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FEATURES

- Introduction to Michael Schoenbach
Telecommunications and Frank Imburgio 22
A brief look at how to get involved in this fascinating world.
- Atari Stocking Stuffers Arthur Leyenberger 27
Our annual gift-giving guide for Atari fanatics of any age.
- Speedski Bill Richardson 35
Beat the clock while avoiding trees and markers in this high-speed assembly language game.
- Bank Switching Allan Moose
for the 130XE and Marian Lorenz 53
A detailed look at manipulating the 130XE's extra memory.
- Halley Hunter Harry Hammond 62
Find out when Halley's Comet is arriving, where it will be and how brightly it will shine.
- Forem Tutor Matthew J.W. Ratcliff 91
Get the most out of your log-on time on Forem-style BBSs with this brief tutorial's help.
- A Master Disk Directory Jason Leigh 99
A disk filing program which uses a joystick to select commands consisting of graphic icons.
- Index to **ANALOG Computing** Lee Pappas 109
The articles, programs and reviews from issues 15-36.

REVIEWS

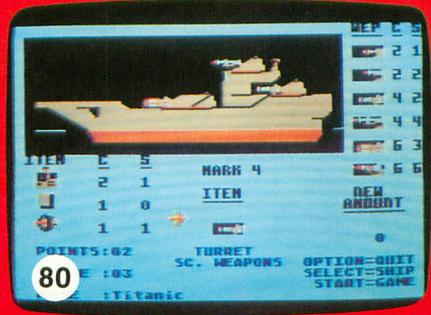
- Crusade in Europe Patrick J. Kelley 11
(Microprose)
A top-notch simulation displaying an ambitious attempt at design and detail.
- Telecommunications
on the 520ST Arthur Leyenberger 18
ST (SST Systems and Mark of the Unicorn)
Two communications programs are examined.

REVIEWS *continued*

- Mindwheel Arthur Leyenberger 33
(Synapse)
One of the leading companies in arcade-type software tries its hand at text adventures.
- Mudpies Arthur Leyenberger 42
ST (Michtron)
The first video game for the ST fills your screen with deadly pie-slinging clowns.
- Panak Strikes Steve Panak 45
Reviewed this month are: **Super Zaxxon** (Sega), **Tapper** (Sega), **The Final Legacy** (Atari), **Gemstone Warrior** (SSI), and **On Track** (Activision).
- People/Link Andy Eddy 51
A low-cost interactive telecommunications network.
- Delphi Andy Eddy 77
Here's your introduction to a newcomer which is rising fast in the ranks of large information services.
- Games Computers Play Clayton Walnum 80
An innovative telecommunications service where graphics and user-friendliness play a vital role.

COLUMNS

- Reader Comment 4
- Griffin's Lair Braden E. Griffin, M.D. 9
- New Products 14
- ST News 16
- Boot Camp Tom Hudson 43
- The End User Arthur Leyenberger 86
- Index to Advertisers 116



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READER COMMENT

MicroCheck for XL and XE.

The following lines should be added to the CHECKBAL module of *Micro-Check* (issues 27 and 28) if you are using an XL or XE computer. LOAD the CHECKBAL module, type in the new lines, then SAVE the program back to disk.

```
290 GRAPHICS N0:GOSUB BRKD
IS
295 POKE 82,N0:POKE 752,N1
300 IF NOT START THEN TRAP
P 300:POSITION N6,N5:? "ENDING
BALANCE"
";:INPUT EBAL:START=N1
310 TRAP 310:POSITION 18,N8:? "
";:POSITION N6,N8:? "WHICH MONTH";:INPUT MONTH
```

Details count.

Thank you for your very kind review of *Wishbringer* in issue 36 of *ANALOG Computing*. I'm glad you mentioned the stone's color; I had to fight with our marketing department to get it!

Steve Meretsky is on his honeymoon, and Doug Adams is cavorting somewhere in England, so they can't add their thanks. But they'll certainly appreciate what you said about *Hitchhiker's Guide*.

Brian Moriarty
Infocom, Inc.
Cambridge, MA

Fair exchange.

In response to Brian A. Nakata's letter complaining about the "undesirable features" in my *Home-made Translator* (issue 32), I'd like to offer a word of explanation.

I did not delete the keyclick and bell routine from the *HMT* simply because I hate sound effects. My translator does something the Atari *Translator* does not do—it simulates a SYSTEM RESET by detecting if the OPTION, SELECT and

START keys are pressed simultaneously. In order to detect this, I had to add a new routine to the existing OS.

Now, the Atari 800 OS is an elegant piece of software designed to fit compactly into 10K of ROM. You don't add routines to it unless you can find some routines of equal size to remove. I selected the keyclick routine, since removing it had the least amount of bad side effects (consider removing part of the disk file manager routine). The bell routine had to go, because the bell is rung by rapidly calling the keyclick routine.

All this, by the way, was explained in my article.

In an effort to please everyone, however, I offer the following patches to the *HMT* program. Change Lines 190, 210 and 230 as follows. Also, delete Line 220.

```
190 DATA 255,255,231,102,233,102,234,234,234
210 DATA 103,114,104,114,208,218,116,114,118,114,76,63,242
220 REM (DELETE THIS LINE)
230 DATA 131,82,133
```

ReRUN the program against the Atari 800 to create an *HMT* with the original background color, the keyclick and the bell! But beware, Mr. Nakata. You also lose the ability to simulate the SYSTEM RESET, since the keyclick routine overlays the key detection routine.

If you just want to restore the background to its original color, but don't wish to lose the SYSTEM RESET capability, do not change the lines as mentioned above. Instead, look at Line 220 in your current *HMT* program. Change the 144 value to 148. Rerun the program while you are under the *HMT* on your XL or XE machine to create a new *AUTORUN.SYS* file.

As a last note, this problem reflects a problem most programmers encounter. Complaints are often made about pro-

ducts simply because the user never fully read the documentation. Often, changes which users feel are minor cause catastrophic effects in a program, as seen here by the loss of the SYSTEM RESET simulation.

Sincerely,
Angelo Giambra
Cheektowaga, NY

Another convert.

Okay, I'll come out of the closet and say it, "I hate computers and I have frequently resented (quite loudly) all the time my husband has spent with his 800." When he first brought it home, I thought it was going to be a fancy electric typewriter that could play games. When I discovered I couldn't type a letter without remembering what seemed like 50,000 commands, I knew I wanted nothing to do with this "Thing." In the time it took me to load a word processing program, I could type a three-page letter on my 28-year-old IBM.

I choose to ignore the "Thing," and my husband became addicted. The "Thing" got its own room, and the children lost their toy room. He once took a vacation to work on a program, and the children thought he was on a business trip. Husband wrote and sold programs (I'll admit I liked the money); the children studied their math and played games; and I snarled at it.

I resented being waked up at 2 a.m. to hear that the program crashed and he needed to bounce ideas off of someone. What a joke! I couldn't define a byte if my life depended on it, and he wanted intelligent conversation. I soon learned it was easier to mumble something unintelligible than to explain for the 512th time that I had no idea what he was babbling about. After six years of this, I became a pro at faking interest.

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READER COMMENT *continued*

About eight months ago, trouble started anew. I began to hear the word *ST*. At first, I thought it was an edited curse, but no—the reborn Atari was having a new baby. As my spouse is an employee of a disk and cassette duplicating service, I knew what was coming. Oh well, he supports my business—I'll support his. An *ST* development system was ordered, and "Thing's" room was rearranged for its sibling. Delivery day came. Each package was lovingly opened and exclaimed over. The *ST* was quickly assembled, and the screams began. "Where's *BASIC*? What, no editor!? Quick, call the bookstore and get me anything they have on *C*."

Muttering, I went off to the bookstore and came home to find husband and children fascinated by a program called *Doodle*. Feigning interest, I watched them draw. Suddenly I noticed directions on the screen. They weren't giving this "Thing" any commands. They were just moving the mouse, and pictures and directions were appearing.

Maybe, just maybe, there was something to the phrase "user friendly."

The next day I found myself browsing through *ANALOG* for any *ST* info. I couldn't understand a word of the technical jargon, but you kept saying the "Thing" was friendly. I decided to try it. The kids were busy, and no one would see me make a fool of myself. I called Atari (long-distance day rates) and humbly asked them how to load *Doodle*. Even I had to admit that it wasn't bad. Hey I'm drawing! I don't like the picture; I just move the mouse, and the picture is gone. No commands—nothing more difficult than moving an arrow across the screen.

All of a sudden, I hear my husband's voice. Holy *ST*! I've been sitting here for four hours. "What else can this thing do?" I asked.

"Nothing much until I get *BASIC* or an editor and learn *C*," was the frustrated reply. Timidly, I suggested a phone call to Atari. Maybe they will ship air express. Two weeks—maybe longer—no fair! I sneak upstairs to call the local computer stores. Oh well, no luck there.

Sitting down to analyze the situation, I realize something. I'll never be a programmer, but "Thing II" just might be my friend. I may even get my business papers out of three disarranged drawers and into some kind of order. To be truthful, my husband has everything on disk, but I always do it again on paper so I can work with it. So, to Atari and all you program houses out there I say, "Please hurry! I've met what might be a new friend. I'd like to find out more about her." Now, if I could just get my husband to stop grinning at me and saying "Gotcha."

Sincerely yours,
Deena Lentchner
Danbury, CT

Using the 1027 with AtariWriter.

The following information on using a 1027 with an *AtariWriter* should solve some problems.

The default values for the left and right margins will give you very wide margins. To adjust them, try setting the left margin at 0 and the right at 80.

Choose printer option #3 when using Print Preview and when printing a file.

To underline, type a *CTRL-O* (*CONTROL* key and the letter *O* simultaneously), followed immediately by the number 15. To end underlining, type *CTRL-O* followed by a 14. Always be sure to end the

document with a *RETURN*. Special variations of these instructions are:

(1) When the text to be underlined begins with a number, use the number 015 instead of 15 to begin.

(2) When the text to be underlined extends beyond the line (i.e., the printer performs a carriage return), your line will extend into the left margin unless you: (a) go to Print Preview (see page 23 in your *AtariWriter* manual) and see where the line will be broken; and (b) stop and then start the underlining at that point (i.e., type *CTRL-O 15 CTRL-O 14*).

To make the printer stop at the end of a page so you can insert another, type *CTRL-W* immediately under the format block at the beginning of the document. When you insert the next page, simply press *RETURN*, as prompted.

To align the paper correctly, remove the large piece that contains the name Atari 1027 and a clear plastic strip. Underneath, you'll see a smaller clear plastic strip which presses the paper against a metal piece. Align the paper right at the bend in the metal piece under the plastic strip. This way, you'll get correct top and bottom margins.

Occasionally, the printer will "time out" when printing. This is due to a bug in the Atari OS in all Atari computers, not in either the *AtariWriter* or the 1027. This occurs randomly and should not happen often, but there's no way to avoid it. When it happens, you've got two choices:

(1) You may wait it out. After 4½ minutes, the printer will resume where it left off.

(2) You may press the *BREAK* key and reprint, starting with that page.

Sincerely,
Lisa Shaules
Atari Corp.
Assistant to Administration Manager

This letter was written in response to queries by Stanley R. Perin, Ph.D., of Woodinville, WA, who forwarded it to us. Thanks, Dr. Perin. —Ed.

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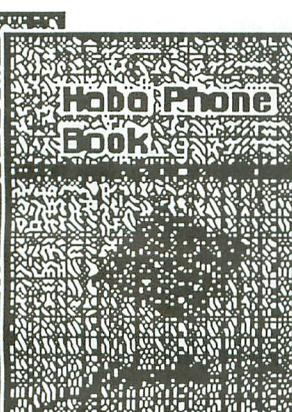
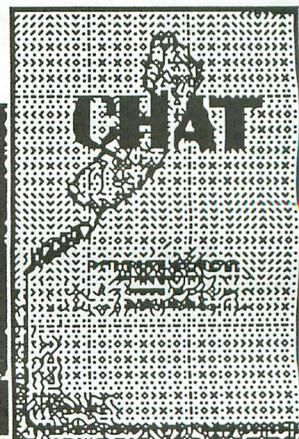
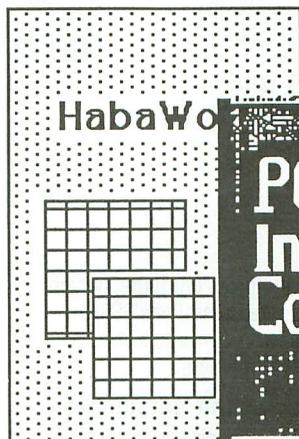
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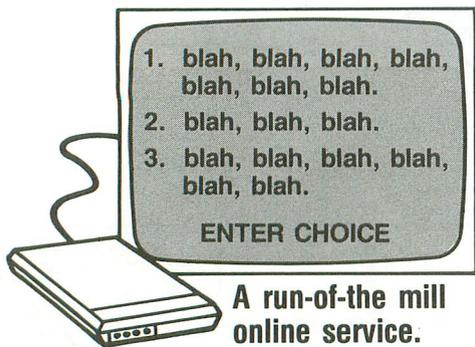
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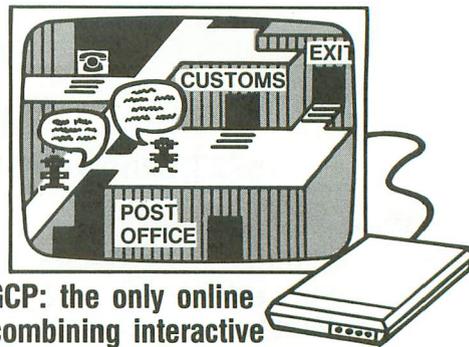
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All other online services are out-growths of business information services. GCP was designed from the ground up to be a service for home computer owners. This means that GCP is easy to learn and fun to use. You can do everything you want with the joystick and function keys on your computer.

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You mean the City is shown on my TV screen?

Yes, indeed. Not only the City, but the inside of the buildings and the games are shown on your screen in full color graphics. Additionally, the other customers are shown on your screen as they move around the City and buildings.

Isn't it slow downloading the graphics?

No, because we do not download the graphics. All the pictures of the City, buildings and games are supplied on disk. When you go from one building to another, the graphics are accessed at disk drive speeds.

Do I need special software?

Yes, very special. But don't worry, we provide it with your signup.

Can I download public domain programs?

Yes, GCP has a public domain archive in its Post Office with about a Megabyte of Atari programs you can download.

What games do you have?

At the moment, we have BioWar, CyberTank and CyberShip. Lords of Space is under development and may be done by the time you read this. All the games are played online against other customers, so you are matching wits with humans from all over the country.

BioWar is a multi-player adaptation of Conway's game of Life. Each player has a cell colony which he tries to expand, often at the expense of the other players, while contending with the problems of under- and over-population.

CyberTank and CyberShip are tactical design and combat games set on the CyberWorld, an artificial battleground for cybernetic machines. You design your own tank or ship and battle it out with up to 15 other players on a scrolling map.

Do the games use graphics also?

Extensively. For example, in CyberTank, when you design your tank, the hull is shown on the screen, as are all the equipment

choices, in full color graphics. You select and place the items by using your joystick.

In the combat phase, your screen shows the status of your tank, the 1 mile area around your tank (only a part of the larger battlefield), and any enemy tanks inside that area.

What equipment do I need?

GCP supports any member of the 8 bit Atari line with 48K of memory. You will also need a disk drive and a modem. We support all the available modems for the Atari.

How much does it cost?

The signup kit includes the software and documentation you need, plus 5 free hours at standard rates. This kit costs \$30. After the free hours are used up, the standard rates are \$6 per hour (weekday evenings after 6pm local time and all day Saturday and Sunday) for either 300 or 1200 baud access. Daytime hours during the week are \$15/hour.

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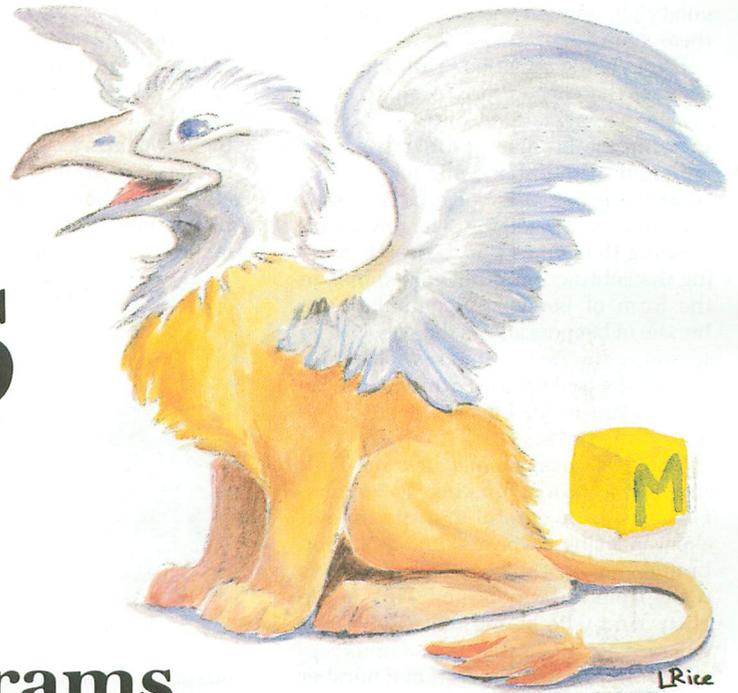
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GRIFFIN'S LAIR



Educational Programs Review

by Braden E. Griffin, M.D.

Not much time this month to wax philosophical, but I will leave you with this poser: If a tree falls in a forest and no one is around, does it gather moss?

TINK'S SUBTRACTION FAIR
Sprout Software
MINDSCAPE, INC.
3444 Dundee Road
Northbrook, IL 60062
48K/Disk \$24.95

An old friend makes a return this month. Children from four to eight years old can improve their subtraction skills, as they accompany the top TinkTonk, **Tink**, to the fair. This program uses the same successful format as its predecessors, with each attraction at the fair providing its own particular approach to the learning objectives. Although the main objective focuses on subtraction, other learning skills are enhanced, as well.

Three levels of difficulty provide an adequate range for the development of basic skills in performing the fundamen-

tals required in the operation of subtraction. Each of the five game booths has its own special features, which complement the different approaches to understanding the concepts involved in subtraction.

Ring the Bell is a game which lets one see how subtraction is done. A group of dolls is displayed, then some are taken away. Correctly figuring out how many are still left will make **Tink** ring the bell. Level 1 tells the player how many are left, while the other two levels require the player to perform the operation.

Witches' Brew is not to be confused with one's morning coffee, though the ingredients may be quite similar. This game gives more practice with subtraction. Bugs, blobs and newts are the basic staples used in this concoction. Figuring out how many creepies are left on the shelf after the double bubble, toil and trouble is the object here. Seeing what emerges from the old crone's cauldron will certainly make you want to eschew the shrew's brew. Phew!

The classic approach to teaching subtraction starts with a number of objects from which some are removed, or sub-

tracted. The remaining objects represent the difference, or the answer. What better way to demonstrate this procedure than with a Magic Show? **Tink** the magician performs this vanishing act with a wave of his wand as he vaporizes eggs, caterpillars, hats and monsters. A player must enter the correct number of objects remaining.

Entering the booth designated Dunk Gork, one finds a group of dolls from which a certain number is to be subtracted. A correct response results in the dunking of Gork, the nemesis of the TinkTonks. Level 2 requires three right answers, and level 3 five right answers to soak this sinister scoundrel.

The fifth game at the fair is Bear Dare. This is a contest between the player and Mr. Barker. Several bears are displayed on the screen. The player and Mr. Barker alternate turns in subtracting one, two, or three bears from the total. If Mr. Barker is left with the last bear, you win. This game involves a good deal of strategy as it further enhances subtraction skills.

Each attraction costs a certain number of tonkers to enter. The exchange rate

GRIFFIN'S LAIR *continued*

of tonkers to U.S. dollars is particularly good right now, so one may want to visit there soon.

Before being admitted, **Tink** must pay Boomer the correct fare. A subtraction problem appears in front of Boomer, showing the number of tonkers started with and the number being taken away. After the problem is solved, **Tink** may enter and play the game. The reward for winning the games (i.e., correctly solving the subtraction problems) comes in the form of beepers. Accumulating a bundle of beepers allows the player to go to one of the two funhouses. One cannot get the tonkers for nothing, and the beepers are never for free, even if one is in dire straits.

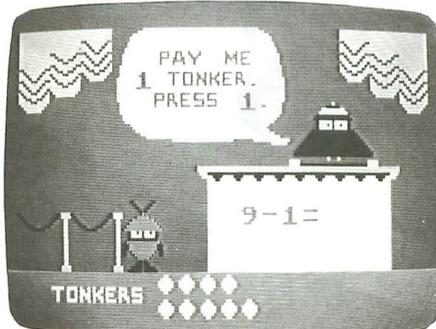
Moonwalk has one maneuvering **Tink** around the Moon, picking up tonkers. **Tink** has to be careful to avoid an evil alien, by using caves and craters to pop in and out of. (Maybe the creature is really from the Moon, and **Tink** is the alien. And who knows what Evil is, or where it lurks? Is that you, Lamarr?)

The Arcade is composed of a number of machines which go off—start functioning, that is—in a certain order. Touching each machine in the proper sequence is rewarded with tonkers, enabling one to play more of the other games. This is quite similar to one of the early electronic games, **Simon**.

Thank Cybernon, the god of electronic games, that the enthusiasm for simi-

lar games has waned, sparing us from the unnerving echoes of those bleeping, beeping contraptions.

Just in time, too; I understand that a special Senate investigating committee was about to launch hearings relating to the devastating influence these modern menaces were having on our children. Now, they have time to devote to the more important issue of the adverse effect of rock and roll on the mores of our



Tink's Subtraction Fair.

offspring. I think we should ban Buddy Holly music immediately. Who knows what harm might come from it? Ah, but I digress. (Great title for a contemporary periodical: *Reader's Digress!*)

Along with developing mathematical skills, additional educational benefits are provided by this program. Since tonkers and beepers are necessary to continue to play the games, their acqui-

sition and disposition are critical. In other words, kids will learn principles of earning and spending. Memory skills and the powers of concentration become an integral part of the learning process in many phases of this program.

The graphics are simple and pleasing. The original musical interludes accompanying the different activities add just the right touch. The nondestructive nature of success-and-reward are important features of this package, a sharp contrast to many of the games youngsters usually play on the computer.

Younger children will require some assistance early on, but even those who cannot yet read will be playing by themselves in no time. This is a fun computer activity for young children and could just as easily be purchased for them as a game alone, without concern for its educational value. The design of this game keeps the joy of learning in the proper perspective. The more fun any game is to play, the longer it is played, and the greater the dividends.

I cannot wait for the introduction of a canine into the land of the TinkTonks. Do you think they will call him Rink Tink Tink? ☐

WHAT IS CHECKSUM DATA?

Most program listings in **ANALOG Computing** are followed by a table of numbers appearing as DATA statements, called "CHECKSUM DATA." These numbers are to be used in conjunction with **D:CHECK** and **C:CHECK** (which appeared in **ANALOG Computing** issue 16 and the **ANALOG Compendium**) or with **Unicheck** (from issue 24).

