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ATARI
THE HOME COMPUTER MAGAZINE
CONNECTION

TAPPING INTO TOMORROW:
A SPECIAL REPORT ON HOME COMMUNICATION

COMPUTER CARTOON ANIMATION

AARON MARCUS: ARTIST FOR THE LIGHT AGE

COMPUTER CLASSROOM: PROGRAM YOUR OWN MAILING LIST

WHY USER-WRITTEN SOFTWARE REALLY STACKS UP TO THE BEST

There's a lot of ATARI Computer users out there. And many of them write software. They really know what users like—and what users want. Because honestly, who knows more about users than other users?

The ATARI Program Exchange—APX—publishes user-written software for ATARI Home Computers. Which means all APX software is written *by* and *for* people just like you.

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Home Computer use

In fact, you could get

might end up writing

If you do, send it to A

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Family Cash Flow	Real Estate Cash Flow Analysis

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Disk Fixer	Extended fig-FORTH
DDT	ATARI Pascal Language
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APX—PROGRAMS FOR USERS BY USERS

THE ATARI
GIFT CATALOG

ATARI®
GIFTS FOR THE
ENTIRE FAMILY

(See Inside Back Page)

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Cover Photographed by Dennis Bettencourt

They Found The Bug — Letters From Our Readers

EVERY ISSUE, WE have the pleasure of reading the hundreds of letters we get in response to the Find The Bug contest. It's exciting not only to see how many new programmers there are out there, but also to know what all you readers are doing with your ATARI Home Computers. Here's just a sample of some of the comments and personal stories from our readers that we'd like to share with you:

Dear ATARI CONNECTION:

Hi! I am eleven years old and live in Salt Lake City, Utah. I am in grade 6 and work with a computer at school, but I don't really get enough time to learn all I'd like to learn. So, my parents bought me an ATARI 800 Home Computer and a disk drive, interface and modem last October.

I really love to program and hope to get very good at it. I'd even like to design a program you could use. I enjoy playing games, too. I have friends who have computers and modems and we talk to each other and leave messages in each other's mailboxes.

One day when I was getting ready to go to the library to look for material on a school project, I remembered the *World Book* encyclopedia service on CompuServe and got all my information without leaving the house. How great, especially in the winter!

Sincerely,
Bill McKay
Salt Lake City, Utah

Dear ATARI CONNECTION:

I am the tennis professional at the Van Der Meer Tennis Center at Hilton Head Hotel in South Carolina. I own an ATARI 800 Home Computer and am using it extensively in tennis match play analysis and as the database for all our games. My students like the idea of getting computer analyses of their tennis games, and the ATARI 800 does the job perfectly.

Sincerely,
Ludovit S. Cap
Hilton Head Island, South Carolina

Dear ATARI CONNECTION:

I am 13 years old and an eighth grader at Junior High School 104 in Manhattan. I attended the Atari Computer Camp last summer. I also had the honor and privilege of demonstrating the new ATARI 1200XL Home Computer for a press conference.

Not only do I enjoy my ATARI 800 for entertainment, but find it very useful in learning to program in different languages; I use the ATARI Word Processor for my homework and reports.

Yours truly,
Lee Arrington
New York, New York

Dear ATARI CONNECTION:

My school's computer club at Morgan Junior High started the MESSUP project. MESSUP stands for the Morgan Educational System Students' Unlimited Programming. MESSUP takes requests from teachers at Morgan Junior High to write programs for use in their classrooms.

I have an ATARI 400 and the ATARI 410 Program Recorder. The computer has 16K. I can fill a tape and the 16K very easily!

Sincerely,
Jeff Raney
Ellensburg, Washington

Dear ATARI CONNECTION:

My name is Jenni Johnsey, I am 12 years old and I go to Arroyo School here in Glendale, Arizona. I have an ATARI 800 and games like Centipede. I am not very tall but I love boys—only the cute ones of course!

Sincerely,
Jenni Johnsey
Glendale, Arizona

TEDRICHARDS
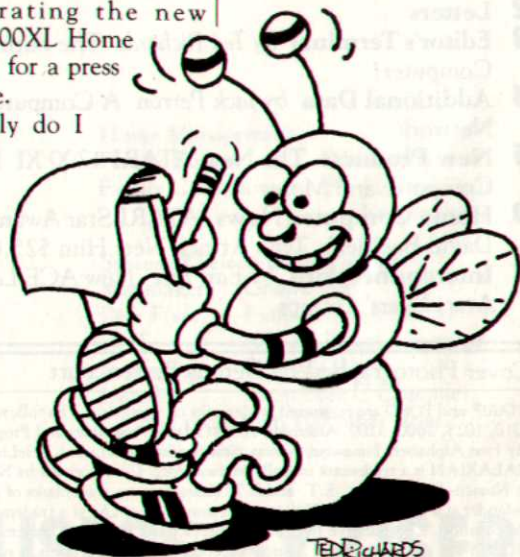
Dear ATARI CONNECTION:

My name is Jimmy Rathan. I am 40 and one-half years old, and I work for the Kinney Shoe Corporation. I like computers, skiing, tennis. I have one dog, one wife, two children (both girls).

If I win, I don't want a PAC-MAN game because I have one already. Instead I would like a Centipede game.

Sincerely,
Jimmy Rathan
Suffern, New York

∎

Dear ATARI CONNECTION:

I am 14 years old and currently living in France for the year. And I can't stand being away from my ATARI Home Computer. I was told there were not any ATARI dealers in France, but recently I found a store that sells ATARI Home Computer equipment. I am in there every day! Atari, you've come through again!!!

Sincerely,
Jim Nylander Jr.
Tours, France

∎

Dear ATARI CONNECTION:

This is my first time actually entering the Find The Bug contest, even though I have debugged all of the other contest programs that have appeared in the ATARI CONNECTION.

I'm 24 years old and physically handicapped. Computers are a really great thing for everyone, but for me they're even better. There may be a lot of outdoor games that I'm no good at, but I can hold my own when it comes to games on an Atari!

I bought my ATARI 800 about one year ago, and between the games and the programming languages it's kept me pretty busy.

I've done a bit of professional programming and have used some of the best mini- and main-frame hardware around and I think the Atari does a very good job, certainly the best in its class.

Well, that about wraps it up for this letter, but you'll be hearing from me again—I expect after the next Find The Bug contest!

Sincerely yours,
Chris Gruenler
South Hamilton, Massachusetts
P.S. My favorite ATARI Computer game is Star Raiders! The graphics are fantastic! Keep up the good work!

∎

Dear ATARI CONNECTION:

I am a 19-year-old Computer Engineering major at the State University of New York College of Arts and Science. I purchased my ATARI 400 Home Computer and my ATARI 410 Program Recorder last fall. Games such as Missile Command and Asteroids are very popular with my friends and my roommates. I really wanted a BASIC Cartridge more than the games but I couldn't afford it at the time.

I am lucky enough to have a wonderful girlfriend who, although on a tight college budget, gave me a BASIC language cartridge for Christmas. I've been experimenting with several ideas for just under a month now and hopefully will be sending some original software to the Atari Program Exchange in the near future.

I am totally enthusiastic about programming and Atari in general. I hope my enthusiasm will pay off in the form of a summer sales position at the computer store where I purchased my Atari. I really enjoy observing people's expressions when I first demonstrate some of the powerful and relevant applications of "my toy." It takes only a few minutes to prove the ATARI 400 is no toy. For this reason I think that a job as a salesman would be a very worthwhile and rewarding experience.

Sincerely yours,
Martin T. Mazurik
Geneseo, New York

The Future in My Computer?

WHEN I WAS TEN YEARS OLD, I remember mulling over a "future illustration" in a magazine. It was a picture of sleek, finned cars whizzing about on automated expressways. The caption noted that the futuristic autos glided along on magnetized strips. You merely had to push the appropriate buttons on your console to indicate your destination, sit back, relax; maybe watch a color television program or read a book. The expressways wove elegantly about towering skyscrapers and were sparsely occupied with sleek, bubble-glassed versions of Detroit's classics of the fifties. Of course I gave no thought to where these cars of the future were headed. Or if they had enough gas to get where they were going. It didn't matter. This was a positive future. A future of *mobility* where we could move our bodies from point A to point B—effortlessly, without a care in the world.

This future vision dulled and darkened through the sixties. True, the "Age of Aquarius" briefly radiated its "New Age" optimism, inspiring some of us to frolic beneath the darkening storm clouds, but the severity of the seventies soon dampened that frivolous vision. OPEC put an end to the future of getting to point A from point B without a hitch. I could barely make it to the next gas station, much less glide along a magnetic strip through an Olympian suburb. No, I had to be content with a future of survival— stock up on freeze-dried rations, buy a four-wheel-drive truck, and camping gear for the entire family, counseled the survivalists.

How do computers fit into this picture? They don't. The unpredicted proliferation of low-cost home computers has encouraged many of us to eagerly abandon the gloomy future we inherited from the seventies. I can attest to this change of view during my first few months of "home computing." It seemed as if this powerful little 48K ATARI Home Computer came with its own built-in vision of the future. Suddenly my mind was filled with notions of all the incredible new things I could do. There were programs to write, kids to teach, stories to tell and a thousand other thoughts and ideas—my future was booked solid for the next ten years!

My childhood vision returned, but with a few slight alterations. Instead of sleek cars whizzing about, I imagined our thoughts flitting about — glowing little bits of light, darting in and out of vast microprocessors, across printed circuit boards then on into space, through satellites and beyond. If my body couldn't get from point A to point B, then at least my mind could do the traveling—at the speed of light.

Yes, the future in my computer appears hopeful and inspires a vision that encourages our better instincts. We are only beginning to visualize this new future of "mass computing," and it's just the opposite of the vision that preceded it—it's *positive*. The new computer future draws upon the higher aspirations of the human spirit—our desire to cooperate rather than destroy, and that innate human desire to communicate—to find out about one another.

I don't believe the "computer age" will become a cornucopia of solutions to all the problems faced by modern mankind. But computers have made it possible for us to dream once again—to aspire to a future where the human spirit has survived with all its imagination, its compassion and its art, music and science. To that end we hope to inspire you with this special home communications issue of ATARI CONNECTION.

—**Ted Richards**

An "On the Air" Network of Computer Hams

No RF Interference With Super-Quiet ATARI Home Computers

By Jack Perron

EVER HEAR YOUR RADIO go fuzzzee-shoe-ba-waaa-weeeee and suddenly realize that it's not the latest punk rock group? Well, that kind of radio noise (called RFI, radio frequency interference) has been known to drive neighbors of computer owners somewhat batty. But it won't happen to the neighbors of ATARI Computer owners. ATARI 800 and ATARI 400 Home Computers are well-behaved and quiet.

That's why ham radio operators are flocking to ATARI Home Computers. There's already an ATARI Microcomputer Network headquartered in Ohio. Its national founder and coordinator, Jack McKirgan II, recently wrote to tell us why hams like ATARI Home Computers so much:

"Since 1977, I have owned Radio Shack, Commodore, and Apple computer systems," says McKirgan. "The one major complaint I have had with them is the interference to my radio equipment. Some of these systems are less prone than others and some have more interference on some radio bands than others. But the ATARI has *zero* RFI, and that really makes it a winner for hams! (Of course, the fact that ATARI Computers give you more value for the dollar makes them good value for anyone, not just for hams!)"

As an "on-the-air" users' group, the ATARI Microcomputer Network just may be unique. And it's growing, according to McKirgan, with an international membership now well over 200. Members are not just broadcasting their messages, either. McKirgan edits a journal called "AD ASTRA" ("to the stars," for you Latin buffs). AD ASTRA comes out every other month, and is filled with member-contributed information about using ATARI Computers to send and receive morse code, radioteletype, and ASCII signals.

If you're an ATARI Computer ham wanting to link up with people with similar interests, you'll want to subscribe to AD ASTRA. For more information, write McKirgan at:

The ATARI
Microcomputer Network
4749 S.R. 207 N.E.
Washington, C.H., OH
43168

ENTHUSIASM IN OREGON

If you're not a ham, but you're really enthusiastic about your ATARI Home Computer, you might want to check out the ATARI Computer Enthusiasts (ACE) of Eugene, Oregon. ACE has one of the finest user-group magazines around.

Editors Mike Dunn and Jim Bumpas fill their monthly journal with news, information, columns, reviews, and tutorials. They also carry listings of some excellent programs for learn-by-doing types. ACE boasts an international membership and provides ATARI Computer news from all over the world.

There's even an ACE Bulletin Board for those with modems. Give ACE a call at (503) 343-4352. If you don't have a modem, but want to learn more about your fellow ATARI Computer Enthusiasts, write:

ATARI Computer
Enthusiasts (ACE)
3662 Vine Maple Drive
Eugene, OR 97405

COMPUTER EDUCATION

The San Mateo County Office of Education's Microcomputer Center has been selected by the state of California as its statewide Software Library and Clearinghouse for software evaluation. One of 15 regional Teacher Education/Computer (TEC) Centers in the state's $10 million plan to speed California teachers into the computer age, the San Mateo TEC will be charged with reviewing educational software for use in California schools.

LeRoy Finkel, Publisher Liaison for the TEC Software Library and Clearinghouse, says software evaluation is already underway. Rotating collections of subject-area programs are being circulated to the 15 centers for critical review. The programs receiving favorable review will be listed on the TEC Software Advisory List and recommended for use in California schools.

Ann Lathrop, Library Coordinator of the TEC Center, says the 15 regional TEC Centers will send software evaluators to San Mateo in May for a Software Demonstration Day. The subject areas have not yet been established, she says, but they will probably emphasize reading, science, and social studies.

The 15 regional TEC Centers are located in Eureka, Red Bluff, San Rafael, Sacramento, San Francisco, Hayward, Modesto/Stockton, San Jose, Ventura, Hanford, Bakersfield, Downey, Riverside, Santa Ana, and San Diego/El Centro.

BRIEFLY NOTED

ANTIC magazine features an excellent example of an educational simulation in its December/January issue. "Candle, Candle, Burning Bright," by Linda Schreiber, shows how a science concept can be graphically animated. For media watchers, Publisher Jim Capparell says ANTIC will go monthly in April. . . . Speaking of teaching, any educators using ATARI Computers who want to contact other educators with similar interests should get in touch with Computer Using Educators (CUE), P.O. Box 18547, San Jose, CA 95158. Well-known for one of the biggest and best educational conferences in America, CUE also co-sponsors (with the San Mateo County Office of Education) a mammoth collection of public domain educational software called SOFTSWAP. The ATARI Computer diskettes go for a mere $10 each. Memberships in CUE are $6 a year (yes, you heard right, six bucks!) Not many bargains like that around anymore. . . .

But there is one big bargain for young people in the journal TURTLE NEWS, published by the Young People's LOGO Association (YPLA), 1208 Hillsdale Drive, Richardson, TX 75081. Fans of ATARI PILOT (with "turtle" graphics) will find this journal filled with all the information they ever wanted to know about turtle graphics. The YPLA also sponsors drawing and programming contests for kids. Oh, yes, the bargain: it's free to kids 18 and under! Adults pay $25 a year. ∎

Jack Perron is the Educational Software Reviewer for the ATARI Program Exchange (APX).

ATARI CONNECTION™

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Right at Home: ATARI 1200XL Home Computer

ATARI 1200XL HOME COMPUTER

THE NEXT LOGICAL STEP

By Jim Carr

WANT MORE computing power than your present ATARI Home Computer offers? Then take the next logical step: Check out the sleek new ATARI 1200XL Home Computer.

The ATARI 1200XL comes loaded with 64K of RAM (random-access memory) and 14K of ROM (read-only memory) to make it one of the most powerful home computers available.

And because all that memory is packed into about a dozen tiny silicon chips fitted onto a single circuit board, Atari engineers were able to design a lightweight, low-profile computer with the style to complement any home environment.

Moreover, the ATARI 1200XL is compatible with most existing ATARI Computer hardware and software products so you won't need to worry about a costly refurbishing of your current system or program library.

Serious programmers will find a host of new features and improvements that allow easier access to the operating system, increased reliability and more power for software development.

The ATARI 1200XL operating system is an enhanced version of the popular 6502 microprocessor-based system used in the ATARI 800 and ATARI 400 Computers. The 1200XL, like the ATARI 400 and ATARI 800 relies upon Atari's specialized graphics and sound chips—ANTIC, POKEY, GTIA, and PIA—to produce stunning graphic and color displays and an incredible new improved sound range that now spans three and a half octaves in four separate voices.

But Atari engineers took the ATARI 1200XL beyond that engineering feat: They gave it a powerful self-testing capability plus five special-function keys that can be programmed to perform many different tasks, including single-key cursor movement.

The ATARI 1200XL full-stroke keyboard is similar in layout to that of the ATARI 800 Computer, but with a major improvement: The control keys—the OPTION, SELECT, SYSTEM RESET, and START keys—plus the inverse video key; the new special-function keys labeled F1, F2, F3 and F4 and the HELP key are all located above the keyboard and set flush within an attractive metallic band that cuts across the face of the computer.

The HELP key calls up a colorful Self-Help diagnostic routine that tests the ATARI 1200XL memory (RAM and ROM) and audio-visual circuits as well as operation of the keyboard. The new ATARI Computer also runs an automatic check of its memory chips each time it's turned on to ensure proper performance.

In addition to providing single-key cursor movement with an ATARI BASIC cartridge, the F1, F2, F3, and F4 keys control a number of special operations when pressed in conjunction with the CONTROL and SELECT keys. They allow you to display a European-language character set of 29 special graphics characters on your TV screen. They also let you deactivate the computer keyboard or turn off the computer's output to the TV set, thus speeding up the operation of the computer.

Cartridge loading has been made easier and more convenient, as well. The cartridge slot is on the left side of the ATARI 1200XL console, where there are no doors to open or close. You can now insert and remove program cartridges while the computer is on without disrupting its operation. The joystick controller ports are also on the left side of the computer, so your controller cords won't obstruct access to the keyboard.

Additional new convenient features include the placing of the serial interface port for disk drives and printers on the back of the computer, and a new TV connector jack which allows you to detach the TV cord. The new back panel design

also includes the color monitor DIN jack.

A full line of new peripherals designed to complement the sleek new ATARI 1200XL Computer will soon be available. These include a new program recorder featuring a compact design, as well as a new low-cost 80-column printer that accommodates the ATARI 1200XL European-language character set.

Atari invites you to visit your ATARI Computer Retailer to see the new ATARI 1200XL. After trying it out, we're sure you'll agree — it's the next logical step.

TIMEWISE

A Week at a Glance on Your Computer

By Paula Polley

I T'S JANUARY 10TH already. The word for the day on my Word-A-Day Calendar is "copacetic" [(ko-pe-set'-ik) adj. *Slang.* O.K.; fine; satisfactory] — and I still haven't found the right date keeper — one that's, well, copacetic.

With datebooks that give you a separate page for each day, getting an overview of the entire week, or — heaven forbid — the whole month, is like playing with a Dingy The Dinosaur animation flip book. In the ones that give you a week at a glance, there's barely enough space to record a birthdate.

Like I said, finding the copacetic recordkeeper is no easy task, and I'm really getting nervous with the first month of the year almost half over. Then I get this interoffice envelope. "Please review the enclosed software package for the ATARI CONNECTION," it reads. I reach in to find a diskette labeled *Timewise*.

I immediately boot it up. "Insert BASIC cartridge," I'm told. Not being one to spend much preliminary time on manuals, I appreciate the prompt.

"Insert Data Disk" greets me once the BASIC cartridge is in place. I don't have a data diskette yet, but how about this blank? I type "Y" in response to the computer's offer to format for me — and "Y" in response to the "Are you sure" query.

My ATARI 810 Disk Drive whirrs into action and soon the following screen appears on my TV set.

Eureka!!! It looks as if Timewise will be the very datekeeper I've been so feverishly hunting for!!!

I start at the top by pressing L and find I can look at today's schedule or at listings for any combination of dates. I'm then asked my name. Happily, Timewise lets you delineate the specific user so that an entire family or office can use the same data diskette. Timewise lets me organize my listings by type, like business, personal, birthdays, dentist, classes, entertainment — whatever I want.

Under "monthly calendar" I can List or Print. I hit L, then type "0183" for January,

1983. The screen fills with a calendar grid and the appropriate numbers pop into each box for January, 1983. There's an asterisk in box 15 so I type in those numbers. The screen clears, then reminds me of a party I entered on that date. "Bring refreshments," I'm reminded.

You can print out this calendar on an 80-column printer. I do. The boxes are big enough to write in, and it's nice enough to hang on my wall.

Adding and deleting appointments is as easy as adding and deleting in word processing. I can even enter an ongoing event (like my Tuesday night BASIC Programming class) in one simple step, for weeks or months at a time.

Timewise also gives me daily print-outs with time slots broken down into half-hour sequences just like those in the carry-around datebooks. I can choose between 12- and 24-hour days and print blanks for precisely the number of days I'm interested in — anything from just the weekend to the entire month. No more deciding how to break down the year. Timewise gives it to me any *way* I want it — any *time* I want it.

But the best part of all is that I don't have to lug around every page of the year every day. I just take a print-out of the dates and appointments I'm currently involved in, and the rest is — history.

There's an Inquiry feature

for looking up certain appointments based on type (say, birthdays) or day of the week (all Tuesdays) or even times (I know there was *something* I was supposed to do at 6:00 p.m. on Monday . . .). The Inquiry mode lists appointments exactly as entered. There's a 'browse' inquiry option that abbreviates the listings and makes it even faster to look up dates and events.

No wonder I couldn't find an adequate datebook. Datebooks are antiquated.

With Timewise, I can review appointments in one glance by the day, the week, the month, or by any combination of dates I want to put together. I can change and delete listings easily and without messy scribbles.

Now, *that's* copacetic. Available in April, 1983. Requires an ATARI Computer with a minimum of 32K RAM. Package includes program diskette and illustrated User's Guide. Suggested retail price: $29.95.

ATARI 1020 COLOR PRINTER

ADD A SET OF COLOR PENS TO YOUR ATARI COMPUTER

T HE NEW ATARI 1020 color printer will add a whole new dimension of graphic art to your ATARI Home Computer's repertoire of computing capabilities. Whether you want to print charts or graphs for business and school reports, vibrant color graphic designs, text in various sizes, or international characters, the ATARI 1020 Color Printer does it all.

The ATARI 1020 Color Printer can perform more than 13 different operations, some in the TEXT mode and some in the GRAPHICS mode. You can try your hand at computer art, or create tables, charts or diagrams for those important reports.

Highlight those same reports with headings or labels printed in any of 64 different sizes. Or plot X and Y axes with scale marks for easily readable graphs.

Included in the ATARI 1020 Color Printer package are two sets of the four colored pens, and you can purchase an additional 16-color pen pack to add extra colors and vibrancy to your computer graphics.

