly valuable for the many Plato programs that include detailed graphics displays.

"I thought of that one (the zoom feature) during my hour-long commute one morning," he recalls. "The

Plato: "Necessity is the mother of invention."



scrolling wouldn't have been possible without unique capabilities of Atari's ANTIC chip. In fact, the entire program utilizes the Atari computer's capabilities to full extent."

When Wu ran into bugs or needed suggestions during development, he simply put out messages on the Plato electronic mail system. Colleagues from all over the country responded to his messages through Plato electronic mail service.

"Because Plato began in an educational environment," explains Wu, "it's rooted in the spirit of camaraderie. There's a friendliness, openness and willingness to share ideas and discoveries that you can't find in other telecommunications networks."

"That's right," agrees Dorothy Deringer. "One of the most important things about the Plato system is that research and development is an ongoing tradition. The tradition started at the University of Illinois 15 years ago and has spread to universities, businesses and now will be available in homes all over the world. What could be better than a learning system that's continuously generating new ideas?" □

ELECTRONIC ENLIGHTENMENT

OWNING A PLATO cartridge is like being enrolled in a grade school, high school, college, technological trade school, medical, business and law schools, and doing research at a library—all at the same time. Once you're on-line with the Plato system (a modem will get you there), you simply type in the first few letters of a subject you're interested in and Plato brings up an index of courses.

You'll find courses such as:

- The Advertising Game (a two-player economics game)
- Aerospace engineering games
- Complex sentences with adverbial clauses.
- Drawing structural formulas
- Geometric optics
- Introduction to computers
- Keno
- Multiplication of fractions
- Russian reading
- Volleyball strategy

And so on. We can't list all 8,000 courses and applications here, but the opportunities for knowledge, enrichment and sheer enjoyment are endless.

Plato addresses its subject material with conversational text, challenging review tests and delightfully designed graphic displays. Most telecommunications networks merely spill letter characters across the screen—all in the same size and font, and at the same speed. But Plato is constantly surprising you with different sizes, styles and deliveries of its character displays.

The Atari program for accessing Plato—part of the Atari Learning Systems series—uses the joystick controller to simulate touch-screen capabilities. If you're studying anatomy, Plato gives you a detailed illustration of the human body and its organs. When the system asks you

where a particular organ is located, you simply use your joystick to move the cursor to the correct spot. This feature is particularly valuable for working with Plato's early reading programs in which young students are asked to point to certain letters and pictures.

Because Plato is on a time-share network you're going to need a modem along with a Plato subscription. Any of Atari's three modems will work perfectly. Obtaining a subscription is as simple as typing in your credit card number. And once you're "on-line" with Plato, you've opened the door to a whole new world of education, communication and computer awareness.

Cartridge available Summer, 1984. Requires 16K RAM. Suggested retail price \$49.95.

MEET YOUR MATCH

Personal Computers Get Personal

by Dr. G.

FORGET SINGLES BARS and personal ads. The newest way to make friends and meet people is through a Dial-Your-Match system. DYM bulletin boards allow anyone with a phone, a modem and a home computer to connect into a nationwide network of people looking for a friend, a mate or, well, a good time. At last, the truly personal use for your personal computer!

With more than 500 electronic-bulletin-board systems (BBSs) in the United States, it was inevitable that there would be an exchange network dedicated to getting people together. The main function of the DYM systems is to match you with a compatible "someone," harnessing the power of the computer to introduce people with like interests. Users change daily, so the DYM offer variety and spontaneity. The systems computer-qualify you through personal questions; the answers are matched to similar lifestyles, hobbies, habits, interests, preferences, education. Commonly asked questions include age, eye color, height, weight, hair color, musical tastes,

living situation, whether you smoke, and so on.

Once you've answered these and other questions, DYM searches its files for a match. You're then given a list showing the "address codes" of likely candidates (Jack211, Jill301) and their percentage of answers matching yours. Results may yield from one or two matches to more than 50. Each DYM system has somewhat different features and themes so results poor on one system may be excellent on another. Many DYM allow you to select the degree of selection you prefer, say 20 percent compatible, 30 percent, all the way up to 90 percent!

The computer-matching process is done in real time, usually taking less than five minutes. Carefully record or print out the list of address codes—you'll need them to "browse" a person's answers to the questionnaire. After browsing the personal answers, and getting to know a few people (electronically speaking), select several prospects and send them electronic mail messages. The E-mail feature allows

note-sending to either a selected party or all users of the system. Messages range from recommending a good book or movie to more serious propositions. Optimally, like-minded individuals will respond to your message by sending you a return E-Mail message which you retrieve with your own address code. The rest is up to you.

These computer-matching bulletin boards attract hobbyists as well as romantics, allowing a wide diversity of people to meet. System users tend to vary with their geographical area (the Sunnyvale, Ca. DYM, for example, offers lots of young professionals from high-tech businesses, like Atari, Inc.; the Los Angeles DYM networks have a younger crowd), and there are varied cultural and interest backgrounds on any given system. Often 50 percent compatibility is considered good. Lots of choices mean lots of chances to match someone. DYM are available to all age groups (18 or over, please!) and accessible all hours of the day. Since only a computer and a modem are needed, this is a low-cost pastime. The systems are maintained as a labor of love, if you will; most of them cost nothing but your phone time.

Using this computer-matching service, the old Doctor came up with some interesting personality profiles. For instance, Julie from Berkeley, a single, blonde, blue-eyed Libra, whose favorite things are "rock music, and being alone with someone special." She matched the old Doctor on 77 percent of the system's questions. Julie has a four-year college degree, a cheerful, outgoing personality, a small circle of close friends, enjoys the performing arts, likes to dress casually, considers herself a penny pincher. She wants to live in a city and feels she should be "true to her partner." Sounds like my kind of gal... I can't wait to meet her.

After all, I would have settled for a 20 percent match!



THE EASY LOG-ON

1. Dial the DYM phone number in your area.

If the number is busy, call back in four or five minutes. These systems allow a new user to log-on every 20 to 25 minutes. Keep calling and you'll get on.

2. After making a phone connection, if you get a blank screen, hit [RETURN]. Your screen should display a moving cursor, then a Dial-Your-Match "welcome" screen.

3. To remain connected, answer the first few questions with a "yes" or a [RETURN], depending on the system. Some systems will ask "How much delay?" or "How many nulls?" For Atari hardware "0" is the answer.

4. Respond to the personal

questions as honestly as possible. But don't answer any questions you don't want to become public knowledge. The answers to these questions can be accessed by anyone who matches a percentage of your answers.

5. At the prompt "What Now?" select the "M" option on the menu. With luck, this will reward you with a list of several "ideal" matches. Record this info for future reference!

6. With the "connect" time you have remaining—there is usually about a 30-minute limit—pick the most promising matches and enter their "address codes," selecting the "Browse Questionnaire" menu option.

Using this method, the old Doctor has collected a ream of compatible persons' answers from ten different DYMs around the country. A list of other DYM systems is available as an option on the main menu.

SELECTED DYM NETWORKS

1. Burbank, Ca. (213) 842-3323—lots of expensive hardware, upscale crowd, salary question asked.

2. San Francisco, Ca. (415) 991-4911—liberal world views, variety of occupations and interests.

3. Sunnyvale, Ca. (408) 736-7356—high-tech users.

4. Freehold, N.J. (201) 462-0435—New York City access.

5. North Hollywood, Ca. (213) 980-6482—HOLLYWOOD!

6. Florida (305) 741-5860. Note: \$5.00 one-time mail-in charge.

7. Scott, La. (318) 289-4973—southern hospitality.

8. Schaumburg, Ill. (312) 289-4973—Chicago access.

9. Flint, Michigan (313) 736-1398—students and business people.

10. Harrisburg, Pa. (717) 657-4997—good source of other East Coast DYM numbers.

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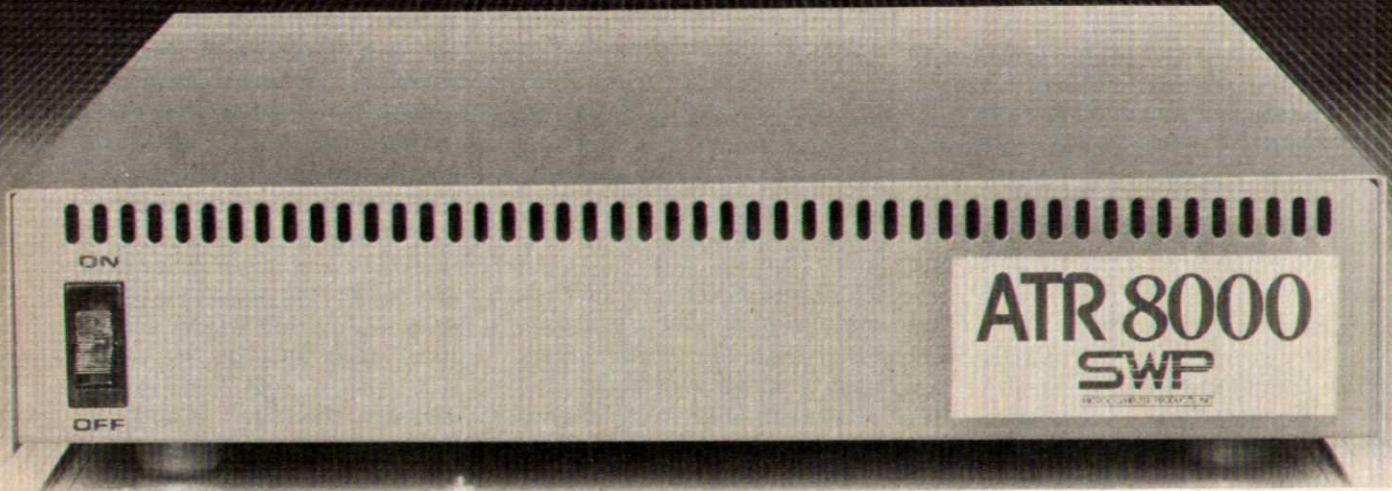
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—Byte Magazine

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KIDBITS

FIND THE BUG WINNER

by Myrna Rae Johnson

Dawn was breaking like eggs in a skillet. I'd been out all night checking out leads that took me nowhere. The sun began peaking through the blinds like the light through prison bars when Belva burst in.

"Oh, Mike! My cousin called right after you left last night. He wants you to call him at the computer convention center. He says he's got something for you."

"Thanks, Doll."

I called him and he said he had ideas about this case. I told him I'd send Belva right over.

The case had taken more turns than a roller coaster in a 3-D movie. My client had come to me two days ago with a problem she said only I could handle. She and her boyfriend had been walking home from a night on the town when they were jumped by some small-time hoods. The boyfriend was carrying a top-secret code program that ended up looking like sliced Swiss cheese.

They couldn't go to the police because the code was so hush-hush. The doll told me that the numbers for the decode line in the program were missing and they had had something to do with the code line being reversed. When I read the program pieces she left me, the only remaining clues were the letters EYX on the edge of the tear.

It came to me when I fixed my tie in the mirror. It was as easy as falling off a cliff.

I wrote down the original code-line sequence. Its letters and numbers were tangled like a spaghetti dinner at Mama Masoretti's:

P1QLAMZ2WO0SK8XG9I3EJDNCBVFH4R7U5T6Y

Then I wrote a regular alphabet on top of it:

ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789
P1QLAMZ2WO0SK8XG9I3EJDNCBVFH4R7U5T6Y

I took each letter from the code string and put it above the corresponding letter in the regular alphabet, like stacking a house of cards.

E D AC B
ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789
P1QLAMZ2WO0SK8XG9I3EJDNCBVFH4R7U5T6Y

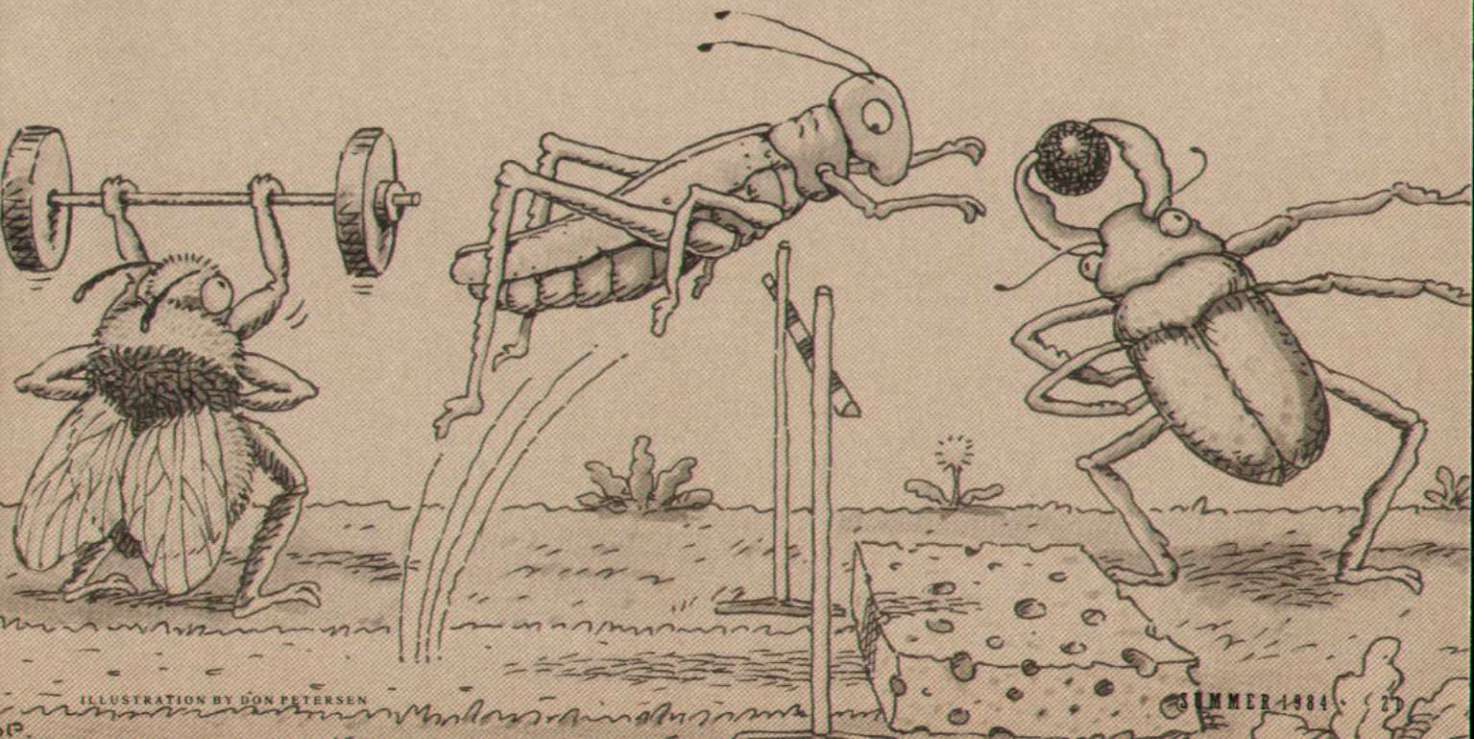
When I finished, I had a CLEAR string that looked like this:

EYXVTOP1RUMDFWKAC3L75ZI09GJBHS2684NQ
ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789
P1QLAMZ2WO0SK8XG9I3EJDNCBVFH4R7U5T6Y

Then I knew I was right. The CLEAR string started with the letters EYX.

I had a foot-wide grin on my face when Belva came in excited. "Here's my cousin's explanation about the code!"

She handed me the paper. I didn't tell her that the whiz kid wasn't the only one who figured it out. I read his letter:



Dear Mike,

I have "found the bug" of your encoder/decoder program. My solution is to add line 25, which sets CLEAR\$ equal to the supplement of CODE\$ to be used in decoding:

25 CLEAR\$=

"EYXVTOP1RUMDFWKAC3L75ZI09GJBHS2684NQ"

I also deleted the last statement in line 90, IN\$=CODE\$. This assignment to IN\$ serves no purpose, and it "erases" whatever the input was in the statement right before it.

In case you need the information, I am 14 years-old, and I have owned my Atari 800 for a year and a half; I really do enjoy it. I am quite "fluent" in BASIC, and I have a firm grasp of 6502 Assembly language. I enjoy database programming more than games, and I have written several packages including a mailing list which I use to keep professional mailing lists. Being the business manager of my school's student newspaper, I have also written a package to keep up with advertising billing, etc. I have often been asked if I regret getting an Atari computer instead of an... [well, we don't have to mention any names!] and my answer is always NO. The Atari computer is a well-designed, well-supported machine!

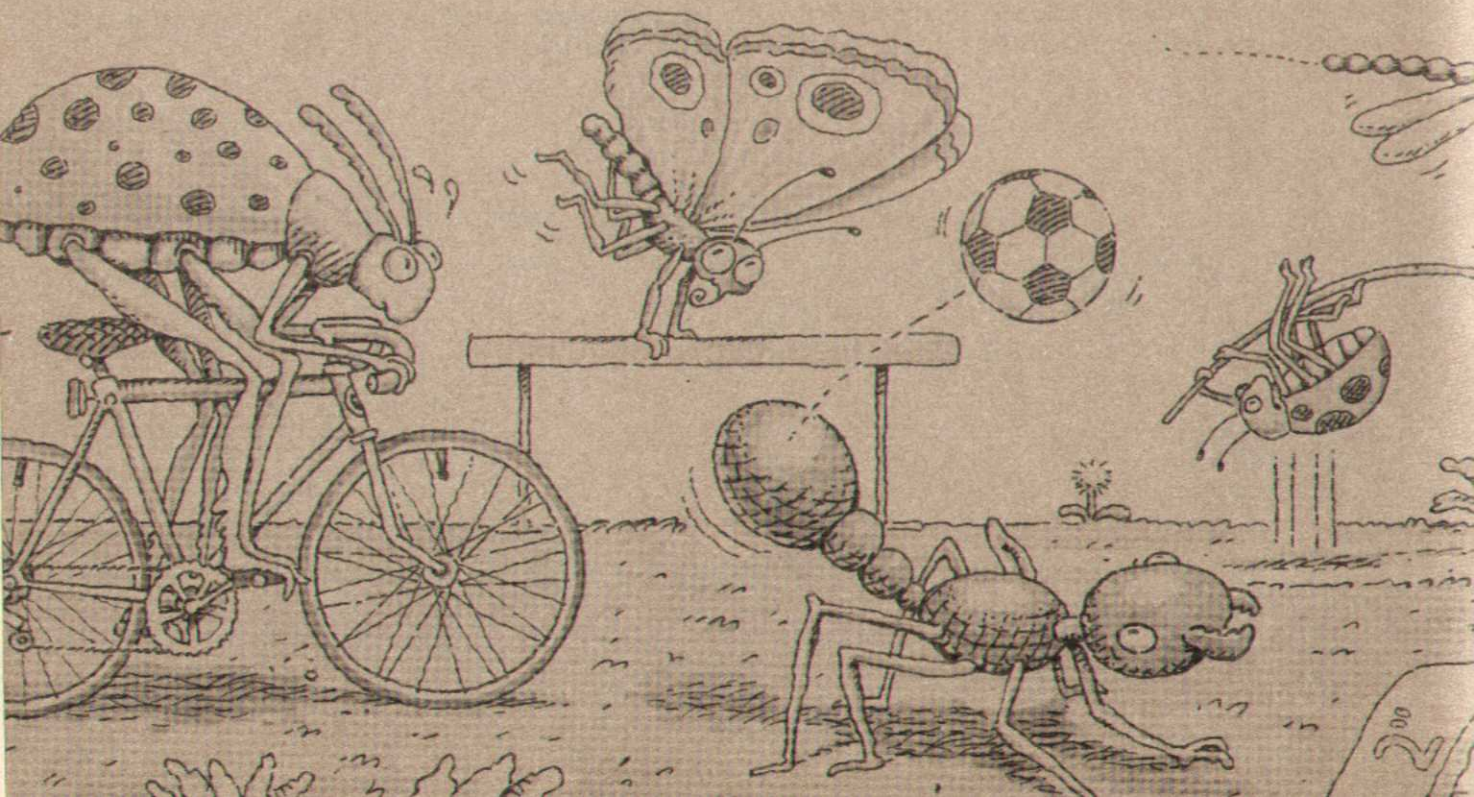
Wade B. Rogers
Charlotte, North Carolina

Good kid, and he certainly deserved the reward of a Pole Position game I promised just in case my touch went south.

I looked out the dusty window. It was just another smoggy morning in the big city. At least we're doing right by the kid. I closed the blinds.

CODEBREAKER

```
10 DIM CODE$(36), IN$(200), OUT$(200), FUNC$(1), CLEAR$(36)
20 CODE$="P1QLAMZ2W0OSK8XG9I3EJDN
   CBV4R7U5T6Y"
25 CLEAR$="EYXVTOP1RUMDFWKAC3L75Z
   I09GJBHS2684NQ"
30 CAPA=ASC("A"):CAPZ=ASC("Z")
40 ZERO=ASC("0"):NINE=ASC("9")
50 ? CHR$(125):? "-----C
   ODE MAKER-----"
60 ? "ENCODE OR DEC (E/D)";:INPUT
   FUNC$
70 IF FUNC$<>"E" AND FUNC$<>"D" T
   HEN 60
80 IF FUNC$="E" THEN ? "ENTER TEX
   T TO ENCODE":INPUT IN$:GOTO 10
   0
90 IF FUNC$="D" THEN ? "ENTER COD
   E TO BE DECODED":INPUT IN$
100 FOR C=1 TO LEN(IN$):CH=ASC(IN$
   (C,C))
110 IF CH=32 THEN GOTO 160
120 IF CH=CAPA AND CH<=CAPZ THEN
   I=CH-64:GOTO 140
130 IF CH=ZERO AND CH<=NINE THEN
   I=CH-21
140 IF FUNC$="E" THEN CH=ASC(CODE$
   (I,I)):GOTO 160
150 CH=ASC(CLEAR$(I,I))
160 OUT$(C,C)=CHR$(CH):NEXT C
170 ? :? :IF FUNC$="E" THEN ? "THE
   CODE IS:"?:OUT$:STOP
180 ? "THE TRANSLATION IS:"?:OUT$
```



FIND THE BUG

IN THE PACKED Coliseum, with the flaming torch high above, an international collection of contestants is limbering up for the day's events. They perform for the cheering crowds, racing the clock in the cooling ocean breezes. On the sidelines, an Atari computer is keeping a ranked list of the top performers in The First Bug Olympics.

Track events include LOAD File Error Putting, System Lockup Relay, String Error Throwing, and Illegal Command Hurdling. The extremely popular Syntax Error weight event is about to begin.

Suddenly, there's a commotion in the press pit. The computer-ranking program has stopped—it won't move the names! One of the contestants must've used the program for warming up!

FIND THE BUG CONTEST

To use this program, type in the listing as shown. When the system prompts, enter the rank (1-9), a space, then the athlete's name (8 letters or less) that you want to sort.

When (and if!) the prompt "What numbers to change?" appears, type the number to move, a comma, then the position you're moving to.

Try to re-arrange the numbers in as few moves as possible; the program will award you a medal based on the amount of moves you've taken to place the performers in their proper order.

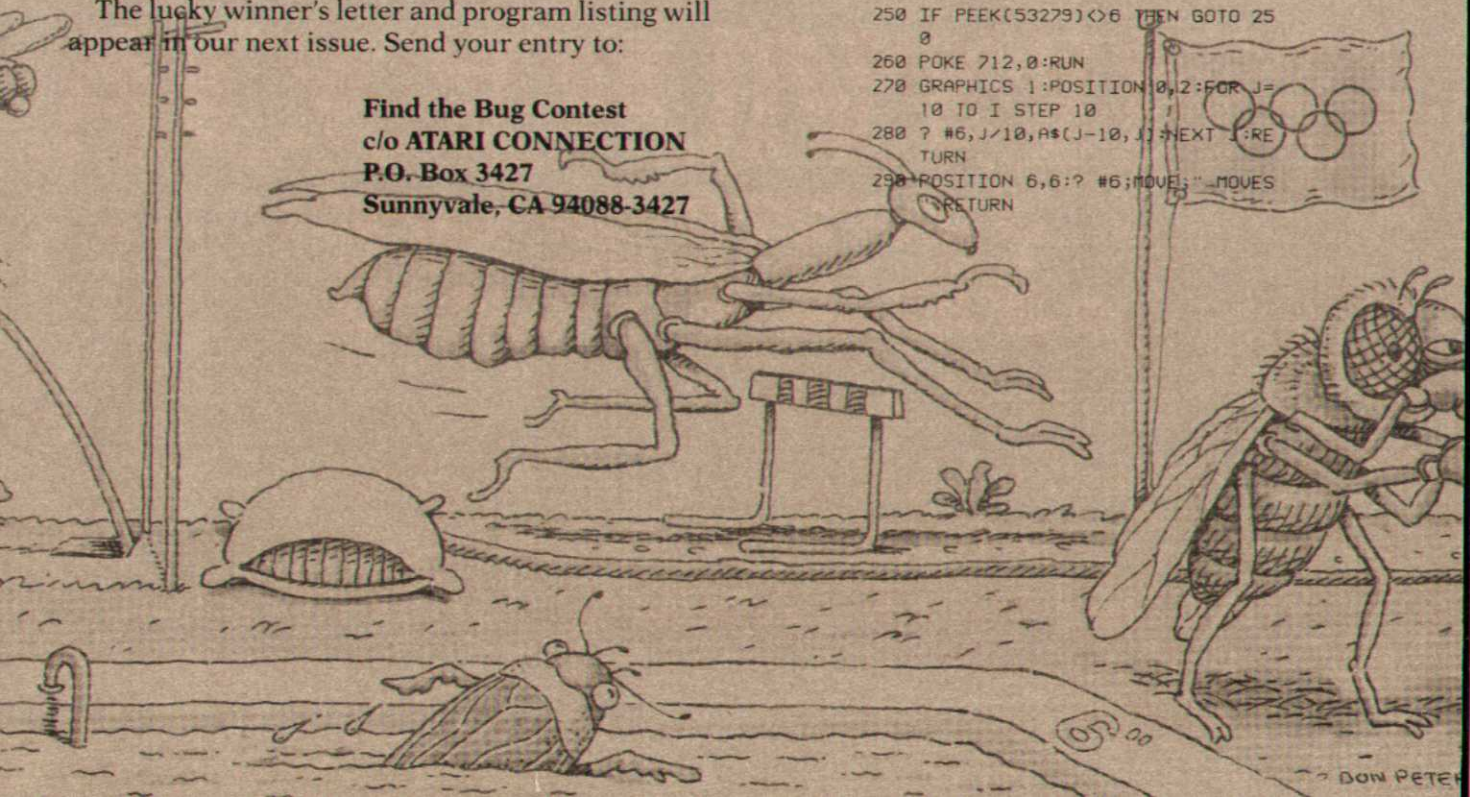
If you can find the bug and fix it, send your program listing to ATARI CONNECTION, along with a short message about yourself. If your entry is correct, you'll qualify for our prize drawing for the favorite hobby of pole vaulting bugs: *Joust*.