D:CHECK and **C:CHECK** (written by Istvan Mohos and Tom Hudson) and **Unicheck** (by Tom Hudson) are designed to find and correct typing errors when readers are entering programs from the magazine. For those readers who would like copies of these articles, you may send for back issue 24 (\$4.00 each) or the **ANALOG Compendium** (\$14.95 plus \$2.00 shipping and handling) from:

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**CRUSADE IN EUROPE:
COMMAND SERIES**
by Sid Meier
and Edward Bever
MICROPROSE SOFTWARE
120 Lakefront Drive
Hunt Valley, MD 21030
48K Disk \$39.95

by Patrick J. Kelley

If there's one thing I admire, it's ambition. Not just in everyday life, but in computer games, as well. It seems that most of us are content to find a certain level of existence and hang on, never questioning or challenging our fate. This "play it safe" attitude has apparently trickled down to game programming, and it's most evident in wargames.

In a market flooded with "retreads," Microprose's **Crusade in Europe** is head and shoulders above the pack. The most endearing facets of this game are the ambitious design and detailing. It takes daring to recreate the European Theatre of Operation for your edification.

In **Crusade in Europe** you're Supreme Commander during the Battle for France and the low countries, circa 1944. The game begins with the D-Day Invasion, and ends with a desperate rush to push Hitler's troops across Europe and back to Germany. How does that grab you? To me, it sounded like a pretty tall order for any computer game to fill. I was surprised to find out just how good this game is.

Hit the beach!

Crusade in Europe is played out on a fine-scrolling, full-colored map of the continent, from the English Channel to the Rhine/Ruhr area. Depending on the game option you choose, the computer will place you in the appropriate tactical area of operations.

Your choices are: the Battle for Normandy, Race for the Rhine, Operation Market-Garden, the Battle of the Bulge and the finale, the Battle for France. Each scenario is a game in itself, and they're far too detailed to discuss here. Suffice it to say that there's something

here for every wargamer, novice or seasoned player.

Your units can either be displayed as icons or standard military symbols (for beginners, I suggest the icons, as some of the military symbols can be confusing). The opposing sides are designated by color, with the Americans as green, the British units red and the German troops black.

You can select limited or advanced intelligence, thereby setting up on-screen how many of the enemy's troops are to be readily visible. As with most wargames, terrain is mixed and well represented, with a bonus of day/night color changes, depending on the time.

Orders can be relayed to your units by either keyboard or joystick, and include the option to study enemy strengths or weaknesses in greater detail. Once combat commences, the computer will do the record keeping for you, even displaying a running tabulation of all casualties and ground taken by both sides.

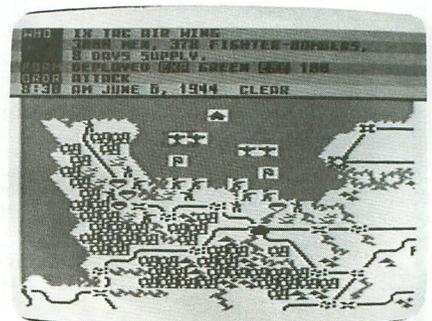
You have a "Supreme Commander's-eye-view" of the battle, watching all of your units' progress at all times. Fire-fights and hard contact are displayed by flashing graphic symbols (a lightning bolt), as are queries by units on their further orders (question mark).

The State of the War.

All of this is handled superbly by the computer, a fine example of what good programmers can do with a great concept. Playtime can be regulated by a speed option, as can handicap levels on either the computer or two-player side.

Crusade in Europe is just dripping with options, something most other simulations are sorely lacking. At the heart of all this is the feeling that the creators wanted to turn out the best product they

could—and did their homework to back it up.



Crusade in Europe.

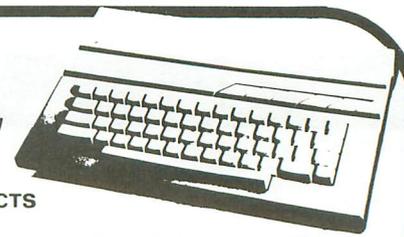
Included in the handsome documentation is a bibliography for those who are inclined to read about the battles they're waging from their armchairs. This even has selections from the Department of the Army concerning the D-Day campaign. All of the realism is taken one step further by the inclusion of variants, or "what if . . ." ideas, in the actual combat situations.

For example, what if Patton had been allowed to advance south into the Ardennes in September of 1944? What influence would that have had on the war's end? Or, what if the ill-fated airborne Operation Market-Garden had succeeded? What would have been the outcome, had the British Third Infantry smashed through and defeated the German 107 Panzer Brigade at Arnhem?

It is these factors that make the game so playable for me, and make me want to return to it again and again. Ambition. It's what makes great generals and great computer games. What else can I say? Thank you for all of the hard work, Microprose, and thanks for a helluva game! 



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 Monitor Cable 5

MODEMS

Atari 1030 Dir. 300 BAUD ... 64
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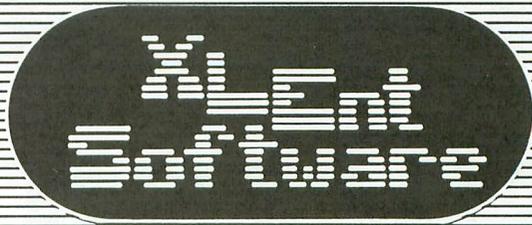


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Coming soon ... special version for the 130 XE.

Let Your Imagination Run Free

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"... a pretty nifty package ..." **Current Notes**



Page Designer lets you design a full page printout (8 1/2 x 11) on-screen and then save it to disk. Combine text, graphics and borders. Edit on-screen in either 40 or 80 columns. Font styles can be mixed in the 40 column mode. All graphic and control characters are displayed and printed PLUS we've included specially designed border characters. Use Page Designer to add text to pictures you've created (Micropainter, Koalapad, Atari Artist). Drawing mode let's you add finishing touches (e.g., circles and spheres). Great for creating ads, reports, newsletters or for dressing up letters.
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For Epson, Gemini, Panasonic, Prowriter, NEC and compatible dot matrix printers.

Explore Your Inner Self

HYPNOSIS

with Brainwave Synchronization by Gene Levine



The most significant self-improvement program. Designed for anyone who is interested in hypnosis, relaxation, or self-improvement. This program replaces the synchronizing strobes that can cost hundreds of dollars. Seven screens pulsate at speeds that you can adjust with paddles or keyboard. Audio tapes may be played using the Atari cassette recorder. Create your own self-improvement tapes to be used with this program. Great for those evenings when you want to relax.
48K disk **Only \$29.95**

**Resolution to the MAX!
491,520 pixels per page**

TypeSetter

by Dennis Young and Len Dorfman



Now your Atari can have higher resolution to the printer than the MacIntosh. The 48K version can have resolution up to 704 x 624 pixels (768 x 640 on the 130 XE version). TypeSetter accomplishes this feat by letting you scroll over multiple graphics 6 screens. You can control the style, height and width (32 sizes) of characters. Type in any direction — forward, backward, up and down. You have the flexibility to mix graphics, text and graphic characters. Sketch Pad lets you create icons and allows you to copy them or any part of the screen anywhere. Used in conjunction with Page Designer, you can add detail to standard Graphics 8 screens. This program is for ALL Atari enthusiasts who've dreamed of having the artistic capability of the MacIntosh. Light years ahead of any other Atari graphics program.
48K disk **Only \$34.95**

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by Jan Iverson

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NEW PRODUCTS

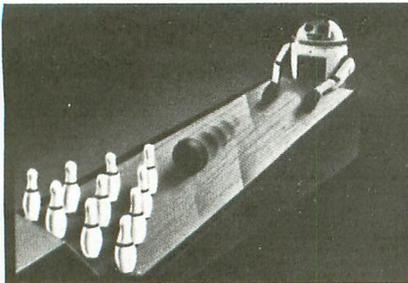
ECLIPSE OFFERS TOP-DOS 1.5

Eclipse Software has released **TOP-DOS 1.5**, an enhanced version of TOP-DOS featuring 130XE support, 1050 enhanced-density compatibility, auto-density selection, high-speed data transfer, auto-ramdisk initialization and error buzzer control.

This new version utilizes the 130XE's 64K ramdisk, along with an expanded 78K ramdisk. In addition, there's a special 90K one-pass disk duplication function, for use with only one drive. **TOP-DOS 1.5** also supports Happy Computer's "warp" speed enhancement and a new status screen offering information on available memory area, modules installed, number of buffers and other valuable data.

TOP-DOS 1.5 lists for only \$29.95 from Eclipse Software, 1058 Marigold Court, Sunnyvale, CA 94086 — (408) 246-8325.

ROBOT * LINK AND SONAR



Verbot Bowling.
Robot * Link provides programs for Omnibot, Omnibot 2000 and Verbot.

ASSEMBLER AND LINKER

This new program from Six Forks Software provides the Atari user with a method of software development that allows a program to become very large and still be manageable.

Hardware requirements consist of an Atari with at least 48K, disk drive and printer. Software necessary for use includes: a word processor for creating and editing source files and a debugger. Familiarity with assembly language is also necessary.

The package consists of the **Assembler and Linker**, sample program and reference manual. For \$39.00, from Six Forks Software, 11009 Harness Circle, Raleigh, NC 27614 — (919) 847-2740.

SUPERSCRIPT, THE INTELLIGENT WORD PROCESSOR

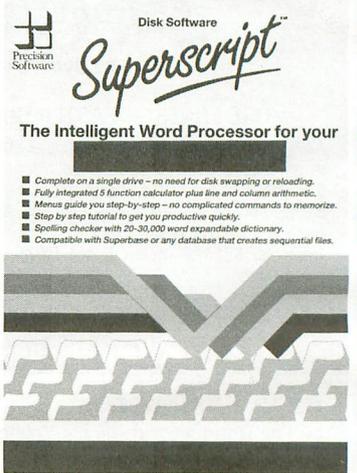
Superscript from Precision Software allows you to write, edit and store letters, papers and any other correspondence—contracts, labels and invoices. Its other features include a built-in mailing list, spelling checker and calculator.

Help screens and menu explanations assist you as needed, providing information that lets you learn at your own pace.

Fully compatible with the 130XE, **Superscript** takes advantage of that computer's additional memory. It provides two text areas for separate documents; 64K machines have one text area.

This full-featured word processor supports most popular printers and gives you complete control over your writing, with centering, underlining, bold print, headers, footers and various auto-page numbering. Block cut-and-paste, text insert, typeover and full search/replace are also provided.

Superscript was developed in England and is available for approximately \$79.95. For further information, please contact Progressive Peripherals & Software Inc., 464 Kalamath, Denver, CO 80204.



Disk Software
Superscript
The Intelligent Word Processor for your

- Complete on a single drive — no need for disk swapping or reloading.
- Fully integrated 5 function calculator plus line and column arithmetic.
- Menu guide you step-by-step — no complicated commands to memorize.
- Step by step tutorial to get you productive quickly.
- Spelling checker with 20-30,000 word expandable dictionary.
- Compatible with Superbase or any database that creates sequential files.

Computer Magic's **Robot * Link** allows you to program Tomy's robots—Omnibot, Omnibot 2000 and Verbot. All may be controlled using the disk and interface provided, to perform a myriad of functions, including Spin the Robot, a game which comes in the package.

Creating, editing, merging and saving your programs are all possible, which also saves the robot's power. Options include: Verbot Basketball, Verbot Bowling and Robot War—games and activities for your 'bots.

Computer Magic also offers the **Sonar Experimenter's Kit**. This package teaches what ultrasonics is all about and lets you make music "in thin air." Three other programs included are Simon Says, Guess Your Distance and Burglar Alarm.

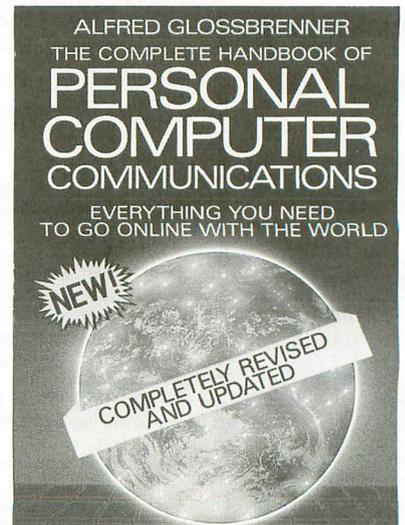
All Omnibot software and the sonar kit programs are available for the Atari. Contact Computer Magic, 18 East Mall, Plainview, NY 11803 — (516) 694-8960-1.

The publishers, St. Martin's Press, have added sections in this newest, updated edition, including pieces on electronic mail, bulletin board systems, electronic stockbrokers and the latest on Delphi, a service similar to CompuServe and The Source.

The useful 545-page tome is retailing now for \$14.95. For further information, contact St. Martin's Press at 175 Fifth Avenue, New York, NY 10010.

EVERYTHING YOU NEED TO GO ON-LINE WITH THE WORLD

Personal Computer Communications is a complete handbook, providing information on what to look for when choosing a modem and communications software, how to access major databanks and "talk" to other users worldwide, and assistance in electronic banking evaluations.



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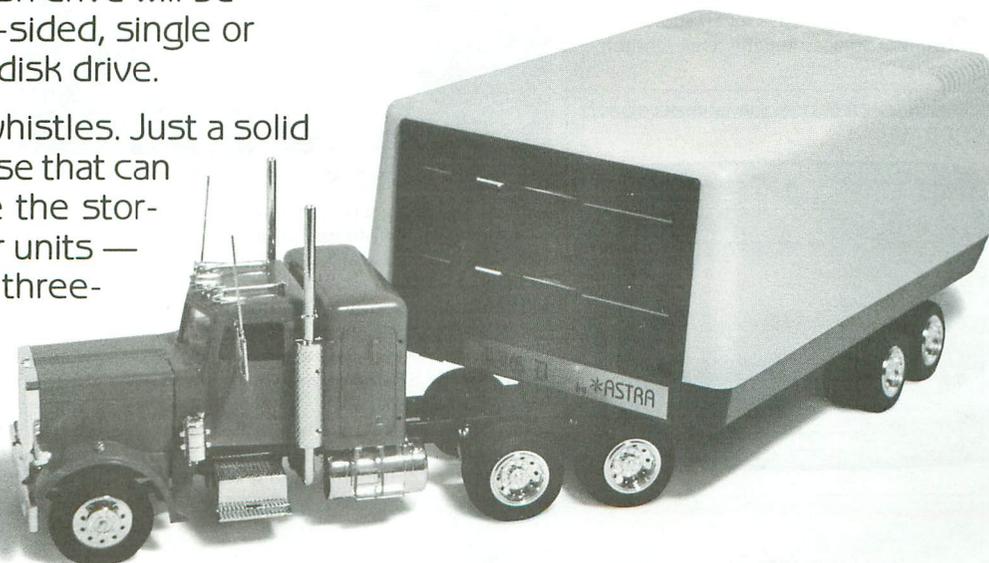
Software programs such as word processing, data base management, spread sheet analysis and mailing lists are made more powerful, and, at the same time, easier to use if you have two disk drives.

And it's compatible with Atari's new XE Series as well as the original and intermediate computers, 400, 800, 600XL, 800XL and 1200XL.

Find out more about Astra's "Big D" reliable performance and heavy load carrying capacity by contacting your nearest dealer or distributor. Call (714) 549-2141.

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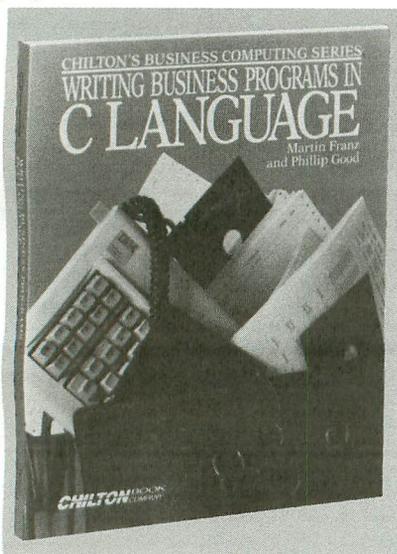
2500 South Fairview/Unit L
Santa Ana, California 92704



ST NEWS!

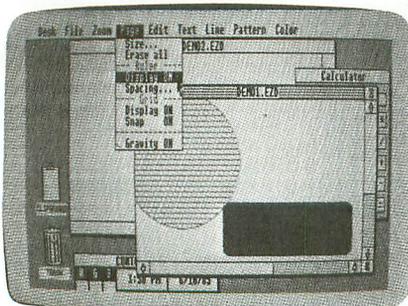
WRITING BUSINESS PROGRAMS IN C

This new book from Chilton allows managers, analysts, consultants, or anyone who programs to utilize C. A single statement in C can replace half a dozen BASIC lines, and much more than that in assembly language. Using program examples, the reader will learn calculations, character manipulation and file management necessary to develop programs.



Writing Business Programs in C Language is by Martin Franz and Phillip Good, and it's available in softcover nationwide for \$16.95, or direct from the publishers for an additional \$1.75. Chilton Book Company, One Chilton Way, Radnor, PA 19089.

EASY-DRAW



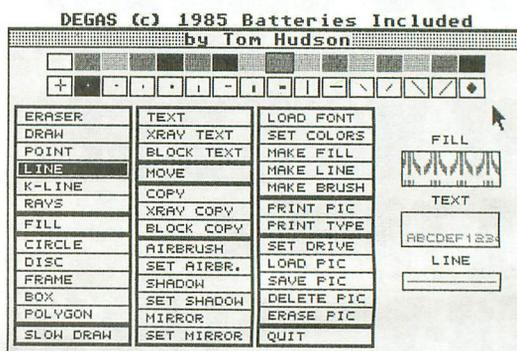
DESIGN AND ENTERTAINMENT GRAPHICS ARTS SYSTEM

DEGAS allows you to take full advantage of your ST's stunning graphics capability, to produce nearly anything you can imagine. Features include the ability to select up to 16 colors at a time from a palette of 500, a main menu with a simple move and click of the mouse, and the capability to mix text with graphics, using the fonts included (or your own via the built-in font editor).

Drawing is accomplished using any one of 15 different brush patterns, plus an "airbrush" mode, shadows and easy color filling, with your choice of over 60 fill patterns. Circles, boxes, lines, frames and disks can be drawn with incredible ease. The Magnify mode permits accurate, detailed work, along with Slow Draw. Editing features allow you to undo a mistake instantly or to move your graphics around the screen in various ways.

Created specifically for the ST by Tom Hudson, this is sure to become an ST standard. At \$39.95,

Batteries Included, 30 Mural St., Richmond Hill, Ontario, Canada, L4B 1B5 — (416) 881-9941.



A BOLD DEPARTURE—FROM INFOCOM



It is 2031; society is on the brink of chaos; and the eyes of the world are on you. *A Mind Forever Voyaging* is Infocom's latest interactive fiction for the advanced player.

Scientists have found that, to think as a human being, a computer must be raised as one—developing self-awareness and intelligence slowly. At twenty, you learn that you're really a machine built to simulate the future to solve all of man's problems.

Included with the program is a map of the huge, futuristic city you will explore, called Rockvil; a 21st-century pen; a security decoder (to enter simulation mode); and a story of your first twenty years, plus the history of your creator's project.

By Steve Meretzky, author of *Planetfall* and *Sorcerer*, co-author of *Hitchhiker's Guide to the Galaxy*, this is the first in a series, with a vocabulary of over 1700 words. It's for the Atari ST (128K, not XL/XE-compatible).

Retail is \$44.95 from Infocom, Inc., 125 Cambridge Park Dr., Cambridge, MA 02140.

Due to a printing error, *ANALOG Computing* ran the wrong photo in the Infocom section of *ST News* last issue. The photo intended was the one above. Our apologies to Infocom and to our readers.

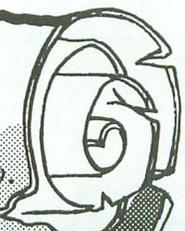
Designed for personal or business applications, **Easy-Draw** is an easy-to-use, powerful program with sophisticated zooming, multi-drawing windows, a pop-up drawing menu, desktop functions and user-controlled object coloring.

Developed by the Consumer Applications Division of MIGRAPH, **Easy-Draw** is their first offering for the ST line, soon to be followed by **DraWrite**, an integrated text/drawing processor.

Easy-Draw's retail price is \$99.95. For more information, contact MIGRAPH, 720 S. 333rd, Federal Way, WA 98003 — (206) 838-4677.

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To the Atari ST and all its new owners, congratulations from MichTron! Never have we seen a computer with such promise. Our enthusiastic crew has already turned its talents to this remarkable new machine.

Although new to the Atari software field, we at MichTron are natives to the industry. We've written over 70 successful programs for the Sanyo 550, Tandy Color Computer, and IBM PC, proving the depth of our commitments, and the quality of our results.

Our first Atari programs are ready to go: fun, fast, colorful games, and utilities made for speed, efficiency, and simplicity. All reasonably priced, with more coming every day...

M-DISK by Timothy Purves

M-Disk will give you the power of an extra disk drive without the extra cost! This amazing device is super-fast, incredibly tough, and costs only as much as a single piece of software!

The key is that *M-Disk* isn't a hardware device, it's a software utility. It reserves a portion of your computer's memory, which is formatted to resemble the data on a disk drive. *M-Disk* makes the operating system recognize this as a hardware device, giving you the equivalent of an extra disk drive: all the speed and power, without the extra cost!

For the Atari ST \$34.95

SOFT SPOOL by Timothy Purves

Get your computer and printer to work as a team! When printing files (from your word processor, FGS, or anywhere else), your computer is just dead weight: waiting and waiting for the printer to finish the job. With *Soft Spool*, the wait is over! Your computer can think and print at the same time! Whenever you print something, instead of going immediately to the printer, it waits in *Soft Spool's* RAM buffer. You can then use your computer normally (edit files, write programs, etc.), as the spooler feeds its data to your printer whenever possible, saving hours of computer time.

For the Atari ST \$34.95

MUDPIES by Phil MacKenzie & Jeffrey Sorenson

When the circus came to town, young Arnold just had to get in on the fun. When the clowns put on their crazy show, Arnold picked up a mudpie and threw it at the nearest clown! But the clowns didn't think it was so funny. They threw things back and tried to catch him. Soon the place was a *REAL* circus!

Keep Arnold from harm by using mudpies to ward off angry clowns in this fun-filled arcade game. Challenge rounds, special prizes, mud-slinging rounds, amazing music and sound effects make this a great addition to anyone's game collection!

Requires Atari ST & TV or color monitor \$29.95

FLIP SIDE by Ken Olson & Phil Hollyer

You'll flip over this Reversi-type strategy game! Surround and flip an opponent's piece. This simple rule leads to strategies as complex as your imagination! Animated graphics bring the board to life as pieces flip themselves.

Play against another person, or against the computer in one of six skill-levels: from novice to expert with look ahead ability. The computer can show all your available moves, or suggest one for you. You can switch sides with the computer, and even edit the board for creating your own custom challenges!

For the Atari ST \$34.95

CALENDAR by J. Weaver Jr.

This complete appointment and reminder calendar is the perfect addition to your GEM desktop. Easily accessible anywhere within the GEM system, *Calendar* lets you display and print calendars for any year and month. You can store reminder messages for any date, any time, from 1980 to 2099. You can even set up "alarms" to inform you of noted events as they occur! Alarms will appear at the selected time on the Desktop or within any GEM application program: even when *Calendar* is not on the screen.

For the Atari ST \$29.95

MI-TERM by J. Weaver Jr.