For ease and convenience of operation, the ATARI 1020 Color Printer connects directly to any ATARI Home Computer.
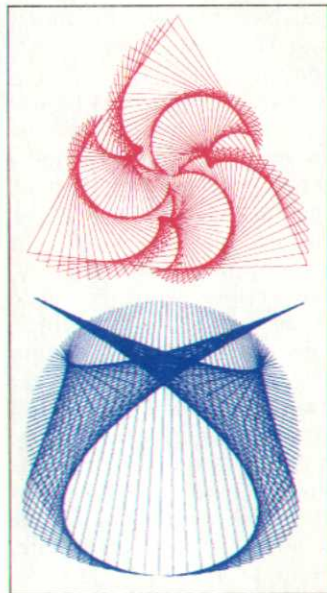
TELELINK II

And The New ATARI 835 Direct Connect Modem

UPGRADE YOUR telecommunications abilities with the new TeleLink II computer communications cartridge and the new ATARI 835 Direct Connect Modem.

TeleLink II is a program cartridge that allows your computer to send and receive information over standard telephone lines. You can use it to communicate with information services, timesharing services, or other ATARI Home Computers. Get the latest stock quotes from Dow Jones or participate in some zany conversation on CompuServe's simulation CB channels.

The unique thing about TeleLink II is that you can program it to save the name, telephone number and sign-on codes of two services in the cartridge memory. It can also perform automatic dialing and sign-on tasks for you. Or, if you prefer, you can manually dial from the computer keyboard or telephone. But you'll never realize the convenience of automatic dialing and sign-on to an information service until you try it out with TeleLink II. No more re-dialing the number or re-entering the ID number or password because you made a mistake. TeleLink II stores all of your information for you.

And you can even keep your telephone plugged into your modem when you aren't doing your home banking or talking to distant computers using TeleLink II. You simply plug the modular jack from your telephone into the ATARI 835 Direct Connect Modem and then use the additional telephone cord supplied to connect the modem to your phone jack.

TeleLink II and the ATARI 835 Direct Connect Modem make an exciting new combination for convenient telecomputing with your ATARI Home Computer (the ATARI 835 is available only in the Communicator Kit).

Available March 1983
Use with either the ATARI 1200XL, ATARI 800 or ATARI 400 Home Computer.

ATARIWRITER

"Farewell, My Ugly" Or, The War Of The Words

By Steven Young

Editor's note: The following exchange of letters tells a touching tale of a typewriter abandoned. As curator of this instructive collection, Mr. Young has changed the names of the principals to protect their privacy; but the letters appear here otherwise unexpurgated.

Dear John,

Come back! Who is this AtariWriter, anyway? A scheming little program cartridge, a plastic Plain Jane, a nouveau! How I scorn her!

You remember when you brought home your ATARI Computer—Yes, my darling, I *was* jealous. How could I share you with another keyboard? But when I saw how enthralled you were, learning to program in BASIC, enjoying a game of PAC-MAN, organizing your notes with The Home Filing Manager, I swallowed my pride. A keyboard, yes, I thought—but no computer could ever replace me, your trusted companion of many years.

But now, this AtariWriter has come between us—between you and reason itself, my dearest! This word processing is madness! I am the very forge of your creativity, and you abandon me at your peril.

I know we've been through some trying times together. But surely we've had our share of the good times, too. Remember working to fit three new paragraphs into that 20-page essay so that your editor wouldn't even know it had been changed? How we laugh-

ed! Now *that* was a four-day job that was worth every minute!

I know those word processors, my darling. Fickle and faithless, all. They confuse a writer with labyrinthine menus and nonsensical commands. Many won't let you see the beginning of a sentence while you're trying to write the end. With others, you don't know how your pages will look until you actually print them. And what if your computer doesn't have enough memory for a long piece of writing?—You know how long-winded you can be when writing a first draft. AtariWriter will be just like the others, John! AtariWriter will break your heart, I just know it!

For both our sakes, my own dear John, come back! What does AtariWriter have that I don't have?

Your cruelly used,
but still faithful,
Mary

Dear Mary,

You know how long I resisted the allurements of word processing software—a pack of clunky diskette upstarts I called them, each with a gaggle of commands larger and more confusing than the last. But I've found happiness at last with my AtariWriter —that handy little cartridge is a powerhouse, and yet simplicity itself to use. Within minutes, I was up and writing with it. And how dare *you*, of all antique technologies, lecture *me* on the trials of the writer's craft?

What can AtariWriter do that you can't do? Well, for starters, it gives me all the standard advantages of word processing. I can insert and delete to my heart's content with on-screen editing. AtariWriter instantly makes room for as much as I want to add, or closes up the space left over when I tighten up my prose. That con job we did on my editor, which you remember so fondly but which bored me to tears, would have been a snap with AtariWriter.

You're wrong, you old-fashioned machine—Atari-Writer has one simple menu, so I always know where I am and what I'm doing. It also has automatic word wrap, so all the text I need to see is visible on my TV screen when I'm writing and revising.

AtariWriter can save my documents (being a little more modern than you are, we

call them *files*) on a cassette program recorder or a disk drive and will fetch them back again without a murmer of complaint. Your petty dig about my long-windedness just rolls off my back; with my disk drive and AtariWriter, I can write and save each chapter of my novel as a separate file, then print them all in a seamless "chain" when I want a complete manuscript to send to a publisher. And AtariWriter works just fine with lots of different printers.

And how my cherished AtariWriter can format! I can control the overall shape of each piece I write—margins, spacing, you name it—with a few simple commands at the start of the file. But I can also vary the format, anywhere within a file and in any way I want, with just a keystroke or two. Headers, footers, automatic page numbering, and more—AtariWriter can do it all!

But do you know what I love most about AtariWriter? *Print preview.* With this feature, I can see how every page

of a file will look when printed—*on my screen before I print it!* You never showed me anything I didn't have to type out first—and then, most times, you had to muck it up in the process.

I think this is the real thing, my poor Mary. Please, don't torture yourself with regrets, or me with recriminations. Bow to the inevitability of technological progress, and set this writer free.

Nostalgic regards,
John

Dear John,

You wretch!—replying to my heartfelt appeal by writing a letter with that—that —AtariWriter! I can hardly stand to set the hated name to paper!

How my heart breaks at your perfectly clean copy, your three different print styles, your double-column printing. What has become of your old familiar misspellings, so dear to me? Gone now, gone forever!—all so easily corrected with AtariWriter's search-and-replace feature. And not content merely to stab me to the heart, you twist the knife by formatting your letter with *justified* right margins. Oh, John, John, you were never so cruel, so base, as to rub my platen in my own inadequacies!

I don't believe, wicked deceiver, that you were "up and writing" within minutes, or that you've mastered Atari-Writer's many commands

and functions so soon. Confess the truth—you're mired in another ponderous, obscure user's manual , a prisoner of high-tech doubletalk!

Come back, my darling, and all will be forgiven. Perhaps I can be upgraded with a correction key! Or I'll pay for the extra paper we need to type multiple drafts. I'll do anything, anything—just spare me the shame of being a trade-in for a toaster oven or (worst of fates) the captive of a pawnshop display window!

Your despairing,
Mary

Dear Mary,

Once again, your bitter accusations are both wrongheaded and in vain. I guess I didn't mention the *User's Guide* and *Quick Reference* card that came with my beloved AtariWriter— a crowning achievement in elegant, easy-to-use, even fun software instructional literature!

No, my poor old friend, I shall never give up my AtariWriter. But there's a place for you still in my heart. Over the years my mother has grown accustomed to your typeface, and so I promise you this: never to write home except with you.

John

Before you can fall in love with AtariWriter, you'll need an ATARI 400, 800 or 1200XL Home Computer with at least 16K RAM. You'll need either an ATARI Program Recorder or an ATARI Disk Drive to store your files, and a printer to print them. The AtariWriter package includes a program cartridge, User's Guide, and Quick Reference card. We expect this irresistable new word processor to be available by April, 1983. Our suggested retail price: $99.95.

Steven Young, a student and practitioner of the epistolary tradition in literature, is Supervisor of Software Writing in the Publications and Packaging Department of the Atari Home Computer Division.

WHAT IF E.T.™ HAD HIDDEN IN YOUR BACKYARD?

ATARI®
A Warner Communications Company Ⓦ

You remember that marvelous moment, when the moon sailed high before the stars, the crickets sang softly in the fields, and Elliott held his breath. Something was waiting in the shed, and neither you nor he knew what would happen next—but somehow you both knew it would change your lives. Would you have been as brave as he was, to face that moment and see what it would bring? If so, *you* would have entered into Elliott's magnificent adventure—and now, with your ATARI Home Computer and this game, *you can!* YOU ARE ELLIOTT, searching for the hidden pieces which will create E.T.'s "phone" and make him *speak* to you. It's not easy—the agents are on your trail, and there's very little time before your extra-terrestrial friend loses all his energy. But if you save him, you'll see his spaceship take him away! Play it and discover—*THE MAGIC OF E.T.*

NEWS

Atari Star Award Winner

SEVENTEEN-YEAR-OLD DAVID BUEHLER'S *TYPO ATTACK* NETS HIM $25,000

Atari Star Award Winner David Buehler receives his $25,000 check from Keith Schaefer, Vice President of Sales

by Paula Polley

SAN FRANCISCO — Saturday, January 15th, 1983, APX (Atari Program Exchange) held its second annual Atari Star Award banquet in the elegant and historic St. Francis Hotel. The Atari Star Award and $25,000 grand prize went to David Buehler of St. Paul, MN, for his educational video game, Typo Attack.

Moments before the final announcement, young David Buehler was seated at the table of honor with three of the other Atari Star Award finalists: Harry Koons, programmer of Astrology; Lee Actor, developer of Advanced MusicSystem; and Doug Crockford, creator of Galahad and the Holy Grail.

Then Keith Schaefer, Senior Vice-President of Sales, stepped forward to add a touch of drama to the occa-

sion. Paul Cubbage, head of the APX Software Review team, handed Keith the bulky package containing the Atari Star Award plaque, bearing David Buehler's name. Over a hundred voices whispered and murmured in hushed anticipation as a TV news crew staked out their position.

Keith slowly opened the package, skillfully prolonging the tension with a few humorous comments. You can imagine David Buehler's reaction when the announcement was finally made. David is only seventeen; probably the youngest person at this gala San Francisco banquet. Suddenly, it's being held in his honor, plus he's $25,000 richer!

After much applause and congratulatory cheers, Keith Schaefer asked David's parents and grandparents to stand up for a round of applause (the whole family was

there from the Twin Cities of Minneapolis and St. Paul, MN). They looked more pleased and proud than David himself. The audience was then encouraged to ask David questions about his award-winning Typo Attack.

A woman reporter wanted to know which Atari system he used to write his program on. "On my ATARI 400 with a 410 cassette recorder,"

David answered. "I only used 16K of memory, and I used all of it," he added.

"Where'd you get the idea for Typo Attack, David?" asked another banqueteer.

"I love games, and programming games," he answered, "but I wanted to do something that was educational . . . and it (Typo Attack) was all I could think of. . . . "

ATARI chose Typo Attack, not only because of its elegant programming and exceptional graphics, but because it combines the best of two worlds: it's a challenging and exciting video game as well as a valuable and effective educational tool. Programs like Typo Attack, that can both entertain and educate, have the best chance at being winners because they can be enjoyed by the widest spectrum of ATARI Home Computer owners.

"How does it feel to be the winner?"

"I like the money," was David's answer to the age-old question.

When asked what advice they would give to other parents on encouraging their children to program, Mr. and Mrs. Buehler answered, "Your child is either interested in programming or he isn't . . . there's really not much you can do one way or the other."

TYPO ATTACK TAKES IT.
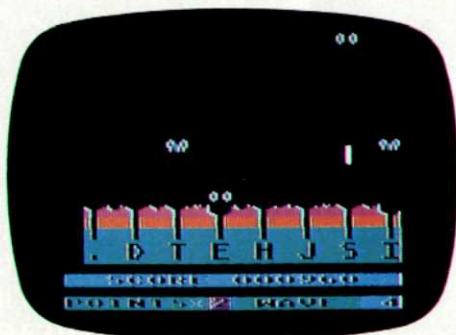
David Buehler's Star Award — winning program, Typo Attack, is absolute proof that learning can be shot full of fun. The 16K's worth of sound and graphics rival those of any game you've played.

L AST SUMMER THE ATARI Computer camps were so successful that Atari has not only decided to continue the program next summer, but will expand the activities to two-, four- and eight-week sessions at seven different locations around the country.

This year, kids wishing to attend an Atari Computer camp can choose between the beautiful settings of Camp Atari New England, the Poconos, Chesapeake, the Smokey Mountains, the Mid-west, the Old West or the Pacific.

All of the camps will be fully equipped with the latest ATARI Home Computer equipment, including the ATARI 400 and ATARI 800 Home Computers and the new ATARI 1200XL Home Computer. Campers spend at

BIG SUMMER AHEAD FOR PROGRAMMING FUN

least four hours per day, six days a week using the computers, including two daily instruction periods. They also

have free computer time for working on individual projects and exploring different types of software programs.

Richard Pugh, who headed instruction at last summer's San Diego Atari Camp explained that in the beginning, "we use projects that interest the kids to teach them programming. The kids learn programming through little programs that mean a great deal to them—something that is a reflection of their total personality."

If you're interested in attending or sending your child to an Atari Computer Camp, write ATARI COMPUTER CAMPS, 40 E. 34th Street, Department APT, New York, NY 10016 or call (800) 847-4180 (New York State and Canada call collect (212) 889-5200). You'll be provided with additional information about the camps and can even have a space reserved at the camp of your choice. ∎

Expressway to Tommorrow

NEW EDUCATIONAL FILM SHOW CHARTS FUTURE COMPUTER CAREERS FOR STUDENTS

B EGINNING THIS FEBRU-ARY, Atari will be sponsoring a travel-ing multi-media assembly pro-gram for junior and senior high schools throughout the country.

It's called COMPUTERS: *Expressway to Tomorrow* and features an exploration of the past, present and future roles of computers in our society. Using two 16-millimeter screens and a live actor, the 30-minute-long show uses contemporary computer-generated music and state-of-the-art computer graphics to illustrate the role of com-puters in our daily life, in in-dustry, and in the creative arts—and what the function of computers will be in our future.

"Teachers and educators

have been asking for help in explaining to their students some of the wonders and challenges of the computer revolution," explained Chris-topher Bowman, Manager of Educational Marketing for the Atari Home Computer Division. "This show is de-signed to be both exciting and informative, capable of stimulating a teenager's imagi-nation while at the same time giving the kids a considerable amount of valuable in-formation."

While the show was being created it was previewed to a number of teachers and stu-dents, and they loved it. In fact, many of the kids said they were not as anxious about using computers after they'd seen the show and were eager to learn more about them.

Produced by Rick Trow Pro-ductions of Pennsylvania, the assembly program is offered free of charge. It is booked a year in advance and will visit 2,000 schools this year, reach-ing over 20 million students and teachers. If you'd like more information on the show or to schedule an as-sembly program of COM-PUTERS: *Expressway to Tomorrow* at your school, call toll free, (800) 523-2310. ∎

New Software Kits From Atari

New Bookkeeper Kit

The new Bookkeeper Kit from Atari gives you a powerful ac-counting system plus fast, easy numerical data entry. In-cluded in this valuable addi-tion to any home business are the Bookkeeper, and the Nu-merical Keypad. With this kit you can generate professional-caliber financial reports such as Balance Sheets and Profit and Loss Statements as well as a General Ledger, Accounts Receivable and Accounts Payable Ledgers and a Trial Balance.

The kit has a suggested retail price of only $249.95 —$24.95 less than if you pur-chased the program and keypad separately.

The Entertainer Kit—Now with PAC-MAN!

Atari, the leader in home computer games, has done it again. We've updated our popular Entertainer Kit to in-clude the only official home

computer version of PAC-MAN! The kit gives you hours of excitement and it's a great value. You get PAC-MAN, Star Raiders and a pair of joysticks, all for the low suggested retail price of $89.95— $19.80 less than if you purchased these exciting games and joysticks separately.

The New Programmer Kit

Keeping in the tradition of all ATARI Home Computer Kits, we're giving you more value for your money in the Pro-grammer Kit. This kit in-cludes the new *Inside ATARI BASIC Book*, a self-teaching guide known for its simplicity. You still receive our BASIC Computing Language Car-tridge and BASIC Reference Manual, but we've added yet another extra—a $5.00 rebate coupon good towards any purchase of An *Invitation to Programming 1, 2 or 3*— retail value of $73.85 for only $59.95. ∎

User Group News

New ACE Logo for ATARI Users' Groups

by Earl Rice

WELCOME TO INTERCONNECTIONS! This is the users' group corner of ATARI CONNECTION. While users' groups are mostly local folks sharing what they know about their ATARI Computers, many groups' contributions become known far and wide. Quite a few of our registered groups refer to themselves as Atari Computer Enthusiasts (ACE), a name truly justified by their accomplishments. In the past year, Atari Computer Enthusiasts have been responsible for setting up a computer wing in the Tulsa Public Library, helping out the Oregon Museum of Science and Industry with their computer display, helping Atari attend the US Festival, providing shopping malls around the country with a gift selection program, setting up electronic bulletin board systems all over the country, turning out about a hundred independent newsletters every month, teaching courses in BASIC, PILOT, FORTH and assembly language programming, hosting community computer fairs, and writing articles for computer magazines. You name it, and if it can be done with an ATARI Home Computer, these ambitious people are doing it! All this by local, independent groups. Imagine what would happen if they all got together on a project!

Among the most exciting possibilities in home computing are those presented by telecommunications systems . . . systems that enable one computer to 'talk' to another by telephone. Atari Computer Enthusiasts all over the country now have software to allow them to operate electronic Bulletin Board Systems (BBS). These systems allow anyone with an ATARI Computer and the Communicator kit to dial in and get local club news or have access to the local club library. The Users' Group Support Program at Atari, Inc. provides each registered group with the software necessary to set up its own BBS. The BBS software is the work of the Michigan Atari Computer Enthusiasts (MACE). Rumors abound that they are working on a way to make all these MACE BBS systems form a network for sharing information on a larger scale! We hope they're true! Such a system would certainly increase the contact possible among our users' groups. The possibilities arising from that are endless.

We have set up a BBS of our own here at Atari for the use of Users' Group officers in the hope that it might help to stimulate more exciting group projects. We've also come up with an Atari Computer Enthusiasts logo for any ACE group to use. That's it above this column. You'll see it on Users' Group support publications, videotapes, and materials designed to promote local groups. Registered groups even have ACE stationery to use for official communications! It's our way of supporting the growing family of Atari Computer Enthusiasts around the world!

If you would like to meet other people who own ATARI Home Computers to learn from and share what you know, the customer support people at Atari have a list of all the users' groups who have contacted us and can tell you how to reach the group nearest you. And if there's no group near you, we'll be happy to help you start one! ∎

Alamo Users' Group Meeting in Alamo, Texas.

KIDBITS

FIND THE BUG WINNER

LORD MOTLEY BUGNUT, of *Centipede* fame, graciously joined us last issue and announced our Find The Bug Winner. Due to popular demand, we persuaded Lord Motley to postpone his next expedition just a bit and stay with us until after the holidays so he could announce the winner of the Christmas Bug. Lord Motley . . . if you please . . .

weevils and spiders and orders and phylums and . . .

Lord Motley? Are you with us?

Pardon me . . . oh, yes, yes, very well then. . . . And hello again, all my dear fellow bug hunters. As you've been told, I've extended the departure date of my next expedition far too long as it is, but I was having such a splendid time chatting with the chaps here at Atari, and I did so want to find out who the next lucky winner of the Find The Bug contest was. It *was* a difficult bug to find, wasn't it? But we did have a lucky winner out of the fabulous number of responses we received: young Mr. Tom Thompson of Naperville, Illinois! He wrote to us:

Dear ATARI CONNECTION:

I found the bugs in Santa's list. In line 90 it should read:

```
90 FOR J=1 TO N-1:FOR I=1 TO 10*(N-2) STEP 10
```

Because each name can be ten characters long, not nine. The second bug (there were two) was in line 100. It should read:

```
100 IF NAME$(I,I+9)<NAME$(I+10,I+19) THEN GOTO 130
```

THEN GOTO 130 because you want the list in alphabetical order.

I am thirteen years old and I live in Naperville, Illinois. I spend most of my free time playing at sports or programming my ATARI 800. I just got an 810 Disk Drive for Christmas. I would like to see seventy-five pages in this magazine because I think it is great. I am currently working on a

Christmas song (with pictures) and game simulation for my four-year-old cousin.

In school, I received an "A" on the computer unit for a ten-line program that any computer owner could do off the top of his or her head. The other kids asked me to help them with their programs because I have a computer.

I enjoy my ATARI Home Computer and prefer it over any others because of the graphics. I would like to see more player/missile graphics information in later issues.

Sincerely,
Tom Thompson

Well, young Tom . . . I'm so very pleased to present you with a Defender game cartridge for your most skillful bug hunting! And now I'm off to the southernmost regions of Pago Pago to search out the tri-winged Drucalopterix! Happy Bug Hunting!!!

```
10 DIM NAME$(100),TEMP$(10)
20 NAME$=" ":NAME$(100)=" ":NAME$(2)=NAME$:GRAPHICS 2
30 ? #6;"   ENTER 10 NAMES":? #6:? #6;" EACH LESS THAN TEN"
40 ? #6;"   CHARACTERS LONG":? #6:? #6;"HIT 2 returnS AFTER"
50 ? #6;"   THE LAST NAME":FOR N=1 TO 10:POSITION 1,8
60 ? #6;"NAME $ ";N;"?":INPUT TEMP$
70 IF TEMP$<>" " THEN NAME$(N*10-9,N*10)=TEMP$:NEXT N
80 GRAPHICS 18:POSITION 5,5:? #6;"SORTING"
90 FOR J=1 TO N-1:FOR I=1 TO 9*(N-2) STEP 9
100 IF NAME$(I,I+9)>NAME$(I+10,I+19) THEN GOTO 130
110 TEMP$=NAME$(I,I+9):NAME$(I,I+9)=NAME$(I+10,I+19)
120 NAME$(I+10,I+19)=TEMP$
130 NEXT I:NEXT J:GRAPHICS 18
140 FOR I=1 TO (N-1)*10 STEP 10:IF RND(0)<0.2 THEN 160
150 PRINT #6;"   ";NAME$(I,I+9)
160 NEXT I
170 POSITION 0,10:? #6;"  HIT ANY KEY"
180 ? #6;"   TO GO AGAIN":POKE 764,255
190 IF PEEK(764)=255 THEN 190
200 POKE 764,255:GOTO 20
```

Listed above is the Find The Bug program. To debug the program, simply replace lines 90 and 100 with Tom's solution.