The lucky winner's letter and program listing will appear in our next issue. Send your entry to:

Find the Bug Contest
c/o ATARI CONNECTION
P.O. Box 3427
Sunnyvale, CA 94088-3427

OLYMPIC SORTER

```
10 REM Go For The Gold!
20 REM BY DAVE MENCONI
30 DIM A$(110),LINE$(10)
40 ? CHR$(125):? "ENTER UP TO 9 A
THELETES.":? "PRESS RETURN TO
STOP EARLY":?
50 A$="" :A$(100)=" " :A$(2)=A$:PO
KE 201,4:MOVE=0
60 FOR I=0 TO 80 STEP 10:?"WHAT
IS NAME # ";(I+10)/10:;INPUT L
INE$
70 IF LEN(LINE$)=0 THEN POP :A$(1
00)=" " :GOTO 90
80 A$((I+10)-9,I+10)=LINE$:NEXT I
90 GRAPHICS 1:GOSUB 270
100 MOVE=MOVE+1:?"MOVE # ";MOVE:?"
"WHICH NAMES TO SWITCH":?
110 INPUT N1,N2:N1=N1*10:N2=N2*10
120 LINE$=A$(N1-9,N1)
130 A$(N1-10,N1)=A$(N2-10,N2)
140 A$(N2-10,N2)=LINE$
150 GOSUB 270
160 FOR J=20 TO I STEP 10:T=J-10:I
F A$(T-9,T)>A$(J-10,J) THEN PO
P :GOTO 100
170 NEXT J
180 GRAPHICS 18:POSITION 4,4
190 IF MOVE<=4 THEN POKE 708,30:PO
KE 712,148:?"#6;"GOLD MEDAL!":
GOSUB 290
200 IF MOVE>=5 AND MOVE<=7 THEN PO
KE 708,110:POKE 712,195:?"#6;"
SILVER MEDAL":GOSUB 290
210 IF MOVE>=8 AND MOVE<=10 THEN P
OKE 708,36:POKE 712,96:?"#6;"B
RONZE MEDAL":GOSUB 290
220 IF MOVE>10 THEN POKE 708,148:?"
#6;"NO MEDALS TODAY":GOSUB 29
0
230 FOR I=100 TO 1 STEP -1:SOUND 0
,I*2,10,8:NEXT I:SOUND 0,0,0,0
240 POSITION 5,11:?"#6;"PRESS star
t"
250 IF PEEK(53279)<>6 THEN GOTO 25
0
260 POKE 712,0:RUN
270 GRAPHICS 1:POSITION 0,2:FOR J=
10 TO I STEP 10
280 ? #6,J/10,A$(J-10,J):NEXT J:RE
TURN
290 POSITION 6,6:?"#6;MOVE:":MOVES
:RETURN
```





A CHIP OFF THE OLD BLOCK

Software for A Maine Hardware Store

by Elizabeth Metzger

IT ISN'T EVERY 14 year old who helps expand his father's business. But that's what Chip Towle is doing these days for his father's store, Towle's Hardware and Lumber Company of Dixfield, Maine, a small mill town 80 miles from the Atlantic coast. And it's all through an Atari 800 computer.

"In 1980 my father bought me an Atari 800," explains Chip. "I learned about computers at school. That's where I also learned BASIC. A year after he bought me the computer, I was almost an expert in BASIC. My father came to me needing a good cheap way to advertise the products in his hardware store. And together we came up with a solution."

What followed was a joint venture in direct-mail advertising. Chip's father drew up a basic layout and wrote the ad copy; Chip wrote a BASIC program to format the ad. Next they secured a bulk-rate postage permit, printed out 1500 copies using a NEC 8023-A printer and mailed the ad to potential customers in half a dozen neighboring towns.

"My father has had spectacular results," says Chip. "We find that about 30 percent of the people who come into the store came in because of the ad."

Chip, who goes under the title, "C. Towle, Man-

ager of the Computer Advertising Division of Towle's Hardware," mails out new ads every two months. "It usually takes me a couple of hours to make the changes my father wants," he says. "My father pays for the cost of paper, postage and printer ribbons, then pays me for the program, printing and sorting. It's a great part-time job!"

The advertising manager also uses the Atari computer to generate and store mailing lists and to organize the "price book"—an updated list of prices for building materials. Chip is planning to expand his record-keeping system and create "fancier" advertising, using colors, borders and preprinted paper.

Chip hopes to learn Assembly language and eventually "get into telecommunications." With all the computing he's doing, Chip is certainly getting an early start on his career—"something with computers, maybe connected with management."

When he isn't hard at work at the keyboard and can squeeze in some free time, Chip likes to water ski, snow ski and play the guitar.

For more information—or to get on his hardware mailing list—contact Chip Towle, Weld St., Dixfield, Maine 04224. Call (207) 562-7595.

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That adds up to formidable Atari performance at about *half the price of an Apple*; hardly a "games" machine!

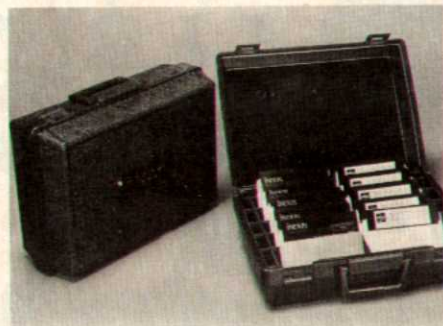
| EQUIVALENT SYSTEM PRICE COMPARISONS: | | | |
|--------------------------------------|----------------|--------------|-------------|
| | ATARI 800XL | Apple //e | IBM PC |
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| TOTAL HARDWARE | 1991 | 3014 | 4113 |
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| Payroll | FREE! | 395 | 595 |
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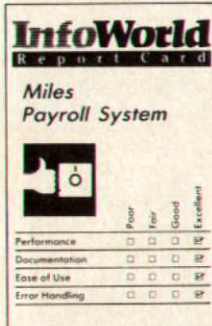
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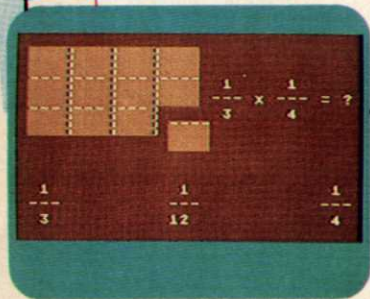
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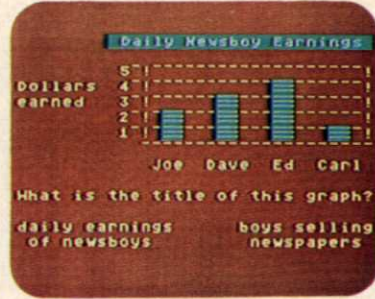
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SENIORS TAKE TO COMPUTERS

by Charlotte K. Beyers

IT'S FRIDAY AFTERNOON in the computer laboratory at Little House, a community center for older people in Menlo Park, California. As usual the small room is crowded. Four students, each well over 60, are using the three Apples and one Atari 800 computer. Their concentration is almost tangible. A woman wearing a blue crocheted hat asks, "What do I do now? These strings of numbers don't come out the way they should."

Matt Lehmann, 75, who started the present computer program and wrote the lessons for it, suggests she put the figures in quotation marks and try again. Lehmann, who is also a lecturer in information systems at Stanford University, thinks Little House is possibly the only senior center in the United States with such a program. Seniors can take beginning or intermediate classes, learn how to create their own programs and join a computer club.

The program began three years ago when Marianne Mannia, executive director of gerontological services for Little House, discovered that Lehmann, a Stanford researcher in holography and member of Little House, had a computer at home. She asked him to teach seniors to use the computer, and he immediately agreed. That first course had four members; to date over 200 more have taken it.

Seniors enjoy taking the class because they want to continue being mentally alert, according to Merry Lee Eilers, a Stanford anthropology student writing a thesis on the Little House computer program. The computer helps them keep up with the outside world as well as with their grandchildren, she says. "They find it both challenging and fun."

The computer literacy program has spawned a self-sufficient enterprise: a computer club whose members sell lessons—written by Lehmann—to teach beginning computerists of all ages BASIC program-

ming, word processing and database management. The club offers discount prices on diskettes and an attractive insignia pin; the proceeds purchase more hardware.

The club has also sparked a romance. Patti McKibbin, 65, and Bob Green, 55, met in the computer laboratory and plan to be married soon.



Forever young: Grace Young of Little House gets a kick out of computing.

McKibbin, who had previously worked as an actuary, learned to use a large mainframe computer in the 1960s. She was in that first four-student computer class at Little House in 1981. "I borrowed some books from the library and taught myself. Then I began teaching others. I never taught before, and it has given me more pleasure than anything I have ever done."

She has a computer at home and uses it for word processing, tracking her investments and organizing trips to the symphony and ballet.

Her fiancé, Bob Green, says, "We're teaching elementary programming using BASIC just to give people an idea of how instructions are fed into a program. The elementary classes are designed to teach how computers work and show what they can do. Computers are

giving seniors new meaning in their lives. It's an exciting pursuit and helps prevent us from withdrawing from the world."

Computers are enriching the lives of seniors by giving them a useful hobby, agrees George Simpson, 62, treasurer of the computer club. "The computer prevents us from just sitting around and watching television. It helps us stay away from nursing homes and keeps our minds active," he says.

For a long time Alice Spinks, a former pharmacist and school teacher, has wanted to write a program listing all the medications a person is taking to make sure that the drugs

aren't working at cross purposes. A person who is taking large amounts of calcium may not know it can harm the liver, she explains. She spends at least four hours each week at the computer lab and an equal amount of time working on her own home computer, which she uses to teach the neighborhood children how to read. "It's a wonderful tool. You just let the child play while he learns," she says.

Marianne Mannia of Little House thinks the program is providing many new opportunities for seniors. "It enables women who have become widows to have the chance to work with men again."

Mannia hopes that all 3,000 members of Little House will try the computers. "It's a dynamic program and we hope other senior centers will learn from us." □

THE SOUND OF MICROS



TWENTY-SIX-YEAR-old Jeffrey Gusman is a classical music up-and-comer. He hasn't written a gigantic body of music as yet, but if you put an *Obelix* cartridge in your Atari 2600 VCS and listen to the melodies that accompany the little Roman gladiators you'll hear one of Gusman's recent compositions. Gusman—Atari's staff composer—wrote leitmotifs ("the way Wagner did") for each of the characters in the game.

And if you pay close attention to new works on the classical scene, you may catch an occasional Gusman composition. He studied advanced composition at N.Y.U. and Juilliard. Attended the prestigious Akademie fur Musik in Vienna. Worked under maestro Vladimir Padwa (who studied with Busoni, who studied with Liszt) and jazzman Jimmy Guiffre.

Or, if you prefer, you can drop a coin into Atari's hot, new arcade game, *Firefox*, an interactive videodisk adventure for which Gusman wrote an astonishing, modular, 30-part orchestral score that fits together thousands of different ways to provide a seamless, pulse-stirring soundtrack regardless of which of 120 path-choices the game takes.

It started with an anonymous

phone call. "They asked me if I wanted to be a corporate composer," says Gusman, who has wavy hair, and wears large glasses and a belt-buckle shaped like a grand piano. He's got a second grand piano around his neck in the form of a gold charm, and a third one—a real one—dominates his Sunnyvale living room. "They said Bach and Haydn had been court composers, which is pretty similar," he recalls. "I thought it was a joke, but it wasn't—it was Atari.

"They told me that blips, blops and sound effects were no longer going to be the norm. They wanted to put real music on every product where it's game-purposeful. And I thought, 'How interesting, to write music for videogames.'" Gusman—who was then making his mark as an up-and-coming composer-arranger-producer, with frequent assignments for NBC, ABC, Texaco and Walt Disney—joined Atari in May 1983.

Like most modern composers, Gusman is used to working with music synthesizers he describes as so advanced that the process of sound manipulation is like "performing surgery, or splicing genes." The first thing he discovered at Atari was that neither the 2600 nor the 5200 game machines were very good at playing music.

"They weren't *designed* for music," he says. "The 2600 will only

play two sound channels—two notes (or one note and one sound effect) at the same time. The 5200 can play four channels, but the sound-generation capabilities of both machines are elementary at best. We only have 32 notes in the scale from which to pick. We can vary the duration and volume of the notes to a limited extent, and the 'ADSRs' (the combination of attack-decay-sustain-release that makes a 'C' on a violin sound different from a 'C' on a tuba). But each specification we make uses up a couple of bytes of memory. And every time we turn a note on or off, we're using up a couple more. So if we have an 8K cartridge, and the programmer has used most of it for visuals and basic sound effects, we have to fight for music bytes." If memory is *very* short, he adds, videogame music tends to be written algorithmically—more for the elegance and efficiency of its computer code than its aesthetics.

OF COURSE THERE ARE compensations. One of them—a computerized music editor for the 2600—boots up on Gusman's Atari computer to produce three rectangular windows marked FREQUENCY, CONTROL and VOLUME. Gusman places an off-the-shelf joystick in his lap, draws a red, ascending stair-step graph in the frequency window, and straight horizontal lines for control and volume. "All right, let's see if



Jeff Gusman's classical training shows up in his surprising, modular compositions for Obelix, Firefox and other hit games.



Tools of the trade: The electronic composer's studio is crowded with keyboards.

this works," he mutters. A thin vertical line scans across the screen, and we hear a three-second burst of burps in a rising pitch that matches the stair-steps precisely. The burps play over and over.

"Only a couple of these control settings produce music," says Gusman, as he redraws the "control" line and the burps change to musical tones. "I can speed them up, too," he adds, changing a control function. Now the scale plays four times a second, like a tiny siren. "And I can change the setting for any part of the scale." He redraws the second half of the "control" line. Now the first half of the siren tones are notes, and the last half are burps.

Gusman cuts the speed in half, redraws the last third of the volume line at a softer level, and changes the margins so we're only listening to the middle-third of the scale. Then he begins giving each note an individual control and volume setting. "See," he says, "I've done quite a lot of sculpting already." By this time, the scale sounds like a Black Hole Warning Alarm on the Starship Enterprise. It plays over and over.

"Sometimes a combination of one of these purer tones with a noisy one will produce an interesting sound," says Gusman, changing control settings again. "Let's add another channel in green, so you can see. I'm not gonna compose anything spectacu-

lar, just another scale." Gusman sketches a jagged, green, down-sloping line over the ascending red stair-steps in the frequency window, and adds lines for control and volume. A second scale is superimposed over the first; it sounds like a rusty kazoo band riding a toboggan on a steep, bumpy, downhill run. Gusman listens. "No, the control position is wrong." He redraws it. Now there are *two* Black Hole Warning Alarms—one going up, one going down.

"We're hearing something that's basically musical," he says, "but watch what happens when I speed it up." He deletes the last third of the scale and triples the playback speed. With both channels playing simultaneously, the foreshortened, two-voice scale sounds like a Martian air-raid siren. "Who!" yells Gusman, happy as a kid. "Now *this* could be a sound effect! And if I wanted to keep it, the program would automatically print it out into code form the head programmer could use." He cuts off the computer. Silence falls.

"YOU WILL BE FLYING THE FASTEST, most sophisticated warplane on the face of this earth," announces a voice from the living room, where Gusman is firing up a tape copy of Atari's *Firefox*. On the TV screen, we seem to be looking through the front windshield of a jet fighter blasting through cloud-cover at just under light-speed. The images are photographic, high-quality, utterly convincing. Urgent music plays along, with a rhythmic bass bottom and sizzling synthesizer on top. Suddenly our plane swoops through a steep mountain pass to hug the ridge of a jagged mountain range. The music takes on a Slavic character.

"They supplied me with these visual elements every couple of days," says Gusman, "and I'd sit at the piano and try to come up with music that . . . fit the picture. Like the Slavic theme for the rural mountains." Our plane climbs into the clouds like a bat out of hell; on the other side, we find ourselves rocketing above snow fields. The music changes character again, and picks up an overlay of supersonic, high-end white noise. Suddenly, enemy aircraft appear.

"The game is built on maybe 50 'cells,'" Gusman explains, "50 short, visual sequences that get shuffled into different arrangements like a jigsaw puzzle depending on the player's decisions. You can pull up, stay close to the ground, attack, evade—it's totally interactive. Each cell always has the same music with it, but the music goes from beginning to end, nonstop, and it has to fit together seamlessly no matter what order the sequences are in." The snow gives way to ocean, and Firefox plummets toward the water. The music smooths out, grows more serene—until the enemy aircraft begin to attack. Firefox returns fire, and enemy planes explode into giant, hellish fireballs, accompanied by subsonic explosions that seem to be part of the score.

An aircraft carrier appears and we race toward it. "Hear that snare drum?" Gusman asks excitedly. "See the ship? That's the one clue I'll give away. There are lots of leit-motifs in the score that precede the visual events, so game players who play often will have musical cues to help them get better scores." The attacking aircraft surround us, explosions fill the screen, and we hit the water. The screen erupts into flame, and GAME OVER appears.

BUT IS IT ART? BY MODERN CLASSICAL standards, the answer is unquestionably "yes." A modular interconnected composition like Gusman's *Firefox* score is very similar to avant-garde experiments by cutting-edge composers like John Cage during the '60s. Even when Gusman scores simpler home videogames, he uses techniques established by pre-Minimalist composers like Webern and Schoenberg. "They've written concert music that's 16-seconds long, and uses three instruments, and is very difficult, virtuoso music," notes Gusman.

"I look at a video game as a similar challenge. Even if I only have six seconds at the beginning of a game, or a three-second button at the end to signify GAME OVER, I'm trying to write music of consequence." □

Michael Goodwin is a noted San Francisco screenwriter, author and music lover.

Light and Magic

THE MAKING OF THE ATARI LIGHT PEN

By Lewis MacAdams

WHAT IS A LIGHT PEN, EXACTLY? Well, when John Madden diagrams the plays on Monday Night Football, he's using a light pen to draw patterns over a freeze-frame image on his monitor. Programmer Steve Gibson calls that simple instrument "probably *the* best device for interfacing with a computer, even in light of touch screens, graphics tablets and the mouse." And in designing the Atari Light Pen, Gibson has combined art with technology to create a sophisticated tool previously unavailable to home computerists.

Now on his fourth or fifth career (after a run in advertising, marketing, medical engineering), the boyish 28-year-old has sealed his reputation in an elite circle of the fiercely independent software developers. His current hit began as a archetypical high-tech start-up—with no money, but lots of inspiration. "I decided that the light pen was something the microcomputer business had passed over. Minis and mainframes had them, but they just weren't to be had down in the micros."

He financed the bootstrapping of Gibson Laboratories, the original manufacturer of the light pen, with his medical-consulting fees. He designed and manufactured the pen by emptying out Mitsubishi ball-point pens and filling them with his electronics. When brought to market, "it took off like a rocket." He sold 3,500 of them by mail order out of his home

before turning the manufacture over to Atari. And if the reaction of press and buyers at last January's Computer Electronics Show in Las Vegas is any indication, the Atari Light Pen and *AtariGraphics* software promises to be one of the hottest products of 1984.

When Gibson signed up with Atari, the plan was to design something a child or computer novice could operate, yet challenging and imaginative enough for the most sophisticated user. So successful has the program been that Peter Friedman, the product manager for the Atari Light Pen, predicts that people will buy a computer that never had one before, "because of the immediacy and flexibility of the light pen."

Clicking away at the keyboard in the computer-room of his Orange County, California, apartment, Gibson discusses the software. It's said that any sufficiently advanced technology will be indistinguishable from magic; but if you talk to the magician, you usually find out his secret is hard work. "My stuff is good," he muses, "because I put about 300 percent more time into it than anyone else."

The light pen was originally created in the early 1950s by a researcher named Sutherland at the University of Utah. He developed a program called Sketchpad that used a light pen as the interactive device. It uses the structure of the television signal—a scanning electron beam that crosses the screen from the upper left-hand corner to the lower right-hand corner 30 times a second, leaving behind a pattern of varying brightnesses that we see as an image. The pen itself is filled with fast-response (75 nanoseconds) photodiodes attached by a wire to the computer.

To use the light pen, Gibson explains, you hold the pen to the screen and wait for the electronic beam to whiz by. The pen then relays an "I see it" signal to the cartridge, which compares the coordinates of the beam and the pen, sets up a timing sequence keyed to the beam's position, and calibrates the pen. Virtually instantaneously the light pen tells you where, down to the individual pixel, it's pointing; you then can actually sketch freehand on the screen



A TALE OF LIGHT AND MAGIC:

of your monitor. It brings a completely new quality and character to the computer, and Atari is the only computer company marketing both light pen and software.

As Gibson speaks, a seemingly three-dimensional folder-like sheaf of files with tabs marked a, b, c, d comes up on the screen accompanied by an ascending sound. Each file in this pop-up menu seems to quiver as it slides into place. "Attention to detail," he grins, "is one of my favorite things." Gibson himself invented the concept of picturing the four software menus as files, as well as the icons on the various menus. "The whole experience—the menus, the charts, the user-interface, the way the whole thing works," he says, "is mine." The tab-file takes an abstraction and makes it "concrete," an illusion that makes Gibson's software extremely easy-to-use.

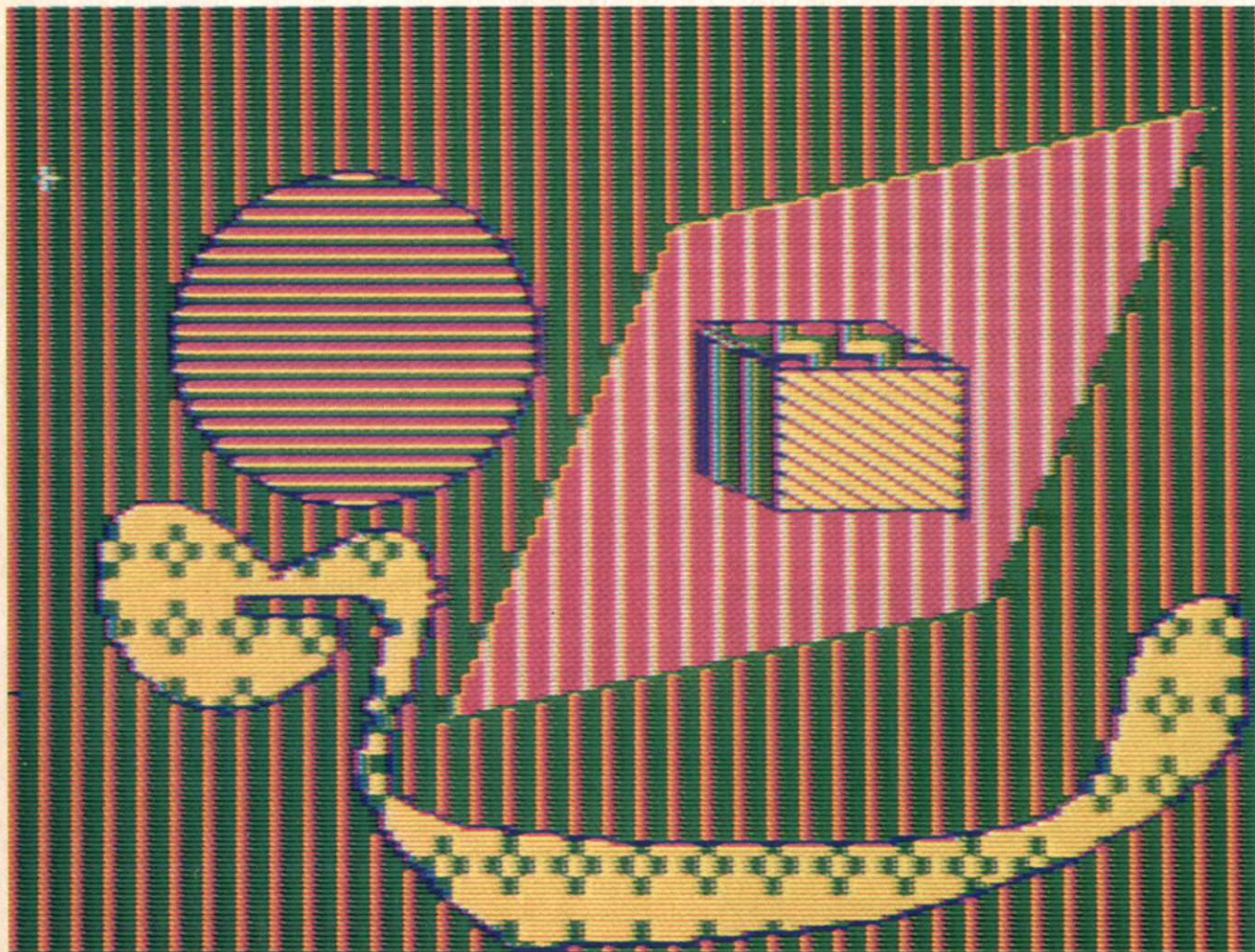
In project after project, Gibson has been refining his Drawing mode until he has what many people think is the most exciting high resolution art system yet devised. For instance, there are 2880 patterns available in Gibson's Drawing mode, plus an unparalleled ability to mix two, three or even four colors at a time.

With his pen, Gibson touches the tab for the first applications menu, then the freehand-sketch icon for the Drawing mode. I watch Gibson sketch the outline of a butterfly. Up till now, one of the draw-

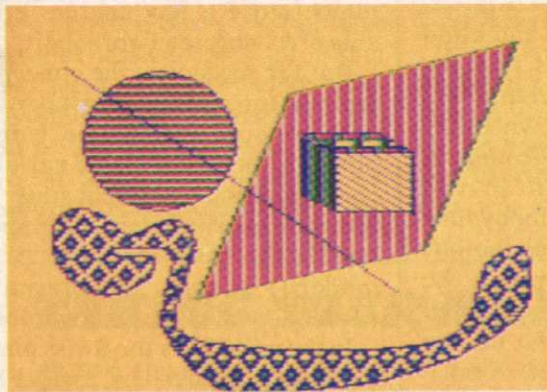
backs of computer art has been the jumpy, jagged effect caused by the impossibility of achieving a true curve on a video screen (because the electron beam moves horizontally). But Gibson's *Atari-Graphics* software—designed entirely on his Atari 800 computer—provides what is called inertia. By holding down the [OPTION] key at the same time he "rubber-bands" or stretches the shapes, his drawing achieves a spraying or smearing effect, a shading rather like a wispy tail.

As soon as Gibson finishes outlining his butterfly, he calls back the menus, this time for the Pattern menu. Quickly an array of one-inch square zig-zags, from herringbones to Harris tweed and beyond, come up. Working the keyboard with his free hand, Gibson zooms in on a pattern to the sound of fingers running down comb teeth. With his pen he seems to be leading the pattern out of its menu toward the butterfly outline. He locks the pattern and suddenly the butterfly is filled with dots accompanied by a chirping sound-effects chorus. Then he magnifies the mode, bestowing a pointillist effect to the butterfly.

Next, Gibson calls up the Color Control menu. Color bars appear with small white squares beneath each color that serve as a palette. Moving the pen around the white boxes as if he were mixing watercolors, Gibson takes awhile to find the color



THE MAKING OF THE ATARI LIGHT PEN



he is looking for. As each color-shade appears, Gibson stares at it before shaking the pen. One of the elegant yet funny features of the light pen is its ability to cancel or erase an image by "shaking it off," that is, shaking the light pen over the mistake as the computer-voice goes "awwwww," as in "Awwwww, I screwed up." With a high-pitched "blew-blew-blew-blew" the errant colors seem to explode as they disappear.

"All kinds of sounds are possible with the Atari computer, I don't think any other computer's got this much sound capability."

Finally, Gibson finds the exact color he was looking for: the enlarged pixel butterfly glitters like distant red-purple cartoon stars. The second menu—Storage Control—saves the picture in his program recorder, which was built into the top drawer of his desk. If he'd had a color printer with screen-dump routines, he could have printed it out and maybe sold it to the Museum of Post-Modern Art.

It took Gibson nearly a year to put together this package for Atari. "Three times I threw away months of work because I didn't know where I was going. I painted myself into a corner, said screw it, and started from scratch." Dave Evans, director of talent for Electronic Arts software, confirms that "Steve never sacrifices quality for market timing. His work always has to be a contribution to the field."