This smart-terminal modem program lets your computer communicate! Through your modem and *Mi-Term*, ordinary phone lines become a wealth of information. *Mi-Term* has transfer routines to support virtually any remote system: ASCII, DFT, X-modem protocols and more. You can set options and parameters to meet the requirements of each system (even write on line)! And with pull-down menus, *Mi-Term* is easy to use. Transfer programs, send messages, and even "talk" between computers. There's a big world out there. Greet it with open arms: greet it with *Mi-Term*!

Requires Atari ST with modem \$79.95

GOLD RUNNER by Dave Dies

In this fast-paced arcade game you're the commander of the "Load-Runners." Infiltrate the underground mines in search of gold and adventure. But beware of the guards; no one has ever returned from their cruel clutches! Dozens of screens, with narrow paths, steep ladders, dangling ropes, and hidden traps will challenge your skill and puzzle your logic!

Requires Atari ST & TV or color monitor \$29.95

TIME BANDIT by Bill Dunlevy & Harry Lafner

Action! Test your wit, skill, and loyalties! Battle Evil Guardians as you try to escape with the Treasures of Time. Dual-player mode even lets two play simultaneously, each on his own window! Help or hinder your partner, but beware of treachery; if one player dies, he may still return for revenge!

Adventure! Use the Timegates to visit over 20 unique adventuring areas with over 15 levels each! Explore medieval dungeons, western frontiers, and future worlds all in one game! And somewhere, somewhere, is a great mystery, just waiting to be solved.

Art! This fast arcade-game uses all the ST's special features. Unique creatures and 3-D terrain for each Time, beautiful scrolling landscapes, detailed animation, thrilling sound and music: hundreds of screens: the conquest of Time and Space awaits you!

Requires Atari ST & TV or color monitor \$39.95

Proudly announcing our first programs for the Atari ST!



Telecommunications on the Atari 520ST

by Arthur Leyenberger

The new Atari 520ST is a fantastic and powerful machine. But, as with any new computer, there are only a dozen or so programs currently available for it. One of the first types of programs to appear for the ST has been telecommunications.

This is fortunate, because there's a wealth of public domain software that exists on various bulletin boards across the country. With either one of the two terminal programs reviewed in this article, bulletin boards can be accessed and the free programs downloaded. Of course, nationally known database services such as CompuServe, Delphi and the **ANALOG Computing TCS** can also be accessed.

This article reviews two terminal programs for the ST: **Chat** by SST and **PC/InterComm** by Mark of the Unicorn. Other telecommunications programs will be appearing soon, and **ANALOG Computing** will review those as they become available.

CHAT
SST SYSTEMS
3456 Willis Drive
Titusville, FL 32796
(305) 269-0063
\$19.95

Chat is an inexpensive communications program designed to turn the Atari 520ST and a modem into an intelligent *terminal*. With **Chat**, you can access databases, download information and software, use electronic mail systems

and trade data with computers that don't know how to read a 3½" floppy disk. It can operate with a modem at either 300 or 1200 baud. If you use a Hayes or Hayes-compatible modem, **Chat** will even dial the phone for you.

The program can transfer files in either of two types of file transfer protocols: ASCII or Xmodem. **Chat** can also capture text to a disk file. None of the special features of GEM are used in **Chat**—no drop-down menus, windows or icons. However, the operation of the program is straightforward and does not suffer from the lack of GEM bells and whistles.

The 19-page manual is complete. In fact, it often gives too much information, which may overwhelm a novice ST user. It consists of sections discussing each of the program features, a sample session and a discourse on Xmodem program transfer. An index is missing, and SST has chosen to follow the industry standard of providing a 2-page warranty disclaimer, which, in effect, says, "we don't guarantee that the program will fit your needs, work or be free of bugs." I find nonwarranties like this infuriating.

After the program is booted up, you're left with a blank screen. With a Hayes modem, you can give the dial command at this point—or, by pressing one of the function keys, call up the list of phone numbers you've previously saved. Using the mouse to point to the phone number of your choice and clicking auto will dial the modem.

Once you're on-line, you can use the HELP key to get help. A list of the commands associated with each of the ten

function keys is presented when help is requested. I'm glad to see that the program authors realized there's a HELP key on the computer and decided to use it.

The function keys are used to change filenames for capturing, up- and downloading files. The keys are also used for toggling on and off delay, echo, phone directory and modem speed. There's a setup program for specifying the type of modem you have, filenames you want to use, baud rate, etc. The phone directory you use for auto-dialing is also created with the setup program. All of these parameters can be saved and executed automatically when the program is ready to be run.

Version 1.0 of **Chat** contained a number of program bugs. Problems with up- and downloading using the Xmodem protocol have been experienced by a number of users. Also, I discovered that, once I was already on-line to CompuServe, if I inadvertently pressed the machine's phone directory function key (F8), the program locked up and I had to reboot the computer.

SST has released a newer version—**Chat 1.1**. This version is said to be free of some problems the first version had. Although I didn't get a copy of version 1.1 in time for this review, I'm told by several people on CompuServe's SIG* Atari that the new version does, in fact, work as advertised.

Registered owners of version 1.0 can receive a free upgrade to version 1.1 by simply returning the original disk and a self-addressed, stamped envelope with two stamps. SST will copy version 1.1 on that disk and send it back to you promptly.



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The primary difference between the versions of **Chat** is the way they handle Xmodem file transfer. Offering a free upgrade is the right thing to do, especially when the program didn't work correctly.

SST tells me that they'll have a **Chat** version 2.0 in the near future. This will feature auto line wrap on capture, ID and password on function keys for such services as CompuServe and Delphi, auto redial for Hayes modems, and other features. This version will cost approximately \$5 as an upgrade or \$25 for a new copy.

**PC/INTERCOMM
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There's no question about it: **PC/InterComm** for the Atari 520ST is a professional program. Trouble is, it has a professional price. At \$125 list, it's far too expensive for the average ST user. I'll give you my bottom line up front: if this program listed for \$75 or less, it could easily set the standard for being the definitive telecommunications program for the ST. But read on; there's more to it than that.

PC/InterComm is a complete telecommunications package. Its interface with humans—"where the rubber meets the road," so to speak—is excellent. Program operation is either via instant menus from the HELP key, or by using direct commands from the keyboard.

Menus are two levels deep, making them quite usable. In fact, I've been using this program for the past couple of weeks and haven't bothered learning the direct commands.

Menus are called up by pressing the HELP key. Then, either positioning the cursor or choosing a number selects the desired operation. The ESCAPE key always gets you out of the menu mode and back to where you left off. If you then press HELP again, the program remembers which menu selection you last used and puts you right back there.

This is especially handy when you're downloading a file using Xmodem. You have chosen to download, given the filename and started the operation. Then CompuServe or Delphi hiccups, and the file download is aborted. No problem—just start the procedure again, and the file transfer type and name are remembered by **PC/InterComm**.

There are almost too many features provided by this program to mention in the limited space of this review. Let's see—baud rates from 50 through 19200; controls for duplex, parity, XON/XOFF, ANSI/VT52, bits per character, etc.; toggles for smooth scrolling, line wrap, cursor type, normal or inverse video, and on and on. I'm not being patronizing here, I just don't have the space to list everything.

The **PC/InterComm** manual reflects the quality of the program. In a word, it's excellent. It is provided in a three-ring binder, enclosed in an expensive-looking slip case. Sections are provided for installation, use, file transfer, menus and troubleshooting. The descriptions of the commands are well written, and there are plenty of examples. A complete table of contents covers the 135-page document, and enough appendices are furnished to keep you going for a week. An index and glossary are also provided.

One of the strongest selling features of **PC/InterComm** is that it emulates a VT100 terminal. I know of at least two big companies that are considering using the ST and this terminal program, in place of IBM AT computers, as a front end to a mainframe computer application. The price on this setup is less than a VT100 terminal costs by itself.

There are other features that make the **PC/InterComm** usable. Up to twenty macro commands or text strings can be assigned to the ST's function keys. These macros can be defined as you need them, displayed on the screen at any time and saved to the disk for automatic loading next time the program's run.

When using **PC/InterComm**, the program automatically keeps a "history" of everything appearing on the screen. This transcript of what happened during a terminal session is quite useful. You can review it, cut out pieces of it and save it in files on your disk. When viewing it, you automatically see the last twenty-three lines, but can page backward as far as you want.

PC/InterComm provides six file transfer protocols: ASCII, raw, Modem 7 (Xmodem with cyclical redundancy checking), inter-PC/InterComm, Kermit and Kermit image. I have used the program to successfully download and upload files to CompuServe, to an IBM computer and to the 8-bit Atari computers. All have worked fine for me and my Hayes modem.

According to some reports, non-Hayes modems cause problems for the program. It seems that when the carrier was lost, the program would take you immediately back to the desktop. Also, with certain versions of TOS (the ST operating system), the program would occasionally lock up.

Mark of the Unicorn is aware of these problems and is now offering a free replacement policy. When you send in your warranty card, you'll automatically receive version 3.03 of the program, which works correctly with all versions of TOS and modems. The only catch is that the new version of the program is copy-protected. Version 3.01 was not. Now you can make a copy of the program disk, but you must insert the original each time you run the program. I find this to be a real nuisance.

The only criticism I have of **PC/InterComm** other than its outrageous price is a minor one. There's no possible way to get a directory of your disk from within the program. Fortunately, you can exit the program to the desktop, look at the files on your disk and rerun the program, without dropping your telephone line.

Mark of the Unicorn claims that a new version of **PC/InterComm**, out by the time you read this, will have a directory list command.

The bottom line.

If you had to choose between these two programs for your 520ST, the choice would not be easy. On one hand, you have a \$20 program that doesn't work very well. It has reliably done text capture for me, but Xmodem file transfer has been a disaster. On the other hand, you have an excellent program that works, and works quite well. However, the copy protection (a real pain) and the high price make it less than optimal.

My recommendation is to wait if you can. Eventually **Chat** will have its bugs exterminated, and **PC/InterComm** will (one hopes) come down in price. Also, there'll be several other terminal programs available for the ST—some of which will take advantage of the special features of GEM, like windows and drop-down menus.

If you must buy a terminal program immediately, get **PC/InterComm**. But please, buy it from a retailer who discounts software. At \$125, an ST terminal program can hardly be described as getting "power without the price." ■

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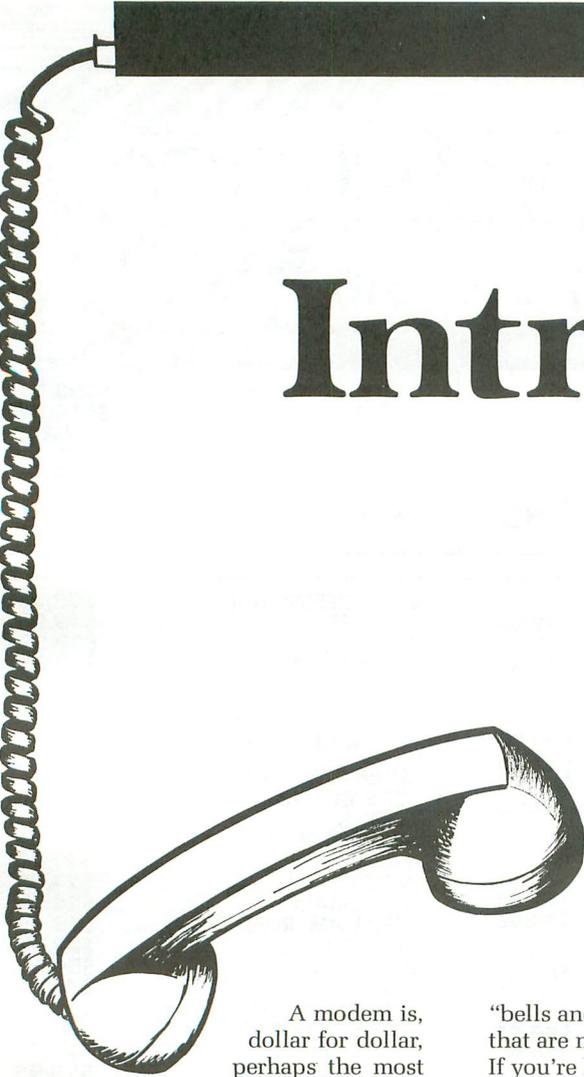
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CIRCLE #111 ON READER SERVICE CARD

Introduction

to Tele

by Michael Schoenbach and Frank Imburgio



A modem is, dollar for dollar, perhaps the most valuable peripheral you can add to your Atari system. For under a hundred dollars, you'll have the ability to access information, meet other computer users and get the latest news—all at the touch of a key.

Choosing a modem.

Your choice of modem will depend on your answers to these questions: (1) how much can you spend?; (2) do you have an 850 interface?; (3) do you plan to ever start a BBS (Bulletin Board System)?; and (4) do you want to access pay services, home banking, etc.?

If you're on a budget, you'll want to choose a modem that connects to your Atari without the 850 interface. Be careful, though! Some modems will be incompatible with software provided by banks and pay services. Choose your modem carefully!

The Atari **1030** is a "no-frills" modem. It's lacking some features that are needed to expand your uses for the modem. It's missing some of the requirements to run a BBS (it cannot auto-answer without the addition of a custom-made ring detector). The modem does not have any

"bells and whistles," the added features that are nice to have, but not necessary. If you're looking for a modem simply to call bulletin boards, then the **1030** modem is a very good choice.

The **MPP** is also a very good modem (a little more expensive than the **1030**, though). The **MPP** comes with its own Smart-Terminal cartridge that has all the necessary commands to access a BBS. You could set up a BBS with very little work on it. For the money, the **MPP** is a good bargain.

If you can afford it, you may decide to get a Hayes **Smartmodem**. The Hayes has many added features over cheaper modems, like tone dialing and a speaker to allow you to monitor the phone line (for busy signals, disconnected numbers and problems of that sort), plus status lights on the front panel and the use of the Hayes **Smartmodem** commands (a standard that's now used in other modems).

The **1200** has the same features of the 300-baud smartmodem and operates at 1200 baud (thus the name), eliminating large connection fees. Not as many bulletin boards operate in 1200 baud as in 300, so don't be surprised if you don't get to use the added baud rate as much

as you had planned. Consider the modems mentioned here and others that are available.

The next step.

Now that you've gotten a modem, taken it home and plugged it in, how do you use it? At this point, you'll be dealing with your terminal software. Here are a few definitions we'll refer to:

Baud Rate — Most available modems operate at 300 baud. Some offer 1200 or 2400 baud. The higher the number, the greater the speed at which the modem receives and sends information.

Duplex (half or full) — While you are telecommunicating, this allows you to see what you're typing. If duplex is set incorrectly, you may see nothing—or two of every character. More on this later.

ASCII/ATASCII — You may have seen these terms before. They refer to the international character set. If you're calling an Atari, you should be in ATASCII mode (Atari has its own character set) and, with all other computers, you should be using ASCII mode.

Xmodem — Due to phone line interference, data coming to your



communications

computer may end up garbled. If the data is part of a program, this could cause the program to be rendered useless! Xmodem is a standard file transfer protocol used by many bulletin boards. It breaks the file down into 125-byte segments of data that are sent to the receiving terminal with a checksum. As each segment is sent, it is checked, to see if the segment transferred correctly. If not, the segment will be sent again. Using this protocol insures that the transfer will be error free.

Parity — If you have a parity setting, leave it *off*. Atari bulletin boards do not use it.

Capture and Uploading without Xmodem — These terms refer to the transmission of data without Xmodem. Text, for instance, will not be divided into 125-byte segments, and no error checking will be done.

Xmodem Upload — This term is used when sending a file to another terminal with the use of Xmodem protocol.

Xmodem Download — This term is used when receiving a file from another terminal using the Xmodem protocol.

With these terms out of the way, let's get on to your software. There are many different terminal programs available. Some are public domain, while others you'll have to purchase.

The software you use greatly depends on the modem you bought. Some modems come with terminal programs. **MPPs** come with a dandy cartridge or disk that will get you started. The **1030**, via its built-in software, will allow you to read text as it comes across your screen.

You'll have to add a terminal program to save or print any of that information. There are three terminal programs that are commonly used.

The **1030** modem has a very good terminal program available in the public domain. **Term 1030**, written by Mathew Arrington and Rich Schmitt, offers Xmodem uploading and downloading. There's a capture buffer and an on-line bulletin board listing with phone numbers. It will repeat the auto-dialing until a connection is reached, and it also supports sector transfer (for the more experienced user).

You'll need an R: device handler written for the **1030**, in order to use this program.

Amodem, originally written by Jim Steinbrecher, features everything you'll need for telecommunicating. It supports all modems that possess an R: device handler.

HomeTerm, written by Russ Wetmore, is the terminal program supplied with **HomePak** (see the reviews—**HomeTerm** in issue 25 and **HomePak** in issue 28). Whichever terminal program you choose to use is all right, except that not all terminal programs will take advantage of the modem you purchased—so choose carefully. There are other terminal programs available; we only listed those most commonly used. Once you get all set up, the question you are faced with is. . .

Who should you call?

Try to get a local BBS number from a friend, magazine or user's group. All you need is one to get started, since most boards will provide you with a list of other BBS numbers.

If you're calling an Atari, set your modem to ATASCII. If you're not sure, or if you know you're calling another brand of computer, use ASCII. In any case, you should be in full duplex. Half duplex is only used if you're calling a friend's computer, not a BBS.

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CIRCLE #112 ON READER SERVICE CARD



You might find that you're asked for a password when you log onto a BBS. Pressing RETURN, or typing HELP should allow you to apply for a password. Passwords and phone numbers are used to discourage abuse of the BBS, and to assure that messages left for you are read by you only!

In any case, here are some hints on how to make your first call:

(1) If at all possible, have a phone nearby, even if your modem dials for you. New users often wonder what they're doing wrong, only to find out that the BBS they've been calling is busy! A phone will allow you to pick up and hear what's happening (if your modem has a built-in speaker, turn it on for the same result).

(2) Before you attempt to transfer programs, try capturing text, like a list of BBS numbers or the HELP often offered on BBS systems. This procedure is usually less complicated than an Xmodem (program) transfer.

Once you get the idea, log off (there's always a command on a BBS that's set aside for disconnecting) and reread the instructions regarding Xmodem. Call back and try Xmodem downloading a program. This should allow you to learn all about data transfers—a little at a time.

(3) You may find that downloading yields a message like *Password required*. Beginners find this perplexing, since they've just applied for a password! Many systems will require a day or two's delay before the SYSOP (SYS^{TE}M O^{PER}ATOR) validates your password, granting you full privileges.

Once you have a password, you might also find that your access "level" allows you very little time on the system. If you'd like to raise your access, Xmodem upload a program to the BBS (make sure you already have the author's permission that it may be distributed without charge). Chances are good that you will get immediate recognition for your effort.

You may find the terms and instructions a bit confusing at first, but with a little practice, using your new modem will become as natural as tying your shoes. Think about your confusion when

you first got your Atari! Little by little, shortcuts and ideas will come to you. Before you know it, you can become a telecommunicating pro.

Most Atari bulletin boards operate off of a bulletin board program called AMIS (Atari Message and Information System). AMIS was written by the MACE user's group and is public domain.

Most AMIS systems operate the same way. They contain a message system (a place for all members of the board to interact with each other), a file area (containing files for you to download), some text files (for special interests), and help files.

When you connect to an AMIS system, you will be prompted to input your first and last name; this is for the BBS's records. You will next be asked to input the city and state from which you're calling. Answer the questions, and you will be on-line. You do not need a password for an AMIS system. A standard AMIS main menu looks like this:

- A Translation switch between ASCII/ATASCII mode.
- B Reprint of the sign on bulletins.
- C Callers listing (list of callers who have logged on).
- D Download a file.
- F File Index (list of available files for you to download).
- G Log-off (disconnect).
- H Help file
- M Message system. The system's subcommands are:
 - E Enter message (leave a message in the message system).
 - K Delete message (deletes a message you entered).
 - R Read messages (read messages in the message system).
 - S Summary of messages (will give you a short summary of the message, containing the date the message was sent, from whom, to whom and the subject).
 - Q Quick scan (will give you the subject of each message).
 - M Return to main menu.
 - O Other BBS listing.
 - Y Call SYSOP to talk with you.

Please remember, the SYSOP is a person, too. Unless he says otherwise, chances are he's not awake during the wee hours of the morning.

A word to the wise.

Remember, BBSs are set up for your enjoyment. Do not abuse them. The SYSOP created the system for computer users to exchange ideas and public domain programs. Please follow the rules of the system (and they all do have some rules). The SYSOP will appreciate it.

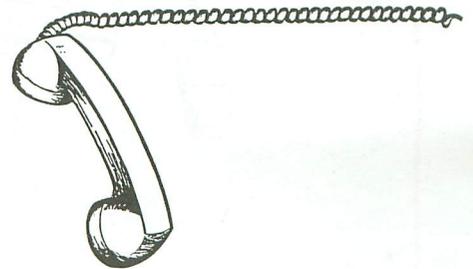
If you have a problem, try leaving a message and looking for a reply (or call

the SYSOP to talk). Someone who reads the message just might have the answer.

Good luck, and happy telecommunicating! **A**

Michael Schoenback operates Army Base BBS, (516) 781-2050. He's also co-SYSOP on the Atari Circuit BBS, (516) 783-6862 and on the Long Island Atari Users Group BBS, (516) 937-1455, where he's an officer.

Frank Imburgio is SYSOP of the General Store BBS, (516) 944-6594. He is store manager at CPI Computers in Port Washington, New York.