FIND THE BUG

Someone has put a spell on our computer graphic of the American Indian "God's Eye" talisman that symbolizes good fortune, good health and a long life.

A veritable mischievous troll bug, he slowly wipes away our God's Eye—color by color and line by line.

Conjure this bug away and Ojo De Dios will smile down upon you till the end of your days and increase your ability to write your own error-free programs!

First type the God's Eye pogram into your ATARI Home Computer exactly as it is listed, then type RUN and see a kaleidoscope of colors appear, then disappear before your very eyes!

Program by Craig Chamberlain. Reprinted with permission of Compute! magazine.

```
1 REM BUGGED
2 REM PROGRAM BY CRAIG CHAMBERLAND
3 REM BUG BY DAVE MENCONI
10 R=53770:GRAPHICS 10:POKE 704,0:FOR I=705 TO 712
20 POKE I,PEEK(R):NEXT I:FOR I=1 TO 31:R=R+(I=3)*1538
30 POKE 705+RND(0)*8,PEEK(R):POKE 705+RND(0)*8,PEEK(R)
40 POKE 705+RND(0)*8,PEEK(R):FOR J=0 TO 31:COLOR C
50 K=I+J:J3=J*3:K3=K*3:J8=J+8:J71=71-J:PLOT K+7,J3
60 DRAWTO K+7,191-J3:PLOT 72-K,J3:DRAWTO 72-K,191-J3
70 C=C+1.5-7*(C>=7):FOR H=3 TO 1 STEP -1
80 PLOT J8,191+H-K3:DRAWTO J71,191+H-K3:PLOT J8,K3-H
90 DRAWTO J71,K3-H:NEXT H:NEXT J:NEXT I:POKE 77,0:GOTO 10
```

Program on following page.

FREE ELECTRONIC NOTEBOOK

Electronic Notebook is a short, sweet and simple text editor you can use to keep notes, write simple letters or perhaps just learn to type. It writes and prints your words, paragraphs, even pages and works on either the ATARI 410 or new ATARI 1010 Program Recorder. And it's yours for the typing.

Written in ATARI BASIC for both the ATARI 400 and ATARI 800, Notebook can be saved on either tape or disc. Start by making sure that your ATARI BASIC cartridge is properly positioned in your machine. Then simply type this program into your computer.

Double check to make sure you haven't made any typing errors. It only takes one to throw off the entire program.

To save the program to cassette tape or diskette follow the directions in your ATARI BASIC Reference Manual. When the program has been saved, type "RUN" and press the [RETURN] key.

. . . On Cassette

Type "C:" to answer the initial prompt "NOTES TO VIEW >>>?" that will appear on your screen. The second prompt for cassette use is "ARE YOUR NOTES ALREADY ON TAPE(Y/N)?" Typing "Y" will answer "Yes" and cause your computer to beep once, reminding you to press the RECORD and PLAY keys on your ATARI Program Recorder. Pressing the [RETURN] key on your computer will then load your stored file into memory and display it on your screen. Answering "N" for "No" enables you to immediately begin writing your notes.

. . . On Diskette

With the program still in your computer's memory, type "RUN." Your screen will clear and then the prompt "NOTES TO VIEW >>>?" will appear at the top of your screen. If you are using Notebook for the first time, or if you do not want to read notes already stored on your diskette, then press the [RETURN] key to answer this prompt. If there are notes on diskette that you want to read, then type the name of those notes. (Do not type the "D:" prefix followed by the filename —*only type the filename*.)

The next prompt is "SAVE NOTES TO (RETURN FOR SAME)?" If you want to save the notes you are about to enter in the same file that you just typed, then press the [RETURN] key. Otherwise, type a new name for your notes. Important: the names for your notes cannot be more than *eight letters long*.

Writing Your Notes

To begin, start typing in your words. Press the [RETURN] key after every three lines of text (Notebook will delete any text beyond three lines without a [RETURN]). We suggest that you type [RETURN] after every *two* lines, because most printers accommodate 80 characters per line of print. Notebook displays a "?" at the beginning of every line on your screen, however, the question mark will not print out on your notes.

Notebook Commands

Notebook has only three commands: NEXT, EXIT and PRINT. To execute the commands, type the first letter of each command while pressing the [CTRL] key.

NEXT: [CTRL] N causes the next page of stored text to be displayed to the screen. When the last page is displayed, Notebook lets you make corrections, add more text, or exit.

EXIT: [CTRL] E will save entered text to the ATARI 810 Disk Drive, or if you are using the ATARI 410 Program Recorder, the computer will beep twice. That is your signal to put in a cassette, press the PLAY and RECORD buttons on your ATARI 410, then press the [RETURN] key on your computer. Your text will then be stored on the cassette tape. To enter more text, type "RUN".

PRINT: [CTRL] P will print all the text you have displayed on your screen.
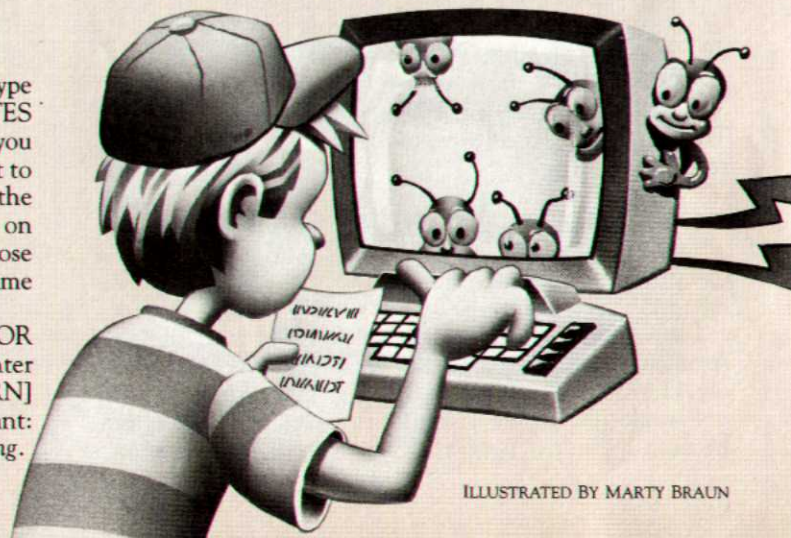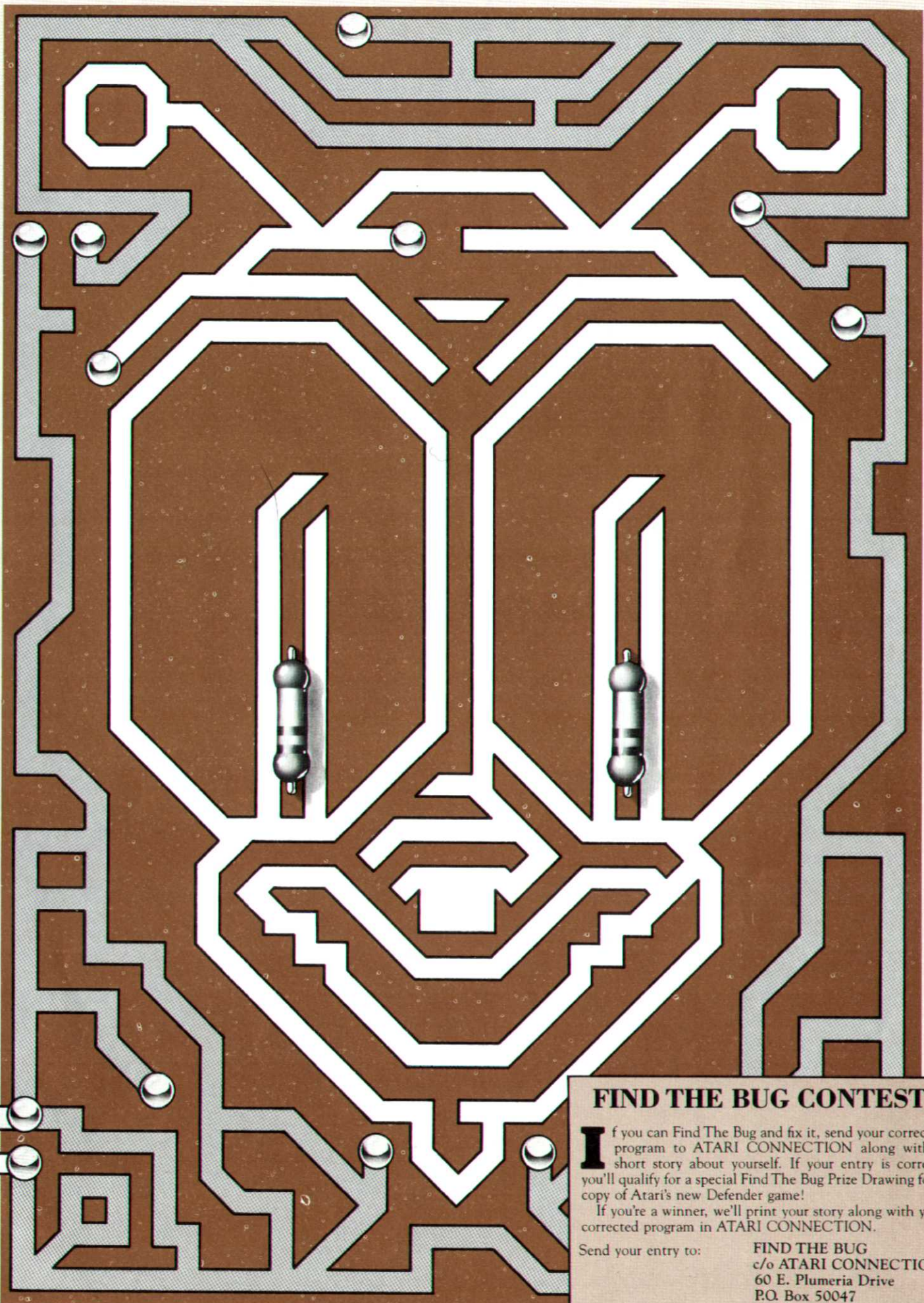
ILLUSTRATED BY MARTY BRAUN

```
1 REM ELECTRONIC NOTE PAD
2 REM BY EARL RICE AND DAVE MENCONI
10 OFF=40000:P=0:D=0:GRAPHICS 0:POKE 82,0:DIM A$(120),B$(6000),I$(17),O$(17):? :? "     NOTES TO VIEW >>>";:INPUT A$
20 IF A$<>"TAPE" THEN GOTO 70
30 O$="C:":I$="C:"
40 ? "ARE YOUR NOTES ALREADY ON TAPE (Y/N)";:INPUT A$:IF A$="" THEN GOTO 40
50 IF A$(1,1)="N" THEN GOTO 100
60 GOTO 90
70 I$="D1:":I$(LEN(I$)+1)=A$:? "     SAVE NOTES TO (RETURN FOR SAME)":INPUT A$:IF A$="" THEN O$=I$:GOTO 90
80 O$="D1:":O$(LEN(O$)+1)=A$
90 TRAP 100:OPEN #1,4,0,I$:GOTO 110
100 TRAP OFF:? "NEW FILE, YOU MAY ADD NEW DATA          OR QUIT (BREAK),":GOTO 150
110 TRAP 130:GRAPHICS 0:P=0:LCOUNT=0
120 INPUT #1,A$:? A$:P=1:L=LEN(A$):LCOUNT=LCOUNT+INT(L/40+0.99):IF LCOUNT<22 THEN GOTO 120
130 TRAP OFF:POSITION 0,0:IF P THEN GOTO 150
140 ? "END OF FILE, YOU MAY ADD NEW DATA          OR EXIT (CTRL E),"
150 INPUT A$:IF LEN(A$)>1 THEN IF A$(1,1)="?" THEN A$=A$(2)
160 IF A$=CHR$(5) THEN GOTO 200:REM CTRL E
170 IF A$=CHR$(14) THEN GOTO 110:REM CTRL N
180 IF A$=CHR$(16) THEN CLOSE #2:OPEN #2,8,0,"P:":GOTO 210:REM CTRL P
190 L=LEN(B$)+1:B$(L)=" ":L=L+1:B$(L)=A$:B$(LEN(B$)+1)=CHR$(155):GOTO 150
200 CLOSE #1:OPEN #2,8,0,O$
210 PRINT #2;B$;:CLOSE #2:TRAP OFF:CLOSE #1:END
```

PIZZA + MATH BOX + ATARI = COMPUTER FUN

By Teddi Converse

LAST SUMMER DON MACLAEY of The Math Box, a retail computer store in the Washington, DC area, had the idea of conducting some computer classes for children in his store.

"Many parents had asked me if there were any computer classes available for their kids," Don said, "and I personally felt that it was something that ought to happen."

At the same time, Cecia Cohen was conducting computer classes for children through her company, The Children's Computer Experience. She and Don decided to pool their efforts. Cecia already had a great deal of experience introducing computers to children and could conduct classes at The Math Box with the benefit of readily available computer equipment.

Computer classes for children were held at The Math Box store for a month. Then, Chuck E. Cheese entered the picture.

Chuck E. Cheese Pizza Time Theater is a combination of fast food restaurant and video arcade center, featuring robotic characters that spring alive from the walls and an actual theater with a 14-foot TV screen; a perfect place to demonstrate computers for first-time users, regardless of their age.

The Math Box, The Children's Computer Experience and Chuck E. Cheese teamed up to offer children courses in computer education. The response was enormous and positive.

"Although the classes were offered to children from ages six to sixteen, there was quite a range of ages in each of the sessions; we had waiting lists for every class," remarked Cecia Cohen.

"Computer education first started to interest me when I was working on my Master of Arts program and took a Futures class. I was really impressed with the future of electronics," Cecia expanded. "And, nowadays, kids are so involved with computer video games that it's a natural progression for them to be excited about learning

how to use computers. They understand that in knowing how to program a computer they can create their own games."

There was an average of 20 children in each class this last summer at the Chuck E. Cheese theater. Don MacLaey and Cecia remarked that many times they were told the children who attended the class saved up their own money to pay for it.

"We taught very elementary BASIC language commands like PRINT, GOTO, LIST and RUN. Then we taught some graphics to the kids," said Cecia. "Actually, we tried to give basic computer information and then let the children manipulate the commands they had learned. We gave them time to problem-solve on the computer with the tools we had presented them," she continued.

"I just felt like it was a good idea," observed Don MacLaey. "And we thought if we were successful, we'd try and do it again. But, at the time, we had no idea what

success really meant. We just thought we would do it and see what happened," he said.

"It was really great to see the excitement in the kids," Cecia added. "There were a lot of brothers and sisters in the groups. Some kids had computers at home, and some had never touched a computer in their lives. But they were learning from one another. It seemed the kids could really tell when one of the others needed some hints because they had run into a problem or just really wanted to know the answer. I find that, a lot of times, teachers or adults don't pick up on that. You need to give the children time to remedy a problem themselves and go at their own pace," Cecia said.

"It *was* a real success," concluded Don MacLaey. "In fact, Chuck E. Cheese has worked out a long-term contract with The Math Box chain to continue the programs. And it was a lot of fun for us, and for the kids," he chuckled. "You ought to see Pac-Man on a 14-foot TV screen!"

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ELECTRONIC BULLETIN BOARDS

Do you long to communicate with other computer people — to exchange ideas and information, or just to say "hello out there"? An electronic bulletin board service could open up your window on the world. When you own a home computer, you can connect your television set to a home information network consisting of thousands of other computer users. All you need are

a telephone and a modem to interact with any of a number of free bulletin board services. You can send and receive computer mail through your personal electronic "mailbox," peruse electronic want ads, or download enlightening and entertaining software programs—for the price of a telephone call.

On the following pages, you'll learn how electronic bulletin boards work, what a modem does, and how to connect your system to the burgeoning computer grapevine. Those who have trouble navigating through the sea of technical mumbo jumbo will find safe harbor in the handy glossary at the end of this section. Welcome to the communications revolution!

Electronic Bulletin Boards

PIN UP Your Electronic Messages Find Hard To Get Information Or Start Your Own Network

IT'S ALL Possible With The Latest Technological Boon For Home Computing

By Jim Carr

ELECTRONIC BULLETIN BOARD systems—like the video games offered on many of them—are addictive.

And like those video games, electronic bulletin board systems (or BBSs) are controversial, a lot of fun, and not always understood.

BBSs are also among the fastest-growing—and hardest to pin down—areas in the home computer field.

"I list 475 BBSs, and there are probably a lot more out there," says Jim Cambron, the Kansas City, Missouri, publisher of "The On-Line Computer Telephone Directory," a quarterly newsletter that lists the telephone numbers, names, and locations of BBSs in the United States, Canada, and a few in Europe. About a dozen BBSs run by ATARI Home Computer owners, including the Michigan ATARI Computer Enthusiasts (MACE) BBS in Detroit, are listed in Cambron's newsletter.

Only free-access bulletin board systems are printed by Cambron: "All it'll cost you to get on them is a phone call," he explains. Cambron doesn't claim his list is totally comprehensive, but it is as complete as possible due to the very nature of BBSs.

"The number actually up and running changes daily," he says. "Basically, two kinds of people will start a bulletin board. One, someone crazy enough to spend about $3000 and tie up all their equipment so it can run 24 hours a day. Two, companies who use it as a tool to communicate with field representatives and to keep in contact with customers."

You can expect those in the latter group to keep their systems going; the ones in the first category aren't quite so reliable.

"The mortality rate on bulletin boards is incredible," agrees
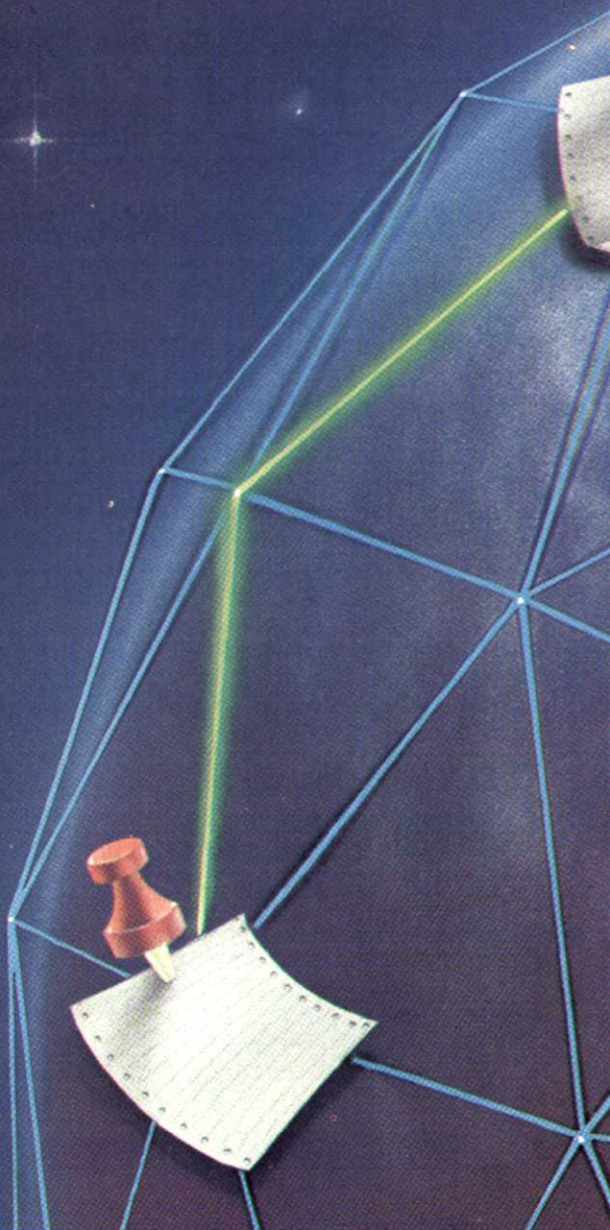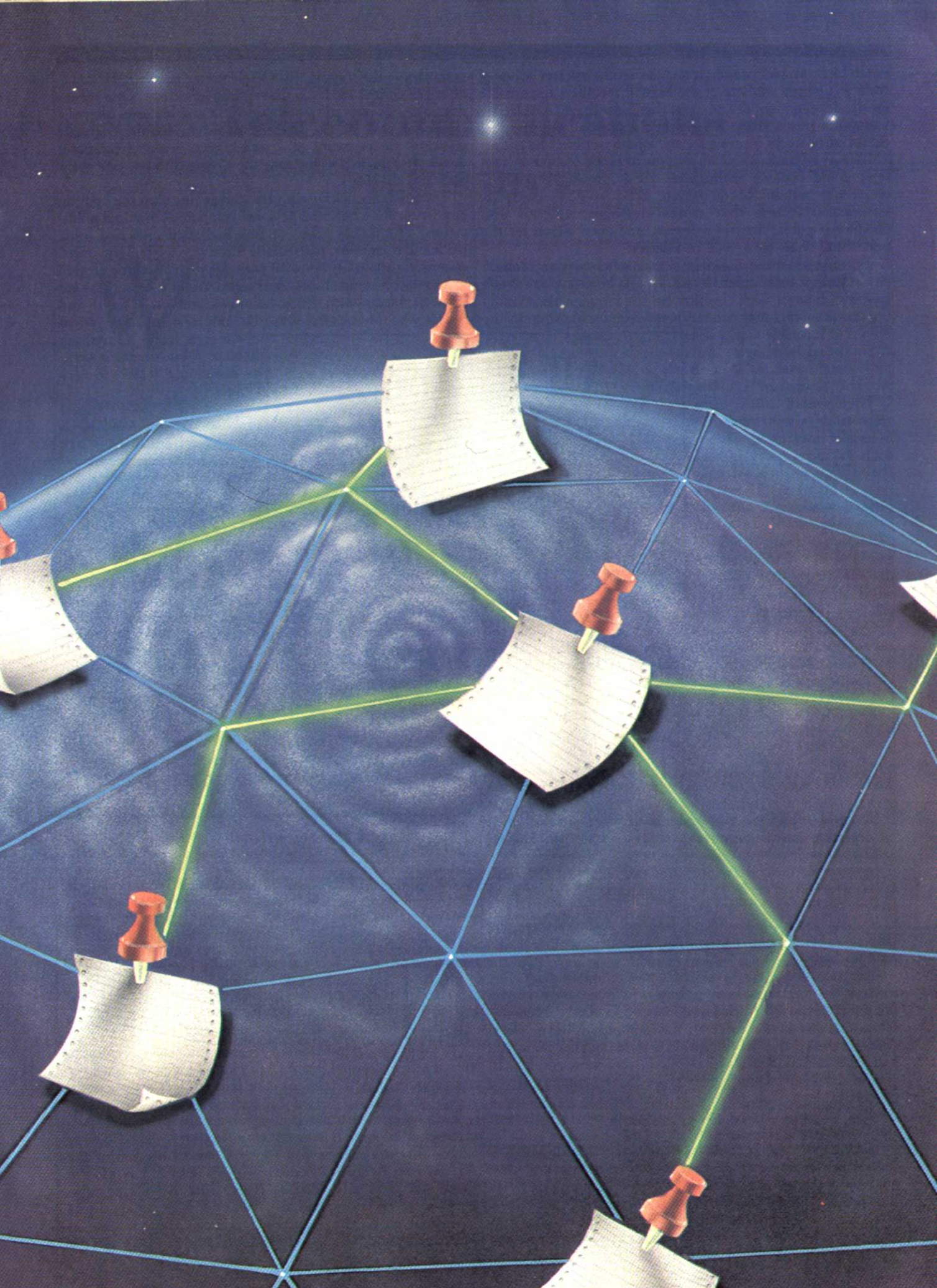
Arlan Leviton, past president and current newsletter editor of MACE. Leviton was one of the MACE members responsible for the development of a program that turns the ATARI Home Computer into a BBS. "I'd say only about one in every five that start up keeps running for any length of time," he adds.