Throughout the afternoon, Gibson, my eldest son and I eat pretzels from a three-foot can and drink Seven-Ups. He runs through the many other capabilities built into the Drawing mode. Besides Pattern Fill, you can draw straight lines, squares, rectangles, circles, parallelograms (only Atari can do parallelograms), and grids. To explain mirroring Gibson draws an eye in one portion of the screen and the eye simultaneously appears in another position. He draws it again and the eye appears in three other positions. Then he moves the four-plane mirror figure all around the screen! Spinning off new applications with the dizzying rapidity of a Magus whose time is almost up, Gibson points at one of the eyes with his pen, hits the space bar, and the eye grows ten times its previous size. Finally, holding

down the [SHIFT] key, Gibson drags the whole magnified image across the screen.

I broke in to ask him about business applications for his software, and it was the closest Gibson came to being exasperated all day. "Business applications are just incredibly dry." He leans across with a gleam in his eye. "Education and entertainment are the two ideal places for the home computer. And by education I don't mean math drills or memorizing state capitals. I mean an entirely new form of learning, where you learn as you play."

I must have looked blank

"Imagine a game called 'Learning About Gravity' where you actually have our solar system on the screen." Gibson's voice grows even more mellifluous and dreamy. "And on the end of your light pen is the planet Earth. When you get it to what you think is its proper orbit, you give it a shove and pull the pen away and whoosh, it starts into orbit. But," he cautions gravely, "if you push too hard, Earth flies off the screen, never to be seen again. If you don't push hard enough, it falls into the sun."

I nod my head enthusiastically like the kid on the old Mr. Wizard television show.

"Someday," he insists, "the software industry will be like the recording industry. And software stars will be like record stars. Your kids will go into the home-computer software section of the super-market and say, 'Look, Mom, there's a new program by Steve Gibson.'"

Dave Evans considers Gibson and a handful of other independent home-computer programmers—Bill ("Pinball Constructor Set") Budge, Scott ("Snooper Trooper") Atkinson, and Dan ("Chop Lifter") Garland—the ones who care most about quality and innovation.

I ask Gibson if he considers himself an artist in the same sense as a painter.

"I guess I use the word artist to refer to any commitment to quality. Like a great mechanic. He doesn't just tighten a bolt. He does it to the optimum tightness. I guess you could call me a perfectionist, basically. But perfectionist is too cold a word. Mine is not a logical approach to things. For me the process of try-and-fail is the whole thrill."

Another pretzel for the road and it's time to go. I keep looking at this little cartridge and thinking about how much not only information, but time of someone's life is stored there. Gibson picks up the cartridge. "When I handed this software package to the Atari people, he concludes, "they went nuts. In fact, many people said that this was the nicest single piece of software they'd seen in their seven-year history. That made me feel great. But that's only part of the reward. Part one is the actual process, the journey. The real reward is exploring the frontier." □

Lewis MacAdams is a freelance writer based in Los Angeles.

by Philip Chapnick

Body Heat: Science Comes Alive with AtariLab

LIKE THE "DEAF, dumb and blind kid" from the Who's rock opera *Tommy*, home computers have been limited in what they can tell us about our environment. Sure your Atari computer can read the bits streaming off a floppy disk and sense the gyrations of the joystick tracking aliens through the video galaxies. And of course tell which key you've pressed on the keyboard. (For that matter, so can a typewriter!) But what about the quality of summer air rising after a midafternoon shower? Or the icy chill of bright morning in midwinter? No doubt your computer can play a mean pinball, but can it do something about the sweating of your hand on the joystick?

Now a truly revolutionary innovation can! The AtariLab Starter Set with temperature module.

AtariLab is more than a learning tool, it's a door to a new world of applications for your Atari computer. It adds the dimension of sensory awareness to your computer.

The first advance is its ability to sense temperature. Temperature seems an uncomplicated concept to us because our bodies have well-developed sensors for detecting temperature changes. Our very sur-

vival depends on keeping our body temperature a few degrees either side of 98 degrees Fahrenheit.

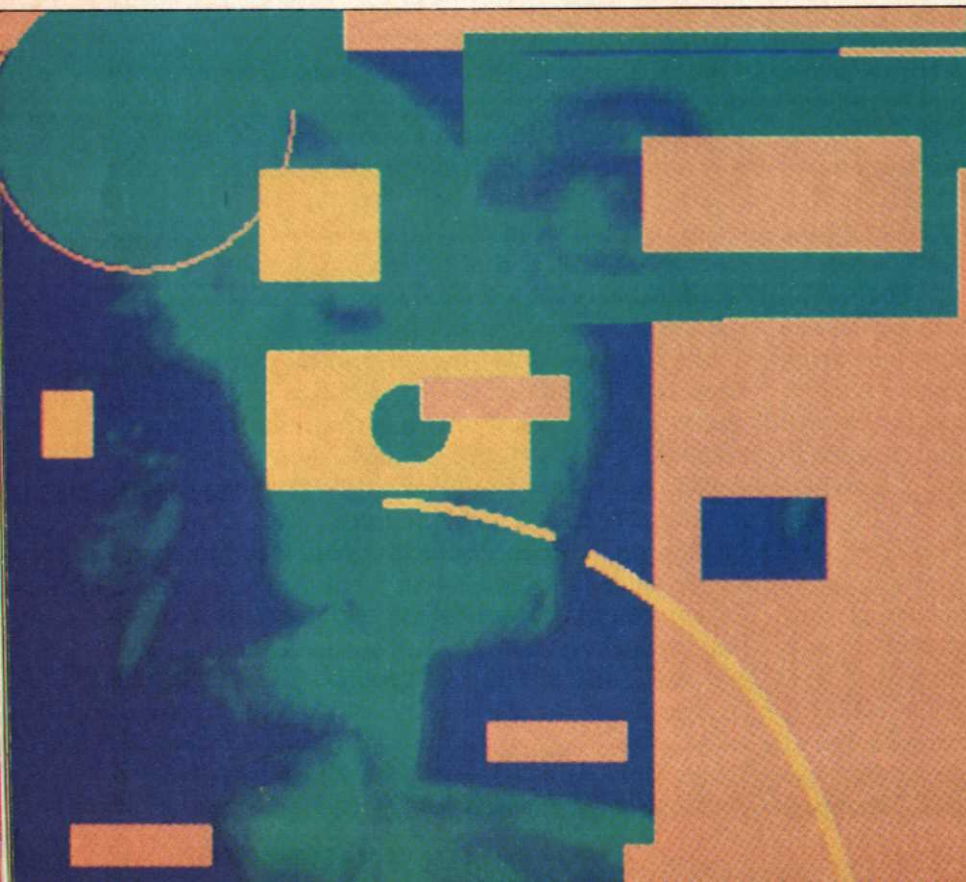
But for physicists the concept of temperature is fundamental. Along with pressure and volume, temperature is one of the basic variables characterizing a physical state. The accurate measurement of temperature is the basis for much of the modern science of thermodynamics—temperature dynamics.

In the mid 1700's the Swiss mathematician and physicist, Daniel Bernoulli found a direct relationship between the velocity of a gas molecule and the temperature of the gas. In other words, the higher the temperature, the faster the molecules move. Upon this foundation, over the next 150 years, the kinetic theory of gases was constructed, as well as our modern concept of both energy and entropy.

The first stirrings of that bulwark of modern physics—quantum mechanics—arose in an attempt to find a way out of some paradoxes of thermodynamics. And, while it is not widely known outside the scientific community, one of Albert Einstein's first published scientific papers was a theoretical explanation of Brownian movement—the random thermal motion of atoms.

Not only is temperature intimately related with energy, but it is also easy to measure. This makes it an ideal variable to use as the dependent quantity in scientific experiments. The AtariLab temperature module lets you bring the full power of your Atari computer to bear upon any experiments involving the measurement or recording of temperature. The temperature probe included in the starter set is a rugged, waterproof sensor, capable of measuring temperatures between 23 and 113 degrees Fahrenheit within about two degrees accuracy.

The interface box that comes with the starter kit includes an input port for the various probes and sensors in the series, and a standard binary-logic output port. You can use this output to control any electrical machine. Robotics lab anyone? Home-appliance programming? What's more, adding to the possibilities, each interface box



contains two channels for input and output. You can plug in as many interface boxes as you have controller jacks to plug into. That comes out to a healthy eight-channel system on my trusty Atari 800 computer, four channels on the Atari XL line of computers. It's a simple matter to program the Atari-

Lab interface using BASIC or Logo; the possibilities are limited only by your imagination.

It's this "open-endedness" that makes the AtariLab so exciting. A simple, functional design makes for a truly usable product. The concept and execution of the AtariLab series was developed at Dickinson

College in Carlisle, Pennsylvania, under the direction of physics professor Dr. Priscilla Laws. The fruit of several years of educational research and development, AtariLab shows the careful craftsmanship of skilled educators. The interface box itself, for example, is functional, color-coded, and even more

TAKING YOUR MEASURE

Once you get your computer talking about the weather, there's a lot more you can do. One program derived from the AtariLab manual monitors the probe's temperature and starts your computer beeping when the temperature comes within a certain range. This would be a fine frost alert or a good way to measure the performance of your refrigerator during hot weather.

The AtariLab cartridge is not necessary to run a BASIC program. Just insert the BASIC cartridge and plug the AtariLab interface into controller port two. Make sure the temperature probe is plugged into the left paddle position of the interface. Now you're ready to go. LOAD and RUN your program as usual, and you'll see the temperature readout on the screen.

Another program adapted from the manual sounds a tone whose frequency is proportional to the temperature. You can use it simply as a sonic thermometer. Or for experiments in temperature biofeedback training.

Biofeedback training can be an effective way to learn to relax. Increased levels of stress decrease the flow of blood to your hands and feet; by learning to raise the temperature of your hands, you are actually learning to increase the dilation of the arteries leading to your hands and feet, keeping them warmer. This helps alleviate stress by eliminating some of its disconcerting effects.

A simple visualization exercise in temperature biofeedback begins by taping the temperature probe to a finger. Don't

make it so tight that you block the very circulation you are learning to increase. Now get comfortable. Close your eyes and focus on your breathing. Breathe deeply and evenly, without strain for a few minutes. This will let the probe come to equilibrium with your finger temperature.

Once you've gotten a baseline tone, begin to increase the temperature of your hand by visualizing a warm place where you feel relaxed and comfortable: a sandy beach on a sunny day, or a hot sauna. With this scene fixed in your mind's-eye, think of your warm hands. Observe the feelings in your hand as you visualize the warmth of the scene you've imagined. When you begin to relax you'll notice that your hand feels warmer.

As the temperature of your hand begins to increase, the tone put out by the computer will begin to rise from the baseline level. Pay careful attention to the internal sensations accompanying this increase, and you may learn how to control hand temperature.

Many people can learn to raise the temperature of their hands as much as six degrees Fahrenheit. Don't get discouraged if the first session doesn't produce results. It can take several 20-minute sessions before you can exercise conscious control over the flow of blood to your hand. (Switch hands on succeeding tries so you develop a generalized ability to increase circulation.)

You might also try to design some experiments to see which form of feedback works best for

you. I've designed this program to use sound as the feedback channel, but it would be a simple matter to redesign the program to provide visual clues too. —PHILIP CHAPNICK

Frost alert

```
1 REM L1 IS LOWER BOUND OF TEMPE
  RATURE; L2 IS UPPER BOUND: IN
  CENTRIGRADE
2 REM SET L1 TO -10 AND L2 TO -1
  FOR FROST ALERT
5 L1=-10:L2=-1
10 BETA=4118:PO=150
20 P=PADDLE(2)
30 TC=(273*BETA)/(273*(LOG(P)-LOG
  (PO))+BETA)-273
35 PRINT TC
40 IF TC>L1 AND TC<L2 THEN GOSUB
  500
50 GOTO 20
500 SOUND 0,121,10,10
510 FOR I=1 TO 50:NEXT I
520 SOUND 0,0,0,0
530 RETURN
```

Biofeedback program

```
1 REM TEMPERATURE BIOFEEDBACK
  PROGRAM
2 REM BY PHILIP CHAPNICK 1984
10 FIRST=0
15 L1=32:L2=35
20 BETA=4118:PO=150
25 GOSUB 1000
30 P=PADDLE(2)
35 IF FIRST=0 THEN P=P1
40 TC=(273*BETA)/(273*(LOG(P)-LOG
  (PO))+BETA)-273
45 IF FIRST=1 THEN TSTART=TC
50 TSOUND=121+5*(TSTART-TC)
55 PRINT "TEMPERATURE IS ";TC;" C
  ENTIGRADE"
60 IF ABS(TSOUND)>245 THEN TSOUND
  =121
65 FIRST=FIRST+1
70 SOUND 0,TSOUND,10,10
75 GOTO 30
950 REM THIS IS USED TO ALLOW THE
  PROBE TO COME TO EQUILIBRIUM
1000 PRINT CHR$(125)
1005 PRINT "↓↓↓↓↓RELAX AND GET COM
  FORTABLE WHILE THE TEMPERATUR
  E PROBE REACHES A STABLE VA
  LUE. ";
1010 PRINT "THIS WILL TAKE APPROXIM
  ATELY 2 MINUTES."
1015 FOR DLAY=1 TO 25000:NEXT DLAY
1020 RETURN
```

Twenty years ago the budding science student got a chemistry set or microscope; now it's AtariLab.

important, if perhaps less obvious, the designers have used readily available, easy-to-use RCA-type audio plugs for connecting the interface to the outside world. I'd recommend anyone buying AtariLab to get a 25-foot extension cord for the probe. It's a lot easier to move the probe around from one room to another, or even outside, than it is to move the computer.

Of course it takes software to really get a computer show on the road. In this case, to convert the reading from the probe to a temperature value, display it in some kind of easy-to-understand form—like a graph—and finally store the data on disk. The software, supplied on a cartridge, is well-designed and convenient. And the entire package is joystick controllable, so it's a snap to set up hands-on demonstrations in schools and museums.

The software enables you to display the temperature of the probe on an attractively designed simulation of a mercury bulb thermometer. It could easily be used with

fairly young children—say seven or older—to teach the basics of how to read a thermometer and to understand what temperature is all about. The bulb reads out the temperature in both Celsius and Fahrenheit. (One thing I noticed is how quickly non-scientific friends pick up the relationship between the Celsius and Fahrenheit scales. It's not enough to know that 0 degrees Celsius is the same as 32 degrees Fahrenheit; you've got to see how the readings change together.)

The software also lets you set up temperature-measurement experiments. You can program the computer to measure and record temperature at regular intervals for up to 24 hours. The computer can draw a graph of the data collected and save it on disk.

The potential of AtariLab as a teaching tool is enormous. Like the very best teaching aids, it works at many levels of educational experience. For students first learning about graphs, the AtariLab temperature module can be used to create

a challenging, yet concrete example of how graphs can be used to represent real-world phenomena.

The AtariLab temperature module can also be used for high school and community college science projects. When I started high school, the appropriate gift for the budding scientist was a chemistry set or microscope; the appropriate gift of the 1980s—after an Atari computer, of course—is AtariLab. It prepares the interested science student—or sparks the not-so-interested—with an introduction to the tools used by working scientists.

The detailed, 143-page manual and project guide that comes with the starter set describes the operation of the temperature kit and spells out over 100 different experiments you can perform with household objects. The experiments illustrate some basic principles involving temperature in physics, chemistry and meteorology. Complete data-recording charts are included to help the young scientist not only learn about temperature, but also experimental technique and scientific method.

Eight appendices of useful information on using the AtariLab are included. (There's a Logo program for calculating the natural logarithm of a number that's worth a whole lesson in itself.)

You can use the manual to design your own temperature-probe applications (see sidebar). An ambitious project might be to fine-tune the energy efficiency of your home. With a second temperature probe, you will be able to set up your AtariLab to measure and calculate thermal efficiency and heat flow. By recording the difference in temperature between the inside and outside of a shelter, you can determine how fast it gains or loses heat.

The excitement of AtariLab is the opening of the computer's powerful processing logic beyond the limits of its previously self-absorbed, electronic universe. Like a blind man seeing for the first time, your computer is now ready to begin interacting with the world outside. □

Getting Started

THE ATARILAB STARTER SET IS compatible with all Atari computers. It requires 16K RAM and includes:

- the interface which supports all the sensors in the series.
- the temperature probe—enabling the Atari computer to sense temperature.
- a program cartridge which displays the temperature and also enables you to easily set up temperature-measurement experiments.
- an illustrated manual and project guide.

Suggested retail price: \$89.95

Many other kits priced under \$50 are on the designer's drawing boards—a pressure sensor, a light sensor, a Galvanic Skin Response (GSR) module (for further biofeedback and lie detection) and more.

AtariLab's Interface box links your home computer to the outside world.



Philip Chapnick is a freelance writer and editor specializing in science and technology.

IMAGINE A GALLERY filled with debutantes, playboys, serious investors and dilettantes all talking at each other in front of framed television screens and posters.

Crisp, clean colors seem to leap from the screens and dazzle the viewers with vibrance and texture never seen before. The easily identifiable computer artists mingling with the guests shine almost as brightly as their creations.

This art gallery of the future may become a reality—and very soon—if artists like 19-year-old Laurent Basset continue to create on their home computers.

French-born Basset brings to this country a special eye for color and composition in the traditions of Impressionist and Post-Impressionist modern art.

Art Gallery of the Future

by David L. Heller

outline on paper, then used a Versawriter Tablet to trace the outline to his Atari computer. He saved the tracing to a disk file and converted the Versawriter file to one that could be accepted by his *Micropainter* program which filled in the eye, the gridded pattern and the digital clouds. Finally, he saved the work and used his own *Graphics Companion* program to enhance the colors.

The smell of turpentine and the feel of canvas have no place in a computer artist's studio. A joystick is used instead of a brush "to paint" the picture directly on a video monitor. Basset's tools consist of a pot-

pourri of software and hardware including his own *Graphics Companion* software, and, of course, the Atari home computer. Basset says that "the Atari computer has the best graphics ability of any computer priced under \$5000.00, that I've tried."

So, if you want to see your own pictures on display in that "gallery of the future," all you need is a brush-stroke of inspiration, a wash of creativity and dedication to your Atari computer. □

David Heller is a contributing editor to ATARI CONNECTION.



To achieve the myriad colors and subtle shadings seen in a work like "Hills" (right), Basset designed and programmed a computer utility called *Graphics Companion*, that uses Atari computers' Display List Interrupt feature to enhance and brighten colors. But, for all the innovation and technology, art and hard work lie at the foundation of his success.

"My grandfather was a graphic artist, my mother is a sculptor, and I've been drawing and painting since I was three years old," Basset says. Two years ago he helped develop and program the Atari computer-generated sound effects for the movie *Tron*. Now a graphic-design student at UCLA, he works as an animator at I/O Productions in Los Angeles where he designs title screens and logos for companies like Atari and Liberty Software. As an example of his commercial work, he created the ATARI CONNECTION logo above.

"Eye," pictured above, evolved from a pencil drawing to computer



10 Tips From the Hex Programming Pros

Atari Advanced Games Group Speaks Your (Computer's) Language.

TAKE TEN COMPUTER PROFESSIONALS, each with diverse experience and at least one successful video game credit. Add the support of a major high-tech company, ample facilities, state-of-the-art hardware and the freedom to explore and create original software. What you'd get would be a consortium like the Atari Advanced Games Group.

For the past 14 months they have been writing text adventures, creating skill-and-action games and dreaming up entirely new electronic entertainment forms for coin arcades, home computers, and video game systems. And without the pressure of the marketplace—the group's mandate was to please itself, with Atari picking up the tab. Even with the quality and polish of the ensemble, Atari expected only 30 to 60 percent of their projects to make it—a respect-

able estimate given the vicissitudes of the market. Currently the group's score is a perfect three-for-three: its first game, *Final Legacy* has just been released, and slated to follow is an innovative maze game and a fully upgraded sequel to *Star Raiders*.

There's a lot of excited conversation around the games-group offices. You hear serious talk about magic rings, black holes, star fighters and their mathematical representations. Also lots of laughter and music. An appropriate tune would be "You Can Be a Star." Sly Stone might have been thinking of the Advanced Games Group.

When we asked the group for Ten Tips, we forgot they think in code. What we got was ten hexadecimal tips—which translates into a few extra. Not a baker's dozen, but a programmer's generous count.

The Atari Games Group came to play (left to right): Jim Morris, Robert Weatherby, Mike Gurganus, Jack Ritter, Chris Horseman (group leader), Dave Menconi, Steve Englehart, Eric Wilmunder, Dan Oliver; (foreground) Rita Pless.



PHOTOGRAPH BY ED KASHI

1 *Don't be afraid of criticism*

Once you've developed a part of your program to your satisfaction, ask a friend or someone you trust to take a look at it. Listen to what's said. Criticism is a very touchy subject with most people, but it *does* work—to your advantage. Never forget, though, that it's *your* program. *You're* the final judge.

2 *Be eclectic*

A video game must put the player inside a world, not just in front of a television screen. A game designer must know more than just computers. The more well-rounded you are, the more you draw from all the aspects of *this* world, the better your game will be.

3 *Learn Assembly language*

It's true that Assembly language is fast and memory-efficient, but the real reason to learn it is that you'll never really understand how the computer sees the world until you do. If you're going to program for real, why do it on a "mystery machine?"

4 *Keep learning—ask questions*

Programming in general, and game programming in particular, is a constantly changing process. There's no such thing as "finally mastering it," the way you might master, say, algebra; so never try to conceal your ignorance. *Everybody* needs help sometime. When that time comes, realize it so that you can get on with the job and your learning by asking. Just make sure you *do* learn, so you don't have to face that problem a second time.

5 *Take chances and big risks*

Yes, there are lots of people out there making *Q-Bert* clones, and some of them are doing quite well, unfortunately. But that's not why *you* got into computing. Why not experiment? Try something nobody's done before. This is still a new field, and big breakthroughs have been made by people just like you.

6 *Get something running as soon as possible so you have feedback*

Use whatever language you're most comfortable with, *just* to get a feel for the program. Don't worry about graphics or error-checking. The program itself may not be exactly what you want—in fact, it probably won't; but you can't play-test a flow chart.

7 *Know your audience*

Any good programmer will make a memory map or sketch out screens beforehand: so decide who your audience is. Many programmers have set out to write software without considering the user. Before you write for other people, talk to them; afterward, let them test it out. Non-programmers are not going to be satisfied with mediocre products, pri-

marily because they still think computers are magic.

8 *Make it simple for the user*

If the game needs complex commands, make sure the player can get by without knowing all of them at the lower levels. When someone buys a game, he wants to play it, not wade through pages of print. (But read on.)

9 *Read the manual again*

It's very easy for programmers to get set in their ways. So many times we're in such a hurry to use that new hard- or software that we only glance at the instructions long enough to set it up—and sometimes not even that long. Once you've got it doing what you initially wanted it to do, take the time to see what else is available. Why reinvent the wheel? Programmers are tool-users. When programming, you're almost always working with hard- or software developed by someone else. But they become yours if you understand them.

A *Clear the decimal flag*

Is this facetious? No! When you first learn Assembly language or experiment with your Atari computer, it's often convenient to access Assembly routines from BASIC. One problem that invariably occurs is that BASIC sets the Decimal Flag when doing math functions, and doesn't tell you. So your program crashes and you spend hours trying to find out why. So—clear that flag whenever you use USR.

B *Throw it out*

The time always comes when a routine turns into a mess. First you try to make it do too much. Then you find a bug and you start rearranging things. Finally you have no idea what's going on anymore. That's the time to pull out a clean piece of paper, get away from the keyboard, and break it all down into smaller routines.

C *Choose your tools according to the job*

No matter whom you ask for advice, *you're* the one who implements it. *You're* the one who has to sit over that keyboard for hours or months on end, so choose the language, programming style, hardware and so forth that suit the project—and you.

D *Take advantage of your computer*

Today's machines have amazing sound and graphics capabilities. The best software (especially games) use every bit of these they can. If you were a quarterback, you wouldn't run a quarterback sneak every play; you'd use every play you could devise, and all the players on your team.

There, we never even got to ten. If you don't understand, see Tip 3. (Or see Computer Classroom, page 57). □

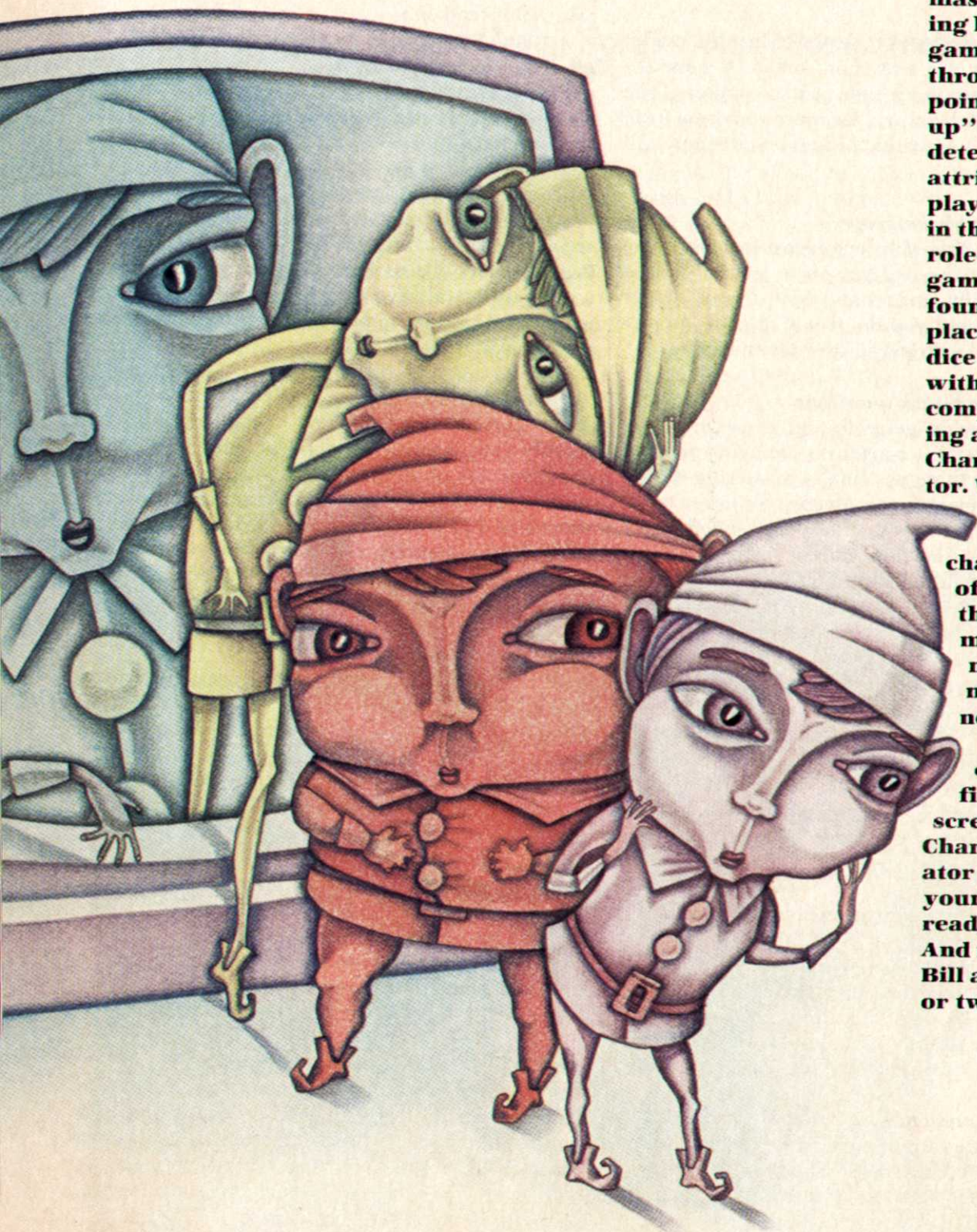
THE COMPUTER

Part Two
W.G. Armintrout

When we left our protagonists, Bill the Dungeon-master was guiding his fantasy game group through the fine points of "rolling up" a character—determining what attributes each player will have in the ensuing role-playing game. Bill had found a way to replace the usual dice and charts with his Atari computer, creating an electronic Character Generator. While his

charges were debating the characteristics of half-elves, the Dungeon-master met his match in a mysterious newcomer.