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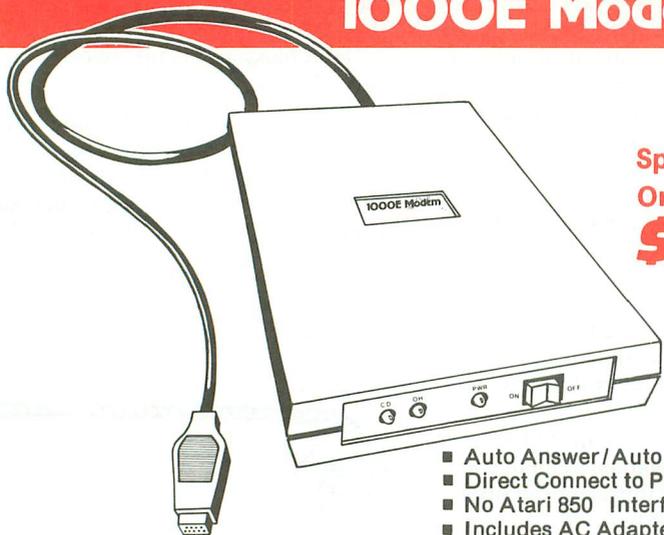
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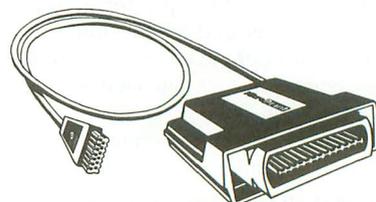
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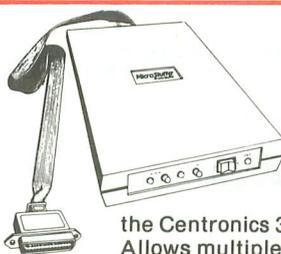
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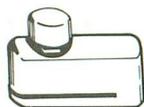
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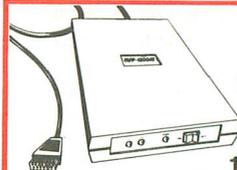
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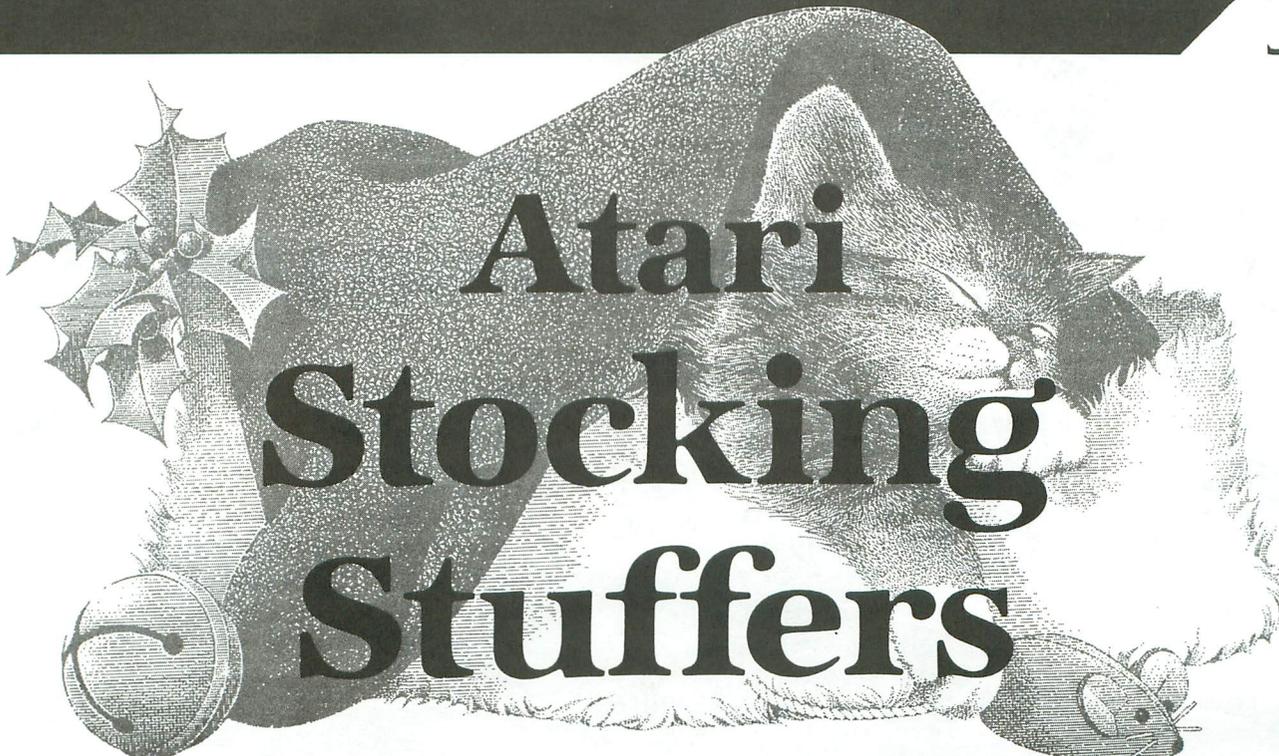


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CIRCLE #114 ON READER SERVICE CARD



Atari Stocking Stuffers

For your Atari (and you)

by Arthur Leyenberger

Whether you're a gift giver or getter, it's difficult choosing the right program, peripheral or gadget for an Atari system. But what do you do when the holidays approach and you or your fellow Atarians have visions of sugarplum fairies dancing in your heads?

Even if you don't know a bit from a byte, you don't need to spend a lot of money to get a gift that will be appreciated by the Atari user in the house. A little knowledge about what's available and what a user's needs are will equip you with the ability to make a thoughtful and useful purchase.

Regardless of how many hours someone has logged at the keyboard, chances are there's something that will help them get the most out of their Atari. The problem is that you may be unaware of a certain product's existence. Worse yet, the users themselves may not know of that special product.

To save the hassle of visiting every computer store in town, then having to actually *tell* someone what you'd like

(how tacky), here's a compilation of goodies for the Atari. Some of the products I'll mention by name, having actually used/tested/played them. Other items will be mentioned in general, with perhaps a couple of suggested brand names. A list of the manufacturers and their addresses can be found at the end of the article.

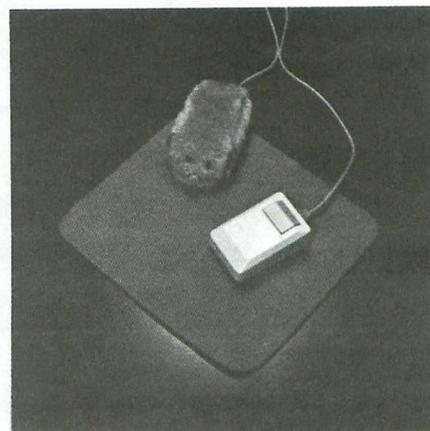
I cannot mention every Atari-related product ever made; I can't even mention all the good Atari products I use or know about. My apologies in advance if I leave out your favorite. As far as objectivity goes, I've been using various computers for over ten years and have been writing about them for more than three years. What I offer is informed judgment with a deliberate attempt at fairness. And, above all, I too am a User.

Mouseware.

With the advent of the new Atari 520ST, some new or unusual concerns have come up. First, there's the question of what to do with your mouse when it's not in use.

The answer, of course, is to get a **Mouse Pocket** from Kensington Micro-

ware. This \$10 gizmo keeps your mouse clean and out of the way, safe from prowling cats. It attaches to the side of your desk or monitor with supplied adhesive strips, and is as attractive as it is useful. Kensington also makes a



Mouse House and Mouse Mat.

mouse cleaning kit that includes enough supplies for a year. The \$25 kit also includes the pocket. Don't forget: a clean mouse is a happy mouse.

ALSO AVAILABLE!
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 with stats of '85 NL & AL players!

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NOW!

—the ultimate Strategy game!

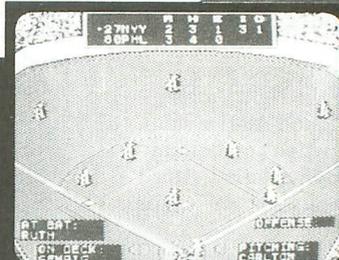
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 was like being in
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Stocking Stuffers *continued*

American Covers, Inc. makes a couple of useful products that will keep your mouse happy, warm and trouble free. Their \$10 **Mouse Mat** is a soft pad that improves a mouse's performance. It increases traction and comes in three colors: burgundy, blue and brown. Another product, **Mouse-House**, is an \$8 cover for your mouse that is as cute as . . . well, as a mouse. If you don't mind a little critter with eyes, nose and ears next to your computer, the **Mouse-House** may be just the thing to keep your mouse clean, warm and snug.

Inexpensive stocking stuffers.

Do you ever get confused about which key goes with which graphic symbol? Or are you tired of looking up those symbols in your dog-eared, tattered copy of "Your Atari Computer"? The only solution I know of is to spend \$5 for a set of **Graph-Fix** keyboard labels. Available from Dovestar Creative Concepts, these self-adhesive labels stick on the front of each of the keys on your keyboard. You'll never get those graphics characters confused again. One size fits all Atari 800, XL or XE computers.

Hey, does your trigger finger ever get tired, constantly pressing the fire button on your joystick? If so, you need a **Pointmaster Fire Control Adapter** from Discwasher. It lists for \$7, but I've seen it at toy stores for about \$3. When it's inserted between your joystick and computer, holding down the fire button causes a constant stream of pulses to be sent to the computer. It's as if you were pressing the button fifty times a second.

Miles Kimball is one of those mail-order companies selling the kind of bric-a-brac that eventually ends up at garage sales. However, there's one item that, although not Atari-related *per se*, would be fun to find in a stocking. It's the **Personal Computer Clock**, for only \$4. It looks like a miniature computer with an LCD clock where the screen is.

I don't know about you, but no matter how clean I keep my "computer room," dust is inevitable. I have covers on just about all of my equipment. You can get a whole range of covers for every Atari computer and peripheral made. The covers usually retail for \$5 to \$10 and will keep dust, moisture and even a spilled drink from damaging your equipment. Several companies make these, and they're readily available in computer stores.

Of course, I would be remiss if I didn't mention the most valuable accessory for

the Atari user. You may have guessed it, but, if not, look at the cover of what you're holding in your hands. Yup, it's a copy of **ANALOG Computing**. If you're reading this article, you probably already know how useful **ANALOG** is. But for a new user or someone who doesn't know about this magazine, I can't think of a more perfect gift than the latest issue slipped into a stocking.

More goodies.

AtariWriter is still one of the easiest-to-use word processors around. Like anything else, it will require a certain amount of time to learn, but **At-A-Glance** has a really useful product that will minimize the time required to get up to speed with **AtariWriter**. It's called the **At-A-Glance AtariWriter Template**.

This \$15 plastic template fits over the keyboard of an 800 or XL series computer, making all the keys accessible. Printed on the template are various commands, control codes and other information for using **AtariWriter**. It's sort of like having training wheels while you're learning. **At-A-Glance** also sells templates for **SynCalc** and **SynFile** (Synapse), and **Letter Perfect** and **Data Perfect** (LJK).

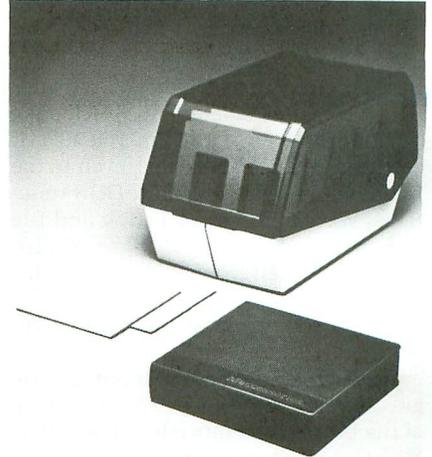


If someone wants to get started in telecommunications at a reasonable cost, they could do worse than buy an Atari **1030** modem. These go for less than \$70.

To make it upload, download and work like a modem should, you need a more sophisticated terminal program than the one built into the **1030**. **E.T. Modem** (Sector One International) sells for \$20 and will make using an Atari **1030** or **835** modem like driving one of the big rigs. It's easy to use and has just about all the features a novice or experienced user would want.

As you start to use your Atari, you begin to accumulate cartridges, disks and whatnot. Unless you decide how to organize all of it, you'll soon be unable to find your computer in the mess.

There are a number of companies that sell disk and cartridge holders. They typically cost anywhere from \$6 to \$30. I personally like the **Flip 'N File** (Innovative Concepts) flip-up tray and the 10-cartridge **Flip 'N File** flip-up holder.



Flip 'N File.

Each lists for \$29.95 and will be quite useful in keeping your work area tidy. There are other companies that make the same type of product. Just be sure that the one you buy won't spill disks when it's full and that it's easy to grab any particular disk.

The 520ST uses 3 1/2" micro disks. I've recently found some excellent, very attractive holders for these smaller disks. Innovative Technologies makes **Pocket Pak**.



Pocket Pak.

Pak and the **Easel**. **Pocket Pak** costs \$14, holds six disks and is small enough to fit in a jacket pocket. The **Easel** holds twenty disks, ten on each side, allows you to read your disks while they're in the holder and costs \$20. Both the **Pocket Pak** and the **Easel** are made of tough nylon, with Velcro fasteners.

If you've ever wanted to be able to list your BASIC programs to the printer and actually see those graphics and inverse characters, then you want to find **Mega-Font II+** under the tree. From XLe

Stocking Stuffers *continued*

Software, this \$25 program is a combination program lister/graphics dumper. It will work with the Epson, Prowriter, Gemini and Riteman printers. It also lets you use your own character sets in listing files.

Another interesting and useful program is **Genie** from New Horizons Software. The \$30 program is available for XL and XE computers only and provides a notetaking, calculator and ASCII code capability for any program you use. It can be called up at any time, even in the middle of another program. DOS functions, such as directory listing and file lock, unlock, rename and delete are also available. When you've finished with one of the **Genie** functions, you return to exactly where you left off in the main program.

There are several other, more generic gifts that fall into this price range. One of the best is a membership to an Atari User Group. There are many fine groups around the country, and memberships typically cost about \$20. The groups have monthly meetings, publish news-



letters and often have libraries of public domain software.

Books and magazine subscriptions also make excellent gifts. Several titles spring instantly to mind. The book that has become the Bible of Atari users is *Your Atari Computer* by Poole, McNiff and Cook. From publishers Osborne/McGraw-Hill, it will set you back about \$16. Another book with equal status is *The Atari User's Encyclopedia* by Gary Phillips and Jerry White. It costs \$20 and is published by The Book Company (Arrays). These two works belong on every Atarian's bookshelf.

One of the best books for learning BASIC on an Atari 800 or XL is published by Hayden. Called *Basic Atari BASIC*, it sells for \$15 and was written by Jim Coan and Richard Kushner. Not just another BASIC "clone" book, it was specifically rewritten for the Atari, to include information on such subjects as graph-

ics modes for the XL, sound and player/missile graphics.

If you'd like to learn more about how computer games are designed, Chris Crawford's book, *The Art of Computer Games Design*, is for you. Published by Osborne/McGraw-Hill, it sells for \$15. Crawford is an unusual person, whose views are expressed very well in his book. It will be good reading for people who are actually designing games, or for those who like to play.

There are a handful of other items that would be welcomed by any Atari user. Disks, printer paper and ribbons, or even a printer or monitor stand would all be useful. A rather novel product is sold by Gemini Enterprises: **Underware** printer ribbons. These \$14 ribbons are available for Epson, Prowriter, Okidata and Gemini 10x printers and allow you to create iron-on dry transfers. Just dump your favorite image to your printer with this ribbon and regular paper. Then you transfer the image to a T-shirt with an iron. **Underware** ribbons are only available in black.

If you need colored (normal) ribbons, Gemini has red, green, blue, brown and purple ribbons to fit a variety of dot-matrix printers. These sell for \$8 each and are available for Epson, Okidata and Prowriter printers (Panasonic's printer ribbon is \$10). Colored ribbons are quite useful with such graphics programs as Broderbund's **Print Shop**.

Gifts that keep on giving.

There are thousands of products made for the Atari. Some of them are the kind that have staying power and value. Here are some suggestions for those products.

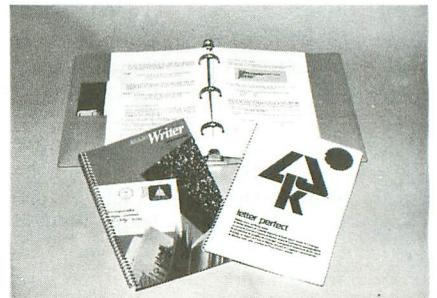
Aside from being the best game-playing computer on the market, the Atari is well suited for more serious endeavors. Word processing can be as full featured and easy to perform as on any other computer. Of the dozen or so word processors for the Atari, several stand out—each for different reasons.

AtariWriter is the choice for people who'll be doing occasional writing. It has all of the features of a powerful program but is still simple to use. Not that it can't handle more complex writing needs, but its strength lies in its excellent design and implementation. List price has come down to about \$50, but I've seen it for as little as \$25.

Since Atari's APX has gone out of business, the **AtariWriter** printer drivers are no longer available. To get full use from your **AtariWriter**, you need a driver

program for your particular printer. At-A-Glance sells these, for just about every brand of printer. They cost \$15 (dot matrix) and \$25 (letter quality) each, and are available for Epson, Okidata, Prowriter, BMC and Panasonic printers. Contact At-A-Glance for your specific printer needs.

Another word processor that I highly recommend for someone doing a lot of writing is **The Writer's Tool** from OSS. **The Writer's Tool** is fairly new, but it has so many features designed to make writing easy that it ranks in the top three. It's also very powerful. The cost is \$80,



and it uses OSS's exclusive bank-selecting Super Cartridge.

The third word processor on my recommended gift list is **Letter Perfect** by LJK (\$80). I've been writing about computers for roughly two years now, and **Letter Perfect** has been with me all the way. It and **Writer's Tool** are equally powerful, but **Letter Perfect** has the advantage of working with either a bit-3 80-column board or (if you already have one) the Austin-Franklin 80-column card. **Letter Perfect** also comes with a spelling checker and dictionary disk.

Any of these three word processors would make a fine gift. **Paper Clip** from Batteries Included is also an excellent word processor. Although it only works in 40-column mode, a full page (over 80 columns) can be previewed on your monitor, by scrolling over the text.

Batteries Included also has what may be one of the best software values around for the Atari 800, XL and XE. **HomePak** is three programs in one: a word processor, terminal program and database. The terminal program, **HomeTerm**, is clearly the best of its type for the Atari 8-bit computers. The word processor, **HomeText**, is quite good, although it doesn't rank with the word processing programs mentioned previously. Finally, **HomeFind** is an electronic filing system. **HomePak** costs \$50 and is worth considering.

There are two database programs for the Atari you should look at. **SynFile+** from Synapse is an extremely easy to use database program which is relatively fast. List price is about \$50, and it can interface with other Syn-programs (spreadsheet and graphics) and **Atari-Writer**. Definitely a best buy.

The most sophisticated database program for the Atari is **Data Perfect** from LJK. It sells for \$99.95 and will interface with **Letter Perfect**. It can be used with the bit-3, 80-column board and has an extensive report generator built in. Learning the ins and outs of it, however, requires time and patience.

One of the best programs I've ever seen for the Atari or any other computer is Synapse's **SynCalc** spreadsheet. It's very powerful and yet easy to use. It has both a menu-driven and a command mode of operation, and literally blows **VisiCalc** right out of the water. List price is about \$40. **SynCalc** is a program that will find many uses, from preparing income tax forms to budgeting and record keeping.

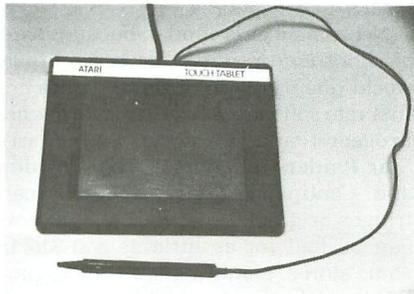
Another useful program is Electronic Arts' **Financial Cookbook**. For a \$50 price tag, this program includes dozens of financial "recipes" to calculate everything from mortgages to IRAs. Highly recommended.

The best graphics and statistical analysis package available for the Atari is **B/Graph** from Batteries Included. With this \$60 program, you can make bar charts, histograms, scatter plots and pie charts. Descriptive statistics and multiple regressions can also be performed on data. It's very easy to use and has excellent documentation and tutorials.

To get started using the vast resources of CompuServe Information Service, the **CompuServe Starter Kit** is a good value. For \$39.95, you receive five free hours of connect time and a thorough manual. Of course, you'll need a modem. Atari's **1030** modem is a good value, as is the **MPP-1100C** from Microbits Peripheral Products. Although Microbits is no longer in business, the newly reorganized company, Supra, is selling the entire MPP line. The cream of the crop is the **Hayes Smartmodem**, but that'll set you back about \$300 for 300 baud and \$500 for 300/1200 baud.

I have several gift suggestions for the creative individual on your list. **Movie Maker** by Reston Software (\$49.95) allows you to create animated graphics sequences on-screen. These can be edited,

saved and combined, to create all kinds of interesting "movies." **Movie Maker** is good for hours of fun and learning, and it's something for whole family to enjoy.



Atari Touch Tablet.



KoalaPad.

A touch tablet for "electronic doodling" would be a nice gift for someone of any age. Atari's **Touch Tablet** is now selling for about \$50—an excellent value. The price includes the easy-to-use Microllustrator graphics program in cartridge form. **KoalaPad** is also about \$50, but has more software available for it. either of these graphics tablets would be an excellent gift for a child.

Games.

No list of gift suggestions for the Atari user would be complete without a sampling of games. There are hundreds now available for the 8-bit computers, but about a dozen stand out as the best examples of game play or game/educational software. The best games fall into a handful of categories.

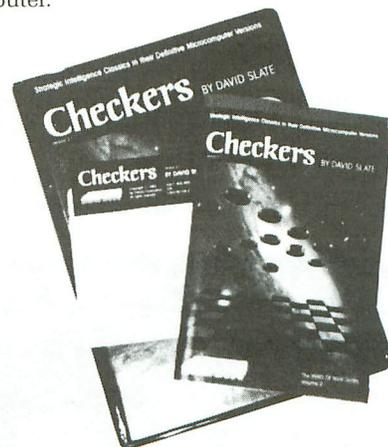
My favorite text-adventure is **Planetfall** from Infocom. This one combines adventure, science fiction and humor into an engrossing example of what's called interactive fiction. For a child or someone new to the text game genre, I'd recommend **Seastalker**, also from Infocom. It isn't as difficult or complex as **Planetfall**, but offers a good challenge and, like all Infocom games, has excellent documentation. Every Atarian should own at least one Infocom text-adventure game. Prices range from \$40



to \$60. By the time you read this, Infocom will have their entire line of text adventures available for the 520ST.

Another excellent text-adventure is from Dynamic Software Design. Called **Wombats I**, this really funny game is a parody of text-adventures. The author, Alex Leavens, has a strange and wonderful sense of humor. The game is at its best when the player's familiar with the others of this genre. It's somewhat difficult to complete, but has a surprisingly good parser, so that it understands your English commands. If you think you've seen all the games for your 8-bit Atari, check this one out. and beware: **Wombats II** is coming!

For the definitive board games, turn to Odesta. Their **Chess**, **Checkers** and **Odin** (Othello) are excellent translations to the video screen and come with complete documentation. They can be played at fifteen different levels, either with another person or against the computer.



Odesta's Checkers.

If your gift recipient enjoys crossword puzzles, Softie has a program you should consider. This game, **Computer Crosswords**, provides you with thirty puzzles from Dell, one of the nation's leading crossword puzzle publishers.

Stocking Stuffers *continued*

The puzzles range in difficulty from one to three stars, and the computer implementation adds to the enjoyment of puzzle solving.

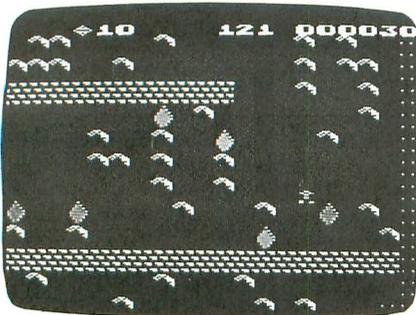
It may sound surprising, but some of the best games are educational, as well. There are two flight simulators for the Atari that fall into this category. **Solo Flight** by MMG (\$30) is fun to play and useful for learning about flying.

The most complete flight simulation program for the Atari is **Flight Simulator II** by SubLogic (\$49.95). **FS II** is an excellent simulation of flying a single-engine plane. The flight manuals that accompany the game are the most extensive I've seen for a home computer. Not only will you learn how to fly with this program, but you'll also have fun doing it.

One of the most creative and innovative games currently available for the Atari is **Pinball Construction Set** from Electronic Arts (\$40). Written by Bill Budge, this game lets you create your own pinball games from a video "parts box." You can then edit and save those games for future play.

When a game is fun and challenging, I tend to ignore its other attributes. In the case of **Seven Cities of Gold** (\$40), also from Electronic Arts, the hidden feature of the game is self-awareness. You play the role of a 16th-century Spanish explorer, searching for new worlds, new peoples and glory. Your own personality and beliefs determine how you play the game. It's simply excellent.

Two of the best hopping games are First Star's **Flip and Flop** (\$35) with its stunning graphics and Parker Brothers' cute **Q*Bert** (\$40). Most of the hopping games that appeared a year or so ago were merely clones that lacked staying power. I find myself still playing these two.