It's easy to understand why a typical home computer hobbyist could become enthusiastic about owning a personal electronic bulletin board system. Who wouldn't enjoy an automated system that stores messages, uploads and downloads public domain software, and even allows for the publishing of an electronic newsletter?

"But, like anything else, if he (the system operator) doesn't pay attention to it, it falls apart," warns Leviton. "It takes a couple of hours a week cleaning out the message files, changing the programs that can be downloaded, checking on the ones that have been uploaded to make sure they're not pirated software . . . it takes steadfast attention."

There are, of course, many responsible system operators —usually user group officers such as Leviton—who keep their BBSs on-line virtually on a 24-hour basis. These provide a wealth of services- —personal electronic "mailboxes," want ads, and public domain software for downloading—that make it worthwhile for many users to call long distance on a regular basis.

> ## "All it'll cost you to get on is a phone call."

One such "SysOp," as the BBS users soon learn to call the system operator, is Frank Huband, who runs ARMUDIC on his ATARI 800 Computer in Arlington, VA.

"I get about 50 to 60 calls a day," he says. "Usually, about five hours of it (calls coming in) is long distance."

ARMUDIC (the name is Huband's phone number turned into an acronym) offers nearly 60 programs in eight categories any caller can download. Utility programs such as terminal emulators make up the bulk of the software available on ARMUDIC, which is the name Huband sells his BBS program under.

Huband's BBS message file is divided into several departments—users can leave general messages, list items for sale, or provide a "want" list.

In general, most BBSs are organized in much the same fashion as Huband's. Still, many first-time BBS users have trouble finding their way around.

It really needn't be so difficult, however, and more than one BBS takes care to help its users develop a mental picture of a bulletin board system's "architecture."

One such BBS is the Living BBS in Menlo Park, CA. The instructions to the system inform you that you're at the "summit" of the BBS when you first call in. Each successive menu takes you "deeper" into the "mountain," as it were. And, naturally, the "mountain" gets wider and deeper as you and other users add messages, reply to other messages, etc. To "climb" back out, a user merely types "S," for summit. If you get really deep, you can move "up" quickly by adding a number to the S. Typing 7S, for instance, moves you seven steps back toward the summit.

To help new users become acclimated to the Living BBS, a special beginners' section offers a "fun questionnaire" that gives users practice by answering often-silly questions ("Are You Naked?" is one, "Are You Famous? Interesting?" another).

Because of its extremely interactive format—callers can append a response to previous messages by typing a one-key

command—the Living BBS (telephone number 415/327-8876) is perfect for long, diverse conversations. One recent discourse between the system operator and his users offered a "Personal Byte of the Month" award to anyone correctly guessing the password of a well-known personal-computer developer rumored to be using the Living BBS (no one got it right, by the way).

There was also a long editorial disagreeing with the opinion of a writer for a national personal computer— oriented publication. The article taken to task had itself criticized some BBSs and their users, particularly those who use bulletin board systems for illegal or immoral purposes such as selling pirated software or leaving obscene messages. And it is true, there are some problems with BBSs, admits Cambron. "You'll find people who'll leave obscene or libelous messages. The system operator is liable if anything libelous is put on his system, so he should watch it very closely."

However, he sees a bigger problem brewing: "As long as people (the callers) are greedy, and it remains a one-way thing, the hobbyist thing could die out. Most of the people aren't interacting- —they're just taking (downloading programs). "But from a business standpoint, it's just beginning," Cambron believes.

Many companies use BBSs to take orders from field representatives, eliminating a lot of paperwork. Other businesses let customers place credit-card orders for merchandise.

The list of possible uses for BBSs is practically endless. Who knows—*you* might even start one next week!

Jim Cambron's "The On-Line Computer Telephone Directory" costs $19.95 per year and is available from Box 10005, Kansas City, MO 64111. Free listing in his directory is available at the same address.

Jim Carr is a Senior Writer for Marketing Publications in the Atari Home Computer Division.

Logging On

Computer Phone Etiquette

By Gary Paul Fox

NOT TO BE CONFUSED with the popular slogan used by lumberjacks, *Logging On* refers to the process of connecting your computer to a telecommunications service such as CompuServe or a bulletin board system (BBS).

To log on, begin by loading a program into your computer to turn it into a terminal. For ATARI Home Computer users, the convenient ATARI TeleLink I or II cartridges are the most logical choices.

Each offers the instant-loading advantage of cartridge programs, but TeleLink II is an advanced version designed to work with either the ATARI 835 Direct Connect Modem or the ATARI 830 Acoustic Modem, while TeleLink I is for the acoustic modem only. TeleLink II also stores two phone numbers and access codes, and dials these numbers automatically at your request. The TeleLink II package also contains an informative and fully illustrated users' guide to help you get

Telecommunications Glossary

WE'LL CALL THIS *"The Slaying of the Great TeleCom Argot"* (or how I learned to stop offering my condolences to friends with terminal software).

I'm no longer bewitched by bauds, scared I'll catch some dread disease from a carrier, or wonder how I'm supposed to shake hands with a modem. I've discovered that the abbreviations, phrases, and terms bandied about in telecommunications (a big word for exchanging information over the telephone system) are no more mysterious or difficult to understand than typical *"computerese."*

Herewith is a short glossary of telecommunications abbreviations, phrases, words, and just plain jargon. This should help you wade through virtually any conversation, user's guide, or magazine article about modems, data communication, and electronic bulletin board systems.

— Jim Carr

Acoustic coupler—A device with earmuff-like cups that uses a telephone to hear tones sent or received by a computer to the telephone network; used in over-the-phone transmission of data between computers. Also called acoustic modem (*modulator-demodulator*).

Analog data—Electronic information that bears an exact relationship to the original information. For example, a telephone electronic signal carries an analog data representation of the human voice. The tones emitted by an acoustic modem are the analog equivalent of the digital information the modem receives from a computer.

ASCII—Abbreviation for American Standard Code for Information Interchange (pronounced ask-ee). Each standard 8-bit information code represents a single alphabetical character or a number.

ATASCII—Atari's specialized version of the ASCII code, developed to handle the ATARI Computer's enhanced graphics capability.

Baud—A variable unit of data transmission speed, usually equal to one bit per second.

Baud rate—The speed at which data is transferred between other computers, communications equipment or devices.

Binary digit—A number in a numerical system having two as its base. The values are 0 and 1, which correspond to ON or OFF.

Bit—Abbreviation for binary digit.

Bit rate—The speed at which binary digits are transmitted. Expressed in bits per second (bps); often synonymous with *baud rate*.

BBS—Abbreviation for bulletin board system.

Buffer—A storage device which holds data temporarily. Often used to compensate for different speeds in data transmission rates. In telecommunications, for instance, data received at 1200 bps may be stored momentarily in memory before it is printed at a slower speed.

Carrier—A continuous electronic frequency capable of being modulated—or varied—with an information-carrying signal.

Dedicated lines—Telephone lines leased for exclusive use by a group or individual for telecommunications. User pays a set fee rather than per-call or per-minute charges for leased lines.

Direct-connect modem—A modulator-demodulator that is connected directly to the phone system for use in data transmission. Contrast with acoustic coupler.

Download/upload—The process of transferring and saving a program over telephone lines. Downloading refers to transferring a program from a central computer to a remote terminal. Uploading, conversely, sends a program from a remote terminal to a central computer. Many bulletin board systems make programs and games available to callers through downloading. Callers to BBSs, on the other hand, often donate programs they've developed for the BBS by uploading.

Frequency-shift keying—A modulation technique that shifts a carrier signal from one frequency to another while transmitting data. Abbreviated FSK. Other modulation methods shift the phase or volume of a signal.

Full-duplex—Data transmission in both directions simultaneously. Can be likened to a phone conversation in which both parties can talk at the same time.

Half-duplex—Data transmission in both directions, but only one direction at a time. Can be likened to a CB conversation in which both parties can talk, but only alternately.

Handshaking protocol—An exchange of predetermined signals by modems and their respective terminals when a connection is established. Only modems similarly configured—for example, at 300 bps, full-duplex transmission— can "handshake" and transfer data.

Hertz—Synonymous with cycles per second (cps); one Hertz (abbreviated Hz) equals 1 cps.

Mark—The signal equivalent of a binary 1; i.e., the presence of a signal.

Packet switching—The transmission of data in blocks—or packets—over phone lines by a private utility company.

Parallel transmission—A method of data exchange which transmits all the bits comprising a character or word simultaneously. Imagine all the bits marching abreast.

Parity bit—A binary digit added to a group of bits to make the total of all bits odd or even.

Public domain software—Software that is not protected by copyright laws and is therefore free for all to reproduce without fear of legal prosecution.

RS232C—A set of standards developed by the Electronics Industry of America (EIA) that standardizes the interface requirements between modems and data terminal equipment.

Serial transmission—A method of data exchange in which each bit of a character is sent sequentially rather than simultaneously as in parallel transmission. Imagine the bits marching in single file.

Space—Signal equivalent of a binary 0; i.e., the absence of a signal.

Start/stop bits—Binary digits that signal the beginning/ or end of an asynchronous serial transmission.

Switched-telephone network—The familiar dial-up phone system; so-called because the phone system is a network of local offices where electronic switching equipment automatically routes calls to the proper destination.

SysOp—Abbreviation for system operator, the individual who maintains a bulletin board system.

Terminal software—A computer program that converts a microcomputer into a "smart" terminal that is capable of interacting with a central-site computer. TeleLink I and II give your ATARI Home Computer the instructions that let it communicate with another computer over phone lines.

started in the information age.

When using the ATARI 830 Acoustic Modem, the telephone number is dialed manually. Then, when the call is "answered" by a tone, the telephone handset is placed in the receptacles on top of the modem. Care must be taken to avoid hitting the modem or letting extraneous noise become too loud, as it may interfere with the acoustical operation of the modem and cause scrambled information. If you like loud rock and roll while you telecompute, better to use a direct connect modem!

When you subscribe to an information service, you will receive an identification number and a password for your account, along with a list of telephone numbers for the service. Since THE SOURCE, CompuServe, and the Dow Jones News/Retrieval service have telephone numbers in most metropolitan areas, a local call will connect the majority of subscribers. If you live in the boonies, however, be prepared for some sizeable phone bills in addition to what you pay for the information service itself.

In contrast to large information services, bulletin board systems are usually offered free of charge. They offer users a more personal way to communicate. Users pay for their own telephone call, and sign on with their names or passwords and locations. Many BBSs are run by computer hobbyists and are organized around a special interest. *The On-Line Computer Telephone Directory* (J.A. Cambron Company, Inc., P.O. Box 10005, Kansas City, MO 64111) lists several hundred BBSs around the country, as well as other useful information.

If you're seeking a BBS in a particular location, or involving a special interest, try asking the friends you may meet on the CompuServe CB Simulator. If there's a BBS for left-handed programmers using FORTH and working in greater Lompoc, somebody on CompuServe CB will probably know about it!

Computer CB's

What's a Nice Guy Like Me Doing On A Channel Like This?

By Gary Paul Fox

A DEMENTED GRIN SPREAD across Dr. G's face. "So you haven't tried CB yet?" He thrust a napkin full of hastily written instructions across the lunch table. "It's great—you'll love it!" he promised. In case you're unfamiliar with the good Doctor, he's our resident telecommunications freak.

Later that evening, with great trepidation I dialed the number that connected my ATARI Home Computer with CompuServe. Sure, I was a writer on assignment, but frankly this telecommunications thing was a little scary. I had no idea who would be out there, or what I should say. I skipped the formalities; at the first prompt I entered "GO PCS-6."

The computer fired back with a quick option: 1 for instructions, 2 to turn my CB on. "What the heck," I thought, "go for 2!" Dr. G had briefed me on the essentials. I remembered that all CB commands were preceded by a slash (/). /TUN followed by a number from 1 to 36 would let me transmit and

receive on that channel. /MON followed by one or two numbers let me monitor additional channels. /STA listed the channels being used, and the number of users, while /UST gave a full listing of everyone on the system along with their location.

"What's your handle?" asked the computer. Now, I've been to more than a few fern bars, but this was a new opener for me. Remembering that a friend had nicknamed me "Gabby," I typed in that moniker. I also selected channel 1 as it seemed the most popular.

Immediately, my TV screen came to life with a near constant stream of transmissions. Each message was headed by the sender's channel number and handle in parentheses. Such names! **JULIE**, Mad Dog, Prof, Cupcakes, St'RAY'cat and SEXY LADY stick in my memory. I later discovered that channel 1 is the "Adult" channel, while 19 is for general calls, and 33 seems to be predominantly gay.

Despite the fact that messages were being displayed faster than I could type, let alone think, I entered a modest "hello" and hit the return button to transmit. Almost instantly, the acknowledgements came back: "Hello, Gabby" . . . "Gabby, where r u?" . . . even "+++++HUGS+++++." "This is certainly a friendly crowd," I thought. As fast as I was able, I returned the greetings. My outgoing messages were displayed character for character as I entered them.

Frequently, however, they were interrupted by incoming messages. The screen read like the transcript of a cocktail party, with everyone talking at once. I quickly became comfortable with the system, though, and in no time at all, was keeping up with the action.

Being new, I was the object of considerable attention. Most CBers are interested in your location, sex and age, though not always in that order, and many other topics are discussed. Outside my window in Oakland the weather was cool and clear, but I soon discovered from "BAD4U" that it was snowing in Wyoming. "BYTE MAN" in Atlanta asked about my computer, and when I informed him I was using an ATARI 800 his reply was "GREAT GRAPHICS!" Several others commented on various models of computers and modems, along with food, cars, and nearly every other subject imaginable.

Throughout the next hour, on several channels, I managed to meet and exchange information with a fascinating spectrum of computer users. One was a nine-year-old girl in Kansas who was obviously a very experienced programmer. In addition to using her computer for homework and math projects, she had organized her paper route billing with her own program. "MOMMA BUCKEYE" turned out to be a retired mother from Ohio visiting her son in San Francisco, and using a computer for the first time!

Perhaps my favorite correspondent was RED DOG. A very intelligent woman (Yale '74), RED DOG and I discussed everything from politics to programming for nearly half an hour. Periodically she would insist upon being petted or scratched. I complied, of course, and my kindness at the keyboard was reciprocated by various woofs, aarfs and bow wows. Did I mention that some CBers really get into their roles?

Someday, I'd like to meet RED DOG in person, along with several other characters I've encountered on the CB

> " 'BYTE MAN' in Atlanta asked about my computer . . ."

Simulator. In fact, many of the CBers do get together for parties and other gatherings. It's all part of the rapidly growing network of home computer users who find they have a lot in common.

Since that first evening, I've used the CompuServe CB service several more times. While not always as lively as that first evening, it never fails to amaze me. Now, whenever I feel like stepping out, I can communicate with people all around the country without leaving home. Thank you, Dr. G.! (1, GABBY):::::POOF:::::

Modem Mumbo

This simple device with the funny name lets your computer talk to other computers

By Jim Carr

I REMEMBER THE FIRST TIME I heard a friend say "modem." My reaction—a typical one, I've since discovered—was a two-word question: "A what?"

To say that modems are little-known, arcane devices is an understatement of monumental proportions. Few people have even heard of them, much less know what they do. Yet many of those same individuals have regular, if indirect, contact with modems each time they operate a bank's automated teller machine or buy a hamburger at a fast-food restaurant.

A modem—the word is a contraction of modulator-demodulator—lets computers "talk" to each other over telephone lines. Strictly speaking, modulation is the process of varying the volume, frequency, or phase of a signal. In practice, a modem converts a computer's digital information into tones that can be transmitted over the phone system. Demodulation, conversely, is the process of reconverting the tones (referred to as analog information) back into digital form.

The ATARI 830 Acoustic Modem and the ATARI 835 Direct Connect Modem modulate data via a method called frequency-shift keying (FSK). The process begins when an ATARI Computer presents the electrical equivalent of the binary digits 1 and 0—these are respective high- and low-voltage signals—to the ATARI 830 or ATARI 835. The modem responds by producing a tone at a specified frequency for each bit. These frequencies are determined on an originate/answer basis: originating modems produce a 1270-Hz signal for the 1 bit, a 1070-Hz tone for the 0 bit; answering modems shift from 2225 Hz (1 bit) to 2025 Hz (0 bit). This produces high-pitched sounds you can actually hear when you put your ear near the ATARI 830's acoustic coupler.

When you insert a telephone receiver into the modem's acoustic muffs, the microphone in the receiver picks up these sounds and sends them over the phone system. The answering telephone directs signals from its built-in speaker to the receiving modem, which recognizes a 1270-Hz signal as an electrical high, a 1070-Hz signal as a low. The electrical highs and lows are sent to the remote computer, which interprets them as 1s and 0s.

The ATARI 835 Direct Connect Modem merely bypasses the audible-tone state, producing voltage levels that are interpreted by the phone system as the equivalent of the 1270- or 1070-Hz signals.

ATARI Home Computers are eight-bit processors—that is, each character, number, or letter is represented by eight bits in the computer's memory. The letter *a*, for instance, is 00100001 in binary notation. To transmit an *a*, the ATARI 830 Acoustic Modem first sends two consecutive 1070-Hz signals followed by a 1270-Hz signal, four more 1070-Hz signals, and finally another 1270-Hz signal.

Naturally, this shifting of frequencies occurs too quickly for the human ear to detect, so all you'll hear is a steady whine that's called a carrier.

ATARI 830 Acoustic Modem

This is an admittedly simplified explanation of what's known as asynchronous serial data transmission, because many other factors are also involved. For example, stop and start bits are inserted by asynchronous modems to designate the beginning and end of characters. These extra bits let the modem send data at irregular intervals without confusing a receiving modem.

Synchronous modems, on the other hand, rely on built-in clocking schemes rather than stop and start bits to synchronize data exchange. Synchronous transmission is faster than asynchronous transmission—fewer bits are sent per character—but their complex clocking circuitry makes synchronous modems very expensive.

Since the phone system was designed to operate in the narrow frequency range that corresponds with the human voice, the physical limitations of standard phone lines generally restrict data transfer to 300 bits (about 30 characters) per second.

Some modulation schemes permit faster data exchange —up to 1200 bps on standard phone lines and 9600 bps on leased lines which have been conditioned to accept a wider range of frequencies. These are used in business applications where rapid exchange of large amounts of data is necessary.

Commercial uses made possible by modems are the automated tellers (the teller is a terminal connected to the bank's central computer), cash registers that store and relay sales and inventory figures to a central site, and distributed data processing.

Few home computer users require the speed of business systems. Most bulletin board systems (BBS) and private information networks such as CompuServe and THE SOURCE transmit and receive data at 300 bps. That's fast enough to permit easy reading but too slow to allow transmission of high-resolution graphics used in fast-moving video games. Hence the popularity of word-oriented adventure games on the BBSs and information services.

The rapid growth of computer-generated BBSs and the increased use of the information facilities by home computer owners is forcing modem manufacturers to take heed. Many now produce easy-to-use, inexpensive models that offer an incredible range of features. Automatic dialing and answering capabilities and built-in tests that pinpoint equipment failure are just a few options available.

And as this expansion continues and modems become more visible, that earlier two-word refrain, "A what?" is apt to become, "So, what—I use one every day." ■

The Future In Your Computer

Robots by Clayton Bailey, courtesy Joseph Chowning Gallery. Plant from Sun Season Products
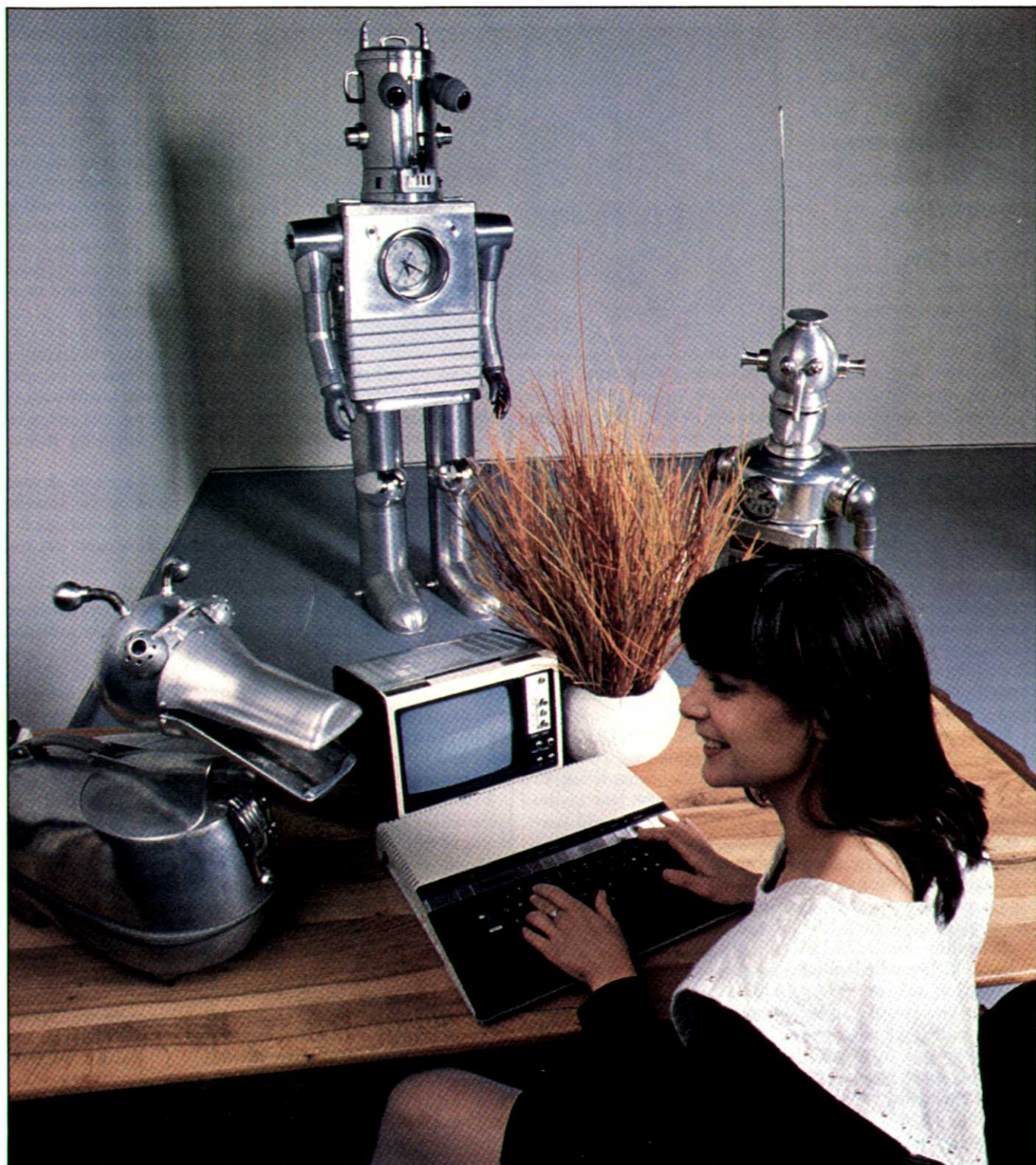
Tapping Into Tomorrow:
Thousands of home computer owners are pioneering a revolutionary new way to communicate — telecommunications

BY PAULA POLLEY AND TED RICHARDS

"The farther out we venture, the closer we get to home."