Having cleaned up the first few screens of Bill's Character Generator program, young Laura was ready to see more. And maybe show Bill another thing or two . . .



THAT ROLLS

Dragons,
Dungeons and
Atari:
Fantasy in 10K

I was walking home, a sack of groceries from the store in each arm, when I heard the motorcycle pulling up beside me. It was Laura.

"Hop on and show me the rest of your program, the Character Maker?" I gave the bike a dubious look. "With these groceries? I think not. It's only half a block, and a fine afternoon..." "Meet you there, Bill!" She roared away.

"Vell, I recall," she imitated a professor, "you ver showink me your fantasy character creation program."

I nodded. "For role-playing games, like *Star Trek*, *Espionage*, *Runequest*..."

"Games like that. And you already revealed your system..."

"Explain, do and show," I said. "A good program works by telling the user what it is going to do, doing it and then showing what it did."

She sat back in her chair, arms folded. "And we got as far as attributes."

"Right, the random ratings for strength, intelligence, luck, dexterity, constitution and charisma that let a player know what his game character can do. Everything the computer does helps you design an exciting, vibrant character; it does all the dice-rolling for the player."

Her eyes closed, her head rested on her shoulder, and she made snoring sounds.

"The next step decides what else to do, and in what order?"

One eye opened. "Does the order matter?"

"Sometimes. I wrote the program to match the game we play, and I used the official sequence. But the rulebook's often inadequate. For instance, I finally figured out that I couldn't do height and weight until doing race and sex."

"How do race and gender affect height and weight?"

"Men are taller and heavier, for example," I said. I typed "BYE" to put the computer in Memo Pad mode, and decided to do the program in this order:

- Program Steps**
1. Attributes
 2. Professions
 3. Race
 4. Sex
 5. Gold
 6. Age
 7. Height
 8. Weight
 9. Languages

"Professions come immediately after attributes," said Laura. "And it's a new

step, so you start with explanations. The usual PRINT statements."

"With only one wrinkle." I LISTed the whole monster program.

"What is line 420 all about?" she asked.

"We're listing the player's choices. But there are minimums: IQ requirements for wizards, dexterity for thieves and so on. The IF/THEN statements skip printing the choice if the character doesn't qualify."

"You're still using the joystick for user input, I see."

Laura typed in the direct command "GOTO 400" and watched this part of the program work. "Moving the joystick in any direction makes the number change. Pressing the trigger makes the selection."

She hit [BREAK] and LISTed. "X is our selection. Line 505 starts it off at one. Line 510 prints it. And lines 515 through 525 are a time-delay loop, with an IF/THEN in the middle waiting for the trigger to be pushed. Why the delay?"

"Try this." I inserted "REM" into lines 515 and 525, temporarily turning them into harmless Remark statements. Then I typed "GOTO 400."

As Laura moved the joystick and the numbers on the screen flashed, she laughed. "The numbers change too fast—I want to get a two, but I keep going past it!"

"Therefore," I said, proudly, "the time delay."

She hit [BREAK] and redisplayed lines 500 through 560. "Lines 530 and 535 are another loop, waiting for something to happen. Press the trigger and you jump out of this whole section. Move the stick and you get lines 540 and beyond."

"All right." She stared at the screen. "If we go to line 540, we've moved the joystick, which means we wanted to change the number. So line 540 increases X by one. But lines 545 and 550..."

I began to explain.

"Wait." She was silent for a moment. "Got it! They go with lines 420 and 430 from before, screening out unqualified characters from becoming wizards or thieves."

"And line 555 keeps X in range by putting it back to one when it gets too high. 560 sends us back to the beginning, so the new X can be printed."

"But you're such a sloppy programmer." She grinned, then typed:

100 POLE 752,1: REM Program Introduction

That puzzled me. "What does that do?"

"Memory location 752 controls the cursor. In the 500-routine, the cursor just sat on the screen like an unwanted blot. This erases it."

"But we need it!"

"Only if we're going to type something into the machine, and then just to use backspace or edit. All it takes to turn it back on is a POKE 752, 0 command."

"I also added this," she added.

```
50 DIM PROFS(7)
565 GOSUB 10030: IF X = 1 THEN
  PROFS = "WARRIOR"
570 IF X = 2 THEN
  PROFS = "WIZARD"
575 IF X = 3 THEN
  PROFS = "THIEF"
```

"This section simply handles selections," I explained. "The race selection looks almost identical. Lines in the 600s list the choices—human, dwarf, elf, hobbit, fairy—and lines in the 700s are almost an exact copy of the 500s, and take the input for your choice."

```
50 SIM PROFS(7), KINS(6)
800 GOSUB 1 0030: IF X = 1 THEN
  KINS = "HUMAN"
805 IF X = 2 THEN
  KINS = "DWARF":
  STR = STR + 1: CON = CON + 1
810 IF X = 3 THEN KINS = "ELF":
  DEX = DEX + 1: CHR = CHR + =
815 IF X = 4 THEN
  KINS = "HOBBIT": LK = LK + 1:
  DEX = DEX + 1
820 IF X = 5 THEN
  KINS = "FAIRY": IQ = IQ + 1:
  LK = LK + 1
825 T = 1
830 GOSUB 10040
```

"I see," she said. "You're changing the attributes by race, so that dwarfs are strong and healthy, and so on. But what is T?"

"A note between la and do?" She hit me.

"T controls the display subroutine you saw last time. Lines 10035 through 10100. Each time we go back to it, T will tell it to display the latest steps."

"That finishes the explain, do and show," said Laura. "What comes next?"

"Choice of sex, male or female. But that's another selection, identical to what we've already seen. Then comes gold, how much money the character has, which is simply the number rolled on three dice times ten."

"The dice subroutine. Line 950."

"Exactly."

"After making T equal to two and displaying age, we arrive at height, weight and age," I explained. We studied lines 1100 through 1180.

Laura whistled. "How did you come up with that?"

"I borrowed it from my rulebook," I said, "only I changed it into something the computer could use. The original chart looked like this:"

| Dieroll | Height in Inches | Dieroll | Height in Inches |
|---------|------------------|---------|------------------|
| 3 | 47 | 11 | 67 |
| 4 | 50 | 12 | 70 |
| 5 | 52 | 13 | 72 |
| 6 | 55 | 14 | 75 |
| 7 | 57 | 15 | 77 |
| 8 | 60 | 16 | 80 |
| 9 | 62 | 17 | 82 |
| 10 | 65 | 18 | 85 |

"See the pattern?"

"Threes and twos. That explains lines 1115 to 1155," said Laura. "But age in line 1110... how can it equal X? Who wants a three-year-old character?"

"Age, height and weight are all influenced by race and sex."

1200 REM Kin and Gender Modifiers

1205 IF KINS# "DWARF" THEN 1225

1210 NCHES = INT (NCHES * 3/4)

1215 WAYT = INT (WAYT * 5/6)

1220 AGE = AGE + 120

1225 IF KINS# "ELF" THEN 1245

"A leapfrog routine," she said, scanning the 1200s. "It leaps along until it hits the right IF/THEN statement, and then it adjusts height and weight and age."

"And then in 1295 to 1330 it modifies weight and height for girls, switches from inches to feet-and-inches, waits

for the user to finish reading and then displays," she said. "Which leads us to..."

"Languages," I said, looking at lines 45 through 90. "The hardest part."

"First, we build some tables. POYNTR is the key—it will match 50 numbers to different languages. If you give it a five, PONTR(5) will give back 530. You can then take that number to the other table, LANGTAB\$. It holds the names of the languages. LANGTAB\$(53,53 + 12) would be 'Dwarfish.' LANG\$ will be where we write the character's languages. BLANK\$ is used to erase used parts of LANGTAB\$, so a language can't be used twice."

"Next come three more variables. NLANG in line 1415 is the number of foreign languages the character might know. LPON1 and LPON2 are language pointers—LPON2 tells where in LANGTAB\$ to get the new language, and LPON1 indicates where to write the new language in LANG\$. On this first time around, characters get their native languages—LPON2 is set by lines 1425 to 1470. Line 1600 puts the new language into LANG\$, while 1605 erases the used-up language from LANGTAB\$; 1610 decides whether enough languages have been rolled up yet, and if not sends us to the 1500 routine."

"My turn," said Laura. "Line 1500 de-

creases NLANG to show we are now using one of our chances for a foreign language. Lines 1510 and 1515 select the new language, using a random number between 0 and 99 produced by line 1505. The FOR/NEXT loop finds the end of LANG\$, adds a comma and gets it ready for the 1600 routine again. Congratulations! A nice piece of programming."

"And powerful. This routine can be applied to anything. I've been thinking about making a background and skills table, to find out if a character knows animal training or blacksmithing or farming..."

Laura laid a hand on my shoulder. "But doesn't all this worry you? With the right programming, the correct logic and routines," a twinkle grew in her eyes, "Dungeonmasters might become extinct. You could be replaced by a computer!"

"Impossible. Never. You're underestimating the human element."

"Once upon a time," said Laura, "they said machines could never play chess."

W.G. Armintrout is a freelance writer based in Tooele, Utah.

For special instructions to type in the program, see page 59.

FANTASY-CHARACTER GENERATOR

```

10 REM DRAGONS,DUNGEONS AND
ATARI
20 REM -----
by W. G. ARMINTROUT
45 GOSUB 10030
50 DIM PROF$(2),KIN$(6),SEX$(6),LANGT
AB$(351),LANG$(117),BLANK$(13),POYNTR(
49)
55 BLANK$=""
60 FOR X=1 TO 351 STEP 13
65 READ LANG$
70 LANGTAB$(X,X+12)=BLANK$
75 LANGTAB$(X,X+12)=LANG$
80 NEXT X
85 LANG$=""
90 FOR X=0 TO 49:READ Y:POYNTR(X)=Y:N
EXT X
100 POKE 752,1:REM
** Program Introduction **
105 PRINT "Welcome to the world of"
110 PRINT " FANTASY ADVENTURE!"
115 PRINT "You are about to enter in
to an alter-nate world, where fantasy
exists and magic really works,"
120 PRINT "This computer program wi
ll help you to design, or 'roll up',
a special"
125 PRINT "character to represent y
ou on your adventures in this marv
elous new"
130 PRINT "world."
135 PRINT "When you are ready to co
ntinue, tap the Joystick."
140 PRINT "[ If you have not done s

```

```

o already, plug in your joystick.]);
145 GOSUB 10015
200 REM ** attributes explanation **
205 PRINT "What your character can
or cannot do depends on his or her AT
TRIBUTES."
210 PRINT "STRENGTH: muscles, the
ability to lift and carry."
215 PRINT "INTELLIGENCE: reasoning,so
lving pro- blems and speaking languag
es."
220 PRINT "LUCK: the ability to be in
the right place at the right time."
225 PRINT "CONSTITUTION: health and
endurance, how much punishment your
body can stand."
230 PRINT "DEXTERITY: agility, manual
dexterity and marksmanship."
235 PRINT "CHARISMA: personal attr
activeness and leadership ability."
240 PRINT "All of the attributes ar
e given a number between 3 and 18
Eighteen is a perfect score."
245 GOSUB 10005
300 REM ** rolling up attributes **
305 GOSUB 10025:STR=X
310 GOSUB 10025:IQ=X
315 GOSUB 10025:LK=X
320 GOSUB 10025:CON=X
325 GOSUB 10025:DEX=X
330 GOSUB 10025:CHR=X
335 GOSUB 10040
400 REM ** explaining professions **

```

```

405 PRINT "There are several TYPES
of character for you to choose from.
Your char-"
410 PRINT "acter is eligible to be:"
415 PRINT "A WARRIOR - like Con
an,they like to bash first and ask qu
estions later."
420 IF IQ<10 THEN 430
425 PRINT "A WIZARD - like Gand
alf or Merlin. Magic is their only p
rotec- tion."
430 IF DEX<10 THEN 445
435 PRINT "A THIEF - they live
off their wits and luck, like th
e Gray Mouser and Cugel the";
440 PRINT "Clever."
445 PRINT "Tap the Joystick until
the number appears below matching t
he class you desire. When that";
450 PRINT "happens -- press the t
rigger."
500 REM ** profession selection **
505 X=1
510 PRINT "Press";X
515 FOR DELAY=1 TO 50
520 IF STRIG(0)=0 THEN 565
525 NEXT DELAY
530 IF STRIG(0)=0 THEN 565
535 IF STICK(0)=15 THEN 530
540 GOSUB 10030:X=X+1
545 IF X=2 AND IQ<10 THEN X=3
550 IF X=3 AND DEX<10 THEN X=1
555 IF X>3 THEN X=1

```

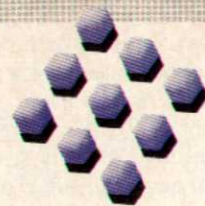


```

560 GOTO 510
565 GOSUB 10030:IF X=1 THEN PROF$="WARRIOR"
570 IF X=2 THEN PROF$="WIZARD"
575 IF X=3 THEN PROF$="THIEF"
600 REM ** kindred explanation **
605 PRINT "54There are many kinds of people in the fantasy world. You may choose to be --"
610 PRINT "4(1) HUMANS (ol' homo sapiens)"
615 PRINT "(2) DWARVES (they have an uncanny way of knowing the value of gems and Jewels)"
620 PRINT "(3) ELVES (they have good hearing)"
625 PRINT "(4) HOBBITS (they are good at hiding and stealth)"
630 IF PROF$="WIZARD" THEN PRINT "(5) FAIRIES (they can fly)"
635 PRINT "4Tap the joystick until the number appears below matching the race you desire. When that";
640 PRINT " happens -- press the trigger."
700 REM ** kindred selection **
705 X=1
710 PRINT "↑↑↑";X
715 FOR DELAY=1 TO 50
720 IF STRIG(0)=0 THEN 800
725 NEXT DELAY
730 IF STRIG(0)=0 THEN 800
735 IF STICK(0)=15 THEN 730
740 X=X+1:GOSUB 10030
745 IF X=5 AND PROF$<>"WIZARD" THEN X=1
750 IF X=6 THEN X=1
755 GOTO 710
800 GOSUB 10030:IF X=1 THEN KIN$="HUMAN"
805 IF X=2 THEN KIN$="DWARF":STR=STR+1:CON=CON+1
810 IF X=3 THEN KIN$="ELF":DEX=DEX+1:CHR=CHR+1
815 IF X=4 THEN KIN$="HOBBIT":LK=LK+1:DEX=DEX+1
820 IF X=5 THEN KIN$="FAIRY":IQ=IQ+1:LK=LK+1
825 T=1
830 GOSUB 10040
900 REM ** gender and gold **
905 PRINT "5444The SEX of your character -- male or female -- is up to you."
910 PRINT "444If you want a female character, move the joystick."
915 PRINT "444For a male character, press the trigger on your joystick."
920 IF STRIG(0)=0 THEN SEX$="male":GOTO 935
925 IF STICK(0)=15 THEN 920
930 SEX$="female"
935 GOSUB 10030
940 PRINT "5444GOLD PIECES are the currency in this fantasy world. You will be able to"
945 PRINT "spend them on weapons, armor, and other equipment."
950 GOSUB 10025
955 GOLD=X*10
960 GOSUB 10005
965 T=2
970 GOSUB 10040
1000 REM ** H, W & A explanations **
1005 PRINT "54The HEIGHT and WEIGHT of your character depends on";
1010 IF SEX$="male" THEN PRINT "his";GOTO 1020
1015 PRINT "her";
1020 PRINT " kindred."
1025 PRINT "444Height and Weight are
seldom important - except, perhaps, when sliding through narrow spots";
1030 PRINT " or treading on treacherous floors -- but they are nice to know."
1035 PRINT "444AGE is also seldom important during a game, but is fun to find out. It too depends on kindred."
1100 REM ** height, weight and age **
1105 GOSUB 10025
1110 AGE=X
1115 GOSUB 10025
1120 NCHES=47
1125 X=X-1
1130 IF X<3 THEN 1160
1135 NCHES=NCHES+3
1140 X=X-1
1145 IF X<3 THEN 1160
1150 NCHES=NCHES+2
1155 GOTO 1125
1160 GOSUB 10025
1165 IF X<10 THEN WAYT=75+(X-3)*15:GOTO 1200
1170 IF X<13 THEN WAYT=150+(X-8)*10:GOTO 1200
1175 IF X<16 THEN WAYT=200+(X-13)*25:GOTO 1200
1180 WAYT=250+(X-15)*30
1200 REM **kin and gender modifiers**
1205 IF KIN$<>"DWARF" THEN 1225
1210 NCHES=INT(NCHES*3/4)
1215 WAYT=INT(WAYT*5/6)
1220 AGE=AGE+120
1225 IF KIN$<>"ELF" THEN 1245
1230 NCHES=INT(NCHES*11/10)
1235 WAYT=INT(WAYT*3/4)
1240 AGE=AGE+30
1245 IF KIN$<>"HOBBIT" THEN 1265
1250 NCHES=INT(NCHES*3/7)
1255 WAYT=INT(WAYT/2)
1260 AGE=AGE+10
1265 IF KIN$<>"FAIRY" THEN 1285
1270 NCHES=INT(NCHES/8)
1275 WAYT=INT(WAYT/10)
1280 AGE=AGE+2
1285 IF KIN$<>"HUMAN" THEN 1295
1290 AGE=AGE+10
1295 IF SEX$="male" THEN 1310
1300 NCHES=NCHES-2
1305 WAYT=INT(WAYT*9/10)
1310 FEET=INT(NCHES/12)
1315 NCHES=NCHES-FEET*12
1320 GOSUB 10005
1325 T=3
1330 GOSUB 10040
1400 REM ** languages **
1405 PRINT "5444LANGUAGES depend upon your Intelligence, and indicate what tongues you have learned to";
1410 PRINT " speak so far in your life."
1415 NLANG=INT(IQ/2+0.5)
1420 LPON1=1
1425 IF KIN$="HUMAN" THEN LPON2=27
1430 IF KIN$="DWARF" THEN LPON2=53
1435 IF KIN$="ELF" THEN LPON2=79
1440 IF KIN$="HOBBIT" THEN LPON2=144
1445 IF KIN$<>"FAIRY" THEN 1475
1450 ON INT(RND(0)*4+1) GOTO 1455,1460,1465,1470
1455 LPON2=183:GOTO 1475
1460 LPON2=235:GOTO 1475
1465 LPON2=274:GOTO 1475
1470 LPON2=287
1475 GOTO 1600
1500 NLANG=NLANG-1
1505 X=INT(RND(0)*100)
1510 IF X>49 THEN LPON2=27:GOTO 1520
1515 LPON2=POYNT(X)
1520 IF LANGTAB$(LPON2,LPON2+12)=BLANK$ THEN 1610
1525 FOR LPON1=LEN(LANG$) TO 1 STEP -1
1530 IF LANG$(LPON1,LPON1)<>" " THEN 1540
1540
1535 NEXT LPON1
1540 LANG$(LPON1+1,LPON1+1)=", "
1545 LPON1=LPON1+2
1600 LANG$(LPON1,117)=LANGTAB$(LPON2,LPON2+12)
1605 LANGTAB$(LPON2,LPON2+12)=BLANK$
1610 IF NLANG>0 THEN 1500
1615 GOSUB 10005
1620 T=4
1625 GOSUB 10040
1700 POSITION 1,20
1705 PRINT "-----"
1710 PRINT "Your character is COMPLETE. To begin a new character, press the trigger.";
1715 IF STRIG(0)=1 THEN 1715
1720 GOSUB 10030
1725 T=0
1730 RESTORE
1735 GOTO 60
10000 END :REM ** subroutines **
10005 POSITION 1,21:PRINT "-----"
10010 PRINT "(When you are ready to continue, just nudge the joystick.)";
10015 IF STICK(0)=15 THEN 10015
10020 GOSUB 10030:RETURN
10025 X=0:FOR Y=1 TO 3:X=X+INT(RND(0)*6+1):NEXT Y:RETURN
10030 FOR DECAY=16 TO 0 STEP -2:SOUND 0,11,12,DECAY:NEXT DECAY:SOUND 0,0,0,0:RETURN
10035 REM ** display subroutine **
10040 PRINT "54FANTASY ADVENTURE/Character display"
10045 PRINT "44Strength =";STR
10050 PRINT "4Intelligence =";IQ
10055 PRINT "4Luck =";LK
10060 PRINT "4Constitution =";CON
10065 PRINT "4Dexterity =";DEX
10070 PRINT "4Charisma =";CHR
10075 IF T=0 THEN 10005
10080 POSITION 21,4
10085 PRINT "Kindred: ";KIN$
10090 POSITION 21,5
10095 PRINT "Type:04";PROF$
10100 IF T=1 THEN 10005
10105 POSITION 21,7
10110 PRINT "Sex:04";SEX$
10115 POSITION 21,13
10120 PRINT GOLD;" gold pieces"
10125 POSITION 25,14
10130 PRINT "on hand"
10135 IF T=2 THEN 10005
10140 POSITION 21,8
10145 PRINT "Age:0 ";AGE
10150 POSITION 21,10
10155 PRINT "Height: ";FEET;" ";NCHES;"'"
10160 POSITION 21,11
10165 PRINT "Weight: ";WAYT;" lbs"
10170 IF T=3 THEN 10005
10175 POSITION 2,16
10180 PRINT "LANGUAGES KNOWN:"
10185 PRINT LANG$
10190 RETURN
11000 DATA Amazonic,Centauri,Common Tongue,Dryadi,Dwarvish,Egyptian,Elvish,Gargoylish,Gigantic,Gnomish,Goblin
11005 DATA Hobbit,Jasmine,Mermen,Nix,Nymphish,Ogrit,Orcish,Pixie,Salamandrian,Saurian,Spriting,Sylvan,Taurian
11010 DATA Titanic,Tribal,Trollish
11015 DATA 1,1,14,14,40,53,53,53,66,66,66,79,79,79,79,92,105,118,131,131,131,144,144,144,144,157,157,170,170
11020 DATA 183,196,209,222,222,222,222,235,248,261,261,274,287,300,313,326,326,326,339,339

```

LOGO AND THE ATARI TOUCH TABLET



The Turtle Meets the Touch Tablet

by *Eric Solomon with Jane Sokolow*

Logo is a well-known learning tool that has won a devoted following among computer students and educators. And *Atari Logo*, like the original high-level programming language, teaches problem-solving, clear thinking and a greater understanding of computing and the learning process itself. Its friendly, interactive design and modular structure make it a valuable resource for a variety of tasks. With features like dynamic turtles, shape editing and collision detection, Logo is an excellent choice for graphics programming.

Now you can combine the power of Logo with another computer-art tool—the Atari Touch Tablet. Starting with simple procedures that demonstrate how the computer and the tablet interact, we can develop useful, coherent graphics programs. You can go from simple freehand drawing to advanced composition—positioning preprogrammed images to construct a scene. Logo's procedural structure is a natural for this kind of application.

In Logo, the Atari Touch Tablet's X and Y coordinates are read by using the PADDLE primitives—the X coordinate is read by PADDLE 0 and the Y by PADDLE 1. Type in the following procedure to see how the computer reads the coordinates:

```
TO READPADDLE :WHICH
  PR PADDLE :WHICH
  READPADDLE
END
```

Connect the tablet to the computer, type **READPADDLE 0**, and move the stylus from the extreme left to the extreme right of the tablet. The numbers read from the tablet and printed on the screen will vary a bit, but the general range will be from 8 or 9 to 220. Now type **READPADDLE 1**. If you move the stylus from top to bottom, you will see approximately the same range (9 to 220). To adjust these numbers to the turtle's

coordinate system, the following procedures will output the stylus position in turtle coordinates. These procedures are building blocks in later programs.

```
TO TABLETX
  OP 140 - 1.3 * PADDLE 0
END
```

```
TO TABLETY
  OP 120 - 1.1 * PADDLE 1
END
```

Here is our first, simple project using these tools:

```
TO MOVETURTLE
  MAKE "X TABLETX
  MAKE "Y TABLETY
  SETPOS LIST :X :Y
  MOVETURTLE
END
```

MOVETURTLE is a utility which will move the turtle around the screen using the touch tablet.

But it would be nice to control the turtle's pen with the tablet's buttons. The left and right buttons on the tablet are read as if they were paddle buttons 0 and 1 respectively, and the stylus button is read as if it were joystick 0 (not joybutton). The following procedures will do the trick:

```
TO PENB
  OP 0 = JOY 0
END
```

```
TO LTB
  OP PADDLE 0
END
```

```
TO RTB
  OP PADDLE 1
END
```

```
TO ANYB
  OP ( OR LTB RTB PENB )
END
```

We can use these tools in this improved drawing program:

```
TO DRAW
  RECYCLE
  IF ANYB [PD] [PU]
  MAKE "X TABLETX
  MAKE "Y TABLETY
  SETPOS LIST :X :Y
  DRAW
END
```

Press the [BREAK] key to leave the program. You can change pens or pen colors and continue drawing.

Of course you'll want to save your

pictures, and we are indebted to Brian Harvey of Atari Research and Development for these saving procedures. They appear in *Logo Works*, a forthcoming book from Harper and Row, by Cynthia Solomon and Margaret Minsky.