Boulder Dash.

Some of my all-time favorite games are First Star's **Boulder Dash** (\$35) and

Synapse's **Necromancer** (\$30). **Boulder Dash** is a climbing/moving game that has a lot of personality. When it first came out, I played it constantly. . . for weeks.

Necromancer is similar, but adds a bit of shoot-'em-up fun to its eerie, other-world quality. Both of these games are first rate software. My other favorites are **Frogger** (Parker Brothers, \$40) Atari's **Star Raiders** (of course), **Pole Position** and **Centipede**. The Atari game cartridges originally sold for \$45, but now can be had for as little as \$10-\$15 in some stores. Now's a good time to pick them up, before they become unavailable. And, for a good game of baseball, Gamestar's **Star League Baseball** (\$30) can't be beat.

For the Atari ST owner, one particular game has gotten a lot of airplay on my computer. **Mudpies** by Michtron (see the review on page 42) is an exciting arcade-style game that brings back the fun of those early games. It sells for \$30 and is notable for being one of the first games for the new Atari computer. It's also very addicting.

For the Atari user who has everything.

This last category of gifts is comprised of products that are either expensive or somewhat unusual. Either way, they'd be fun to give or receive.

The best color monitor available is the **Commodore 1702**. It retails for about \$350, but is heavily discounted. It accepts either composite or separate chroma and luminance video signals from the Atari 800, 800XL or 130XE, and displays a beautiful picture. You haven't seen what the Atari can do until you've seen it on the 1702. The quality of the built-in amplifier and speaker is also excellent. There might be better ways to spend \$300, but there's no better monitor for the Atari.

A great bargain in a dot-matrix printer is the C.Itoh **Prowriter Junior**. This printer is completely Epson compatible; any escape code sequences that were intended for the Epson FX-80 printer will work without a problem. It offers a Near Letter Quality (NLQ) mode, where the print looks a very much like typewriter print and has proportional spacing. The **Prowriter Junior** also has both friction (single sheets) and tractor feed (continuous pin-feed) capability.

One of the best things about this \$300 printer is the way it lets you address envelopes—letter or business size. Insert

the envelope, crank it up to the starting position, and tell your word processor to print. I haven't seen a printer anywhere that offers hassle-free envelope addressing like this.

An excellent letter-quality printer is the Silver-Reed **EXP-550**. It normally sells for about \$450-\$500 and is available under other names, like the **Transtar 130**. The Silver-Reed uses changeable daisy wheels, has a wide carriage and prints at 17 characters per second. It offers three type pitches (10,12, and 15) and even proportional spacing. Carbon film ribbons can be used for exceptional quality printing. I've been using one for almost two years and love it.

Another printer-related item is a printer buffer from Practical Peripherals. The **Microbuffer** comes in either 32K or 64K versions and, simply stated, works as advertised. The buffer sells for \$250 to \$300 and allows you to get back to your computer task while the printer is still working.

The last item on my list is not a computer. It can hardly be called a peripheral. It's . . . well, a pet, sort of. The **Petster Deluxe Catster** from Axlon is an electronic kitty that requires no feeding or cleaning up after. This \$70 robot pet can be (house?) trained, played with or just left to roam around the room on its own. A variety of sensors allow the cat to interact with people and its environment in an interesting and entertaining way. Axlon is another company created by the founder of Atari, Nolan Bushnell.



Petster Deluxe Catster.

That wraps up my list of gift ideas for the Atari user. As I said at the beginning, this collection of products is a result of my personal experience and opinion gained from several years as an Atari enthusiast. I hope that I've either given you some useful suggestions for gift giving, or if you leave this article open in a strategic place, helped you get what's on your Christmas list. ☐

(Manufacturers list on page 112)



MINDWHEEL

By Robert Pinsky
Programmed by Steve Hales
and William Mataga

SYNAPSE

17 Paul Drive
San Rafael, CA 94903
(415) 479-1170
48K Disk, 2 drives \$39.95

by Arthur Leyenberger

As a person who's often been called "the ole' game doctor," I confess to playing my share of arcade-style games over the years. I never seem to tire of sitting behind my Atari, battle-beaten joystick in hand, playing a good shoot-'em-up game. I can blast the aliens with the best of them.

But there comes a time when I want something more. Rather than a mindless test of my hand-eye coordination skills, I long for something more involving, intellectually satisfying and, ultimately, more challenging.

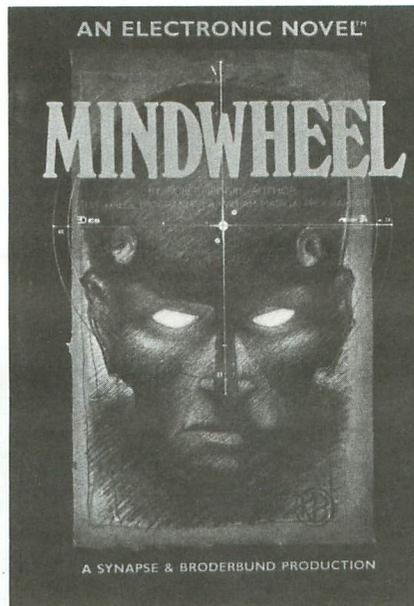
Until now, I've played text adventure games from Infocom, undoubtedly the best of the genre. The complexities and subtleties of a story, combined with the elements of strategy and challenge make computer adventuring very rewarding.

.. Synapse, a company long known for producing quality application and arcade game software, has entered the text adventure sweepstakes. Obviously, introducing a text adventure game in a market where Infocom has been the undisputed leader for so long has its drawbacks.

The least of these is striving to maintain the level of quality that Atari computer owners have come to expect. However, Synapse's first computer adventure game, **Mindwheel**, is a humorous, challenging game that's satisfying in play and rich in its storyline.

Let's take a look and see why it ranks with the best.

Synapse calls **Mindwheel** an "Electronic Novel." This and future products in the line consist of two carefully integrated parts: a hardcover book and the disks. The book sets the scene and in-



Mindwheel.

roduces the main characters. The disks naturally contain the program, which, when loaded into the computer, place the user (reader?) in the center of a constantly changing and highly interactive universe.

The book is an effective device for describing the characters without the player having to waste time asking particular questions in order to get going. You read the book, know exactly who the characters are, and can begin playing immediately.

That's not to say that it's easy. Far from it. But the use of the book allows the story itself to involve the player in such a way that the suspension of disbelief is accomplished, and the realm of imagination can be entered.

The plot.

Your fictional world is teetering on the edge of self-destruction, and you have been chosen to perform a daring rescue mission. Only by journeying back telepathically to the first moments of civilization can you retrieve the Wheel of Wisdom, the object upon which your planet is dependent for survival.

Your voyage casts you into an interlocking matrix of four extraordinary and powerful minds. Although these individuals are dead, their thought patterns survive in a kaleidoscope of shocking episodes and mutating images.

The minds of the matrix are: Bobby Clemon, assassinated rock star and the voice of a generation; the Generalissimo, ingenious dictator and hideous criminal of war; the Poet, a victim of love/composer of glorious epics which are your culture's supreme literary achievement; and Dr. Eva Fein, scientist, humanist and distinguished musician, "the female Einstein" of the late technological age.

In your search for the Wheel of Wisdom, you encounter bizarre events and even stranger people. For example, in the mind of the dead rock star, "you are suddenly placed on stage in front of a hysterical crowd. On the giant video screen above, scenes of a bald female motorcycle gang performing a black mass are shown simultaneously with the film of Bobby Clemon's assassination. In tight, sequined costumes, a chorus of singers writhe, imitating the gestures of the fatally wounded figure on the screen. In the crowd, people are waving primitive fetishes—dead animals, bizarre toys, poetry books published by Ecco Press."

The mechanics.

Mindwheel utilizes a highly sophisticated, 1500-word parser that allows easy



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CIRCLE #116 ON READER SERVICE CARD

communication with the characters. If you try to use traditional text-adventure lingo, like "where is the door," the program responds with "you are talking to yourself again, if you want to speak with someone, first address them by name."

However, you can issue commands. For example, I said, "kiss singer" and received the following response: "you purse your sensuous lips and give the singer a medium-long, fairly wet kiss. This behavior with the singer does no good."

The folks at Synapse have also come up with a unique anti-piracy scheme which, happily, does not affect the speed of disk loading. Each time the disk is booted, you're required to enter a password in order to play the game. This password happens to be a specific word in a particular line on a certain page of the book. Since the password changes each time you play the game, the disks are useless without the book.

Mindwheel is an unusual but enjoy-

able text adventure. Its use of humor, its wit and the general tone of the story all make for an excellent product. Most importantly, the game succeeds at allowing you to temporarily ignore reality and enter the whirling realm of the minds.

Synapse has certainly done an excellent job on their first text adventure game. I'll be looking forward to future "electronic novels" from a company that Atari users are very familiar with. **A**



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Speedski

by Bill Richardson

Can you be the fastest one down the mountain? That's your objective in **Speedski**. Ski as fast as you think you dare, but remember, crashing into the trees or gates will cost you precious seconds.

Typing it in.

Before typing anything, look at the listings accompanying this article.

Listing 1 is the BASIC data and data checking routine. This listing is used to create both cassette and disk versions of **Speedski**.

Listing 2 is the BASIC data for an alternate ski slope. More on how to do this later in the article.

Listing 3 is the assembly language source code for the game of **Speedski**, created with the Atari Assembler/Editor. You *don't* have to type this listing to play the game! It is included for those readers interested in assembly language.

Follow the instructions below to make either a cassette or disk version of **Speedski**.

Cassette instructions.

1. Type Listing 1 into your computer using the BASIC cartridge and verify your typing with **Unicheck** (see page 10).

2. Type **RUN** and press RETURN. The program will begin and ask:

MAKE CASSETTE (0), OR DISK (1)?

Type **0** and press RETURN. The program will begin checking the **DATA** statements, printing the line number of each as it goes. It will alert you if it finds any problems. Fix any incorrect lines and re-RUN the program, if necessary, until all errors are eliminated.

3. When all of your **DATA** lines are correct, the computer will beep twice and prompt you to **READY CASSETTE AND PRESS RETURN**. Now, insert a blank cassette in your recorder, press the **RECORD** and **PLAY** buttons simultaneously and hit RETURN. The message **WRITING FILE** will appear, and the program will create a machine language boot tape version of **Speedski**, printing each **DATA** line number as it goes. When the **READY** prompt appears, the game is recorded and ready to play. **CSAVE** the BASIC



Speedski *continued*

program onto a separate tape before continuing.

4. To load, rewind the tape created by the BASIC program to the beginning. Turn your computer OFF and remove all cartridges. Press the PLAY button on your recorder and turn ON your computer while holding down the START key. If you have a 600 or 800XL computer, you must hold the START and OPTION keys when you turn on the power. The computer will "beep" once. Hit the RETURN key, and **Speedski** will load and run automatically.

Disk instructions.

1. Type Listing 1 into your computer, using the BASIC cartridge and verify your typing with **Unicheck** (see page 10).

2. Type RUN and press RETURN. The program will ask:

MAKE CASSETTE (0) OR DISK (1)?

Type 1 and press RETURN. The program will begin checking the DATA lines, printing the line number of each statement as it goes. It will alert you if it finds any problems. Fix incorrect lines and re-RUN the program, if necessary, until all errors are eliminated.

3. When all the DATA lines are correct, you will be prompted to *INSERT DISK WITH DOS, PRESS RETURN*. Put a disk containing DOS 2.0S into drive #1 and press RETURN. The message *WRITING FILE* will appear, and the program will create an AUTORUN.SYS file on the disk, displaying each DATA line number as it goes. When the READY prompt appears, the game is ready to play. Be sure the BASIC program is SAVED before continuing.

4. To load the game, insert the disk containing the AUTORUN.SYS file into drive #1. Turn your computer OFF, remove all cartridges and turn the computer back ON. **Speedski** will load and run automatically.

Playing Speedski.

Speedski is a skiing simulation for one player. You begin your journey down the slope either by pressing START or by hitting your joystick button. The game may be paused at any time by pressing any key, and resumed by pressing OPTION. Press START at any time to start the game over.

Use the joystick to steer your skier. Pulling back on the stick causes you to speed up; pushing forward will slow you down. Steering back and forth will also slow you down, but not as fast as pushing forward on the joystick.

If you crash, your skier will get up again, but it will cost you some time.

To play again, press START or your joystick button. (Try to beat my record time on course #1 of 0:35.56.)

Using course #2.

Mastered course #1 yet? If you have, or if you just want a tougher ski slope, follow the instructions below to create a version of **Speedski** with course #2.

1. Load Listing 1 into your computer.
2. Substitute the lines in Listing 2 for the lines in Listing 1.
3. Follow the instructions under "Typing it in" to create a new disk or tape version of **Speedski** with course #2.

Speedski's graphics.

Speedski takes advantage of several of the features which make Atari graphics unbeatable.

Fine scrolling is used to smoothly roll the ski slope up the screen. The screen is scrolled at a rate of one



Speedski.

to four scan lines per vertical blank, depending on how fast you're going. The vertical blank is also used to run the clock.

Speedski uses a completely redefined character set. All eleven of the different trees, the game logo, the numbers and my name are made of redefined characters. These are not ordinary redefined characters, but ANTIC mode 4 and 5 characters, which are multi-colored.

Player/missile graphics are used for the skier. The technique of overlapping two players to create a third color which is a logical OR between the two colors (by setting bit 5 in GPRIOR-location 623) is employed

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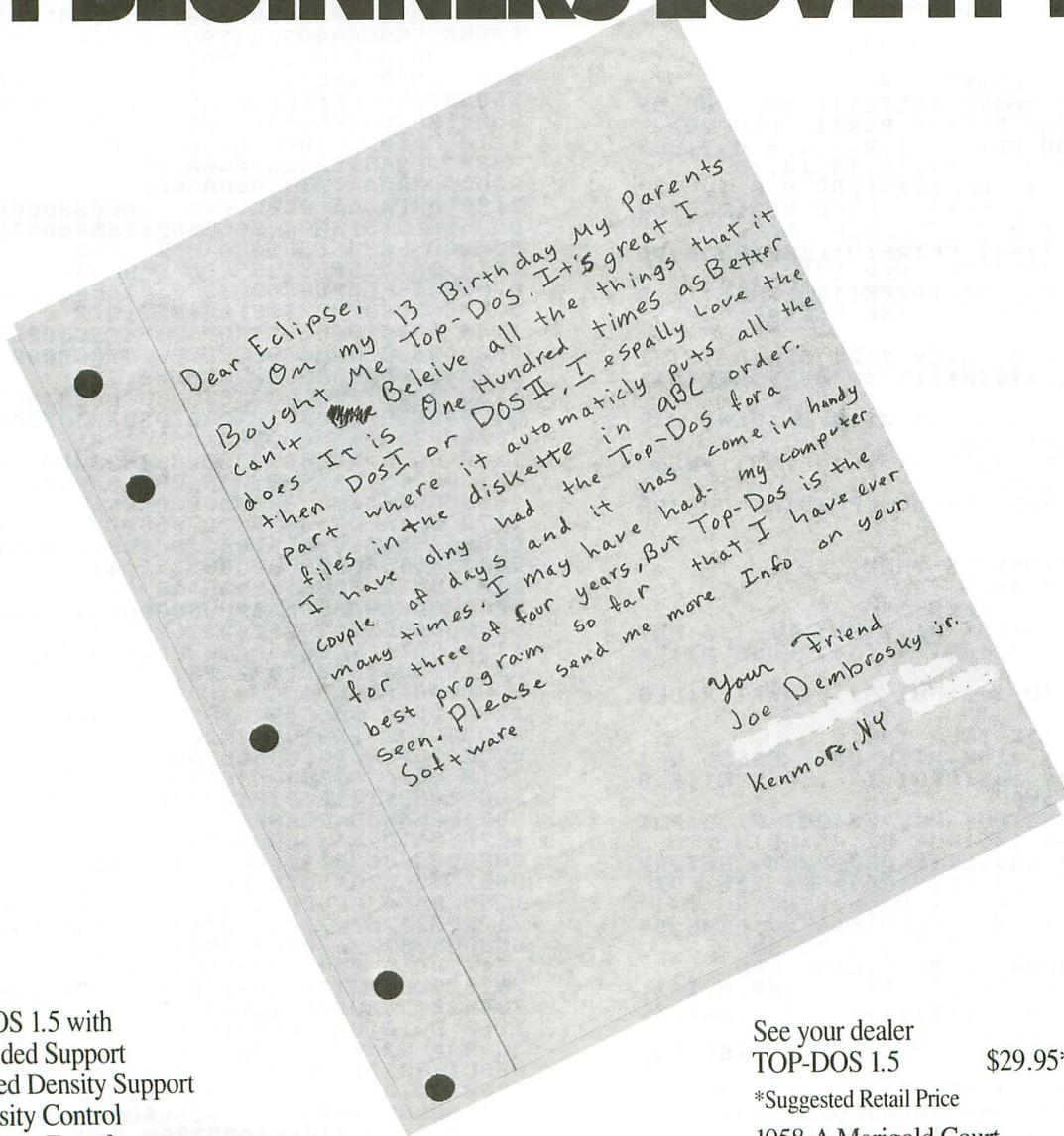
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```

1280 DATA 299D00319DA036BDA22B9DE0329D
8038BD822D9DC0349D603AE8E0E0D0E0A900AA
9D403BE8D0FAA5588D3724A5,951
1290 DATA 598D3824A900A07891588810FBA2
04BDC5249DC402CA10F7A9348D3002A9248D31
02A01BA20FBD0024915888CA,735
1300 DATA 10F7A043A21FB00024915888CAE0
0FD0F5A9208DF402A9008D08D2A9038D0FD2A9
028D1DD0A9048D07D4208E26,854
1310 DATA A9288B4A4A4A9988D002A9768DC1
02A92E8D2F02A06EA213BD2024915888CA10F7
A9008D3D24A9308D3E24A900,575
1320 DATA 8587858F858E8588A9018589A900
A2069580CA10FB86828EFC02CA8685A978858A
A924858BAD1FD06A9005AD84,324
1330 DATA 02D0F520F027A9068D3B24854D20
9B26A58A8D00D08D01D0208E26A965858CA924
858D20AA26E68BA58BC948F0,598
1340 DATA 15A58B4A4A4A8D00D28D01D2A20A
A0002087264CE5258D1ED0AD7802C905F00AC9
06F004C907D005C6894CBE26,368
1350 DATA C909F00AC90AF004C90BD005C689
4CCF26C90DD005E6894CEC26C90ED007C68920
0027C6894CEC26A58A800D0,681
1360 DATA 8D01D0ADF02CF9FF003201027AD
1FD0C906D0034C9425AD04D0F003209227A20C
A000208726A588F0034C2227,412
1370 DATA 20FC274C102688D0FDCAD0FA60A9
00AA9D00069D8006CAD0F760A228A00CD004A2
E4A05FA9064C5CE4A68BA017,54
1380 DATA B18C9D800688B18C9D0006CA8810
F160200027E68AA97D858CA924858DA906D00F
200027C68AA94D858CA92485,116
1390 DATA 8DA9048D00D2A90C8D01D220AA26
4C4F26200027A965858CA924858DA9028D00D2
A908D0E3A589C941D003C689,88
1400 DATA 60A589D002E6896020A126A9FF8D
FC02AD1FD0C903D0F94C9B2620A126A9798D00
D2A9A68D01D2A200A0002087,599
1410 DATA 26A9608D00D2A9798D02D2A9AA8D
01D28D03D2A280208726A9518D00D2A9608D02
D2A9AC8D01D28D03D2A2C020,88
1420 DATA 8726A93C8D00D2A9518D02D2A9AE
8D01D28D03D2208726208726A9008D01D28D03
D2AD1FD06A9005AD8402D0F5,205
1430 DATA 4C9425A9018588A90F8590A9FF8D
00D2E5908D02D2A95908D01D269C08D03D2C690
A214208726A590D0E1A99585,101
1440 DATA 8CA924858D20AA26A21E208726A9
AD858CA924858D20AA26A208726208726208726
A9008588A965858CA924858D,766
1450 DATA A90185894CAA26A900A078915888
C04FD0F960A58AC92FD003E68A60C9C4D002C6
8A60A588D06EA5894A4A4A4A,614
1460 DATA D004A201D001AAE687A5878D05D4
C910F005CAD0F2F051A9008D05D48587AD3D24
1869288D3D249003EE3E24A5,946
1470 DATA 8FD026AD3E24C935D031AD3D24C9
A0D02AA9308D3E24A9008D3D24E68EA58EC90A
D018A901858FD012AD3E24C9,127
1480 DATA 3AD00BAD3D24C950D004A9018588
E680A580C906D02AA9008580E681A581C90AD0
1EA9008581E683A583C90AD0,753
1490 DATA 12A9008583E684A584C906D006A9
008584E686A057A206B5801869D09158C8CAD0
F54C5FE40032333435360000,890
1500 DATA 00A9C000000000D1D200000000D1
D2001B46000000004546000000000000000037
38393A3B3C3D004142434422,31
1510 DATA 2300D60000000000D61D1E1F2021
00004748494A00000000000000004546000028
292A2B000000252627000000,358
1520 DATA 000000000000000028292A2B000000
00294000000000004748494A2C2D2E2F303100
0000000000000000000000,198
1530 DATA 002C2D2E2F303100004142434400
0000004B4C4D002940000000000029400000
000000000000000000000022,215

```

```

1540 DATA 232400451C000000000000004E4F
5041424344004546004142430000D4D5800000
00D4D5000000252627474849,531
1550 DATA 4A000000000000001A1B1C000000
4748494A451C00002940D700000000D70000
0028292A2B00001A1B1C0000,855
1560 DATA 00001D1E1F202100222324004748
494A41424344000000000000002C2D2E2F30
311D1E1F2021000000000000,105
1570 DATA 00000025262728292A2B00000000
0000000000000000000000002940000022
2324000001B1C0000454600,789
1580 DATA 2C2D2E2F30310000000000000000
00000001B4600004142434400252627000047
48494A4748494A00000000D1,334
1590 DATA D200000080D1D200000000004748
494A0000000022232400000004B4C4D003233
3435360000006000000000,188
1600 DATA D6000045460000294000001A1B1C
00252627004546004E4F503738393A3B3C3D00
000000000000000000474849,839
1610 DATA 4A414243441D1E1F202100000047
4849000001A1B1C00000000029400000000
000000000000294000004B,916
1620 DATA 4C4D00000028292A2B00000001D
1E1F20210000004142434400000000000000
0041424344004E4F5000002C,203
1630 DATA 2D2E2F3031000000323334353600
0000000045460080D1D20000000D1D2001B
460000000022232400002940,366