— ANONYMOUS

WHEN GUTENBURG INVENTED THE printing press in the 15th century, the written word was available to only a privileged few. The medieval Church welcomed the printing press as a way of ending the tedium of handwriting copies of the Bible. A century later, the proliferation of printed editions of the Bible and ancient philosophical works gave birth to the Renaissance.

When Alexander Graham Bell invented the telephone, he envisioned people using his invention to listen to remote music concerts. But by the turn of the century, newspaper journalist Wilbur Basset wrote:

A quiet revolution is taking place in Western country life, which promises to accomplish results within a year more important and far-reaching than any since the advent of the transcontinental railroads. . . The telephone does away with the seclusion of rural life, binds together scattered communities, creates social interests, and destroys the barrier between city and country. Henceforth the country is but a vast suburb, in touch with the metropolis of its neighborhood, unified by the voice of one leader.

Bell was not alone in failing to understand his own invention. Thomas Edison at first envisioned his phonograph being used to record, store and relay telegraph messages. The first radios were used for ship-to-shore communications in Morse code. Not until ten years later did radio discover its true calling when newly constructed radio stations began broadcasting music over the airways to owners of new "home radios." In 1937, the *New York Times* found it hard to imagine television being a successful consumer product. The *Times* conceded there were indeed military applications for television, but could not imagine all the members of a typical American family spending any significant time together in the same room.

The invention of the modern computer and its subsequent evolution nearly forty years later into the small, low-cost home computers available at department stores has likewise not been immune to faulty futuristic visions. Jaques Vallee,

author of *The Network Revolution: Confessions of a Computer Scientist** offers an interesting insight:.

"When the Moore School built ENIAC [one of the first electronic computers] in the mid-forties, most experts agreed that a half-dozen such machines would certainly suffice to satisfy the calculation needs of the entire world. . . When cars were first introduced, progress-conscious New Yorkers hailed them as the harbingers of a clean environment. And they were at least half right: it is a fact that few of today's enemies of smog and pollution would put up with the mountains of manure that horses used to deposit on the streets of Manhattan. The automobile has, unexpectantly, made the pavement clean and the air foul. It has also made suburbia possible and has changed courtship patterns everywhere."

What effect will the new home communications technology have upon our lives? Imagine if our home computer systems were connected to thousands of other computers, large and small, throughout the country—even the world. The prospect of such a massive network staggers the imagination and forms what Jaques Vallee has christened the *Grapevine Alternative.*

"In the Grapevine Alternative," according to Vallee, ". . . computers are used by people to build networks. And beyond the simple use of these networks for information we find people actually communicating through them. This use of computer networks for group communication is a dynamic force that began in obscure research organizations ten years ago. It is now ready to explode in public view. The explosion will be helped by the growing demand for home computers, for new television services, for access to databases and information sources. But it will go far beyond such applications when people in large numbers discover in these networks gateways to other minds, windows to unsuspected vistas, bridges across their loneliness, and precious understanding."

Computers are merely extensions of ourselves, and the new telecommunications technology offers us the opportunity to communicate as we have never done before. We are standing on the threshold of a truly global community. The irony here is that the farther we transmit our words, our thoughts, the closer to our homes we may find ourselves. What follows is a home telecommunications vision that blends together both the present and the future.

Electronic House Calls

JUST WHEN WE THOUGHT the family doctor's housecall had gone the way of the milkman, we now have electronic medical service. CompuServe offers a home service that can help eliminate the time and expense of an unnecessary visit to the doctor's office or hospital emergency room. It's called *Health-Tex*, and it allows you access to a plethora of information on prescription drugs, symptoms, first aid, and preventative health advice.

Let's say you've been prescribed a certain antibiotic and want to find out how it reacted with a dairy product, such as cheese. You can look up Health-Tex on CompuServe instead of calling your doctor. Health-Tex dispenses information on over-the-counter drugs, in addition to offering suggestions on dealing with drug overdoses of any type. Admittedly, you wouldn't use a medical information service for life or death emergencies, but for day-to-day health problems and questions, you could come to rely upon an "electronic doctor."

The future of electronic health care may evolve along the lines of electronic bulletin board systems (BBSs). Your doctor or clinic may set up a patient network on a small mini-computer system. Such a computerized patient network system would have personalized account codes for each patient. Using your home computer, you could access the doctor's bulletin board using your account code, leave a message or question for your doctor, stating whether it's an emergency, or simply a request to have your prescription for allergy medication renewed. Your doctor could leave a message for you that offers advice, or lets you know a new prescription was sent to the pharmacy you requested. Computerized health care will never replace the warmth and familiar intimacy of a personal visit to your family physician. But health care through computers offers exciting new opportunities for better health and well-being.

Ask the Computer Gardener

PEOPLE WHO CULTIVATE gardens, whether for growing vegetables or prize-winning flowers, know how difficult it is to get accurate, up-to-date information on garden pests, fertilizers, and diseases. Witness the proliferation of "Ask the Gardener" radio talk shows, gardening books, and special garden and plant stores across the nation. Gardening has become a great American pastime.

Now, through CompuServe's *Victory Garden*, you can have access to a comprehensive database of gardening information. You can find answers to your questions on soil preparation, seed choices, calendars on planting and harvesting, as well as information on tools, pesticides, and fertilizers.

But this is just the first step. As more information becomes available and computerized, we will begin to see special-interest databases and networks on gardening evolve. For example, if you live on the eastern slopes of the Idaho foothills, you may be able to find out about the soil chemistry for your region, and when to plant for the best results. Likewise, if your fire escape in New York City is brimming with lettuce and tomatoes, you would access a special network for "urban gardeners."

Unfortunately, as interesting and valuable as these gardening databases may prove to be, we'll probably have to continue pulling the weeds ourselves for some time to come!

Computer Lobbyists

THROUGH COMPUSERVE'S *Lobby Letters of America*, we have more opportunity than ever to affect the nation's laws. We simply specify the name of the person or issue on which we want to comment, along with our message. We can give a short but pointed opinion on nuclear arms or create a long letter filled with stories, statistics and examples that support the importance of the space program. In either case, Lobby Letters then posts our letter to its appropriate destination.

Nationwide communication services such as CompuServe's CB channels allow us to share our ideas and opinions quickly, directly and unedited—at any time. Through services like this, we can make our own evaluations of the political or social climate by talking directly to other citizens all over the country. Instead of relying on Gallup, we can instigate our own polling investigations. These services enable special interest groups, regardless of geographic inconveniences, to enjoy greater and more immediate communicative powers.

With the prospect of millions of Americans owning home computers, now is the time for all our voices to be heard. How this phenomenon will affect the future of computers, nobody can really say.

But it will certainly make our national political life more colorful and interesting.

All the News Fit to Print Out

IF YOU'VE EVER VISITED or worked in a newsroom, you know that there's nothing new about electronic news services. What *is* new is that in the future all of us may have access to this "newsroom" information right from our home computer centers. The technology exists today. Like Gutenburg's press, telecommunications can put information once limited to a select few in the hands of anyone and everyone.

At the present, home computer owners already have access to one major news source—*The Dow Jones News/Retrieval Service* which provides news articles from the *Wall Street*

Journal. But future news networks may prove to be truly interactive. Imagine a computerized news network service that would allow direct by-lined updates and commentary on major daily and weekly news stories. This electronic "open forum" would accept a variety of views and news from national and international sources.

By the next decade we should begin to see true electronic books, magazines and newspapers. What will they be like? No one looks forward to reading electronic text on video screens. For personal convenience and portability, the "printed page" will reign supreme for some time to come. But in the near future, there will undoubtedly be a major breakthrough in display screen technology that will finally free us of the cumbersome CRT (Cathode Ray Tube). Small, flat and inexpensive full-color display screens with resolutions high enough to render the detail of a printed page will usher in the era of the "electronic book."

Using magnetic strip data storage, we'll be able to buy electronic books, magazines or newspapers—even hybrid forms of media we cannot even imagine today. Our electronic book would resemble a legal pad in shape and size. By slipping in a magnetic "book card" our book would come to life with text, graphics, photos—even animated illustrations. And who knows what technological advancements we'll witness in small printers? We could possibly choose to read our electronic book on a display screen or have a page printed out in "hard copy," complete with color graphics and photographs. The popular phrase, "the Bible on a chip," may indeed come true!

Telecomputing Instead of Commuting

HOW MANY TIMES HAVE YOU thought, or even verified, that you could do certain parts of your job much more efficiently right at home? How many times have you wanted to be free of time-consuming interruptions, away from the social chatter, and free of freeway frustrations? You could be computing instead of commuting!

If our *home* computers were teleconnected to our *office* computers, we could work as easily and quickly at home as we do while sitting in our office cubicles. We could interact via electronic mail with our fellow workers, even if they too were at home. Obviously, staying home won't work when we have to attend important meetings, but it could certainly help when we need the privacy to concentrate.

Continental Illinois and *Control Data* are among the companies experimenting with telecommuting home work stations. Results are as varied as the personalities involved in the experiments: some people enjoy spending more time with their families, while others miss the social stimulation of the corporate culture. A mix of office exposure and home telecommuting may eventually produce the best results.

At Atari, our Wang system includes an interoffice Electronic-Mail feature that saves time and paperwork; it even provides moments of levity, courtesy of those with a penchant for absurd prose. Electronic messages seem to command a style all their own—a curious hybrid of graffiti, L.E.D. readouts and journalism.

There's no question the trend towards computerized office automation will continue in the future. And telecommunications will play an increasingly larger role in this evolution.

Already a significant part of American corporate management relies upon electronic mail to communicate with their offices around the globe. As more of the new "knowledge workers" work at home or from other off-site locations, new types of relationships between employees and management will evolve. Some people may even find talking to their boss's computer preferable to talking to their boss!

The Electronic Cottage
So That's What Mommy and Daddy Really Do . . .

OUR SOCIAL FABRIC WAS more tightly woven before the industrial era. Families worked together——dependent only on their farms or small businesses and their collective energy. People were essentially self-sufficient. Friends and relatives whiled away long evenings with endless talk—about philosophy, politics, the day's events and just plain storytelling. Social critics point out that this old-fashioned form of communication provided a much richer form of interaction than that offered through the newfangled wonders of modern communications—television and telephones.

One of the unfortunate side effects of the industrial revolution was that it pulled families apart. Fathers worked in the cities or factories, mothers managed the home front, and youngsters were marched off to school. Children became alienated from a vital aspect of their parents' lives—work.

Today, through the networking of jobs via telecommunications, we can diminish the rift between our work and personal lives. If we begin working at home again, we'll feel more integrated as human beings, and our children will gain a better understanding of what we do and how our work activities fit into the outside world.

For example, we might leave the office at 3:30 p.m. in order to watch our child's performance in a class play, then finish an office report later in the evening, on the home computer. Through a modem, we would then transmit the report to a co-worker's office computer, so he or she could read it first thing in the morning. Our co-worker may also be operating a home computer on a flexitime schedule; if so, our report might be reviewed, approved and handled before we even get to the office at all that day.

Children, household upkeep, family and job responsibilities never did quite fit into a rigid nine-to-five framework. Today, through work-at-home telecommunications networks, it's possible to create our own schedules. Some innovative American corporations are beginning to see the advantages of employee flexitime — increased productivity and employee satisfaction.

We may also develop a new era of high-tech literacy. Recent research has documented a decline in the reading and writing skills of too many of our nation's young. Letter writing has almost become a lost art. Perhaps telecommunications, a medium dependent on prose, will restore our respect for the proficiency in the power of the written word.

The current telecommunications revolution can bring us the best of all worlds — the richer social fabric of pre-industrialization, a new Age of Letters, diminished dependence on fossil fuels, greater individual political influence and increased access to the world's wealth of knowledge. ∎

AARON MARCUS:
AN INFORMATION ARTIST
FOR THE LIGHT AGE

BY CARLOS GRETH

TODAY WE CAN COMMUNICATE enormous amounts of information by means of powerful visual symbols in color and three dimensions. Just as creative writers have discovered the wonders of word processing and musicians have tuned in to digital sound, a new breed of artists and designers now exercise their talents in computer graphics. These pioneering information and interface designers are replacing the cold, white, shimmering video pages of computer programs with warm, colorful displays that communicate not only information, but human emotions as well.

Aaron Marcus, an artist and technological visionary, is a leader of this new school, which is designing new images for the information revolution. By applying typographic, artistic and graphic design principles to the development of computer information systems, Marcus and a handful of others have made databases easier to use and understand, more pleasing to the eye, and ultimately more human.

According to Marcus, the fundamental question the computer graphics designer must face before starting work is, "How do facts, concepts and emotions get into the human mind?" The designer's task, he says, is to frame information in digestable, byte-sized chunks.

"We are leaving the world of ink and carbon particles on bleached surfaces and are entering the light age," proclaims Marcus. "It's a birthing time for new approaches to visual languages."

Earlier in this century, typesetters could only use a limited number of characters, because it was so expensive to tool, cast and redistribute pieces of lead. In the light age, Marcus says, graphic designers compose frameworks for information with elements of light. "The electronic medium allows typog-raphers and designers the freedom to create a virtually unlimited set of characters, symbols and patterns."

THE ELECTRONIC BOOK

Book, magazine and newspaper production has changed dramatically because of the technology of the light age, although the first attempts to produce electronic versions of printed media have met with mixed results. Books printed on paper can be filled with beautiful, detailed characters. The negative side of traditional book publishing, however, is that it takes about nine months for the finished product to reach the stores. An electronic book can be produced on a computer in a tiny fraction of a second, but the finished product may be hard to read, poor in resolution and not as aesthetically appealing on the video screen.

Marcus and other information designers are working to transform this reading matter into attractive, functional formats, but there is still much work to be done. One of their goals is to develop images for the video screen that duplicate, and even surpass, the quality of graphics that appear on the pages of traditional newspapers and magazines. This may result in computer graphics that will be much more exciting than traditional photographs and illustrations.

THE THREE FACES

Marcus developed his idea of the "three faces" while working on the design of Seedis, an experimental information management system created in the computer science and mathematics department of Lawrence Berkeley Laboratory at the University of California. Seedis contains data from the 1980 U.S. census. In one project, Marcus helped design page specifications for more than two million pages of text, chart
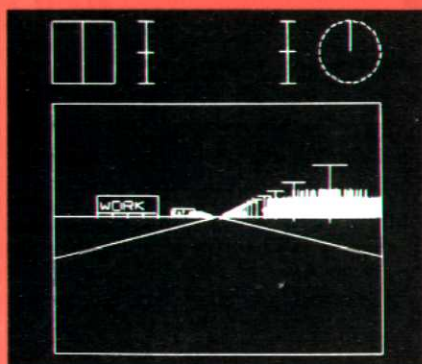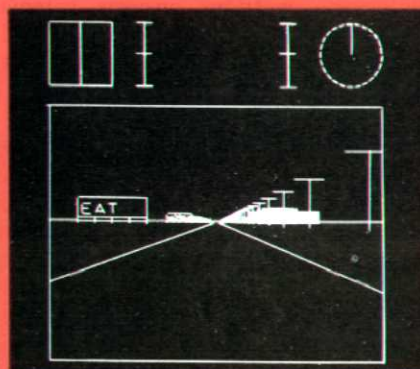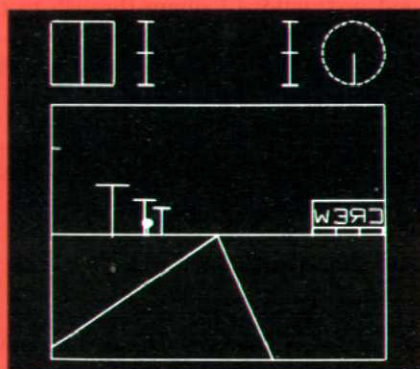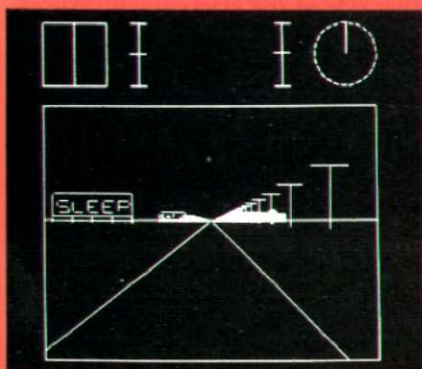
Top: Aaron Marcus illustrates the three design interfaces—Outerface, Innerface and Interface. Bottom: Marcus's Cybernetic Landscape 1—a poem-drawing programmed in Fortran. Reprinted from West Coast Poetry Review, Fall, 1974.

Marcus at work. A sample information screen for the Seedis database. Each frame is based upon the familiar red stoplight which suggests "stop and look, you've just arrived at Seedis." Green suggests that the user may "go" to another screen in the system. White calls attention to items that need an immediate decision.

STF 1			1980 Census: Summary 1	Page 8/90
			Table 18: Age (2)	
L	DE	SF	Universe: Related children (8)	
a	18.1	1	Under 5 years	
b	18.2	1	5 to 17 years	
			Table 19: Household Type (4)	
L	DE	SF	Universe: Hshlds, 1 + persons under 18	
c	19.1	10	Married - couple family	
			Other family:	
d	19.2	10	Male householder, no wife	
data			(line), (page), t(table), CR	

* a,b

and map materials.

"I began to realize that there were many kinds of computer systems that needed a face lift in three directions," he says. Marcus recommends that graphic designers explore all aspects of what he calls the "three faces of the future"—*outerface, interface* and *innerface.*

Outerfaces include text, tables, charts, maps and diagrams—the end result of data processing. *Interfaces* are the response dialogues—questions, answers, commands and instructions used while creating the outerfaces and doing their work or having fun. *Innerfaces* include programs, debugging tools and other devices used by the designers and programmers of computer systems.

Applying elementary principles of design to computer interfaces is "just kid stuff," claims Marcus. He stresses that, to be most effective, graphic designers should become involved with all areas of the computer environment.

"There's a need, not only for computer literacy, but also for computer graphicacy." Computer users might also begin thinking in terms of graphic design, Marcus points out.

"We must become as literate about graphics as we are about prose. The three R's are going to have to be supplemented by the three VR's—Visual Reading, Visual 'Riting and Visual 'Rithmetic."

All computers, except those that only tweet or talk, are computer graphics systems, Marcus explains. By their very nature, computers enable us all to become graphic designers. At the computer keyboard, the user is not a mere typist, but "a composer of diagrammatic portrayals of experience, a manipulator of space, time, color and symbolism."

In the following interview Marcus reveals more of his design philosophy.

CONNECTION: *What do you consider the greatest challenge you face as a computer graphics designer?*
MARCUS: A difficult part of my job is creating menus that clearly and effectively prompt the interaction capabilities of computer systems. I try to find exciting and appealing ways to draw people into a system. It should be as much fun to work with data management as it is to play a video game.

A side interest for me is to try to discover how to absorb fun stations into work stations. Then the work interface is not a drag on our intellectual and emotional responses to the world.
CONNECTION: *You can already play games on many computers. How is what you are proposing for work and fun stations different from what already exists?*
MARCUS: There is so much in our world that may be housed on the glass screen of the computer terminal! The user's mind jumps through to the other side of the glass, as with Alice's magic mirror. We have ways of getting into these giant symbol houses in which there are monuments and oases. Imagine an oasis in a conceptual environment. That's a video game built into a work station.

We can make an analogue for moving around the urban landscape. You're zooming along the highway at about 55 miles per hour, and your brain needs a shift of gears. So you stop at the oasis or hamburger stand for a snack and some conversation. In the work station, where is your fast food place? Where's your quality food place for getting ideas and for getting rest? Video games and computer simulation are fantastic ways to get rest and knowledge in the computer landscape.
CONNECTION: *How should the immediate environment of the computer user be changed?*
MARCUS: We should be able to get all the exercise we need at our work/fun stations. A simple way to do this is to place a treadmill or similar device near the terminal. Or, sensors could be attached to our bodies so that we could participate physically in the interface. This system would be carefully packaged before use by a consultant team of aerobic exercise coaches or karate experts to stress every useful muscle in our bodies while we do our database management.

The design of visual displays—and the terminals that contain them—may soon become highly individual and, in some cases, eccentric. Neiman-Marcus doesn't market fur-covered computers, but they could. Furry things are lovable, so why not create the ultimate in user-friendly computers? As has occurred with telephones, we may one day see computers in the shape of Mickey Mouse or PAC-MAN.
CONNECTION: *As an information designer, how do you help people navigate through the immense sea of data found in a modern*

computer database or information service.

MARCUS: Remember the Burma-Shave signs placed along the highways in the 1940s and '50s? They were little frames of text one hurriedly glimpsed while driving. We have a similar situation with computers. We're moving very quickly along conceptual highways and are faced with lots of rapid frame changes. Interface designers need to be ruthless about making sure that people get the key things they're supposed to out of those frames, and not let the garbage [extraneous information] block traffic.

We're in an age when we're constantly traveling through cartoons and headlines. This is an environment in which the graphic designer can help communicate. When I was going to school, I was a cartoonist for undergraduate humor magazines.

Now what I'm doing is trying to find ways of visual punning, presenting multiple layers of meaning, and communicating the essence of things through a minimum of visual form. That is what cartooning is all about.

Headlines include all of the verbal descriptions of the files in databases. The files have large amounts of information in them, such as the 1980 U.S. Census. In order to know what's in the files, we need data about the data, or data dictionaries.