(A line ending with an arrow is part of one long line. Do not hit [RETURN] until you've typed the whole line.)


```
TO SAVEPICT :FILE
  SETWRITE :FILE
  SAVEPICT1 16384 3840 0
  REPEAT 2 [TYPE CHAR 0]
  SETWRITE []
END
```

```
TO SAVEPICT1 :LOC :NUM :NULL
  IF :NUM = 0 [STOP]
  SAVEPICT1 :LOC + 1 :NUM - 1 SAVEPICT1
  2 .EXAMINE :LOC :NULL
END
```

```
TO SAVEPICT2 :BYTE :NULL
  IF AND :BYTE = 0 :NULL < 255 [OP :
  NULL + 1]
  TYPE CHAR :NULL
  TYPE CHAR :BYTE
  OP 0
END
```

```
TO LOADPICT :FILE
  SETREAD :FILE
  LOADPICT1 16384 ASCII RC ASCII RC
  SETREAD []
END
```

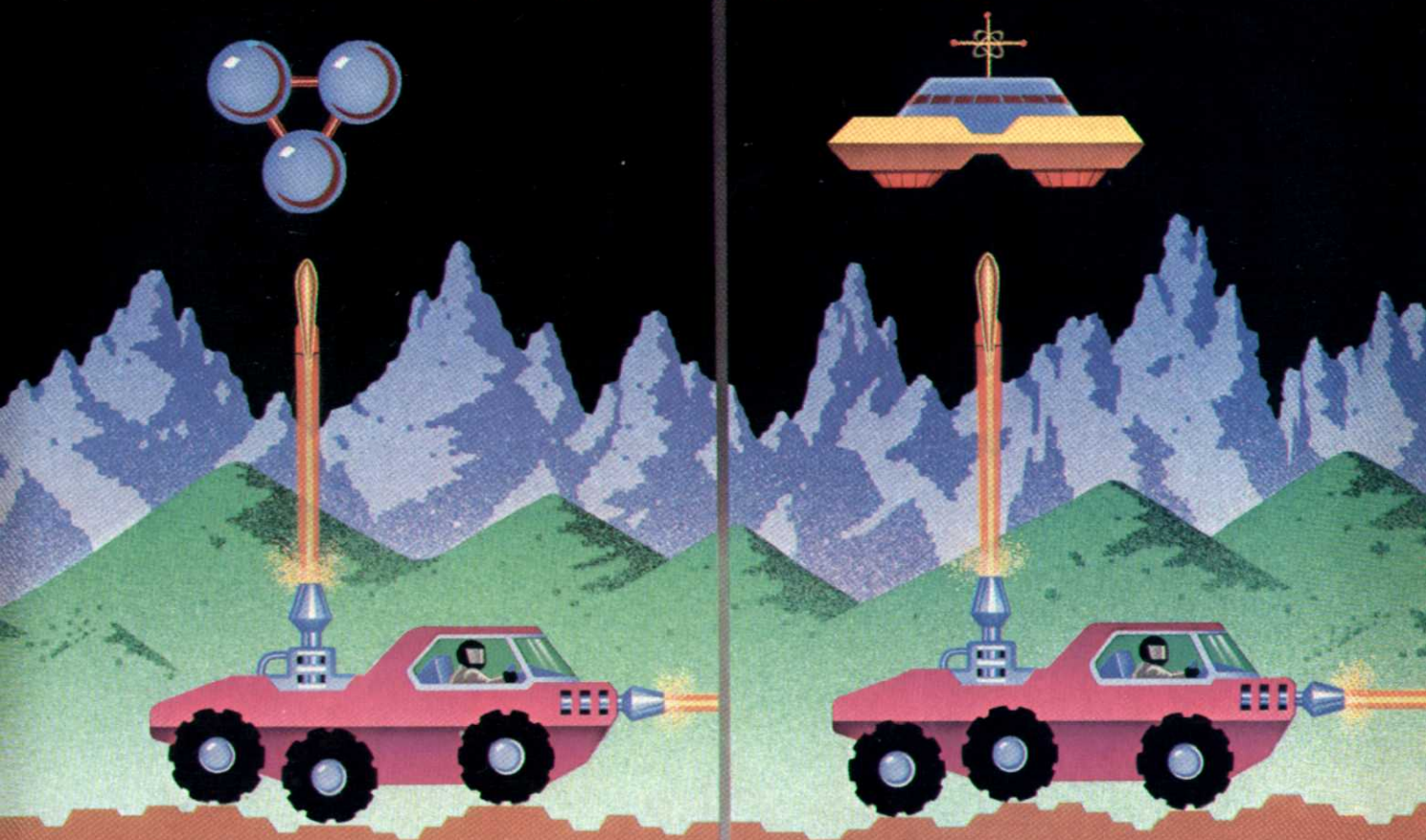
```
TO LOADPICT1 :LOC :NULL :BYTE
  IF AND :BYTE = 0 :NULL = 0 [STOP]
  .DEPOSIT :LOC + :NULL :BYTE
  LOADPICT1 :LOC + :NULL + 1 ASCII RC
  ASCII RC
END
```

(If your Atari computer has 16K of memory, use the number 8192 instead of 16384 in the SAVEPICT and LOADPICT procedures.) 

A scene executed in a series of Logo procedures on the Atari Touch Tablet.



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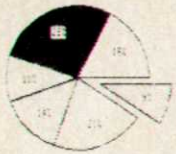
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To save a picture, type **SAVEPICT "D:FILENAME"** where *filename* is the name you want to use for the picture file. Load the same picture by typing **LOADPICT "D:FILENAME."**

When saving a picture, remember, it will take awhile (three to five minutes). Graphics characters will appear on screen, and the busy light on your disk drive will go on and off several times. The cursor and prompt will reappear on the screen when the saving process is complete.

So far you've seen the tablet used for freehand drawing. Now we'll use it another way: as a tool to position picture elements into a scene. In other words, you can move the stylus to a particular position, then call up procedures to draw a house, tree, person, or whatever image you've designed at whatever position you choose. The finished scene is remembered as a list of Logo instructions you can run again.

Start by typing **SCENE.**

```
TO SCENE
MAKE "SCENELIST []
MAKESCENE
END
```

```
TO MAKESCENE
FS
MOVETURTLE2
MAKE "SCENELIST ( SE :SCENELIST →
"SETPOS "LIST :X :Y )
DRAWPROC
MAKE "SCENELIST ( SE :SCENELIST →
"PD :RUNLIST "PU "SETH 0 )
MAKESCENE
END
```

```
TO MOVETURTLE2
PU
MAKE "X TABLEX
MAKE "Y TABLEY
SETPOS LIST :X :Y
IF OR RTB LTB [STOP]
MOVETURTLE2
END
```

```
TO DRAWPROC
SETH 0
SS
PR "
TYPE "?
MAKE "RUNLIST RL
PD
RUN :RUNLIST
PU SETPOS LIST :X :Y
SETH 0
TYPE [REDO]
IF RC = "Y [PE RUN :RUNLIST PU →
SETPOS LIST :X :Y DRAWPROC]
END
```

As you move the stylus over the tablet, the turtle will follow it on the screen, without drawing a line. When you get to where you want to start, press either tablet button. You'll see a question mark prompt to enter a Logo command line. If you have already prepared procedures to draw picture elements, use them here. Another possibility is to design

a picture element by using Logo primitives. For example, you could type

REPEAT 4 [FD 30 RT 90]

to draw a square. (You can, of course, put several commands on the line. But you can only type a single instruction line.)

The turtle will carry out the instructions you give it. The program types **REDO?** to prompt you for this decision. You then decide whether or not you want to keep this newly-drawn element as part of the finished scene. If you type **Y** for Yes, the program will erase what it has just drawn. You can then reposition the stylus and enter another command. If you type **N** for No, the element remains part of the scene.

When you are finished drawing your scene, press the **[BREAK]** key. The instructions for redrawing this scene are now in the variable **SCENELIST**. You could now clear the screen and then redraw the scene by typing

RUN :SCENELIST

Since the instructions are stored as a Logo list, you can modify the scene by editing the instruction list. Type **EDNS** to allow editing of all your variables, and use the Logo editor to change the variable **SCENELIST**.

If you want to save more than one scene, you can put the finished instruction list into a different name. For example, you could say

MAKE "HOUSESCENE :SCENELIST

and then run the **SCENE** procedure again to create a new scene.

When you save the workspace, as usual, all your variables will be included. So later, when you load your workspace, you will still be able to **RUN** these scenes.

These are but a few of the ways the Atari Touch Tablet can be used with *Atari Logo*. The creative work is up to you! □

For information on using the Atari Touch Tablet with BASIC, ask for Demopac #12 from Atari Customer Service, 1312 Crossman Ave., Sunnyvale, CA 94088.

Erric Soloman is a technical consultant for Logo Computers Systems, Inc. Jane Sokolow is a product specialist at Atari, Inc.



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SOFTWARE

REVIEW

New and Notable Programs for Your Home Computer

BALLBLAZER

A Thriller from Lucasfilm

EVER SINCE WORD got out that Lucasfilm Ltd., the northern California creator of extraordinary film fantasies, had launched a venture into computer games, connoisseurs have intently awaited the first products. Expectations and critical standards were high, but with *Ballblazer*—the game division's first release—it's clear the game was worth the wait. *Ballblazer* (initially available for the 5200 SuperSystem, with computer versions to follow) meets the standards that Lucasfilm set in motion pictures: it is original, exciting and crafted with exquisite attention to detail. It's also a lot of fun and—just as with *Star Wars*—it creates a world you're likely to want to visit again and again.

Ballblazer pioneers an innovative split-screen technique, providing that rarity in computer entertainment, a truly effective two-player game. The monitor screen divides into two halves, upper and lower, each displaying the view from one of the "rotofoils" that each player commands by joystick. The rotofoils float on a grid (on the surface of an artificial asteroid), with a goal at each end. The game itself is simple: a charged "plasmorb" ball shoots into the center of the grid, and the rotofoils rush forward. If you're there first, your rotofoil automatically captures the plasmorb in a forcefield—the ball becomes centered in your half of the viewscreen. At the same time, your craft also turns automatically ("rotosnaps") to face the opposing goal, and you can charge ahead. When the ball is aimed between the goalposts, a touch of your fire button activates another forcefield, which blasts the ball through the goals. The scoring is straightforward: when one player gets ten points, he or she wins. Otherwise, the point leader at the end of the game wins (a tie means a sudden-death play-off).

Sounds simple, and it is—except

that your opponent can also use a forcefield to blast the ball out of your possession and capture it. The result is a high-speed combination of pursuit, battle, capture and scoring—all as viewed from the perspective of your own rotofoil, as you blaze across the bright-green grid, with very fast graphics that are almost dizzyingly real. By the end of a standard three-minute game (games can run one to nine minutes), you really feel like you've been in a competition.

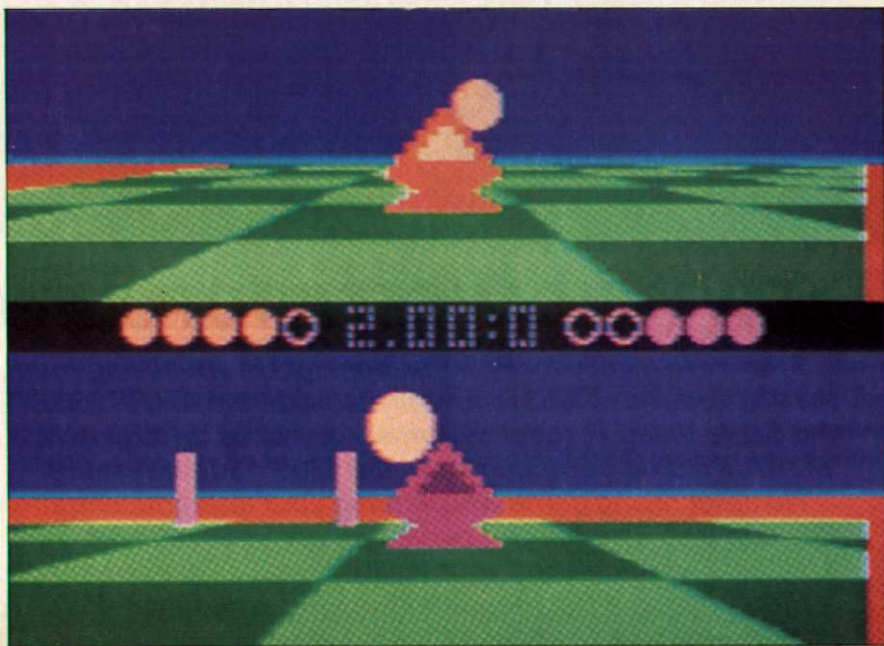
To add to the experience *Ballblazer* features one of the more cleverly designed soundtracks yet to grace a video game. The theme song ("Song of the Grid," according to the manual) is "autocomposed" of various short bits of music, randomly selected and strung together in a surprisingly listenable way. And the sounds that accompany various actions within the game are imaginative, and sufficiently

well-engineered to help your game play if you're listening carefully.

Ballblazer, played with an automatic "Droid" manning the other rotofoil, provides you with a practice mode. The Droid can be set to nine levels of ability as well, and two Droids can even be set to play against each other. But it's clear that the game was optimized for two human players. The reality of the grid and the physics of the forcefields, the acceleration and maneuvering of the rotofoils, are all so precisely done that *Ballblazer* creates an unusually consistent "world" in which to develop your playing skills. Even the curvature of the grid (due to the fact that it's on a very small asteroid) is rendered with accuracy—objects like the goalposts and the other player's rotofoil gradually recede and then disappear as you move away from them.

Although the basic rules of the game are simple, challenges abound: you get two points for a goal made from a distance away, three points if you shoot from "over the horizon" of the tiny asteroid. The goalposts, however, are moving—gradually migrating at

Ballblazer: More sport than game.



five meters per second from one side of the grid to the other. And each time a goal is scored, the goal posts get slightly closer together—they begin with a 12-meter spacing and end up only two-and-a-half meters apart.

The accompanying manual—which is itself fairly entertaining, describing an epic interstellar *Ballblazer* tournament far in the future—passes along various tips for game play, like using the forcefield to “dribble” the ball, and doing “off the wall” shots that bounce off the invisible “electro-boundary” surrounding the grid.

It's clear that the consistency of the *Ballblazer* world offers a great deal of depth for perfecting game play. But past that, the game itself is just plain exciting. The excellent graphics and sound, along with fast, simple action, is a powerful combination. And the fact that *Ballblazer* is just as much a true two-player game as, say, Ping-Pong, puts this first Lucasfilm offering clearly over the top. All that remains to be seen is what other surprises are to come from the wizards in San Rafael.—ALAN MICHAELS

Available in July for 5200 SuperSystem; September 1 for 7800 ProSystem and in cartridge format for Atari home computers. Suggested retail prices: to be announced.

RESCUE ON FRACTALUS!

Without a doubt
a new dimension in games

A BREATHTAKING TECHNICAL INNOVATION in game design: *Rescue on Fractalus!*—one of two new games from Lucasfilm—offers an approach to game-playing that's decidedly cinematic.

Rescue on Fractalus! can best be described as a participatory science-fiction fantasy. Its remarkable flight simulation and startling first-person point of view set it worlds apart from conventional skill-and-action space games. The plot concerns a futuristic rescue mission in which you, as the pilot, take the leading role. There's no animated surrogate: you *are* the pilot, seated in your cockpit, flying a dangerous mission.

Entering the atmosphere of *Fractalus*, you'll see the planet's nitrite-saturated yellow sky through the windshield of your Valkyrie fighter.

As in actual flying, everything on your instrument panel is operational, every reading critical. You use your joystick as a throttle, your compass in making turns and in guiding you to specific locations. The clearance bar helps you avoid slamming into canyon walls. A long-range scanner signals the proximity of a downed pilot, a thrust-level indicator lets you know how fast you're flying and the energy-level bar measures your fuel.

The altimeter does exactly what it's supposed to, tracking your distance from the surface. If you *do* get too close to the ground, lights will start flashing. Other gauges supply information about bank, pitch, pilot quota, shield activation, target ranges, even the number of enemies destroyed. Keep alert, or you're done for.

The flight simulation is a hands-down winner. Mountains dip and rise on the horizon with dizzying speed—particularly when you gain momentum in the game's upper levels. And you really have to scramble to clear the jagged peaks.

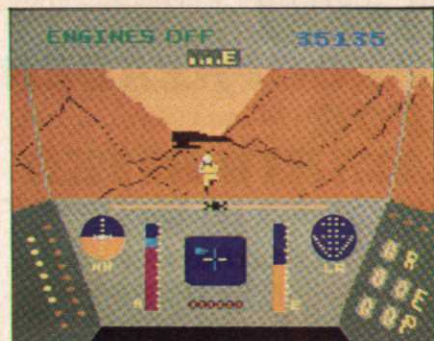
And as in any Lucasfilm production, sound is almost as important as graphics. A musical title theme draws you into the fantasy, while sound effects throughout the game signal critical events: a pilot approaching your plane and knocking on your door, the airlock opening and closing, even engine noises.

While flying across the craggy peaks of *Fractalus*, you're constantly on the lookout for fellow pilots shot down by the vicious Jaggie race and desperately waiting for rescue. Once you've spotted a stranded pilot, you'll have to negotiate a landing—risky business.

After you land and turn off your engines, the terrified pilot races toward safety—you'll see his flight-suited figure come into view as he approaches your plane. And when his footsteps stop and you hear him knock—another impressively realistic touch—you have to let him in immediately. Already faint with hunger and drained by fear and exhaustion, the pilot needs relief as quickly as possible from *Fractalus*'s poisonous air.

But even picking up pilots can be treacherous. The enemy will harass you with their ion beams. You're a sitting duck on the ground. Plus *Rescue on Fractalus!* has something never before attempted in video-game design: a terrifying surprise. We don't want to ruin the tension by giving anything away...but watch out for hitchhikers!

While searching for downed pilots, you have to avoid becoming a casualty yourself. Enemy-gun emplacements



You and your instrument panel under hostile fire on *Fractalus*.

on mountain peaks bombard your plane with energy-depleting ion beams. Inertia-less flying saucers make kamikaze runs straight at you. And landing is especially dangerous when your fuel is low.

Fortunately, you're armed with AMB (Anti-Matter Bubble) torpedoes; if you aim carefully while calculating your instrument readings—you have crosshairs on both your windshield and your targeting scope—you have a fighting chance at protecting yourself. With every new horizon, however, you'll find new gun emplacements lying in wait for you.

Rescue on Fractalus! premieres the wizardry of fractal mathematics, a programming technique through which natural patterns—like those found in mountains, waves or clouds—are stored in memory and then generated at random. So each time you fly a mission on *Fractalus* you zoom over new, realistic terrain. And at anytime you can return to a unique point on the landscape; once created, a particular image can always be recreated.

The game has over 99 levels. After you've successfully completed one level, you're advanced automatically to the next. The beginning levels are rather tame—flying around picking up pilots is something like driving a bus. But you have the option of starting at any level you want for accelerated speed and more challenging opposition.

If you need to be rescued from the one-dimensional quality of ordinary space games, take on *Rescue on Fractalus!* And discover a video game that gives new meaning to the term “flights of the imagination.”—PAULA POLLEY and MARINA HIRSCH

Available in July for Atari 5200 SuperSystem; September 1 for 7800 ProSystem and in cartridge format for Atari home computers. Computer version requires 32K RAM. Suggested retail prices: to be announced.

ATARI PROOFREADER FOR ATARIWRITER

*"The Spell is Broken"
Or, Peace Comes to
the War of the Words*

EDITOR'S NOTE: With persistent epistolary scholarship, Mr. Young has brought to light yet another episode in the bittersweet tale of faded romance between a man and his typewriter (see "Farewell, My Ugly," ATARI CONNECTION, Spring 1983). Here, as John's AtariWriter household is blessed with another new arrival, Mary Typewriter finds acceptance in her heart for the wonders of word processing.

Dear Mary,

Trembling with excitement, my fingers are flying over my computer keyboard! So my first draft of this letter will no doubt bristle with typos. But I write on with self-possession—and without bothering to look up the spelling of that potentially tricky word—because I now have *Atari Proofreader* to back me up.

Yes my old friend, you—better than anyone—know my weaknesses as a speller and typist. How we used to fight and tease about which of us was to blame for this typo, that misspelling! And, though I say it myself of my own dear word processor, *AtariWriter* alone was unable to free me from such errors. But now *Proofreader* has liberated me from the error of my ways.

I load *Proofreader* into my computer along with *AtariWriter*. When I want to proof and correct a text file (or a specific passage from a file), I select VERIFY Spelling—*Proofreader's* addition to the standard *AtariWriter* menu—and I'm transported instantly to *Proofreader's* own rich menu.

I have three options for checking my spelling against *Proofreader's* dictionary of over 36,000 words. One highlights all my misspellings on my screen, each one glaring its reproach at such a perfectionist as I. Another both highlights and prints out my gaffes—a double dose of edible crow for any writer. But a third option allows me to correct each error as *Proofreader* finds it. I don't even have to lift my hands from the keyboard to reach for my well-thumbed Webster's: With a few keystrokes, I can "look up" a spelling in *Proofreader's* dictionary—right on my screen!

In closing I'll take just a minute to proof and correct this letter with *Proofreader*. Then I'll urge you to rejoice with me, Mary—and with my editors. Henceforth all my copy will be as clean, as error-free, as this. The Dunce of the Spelling Bee no longer, I am

Exultantly yours,
John

Dear John,

I am happy for you, my old hunt-and-pecker, but I confess that I'm somewhat worried as well. Though it has cost me much anguish, my jealousy of *AtariWriter* has given way before my devotion to your vocation, the craft of writing. You will permit me to underscore the point, John! I am a typewriter—a calling of no little honor in literary history.

You're too hard on yourself, dear friend. If ever you were "The Dunce of the Spelling Bee," it was only because of your extraordinarily rich vocabulary. In what unfamiliar patterns, sweet to recall, did you make my keys dance! And it wasn't just that you were misspelling words or making typos—all right, all right, let us make peace! We were making typos together!

But you'll understand my fears for you, even in the midst of your zeal for *Atari Proofreader*. Stylist that you are, you commonly use words that are far from common. A computerized dictionary of over 36,000 words is impressive indeed. Yet I have my doubts. Does it include all the quaint locutions that spice up your style? Those foreign expressions that lend such *je ne sais quoi* to your voice? The proper names and specialized terms that give your prose its air of quiet, majestic authority?

Take care, John, take care, lest *Proofreader*, like a competent but not faultless editor, dulls your vigilance and leads you unwitting down the path of ignorant error.

Your ever-solicitous
Mary

Dear Mary,

Best of friends, I understand your fears. But let me lay them to rest. Unlike many writers and some editors, *Proofreader* is smart enough to know when it doesn't know a word: while checking my *AtariWriter* files, *Proofreader* highlights as *incorrectly spelled* any word it cannot find in its dictionary. When I use the program to correct a file, I can of course let any suspect spelling stand—if I'm sure it's right. But don't you see? By putting the "burden of proof" on me when I use an out-of-the-ordinary word or expression, *Proofreader* makes me more, not less, vigilant as a speller.

Proofreader even enables me to use my own personal dictionary files of special words! My favorite foreign terms, my "quaint locutions" (as you so quaintly put it), even the names of the characters in my novel. I can use *AtariWriter* to make up a personal dictionary out of whole cloth, so to speak. Or I can create one while correcting my errors with *Proofreader*. Each time I let stand a word that isn't in *Proofreader's* basic dictionary, the program adds the word to a "memorized" list I can then save as a personal dictionary file. I can load my personal dictionary files any time I want to use them, in addition to *Proofreader's* dictionary, to check my spelling.

So you see, Mary, *Proofreader* is truly a compendium of orthographic wisdom, a lexicon-lover's delight, the Queen of the Spelling Bee.

Yours contentedly,
John

Dear John,

You have laid my fears to rest, old friend—I'll worry no more that *Proofreader* might lead you astray. Nor, however, will I permit you to pun at me so shamelessly (as you did in your last) with impunity. Let me just say that I "stand corrected."

My best wishes to you, *AtariWriter* and *Proofreader*—a formidable word-processing family indeed.

Your resigned,
Mary
—STEVEN YOUNG

Available in diskette format. Requires 32K RAM. The *Atari Proofreader* package includes a program and dictionary diskette for both DOS 2 and DOS 3 users. Suggested retail price: \$49.95.

ATARI HOME COMPUTERS GET DOWN TO BUSINESS

*State-of-the-Art
Data Management*

PIE-IN-THE-SKY praises of computers and computer applications abound. But after all is said, what remains is that computers do one thing very, very well—information manipulation, storage and retrieval.

No wonder the Computer Age has fostered the Information Age. We are now inundated with computer-generated information that vies for our attention. Our response to an information overload may be to withdraw. But

better to ask, "How can I use the computer as an information processor to my own advantage?"

Until recently, there were few powerful database managers available for Atari home computers. Certainly none as comprehensive, nor as fully integrated, as the new Home/Business Series developed exclusively for Atari by Synapse. This remarkable series consists of three software packages: *SynFile*, *SynCalc*, and *SynTrend*. *SynFile* is a powerful, sophisticated database manager; *SynCalc* is an electronic spreadsheet program in the tradition of *VisiCalc*; and *SynTrend* is a business graphics and statistics program.

Like the now industry-standard *Lotus 1, 2, 3*, all the programs in the Synapse series are compatible, allowing free interchange of data. *SynFile* and *SynCalc* are also compatible with *VisiCalc* and *AtariWriter*; *SynTrend* with *VisiCalc*.

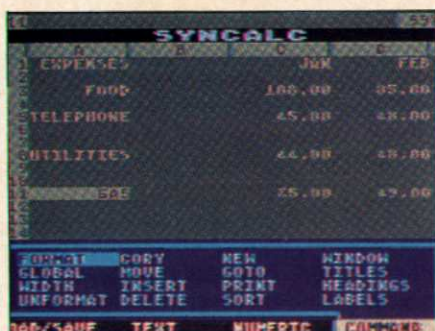
At the center of the series is *SynFile* which establishes and maintains an electronic filing system. Once files are formatted and records are entered, the user can search through records selectively. For instance, you might search purchases made before a specific date (for insurance or tax purposes), for customers whose last names begin with Z, or who live in a certain zip code area. Or perhaps Chinese restaurants within your own restaurant database.

SynFile is a powerful, inexpensive and easy-to-use database manager, capable of holding up to twice as many records as any other Atari-compatible database program. It allows up to 255 characters per field, 31 characters per field name, and 66 fields per record. The program can search up to 16 specific items, as well as for less than, greater than, and not-equal-to fields.

Larger databases pose no problem for *SynFile*. Files may extend over 16 diskettes, and the program is compatible with both the Axlon 128K and Mosaic 64K Select memory expansion systems. Writing reports is a breeze; you can insert data into an *AtariWriter* text file and create form letters with *SynFile*'s merge mail function.

Virtually any record-keeping task is made easier and more efficient with *SynFile*. Applications for small businesses are nearly endless: mailing lists, inventory tracking, sales records, library indexing, client records, research notes, and cataloging possessions are just the beginning.

SynCalc is a second-generation *VisiCalc*-type program. The software allows users to design their own electronic worksheets, and to use the computer's power and speed to recalcu-



The screenshot shows the SynCalc menu window. At the top, it says 'SYNCALC' and '653'. Below that is a spreadsheet with columns for 'EXPENSES', 'JAN', and 'FEB'. The rows are 'FOOD', 'TELEPHONE', and 'UTILITIES'. The values are: FOOD (100.00, 85.00), TELEPHONE (45.00, 48.00), UTILITIES (44.00, 48.00). Below the spreadsheet is a command menu with options: COPY, MOVE, GOTO, WINDOW, GLOBAL, MORE, GOTO, TITLES, WIDTH, INSERT, PRINT, HEADINGS, UNFORMAT, DELETE, SORT, LABELS. At the bottom, there are tabs for 'TAB/SAVE', 'TEXT', 'NUMERIC', and 'COMMAND'.

SynCalc's menu window

late numbers, formulas and other variables for budgeting, financial analysis, and sales and income projection. Some of the program's advanced features include: individually variable column widths, logic functions, sorting, and an "on board" editor that uses the Atari computer's familiar keyboard edit functions. The ability to merge data from *VisiCalc* allows you to upgrade prior worksheets without having to re-enter the data.

SynTrend, the third software package in the series, is divided into two parts: "SynGraph" and "SynStat." "SynGraph" enables you to take data from *SynFile*, *SynCalc* and "SynStat" to generate high-resolution, full-color graphs and pie charts. Line and scatter graphs can display up to three factors of 100 observations each; bar graphs can display up to three factors of 32 observations each. Graphs and pie charts can be printed with an Epson or NEC/C-ITOH printer.

"SynStat" is a powerful statistical planning program which can perform descriptive analyses on variables, and simple and multiple regressions, as well as calculate means, variance and standard deviations. Results may be displayed graphically with "SynGraph." Other uses include the manipulation, calculation and display of data developed with *SynCalc* or *SynFile*.

Each of the programs in the Home/Business Series is menu-driven. Pop-up, on-screen commands make it easy to use any of the programs without constantly referring to the manual.

SynGraph means business



Excellent tutorial manuals guide you step-by-step through each program's features. Together, the documentation and menu-driven character of the programs make learning the series unimposing. A glossary of terms, error-message listings and an index are included, as well as a quick reference guide. Tutorial diskettes are included with *SynFile* and *SynCalc*.

Whether you're a novice or a seasoned database user, the Home/Business Series provides a sophisticated and user-friendly means to manipulate, store and retrieve the information of your choice.—**J. D. BASS**

Available in diskette format. Each program requires 48K RAM. *SynGraph* requires BASIC. Suggested retail price: \$99.95 each.

FINAL LEGACY

FINAL LEGACY—the apocalyptic first release of the Atari Advanced Games group—brings exciting, innovative game play to a sobering scenario. While the game manual is fraught with doom and gloom, this tense, post-nuclear-war game leaves room for hope—a message relayed by the upbeat, *Star Wars*-like tune that opens the game.