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Listing 2.
BASIC for alternate ski slope.

```

1490 DATA 12A9008583E684A584C906D006A9
008584E686A057A206B5801869D09158C8CAD0
F54C5FE4001A1B1C0000000,711
1500 DATA 4546000000000000000000000000
00002940000000000000002223240000001D
1E1F202100004748494A2940,610
1510 DATA D4D500000000D4D5000041424344
004546000000002526270000000000000000
2940000041424344D7000000,565
1520 DATA 0000D70000000000004748494A32
33343536000000004B4C4D0000414243440000
000000000000000000000028,864
1530 DATA 292A2B000000003738393A3B3C3D
0000004E4F5045460000002223240000000000
00000000002C2D2E2F303100,156
1540 DATA 001A1B1C00000000002940000000
474849A000025262700000000000000000000
004B4C4D0000001D1E1F2021,129
1550 DATA 0000004142430000451C00004546
0000002940D4D500000000D4D500004E4F5000
000000000000001A1B1C0000,836
1560 DATA 00004748C9A4A474849A00C1C243
44D70000000000D7A9C0000022232400454600
001D1E1F202100000000A8A9,593
1570 DATA AAAB00002223240000000000000000
00004142434400252600474849A2940000000
00000000ACADAE2F30310025,475
1580 DATA 2627000000000000000022230000
29400000000000004142434400222324000000
000000000000000000000000,97
1590 DATA 0000C5C600252627414243440032
33343536000000002526270000222380D1D200
000000D1D2002223474849A,640
1600 DATA 292A2B000000003738393A3B3C3D
0045460000294000252600D60000000000D600
00252627002C2D2E2F303100,312
1610 DATA 1B4600000028292A2B474849A41
424300000000000000000000001A1B1C0000
282940000000474849A0002C,623
1620 DATA 2D2E2F3031004B2300000000001B
460000000000001D1E1F2021004142434400
28292A2B0000001B46000000,749
1630 DATA 00252627222300474849A222324
000000000000000000004B4C4D2C2D2E2F3031
00474849A28292A2B000025,327
1640 DATA 2600000000002526294000D1D200
000000D1D24E4F5000451C00001A1B1C00002C
2D2E2F303100000000004B4C4D,305
1650 DATA 0000414243C4D60000000000D629
400000474849A1D1E1F202100000000004B4C
4D0000004E4F502223240045,316
1660 DATA 4600000000000041424344000000
0000004546000028292A2B004E4F5000000000
0000252627474849A000000,598
1670 DATA 0000000000000028292A2B474849
4A2C2D2E2F30310000002940004B230000004B
4C4D00454600000000000000,915
1680 DATA 002C2D2E2F303100001A1B1C0000
001B46004142430025262700004E4F00474849
4A000000D1D20000000000D1D2,97
1690 DATA 0000001D1E1F202100474849A000
0000000000A8A9AA00000045460000000000D6
0000000000D6004546000000,926
1700 DATA 22232400294000001B46000000AC
2D2E2F3031474849A0001A1B1C000000000000
004748492940002526274142,577
1710 DATA 4344474849A00000454600002940
00000000D1D1E1F202100000000000000004142
434428292A2B00001A1B4600,956
1720 DATA 0000474849A4142434400323334
35360000000000000000000000002C2D2E2F
30310047484900000000001B,294
1730 DATA 1C000000003738393A3B3C3D2940
222300D1D200000000D1D200000000292A2B00
004B4C001D1E1F202100A8A9,637

```

```

1740 DATA AAAB80000000414243252600D600
00000000D62223242C2D2E2F3031004E4F0000
1B460000ACAD2E2F3031004B,55
1750 DATA 4C4D002940000000000000000000
2526271A1B1C00002223240000474849A2829
2A2B000000004E4F50414243,504
1760 DATA 4445460000000000000000D1D1E1F
20210025262700000000002C2D2E2F30310045
4600004B4C4D00474849A29,957
1770 DATA 4000000000000000000000C5C600002940
000000002940002940000000474849A0004E4F
502940000041424300000000,561
1780 DATA 0000C74849A4142434400004142
4341424344001A1B1C0000222324414243441A
1B1C00D4D500000080D4D500,220
1790 DATA 4B4C4D2223240000002940000000
1D1E1F202100252627000000D1E1F202100D7
0000000000D7004E4F502526,824
1800 DATA 2700004142434422232400004546
000000002940000000000000000000000000
00001A1B1C00000000000000,559
1810 DATA 000025262700474849A00004142
43440000000000000000000000D1E1F20
2100000000000000000000,384

```

(Assembly listing starts on page 83)



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CIRCLE #121 ON READER SERVICE CARD



MUDPIES

by Philip McKenzie
and Jeff Sorenson

MICHTRON

576 Telegraph

Pontiac, MI 48053

(313) 334-5700

520 ST w/RGB monitor \$29.95

by Arthur Leyenberger

Do you remember the first video game you ever played? The excitement, the action, the awe of seeing the results of your joystick movements right on the screen, in living color?

Regardless of what hardware you had when you first experienced a video game, you'll instantly feel comfortable with **Mudpies** by Michtron. Yes, the first arcade-style game for the Atari 520ST will bring back those exciting memories of your early video-gaming days.

There's a certain amount of debate over what game was *really* the first out for the new 16/32-bit computer. It's a toss-up between **Hex** by Mark of the Unicorn (reviewed in issue 36) and **Mudpies**. Although **Mudpies** was the first game that I was able to get my hands on, we won't debate the issue here. Nonetheless, **Mudpies** was number one on my ST, and it ranks as number one for me.

Mudpies was written by Jeff Sorenson and Philip McKenzie. It was originally produced for the Sanyo computer, but, having been written in C, it was quite easy to port to the ST. Anyway, enough of the formalities: what is this game all about?

You are Arnold, a mischievous boy with a wacky sense of humor, who hap-

pens to be visiting a circus. Arnold finds out that the circus isn't quite what he expected. He quickly gets bored with the circus clowns and decides to have a little fun by tossing a mudpie at one of them. Well, this is where we come in. We get to see that the clowns don't think it's very funny. Before you know it, the air is full of mudpies.

There are clowns everywhere. If Arnold happens to touch one, it knocks him down, then the first aid fellows come out with a stretcher and carry him off to the first aid tent. Arnold also has to avoid the juggling pins that the clowns keep throwing at him. Your only defense is to hurl mudpies at the clowns and get the heck out of there. Points are awarded for each clown that's hit.

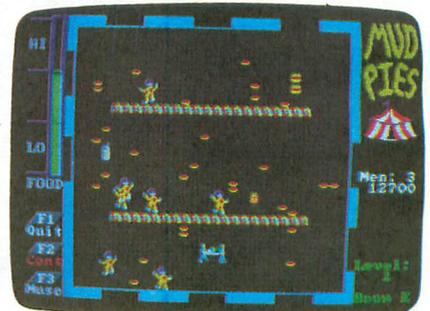
It's bad enough trying to avoid the clowns, throwing mudpies and all that, but Arnold's a hungry guy. The only way to keep him moving is to eat junk food that's available at various places (it's only fitting that there be junk food at the circus).

The food is displayed on-screen in a very clever way—there are little pictures of McDonald french fries (large), milk shakes, hamburgers and candy.

At the left side of the screen is Arnold's food level. If his level drops below 100, he slows down, because he's hungry and running out of energy. How-

ever, if Arnold eats too much, he also slows down. Like you and me, Arnold feels a little sluggish if he happens to eat too much.

When Arnold is too hungry or too full, his speed is half of what it normally is, and it becomes very difficult to get out of the way of those juggling pins.

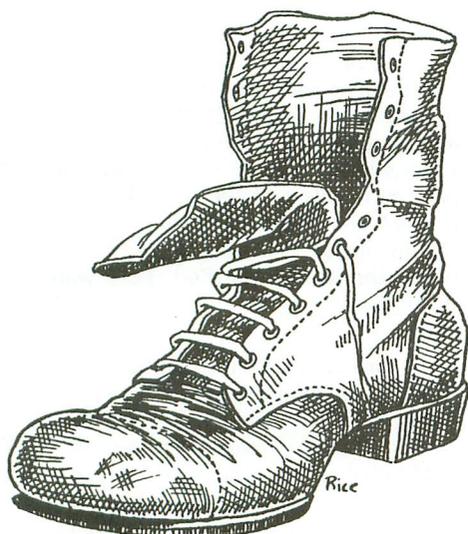


Mudpies.

The object of the game is to complete as many rooms as possible and score points. There are six main rooms into which Arnold can run. He'll leave a room only when he reaches a completely open door.

Fortunately, Arnold is allowed to leave a room carrying a mudpie, enabling him to be ready for those clowns as he enters the next room.

(continued on page 75)



Boot Camp



by Tom Hudson

In our last **Boot Camp**, we looked at a simple example of using CIO to examine the keyboard and return the ASCII value of the key that was pressed. This issue, we'll begin looking at the finer points of keyboard data entry, including error-trapping and the printing of error messages to the screen. As you can imagine, the knowledge of the process is essential to most advanced machine language applications.

Record or character?

As we've seen in previous **Boot Camp** installments, the Central Input/Output (CIO) system of the 8-bit Atari computers is designed to receive text input in two different ways: characters and records. With character I/O, the system gets or puts one character at a time. We used this type of input in the last **Boot Camp** (issue 34), when we accepted characters from the keyboard and changed the screen color accordingly.

This issue's **Boot Camp** will show how to accept data from the keyboard in records. These are strings of characters terminated with the ATASCII End-Of-Line (EOL) character, which has a value of \$9B. We'll also see how to output records to the screen. This is perhaps the most important I/O operation, since without it, the computer wouldn't be able to communicate with the user.

All the I/O in this installment of **Boot Camp** will be the record format, using CIO's two record I/O operations, GET RECORD and PUT RECORD.

GET RECORD review.

In order to input records, the computer must have three pieces of information in addition to the Input/Output Control Block (IOCB) number. These are shown below.

The most important piece of information for the GET RECORD command is the command byte, which is placed in ICCMD. For GET RECORD, this byte is \$05.

Since CIO is going to be reading data into memory, we'd better tell it where it's supposed to put the data record. This address is supplied via the IOCB's ICBAL and ICBAH variables, which hold the low and high bytes of the input data buffer's address, respectively. It is *absolutely essential* to set this address before you call CIO, or CIO will read the data into whatever address is in these bytes, merrily wiping out screen memory, the system variable area, the stack, or (gasp!) your program! 'Nuff said.

People sometimes (all too often, actually) make mistakes, so the third critical parameter is supplied in order to avoid the problem of reading too many characters into memory on the GET RECORD command. Obviously, the GET RECORD command is intended to read a group of characters, terminated with

an EOL, into memory, but the program has no way of knowing beforehand how many bytes will be contained in the string.

The string could be 40 characters, 0 characters (just an EOL), or all the way up to 65536 characters. If you were expecting a 40-character string, and the string you received was 65536 bytes long, it could clobber huge pieces of your program, data, screen, and so forth — thus making you look like a pretty pathetic example of a machine language programmer!

Fortunately, the third parameter of the GET RECORD command allows you to tell CIO the maximum length of a record read by the GET RECORD operation, potentially saving your reputation. To use it, simply place a 2-byte character count into the IOCB parameter bytes ICBL and ICBLH (Buffer Length Low and Buffer Length High) before calling CIO.

Potential problems.

A wise man by the name of Murphy once stated that "if anything can go wrong, it will." Mr. Murphy must have been a computer programmer, because this statement has been proven an untold number of times in the computer industry. Don't get caught assuming the person entering the data won't make mistakes. You and I both know we never make mistakes, but those "other" people out there can't be trusted as far as

Boot Camp *continued*

you can throw them. Examples coming right up!

Example #1: Martha, the data entry person, fatigued after typing for eight hours straight, was in a hurry to finish the Jones account report on a custom program written by Fred, the careless programmer. Her fingers flying and flapping over the keys with blinding speed, her right pinkie made a one-centimeter error, striking the BREAK key instead of the RETURN key. Fred's careless programming failed to handle the BREAK key properly, and eight hours of nonstop typing instantly made its way to ATAS-CII heaven.

Example #2: Freddy Fruegle, 8-year-old boy wonder, had just finished his first machine-language word processing program on his Atari 130XE, and proceeded to type like mad on his 80-page nuclear physics term paper, due the next day. At 6 a.m., his 320,000-character essay (average sentence length: 287 characters), outlining obscure physical properties of energy plasma, was complete.

He proceeded to print out the masterpiece, only to find that each sentence had been chopped off at five characters! Freddy may have been just eight years old, but his mastery of verbal obscenity was matched only by his 200+ IQ.

As you can see in the above examples, untrapped errors in machine language programs using CIO can result in some heartbreaking experiences. This doesn't have to happen, though, as we'll soon see.

BREAKing away.

In the case of Martha, Fred, the careless programmer, obviously failed to handle the BREAK key properly.

When CIO is accepting data from the keyboard, it reads characters until the RETURN key is pressed (generating an EOL) or the BREAK key is pressed. If CIO encounters the BREAK key, a special error condition (error number 128, BREAK key abort) is generated and returned to the program in the Y-register. Whatever Fred was doing, he handled the BREAK incorrectly and blew away hours of effort. Whenever you're handling keyboard input, it's absolutely essential to test for the BREAK key abort error after the CIO call, and handle it properly.

If the BREAK key abort *does* happen, you should detect it by testing the Y-register for 128 (\$80) and report the *problem to the user*. The input buffer will contain text entered to that point,

but will not have a terminating EOL character. After telling the user that the line was lost, return to the input routine to try again.

If the BREAK key isn't used to stop a scrolling listing or to perform some other function in your program, you can "mask" the BREAK key interrupt by performing the following set of instructions at program initialization time and each time the graphics mode is changed:

```
POKMSK = $10
IRQEN  = $D20E
;
LDA POKMSK
AND #$7F
STA POKMSK
STA IRQEN
```

This code changes the IRQ enable control register, so that the BREAK key is completely ignored. This will prevent the BREAK key abort error from occurring. The high-order bit of the IRQEN register controls the BREAK key interrupt, and when this bit is turned off (with the AND #\$7F instruction), any presses of the BREAK key are not detected by the system.

Truncated lines.

Freddy Fruegle's despair could have been prevented if he had simply taken two simple steps when programming his word processor.

First, he accidentally forgot to set the input buffer length (ICBLL and ICBLH) to the maximum line length his program was to accept. Apparently, buffer length had previously been set to 5 bytes, and CIO, assuming that the input buffer was only five characters long, diligently ignored all characters after the fifth one entered!

Second, Freddy's program ignored the errors returned by CIO each time a line longer than five characters was entered. Every time this happened, CIO returned an ERROR 137 (\$89) in the ICSTA variable and the 6502 Y-register. Had Freddy been thinking properly, he would have had his program examine the Y-register upon return from CIO and print a message warning him about the truncated input. See what careless programming can do? If anything can go wrong, it will, but CIO gives you the chance to recover without undue effort.

This issue's program.

The example program in this issue illustrates the principles I've been talking about and demonstrates how to set up and print prompts and error messages. Briefly, when executed, the program opens the keyboard for input, accepts

text records from it, and exits with a BRK instruction if an End-Of-File (EOF) is detected.

An EOF is generated on the keyboard by pressing CTRL-3 (CTRL and 3 keys at the same time). After each line of text is entered, the computer prints the line back to the user. If the BREAK key is pressed, the program will alert the user. If a line longer than 40 characters is entered, the user is notified. Let's walk through the program and see how it works.

Lines 110-200 set up the equates for the system variables we'll be using. COLOR4 is included so that, in the event that we can't print text, we can change the color of the screen to indicate the error. Failure to print text will usually only result from the screen editor (device E:) not being opened properly. Assuming you are using a debugger such as **ANALOG Computing's H:BUG** or the Atari Assembler Editor cartridge, IOCB #0 will always be open as the screen editor, ready for your use.

Line 240 sets the start of our program at \$6000, since this program is too large to fit on page 6 of memory (\$0600-06FF). If you have less than 32K of memory, you'll have to change this line to a safe area of memory (about 512 bytes).

Line 280 clears the decimal mode (never, never forget this instruction if your program is going to do any math operations).

Line 290 begins the set of instructions that opens the keyboard (K:) for input. This line loads the X-register with \$10, indicating the IOCB #1 is to be used for the keyboard.

Lines 300-310 set the CIO command byte to \$03, the OPEN command, once again getting ready to open the keyboard.

Lines 320-350 point the IOCB buffer address to the keyboard device string, KEYBD, defined at Line 1760. This string indicates that the device we want to open IOCB #1 for is the keyboard (K:).

Lines 360-390 set the IOCB auxiliary bytes for the open. ICAX1 is set to \$04, telling CIO that the keyboard is to be opened for input, and ICAX2 is set to 0 (has no function for the keyboard device handler).

(continued on page 72)



PANAK STRIKES!

Reviews of the latest software

by Steve Panak

As I write this, I've just finished my first session with the 520ST . . . and I have the answers to the questions on everyone's lips: What games can I play on this new marvel? Can I play games on the 520? The answer to both is a resounding yes! But first, a little about the 520.

The thing was simply marvelous. This was the first time I'd gotten hands-on experience with a Mac-type system, due to the mystique many high-price computer dealers prefer to enshroud their merchandise with. I was immediately impressed by the ease with which the menus were manipulated using a mouse. It quickly became apparent that this was equivalent to an under-\$1000 Macintosh (less than \$800 with mono-monitor).

There are drawbacks, which must be taken with a grain of salt, as everything has bad points. Nothing is *all* good. A sunny summer day is too hot, chocolate is fattening and causes acne, and the 520 has limited software.

Anyone familiar with the industry knows that this problem plagues the Mac, as well. And anyone familiar with the industry should also know that the Atari line, as a whole, has always had good software support. While software has been geared toward the low-budget, nonbusiness home user, this trend was created by the design of the product line

itself, spawned of a limited memory—a problem being rectified by the ST line. If the machine is a business success, games usually follow. Only time will tell, but I feel that once the ST catches on, software will be plentiful. This brings me back to the reason behind my rambling: *What about games for the 520ST?*

Starting in a couple of months, ST game reviews should begin cropping up regularly. I'm particularly interested in how a couple of Atari arcade conversions (especially **Centipedes**, my favorite) are to be handled. Could we finally be at the point of real arcade action in the home? Stay tuned to find out.

SUPER ZAXXON
SEGA
360 N. Sepulveda, Suite 3000
EI Segundo, CA 90245
48K Disk \$44.95

It seems that 800-compatible software has finally hit the bargain bin, joining the 2600 games, as well as those for oth-



er systems which have since met the great mainframe in the sky. However, some software manufacturers have failed to foresee this glut and have continued to pump out high-priced arcade conversions, often without much care as to how well the conversion's done.

Such seems to be the case with **Super Zaxxon**.

Just what is wrong with this game? Everything. Graphics were cheap, not nearly as distinct as even the ColecoVision version of the game. Evidence of this is seen in fact that the outside of the package displays, not pictures of the graphics, but an artist's rendition of what they'd like the screens to look like. The indistinct forms made it very difficult to gauge relations between the screen objects, with the result being undeserved fiery impacts against the enemy obstacles. Also, the action seemed to move very slowly, when compared to the arcade version.

For those of you who aren't dissuaded by the above-mentioned problems, you may want to know that it's set up like the arcade version (although I've never played **Super Zaxxon** in the ar-



PANAK STRIKES! *continued*

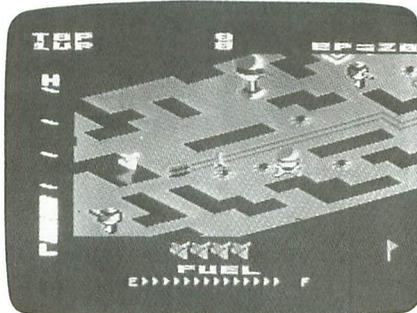
cade, I have had some experience with **Zaxxon**).

Using your five spaceships, you repeatedly attempt to pass through three screens, on your way to the **Super Zaxxon** Dragons. Each screen has an altimeter bar along the left side and a fuel indicator along the bottom. Other indicators show the number of ships left to destroy, your remaining ships and your current level.

The first screen is the Space Fortress, which I found quite similar to **Zaxxon**. Keeping away from enemy fire, you swoop along the landscape, knocking out cannons, radar towers and enemy planes, while avoiding the dreaded force fields.

The second is much the same, but you will fly at a lower altitude as you move through the "Tunnel." Enemy planes and minelayers try to destroy you, while you try to eradicate eighteen of them for a bonus.

The final screen is the Dragon Fortress, again similar to the first, except with more enemy fire and force fields,



Super Zaxxon.

and, of course, three dragons. Six hits are needed to destroy each of these. If successful, you continue on to the next level, where you encounter more of the same.

The manual is the typical Sega manual, short and concise on instructions,

long on advertising for other games. Scoring is similar to the arcade version.

So, while I can't recommend this game—except perhaps as fuel to warm your home during these cold winter nights—there are, no doubt, some fans of the arcade version who will buy and actually like **Super Zaxxon**. What can I say, except that fanaticism has no rational basis?

TAPPER

by Bally/Midway
SEGA

**360 N. Sepulveda, Suite 3000
El Segundo, CA 90245
32K Disk \$39.95**

There are few arcade games with which I'm not completely familiar. My first exposure to **Tapper** was in an Akron bowling center, when a couple of us snuck into a pro bowling tournament. We got to meet the champion before we

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were thrown out into the gutter, but that's another story.

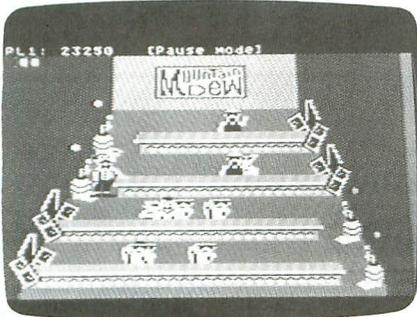
My second exposure to **Tapper** came courtesy of the TV atrocity called **The Video Game**. Apparently, what happens here is that a TV crew goes to an amusement park when the temperature is hovering just above the boiling point of asphalt, and they offer the crowd (who each paid between \$15 and \$20 admission) the option to broil or to watch some idiot TV game show.

The survival instinct—inbred eons ago—urges them in, because it certainly isn't the prizes (video game watches). Once this captive audience is assembled, it is forced to watch some of its members compete to the death on various video games.

Fortunately, **Tapper** is superior to **The Video Game**. But then it'd almost have to be. In **Tapper**, you're a bartender who must keep the never-ending flow of thirsty customers well watered.

You must fill mugs and sling them to customers, as they move down the bar toward you. You cannot allow them to reach the end of the bar. You must also catch and refill any mugs the unquenchable hoard hurls back to you. You'll have to leave your post to grab a tip for extra points, but upon your grabbing the tip, three dancing girls appear.

At this point, the crowd, a bit more lecherous than thirsty, turns to watch the girls. If you sling brew while their backs are turned, it will hit the ground and you'll lose a life. In fact, it seems you're cursed with a rather strict boss, for any property damage or crowd displeasure will cost you a life.



Tapper.

There are five game screens: the Old West Saloon, the Jock Bar, the Punk Bar, the Space Bar and the Bonus Round. In each of the bars, the action is similar (as outlined above), while the bonus round is a little different. A bandit appears and shakes up five or six soda cans, and, in

a variation of the old shell game, you must choose the nonexplosive can. A correct choice nets you 3000 bonus points, while the incorrect choice soaks you with suds.

Upon finishing in each bar, you progress onward to the next. There are three levels of play, which vary in difficulty and number of lives awarded.

The graphics in this game were acceptable, and the action was adequately controlled with the joystick. Documentation is similar to that described above for **Super Zaxxon**. I found this to be a little more entertaining than **Zaxxon**, probably because of the novelty of it—like first seeing a new game in an arcade and wanting to try it out. As for long-term prospects, **Tapper** is all tapped out.

THE FINAL LEGACY

by Chris Horseman

and Dan Oliver

ATARI

**1312 Crossman Ave
Sunnyvale, CA 94088
16K Cartridge \$19.95**

The year is 2051. The location is the Dead Zone. The game is **The Final Legacy**.