In the near future, people will spend relatively little time examining long prose statements. Most of their time will be spent with headlines, for better or for worse. In order to get the big picture, they will also need graphics about graphics and graphics about data.

We have to state our goals and values so that we know what

HOW TO CREATE AN EXCITING VIDEO DISPLAY

It can be relatively easy to organize, clean up or beautify an unsightly, hard-to-read video page, says Aaron Marcus. Here are some of the guidelines Marcus uses:

• **Limit** the computer's responses to lines that are 40 to 60 characters wide. This helps distinguish the computer's response from the user's query.

• **Place** important features in the same position on each video page, so people don't have to search every frame to find where things are located.

• **Develop** a standard layout approach for portraying different kinds of video pages. This involves designing a *layout grid*, an invisible framework that lies behind every video page. This grid will guide users on their next moves. It also provides a mental map of the overall database.

• **Enhance** and clearly identify symbols to indicate where you are, where you came from and where you are going in the database. One of Marcus's ideas is to use colors to make the experience of using a data base like exploring a cave. (As the user goes deeper into the system, he has the impression of going deeper into a cavern, with the background getting darker and darker, and the letters glowing with appropriate colors.)
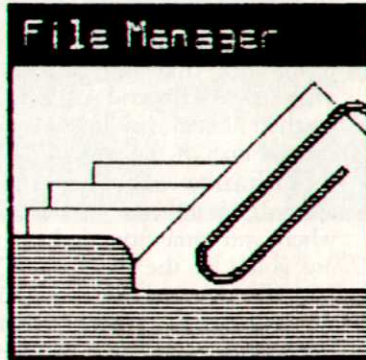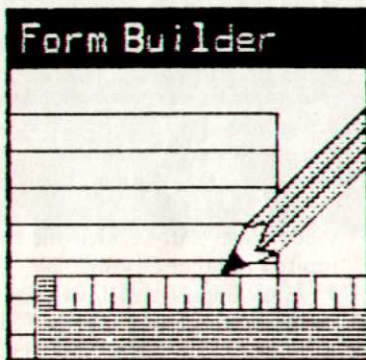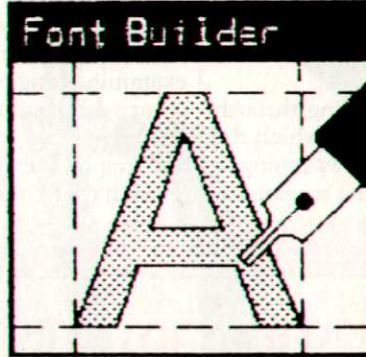
• **Design** a frame *header* (headline) or *footer* (footnote), such as a line of underscoring or reverse video characters across the top or bottom of the screen, to state clearly when users are in a monitor, command, or inquiry mode. This way, certain types of video pages can be identified with a limited number of symbols.

• **Use** upper- and lower-case type for maximum readability. Studies have shown it's more difficult to read and understand information printed in all uppercase. The more you conform to the accepted rules of good magazine and book design, the more attractive your video screens will be.
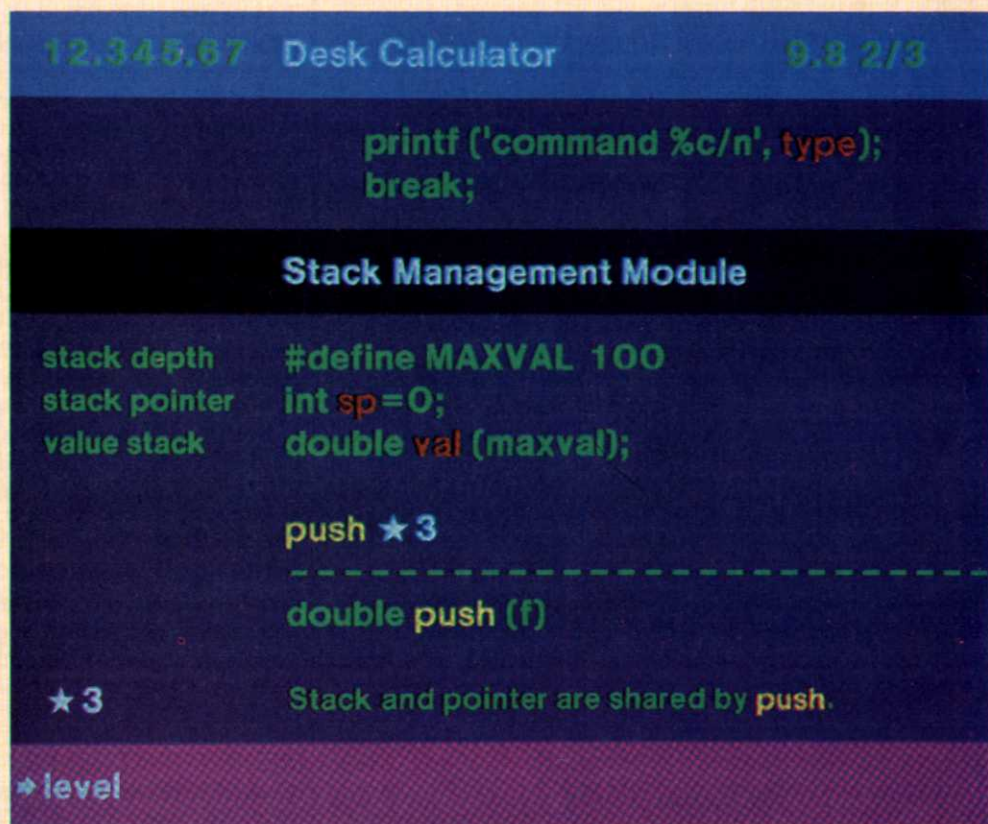
An illustration of polychrome screen design for a program writing aid. Different colors have been assigned to the locations of the various modules as well as the specific commands. The design provides the programmer with easily identifiable commands and a "mental map" of the program's structure. Note the use of lowercase type and the wide margins.

```
12.345.67    Desk Calculator              9.8 2/3

              printf ('command %c/n', type);
              break;

         Stack Management Module

stack depth    #define MAXVAL 100
stack pointer  int sp=0;
value stack    double val (maxval);

               push ★3
               - - - - - - - - - - - - - - - - - - - -
               double push (f)

★3             Stack and pointer are shared by push.

→level
```
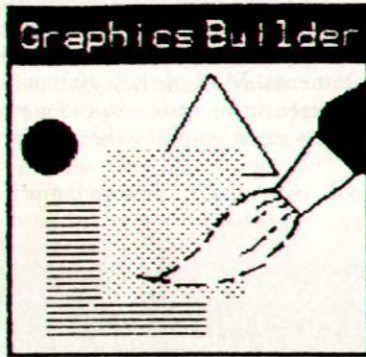
Examples of cartoon graphics used to create friendly, easily understood buttons and cursors for Intrau's Metaform System. Designed by Aaron Marcus and Associates.

is important in the torrent of information in which computers submerge us. The main challenge for computer technology companies is to assist in the development of computer-based systems that help people determine what is significant to their lives.

CONNECTION: *Would you give an example of the kind of cartooning that might be done with databases?*

MARCUS: Three-dimensional graphics and alphanumeric characters are generalized examples. They are important because they portray information in a way similar to the way we move in the world. A three-dimensional representation of a database might, by virtue of size and spatial relationships, tell us important things about the nature of the data. Maybe the stuff that's the furthest away on the screen is the material that I need to consider the least. If something is relatively small and appears to be far away, it naturally commands the least attention in my visual sphere.

CONNECTION: *How has your work as an artist and visual poet affected your work as an information or interface designer?*

MARCUS: I've created things as an artist that at the time I understood only intuitively. Five to ten years later, I look at the work again and see levels of meaning that I didn't appreciate in an articulated way at the time. My art becomes a bed of thought that I can go back and plow again.

I did a real-time computer art piece called "Cybernetic Landscapes" on an Evans and Sutherland line drawing system about a decade ago. I tried to direct the viewer in the landscape so that he wouldn't get disoriented. I provided pictures of the plane angle view, the angle of rotation and even three-dimensional text. That experience helped me years later when I was designing charts, maps, and frames for interfaces.

CONNECTION: *Do you consider yourself a catalyst for a new profession blending computer science and graphic design?*

MARCUS: Designers have been rightly dismayed about the kind of decision making that has gone into computer display systems, but many designers view computers as a threat. Often when we don't understand things, we fear them.

I'm calling for the creation of a new professional group of information-oriented graphic designers for computer-based visual telecommunications systems. This will require designers to build new informational edifices and to make a certain commitment in terms of time, money, and philosophy. The rewards for getting involved will be great, but not immediate.

CONNECTION: *Where will the driving force for the forging of this new profession come from?*

MARCUS: I think that the new generation of designers may emerge just as easily from the computer science side as from the graphics side. The power of the future is clearly in computer land, not in graphics land. The inhabitants of graphics land can help create a humane environment, but it will be powered by computer technology.

If the computer world is going to be effective and pleasant to live in, we'll need tale facilitators. Good conversation and good storytelling is what computer graphics is all about. We all love a storyteller, and we all have stories to tell. ∎

BIOGRAPHICAL NOTE

Aaron Marcus is president of Berkeley-based Aaron Marcus and Associates, a computer-oriented research, development and graphic design firm. He is the author of *Soft Where, Inc.* (vol. 1 and 2, West Coast Poetry Review Press) and *Managing Facts and Concepts* (National Endowment for the Arts), and co-author of *The Computer Image* (Addison-Wesley).

Carlos Greth is a Writer in the Atari Home Computer Division

COMPUTER CLASSROOM

DATA PROCESSING
Storing Data on Cassette
By Bill Bartlett

O NE OF THE MOST basic and useful jobs your home computer system can perform is the storage and retrieval of information. The sorting, filing and updating of this information is known as *data processing,* which you can now do in your own home thanks to powerful but inexpensive home computers. When you use your computer for data processing, most of the updating and handling of the data takes place in your computer's memory. When this work is completed, the information is stored on either cassette or diskette.

This *Computer Classroom* article will provide you with a good basic knowledge of data processing by helping you learn how to create and write your own mailing list program that will operate on either an ATARI 410 or ATARI 1010 Program Recorder. Keep in mind that there's nothing mysterious about data processing. Just imagine a large computerized filing cabinet full of file folders containing information you want to retrieve, update, sort, add notes to, then file neatly back into their folders to be retrieved again when needed.

Part I

The ATARI 410 Program Recorder stores data on standard audio cassette tapes. The ATARI 410 is called a *sequential* device because files are identified only by their physical location on the tape. Proper positioning of the tape is crucial to insure accurate data retrieval and storage operation. For this reason, the recommended procedure is to store only one file on each side of a tape immediately after the tape leader. The data is transferred from your computer to the cassette tape at the rate of 600 bits per second, which means about 60 characters per second. The storage capacity of a cassette tape is roughly 1000 characters per minute; therefore, a 30-minute tape would allow storage of about 30,000 bytes (characters) on each side.

A typical cassette data file consists of three sections: a 20-second leader of mark tone, followed by any number of *data blocks* consisting of a *Pre-Record Write Tone* (PRWT), four control bytes, 128 data bytes, and a *Post-Record Gap* (PRG); finally, there is an *End-Of-File* mark. Each of these sections is audible through the TV speaker during transmission of your data to and from your computer's memory. The procedure for creating a data file on the ATARI 410 from ATARI BASIC is to write an OPEN command to "open" a file, a series of PRINT #N; or PUT #N commands (outputs) to record your data, and a CLOSE command which ends the file.

The Open Command

The OPEN command establishes a channel for sending your files to storage from the computer's memory (RAM) to the cassette tape. There are eight channels in the ATARI Computer's Operating System (OS) numbered 0 through 7. The OS reserves chan- nels 0, 6, 7 at various times for its own purposes so you should only use channels 1 thru 5. The correct BASIC command for writing files (write mode) is: OPEN #1,8,0, "C:". When this command is executed, the keyboard buzzes twice to remind you to position the tape and push down the PLAY and RECORD buttons on the ATARI 410. You need to acknowledge this buzzer by pressing the [RETURN] key. The OS then writes 20 seconds of mark tone on the tape, however the cassette motor is not automatically shut off. The motor shuts off only after a data file has been recorded on the tape. This is not a problem if all of the data has been recorded immediately after the file is opened (See Note #1).

The Output Commands

The output commands, PRINT #N and PUT #N, transfer data from the computer's memory to a special buffer that acts as a temporary staging area for the data before it is recorded and stored on the cassette tape. When the buffer fills up with 128 bytes, the OS writes this block of data to the tape, turns off the motor, and clears the buffer.

Two types of Input and Output (I/O) commands can be used to write data to a file on tape: *Character I/O* or *Record I/O.* Character I/O means that you process the data one character (byte) at a time with none of the values interpreted as special control characters —in other words "raw data." The statement PUT #N,X executes a Character I/O by transferring one ASCII character (American Standard Code II) to the data file.

Record I/O means that your data is recorded in groups one field at a time. An *End of Line* (EOL) character (ASCII 155) is used to mark the end of each field. The EOL character is automatically generated by the PRINT #N statement. If one field is transferred to storage using a PRINT #N; statement, then

all the fields will be properly separated. The proper syntax for the PRINT statement should include a *semicolon* and not a *comma*. A comma is interpreted as a tab, so 10 blank spaces would be inserted in front of your data. The following statements illustrate how to transfer 10 data fields to a cassette tape file.

```
DIM NAME$(16)
OPEN #1,8,0,"C:"
FOR I=1 TO 5
PRINT "NAME..."; :INPUT NAME$
PRINT "AGE..."; :INPUT AGE
PRINT #1;NAME$
PRINT #1;AGE
NEXT I
CLOSE #1
```

The Close Command

The CLOSE command records the current data stored in the buffer as the last data block and then records the End Of File mark on the cassette tape.

Retrieving Data

If you want to retrieve a data file from cassette tape and transfer it to your computer's memory, you must use the following BASIC commands: an OPEN which "opens" the file, a INPUT #N or GET #N to retrieve the information, and a CLOSE to end the file.

The OPEN command sets up a buffer and establishes a channel to the ATARI 410 Recorder. The correct syntax for the read command is: OPEN #1,4,0,"C:". When this command is executed by the program, the keyboard buzzes once to remind you to position the tape and press the PLAY key on the ATARI 410. You acknowledge this by pressing the [RETURN] key. The OS turns on the cassette motor and reads past the mark tone but does not shut off the tape motor. The motor is shut off only after a data file or block has been read from the tape. The motor control should never be a problem if you open the tape file only when you are ready to read the data from it.

Your data is retrieved from the cassette file much in the same manner as it was stored. The Character I/O retrieves one byte at a time with none of the values being interpreted as control characters. The GET #1,X command transfers one ASCII character (byte) from the data file to the variable X.

Record I/O retrieves a block of data, one field at a time using the EOL (ASCII 155) character to mark the end of each field. Each INPUT #N statement can transfer many fields of data. The following BASIC statements retrieve 10 fields from the data file stored on cassette tape.

```
DIM NAME$(16)
OPEN #1,4,0,"C:"
FOR I=1 TO 5
INPUT #1,NAME$,AGE
PRINT NAME$,AGE
NEXT I
CLOSE #1
```

There are three ways to retrieve all the data from the file and exit without an error (End-Of-File, Error-136). First, if you know how many fields were written, you can simply retrieve the same number of fields, as in the example above. Secondly, if the number of fields changes, you can create a field with a special value at the end of the file and check for this value after each input. If you don't know what's in the file, you can use the TRAP command. When the *End-Of-File Error* 136 occurs, the TRAP command will use the OS error routine to check the error status location (195) for an Error 136, then CLOSE the file.

NOTE 1:

If the PRINT or PUT commands do not immediately follow the OPEN command, the motor stays on and garbage may be written onto the tape, making it unreadable. A solution to this problem is to write a dummy record of 128 blanks immediately after opening the file. The following statements accomplish this.

```
FOR I=1 TO 27 :PUT #1,32 :NEXT I :PRINT #1
```

When you then OPEN the file to retrieve it, you must immediately read past this dummy record. An input of any string variable accomplishes this.

```
DIM A$ (1) :INPUT #1,A$
```

NOTE 2:

It is possible to transfer more than one field with each PRINT statement. However, you must write the EOL character (155) after each field. The following two program statements are examples of this process.

```
PRINT #1;NAME$;CHR$(155);AGE
```

or you can write:

```
DIM CR$(1) :CR$=CHR$(155)
PRINT #1;NAME$;CR$;AGE
```

Sample Mailing List Program

The following set of programs create and maintain a simple mailing list using the ATARI 410 Program Recorder. In studying these programs you will find examples of the data file management methods described above. The first program (CASSINIT) sets up your files by reserving space for each record. The second program (CASSUP) enters or changes information in the file. The third program (CASSPRNT) prints your file.

Key concepts illustrated in these programs are proper use of the OPEN command and writing to a file using the PRINT #N command. You will also discover that the [START] key is used by PEEKing location 53279. Using the [START], [SELECT], and [OPTION] keys can be very useful in your own programs.

The mailing list program has been developed to operate on any ATARI Computer system with 16K RAM and an ATARI 410 or new ATARI 1010 Program Recorder. However, in order for the program to work properly on your ATARI Program Recorder, you should *turn off* your *ATARI 850 Interface Module* and *ATARI 810 Disk Drive*. Both devices require additional memory from your computer. If these peripherals are left on, you'll need at least *48K RAM* for the mailing list to operate correctly.

Program 1

```
1 REM *****************************
2 REM * PROGRAM NAME: CASSPRNT *
3 REM * by WBB/JB 3/82        *****************************
4 REM * This program gets the data file from the tape, *
5 REM * Then prints out your records on a printer.      *
6 REM *********************************************************
10 PRINT CHR$(125):REM clear screen
20 PRINT "MAKE SURE YOUR PRINTER IS TURNED ON...":? "TURN ON YOUR 850...":?
30 PRINT "PREPARE THE TAPE FOR READING...":PRINT
40 PRINT "PRESS 'START' WHEN READY..."
50 IF PEEK(53279)<>6 THEN 50:REM wait for start key
60 POKE 201,2:REM set comma print zone at 2 spaces
70 DIM X$(24):REM only one variable needs to be used
80 OPEN #1,4,0,"C:":REM press play on cassette unit
90 OPEN #2,8,0,"P:":REM open printer for output
98 REM The following section gets each field from the tape file
99 REM and prints it to the printer file.
100 FOR I=1 TO 100:REM read and print 100 records
110 PRINT "READING DATA FOR...";I
120 PRINT #2;"READING...";I
130 INPUT #1,X$:PRINT #2;X$
140 INPUT #1,X$:PRINT #2;X$
150 INPUT #1,X$:PRINT #2;X$,
160 INPUT #1,X$:PRINT #2;X$,
170 INPUT #1,X$:PRINT #2;X$,
180 INPUT #1,X$:PRINT #2;X$
190 NEXT I
200 PRINT "REWIND THE TAPE"
210 PRINT " -- END OF PROGRAM --"
220 CLOSE #1
230 CLOSE #2
240 END
```

Program 2

```
1 REM *****************************
2 REM * PROGRAM NAME: CASSUP *
3 REM * WBB/JB 3/82          *********************************************************
4 REM * Use this program to enter or change information in the file. *
5 REM *********************************************************************
10 PRINT CHR$(125):REM clear screen
20 PRINT "ENTER OR REPLACE RECORDS"
25 REM set up long-string variables
30 DIM NAME$(100*24),ADDR$(100*24),CITY$(100*16),STATE$(100*2),ZIP$(100*5)
40 DIM PHONE$(100*8),BLANK$(24),X$(24)
50 BLANK$="                        ":REM string of 24 spaces
60 REM *********************************************************************
70 REM read in existing file from the tape
80 PRINT "PREPARE TAPE FOR READING,"
90 PRINT "PRESS 'START' TO CONTINUE..."
100 IF PEEK(53279)<>6 THEN 100:REM wait for start key
110 OPEN #1,4,0,"C:":REM press play on cassette unit
120 FOR I=1 TO 100
130 PRINT "READING DATA FOR...";I
140 INPUT #1,X$:NAME$(I*24-23,I*24)=X$
150 INPUT #1,X$:ADDR$(I*24-23,I*24)=X$
160 INPUT #1,X$:CITY$(I*16-15,I*16)=X$
170 INPUT #1,X$:STATE$(I*2-1,I*2)=X$
180 INPUT #1,X$:ZIP$(I*5-4,I*5)=X$
190 INPUT #1,X$:PHONE$(I*8-7,I*8)=X$
200 NEXT I
210 CLOSE #1:REM the string-arrays now hold the data from the saved file
215 REM *********************************************************************
220 REM -- update the file --
221 REM ask user which record to look at,
222 REM then call subroutine which displays that record
223 REM and replaces it with new data as entered by user.
230 PRINT :TRAP 240:REM in case of input error, keep trying
240 PRINT "ITEM (1-100)(0 TO END)...";:INPUT I
245 TRAP 40000:REM turn off error trap
250 IF I=0 THEN 300:REM if no more records, go write them out
260 IF I<1 OR I>100 THEN 230:REM bad number, try again
270 GOSUB 1000:REM call subroutine which displays and updates data
280 GOTO 230:REM get next record number
290 REM *********************************************************************
295 REM -- write the updated file back out to the tape --
300 PRINT :PRINT "PREPARE TAPE FOR WRITING,":REM rewind or turn over tape
310 PRINT "PRESS 'START' TO CONTINUE..."
320 IF PEEK(53279)<>6 THEN 320:REM wait for start key
330 OPEN #1,8,0,"C:":REM press play and record on cassette unit
340 FOR I=1 TO 100
350 PRINT "WRITING DATA FOR...";I
360 PRINT #1;NAME$(I*24-23,I*24)
370 PRINT #1;ADDR$(I*24-23,I*24)
380 PRINT #1;CITY$(I*16-15,I*16)
390 PRINT #1;STATE$(I*2-1,I*2)
400 PRINT #1;ZIP$(I*5-4,I*5)
410 PRINT #1;PHONE$(I*8-7,I*8)
```
continued

```
420 NEXT I
430 CLOSE #1:REM the updated file is now saved on the tape
440 PRINT :PRINT "REWIND THE TAPE"
450 PRINT "  ** END OF PROGRAM **"
460 END
470 REM ***************************************************************
990 REM the following subroutine displays the desired record,
991 REM asks the user whether it should be changed,
992 REM and performs the change if requested.
1000 PRINT :PRINT "RECORD NUMBER...";I
1010 PRINT "NAME",NAME$(I*24-23,I*24)
1020 PRINT "ADDRESS",ADDR$(I*24-23,I*24)
1030 PRINT "CITY",CITY$(I*16-15,I*16)
1040 PRINT "STATE",STATE$(I*2-1,I*2)
1050 PRINT "ZIP",ZIP$(I*5-4,I*5)
1060 PRINT "PHONE",PHONE$(I*8-7,I*8)
1070 PRINT :PRINT "DO YOU WISH TO REPLACE (Y/N)...";:INPUT X$
1080 IF X$<>"Y" THEN RETURN
1085 REM ***************************************************************
1090 REM the following section calls a subroutine which
1091 REM gets the new data, and blank-fills if necessary,
1092 REM so that all fields are the proper length.
1093 REM the input field, with the blank-fill, is then
1094 REM put into the string-array in the correct place.
2000 PRINT "NAME",
2005 GOSUB 3000:NAME$(I*24-23,I*24)=X$
2010 PRINT "ADDRESS",
2015 GOSUB 3000:ADDR$(I*24-23,I*24)=X$
2020 PRINT "CITY",
2025 GOSUB 3000:CITY$(I*16-15,I*16)=X$
2030 PRINT "STATE",
2035 GOSUB 3000:STATE$(I*2-1,I*2)=X$
2040 PRINT "ZIP",
2045 GOSUB 3000:ZIP$(I*5-4,I*5)=X$
2050 PRINT "PHONE",
2055 GOSUB 3000:PHONE$(I*8-7,I*8)=X$
2060 RETURN
2070 REM ***************************************************************
2080 REM here is the subroutine that gets the new data
2090 REM and blank-fills if necessary
3000 INPUT X$
3010 IF LEN(X$)<24 THEN X$(LEN(X$)+1)=BLANK$:REM concatenate spaces
3020 RETURN
```