The date is 2051: 50 years after the Warmongers have turned most of the world into a dead zone. Now they're out to finish the job. As part of a colony of brave survivors, your task is to stop them before they can destroy the few remaining cities of the world. You attack on three fronts—against enemy ships at sea, against sites on land and missiles in the air.

The complex game was designed as a bridge between text adventures that require strategy and skill-and-action games that demand speed. You shift back and forth among five modes. In the Command and Navigation modes you can select your battlefield through a set of world maps. When you're in one of the three fighting modes, you must listen to the game sounds for clues to enemy position. Frequently, you are forced to interrupt a battle on one front in order to switch to a fiercer fight at another.

Dodging torpedos on the high seas, you pursue and gun down three types of ships. The graphics in this, the sea, mode are great. Your vantage is a sweeping view of the sea ahead. From the prow of your rebel ship the distant dot-like Warmonger ships acquire increasingly recognizable detail as you



Final Legacy's Sea Mode

close in on them. Watch for Intelligence ships which, unlike Hunter and Warrior ships, follow a direct course from their home ports to your coastal cities. When sunk, Intelligence ships yield the location of secret enemy missile sites.

The graphics in the other two battle modes are less impressive. The moving land missile sites look like innocuous pink pyramids, and they don't shoot back. But the time factor saves us from tedium: If you don't destroy the missile sites within a few seconds, they will shoot long-range missiles at your cities. You must switch to the Air mode to counter them, shooting the missiles before impact. The exploding graphics in this mode resemble *Missile Command*.

With six levels of difficulty—from Ensign to Admiral—there's no lack of challenge in *Final Legacy*. Too bad it's for one-player only. The game can be played with either a joystick or Trak-Ball, and includes an option for left-handed players—a real break for those who otherwise have to tear down and rewire their joysticks to get optimal access to the controls.

After all, you need every advantage when trying to save the remainder of the civilized world!—RANDI ROHDE

Available in cartridge format for home computers. Requires 16K RAM. Suggested retail price: \$47.95.

FIREFOX

A Fighter's Fighter

THE NEW ATARI coin-op game *Firefox* is more than an exciting shoot-em-up. Based on the Clint Eastwood movie, *Firefox* is the first laser-disk game spun off a commercially released film. Atari's game engineers made use of the latest video technology to create the kind of realism, action and special effects that's revolu-

tionizing arcade games. Combining the high-resolution images of laser disks with the graphics animation of the computer, *Firefox* reaches new heights of video-game play. The game-design team screened more than 75 miles of footage looking for the best of the movie's flight scenes—and some that didn't make it into the movie. Film action is reproduced on video disk in two action tracks—one of enemy planes coming towards you and another of enemy planes exploding; the laser game cuts smoothly between the two. The cinematic effect is enhanced with dialogue from the film and music by Atari's resident composer, Jeff Gusman (see page 30). Plugging your portable headphones into the game console will get you the full stereo effect.

As the *Firefox* pilot, you must get the plane out of Russia, avoiding the attacking MiGs, other Firefoxes, helicopters, ships, ground bases, enemy cannons and missiles, to land safely at the secret refueling station.

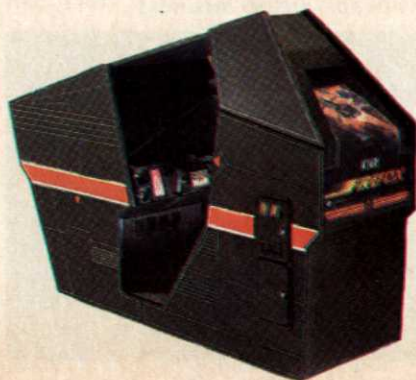
Your chances to get to the border refueling station include a 3000-, 6000-, or 9000-mile journey, or a "Pro" mission. Obviously, the longer you stay in enemy territory, the harder it will be to escape alive.

Prepare for takeoff.

The Action

Seated in the cockpit of *Firefox*, you face a display that not only aims your firepower but also computes your fuel and missile gauge. *Firefox* is a stealth plane—it cannot be detected by regular radar. As a result, enemy planes can't see you, though you can fire at them. But you can be detected by infra-red radar. Shoot quickly before the infra-red radar rings engulf you. If you avoid detection long enough, you get a special bonus.

You have a choice of weapons. The first are your guns, fired by the finger switches. Using the guns, you may have to hit your target several times. You also have four missiles that destroy anything. Keep in mind that only a missile can destroy a ship.



The Strategies

You've been detected by Soviet infra-red radar! When the Soviets locate you, they fire from every angle.

You have three strategies. The first is to fire one of your missiles. This paints the entire screen quickly and destroys the radar. While this is effective, it costs you the extra points you could score for saving your missiles. The second strategy simply is to dodge the enemy shots. The last is to fire your guns at the incoming rockets and cannons while waiting for a break in the attack.

When a break occurs, you can change altitudes to try to lose the Soviets in the clouds. Remember, flying quickly over the ground will cost you more fuel than cruising. But the ground is safer with fewer enemy attacks and more vulnerable radar rings.

Be aware that your terrain-following radar may get damaged—this means that you will have to fly *Firefox* yourself! For example, there is an ice cliff that you can avoid by pulling back on the controls. If you pull back in time, you get a bonus. If not . . .

When you reach the refueling sub on the ice flow, you pick up fuel and bonus points. But if you have missed too many enemy planes, they will converge to prevent a full refueling.

"Good luck, Major!"

Firefox makes you the star of the show. It's the first of many laser-disk games you'll be seeing from Atari. We have seen the future, and it flies.

—ELAINE AND GREG RIVERA

Available at better game arcades.

TYPO ATTACK

Keeping Those Fingers Nimble

TYPO ATTACK is a different kind of shoot'em-up. Actually, it's a shoot'em down. And it accomplishes what a lot of software only attempts—combining fun and learning.

This game easily holds the attention of children and adults: it allows both to learn touch typing, improve skills and enjoy the experience.

The title screen showcases the Atari computer's graphics capabilities, and the game play won't let avid Atari fans down.

The game displays a base of eight letters—starting with the "home row" of typewriter keys and the space bar.



Typos teach you a lesson

Action begins with alien typos that fall from the sky; you shoot 'em down with energy bolts by typing the letter the typo is heading for. The changing display of letters and symbols keeps your fingers moving. On some waves, it even takes a double shot to kill the invader. If you miss the invading typo and it hits your base, it will begin to dig out your shelter. Once it hits the buffer zone, the invaders land and you lose that round. Back to wave one.

Four different options build on each other for an engrossing learning experience. There is an uppercase version, an upper and lowercase, a symbols set, and a fast one. The most challenging is the symbols version, which concentrates on keys not ordinarily used. The fast version challenges the swiftest typist and helps increase your speed after slower versions are mastered.

Scoring is simple. You win points by shooting the typo invaders from the sky. As the typos fall faster, your score increases by multiples of ten.

The game, originally created by 17-year-old David Buehler of Minnesota, was popular with the Atari Program Exchange (APX) and last year won first prize in the educational category. The success of the game prompted Atari to bring it out through its main-line distribution. The game will also be sold through AtariSoft for Apple, Commodore, and IBM PC computers.

—ROSJE GOURLEY HITCHENS

Available in cartridge format. Requires 16K RAM. Suggested retail price is \$39.95.

BASIC Goes XL

Language Gets Refined

HAVING TROUBLE WITH player/missile graphics? Wish your program would run faster? Struggling to

trace a critical section of your program to find that nasty little bug keeping you from fame and fortune? You can do all that and more with BASIC XL, the exciting new language developed exclusively for Atari computers.

When Atari was preparing to present its first computers to the Consumer Electronics Show in January 1980, it contracted a software company to implement a BASIC language interpreter. Atari wanted to fit an easy-to-use language into an 8K ROM cartridge and still have it support the computer's unique sound and graphics capabilities. Based on the then popular BASIC of Hewlett-Packard, ATARI BASIC was born in record time and delivered in cartridge format for the CES show.

The company that produced ATARI BASIC eventually became known as Optimised Systems Software or OSS. Not content to rest on its laurels, OSS has worked over the last several years to produce an enhanced version of ATARI BASIC they call BASIC XL. Combining the wish lists of ATARI BASIC users with an advanced ROM technology, BASIC XL offers Atari users a very powerful, yet accessible language.

BASIC XL comes in a 24K cartridge that takes up only 8K of user memory! It will run any program written in ATARI BASIC and will execute ATARI BASIC programs four to ten times faster. BASIC XL greatly eases the programmer's task with commands such as auto number, renumber, trace and indented listings. Advanced control structures like WHILE...ENDWHILE and IF...THEN...ELSE make program flow more professional and understandable, and greatly simplify string handling, true concatenation and string arrays.

But the most useful BASIC XL feature may be the ten player/missile commands that take the drudgery (and PEEKS and POKES) out of using Atari computers' advanced-graphics capabilities. Commands such as PM-MOVE, PMWIDTH, MISSILE, etc., allow for much simpler access to animation for education and entertainment applications.

Formation of screen displays and printed reports is also simplified with a variety of PRINT USING options while HSTICK and VSTICK are among several new commands to read input from a joystick. And, joy of joys, no more saving a program and calling DOS in order to get a listing of the directory. The BASIC XL DIR command will list a directory directly from BASIC.

All in all, OSS has achieved a re-

markable synthesis of power, simplicity and advanced technology that will interest anyone serious about programming in BASIC on an Atari computer.—JASON GERVICH

Available in 24K Bank Select Cartridge. Requires 16K RAM. Suggested retail price: \$99.00.

SKY WRITER

Fly the Friendly Skies

IMAGINE THAT YOU'RE a pilot flying a two-propeller plane over your home town. As you zoom through the sky, huge cumulus clouds with word roots ('pig;' 'tail') float past you and a word definition hovers above. You must search the skies for two word roots that equal a compound word (like 'pigtail') which matches the definition you see.

This airborne adventure is *Sky Writer*, a vocabulary-building educational game for children ages six to 14, created and designed by Milliken Publishing Company's EduFun! group.

Sky Writer teaches basic word structure and helps build vocabulary in the context of a simple game: You have three chances to fly a plane using the arrow keys on the computer keyboard or a joystick. When you reach a cloud with the right root word, you press either [RETURN] or the joystick fire button.

This isn't as easy as it sounds. While you're cruising through the skies, you must always choose root words in the right order, avoid flying into rain clouds, and be careful not to run out of fuel. One mistake and you'll crash!

Sky Writer is entertaining, colorful, and fun. It is also an excellent vocabulary builder, because it repeats old word definitions while introducing new ones as you proceed through each of eight game levels. But is its educational value sacrificed for its entertainment value? The player with excellent hand-eye coordination will learn quickly how to fly his or her plane through the skies. But what about the child who recognizes the right root words but isn't agile enough to maneuver the plane accurately? Perhaps a little practice will help develop that skill as well.

—ELIZABETH METZGER

Cartridge available now. Requires 16K RAM. Suggested retail price: \$39.95.

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*DIG DUG is created and designed by Namco Ltd., manufactured under license by Atari, Inc. Trademark and © Namco 1982.



Which is the best way to inflate your score?

Better find out. We've done our ground-work on DIG DUG so well, it plays just like it does in the arcade. So don't dig yourself a hole. Like the player on the left. Sure he'll score points for blowing up the Fygar™ in a vertical path. But blow up the Fygar in a horizontal path, like the player on the right, and score twice as many points. A landslide.


You can dig up even more points by uncovering a bonus veggie. But you get only one on each level. All you have to do is drop two boulders and you'll see it. Buried treasure disguised as a veggie.

Only Atari makes DIG DUG for the ATARI® 2600™ Game, Sears Video Arcade† systems, and versions exclusively for the ATARI 5200™ Super-System and all ATARI Home Computers.

So get to your nearest store and dig into your pockets. For DIG DUG.

Here comes Dig Dug™ from Atari.®



 A Warner Communications Company

COMPUTER CLASSROOM

Step-by-Step Advanced Programming and Assembly Language

by Bill Bartlett & David L. Heller

WELCOME TO COMPUTER CLASSROOM. Starting with this lesson, and continuing in succeeding issues of ATARI CONNECTION, we'll guide you through the basics of Assembly language and advanced programming techniques in step-by-step fashion. Each Classroom will build to the next. So after you've read this module and enjoyed the program at its end, you can remove these pages, and start your own Atari Assembly language and advanced programming guide.

Why Assembly Language?

Programming in Assembly language brings you one step closer to your computer than programming in a high-level language like BASIC. Assembly language is a more direct way of communicating with your computer; you'll be able to create programs that execute faster, have more intricate graphics, complex sounds and a truly professional look. In short, learning Assembly language will help you reach your full programming potential. If you're ready to take the plunge, you'll eventually need the Atari Assembler Editor cartridge (Atari CXL4003). We'll be showing you how to design programs using the Assembler cartridge in future lessons. So put it on your shopping list and get ready for an adventure in advanced programming.

Lesson 1: Numbering Concepts The Decimal Numbering System

You and I, and the rest of the human race, feel comfortable using the decimal numbering system: counting in powers of ten. That's because we've got ten fingers, ten toes, and in a pinch can use our digits like a built-in abacus. The ten symbols, or digits, used to represent decimal values are 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. Each digit to the left of the decimal point has a value that is a power of ten higher than its neighbor.

For example, the decimal number 237 represents $2 \times 10 \times 10 + 3 \times 10 + 7 \times 1$. So far so good. But not good enough for computers.

The Binary Numbering System

Binary, a numbering system based on powers of two, is ideal for computers. Computers are really very simple machines. They store information in simple binary terms such as on/off or high/low and can use the two digits 0 and 1 to represent any binary number. In computer jargon a binary digit is commonly referred to as a bit. Each bit to the left of the decimal point has a value that is a power of two higher than its neighbor. For example, the binary number 1011 represents $1 \times 2 \times 2 \times 2 + 0 \times 2 \times 2 + 1 \times 2 + 1 \times 1$. The decimal equivalent of 1011 is 11. Here's a little chart that shows why:

| | | | | |
|----------------------|---|---|---|----------------------|
| 8 | 4 | 2 | 1 | [Value of each bit] |
| 1 | 0 | 1 | 1 | [Binary number] |
| $8 + 0 + 2 + 1 = 11$ | | | | [Decimal equivalent] |

The example 1011 is a four-bit number. But your Atari computer groups eight bits together to form one byte. A byte is the smallest unit of memory that your computer can work with. Any number ranging from zero (00000000) to 255 (11111111) can be stored

in eights bits. This chart shows why the binary number 11111111 equals 255 decimal.

| | | | | | | | | |
|--|----|----|----|---|---|---|---|----------------------|
| 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 | [Value of each bit] |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | [Binary number] |
| 128 + 64 + 32 + 16 + 8 + 4 + 2 + 1 = 255 | | | | | | | | [Decimal equivalent] |

Where These Numbers Are Stored

Binary numbers are stored in memory locations. In ATARI BASIC, the PEEK command lets you "look" into a location and "see" its contents. For example, location 53770 is defined as the random-number generator, so PEEK(53770) lets you see the random numbers, between 0 and 255, that this location contains. Here's a short program example that illustrates this point. **10 PRINT PEEK(53770):GOTO 10**

Conversely, the POKE command lets you put a one-byte decimal number into location. Try this short example and you'll get the idea:

10 POKE 82,10

After you RUN this one-line program, the cursor—and left-hand margin—moves to the right. To set things straight again, just enter this bit of programming in the immediate mode:

POKE 82,2 [RETURN]

HI-BYTE, LO-BYTE

Numbers Greater Than 255

TO REPRESENT A VALUE that's greater than 255 you'll need to use more than one byte. You can combine two consecutive bytes (16 bits) and be able to store up to 65,536 values. These values range from zero (00000000 00000000) to 65,535 (11111111 11111111). Of the two bytes that make up each 16-bit combo, the byte with the most significant value is called the hi-byte or MSB (Most Significant Byte). The byte with the least significant value is called the lo-byte or LSB (Least Significant Byte). In ATARI BASIC you can combine the hi-byte and lo-byte of a 2-byte value by using the formula, **PEEK(LSB) + PEEK(MSB) + 256**.

Because all Atari computers can address 64K of read-only memory (64K = 65,536), there are many instances where two bytes are used together (hi-byte and lo-byte) to represent a value within the range of 0 to 65,535. For example, locations 88 and 89 are used together as one value to "point" to the location (within the 64K of memory) of the beginning of screen RAM:

SCRAM = PEEK(88) + PEEK(89) + 256.

Location 88 contains the lo-byte (LSB) and location 89 contains the hi-byte (MSB). Remember, the lo-byte always precedes the hi-byte in this formula.

The Hexadecimal Numbering System

When we begin our Assembly language work you'll be using a unique numbering system based on powers of 16, called "hexadecimal." The 16 symbols or digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E and F are used to represent hexadecimal values. When a hexadecimal value is written, it is always preceded by a dollar sign (\$) so it can be distinguished from a decimal value. Here's what a typical hexadecimal number looks like: \$D01F. Each digit to the left of the decimal point has a value that is a power of 16 higher than its neighbor. The hexadecimal number \$D01F represents $13 \times 16 \times 16 \times 16 + 0 \times 16 \times 16 + 1 \times 16 + 15 \times 1$. The decimal equivalent of \$D01F is 53,279. The hexadecimal numbering system is used as a shorthand method of expressing binary values. One hexadecimal digit replaces four binary digits (bits), and two hexadecimal digits can be used to express any eight-bit byte. Here are a few examples:

| Binary Number | Hexadecimal Equivalent |
|---------------|------------------------|
| 01010110 | \$56 |
| 00000000 | \$00 |
| 11111111 | \$FF |

Easy Hexadecimal-to-Decimal Conversion

To make conversion a snap, we've provided a program in ATARI BASIC that converts any integer value within the range of 0 to 65,535 to its equivalent binary or hexadecimal value. Save this value utility; it will get lots of use when we move on to future Assembly language modules.

```

10 REM :CLASS1.BAS
100 REM *** MAINLINE ***
110 GOSUB 1000:REM SETUP
120 GOSUB 1100:REM GET A DECIMAL VALUE
130 GOSUB 1200:REM CALCULATE BINARY
140 GOSUB 1300:REM CALCULATE HEX
150 GOSUB 1400:REM DISPLAY
160 GOTO 120
1000 REM *** SETUP ***
1010 POKE 82,0:GRAPHICS 2:REM LEFT MARGIN
1020 DIM BINARY$(16),HEX$(4),HEXDIGIT$(16)
1030 HEXDIGIT$="0123456789ABCDEF"
1040 POSITION 7,0:? #6;"binary"
1050 POSITION 5,3:? #6;"hexadecimal"

```

```

1060 RETURN
1100 REM *** GET A DECIMAL VALUE ***
1110 TRAP 1110:REM RETURN HERE ON INPUT ERROR
1120 ? "DECIMAL VALUE (0-65535)"; REM PROMPT
1130 INPUT DECIMAL:TRAP 40000:REM GET VALUE, CLEAR TRAP
1140 IF DECIMAL<0 THEN ? "TOO SMALL!" :GOTO 1100
1150 IF DECIMAL>65535 THEN ? "TOO BIG!" :GOTO 1100
1160 RETURN
1200 REM *** CALCULATE BINARY ***
1210 BINARY$="0000000000000000":D=DECIMAL:REM CLEAR STRING
1220 IF D>=32768 THEN BINARY$(1,1)="1":D=D-32768
1221 IF D>=16384 THEN BINARY$(2,2)="1":D=D-16384
1222 IF D>=8192 THEN BINARY$(3,3)="1":D=D-8192
1223 IF D>=4096 THEN BINARY$(4,4)="1":D=D-4096
1224 IF D>=2048 THEN BINARY$(5,5)="1":D=D-2048
1225 IF D>=1024 THEN BINARY$(6,6)="1":D=D-1024
1226 IF D>=512 THEN BINARY$(7,7)="1":D=D-512
1227 IF D>=256 THEN BINARY$(8,8)="1":D=D-256
1228 IF D>=128 THEN BINARY$(9,9)="1":D=D-128
1229 IF D>=64 THEN BINARY$(10,10)="1":D=D-64
1230 IF D>=32 THEN BINARY$(11,11)="1":D=D-32
1231 IF D>=16 THEN BINARY$(12,12)="1":D=D-16
1232 IF D>=8 THEN BINARY$(13,13)="1":D=D-8
1233 IF D>=4 THEN BINARY$(14,14)="1":D=D-4
1234 IF D>=2 THEN BINARY$(15,15)="1":D=D-2
1235 IF D>=1 THEN BINARY$(16,16)="1":D=D-1
1240 RETURN
1300 REM *** CALCULATE HEX ***
1310 HEX$="0000":D=DECIMAL:REM CLEAR STRING

```

```

1320 I=INT(D/(16*16*16)):D=D-I*(16*16*16)
1321 HEX$(1,1)=HEXDIGIT$(I+1,I+1)
1330 I=INT(D/(16*16)):D=D-I*(16*16)
1331 HEX$(2,2)=HEXDIGIT$(I+1,I+1)
1340 I=INT(D/16):D=D-I*16
1341 HEX$(3,3)=HEXDIGIT$(I+1,I+1)
1350 I=D
1351 HEX$(4,4)=HEXDIGIT$(I+1,I+1)
1360 RETURN
1400 REM *** DISPLAY ***
1410 POSITION 2,1: ? #6;BINARY$
1420 POSITION 8,4: ? #6;HEX$
1430 RETURN

```

Coming up Next

Join our next Classroom as we explore the inner workings of your Atari computer. We'll introduce you to the Atari memory map and show you what's lurking deep within the recesses of your computer's brain. After you learn how to read the map, you'll discover what parts of memory are used by your Atari computer, what parts are free for your use, plus exciting memory locations that put you in control of your computer.

See you next time.

Bill Bartlett is manager of Product Support for Customer Relations at Atari, Inc. David Heller is a contributing editor of ATARI CONNECTION.

Special Listing Instructions for "Bits and Pieces" and "The Computer That Rolls"

When you see:

- ↑ First press [ESC], then hold [CTRL] and [↑] at the same time.
- ↓ First press [ESC], then hold [CTRL] and [↓] at the same time.
- ← First press [ESC], then hold [CTRL] and [←] at the same time.
- First press [ESC], then hold [CTRL] and [→] at the same time.
- ↵ First press [ESC], then hold [SHIFT] and [CLEAR] at the same time.
- ▷ First press [ESC], then [TAB].

Users' Group Update

ATARI COMPUTER ENTHUSIASTS operate bulletin board systems, distribute public domain software and offer creative solutions to technical problems. ATARI CONNECTION continues its regional directory of users' groups. Listings are current as of April 5, 1984.

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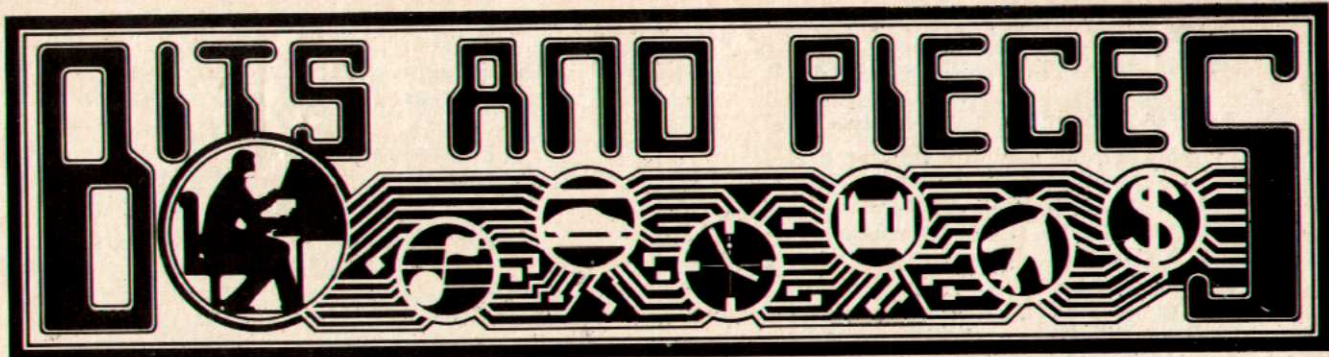
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ACROSS THE NATION

By David L. Heller

YOUR RESPONSE TO OUR requests for programs and utilities continues to be fantastic. So great in fact that this issue contains programs from across the nation—Arizona, California, Michigan, Massachusetts, Maryland and Virginia.

The programs reflect each contributor's regional area. For example, the three programs using ATARI BASIC: Norman Yee of Massachusetts gets right down to business, Keith Loritz's programs are definitely high-tech, pure Southern California, and make use of Boolean algebra and other sophisticated math tricks, while David Kessel's submittal is loose and easy, reflecting the kick-back atmosphere of sunny Arizona.

We're also proud to present innovative selections that help make your programs more efficient, show you a few tricks of the programming trade, and demonstrate three examples of math magic.

DISK DRIVE MANIA

Here are three reader programs that approach disk control from BASIC in three unique ways.

DOS.BAS

Using the XIO Command

Norman Yee

NORMAN YEE, a 13-year-old Atari computer whiz-kid from Boston submitted DOS.BAS to show us how to get the most from the XIO Input/Output command. Instructions for using XIO aren't included with the purchase of your computer, so Norman's program serves as an introduction to this little-known command.

It uses XIO to perform most of the functions usually handled by the DOS that comes with your disk drive, with one exception. The Disk Directory option uses the more conventional OPEN statement.

The variable X is used as the function number in the XIO command in line 170, and Norman has added "D1:" to the file name in line 160 so you don't have to type it in. Type in DOS.BAS, RUN it, then simply enter your choice of commands to see its versatility.

DOS.BAS

```
1 REM **DOS.BAS**
2 REM NORMAN YEE
10 DIM D$(26),FILE$(23),CMD$(9),A
   $(1)
20 GRAPHICS 0:POKE 752,1
30 POSITION 7,0:? "BASIC Disk Ope
   rating System"
40 ? :? "Commands: RENAME, DELETE
   , LOCK, UNLOCK
   , FORMAT, DIR(ECTORY)"
50 D$="D1:"
60 ? :? "Enter a command:"
70 INPUT CMD$
80 IF CMD$="RENAME" THEN ? "old n
   ame,new name";:X=32
90 IF CMD$="DELETE" THEN ? "What
   file to delete";:X=33
100 IF CMD$="LOCK" THEN ? "What fi
   le to lock";:X=35
110 IF CMD$="UNLOCK" THEN ? "What
   file to unlock";:X=36
120 IF CMD$="FORMAT" THEN POKE 710
   ,34:POSITION 5,10:? "Formattin
   g Erases Your Disk":GOTO 280
130 IF CMD$="DIR" OR CMD$="DIRECTO
   RY" THEN GOTO 190
140 IF X=0 THEN ? "Invalid Command
   ":GOTO 50
150 INPUT FILE$
160 D$(LEN(D$)+1)=FILE$
170 TRAP 260:XIO X,#1,0,0,D$
180 X=0:GOTO 230
190 TRAP 230:REM DISK DIRECTORY
200 OPEN #1,6,0,"D1:*.*"
210 INPUT #1,FILE$:? FILE$
220 GOTO 210
230 CLOSE #1:POSITION 22,15:? "Pre
   ss START"
240 IF PEEK(53279)<>6 THEN GOTO 24
```

```

0
250 RUN
260 IF PEEK(195)<>0 THEN ? CHR$(12
5)
270 POSITION 2,10:?"File Name Inc
orrect":?" OR "
"? "Locked File Error": FOR X
=1 TO 1100:NEXT X:RUN
280 POSITION 5,12:?"DO YOU WANT T
O CONTINUE (Y OR N)";
290 INPUT A$
300 IF A$<>"Y" THEN RUN
310 POKE 710,148:POSITION 10,15:?"
FORMATTING...";X=254:GOTO 17
0

```

OPERATOR

A Disk-Selection Subroutine

Keith Loritz

THE PROLIFIC CALIFORNIAN, Keith Loritz has submitted more than ten programs to ATARI CONNECTION. In this issue (which could be called "Bits and Loritz") we are delighted to present three of Keith's programming gems.