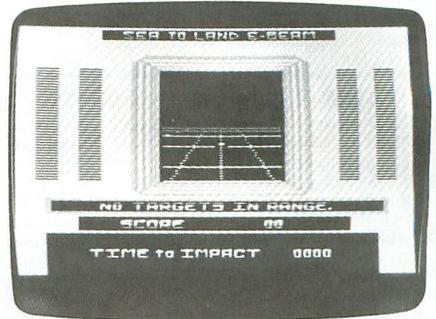
A little over fifty years ago, the warmongers of the East and West launched their final, apocalyptic volley of weapons at each other, vowing that there would be no survivors. Truly a case of less-than-responsible elected officials.

However, once again, the bumbling government bureaucrats erred, and a few survivors, the Patriarchs, sought refuge in one of the only habitable areas left on Earth, Antarctica.

This peaceful retreat is shattered by radio transmissions from the Dead Zone. Ancient computers, programmed by the Warmongers to complete a war ended decades ago, are targeting the cities occupied by the Patriarchs. Their only chance is to knock out the missile installations which are threatening their existence. You are sent to protect this war-weary bunch, in command of a newly armed battleship, the *Legacy*.

In *Legacy*, you must sail to the missile sites, knocking out enemy ships at sea with torpedoes. Once you've arrived at the sites, you use sea-to-land missiles to destroy the bases. Finally, you must defend the Patriarch cities from incoming missiles, using your own sea-to-air plasma beams. Each battle mode utilizes a different screen, and each screen is finely detailed.

The navigation screen shows your relative position against the enemy missile sites. Using this map of the world, you navigate to your destination, either enemy targets or home bases, for defense or refueling.



The Final Legacy.

On the way, you may encounter any of a number of enemy ships, which you must sink before they sink you. There are three varieties of ships: war, hunter and intelligence. The first is the deadliest, and, if you manage to sink it, your damage will decrease by 5 percent. The hunter ships are less powerful than war ships, while the weakest intelligence ships, if sunk, may uncover hidden missile bases.

Once you've arrived at an enemy target, you strafe the missile bases, using the joystick to position the cross hairs on the desired target, and firing with the fire button. However, once threatened, these warmongers retaliate.

When you hear the alarm buzzer, you know that your cities are being attacked. You'll have to rush back to defend them against the incoming missiles, using the sea-to-air battle mode. You have to cut down the incoming bombs as they circle toward you.

Generally, the graphics were good, much better than most Atari cartridges. Also, the idea itself was very original—unusual for any game. The manual is the typical Atari leaflet, with eight pages which thoroughly explain the game and also give hints and strategies. There are six levels of increasing difficulty to challenge you.

One distinguishing feature of this game is its capability to toggle between screens. This is easily done by pressing the SPACE BAR to enter the command mode, then using the stick to highlight the mode you wish to enter. *Overall,*

(continued on page 49)



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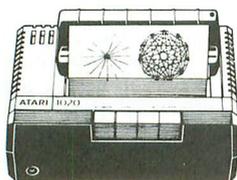
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CIRCLE #124 ON READER SERVICE CARD



PANAK STRIKES! *continued*

control of the game is sure and swift, especially if you use the optional Trakball.

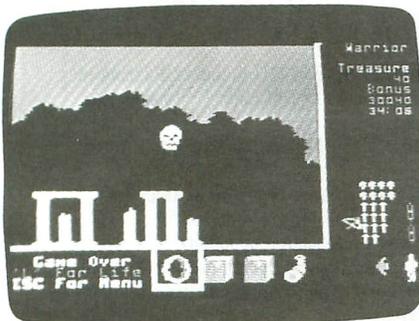
The **Final Legacy** is one of the most original games I've seen in a long time, a real surprise coming from Atari, which is usually content to put out only old arcade conversions. I've heard that this game has been available for some time on a bootleg disk, but now it's available to all, and I recommend it highly.

GEMSTONE WARRIOR

by Peter Lount
and Trouba Gossen
SSI

883 Stierlin Road, Bldg. A-200
Mountain View, CA 94043-1983
48K Disk \$34.95

D&D-type adventures have become almost a dime a dozen, and I thought long ago that the industry had milked this theme of all its potential. A lack of imagination had turned a worthy game format into a simple formula (take three trolls, add five skeletons and a pinch of magic, and serve to the adventurer). Again, and happily, I am proven wrong.



Gemstone Warrior.

Gemstone Warrior from SSI is the latest game I've tested which combines the infinite variation of a good D&D campaign with the tense action of an arcade classic. What's better, though, is that **Gemstone**, not content to rehash old methods, boldly goes where no game has gone before.

Unfortunately, the theme is familiar. But then, how could it not be? All these games rely on the damsel in distress, hero to the rescue scenario. Here, the damsel is the magical **Gemstone**, a gift from the gods to man. However, the evil ones, not content to fester in their underworld prisons, conspire to obtain the stone and convert its power to suit their own evil whims.

Upon finding that only man can harness the good within the stone, they—

in a wasteful display of their infinite evil—destroy the **Gemstone** so that no one can use it, ever again. However, they are only able to shatter it into five pieces, which they secrete in underground caverns. To make matters worse, they create hordes of evil, mutant monsters, to guard the sacred shards from anyone foolish enough to venture underground.

And you, fool, dare to venture down.

Gemstone shows just how a complex game can be made simple to use—if enough time is taken in designing it. Control is divided into four phases: movement, attack, inventory and the all-encompassing "other." A well-designed reference card helps the novice player use the keyboard and joystick to move about, fire weapons and inventory valuables.

Once you've become accustomed to the game, you may wish to switch to expert control. This places the most often used commands on the stick, although it's unlikely that you'll be able to calmly sit back and play this game.

Simply stated, the screen is superb. The upper left three-quarters of the display shows your position in the current "room." This scrolls smoothly as you move about, and when you hit a portal, you dissolve into the next area.

The bottom and right-hand margins of the screen provide information to keep you on top of the game during every moment of play. Graphically displayed are various inventories (yours or the treasures found in a search), the weapon you are using, as well as the amount of firepower you have, and various scoring displays showing points acquired and time elapsed. Of course, the life bar—which diminishes with every successful attack against you—is always shrinking, a constant reminder for you, of your own mortality.

The graphics are excellent, with no difficulty in discriminating between various items and creatures. Control is sure and quick, once you get used to it. What adventure game would be complete without magical items? Again, **Gemstone** does not disappoint. Fifteen magical items can be found and used, each with its own known or unknown magical power.

Other options allow you to save a game, redefine the keyboard, freeze the action or turn the sound off. High scores are saved and can also be wiped out, should you be beaten by what you consider to be an inferior warrior.

The manual is complete and more

than fleshes out a fine game. It gives background information and describes the creatures, allowing you to better visualize them as they creep toward you. This allows you to exploit them to your own advantage. The hydrogen plant, for instance, reacts as hydrogen usually does when exposed to flame, with a negative result to all who are near it. Tactical decisions abound.

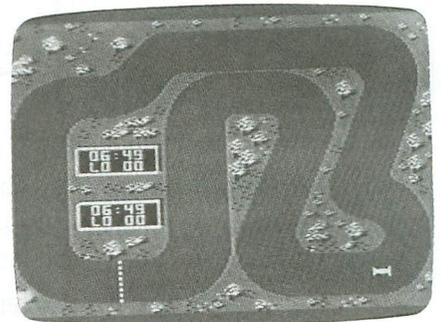
Gemstone Warrior is a fine game, both for the first-time adventurer and for the experienced player. Its user friendliness makes a complex simulation easy to learn and a joy to play. It's truly a gem.

ON TRACK

by Ed Ringler, Scott Orr,
John Cutter and Dan Ugrin
GAMESTAR, INC.

1302 State Street
Santa Barbara, CA 93101
48K Disk \$29.95

When I was young, I didn't have a computer. It wasn't that I was deprived—everyone was. They just weren't around yet. I guess I'm a relic, but I got by.



On Track.

One thing I did have, though, was slot car racing. It was a reasonable substitute that provided hours of enjoyment. The thrill of racing from the safety of an overstuffed chair. Well, for the computer generation, slot racing has been reinvented, but with disastrous results. It seems that they'll try to cram anything onto a disk.

On Track is a simulation of model car racing. My recommendation is to put the purchase price toward the real thing. Not the small HO scale version, with wall-huggers that won't leave the track even when inverted. No, get the old-fashioned big cars, with woven wire pickup brushes which stink of hot electricity (like amusement park bumper cars) as they streak around the track.

(continued on next page)



PANAK STRIKES! *continued*

Enough of this raving; here's what's wrong with this program, in order of importance.

One: graphics. As a single descriptive word, *poor* would be a compliment. The cars are small and nondescript; the track itself, colorless. I seem to remember a game like this from Atari way back in the beginning. I think it was called **Indy 500**, and four players raced simultaneously. It was a good game—about seven or eight years ago—but thousands of them (if they still exist) are gathering dust and cobwebs somewhere.

Two: control. Really poor. The joystick seems unresponsive to your wishes, as your car continuously leaves the track. No doubt you'll get used to it, but why bother?

I hesitate to describe the game fully, for fear someone will like the features it seems to have. Just bear in mind that they're more than outweighed by the two faults listed above.

You can race against the computer or a human opponent. You first pick a driver; this sets parameters which control you. Some drivers are better at braking, others at handling or acceleration.

You can choose automatic or manual (two-speed) transmission. Using the joystick, you steer and brake your car. Acceleration is automatic—forward and back on the stick shift. You choose from ten raceways, all in either a paved or slippery dirt mode. Also, you can race a set number of laps or against the clock.

The manual is cheap, although it does

explain the program fully. It also proclaims that Total Track Graphics (trade marked) let you experience the essence of racing like never before. Not a chance. As I said earlier, get a real slot racing track, because, as a substitute, **On Track** is a wipeout.

That's it for this time around. Next month will bring, in addition to possible 520 games, an examination of some new Activision titles, which seem to signal a new turn in that company's products. 

I'd like to thank Perfect Computers of Barbarton, Ohio for their valuable assistance in the creation of this article.

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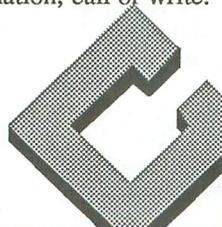
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CIRCLE #126 ON READER SERVICE CARD



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by **Andy Eddy**

Ever since the beginning of this "information revolution" we and our computers live in, we've tried to make the best of our time and money, to bring the most up-to-date features to our fingertips. Modems became affordable to the average consumer, and the characters on our screen then took flight across the web of telephone wires that span the nation.

Various bulletin boards and data retrieval utilities sprouted up, giving us access to the vast wealth of information that was available. But, through all this, the users of these impersonal services all agreed that there was one thing missing: interaction with one another.

These networks all served up something resembling a "citizens band" (CB) radio simulation, and many people who used these networks met through their keyboards and phones to discuss the latest in computers and other interests. The only evil left to conquer was the enormous cost of the on-line connection time.

Enter **People/Link**, a service that has brought affordable on-line interaction coast-to-coast.

In business since the beginning of 1985, **People/Link** has pulled over 2500 subscribers through its computers in Chicago. While they may not have tried to challenge CompuServe, The Source or Dow Jones for the top spot, they certainly have made an impact on the community by swaying some die-hard users from those services.

The main attraction to **People/Link** is its low cost. During nonprime time, which occurs Monday through Friday between 6:01 p.m. and 7:00 a.m., (determined by your local time), and all day on weekends and certain holidays, the rate is \$3.95 per hour at 300 baud, and \$4.95 per hour at 1200 baud. Because only 1 percent of system usage occurs during prime time (which falls between 7:01 a.m. and 6:00 p.m.), the rates for this period are higher; \$10.95 per hour

at 300 baud, and \$12.95 per hour at 1200 baud. As a novel idea, they also feature "happy hours" for 300 baud users, costing \$2.50 per hour, weekdays from 6:30 to 7:30 p.m., and weekends from 9:00 to 10:00 a.m.

Three mainframes, no waiting.

Crashes of the system haven't been totally avoided, but **People/Link** has taken steps to try to build up their reliability. To avoid the delays that occur on most on-line networks, they utilize three separate mainframes linked together to provide "nonstop" service.

The backup computer will take over in the event of a failure, and, in many cases, the subscriber will not even be aware of the foul-up. The worst that usually occurs is return to the main menu. All of this insures that the time you spend on-line will be free from unintentional "coffee breaks" waiting for an operation to load, which maximizes the CPU time your money buys.

Being a new service, there are many growing pains, but more and more of the planned services have appeared alongside the main features. The simple and easy-to-remember "slash" (/) commands will bring you to your destination directly from any prompt, and there are some interesting additions slated for the near future, many revolving around the Partyline feature.

Partyline is a real-time conversion service with a number of embellishments designed to improve upon previous efforts. Upon entering this mode, up to 100 "lines" are available, with summaries of the occupants' names just a command away.

The "bounce back" of your entries displays at the same time everyone else receives it, so you see exactly how fast the system works. You can shut off this "bounce" or suppress the echo while you type, to prevent seeing your entries appear on your screen twice.

Bothersome users can even be dealt with, through /HUSH and /MUFFLE commands. These prevent their dialogue from reaching your screen or yours from

being displayed on theirs. This cuts down on the mess that accompanies multi-user meetings. In addition, two users can use the /CHAT mode to pull away from the action for a more private discussion.

Most subscribers I spoke to on this service agreed that the most positive addition to Partyline was the /MSG feature, which allows you to send a message to any user, no matter where he or she is in the system, within seconds. If you want to give someone an important message, this command will send it over to them immediately and without disturbing the work they're doing!

Along with Partyline and the standard electronic mail services, **People/Link** has a full-fledged bulletin board service which can be used to post notices or advertisements, a users directory for locating other Plinkers (as they're called) with interests similar to your own, and even a /FIND command so you can see where various users are located in the system.

Once the menu commands have been mastered, the /ADV will bring you into an abbreviated menu mode which can avoid costly, time-consuming menu displays. Even if a menu has you stumped, the /HELP command at any prompt will give you advice toward your next move.

Coming attractions.

Many of the advertised features were missing at the time of my journeys into **People/Link**, but assurances that they would be forthcoming are promising. The service claims to have over forty clubs, which will be operated much like the SIGs (Special Interest Groups) on CompuServe. I was fortunate to be given a sneak preview of a club in development.

Each club is designed to have bulletin board forums for posting messages and discussion with each section devoted to a certain subject. Any message can be "quickscored," a feature taken from the "mail" service. All clubs will also be equipped with individual Partylines for

(continued on next page)



Review *continued*

conversation. An Atari club is in the works.

Another exciting offer is the prospect of color graphics on some of the games to be available soon. Certain contests will allow interactive conversation exchanges between players during a game.

Disappointments?

Through the use of Partyline, I was able to survey various users as to their gripes concerning **People/Link** and, surprisingly, found very few complaints. Many of these people were die-hard users of other networks, and the message came across loud and clear: for entertaining, inexpensive computer interaction, **People/Link** is hard to beat in its offerings and promises for future services.

Many of the people I spoke to felt that the problems they've experienced were either already resolved or being dealt with, and that this network really cares about the needs and wants of its users. This seems to be a refreshing attitude, but one that may be necessary for the

survival of the network. Missing is the data retrieval that supports many utilities, but **People/Link** states that among the services soon to be added will be uploading and downloading.

My experiences show this utility's main problem to be rooted in its youth. Certain commands work differently at varying locations in the system. In one segment, the CTRL-C will break the program you're running and take you back to the last menu you saw; at other times, it will bring you back to the main menu, which forces you to completely restart the function. Other documented control characters (of the few there are) don't seem to function as intended, if at all.

My main gripe is the newsletter that is sent to all subscribers. *Linkletter* appears to be focused on a teenage audience, even though the average age of its readers would be between twenty and forty-five. The humorous approach it takes makes it easy to read, but the information it passes along is sometimes hidden among the jokes. I'm hopeful

that, once the service gets to a larger audience, the newsletter will be a stronger tool.

These complaints are minor and, in time, should be handled. **People/Link** seems to have an attitude that concentrates on customer satisfaction, and they staff a toll-free number most hours of the day, to answer any of your questions.

The registration fee is \$29.95, with occasional discount offers available. To register or receive more information on **People/Link**, contact them at 1-800-524-0100 (1-312-870-5200 in Illinois).

If you have work or research to do, then any data-retrieval utility will do the trick, but for a little vacation from smoke-filled computer rooms, **People/Link** is an exciting change. **A**

*Andy Eddy works as a cable television technician, with a long-time interest in computers. While his family's 800 is three years old, he's been avidly playing since **Space Invaders** and is a former record holder on **Battlezone**.*

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CIRCLE #127 ON READER SERVICE CARD



Bank Switching for the 130XE

by Allan Moose and Marian Lorenz

When the Atari 130XE became available at our local computer store, we decided to purchase one. Not because we were unhappy with our "old 800," but, rather, we were eager to explore the things that could be done with an extra 64K of memory.

The thought of all that memory available conjured up a variety of ideas: now it would be practical to scroll graphic 8 screens; machine language routines could be stored safely out of the way; data generated by a program could be stored in the extra memory at lightning speed, to name a few.

In this article, we'll explain how to access the extra memory of the 130XE and demonstrate the concepts with a simple page-flipping program.

Dig in.

The memory of the Atari 130XE can be thought of as two blocks of 64K existing side by side, as illustrated in the schematic memory map shown in Figure 1.

The address bus of the 6502 is 16 bits wide, therefore, the maximum address value that can be put on the bus is 65535. This means that the additional 64K memory is not added on to the main memory, but is best thought of as four separate 16K sections that can be switched into and out of the "access window" at location 16384-32767 of the main memory.

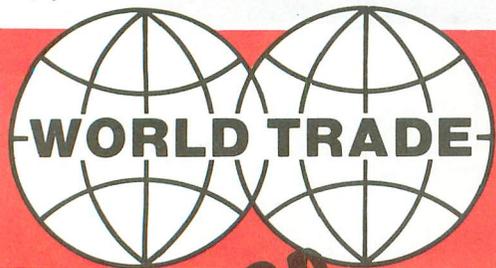
ACCESS WINDOW	MAIN BANK	EXTRA BANK	
	49152 to 65535	49152 to 65535	Bank 4
	32768 to 49151	32768 to 49151	Bank 3
	16384 to 32767	16384 to 32767	Bank 2
	0 to 16383	0 to 16383	Bank 1

Figure 1.

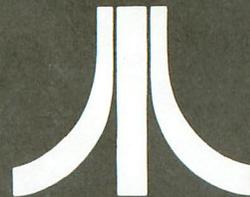
This implies two things: (1) if you switch in an extra bank, any information in main memory at locations 16384-32767 is *not* lost; and (2) the address numbers associated with the extra memory banks in Figure 1 are to help you visualize the memory structure, *but are not used in programming*. In other words, when you program, you don't have to worry about bank addresses—just the addresses in the access window.

Both ANTIC and the CPU can have access to the extra memory. Their access is controlled by the Peripheral Interface Adapter (PIA) Port B register at 54017. Port B of the PIA is used by joystick ports 3

(continued on page 56)



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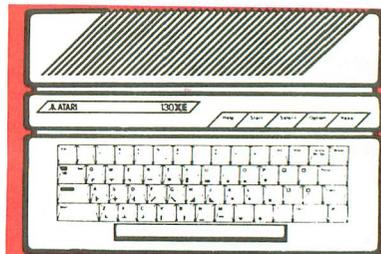
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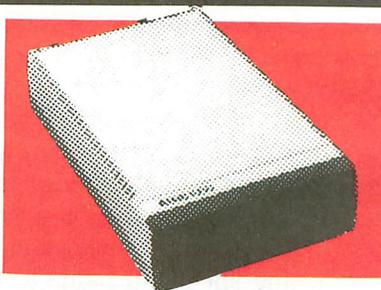
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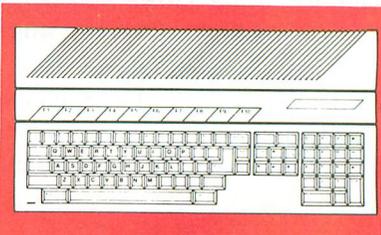
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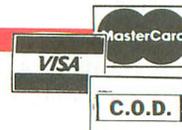
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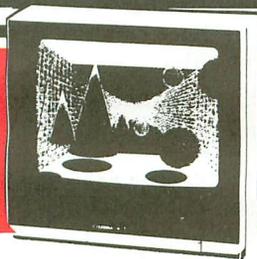
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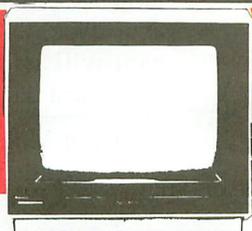
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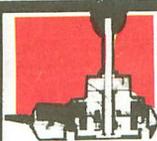
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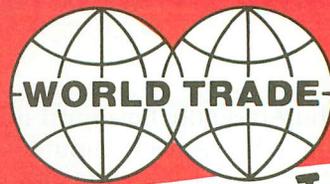
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Bank Switching *continued*

and 4 of the Atari 800, but, until now, has been unused by the other Atari computers.

Since ANTIC and the CPU can access the extra bank, either singly or together, there are four access options for the processors and, as indicated in Figure 1, four choices for which bank to use. How to select the options by setting bits in 54017 is summarized in Figure 2.

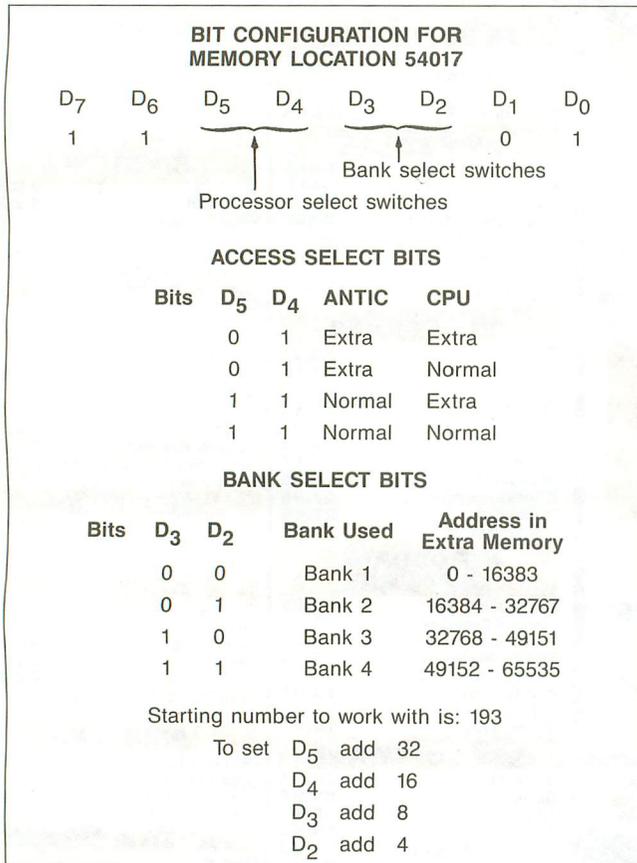


Figure 2.

On powerup, the value in 54017 is 241, and both ANTIC and the CPU "see" the main memory from locations 0-65535. From Figure 2, we can see that this corresponds to the bit configuration:

1 1 1 1 0 0 0 1

In this situation, the access window at 16348-32768 exists as normal memory. How does one go about changing the various banks and determining which processor has access to them?