Program 3

```
1 REM ****************************
2 REM * PROGRAM NAME: CASSINIT *
3 REM * by WBB/JB 3/82         ****************************************
5 REM * Run this program first to reserve file space on your tape.*
6 REM * Each field is stored in a long-string variable.          *
7 REM * There is space for 100 records.                          *
8 REM ***************************************************************
10 DIM NAME$(100*24),ADDR$(100*24),CITY$(100*16),STATE$(100*2),ZIP$(100*5)
20 DIM PHONE$(100*8),BLANK$(24)
30 BLANK$="                        ":REM a string of 24 spaces
40 FOR I=1 TO 100
50 PRINT "INITIALIZING SPACE FOR...";I
60 NAME$(I*24-23,I*24)=BLANK$
70 ADDR$(I*24-23,I*24)=BLANK$
80 CITY$(I*16-15,I*16)=BLANK$
90 STATE$(I*2-1,I*2)=BLANK$
100 ZIP$(I*5-4,I*5)=BLANK$
110 PHONE$(I*8-7,I*8)=BLANK$
120 NEXT I
125 REM ***************************************************************
130 REM * All of the records now contain the correct number of blanks. *
140 REM * The blank records now get saved to tape.                     *
145 REM ***************************************************************
150 PRINT :PRINT "PREPARE TAPE FOR WRITING,"
160 PRINT "PRESS 'START' TO CONTINUE..."
165 IF PEEK(53279)<>6 THEN 165:REM wait for start key
170 OPEN #1,8,0,"C:":REM press play and record on cassette unit
180 FOR I=1 TO 100
190 PRINT "WRITING FILE SPACE FOR...";I
200 PRINT #1;NAME$(I*24-23,I*24)
210 PRINT #1;ADDR$(I*24-23,I*24)
220 PRINT #1;CITY$(I*16-15,I*16)
230 PRINT #1;STATE$(I*2-1,I*2)
240 PRINT #1;ZIP$(I*5-4,I*5)
250 PRINT #1;PHONE$(I*8-7,I*8)
260 NEXT I
270 CLOSE #1
275 REM ***************************************************************
280 REM * The file space is now reserved on the tape. *
285 REM ***************************************************************
290 PRINT :PRINT "REWIND THE TAPE"
300 PRINT "** END OF INITIALIZATION **"
310 END
```

Home Computer Photos

Home computer centers designed by our readers

Dear ATARI CONNECTION:

Enclosed are photos that illustrate our mobile ATARI 800 Home Computer system.

First, to accommodate both my eleven-year-old son and myself, we had to be able to move the computer from room to room without it having to be set up each time. He needed access to the color TV, but my requirements were a B/W monitor and a fixed workstation at the correct typing height.

Therefore, we chose a standard metal industrial cart, which was purchased from a local furniture clearance warehouse as a kitchen cart.

With the first look came the concept to invert the top shelf and have a cut-out for a drawer. This modification provided a table-top, sit-down keyboard at the proper height, hidden storage space for power cords and adaptors, mobility, and a metal workhorse.

The additional pieces needed for construction are pre-drilled utility angle iron, ¼-inch stove bolts and nuts, kitchen cabinet drawer hardware and a stand for ice cube trays to hold the interface unit and the modem we plan to buy.

Sincerely,
Edward Koretzky
Copiague, NY 11726

Dear ATARI CONNECTION:

My brother-in-law and I each purchased our own ATARI 800; since we don't use our dining room, we instead converted it into our own Computer Room. We have our computers set up side by side on a table that Justin Villa, my brother-in-law, built. He used an unfinished interior door for the table top and pine beams for the base. The door "table top" gives us plenty of space to work and play, especially for our wives, Alice and Emma, who enjoy spending their computer time playing our video games. Even my son, Jason, manages to play computer games all by himself at the age of two. This sometimes leaves me and Justin watching the games on our own computers instead of working. But that's O.K., we own them.

Mel A. Carian
Justin K. Villa
San Francisco, CA 94134

Dear ATARI CONNECTION:

As was suggested in the Summer, 1982 ATARI CONNECTION, I am sending in pictures of my ATARI Home Computer system.

Our system consists of an ATARI 48K 800 Computer, ATARI 410 Program Recorder, ATARI 810 Disk Drive, ATARI 850 Interface Module, and ATARI 825 Printer. I use a Crest 9″ video monitor for most applications and a 25″ Heathkit TV for games and graphics.

I have set the system up on a Bush CT-101 Home Computer Table, which is quite sturdy and good looking and reasonably priced.

As for software, I prefer to purchase what I need until I become sufficiently proficient at programming to write my own. I find the user-written APX programs to be an excellent value.

As a relatively new user, I am quite pleased with ATARI CONNECTION's useful information. I am ordering all available back issues and sending in my paid subscription to continue to receive this very fine publication.

In closing, I would like to express my utmost satisfaction with Atari Customer Service and after-sale support. You may count me in among the thousands of satisfied Atari owners and users.

Sincerely,
Tris N. Thomson
San Francisco, CA 94103

Computer Catalogs?

Not Yet, But Comp-U-Store Offers Over 50,000 Items You Can Order Now on Your Home Computer

By Teddi Converse

Now you really can let your fingers do the walking when you go shopping.

The phone company's old slogan was never more appropriate than now, as electronic shopping—once the domain of science fiction writers—becomes more readily available, thanks to the rapidly growing use of home computers and new information networks accessible via telephone.

Shopping from your home computer is made possible by connecting to a telecommunications network using either a TeleLink I or II cartridge, an ATARI Modem and an ATARI Interface Module. Besides providing home shopping services, major networks such as CompuServe and THE SOURCE, America's Information Utility, offer home banking, access to numerous data banks, newspapers, library services and much more. Compu-Store, today's foremost electronic shopping service, is available on both CompuServe and THE SOURCE.

Comp-U-Store gives electronic shoppers access to more than 50,000 items, ranging from electronics products to sportswear to hotel and flight reservations. After calling the information service and entering your ID number and code to log on, shopping is easy using Comp-U-Store. You simply low the easy-to-understand instructions provided by the network and pick a selection from a number of choices in a series of "menus," much like choosing a particular item from a restaurant. It all sounded so easy and convenient that I and my fellow staff writer, Paula Polley, decided to try it out and see what we could buy.

For example, it's possible to purchase a plane ticket to Chicago by merely following prompts provided by the information network. Once into the travel section of the menu, you merely type *Chicago Illinois* in response to the "destination" query from the information system. A list of more than 20 flight choices and times quickly appears on the user's TV screen. After making note of the order code, the user enters his or her credit card number and Comp-U-Store ID.

Buyers can also find bargains through Comp-U-Store. For example, say you're one of many people who loves music, and enjoys piecing together your own eccentric selections of various musical styles. While experimenting with this electronic mall, we found a TEAC tape deck for $168.00 less than the best advertised price in the Santa Clara Valley. Comp-U-Store eliminates middlemen and costly showroom overhead, so the prices are inevitably better. And again, you only need to give the necessary codes, IDs and credit cards to complete your electronic transaction. "In fact," says Rich Baker of CompuServe, "you can save from 10 to 40 percent on any particular item found in Comp-U-Store."

Before leaving the *Home Electronics* section of the menu, we decided to browse through the *Video Cassette* selections. I have a nephew who is crazy about his new video cassette recorder, and has an approaching birthday. Knowing little about VCRs, I found the reviews quite helpful. I decided to get a classic Walt Disney movie, then instructed Comp-U-Store to send the gift directly to him. Needless to say, I saved extra postage and a lengthy stint in the post office line.

In many areas of the country, both Compu Serve and THE SOURCE provide electronic banking services as well. These allow you to transfer funds from one account to another—from a savings account to an overdrawn checking account, for instance—via computer. It's a simple matter to exit Comp-U-Store's electronic mall and then choose the banking option from the information service's menu.

In the middle of this computer shopping spree, I thought how nice it would be to be able to see what I'd just purchased, or was interested in, on the TV screen. I soon found out my vision hasn't gone unnoticed.

Richard Baker predicts that electronic shopping will use more graphics as the technology of video text information systems advances, thus making it even more convenient for the user. For example, in the near future we may be able to see a graphic floor plan of a piece of real estate, or a brief demonstration of a video game, right on our screens as we ponder our purchases.

Eventually, major catalog department stores, like Sears and JC Penney, could possibly supplement their printed catalogs by offering mail order purchasing through electronic shopping services.

At present, electronic shopping is used mostly in addition to conventional shopping. You probably wouldn't buy a new suit or a pair of shoes via a computer, but the possibilities are virtually endless. Whether you want flight reservations or the latest electronic toy, electronic shopping can indeed save you time and money.

And you don't have to leave your home to do it.

Mickey Mouse – the Latest Home Computer Star

New Educational Products From Walt Disney Telecommunications

HE IS CERTAINLY the most widely recognized character in the world and, without doubt, the world's favorite mouse. That's right, the legendary Mickey Mouse will soon be appearing on the screens of ATARI Home Computer systems.

Mickey will be the star in the first of five new Educational Products being produced for Atari by Walt Disney Telecommunications and Non-Theatrical Company. Each package in the Disney Education Series will contain two computer-animated adventure programs, designed for children ages seven to fourteen.

The first release, "Mickey in the Great Outdoors," will help children improve their language and math skills. In the first program, "Mickey Goes Hiking," kids can help Mickey complete the missing word in a sentence, and unscramble a word in his flower garden, in order to move him along the trail. "Mickey Goes Exploring," the second adventure, features Mickey paddling a canoe and catching butterflies with his net. Youngsters can complete simple equations and number sequences to help Mickey in his adventure.

These fun-filled programs will combine the magic of Disney with the brilliant graphics and sound capabilities of ATARI Home Computers. They also promise great opportunity for children to learn important educational concepts.

Look for "Mickey in the Great Outdoors," available soon from Atari.

A sample screen from "Mickey in the Great Outdoors."
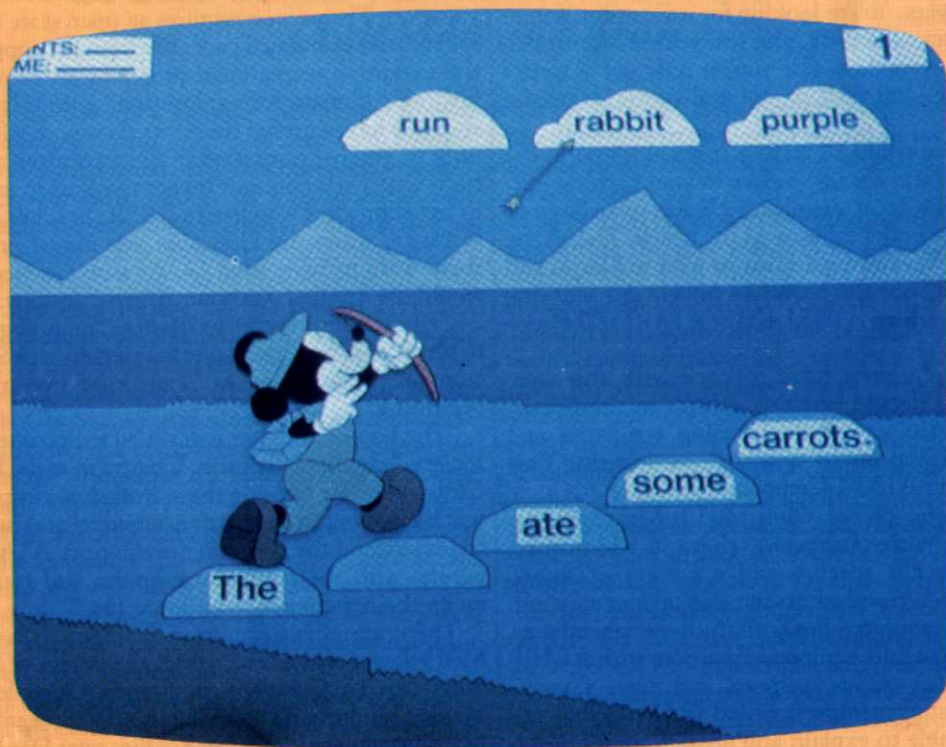
A Computer Vacation for Families at Club Med

Fun, Relaxation and a Chance to Make Friends With Computers

By Marianne Smith

THE PROBLEM: You need to get away. Shake off the pressure. Relax. You're looking for a vacation, something new, an adventure, plus you've been wanting to learn how to use a computer. But you've only got a week's leave from the office, and your spouse and your kids need a break too.

THE SOLUTION: You could all go to a tropical island in the Bahamas where it's warm enough to live in your bathing suit. Where, every day the most agonizing choices you have to make are either at the buffet table or on the beach. There's the pool. Tennis courts. Special excursions to remote islands and native markets. And, you can spend an hour a day learning how to use and program an ATARI 400 or ATARI 800 Home Computer.

Meanwhile, your children have to cope with the same dilemmas, having to decide between a swim in the ocean, film-making in a video workshop, learning acrobatics and staging a show in a real circus tent, or . . . learning how computers work in an ATARI Computer workshop.

And that's a sampler of the Club Med itinerary in the village of Eleuthera in the Bahamas, where in addition to gourmet meals, beautiful beaches and a variety of sports instruction, both children and adults can sign up for computer classes and learn programming. For both the experienced user and the novice, there's a fully equipped classroom with ATARI Home Computers, disk drives, printers and even a voice synthesizer. Trained staff members, called G.O.s (*gentils organisateurs*) are available to explain and answer questions for guests, known as G.M.s (*gentils membres*). The well-stocked library of Atari software contains a variety of programs, including "Family Budget," "Stock Analysis," "Word Processing," and language training in English, Spanish and French. One village offers a special French-intensive program in con-

junction with the computer language lessons. Video game time is scheduled daily in the classroom, and there are free time slots for anyone to come in and use the computers.

Club Med for families? Computer classrooms in a resort? That's the idea. Contrary to popular misconception, Club Med is not an exclusive playground for the young and single. While it's true the Club brings people together in a relaxed environment, each village is geared to suit the needs of families and couples, as well as singles and single parents. The "mini clubs" for children are devoted exclusively to providing a private world of discovery and recreation for different age groups (4–7, 8–11, and teens). Special outings are planned to cater to each group, along with sports, drama, arts and crafts, video games and computer workshops. All programs are geared to individual choice; there's no pressure to follow a curriculum or a tight schedule. There's even a separate menu for children, and many Club Med packages offer discount rates for kids.

The process of discovery is a key ingredient of the Club Med vacation. The process requires an open state of mind. At each village, the unhurried pace; the friendly, supportive staff; and the extensive recreational programs all combine to create a favorable climate for exploration. Formerly "computer-shy" students have entered the Atari classroom with sweaty palms, only to emerge enthusiastic converts after a week's instruction. One Paris boutique owner resolved to install a computer in her shop after a course in BASIC at Club Med. In another instance, when the classroom was closed briefly for repairs, there were protests from G.M.s who claimed their vacation would be spoiled without BASIC lessons. Other reports describe the innovative program as "mental gymnastics added to physical gymnastics"; one gentlemen, age 90, described the computer experience as "Fantastic! For me, it's just the beginning!"

"The home computer is destined to become a major force in society," says Serge Trigano, Chairman and Chief Executive of Club Med. "By offering these workshops to our members, we will be helping to demystify computers and helping our guests to understand the computer revolution. ATARI Home Computers, with their superior graphics and sound capabilities, make the experience even more fun."

There are now eight Atari Computer classrooms in Club Med villages around the world: the village of Eleuthera in the Bahamas, La Caravelle in French Guadeloupe, Ixtapa in Mexico, and the newest Club Med winter village on Copper Mountain in the Colorado Rockies near Denver. Other Atari classrooms are located at Dom Miguel village in Marbella, Spain; Chateau Royal in Noumea, New Caledonia; in Africa at Les Almadies village in Senegal; with another opening in January 1983 in Cherating, Malaysia.

The computer program began two years ago and has be-

come a star feature at Club Med—a far cry from the Club's beginnings in 1950 as a tent camp on a Mediterranean island, where the first village provided a respite from war-torn Europe. Since then, Club Med has become the ninth largest hotel chain in the world. There are currently 88 villages in 26 countries, with 13 located within the Western Hemisphere.

All Club Med activities, meals and lodging are part of a comprehensive package. Tipping is not required, and the only extra charges are at the bar.

For more information, contact your local travel agent, or call Club Med's toll-free number: (800) 528-3100, Monday through Saturday. ∎

Marianne Smith is a free lance writer.

A 21st-Century Computer Vacation with Club Med and Atari

CLUB MED AND ATARI will join forces this summer to offer adventuresome vacationers a recreational holiday combined with an exciting computer experience. The participants will take part in an experimental 21st century vacation in the exotic West Indies, where activities include tennis, sailing, scuba diving, painting, weaving — and daily use of ATARI Home Computer systems.

Fort Royal Club Med Village on the island of French Guadeloupe will host up to 300 futuristic vacationers per week from June 11th through September 10, 1983.

"It'll be a way of looking into the future of our leisure lives," says Linda Gordon, vice president of special projects at Atari. "It will bring the computers out of the classroom and integrate the use of them into all the exciting activities the Club normally offers."

On the first night at Fort Royal, guests will participate in a social experiment. A giant wall — a free graffiti space at the hub of the island — will allow vacationers a chance to portray their visions and fantasies of the future. Throughout the remainder of the stay, guests can scribble new ideas on the wall or polish their original ideas.

At the end of each day, all of the guests' ideas will be fed into ACTRAN, a special computer program. The result will be a fanciful scenario of a typical day in the future, presented to all project participants.

Pigeon Island, just a 30-minute shuttle from Fort Royal, is one of the five best locations in the world for diving and snorkeling, and excursions to the island are included in the vacation package. A computer conveniently located on the site will be able to display diving tables for beginners, news of the Fort Royal village activities or guests can leave messages for each other.

The ATARI Computer workshop offered at Club Med villages during the past year will be expanded to integrate the computer into Fort Royal's daily life. A group of beginners could program the ATARI Computer to maintain lighting for a night's entertainment, or use an ATARI Computer to provide background music for a children's group performance.

Fort Royal's village chief, Gerard Barouh, and his dedicated team will maintain computers in key locations around the village in order to set up a bulletin board system (BBS) for guests. Here you can get a complete rundown of the day's schedule to help you plan a daily itinerary. You'll also be able to send and receive messages with the system — meet friends by the pool for drinks at 5:00 PM, for example, or arrange morning sailing lessons.

In the relaxed atmosphere of Club Med, you may find that computers really aren't as intimidating as you had imagined. Not only will the impact of computers in our lives become more of a reality to you as you spend your time at the Club Med village, you'll also be able to share in a vision of the future.

For more information about the Fort Royal Club Med/Atari Computer vacation getaway, call your travel agent or the toll-free Club Med number: (800) 528-3100, Monday through Saturday. ∎

The Walking, Exploding, Flying ATARI Computer

How to Create Your Own Computer-Animated Cartoons

From *Computer Animation Primer* by David Fox and Mitchell Waite. A BYTE Book copyright © 1983 by McGraw-Hill, Inc. Reprinted by permission.

By David Fox and Mitchell Waite

HAVE YOU EVER had the urge to create your own computer animated cartoons, to make birds that flap their wings on your screen, human characters that walk with arms and legs swinging, horses that all gallop in perfect unison, or bombs that explode in flashes and fragments, like in the best arcade games?

"Sure, I'd love to," you say. "But that kind of animation and special effects are really hard to do on a computer screen, even on an ATARI Computer system. I know that drawing a simple graphic pattern on the screen with a computer is pretty easy. But animation? Whoa! Now that's really tough. I think I need to know the dreaded Machine Language to do that!"

Sorry, Charley, just not so.

Custom animation and motion effects on your ATARI Computer are actually quite simple to create. In fact, if you know just a little ATARI BASIC you can still create some really startling effects with the ATARI Home Computer.

Our new book on the subject, called *Computer Animation Primer*, published by Byte Books/McGraw-Hill (New York), teaches you how to unlock all that animation power within your ATARI Computer. We set out to create animation on the ATARI Computer comparable to the motion effects found in the Saturday morning cartoons. To this end, we've created a final program in the book that is a complete motion picture scene: a man walking down the street, houses and trucks zooming by in the foreground, trees slowly passing by—all viewed from the window of a moving car! In the next three articles we will be showing you some excerpts from the chapter on *Character Set Animation*.

The balance of our computer animation book covers color register animation, player/missile animation, and scrolling animation. These deeper and more powerful features require some machine language routines to operate properly. However, we did not want to make the knowledge of 6502 assembly language a prerequisite. So we have provided a simple feature called black box programs. These are machine language programs that are POKEd into memory by BASIC. You need not understand how they work, only what they do. Values are simply POKEd into them from BASIC. The articles in this series do not use the black box programs. But since the book picks up where our installments end, and shows you how to squeeze a lot more from the ATARI 800 or ATARI 400, you'll probably want to have it. (There is also a diskette of the programs available from Adventure International).

In this first article we'll be showing you how to do really simple BASIC animation that makes a bird's wings flap. We'll also be showing you how to use the ATARI Computer's built-in graphic characters. The next article will show how you can define your own character set and get a man to walk gracefully across the screen. The third installment shows how to do character sets to get dozens of detailed horses to gallop at the same time. The last installment will get really deep inside your ATARI Computer, revealing how a bomb can be made to explode by modifying the infamous ATARI Computer display lists.