OPERATOR is a fancy disk-controlling subroutine that can be added to, and called from, one of your programs. When called (GOSUB 30000), OPERATOR presents a complete disk directory. You then choose a program listed on the directory by using the [CTRL] key in combination with the arrow keys and pressing [RETURN].

Once you've made your selection, the value of B\$ is equal to the selection—including the prefix "D1."

This subroutine makes a nice addition to any program that uses data stored on disk such as a database, character generator, word processor, or art program.

After you've typed and saved OPERATOR, remove "RETURN" from line 31700 and replace it with "PRINT B\$" to see how OPERATOR operates!

OPERATOR

```

1 REM **OPERATOR**
2 REM KEITH LORITZ
30000 DIM B$(30):DRIVE=1
30100 B$="D1:*.*":B$(2,2)=STR$(DRIVE
)
30200 CLOSE #6:OPEN #6,6,0,B$:CLOSE
#7:OPEN #7,13,0,"E:":?"DIRECT
ORY":G=0:POSITION 2,3
30300 G=G+1:INPUT #6,B$
30400 IF LEN(B$)<>17 THEN ? :? B$:;G
OTO 30800
30500 ? B$, :INPUT #6,B$
30600 IF LEN(B$)<>17 THEN ? :? :? B$
:;G=G+1:GOTO 30800
30700 ? B$:GOTO 30300
30800 CLOSE #6:POKE 752,1:I=0:J=3:OP

```

```

EN #6,4,0,"K:":IF G>19 THEN G=
20:J=0
30900 C=I*20+1:POSITION C,J:?" CHR$(2
7);CHR$(31):;GET #6,A:POSITION
C,J:?" " " ";J=J-(A=28)+(A=29):
I=I-(A=30)+(A=31)
31000 I=(I<0 OR I=1):IF A=155 THEN I
NPUT #7,B$:POSITION 2,G+2:?" :L
OCK=(ASC(B$)=42):IF LEN(B$)<>0
THEN GOTO 31400
31100 IF (J<3 AND G<20) OR J<0 THEN
J=G+1
31200 IF J>G+1 THEN J=3*(G<>20)
31300 GOTO 30900
31400 CLOSE #6:CLOSE #7:B$(15)=B$(3,
14):B$(1,3)="D1":B$(4,11)=B$(
15):B$(12,12)="." :B$(13)=B$(23
,25)
31500 C=0: FOR A=1 TO 15:IF B$(A,A)
<>" " THEN C=C+1:B$(C,C)=B$(A,
A)
31600 NEXT A:B$=B$(1,C):IF B$(LEN(
B$))="." THEN B$=B$(1,C-1)
31700 B$(2,2)=STR$(DRIVE):POKE 752,0
:?" :RETURN

```

DISKMENU

Disk Fun and Artificial Intelligence

David J. Kessel

DAVID KESSEL USES programming as a way to unwind from his job as manager of KAZM Radio in Sedona, Arizona. To help us unwind and have a little fun, David has submitted DISKMENU, an entertaining disk-management program with a mind of its own—it actually talks back!

Although the listing is long, typing it in is well worth the effort. DISKMENU is loaded with novel programming techniques that are guaranteed to help you write your own "smart" programs.

Operation Hints

After you type, SAVE and RUN DISKMENU you'll be asked for your name. Try typing in your *full* name. When asked for an "Activation Code," talk to the program like this: "I NEED SOME HELP," or "CAN YOU SHOW ME THE DISK MENU," or "I'D LIKE TO RUN A PROGRAM." The responses you receive may astound you!

DISKMENU

```

10 REM ***DISKMENU***
20 REM DAVID J. KESSEL
30 GRAPHICS 0:CLR :POKE 710,208:P
OKE 709,6:POKE 752,1:TRAP 10
40 ? :POKE 16,64:POKE 53774,64:PO
KE 580,1:POKE 694,0:POKE 702,6
4:POSITION 17,0:?"ATARI"
50 CLEAR=230:WRITE=240:CENTER=250

```

```

:ANS=260:DIM A$(39),NAME$(20),
CODE$(400),B$(13)
60 RESTORE 720: FOR I=1 TO 10:RE
AD A: FOR W=14 TO 0 STEP -1.5
:SOUND 0,A,10,W:SOUND 1,A+1,10
,W:NEXT W:NEXT I
70 X=2:Y=5:A$="Please identify yo
urself":GOSUB WRITE:?
80 INPUT NAME$:Y=5:GOSUB CLEAR:Y=
6:GOSUB CLEAR
90 FOR I=1 TO LEN(NAME$):IF NAM
E$(I,I)=" " THEN 120
100 NEXT I:GOTO 170
110 ? CHR$(125):X=2:Y=5
120 A$="May I call you ":GOSUB WRI
TE:? NAME$(1,I):INPUT A$:IF L
EN(A$)<=3 AND A$(1,1)="Y" THEN
150
130 IF LEN(A$)<=3 THEN 160
140 FOR W=1 TO LEN(A$)-2:IF A$(W
,W+2)<>"YES" THEN NEXT W:GOTO
160
150 NAME$(I)=" ":? CHR$(125):X=2:Y
=8:A$="Thank you ":GOSUB CENTE
R: FOR W=1 TO 400:NEXT W:GOTO
170
160 ? CHR$(125):X=2:Y=5:A$="Have
t your way then ":GOSUB WRITE:
? NAME$: FOR W=1 TO 600:NEXT
W
170 GOSUB CLEAR:X=2:Y=5:A$="Welcom
e":GOSUB WRITE:A$=NAME$:X=X+W:
GOSUB WRITE:X=2:Y=8
180 A$="What is the Activation Cod
e":GOSUB WRITE:? :INPUT CODE$:
B$=" "
190 B$="HELP":A=0:GOSUB ANS:B$="GA
ME":A=2:GOSUB ANS:B$="MENU":A=
4:GOSUB ANS:B$="PLAY":A=2:GOSU
B ANS
200 B$="DISK":A=4:GOSUB ANS:B$="WH
AT":A=0:GOSUB ANS:B$="PROGRAM"
:A=2:GOSUB ANS:B$="RUN":A=2:GO
SUB ANS
210 ? CHR$(125):X=2:Y=5:A$="I don'
t understand what you want!":G
OSUB WRITE:X=2:Y=7
220 A$="Please try again...":GOSUB
CENTER:X=2:Y=9:GOTO 180
230 POSITION 0,Y:? "
RET
URN
240 POSITION X,Y: FOR W=1 TO LEN(
A$):SOUND 0,2,2,0:? A$(W,W):S
OUND 0,0,0,0:NEXT W:POKE 694,0
:POKE 702,64:RETURN
250 X=19-LEN(A$)/2:POSITION X,Y:
FOR W=1 TO LEN(A$):SOUND 0,4,2
,W,0:? A$(W,W):SOUND 0,0,0,0:NE
XT W:RETURN
260 SOUND 0,9,10,12:B=LEN(B$):C=LE
N(CODE$):IF C<B THEN SOUND 0,0
,0,0:RETURN
270 SOUND 0,180,12,4: FOR I=1 TO
C-B+1
280 IF CODE$(I,I+B-1)=B$ THEN 30
0
290 NEXT I:SOUND 0,0,0,0:RETURN
300 POP :SOUND 0,0,0,0:POKE 580,0:
ON A GOTO 330,380,410,420

```

```

310 ? CHR$(125):X=2:Y=5:A$="Do you
need assistance":GOSUB WRITE:
INPUT CODE$
320 IF LEN(CODE$)<3 AND CODE$(1,1)
<>"Y" THEN GOTO 370
330 IF CODE$(1,1)="Y" THEN 480
340 FOR I=1 TO LEN(CODE$)-2
350 IF CODE$(I,I+2)="YES" THEN 4
80
360 POSITION 5,18:? CODE$(I,I+2)
NEXT I
370 A$="WELL...": FOR I=1 TO 4:Y=1
0:GOSUB CLEAR: FOR W=1 TO 50:
NEXT W:GOSUB CENTER:NEXT I:X=2
Y=12:GOTO 180
380 ? CHR$(125):A$="GREAT!":Y=5:GO
SUB CENTER: FOR W=15 TO 0 STE
P -0.5: FOR I=0 TO 1:SOUND 0,
9,10,W:NEXT I:NEXT W
390 POSITION 2,7:? "Okay, ":NAME$:
A$="What Program do you want":
X=2:Y=9:GOSUB WRITE
400 INPUT CODE$:TRAP 540:IF CODE$(
1,2)="D:" THEN RUN CODE$
410 A$(1,2)="D":A$(3,3+LEN(CODE$
))=CODE$:TRAP 540:CODE$=A$:RUN
CODE$
420 ? "5":A$="Would you like to se
e the Disk Menu":X=2:Y=5:GOSUB
WRITE:INPUT CODE$
430 IF LEN(CODE$)<3 AND CODE$(1,1)
<>"Y" THEN 470
440 IF CODE$(1,1)="Y" THEN 600
450 FOR I=1 TO LEN(CODE$)-2:IF C
ODE$(I,I+2)="YES" THEN 600
460 NEXT I
470 GOTO 370
480 ? CHR$(125)
490 A$="Just give me a KEY word or
PHRASE":X=2:Y=5:GOSUB WRITE:A
$="so I will know what you wan
t me to do.
500 Y=7:GOSUB WRITE
510 A$="I know this maybe hard, bu
t after all":Y=9:GOSUB WRITE:A
$="you are a smart human so tr
y it!"
520 Y=11:GOSUB WRITE
530 A$="XXXXXXXXXX":Y=13:GOSUB CENTE
R: FOR I=1 TO 200:NEXT I:Y=17
:X=2:GOTO 180
540 I=LEN(CODE$):A$=CODE$(1,I):A$(
I+1,I+2)="*":TRAP 550:CODE$=A
$:RUN CODE$
550 ? CHR$(125):Y=5:A$="SORRY...":G
OSUB CENTER:Y=7:A$="I'm unable
to find that program":GOSUB C
ENTER
560 A$="Press START to try again":
Y=9:GOSUB CENTER:A$="Press SEL
ECT for the Disk Menu":Y=11:GO
SUB CENTER
570 IF PEEK(53279)=6 THEN ? CHR$(1
25):GOTO 390
580 IF PEEK(53279)=5 THEN 420
590 GOTO 570
600 ? CHR$(125):Y=0:A$="Checking t
he Disk Program Menu":GOSUB CE
NTER:Y=2:I=0
610 CLOSE #2:OPEN #2,6,0,"D:*,*":0

```

```

=0:X=3
620 TRAP 680:INPUT #2,B#:IF B$(11,
13)="SYS" THEN GOTO 620
630 IF B$(2,2)<>" " THEN GOTO 620
640 I=I+13:Q=Q+1:Y=Y+1:IF Y=18 THE
N X=21:Y=3
650 IF Q=30 THEN POSITION 3,19:? "
Not all programs can be displa
yed!":GOTO 670
660 POSITION X-2,Y:? Q:A$=B$:GOSUB
WRITE:CODE$(I,I+12)=B$(1,13):
GOTO 620
670 SOUND 0,2,4,8:Y=20:GOSUB CLEAR
SOUND 0,0,0,0
680 Y=0:A$=" HERE IS THE DISK MENU
LISTING ":GOSUB CENTER:CLOSE
#2
690 TRAP 670:Y=20:X=2:A$="Press NU
MBER & RETURN for program":GOS
UB WRITE:INPUT A:A$(1,2)="D:"
700 A$(3,13)=CODE$(A*13+2): FOR I
=3 TO 13:IF A$(I,I)<>" " THEN
NEXT I:I=11
710 A$(I)=" ":A$(I+1)=CODE$(A*13+1
0):RUN A$
720 DATA 91,91,91,91,76,81,91,102,
0,0

```

How DISKMENU Works

Here's a line-by-line description of DISKMENU to help you learn some of David's programming tricks.

Line 30: Sets COLOR and blanks the cursor.

Line 40: Disables the [BREAK] key (POKE 16,64 and POKE 53774,64), sets the computer to "cold start" (POKE 580,1) if the [SYSTEM RESET] key is pressed, and insures that the INPUT statements are printed in upper-case, non-inverse characters (POKE 694,0 and POKE 702,64).

Line 50: Sets or DIMensions variables.

Line 60: Plays tones read from line 720.

Line 70-220: The ascertainment section of the program.

Line 230: Clears out a section of text.

Line 240: Prints A\$ to the screen at POSITION X, Y.

Line 250: Similar to line 240, but it also centers the text on the screen.

Lines 260-300: Checks to see if the INPUT contains any of the "Activation Codes."

Lines 310-370: Asks if assistance is needed—if so, then it goes to line 520.

Lines 380-410: Prompts user to INPUT a program name and jumps to line 540.

Lines 420-470: Checks to see if the user wants to see the DISK MENU—if so, then it goes to line 600.

Lines 480-510: Prints brief instructions.

Lines 520-590: RUNs a disk program or offers options.

Lines 600-700: Reads the disk, prints a menu and RUNs programs.

Programming Helper LISTER.ENT Review Each Program Line David K. Macpherson

DAVID K. MACPHERSON, a field engineer for a Michigan data-processing company submitted a handy program-proofreading tool called LISTER.ENT that lets you review each program line at the push of a button.

Type this subroutine then LIST it to your disk drive or cassette recorder like this:

LIST "D:LISTER.ENT" or LIST "C:"

To use LISTER.ENT, ENTER it at the end of your program (ENTER "D:LISTER.ENT" or ENTER "C:"), GOTO 32600, and follow these simple operating instructions:

| Press | To |
|----------|----------------------------------|
| [START] | Increment listing by 10 |
| [SELECT] | Increment listing by 5 |
| [OPTION] | Increment listing by 1 |
| [SPACE] | |
| BAR] | Decrement listing by 10 |
| [RETURN] | Select new beginning line number |

LISTER.ENT

```

1 REM *****LISTER.ENT*****
2 REM DAVID K. MCPHERSON
32600 GRAPHICS 0:POKE 752,1:? ENTER
BEGINNING LINE NUMBER":INPUT
INCR:GOTO 32670
32610 A=PEEK(53279):IF A=7 THEN 3270
0
32620 POKE 77,0
32630 IF A=6 THEN INCR=INCR+10:GOT
O 32670
32640 IF A=5 THEN INCR=INCR+5:GOTO
32670
32650 IF A=3 THEN INCR=INCR+1:GOTO
32670
32660 GOTO 32610
32670 ? "5":IF INCR>32767 THEN INCR
E=32767
32680 IF INCR<0 THEN INCR=0
32690 ? "↓↓↓↓↓↓↓↓":LIST INCR:?:? "
(" ;INCR;")": FOR W=1 TO 50:N
EXT W:GOTO 32610
32700 B=PEEK(764):IF B=33 THEN INCR
=INCR-10:POKE 764,255:GOTO 32
670
32710 IF B=12 THEN POKE 764,255:GOTO
32600
32720 GOTO 32610

```

TRICKS OF THE TRADE

DELETE.ENT

The Automatic RETURN

David L. Heller

WHEN YOU POKE location 842 with 13, your Atari computer goes into "automatic RETURN" mode. It RETURNS the cursor continuously, until location 842 is POKEd with 12.

Here's a short subroutine—and example program—that shows how to use the power of 842 to delete programming lines, saving valuable memory space, after they've been executed. You can use a subroutine like this in any program that reads data into memory locations. After the data is read in, the lines containing the data are automatically erased!

The automatic RETURN subroutine is in lines 1000 through 1030 of the DELETE.ENT example. When RUN, it erases lines 10 through 75 before coming to a screeching halt in line 100. If you want to see it in action, just remove "POKE 559,0" from line 90, and "POKE 559,34" from line 100.

DELETE.ENT

```

1 REM ***DELETE.ENT***
2 REM DAVID L. HELLER
10 REM YOUR PROGRAM -DATA ETC -
15 REM
20 REM
25 REM
30 REM
35 REM
40 REM
45 REM
50 REM
55 REM
60 REM
65 REM
70 REM
75 REM
90 POKE 559,0:GOSUB 1000
100 POKE 559,34:? CHR*(125):? "THA
    T'S ALL FOLKS!":END
1000 ? CHR*(125):POKE 842,13
1010 POSITION 2,6: FOR I=10 TO 85
    STEP 5:? I:NEXT I:? "CONT":POS
    ITION 0,0:STOP
1020 ? CHR*(125):POSITION 2,6: FOR
    I=1000 TO 1020 STEP 10:? I:NE
    XT I:? "G.1030":POSITION 0,0:S
    TOP
1030 POKE 842,12:RETURN
  
```

SCRNDMP.ENT

A Screen to Printer

Transfer

Keith Loritz

KEITH LORITZ DOES it again! SCRNDMP.ENT is a short subroutine that prints the contents of your Graphics Mode 0 (text mode) screen to your printer. Just LIST this subroutine to disk or cassette, ENTER it at the end of your program, and GOSUB 30100 to see the printed results. Make sure your printer and interface (if you've got one) are turned on! Your screen clears after you RUN this example. Do some typing. When you want a print-out, press [CTRL] and [P].

Here's a short example that shows how you might use SCRNDMP.ENT in one of your programs. (The subroutine is in lines 30100 to 30300.)

When you use this subroutine, make sure your program is in Graphics Mode 0.

SCRNDMP.ENT

```

1 REM *SCREENDUMP*
2 REM KEITH LORITZ
10 OPEN #1,4,0,"K":OPEN #2,12,0,
    S:"":OPEN #3,8,0,"P:"
20 GET #1,A
25 IF A=16 THEN GOTO 30100
30 PUT #2,A
40 GOTO 20
50 REM
60 REM ***SCREEN PRINT SUBROUTINE
    ***
70 REM
30100 POKE 82,0:POKE 752,1:POSITION
    0,0:? :POSITION 0,0:POKE 752,0
    FOR A=0 TO 23: FOR D=0 TO
    39:GET #2,C
30150 ? #3;CHR*(C);
30200 NEXT D:? #3:NEXT A:? #3:?
    #3:POKE 93,PEEK(PEEK(95)*256+P
    EEK(94)):POSITION 2,0:? ""?:PO
    KE 82,2
30300 CLOSE #1:CLOSE #2:CLOSE #3:GOT
    O 10
  
```

WINDOW

A Window To The World

Scott Sheck

SCOTT SHECK WROTE this short program to demonstrate the usefulness of adding "32" and "48" to the tail end of graphics commands. Adding "48" to a graphics command (GR.7+48) is the same as adding a "16," but the screen isn't cleared!

Scott said, "I was using a drawing sketchpad program and constantly had to look back at the instructions for each command. This was a real inconvenience." WINDOW demonstrates how Scott feels it should be done, and we tend to agree with him.

After you RUN the WINDOW program, press the [START] key to see Scott's sample menu, and you'll get the picture.

WINDOW

```
1 REM ***WINDOW***
2 REM SCOTT SCHECK
10 GRAPHICS 7:16:COLOR 2
20 PLOT 32,22:DRAWTO 128,22:DRAW
   0 128,75
30 DRAWTO 32,75:DRAWTO 32,22:DRAW
   TO 128,75
40 GOSUB 60:REM MENU CALLED
50 GOTO 20
60 IF PEEK(53279)<>6 THEN RETURN
70 GRAPHICS 7+32:POKE 752,1
80 PRINT CHR$(125); "    ***TYP
   ICAL MENU***"
90 ? "LINE      LOAD      HU
   E"
100 ? "CIRCLE    SAVE      FI
   LL"
110 IF PEEK(53279)=6 THEN 110
120 GRAPHICS 7+48:RETURN
```

MEMOPAD

For Atari 600XL & 800XL Computer Users

Richard Inge

RICHARD INGE JUST got an Atari 800XL computer. He's really having fun with it, but found that it doesn't come equipped with a Memo Pad, like his Atari 800.

Richard's short program takes care of this disparity. RUN it, and start typing! Press [RESET] to get back to built-in BASIC.

MEMOPAD

```
1 REM ***MEMOPAD***
2 REM RICHARD INGE
10 GRAPHICS 0
20 FOR I=1536 TO 1545
30 READ B:POKE I,B
40 NEXT I
50 X=USR(1536)
60 DATA 32,226,246,32,164,246,24,
   144,247,0
70 END
```

MATH MAGIC

Keith Loritz

IF YOU'RE A MATHOPHILE, here's another short program submitted by Mr. Loritz that's sure to be of interest to you.

GCD

GCD asks for two numbers, then tells you their greatest common denominator. For example, enter 690911 and 11214017 and you'll soon discover that their GCD is 53147.

```
1 REM ***GCD***
2 REM KEITH LORITZ
10 ? CHR$(125):? "Enter two numbe
   rs - Press RETURN after each e
   ntry -"
20 INPUT N1,N2
30 GOSUB 30000
40 ? "Their GCD is ";? AN
50 POKE 752,1:POSITION 10,10:? "P
   ress START To Continue"
60 IF PEEK(53279)<>6 THEN GOTO 60
70 POKE 752,0:? CHR$(125):GOTO 10
100 REM *****SUBROUTINE*****
30000 AN=0:POKE 195,0:TRAP 30400:M=(
   N1)>N2)*N1+(N2>N1)*N2:N=[M=N1]
   *N2+(M=N2)*N1
30100 IF INT(N1)<>N1 OR INT(N2)<>N2
   THEN RETURN
30200 P=M-INT(M/N)*N:M=N:N=P
30300 IF P<>0 THEN GOTO 30200
30400 AN=M*(PEEK(195)=0):RETURN
```

For special instructions to type in the above programs, see page 59.

Submitting a Program or Subroutine to BITS AND PIECES

To prepare a program or subroutine for submission to "Bits and Pieces" follow these guidelines:

1. Give your program or subroutine a name of eight or less characters.
2. Write a brief description of the task performed by your program or subroutine and describe any special features.
3. Write a few lines about yourself and how you came to develop your program or subroutine.
4. If you are a more experienced programmer, then be sure to include the following information:
 - List all variables (ENTRY, EXIT, DIM)
 - List all IOCBs used in OPEN statements
 - Any other special routines or characters
 - List the variables which may be generated by the subroutine and passed back to the main program (exit variables).
5. Send your program on cassette or diskette, along with printed listing, to:

Bits and Pieces
ATARI CONNECTION Magazine
P.O. Box 3427
Sunnyvale, CA 94088-3427

6. Be sure to include your mailing address and phone number.

Even if you don't consider yourself an "expert" or "advanced" programmer, don't be discouraged! "Bits and Pieces" is for experts and beginners alike. So don't be shy. Even novices develop programs and routines that are of interest to others.

By submitting a program, you consent to its publication and use in ATARI CONNECTION and elsewhere. If your entry is published in ATARI CONNECTION, you will receive your choice of Atari software, worth up to \$30.

COMPUTER COMFORT *Saving Programs to Tape or Disk*

by Jane Sokolow

THIS TIME I'm *not* going to help you figure out what ERROR 138 or 140 or 143 or even 21 are all about. All that was covered in our last issue, so if you're having trouble loading a tape and getting these particular errors, see Computer Comfort, Spring 1984 ATARI CONNECTION. What I'm going to tell you about are the ways to save and load a program and the differences among them.

The first two procedures can be used with either cassette or disk. But there is one significant difference. Since a disk drive has its own operating system, it has a *directory* that can find a file by name. (The word FILE means something you save—a program, subroutine or just data.) Whenever you save or load a disk file, you refer to it by name. (There is a specific protocol in constructing a name: it has to be made up of letters and numbers (no punctuation marks, inverse video characters, etc.), eight characters or less in length, with the first character an uppercase letter. If you want to further identify the file, you can use an *extender*, which simply means putting a period after the name and then up to three more characters.) Since the recorder doesn't have an operating system, it can't find a file by name, so you don't use a file name.

Every key on the keyboard has a unique code. *Combinations* of specific keys—like the Inverse key, the [CTRL] or [SHIFT] keys in combination with other keys—have separate codes. When you save a program these code numbers are copied from RAM in the computer and transmitted to the tape or disk as electrical impulses.

LIST-ENTER

The LIST-ENTER procedure is the only one of the three possible saving/loading procedures that transfers the data the way you typed it, *character-for-character*. (For this reason *AtariWriter* uses this procedure.) This is called an *untokenized* file, which will make sense later on. After you have typed in a program and you want to save it, if you have a tape recorder, you type: **LIST "C:"** and if you have a disk drive: **LIST "D:FILENAME"**

Then press [RETURN] and your program will be saved. (Remember with a recorder, the tape must be rewound, and the PLAY and RECORD buttons pressed, before you LIST. When you press [RETURN] the buzzer will sound twice, and you press [RETURN] again. This goes for *all* the saving procedures.) When you want to load this file back into the computer, you simply get the correct tape or disk ready (rewound if it's at the beginning of the tape or wound to the correct place on the counter) and for cassette type: **ENTER "C:"** or, for disk: **ENTER "D:FILENAME"**

and press [RETURN]. Soon you should see the READY prompt. (On the tape recorder a buzzer will sound, and you press [RETURN] once again. Again, this is true for *all the loading procedures*.) Type **LIST** and press [RETURN] to see a listing of your program, or type **RUN** to run it.

The advantages of this type of save is that it does not wipe out a program you might have just typed or loaded in. It *merges* with the program already in memory. Two programs merged by loading one with another in RAM must have *different line numbers* because the BASIC editor cannot accept two same-number lines. This procedure is a handy way to save subroutines you want added to programs. Just make sure your subroutines start with line numbers not likely to be in the main routine (high numbers, line 5000 or so).

SAVE-LOAD

This procedure saves the program in a *tokenized* form in which all the BASIC commands are saved in a condensed code. This saves space and time, the main advantage of this type of save. The procedure is to type the program in and then, if you have a recorder, type: **SAVE "C:"** or, if you have a disk: **SAVE "D:FILENAME"**

Be careful because this procedure *will* wipe out any program already in RAM. With this procedure, you may take a shortcut: you may *load* and *run* a program at the same time by typing: **RUN "C:"** or **RUN "D:FILENAME"**

whichever is appropriate, and the file will run after it is loaded. You may also *chain programs* together by typing the *last line* of the previous program: (line number) **RUN "C:"**

or (line number) **RUN "D:FILENAME"**

With a disk drive you only need to be sure all the programs to be chained are on the same disk. With a recorder you will have to get the second program ready and press RETURN when the buzzer sounds.

CSAVE-LOAD

Only used with the cassette recorder, this procedure saves the program in a *tokenized* form, like the SAVE "C:" procedure, but it cannot be used to chain programs. It is probably the most commonly used procedure because of the ease of typing the command. As before, simply type in your program, then type CSAVE and press [RETURN]. Type CLOAD to load.

S'all for this issue, folks. Remember, if you have any questions, call the Atari toll-free numbers: (800) 538-8543; in California (800) 672-1404. □

Jane Sokolow is a product specialist in the Customer Service Department at Atari, Inc.



THE EASY GUIDE TO YOUR ATARI 600XL/800XL

by Thomas Blackadar
Sybex Computer Books
198 pages, paperback, \$9.95

IN THE PLETHORA of literature on computer literacy, *The Easy Guide to Your Atari 600XL/800XL* is notable for simplicity and the fact that it's the first book to address the Atari 600XL and 800XL computer systems. The introduction declares it "an easy guide, which assumes you have never used a computer before." The ensuing chapters come through on this promise: Simply and clearly written, the book provides step-by-step instruction to using these two computers. But it can be used with every other Atari computer—from the earliest Atari 400 to the forthcoming Atari 1450XLD.