SOME PREPARATIONS

WE ASSUME that you already have some experience with ATARI BASIC programming language. Although we will explain the logic behind our animation demonstration programs, we won't cover the meaning of the BASIC keywords (eg., PRINT, GOTO, GOSUB, etc.). Therefore, if you are new to programming in BASIC, reading a beginning book like *BASIC Programming Primer* (by Waite and Pardee, Howard W. Sams & Co., Inc.) will better help you to understand our examples.

As you enter the programs, it is important to copy them exactly as they are, without changing any line numbers or omitting any lines. Otherwise, when it is time to expand the programs, or merge some of them together, you will have quite a bit of difficulty.

BUILT-IN CHARACTER SETS

ANIMATION is created simply by rapidly displaying a series of pictures which differ slightly from each other. Our brains are fooled into thinking that they are seeing continuous motion rather than individual pictures. The most basic method of creating animation on a computer is by using PRINT statements to draw a figure on the screen and then PRINTing over the figure with a different picture. When these figures are PRINTed in rapid succession they appear to move.

One simple way to draw our figures is to use the computer's built-in characters —the letters of the alphabet, numbers, punctuation and special graphics characters. (See your *ATARI BASIC Reference Manual* for an illustration of the complete Atari character set.) A graphics character set is made up of straight lines, diagonal lines, corners, squares and circles. They can be used much like *Lego* building blocks to construct a block-like picture on the screen. You can only put the blocks in certain places on the screen, but the color and block shape can vary.

An imaginative programmer can artfully put these elements together and create a really interesting, identifiable shape. The greater the variety of characters, the more flexibility a budding animator has in creating "living" figures. In our first example, we will use the graphics character set built into ATARI Computers to show a bird flying on the screen.

CREATING THE FRAMES

T O PRODUCE the effect of animation, a series of individual pictures needs to be created which can then be rapidly flashed on the screen. Each picture is called a *frame*. In conventional "cell" animation, like the kind used in movies, the animator usually first draws the *key frames* that show the figure in extreme or key positions. For a short animated motion, there might be two key frames: the first position of the figure (before the action begins) and the final position of the figure. For example, a person waving good-bye could be animated with two key frames. Longer actions, like twirling or jumping, on the other hand, might contain many key frames, each one only slightly displaced from the one preceding it. An example of this might be a battle between two figures. The key positions are created as the fight is choreographed. This is done by breaking the complicated action into short simple actions. In Example 1, our flying bird, we used two key frames, one with the bird's wings fully raised and one with the wings pointing downwards at the bottom of the flapping cycle.

The next step is to create the *in-between frames*. The number of in-between frames determines the smoothness of the animation. In Example 1, if we had used only our two key frames, without any in-between frames, the animation would have looked jerky and unnatural. (This jerkiness is called *jitter* and is an indication of lazy animators or tight production budgets.) On the other hand, since the computer can only PRINT a limited number of frames per second, too many in-between frames would result in slow glue-like mo-

tion. This is because the computer would not be able to flip through all the frames fast enough to make the bird flap its wings at the proper speed.

In film animation, the rate at which the frames are flashed on the screen is 24 frames per second. The cartoons produced during the golden age of animation, such as Mickey Mouse or Bugs Bunny, used "full" animation in which each of those 24 frames required a separate drawing. Today's low-budget, low-labor cartoons necessitate the "re-use" of each drawing in consecutive frames. A drawing is placed under the animation camera and photographed two, three, four or even six times before the next drawing in the sequence is used. This yields a respective animation rate of twelve, eight, or six frames per second. Twelve frames per second is tolerable, but anything slower looks painfully crude in comparison to the classics.

Also note we don't use very many graphic characters in our bird. We could have given it longer wings or a bigger body, but then there is another price to pay: too many graphic objects to PRINT leads to a phenomenon called "flicker." Flicker results in your bird flashing and strobing on the screen as it flaps, a disturbing effect.

When using character set animation, the problem of how many frames to display is approached differently. With built-in character sets, we are restricted to the number of in-between frames which can be created with the limited set of characters. For the flying bird, we could only draw two in-between frames with the available graphics characters, resulting in a total of four unique frames. Even without the restriction of built-in character sets there is another limiting factor—the computer's processing speed. How many frames can the computer draw in one second without becoming bogged down? The answer is dependent upon the complexity (size) of each frame, the number of different objects which must be animated at one time, and the other programmed functions (sound effects, calculations, or joystick inputs) which must be taken care of dur-

ing the animation cycle.

How do you decide how many frames to use in your animated sequence? After months of creating animation programs we will now pass on our foolproof technique for creating realistic-looking animations—it is called "Trial and Error."

THE ART OF TRIAL AND ERROR

M OST of the development time for this program was spent deciding which characters to PRINT on the screen to create something that looked like a flying bird. Writing the actual program logic took very little time, which is often the case in creating computer animation. Much time is spent in trial and error, trying to get the figure motion on the screen to look just right. We had certain prerequisites. Not only did our figure have to resemble a bird, but when it moved, it had to elicit the feeling of a bird in flight. If the wings moved too fast, the viewer would see only a blur. If the wings moved too slowly, the effect of motion would be lost. As you begin to create your own animated figures, you'll begin observing the motion of living things. An excellent way to learn about animation is by simply watching animated cartoons. Notice how simple and limited the animation and motion can be while still conveying the effect of movement. At first you may become frustrated with your programming results, especially after looking at the video games created by the masters. Don't give up! In time you'll develop an intuitive feeling for creating animation frames and will find that your trials are shorter and the errors farther apart. After all, even master programmers spend much time throwing away earlier attempts that don't look just right.

One nice thing about computer animation is that the results are visible immediately. We don't have to wait for the film to come back from the lab before discovering that our bird looks like a boomerang with arthritis! With a computer, if you don't like what you see, you

THE FLYING BIRD FRAMES

HERE are the four individual frames you will use to create our flying bird. Notice that only four different graphics characters are used throughout the frames.
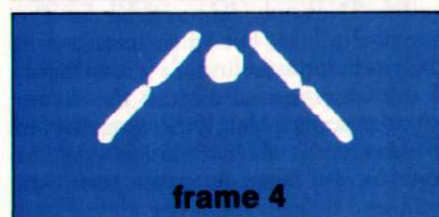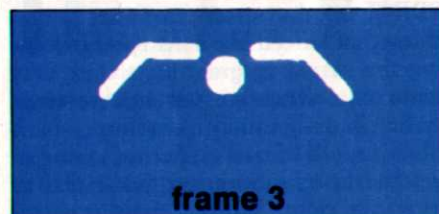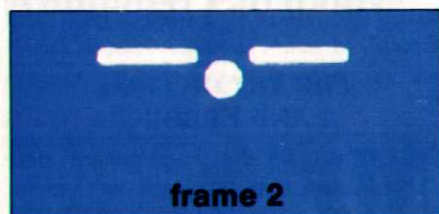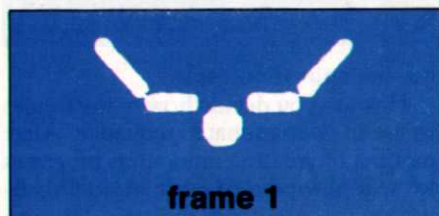

frame 1

frame 2

frame 3

frame 4

Fig. 1

Each frame is five characters across and three high. To make the job of animating the bird easier, each frame should be identical in size and shape. To accomplish this, many of the character positions are filled with spaces.

By taking these four frames and cycling through them in a specific order, the bird flaps its wings.

For obvious reasons, this is called *cyclic animation* or a "loop" among animators. It is relatively easy to implement because the object can be animated for many seconds or minutes by using only a few different frames. In conventional cell animation, each frame would be photographed in order, over and over again. This can be very time consuming. But with a computer, we can use a simple GOTO loop to repeat the cycle. In the Flying Bird program, six frames are displayed before the cycle repeats.

THOSE INVISIBLE CHARACTER SETS

THROUGHOUT the program listing in these installments (and in our book) are many characters *which either cannot be printed by our printer or are difficult to find on the ATARI Computer keyboard* (e.g., inverse video, cursor control, and graphics characters). To make it easier to enter the programs, we modified the listings so that all special characters are indicated in a unique, easily identifiable manner. Before you try to enter the program, read the accompanying *Special Listing Instructions* chart.

You will also notice that our printed listings look different from programs listed on your screen. We used a special program to print them in a manner which emphasizes their "structure," thus making them more easily read and understood. All FOR/NEXT loops are indented so it's easy to see where the loop starts and ends. IF/THEN statements are also indented—you can see exactly what will be executed if the condition is true. Also, the multiple parts of all statements (separated by colons) are printed on a separate line. Of course, when you enter the programs, the structure will disappear, therefore, don't try to maintain it by entering each statement on a separate line!

EXERCISE

WRITE a program that draws a flying bird with flapping wings on the screen using the built-in ATARI Computer graphics character set.

Look at the lines where the Bird strings are initialized (lines 120-150). We are using a special technique here to tell you which keys to press to get the appropriate graphics characters. When

```
10 REM    *** FLYING BIRD ***
20 REM         EXAMPLE 1
30 REM
40 REM Demonstration of Character Set Animation
50 REM Copyright (C) 1982 by David Fox and Mitchell Waite
60 REM
100 REM Initialize
110 DIM BIRD1$(17),BIRD2$(17),BIRD3$(16),BIRD4$(16)
120 BIRD1$="{DOWN}b{F}{T}{G}b{DOWN}{5 LEFT}{F}bbb{G}"
130 BIRD2$="{DOWN}{F}{M}{T}{M}{G}{DOWN}{5 LEFT}bbbbb"
140 BIRD3$="bbbbb{DOWN}{5 LEFT}{2 M}{T}{2 M}"
150 BIRD4$="{G}bbb{F}{DOWN}{5 LEFT}b{M}{T}{M}b"
160 POKE 752,1
170 PRINT "{CLEAR}"
180 REM
200 REM Animation Loop
210 FOR I= 1 TO 6
220    POSITION 17,10
230    ON I GOSUB 310,320,330,340,330,320
240    FOR W=1 TO 25:
    NEXT W: REM Pause
250 NEXT I
260 GOTO 210
270 REM
300 REM Draw Frame
310 PRINT BIRD1$;:
    RETURN
320 PRINT BIRD2$;:
    RETURN
330 PRINT BIRD3$;:
    RETURN
340 PRINT BIRD4$;:
    RETURN
350 END
```

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you see a word or character which is surrounded by curly brackets, you must do something special to get the appropriate character into the string.

HOW IT WORKS

As you probably surmised, the cornerstone of our technique is to use "strings" to hold our graphic characters for the bird. The strings also hold cursor movement characters that relocate us to a new place in the frame. In line 110, we DIMension the string variables we will be using in this program. The number within the parentheses tells BASIC the maximum number of characters each string may hold. In ATARI BASIC, all strings must be declared in this manner.

The four frame strings, BIRD1$, BIRD2$, BIRD3$ and BIRD4$ (initialized in lines 120-150), each represent one of the frames in Figure 1 and contain these different types of characters:

1. The graphics control characters which make up the bird.
2. The cursor control characters which move the cursor before printing a graphics character.
3. Spaces which are used to erase a section of previous frames.

Normally, whenever something is being PRINTed on the screen, you will see the little white box, called the cursor, following each printed character. The POKE in line 160 turns off the cursor (makes it invisible) so we don't see little white boxes swarming around like a bunch of hornets while each frame is drawn.

THE ANIMATION LOOP

Lines 200 thru 270 contain the logic to print each frame in the correct order. This section is simple and straightforward. We just have to place the cursor in the middle of the screen with the ATARI BASIC cursor POSITION command (line 220) and print the appropriate frame 1-4. The entire wing-flapping cycle consists of six frames (two of which are repeated). To accomplish this we use a FOR/NEXT loop from 1 to 6 to step through the frames. An ON GOSUB (Line 230) uses the current FOR/NEXT value (I) to control which frame is printed. When I equals 1, line 310 is executed and BIRD1$ gets printed. When I equals 2, line 320 is executed, and so on.

Line 240's FOR/NEXT loop is used to slow down the rate at which the frames

are printed. Try changing the value on this line to see what happens to the bird. You may like the bird better at a different frame rate.

Now run the program.

If everything was typed in correctly, your bird should immediately begin its first flight. If there are any gaps in the frames, or pieces out of place, go back and correct the particular string at fault.

Note that many of our programming examples are expansions of previous examples. This means that instead of typing an entire program, you will often only need to add new sections to an existing program. Therefore, DO NOT erase the programs you type in—you may need them later on.

MODIFICATIONS

Here are some modifications you can try on Example 1:

1. Change the program so that more than one bird is flapping its wings on the screen. This could easily be done by repeating line 220 and 230 within the main Animation Loop and changing X, Y coordinates of the POSITION statement. You will also have to change the value in the pause loop (line 240) to adjust the frame rate of the birds. (You may be able to gain some animation speed by using separate PRINT statements for each of the three horizontal rows of bird characters per frame. This will save you from having to use the cursor control characters; the fewer characters printed, the faster the program will run.)

2. Make the bird move around the screen. To do this, just control the values in line 220's POSITION statement. Be sure to erase the bird each time you move it or the screen will become wallpapered in bird! To completely erase the bird from the screen you'll need to make up a new frame that contains *blanks* where the graphic characters normally are. If you always end with the same frame before moving, this will work fine. If you end the animation before moving on a *random frame*, you'll need a more universal erase string that contains several lines of blanks. Another point to remember is this: anytime you erase and re-draw a figure, it will appear in *flicker* on the screen (the light from the image is interrupted by blankness during the instant the image is erased, thus the flicker). To minimize the flicker, erase the bird immediately before drawing the next frame—avoid inserting any program logic or calculations after the bird is erased.

A PEEK AHEAD

Although you may not qualify for a pilot's license, you now have enough knowledge of computer animation to put all kinds of simple objects into motion on your ATARI Computer. In the next installment we'll see how to do highly detailed animation (again in BASIC) by creating our own custom character set. We'll see how to use these to make a man walk down the street, his arms and legs swinging perfectly. Even his footsteps can be heard.

Everything You Always Wanted to Know About BASIC but Were Afraid to Ask

Osborne/McGraw-Hill

Armchair BASIC
An Absolute Beginner's Guide to Programming in BASIC

Annie Fox and David Fox

Armchair BASIC

An Absolute Beginner's Guide to Programming in BASIC
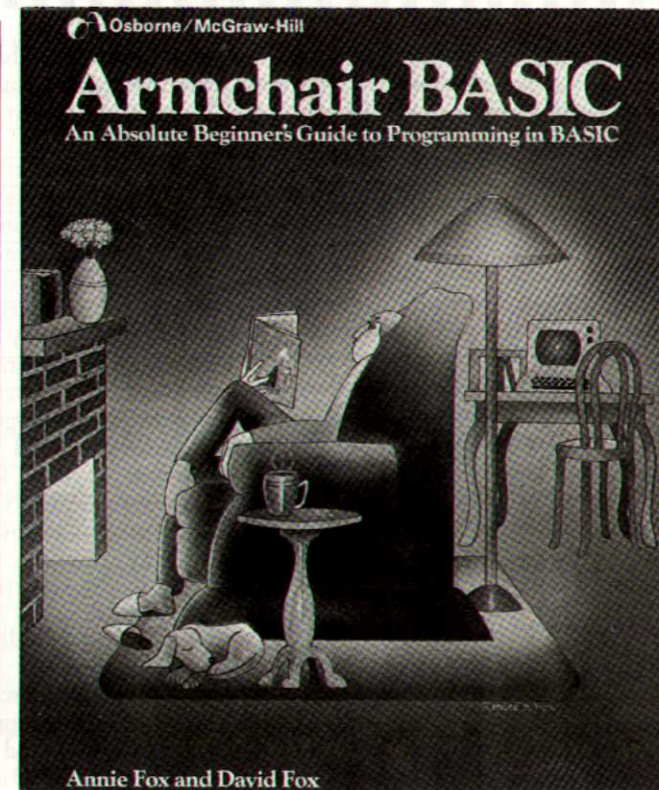
by Annie Fox and David Fox
Osborne/McGraw-Hill, 164 pp.

THIS book is ideal for the many people who've heard about personal computers, read about them in *Time*, seen the ads in the papers for them, but haven't the foggiest notion of what they actually *do*.

It's a very neat job, too. Starting with a whimsical walk through the garden of computing history, **Armchair BASIC** establishes a refreshingly conversational tone that sustains the reader throughout. With asides like computer pioneer Charles Babbage's prediction of "Difference Engine User Groups," the book works with an easy good humor that makes the whole subject seem that much more comprehensible.

It isn't until the third chapter that the book arrives at its nominal subject matter —programming in BASIC —and then, of course, we run smack-dab into what may be the dullest commands in all of BASIC: PRINT, LIST, RUN and NEW. However, *Armchair BASIC* makes the most of this material, churning out some examples to get the keys clicking and the mind stirring. By taking a text-oriented approach to programming in this chapter (and throughout the book), the authors maintain interest while clearing one of the great roadblocks for the beginning hacker—mathphobia. They keep mathematical applications to a minimum, and most of the samples they present combine text and math. In answer to the question, "Well gee, don't I have to know a lot of math to learn programming?" this book firmly answers "No!"

Subsequent chapters discuss individual BASIC statements, conventions, and commands: variables, INPUT, IF/THEN, FOR/NEXT loops, random numbers, READ/DATA and subroutines. Each presents interesting examples (the familiar "Dear John Smith" junk mail letter is used to demonstrate string variables) and emphasizes the ease with which programming skills can be developed and built upon. At the end of these chapters, quizzes reinforce the concepts presented and help the reader remember specific programming applications for the material presented.

The book attempts to cover all dialects of BASIC, and does so quite adequately. There's even an occasional aside to deal with specifics of various dialects of BASIC —for example, the fact that string variables in ATARI BASIC have to be preceded by a dimensioning statement. On the other hand, as a "basic" BASIC, this book does not try to deal with those unique features of ATARI BASIC that many users find most intriguing—SOUND, SETCOLOR, the graphics modes and player/missile graphics.

The book ends with a far-fetched chapter on how pervasive the small computer may be in the future. Ranging from the home to the school to the workplace, this chapter presents a fanciful view of the global village, with everyone interconnected, interactive and, of course, user-friendly. While there is some valid futurism here, it gets somewhat bogged down in implausible minutiae, such as a prediction that plant computers will one day monitor individual fruit on trees and zap pests with laser-powered fly swatters. But this is a minor shortcoming, far outweighed by the genuine strengths of the rest of the book.

Armchair BASIC is right on target because of the experience of its authors, Annie and David Fox. Founders of the Marin Computer Center, Annie and David are among a handful of pioneers who saw that the microcomputer revolution of the late '70s was something that could and would affect everyone in our society. And with their public-access approach to micros, they've attempted to make the use and understanding of personal computers available to anyone who's interested. During the nearly six years that David and Annie have been teaching programming through the Marin center, they've searched for the perfect book to introduce

their inquisitive yet apprehensive students to BASIC programming. Failing to find just what they were looking for, they decided to write one of their own.

The results speak for themselves. As promised in the introduction, even someone without access to a computer could read this book and grasp the rudiments of programming.

Armchair BASIC stands out from the pack; it's a book you'll find useful if you enjoy your ATARI Home Computer but have been afraid to venture into the murky waters of programming. Though not really a book for young whiz kids into computer ZAP, BAM and POW, *Armchair BASIC* is an excellent starting place for adult readers who want to ease into computer literacy. Even if you don't need an introduction to BASIC yourself, *Armchair BASIC* would make a great gift for friends and relatives who ask, "Just what the heck can you do with that thing besides play games?"

—Jim Inscore, Consumer Writing Manager for the ATARI Home Computer Division

■■■■■■■■■■■■■

COMPUTE!'S SECOND BOOK OF ATARI

by Compute! Books
250 pages

THIS SECOND BOOK from the editors of COMPUTE! magazine follows the format and general 'flavor' of the FIRST BOOK OF ATARI. It presents a series of chapters and articles, each explaining a programming technique or utility. The programs in the first chapter are simple utilities such as an ATARI BASIC joystick routine and a memory test. The articles cover a range of topics including BASIC string manipulations, data plotting, a Player/Missile Drawing Editor, advanced

graphics techniques such as a Polygon Fill Subroutine, Display List Interrupts, and a very useful section on the resident disk handler.

Each previously unpublished article covers its subject clearly enough to be used by intermediate to advanced home programmers. Beginners will find many of the articles a rough go. The functions of the example programs are explained, but the concepts underlying them often are not. Some explanations could be more clearly written. Altogether though, the book is worth having. What may seem puzzling on the first reading will become clearer later as you gain programming skill. The articles tend to assume a working familiarity with your computer and terms such as RAMTOP, INTERRUPT, and the like. Usually a familiarity with these words comes about by a sort of osmosis as you spend more time programming and reading.

The main flaw to be found in most "collection of articles" books, such as this one, is a lack of consistent style. This is not so much a criticism of the fine editing job done with this book as a recognition of a fact of editorial life. To get twenty-seven contributors to write in anything resembling a common format is a truly astounding feat in itself, and Robert Lock is to be congratulated for it. The reader must be aware, however, that the variations in personal style from article to article might make the book seem "lumpy".

As mentioned before, the articles are previously unpublished. That is in itself commendable. It's much easier and less risky to repackage what you've already done than to put together a completely new book. Hats off to Robert Lock and his crew at COMPUTE! for a useful and honest effort!

—Earl Rice, Manager of User Group Support with the ATARI Home Computer Division.

NEXT ISSUE:

Summertime Programming Fun
Easy-to-list programs in BASIC, PILOT, even Assembly Language: home applications, games, graphics, and sound!

Feature: Silicon Valley Girls — Top ten programmers talk about programming and future careers in computers

Profile: Futuristic interior designer John Allin makes ten predictions for home and office

Plus: More Computer Animation – Find the Bug

Corrections

Last issue (Christmas, 1982) some rather strange errors occurred in two of our program listings: *Computer Christmas Carols* and *Helicopter* from the book, *Atari Games and Recreations.*

On page 39 of the Christmas Carol program, the data statements for *Deck the Halls* are incorrect. To correct the program, delete the *second line* of 8 numbers beneath Line 290.

The *Helicopter* program on page 43 has a rather amusing error. Several readers called and wrote that only the helicopter's blades rose into the air, leaving the helicopter behind. Line 180 is missing the two PRINT statements that enable the helicopter to remain with its whirling blades. The correct Line 180 should read:

```
180 POSITION X,Y:PRINT A$:POSITION X,Y+1:PRINT B$:POSITION X,Y+2:PRINT C$:POSITION X,Y+3:PRINT D$
```

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