Easy Guide surveys the Atari computer line: an overview of historic facts and interesting details along with a comparison of the various computers and peripherals. You're eased into computing through an early chapter on keyboard functions, introducing basic commands and helpful interpretations. Then you are invited to try some exercises to further your interaction with the keyboard and screen: correcting mistakes and tracking down the

EASING YOUR WAY THROUGH COMPUTING

More Fun! More Games! More Pilot!

meaning of an Error message.

You get into the Atari computer graphics capabilities concluding with instructions for drawing four-color pictures. You learn how to plot screen points and draw lines between them. This effect is like Etch-a-Sketch drawing. There's a chapter on commercially available software with guidelines for intelligent selections—helpful when you consider how much software is on the market. Ultimately you are encouraged to write your own programs, and supported by yet more instructions.

Easy Guide is easy enough, but the writing is dry and the exercises are dull. You wind up hungry for a more entertaining book that would deliver novice programmers from the tedium of such guides.

—RANDI ROHDE

GAMES FOR YOUR ATARI COMPUTER

by Paul Bunn
Dell Press
128 pages, paperback, \$5.95

WHERE CAN you get 11 video games, six brain teasers, five graphics and sound utilities, and a straightforward introduction to BASIC programming for under six dollars? The Dell Computer Games series title *Games for Your Atari Computer*, that's where.

The program listings run between one and six pages long, but the type is a lot easier to read than many of the programs I've tried to copy from magazines.

The games in the book, though simple, have winning graphics and excellent sound. And typing in these games teaches you the programming process. You'll be able to see how a programmer sets up sound data, what commands are used to draw player/missile graphics and how to create title displays.

In additional to all the games and

other listings *Games for Your Atari Computer* includes a helpful guide on designing and writing your own programs, a 14-page thorough glossary of high-tech terms and an eight-page bibliography of other valuable computer books.


Paul Bunn, the author, is a 16-year-old from England. *Games for Your Atari Computer*, is his second book.—PAULA POLLEY

ATARI PLAYER/MISSILE GRAPHICS IN BASIC

by Philip C. Seyer
Reston Publishing Co.
173 pages, paperback, \$14.95

FOR THE PAST TWO years, I have wondered how to use my Atari computer's famous player/missile graphics capabilities. I read magazine articles. I thumbed through manuals. Laboriously I typed in sample programs. I even discussed the subject with professional programmers. A piece of information here, and a piece there. But always, I left discouraged. "This stuff is so technical," I thought, "that I will never understand it."

Atari Player/Missile Graphics in BASIC by Philip C. Seyer translates this sophisticated subject with immediate and exciting results. Within two hours I was using a joystick to move my own custom-designed skier down a flight of stairs. Ten minutes later the stairs transformed into smooth, undulating hills. Then I straightened the hills, removed the skis and made my little guy's legs bend at the knees as he ran, practicing the 100-meter dash for the Olympic decathlon. His hands even went up as he leaned across the finish line. Victory!

If you have felt defeated by Atari player/missile graphics, then Philip C. Seyer's book will make you a winner. The competition is now over, but the rewards have just begun. 

—NELSON ZANE

ATARI SINGS YOUR FAVORITE SONGS!!!

THE Original VOICE BOX Speech Synthesizer by the ALIEN GROUP has received rave reviews:

MICRO COMPUTING—"The VOICE BOX injects an endearing personality to your computer. The possibilities are enormous."

COMPUTE—"The VOICE BOX offers more human-like tones and does not blank out the screen."

CREATIVE COMPUTING—"English text and phonetic code may be freely intermixed rather than requiring separate modes as is the case without exception with every other speech system. A mode called talking face displays an animated face with impressive lip sync animation."

ANTIC—"There is a great potential for teaching children to spell and an added dimension to games overall. I believe the VOICE BOX is well worth the price tag."

ANALOG—"For ATARI owners who want to add speech to their programs, the Alien Group VOICE BOX is probably the best choice."

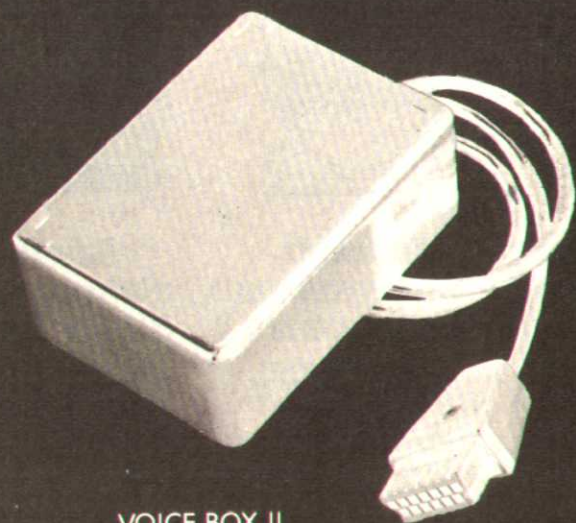
POPULAR SCIENCE—"The speech quality is excellent. Besides creating speech, the software has a bit of fun with graphics."

and on the new VOICE BOX II

TIME MAGAZINE—"Machine of the Year" "The VOICE BOX by the Alien Group enables an ATARI to say aloud anything typed on its keyboard in any language. It also sings "Amazing Grace" and "When I'm 64" or anything else that anyone wants to teach it."



INCORPORATE THE SINGING HUMAN FACE INTO YOUR PROGRAMS AND GAMES



VOICE BOX II
Speech & Singing Synthesizer

To order by mail send a check or money order to the ALIEN GROUP for \$169. Then, try the VOICE BOX II for 10 days, and if it isn't the finest value you've ever seen in a computer peripheral, the most challenging and provocative addition you've ever made to your system, return it in its original condition for a full refund.

THE ALIEN GROUP
27 West 23rd Street (212) 741-1770
New York, NY 10010

The New VOICE BOX II for ATARI plugs into the serial port of the ATARI 400/800 with sound coming out of the TV/monitor. 48K DISK is required. It has all of the features of the original VOICE BOX plus many exciting new hardware and software features:

- The ability to sing with voice and 3 part music.
- A library of 30 famous songs.
- A comprehensive music system that allows the user to easily enter or modify new songs.
- Software that can convert the bottom two rows of the ATARI keyboard into a piano with a range of 3½ octaves using the shift and control keys.
- Programmable musical sound effects such as tremolo, vibrato, glissando and click track.
- A singing human face with lip-sync animation designed by Jerry White.
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SPACE KNIGHTS

by David Heller and Robert Kurchina
Reston Publishing Co.
156 pages, paperback, \$24.95

ALL RIGHT, SCIENCE fiction fans, put away your outdated *Star Trek* trinkets for a look at *Space Knights*, a sci-fi book and video game combination by author David Heller and programmer Robert Kurchina. *Space Knights* comes packaged with a diskette for Atari computers which features eight video games based on action scenes in the book. The concept of writing feature-length stories, and then programming games to fit has been a long time coming; *Space Knights* offers a good start for the genre.

Unfortunately, Heller's original stories get bogged down in corny dialogue and character development—Jake, the forthright-but-naive-hero; Lisa, the capable-but-overly-sensitive-feminist; and CLIDE, the bumbling-but-lovable-computer are old hat.

The games, on the other hand, are genuinely enjoyable. Though the graphics are simple, the exciting game play makes up for the lack of fancy visuals. Games like "Navigate," "Impact," "Weomby," and "Gammalon" introduce you to challenging spaceship navigation and flight simulations that are fun to play. Others, like "Mind Demons" and "Bug Blaster" are based directly on scenes from the story. And, although they are fun initially, they are too easy to master and become boring. The higher levels of "War Room"—a *Berzerk*-like maze game—provides some of the speediest game play on the disk.

Space Knights is a good start. And why shouldn't we expect the exponential quality improvement in these novel/games that we've seen in video games themselves?

—MIKE DASHE

TAKING OFF WITH PILOT

PILOT (Programmed Inquiry, Learning Or Teaching) was designed by Dr. John Starkweather, University of California in San Francisco, to be easy for teach-

ers to learn and to use in generating computer-aided classroom materials. Dr. Dean Brown in his work at the Stanford Research Institute found in addition that *Pilot* was a good first programming language for children.

The books that follow were designed to help you get the most out of *Atari Pilot*. The original *Pilot* had only eight or nine "core" commands; *Atari Pilot* has been enhanced into a much more powerful language than the original, incorporating special commands for sound and "turtle graphics."

PILOT PRIMER: THE PILOT PROGRAMMING LANGUAGE INSTRUCTION MANUAL

Atari Inc.
191 pages, hardcover, \$25

Of all the books currently available on *Atari Pilot*, the most essential for learning the language is the *Pilot Primer: The Pilot Programming Language Instruction Manual*. It is the best organized, most complete source on *Atari Pilot* to date. Even more important, it is written as a tutorial. It assumes no prior computer experience and takes the user step-by-step from an introduction to the Atari computer's keyboard to advanced string manipulation and "turtle graphics" special variables. The *Pilot Primer* is included in the "Educator" *Pilot* package and is also available as a separate item from many Atari dealers. The primer is also available by mail for \$25 from Atari Customer Relations, 1312 Sunnysvale, CA 94086.

ATARI PILOT FOR BEGINNERS

by Jim Conlan and Tracy Deliman
Reston Publishing
225 pages, paperback, \$14.95

This fast-paced, humorous introduction to *Atari Pilot* is full of puns, jokes and provocative programming ideas. It serves as a useful teacher's guide for preparing classroom lessons that can be both witty and challenging. The sections on turtle graphics are especially well geared to inject creativity and innovation into anyone working with *Atari Pilot's* graphics. Poor organization is the book's major drawback. Ideas and programs are introduced out of context and may confuse the reader.

PICTURE THIS!

by David Thornburg
Addison-Wesley Publishing
191 pages, paperback, \$14.95

Unlike the other books mentioned here, *Picture This!* is concerned solely with the turtle graphics functions of *Atari Pilot*. This may be the best way to introduce *Pilot* to someone who has an artistic bent. Written for beginners in a light, frequently humorous style, *Picture This!* takes the reader/user into the world of the "turtle." It is an exciting world where geometry, design, color and computer programming are synthesized so that by the completion of the book "kids of all ages" feel proud of what they've accomplished. David Thornburg has played a prominent role in advancing the cause of user-friendly languages like *Atari Pilot*; *Picture This!* shows just how educational and entertaining computing can be.

ATARI PILOT ACTIVITIES AND GAMES

by Herb Kohl, Ted Kahn and Dale Dishroon
Reston Publishing
250 pages, paperback, \$14.95

One of the best ways to learn to program is to study programs written by others and then experiment with them. The recent release, *Atari Pilot Activities and Games*, encourages the reader to do just that.

Unlike other introductions, *Activities and Games* goes beyond the basics and presents a wealth of sophisticated programs that showcase *Atari Pilot's* flexibility and power. This book explores programming structure; word and language games; math, logic and strategy programs; and adventure games.

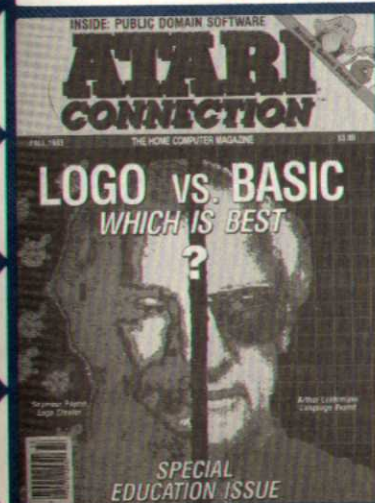
Each idea is illustrated by a variety of easy-to-follow programming examples. Of special interest to more experienced *Pilot* users is the appendix on *Pilot* PEEKS and POKES, explaining "tricks" that can be done by examining and changing the information stored in the computer's memory.

Atari Pilot Activities and Games is the largest collection of interesting *Pilot* programs ever published and should grab anyone interested in seeing what *Pilot* really can do. □

—JASON GERVICH



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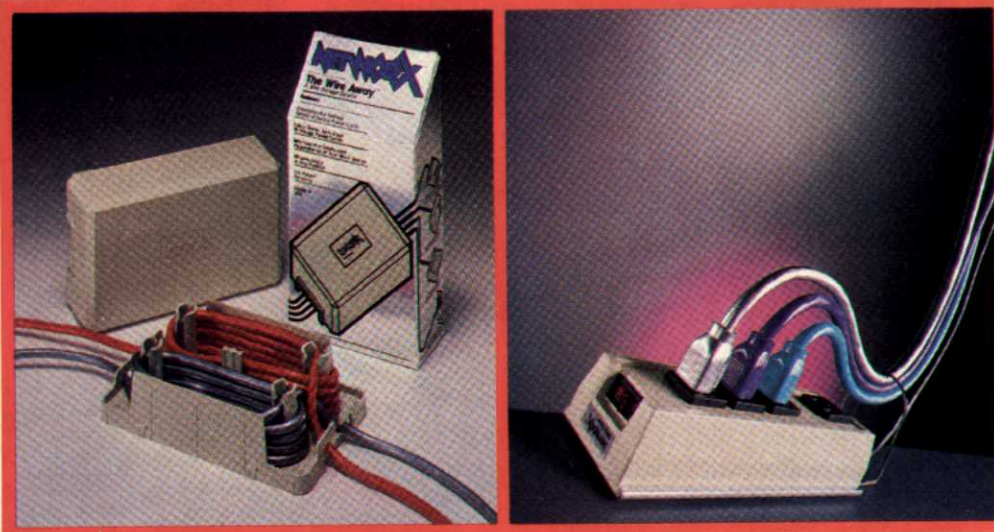


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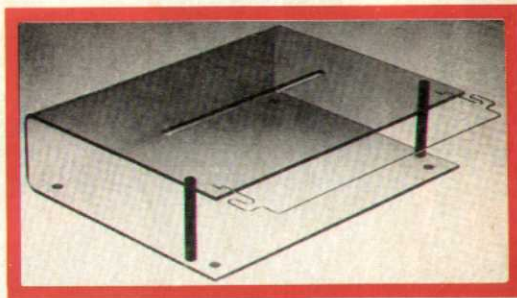


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In the ATARI CONNECTION Winter 1984 issue we cheered the Atari Touch Tablet with *AtariArtist* software. But it seemed a shame that while you could store your art on disk, there was no way to print a hard copy of your creations. We stand corrected. The NPC Screenshooter gives you instant prints and slides directly from your computer monitor. The hood fits snugly over 12- and 13-inch screens and sets the camera the correct distance from the screen. Special brackets accommodate either a 35mm camera or the Polaroid OneStep included in the package. And with the optional Polaroid Auto-process kit, you can develop your slides in minutes. The Screenshooter is fast, simple and affordable. Now *that's* a system. Cheers and more Cheers!

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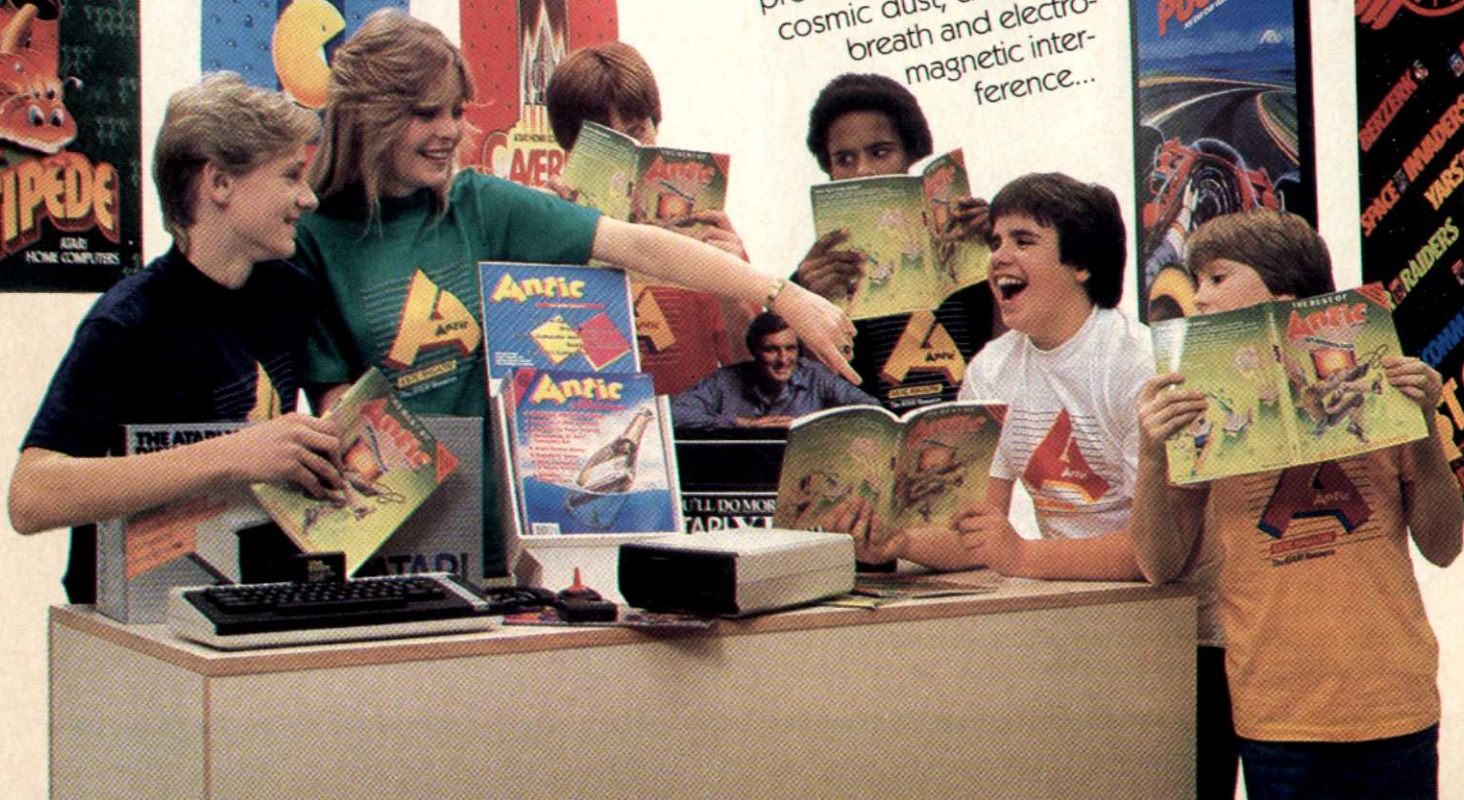
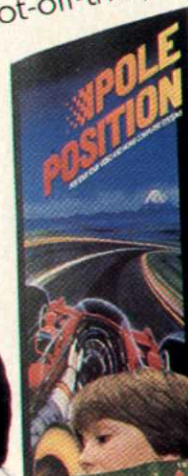
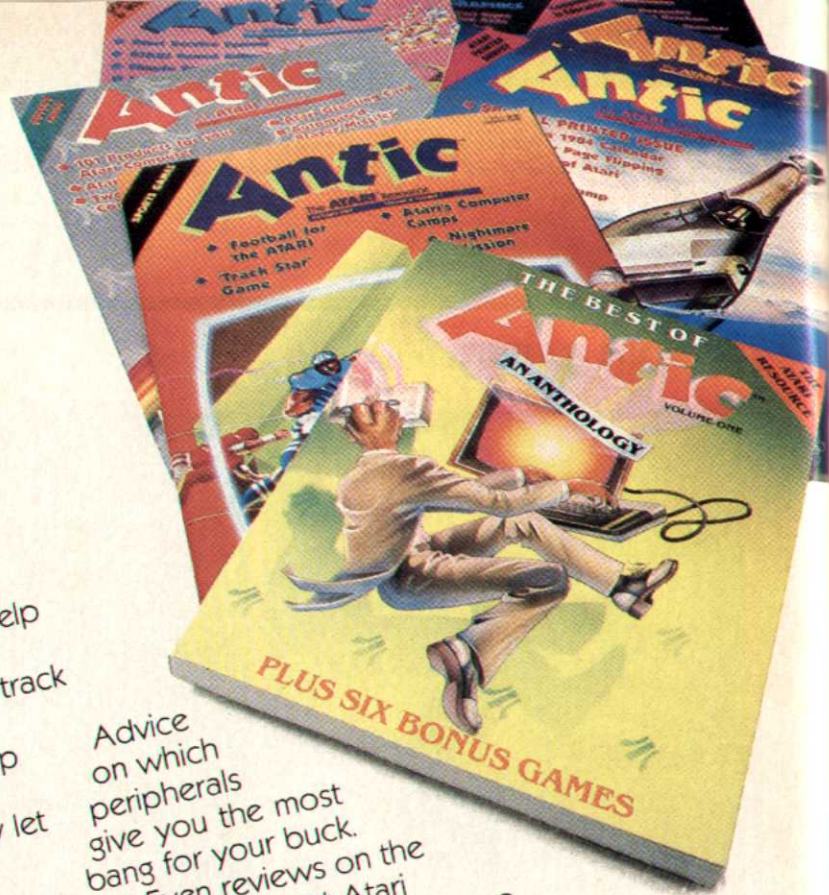
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HOW TO TURN ON YOUR ATARI

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ART ON THE RUN

by Earl Rice

COMPUTERS AND ART. A formidable marriage. I'm not surprised they got together, but it seemed touch and go for a while. Back when I was in college, art and engineering met in Industrial Arts. They hung out together dreaming up fanciful flying machines, new ways to build houses, form-fits-function kitchen tools, things like that. Computer Science was out in left field somewhere. Most of my art major friends disdained computers. They'd seen too many form letters; gotten too many computer print-out bills. Computers had a bad reputation. They sent draft notices.

Home computers with sound and graphics hadn't been invented yet. The only real computer art was done on humungous computers off in heaven somewhere. Getting your hands on one of those was like hitching a ride on the space shuttle. "Sorry, kid, high priests only."

Besides, it's hard to sing in FORTRAN.

Now we've got it made. Plunk the ol' computer down on the desk, slap on a touch tablet, and voila! Computer art! How about a *Paint* session? Or some "Pictures at an Exhibition" with the *Advanced Music System*? Easy! Off the shelf! Nothing to do but master the medium. And survive the critics.

I've heard recordings, made at home with the *Advanced Music System*, that are astounding. I've seen a bamboo stalk drawn in gray scale with all the serenity of a Japanese brush painting.

If you want to get really heavy-duty, explore animation. Get yourself to a users' group and learn how to program: sound, how to make screens. I've seen some really impressive stuff out in users'-group-land. Great animations. Outstanding music. You'll have to learn a language, of course. BASIC is OK, but a little slow. C is faster; FORTH is faster yet. Backwards, like Yoda, to talk you must learn. But fast programs with it will you write, Mmmm. Yes. ACTION!

BASIC XL, a new language from

Optimized Systems Software is the fastest to date. They're not Atari, but Bill Wilkinson's folk are good craftspeople and the language well deserves mention. The true language of the masters is Assembly language. Macro Assembler from Atari is quite good—much of our commercial software has been developed with it.

For every one of these languages, there is a special-interest users' group. Master a language and speak your art. You'll be amazed.

A new concept—the Bulletin Board Gallery—lets you send pictures over the phone. Your users' group can download software to do that from the Atari Computer Enthusiasts bulletin board (ACES BBS). It's a straightforward program in BASIC. John Clark, one of our product specialists, wrote it for us to give to you. You can set up screen files with it on a BBS and make them available to callers with Atari computers. Go public! Share your work with the world! How about sending music files? Tinker with Clark's program and see if you can improve it. Don't be surprised if your art ends up across the country in less than a week!

The possibilities are as infinite as human ingenuity. We've got light pens, touch tablets, joysticks, plotters—devices that would have had us all drooling as little as five years ago. And a lot cheaper than a cello. Better priced than a garden variety darkroom. So get in there and try it out! After all, what's technology for, if not art? □



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GOODBYE, COLLEEN



by Bill Carris

What is this—? When I was a kid they used to make me stand in the corner. This is the first time I've ever had to write in the corner. It must be they were looking for someone to write the off-the-wall remarks. Ok, so here goes.

AS SOME ATARI computer trivia fans are aware, Candy was the developmental code name for the Atari 400, and Colleen was the code for the Atari 800. But in September 1979, most people around the production line on Borregas Avenue in Sunnyvale simply referred to them as "the 400" and "the 800." The marketing and legal staff at corporate headquarters, on the other hand, were adamant that people use the heavyweight "ATARI 800™ Home

Computer"; but they had potential legal squabbles and imitators to consider.

One of the most complex areas of the company, software engineering, however, liked to simplify things the most. It was not unusual to hear something like "Are you working on a version for the game or the computer?" For in those days, there was only one game system (what became known as the 2600) and only one computer of preference—Colleen, the 800, the Atari 800 Home Computer, the one, the only, the original Atari 800.

And now it's gone, replaced by something which is simply sleeker, more sophisticated, has more built-in features, higher production and field-reliability factors, and is more competitive; all of these add up to extremely good reasons to introduce a new model.

But in some ways, the original Atari 800 is no more gone than the '57 Chevy, the Beatles, or *Star Wars*, because like all classics, it might not get better with age, but it certainly is appreciated more. If this seems like

little more than high-tech nostalgia, consider the fact that I have overheard around the engineering section furtive whispers about "buying up 800s at retail close-out prices and sitting on them until the price goes up!" Now, maybe this is fanciful financial speculation, but it sure shows insider faith in the quality of the product.

Time plods along and computer technology seems to be determined to overtake it. So it's foolish to think that the Atari 800 will not eventually become part of your computer collection. But it must have been ahead of its time; otherwise, how could we stand behind it for so long?

I and many others at Atari are proud to say to my friend Bryan Hockett, my brother-in-law Charlie Brown, my nieces Kathy and Laura, nephews Peter and Timmy, all the others I have recommended the Atari 800 to, and hundreds of thousands of people who are beginning or continuing your relationship with Colleen, "You have at your fingertips a real piece of computer magic." □

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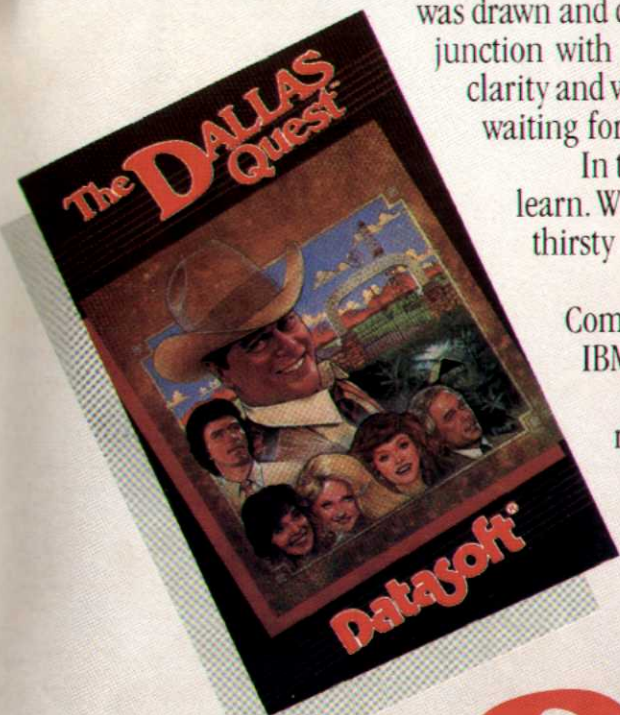
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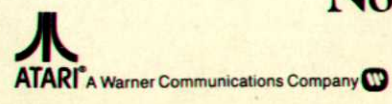
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