Let's assume you want to have the CPU store something in Bank 1. In this case, you must POKE 54017, 225 (193 + 32 = 225). If, on the other hand, you want to give ANTIC access to Bank 2, then POKE 54017, 229 (193 + 32 + 4).

The demonstration program (Listing 1) accompanying this article uses banks 1 and 2 as screen memory for two different geometric designs. By allowing the CPU and ANTIC to "see" the access window, you can watch the flower and spiral being drawn.

After the designs are stored in memory, the CPU's access is turned off, and the display is flipped back and forth between the two banks, simply by changing the value in 54017.

The program illustrates something to keep in mind when using the extra memory. On powerup, the extra memory banks are not cleared out. For that reason, we included a short machine language routine—to clear memory in each bank *before* creating the display.

A word of caution.

Finally, it should be noted that bank switching is a technique that you can use with your 130XE and does not depend on which DOS version you use. However, if you use DOS 2.5 with a RAMDISK setup, you will wipe out the DOS files that are stored in the extra memory on powerup. **A**

Allan Moose is an Associate Professor of Mathematics and Physics at Southampton College in New York. He's been using home computers for research and recreation for four years, and has co-authored a book on assembly programming for Atari computers with Marian Lorenz.

Marian Lorenz is in charge of the Central Islip Public School's preschool program for handicapped children. A twenty-five-year teacher, she's been interested in computers for about three years. She has just purchased a 520ST and is learning its ins and outs.

Listing 1.

```

10 REM BANK SWITCHING DEMONSTRATION
20 REM FOR ATARI 130XE
30 REM BY ALLAN MOOSE/MARIAN LORENZ
40 REM (C) 1985 ANALOG COMPUTING
50 REM READ IN MEMORY CLEARING SUBROUTINE
60 FOR I=0 TO 17:READ ML:POKE 1536+I,ML:NEXT I
70 DATA 104,169,0,162,20,160,0,145,203,200,208,251,230,204,202,208,246,96
80 POKE 203,0:POKE 204,64
90 REM GIVE ANTIC AND CPU ACCESS TO BANK 1
100 POKE 54017,193
110 REM PREPARE OS AND ANTIC FOR DEMO
120 GRAPHICS 7:COLOR 1:POKE 708,88
130 POKE 88,0:POKE 89,64
140 DL=PEEK(560)+256*PEEK(561):REM LOCATE DISPLAY LIST
150 POKE DL+4,0:POKE DL+5,64:REM SET SCREEN ADDRESS
160 ? "K":PRINT "DIRTY MEMORY!!!"
170 FOR DELAY=0 TO 600:NEXT DELAY
180 PRINT "CLEARING OUT MEMORY!!!"

```

```

190 CLEAR=USR(1536):REM CLEAR OUT BANK
1
200 ? "K":PRINT "DRAWING A FLOWER IN B
ANK 1"
210 REM DRAW FLOWER ROUTINE
220 DEG
230 FOR S=0 TO 360 STEP 3
240 F=20*5IN(6*5):X=INT(F*CO5(S)):Y=IN
T(F*5IN(S))
250 IF S=0 THEN PLOT 80+X,40-Y
260 DRAWTO 80+X,40-Y:NEXT S
270 FOR DELAY=0 TO 400:NEXT DELAY
280 ? "K":PRINT " NOW A PAUSE... W
HILE I"
290 PRINT " DRAW A SPIRAL IN BANK
2"
300 REM GIVE CPU AND ANTIC ACCESS TO B
ANK 2
310 POKE 54017,197
320 POKE 204,64:REM RESET FOR CLEAR RO
UTINE
330 CLEAR=USR(1536):REM CLEAR OUT BANK
2
340 REM DRAW SPIRAL ROUTINE
350 FOR S=0 TO 1080 STEP 4
360 F=2*5/60:X=INT(F*CO5(S)):Y=INT(F*5
IN(S))
370 IF S=0 THEN PLOT 80+X,40-Y
380 DRAWTO 80+X,40-Y:NEXT S
390 REM GIVE ANTIC ACCESS TO BANK 2, C
PU MAIN MEMORY
400 POKE 54017,213
410 ? "K":PRINT " HERE IS THE SPIR
AL"
420 FOR DELAY=0 TO 300:NEXT DELAY
430 ? "K":PRINT " AND NOW THE FLOW
ER"
440 REM GIVE ANTIC ACCESS TO BANK 1, C
PU MAIN MEMORY
450 POKE 54017,209
460 FOR DELAY=0 TO 300:NEXT DELAY
470 GOTO 400

```

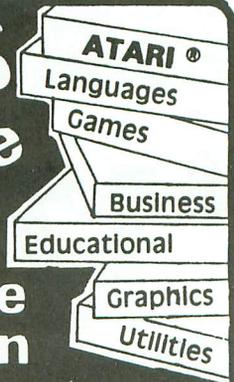
CHECKSUM DATA.
(see page 10)

```

10 DATA 162,75,907,108,893,131,686,260
,732,309,176,655,98,40,848,6080
160 DATA 268,418,307,557,744,874,28,41
8,629,850,573,414,682,138,930,7830
310 DATA 320,52,545,885,143,568,858,58
1,993,293,244,400,169,977,311,7339
460 DATA 412,716,1128

```

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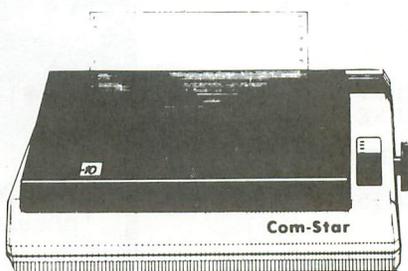
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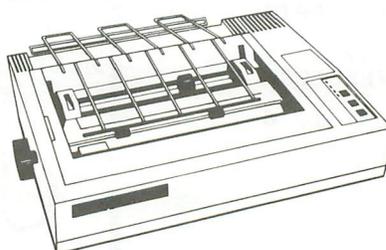
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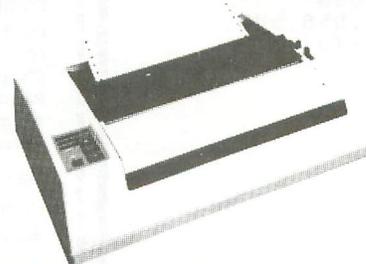
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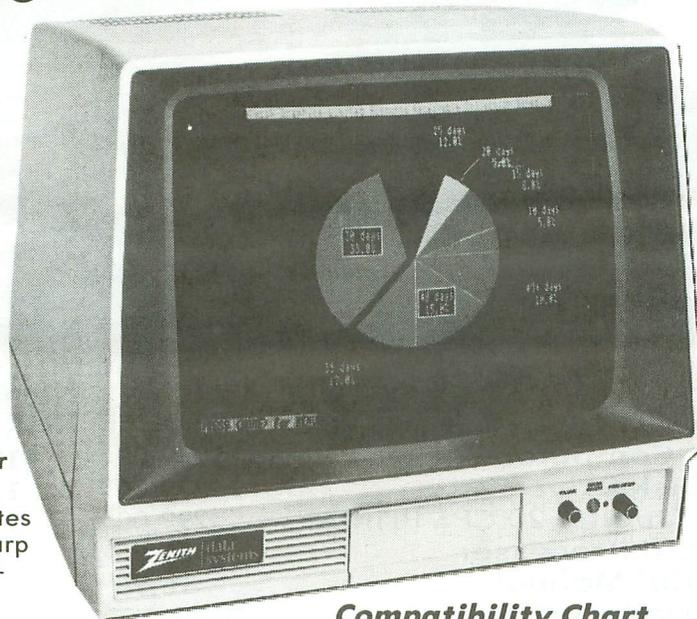
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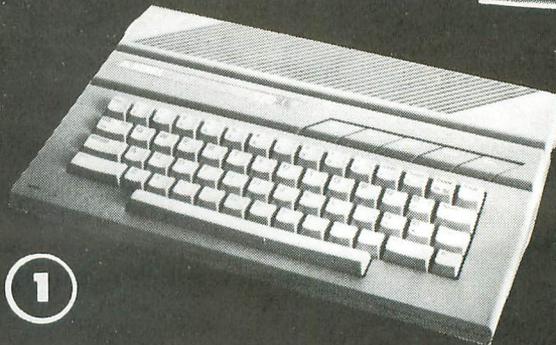
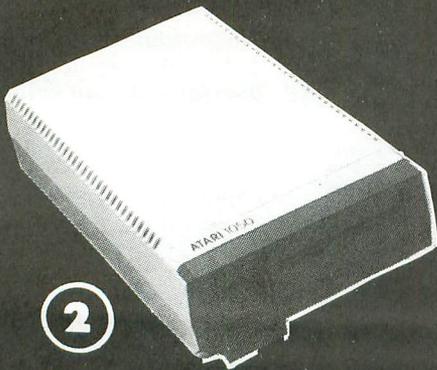
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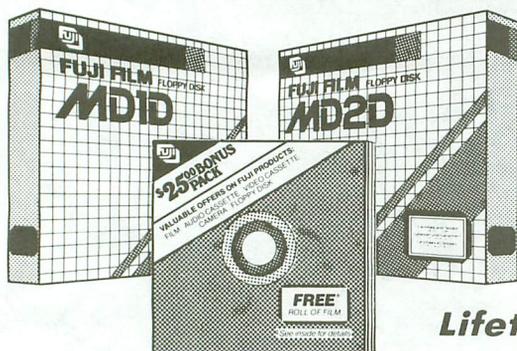
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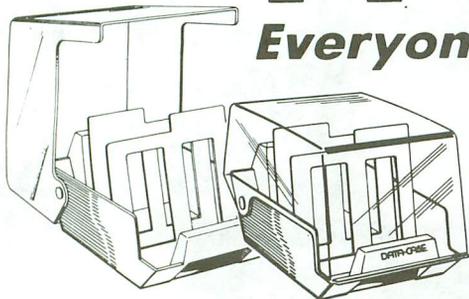
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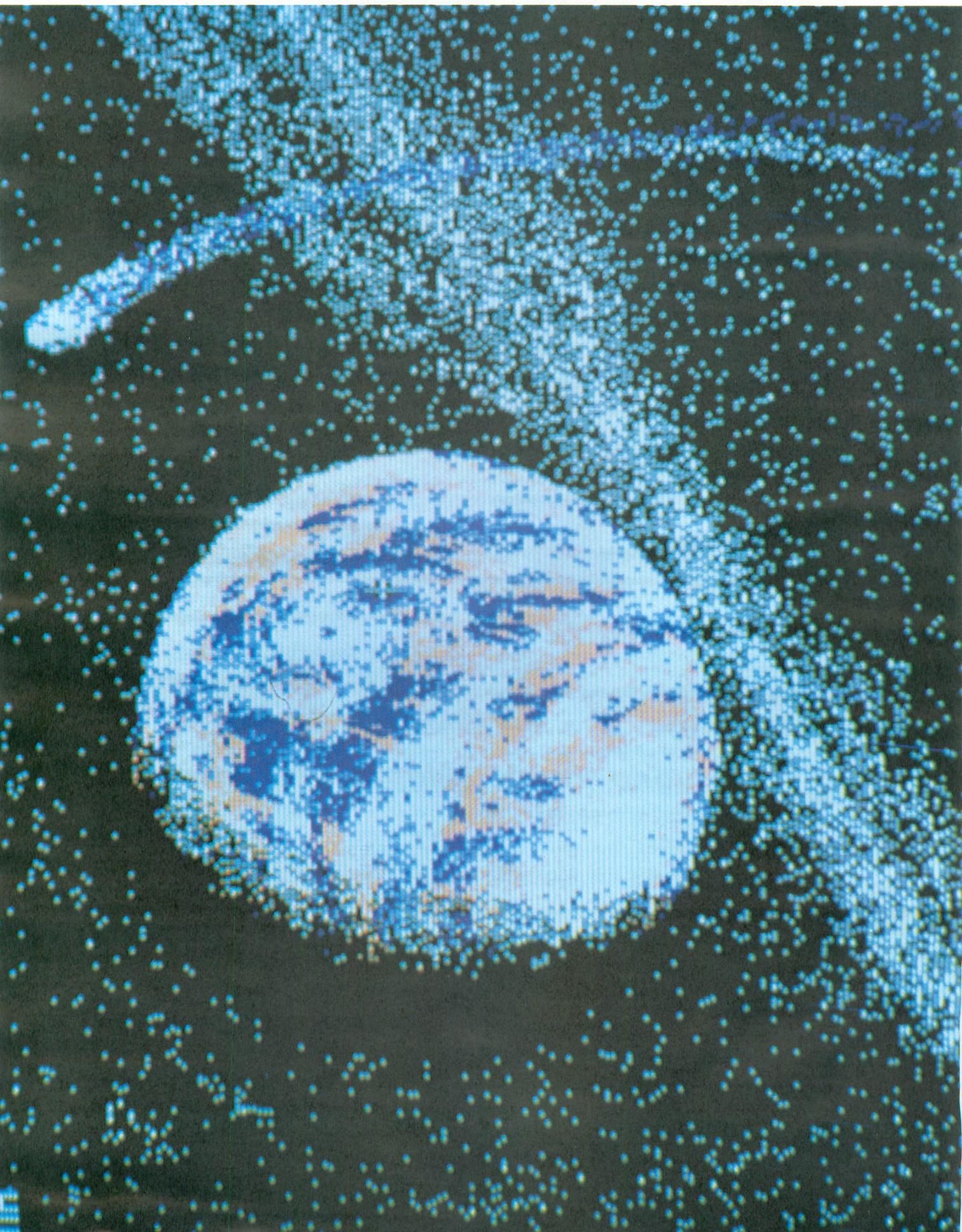
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Halley Hunter

Get the best view of the comet.

by Harry Hammond

As a lover of astronomy and my trusty Atari 800, I often bring the two together; amateur astronomy and home computing seem made for each other. I've written several programs over the last few years to find sidereal time, rising and setting phenomena, and other data to help with observing. Since last spring, I've been putting together **Halley Hunter**, in an effort to bring my love of this great hobby to others. Now, the growing interest in Halley's is a great window of opportunity to share my excitement.

Halley Hunter was written to help Atari users find and observe the comet. With that in mind, the program offers a useful blend of information for the casual observer, along with the use of topics and terms familiar to amateur astronomers. Beyond serving as an observing and educational aid, we hope that **Halley Hunter** will spark your interest in astronomy. If you already enjoy astronomy, perhaps you'll be motivated to improve on this program or generate one of your own...

Getting started.

Type in **Halley Hunter** just as you would any other BASIC program. Then check it with **Unicheck** (see page 8), to catch any typing errors. Since **Halley Hunter** depends on complex mathematical calculations to accomplish its task,

a single typing error could cause you to miss the comet entirely. Be careful.

Make sure BASIC is loaded. Boot the disk by first turning on your disk drive. After the busy light goes off, insert the disk, then turn on the computer. The disk drive will whirl again and load **Halley Hunter** into memory.

The computer needs some information from you before it can tell you where to find the comet. First, it will ask you for the date and the time at which you'd like to observe the comet. You must use a 24-hour time system; i.e., 8 a.m. is 8; but 1 p.m. is 13—add 12 to any p.m. hour and you'll have the 24-hour time. Some additional questions about time are asked, and, after you enter that information, the program takes a few seconds to figure out where the comet is on that day.

Next, the computer needs to know where on the planet you're located, so that it can tell you where to look. It asks for your position, expressed in latitude and longitude. It's perfectly adequate to round these figures to whole degrees. (You can find out your approximate latitude and longitude by consulting an atlas, a topographical map or a road map.) West longitude and south latitude are entered as negative numbers.

Understanding the output.

The computer tells you where to look for the comet and how bright to expect it to be. Brightness is measured in *magnitude*. Magnitude numbers might seem backwards, as they're inversely propor-

tional to brightness. In other words, the smaller the number, the brighter the object.

A magnitude of 1 is brighter than a magnitude of 2. A negative magnitude is brighter still. A body with a magnitude of 6 is about the dimmest object that can be seen with the naked eye. Bright stars are generally first magnitude. Sirius, the brightest star, has a magnitude of -1.4.

The terms which can direct you to the comet in your sky are *altitude* and *azimuth*. Altitude is a measure in degrees of how high above the horizon the comet will be. Azimuth is a measure, also in degrees, of the direction you should look to find the comet.

Altitude is measured from 0 degrees at the horizon to 90 degrees at the *zenith*, the point in the sky directly overhead. A negative number for altitude means that the body is below the horizon and, therefore, not observable. In reality, altitudes below 10 degrees are quite low for clear observation.

Azimuth is measured clockwise from north, in degrees. Thus, north is 0, due east is 90 degrees, south is 180 degrees, and west is 270.

There are some other terms in the output section which do not bear directly on amateur observation of the comet, but may provide interesting information. *Perihelion* is a body's closest point of approach to the sun. A.U. is an abbreviation for *astronomical unit*, a measure of distance roughly equal to 93 million

Halley Hunter *continued*

miles. This is the average distance from the Earth to our sun, and astronomers use it as a yardstick for describing distances within the solar system.

R.A. and Dec. are abbreviations for right ascension and declination. These are similar, in effect, to longitude and latitude used on Earth, except they apply to the celestial sphere. Although they don't directly help you locate the comet (unless you're experienced at using a telescope with setting circles), they do define its position relative to other objects in the sky.

Step by step.

It will be helpful to walk through the program once or twice to understand how it's used. Let's first try to find a date that the comet might be visible by referring to the favorable dates table at the end of this section.

How about December 25? The table below suggests early evening, approximately 1 1/4 hours after sunset. Looking in my local newspaper, I find that sunset will

be at 4:17 p.m. That means I'll be looking for the comet at about 5:30 p.m., or 1730 using military time. You'll have to determine time of sunset for your area using a newspaper, almanac or some other method. Local radio and TV stations often broadcast this information in their weather reports, and NOAA Weather Radio includes sunset and sunrise times in their broadcasts. An almanac would also be useful for obtaining the time of moonrise, since the bright moon will interfere with your view of the dimmer comet.

The first thing **Halley Hunter** asks for is the date, which we enter as 122585. The computer takes care of the slash marks. If we wanted to enter a single-digit day or month, like January 1, we would have to type 010186.

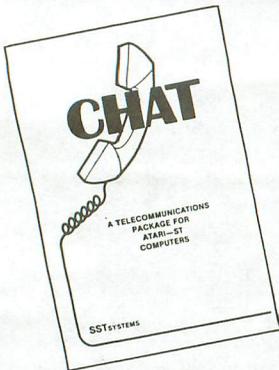
Now, the computer asks for the time you want to observe. Here we enter time as 15,30 (remember the comma!) and hit the RETURN key. If you entered only the 17, the computer will prompt you again and await the minutes. The computer will immediately ask if you are on day-

light saving time, which is common during the summer in the U.S.; respond accordingly. Most often, the sunset and sunrise times given by local radio stations or newspapers will be the normal watch or clock time, which in the summer months will be daylight savings time. For most of the time, Halley will be visible, your response here will be N. In this case, I type N, and I'm asked for my time zone. I live on the East Coast, so I press 1. Do not press the RETURN key after this entry.

Here, your Atari takes a few seconds to figure out where Halley is in the solar system at the time you want to observe it. Last, we're prompted for latitude and longitude, specifying our location for **Halley Hunter**. Enter this in whole degrees—or, if you wish greater accuracy, degrees and decimal fractions (42.5). I live near Boston, so I would enter 41, -70 and press RETURN. (Remember that west longitude is entered as a minus number.)

That's all the program needs to know,

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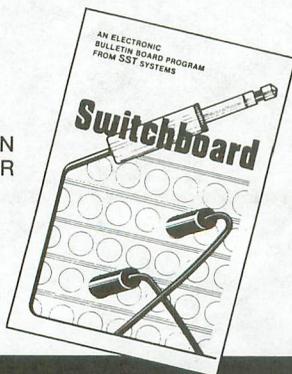
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and it then displays the altitude, azimuth and magnitude we need to locate the comet.

The output section tells us that the predicted magnitude is 5.5—not very bright, but possibly observable if you were in a dark environment or used binoculars. First, locate true north by finding the North Star or by some other method. Then find the azimuth of 213.6 by looking south (180 degrees), and then clockwise another 34 degrees, or just to the south side of southwest. It would be useful to pick out an object on the horizon or in the sky in that direction, so that you can come back to it easily.

Next, estimate an altitude of 43 degrees. There are several possibilities: the horizon is 0 degrees and the zenith is 90, so 43 will be just about halfway up. Another way is to hold your fist with thumb extended vertically at arm's length. The vertical distance from the bottom of your fist to the top of your thumb should be about 15 degrees. So start with your fist on the horizon and walk it up about 45 degrees. The comet ought to be in that area and, we hope, visible in binoculars. That's all there is to it.

Favorable dates of observation for North America.

November, 1985 to	1¼ hours
late January, 1986	after sunset
February 24th to	1 hour
mid-March	before sunrise
Mid-March to	1½ hours
mid-April	before sunrise
Mid-April to	2 hours
mid-May	after sunset

First, the bad news. . .

There's a good chance a lot of people are going to be disappointed with Halley's Comet. With the advent of Halley hype and commercialism, the unsuspecting public may be awaiting the light show of the century, only to be bitterly dismayed at not being able to locate the comet at all. To the extent we can appreciate the subtleties and techniques of finding and observing this wisp of light, our experience increases in enjoyment. There's no denying it: Halley will be a hot topic, but it'll take a little more than a casual interest to have an experience worth telling your grandchildren about. Here's why.

Light pollution. When's the last time you enjoyed the awe-inspiring sight of the Milky Way from your hometown? Unless you live in the isolated country, devoid of heavy lighting, chances are the

night sky doesn't contain many stars or planets for you. Although Halley may attain brightness akin to that of some bright stars, its brightness will be spread over a larger area, so it will require a dark sky for contrast.

Halley's orbit. This trip around the Sun will not bring the comet as close to Earth as the 1910 apparition, and the United States and other northern latitudes will not be the optimum viewing sites. During March and early April of 1986, when Halley will be at its brightest, it will be very low to the horizon in the predawn hours in the U.S. (a fact you can verify for yourself by running **Halley Hunter** for that time).

The moon. Yep, that friendly source of wonderment for anyone who has ever turned an eye skyward will be the bane of us comet-chasers; as it is for observers of deep-sky objects (galaxies, nebulae and such). It's just too bright; its skywash drowns out all but the brightest of stars and planets. So we have to pick a time when it's near new (no moon) or a thin crescent, or when it's below the horizon entirely.

Misinformation. We suspect hype will sell a lot of telescopes. But a lot of folks will be disillusioned when those "zillion-power" cheap telescopes prove no alternative to informed observing. In fact, high-powered telescopes will not provide the most dramatic views, as we'll see.

Ah, the good news.

The plane of Halley's orbit is inclined 18 degrees to that of the Earth, and at its closest point to the Sun (perihelion), it'll be on the opposite side from us. What this means to us is that we will witness two fairly favorable passes by the Earth instead of one. While the comet is heading inward toward the Sun, observers in the Northern Hemisphere will have the optimum view; after perihelion, Southern Hemisphere observers will be treated to a longer and more dramatic display of Halley's tail.

So, unlike our ancestors, we'll be treated to the arrival and departure of this grand visitor from good vantage points, globally speaking. And, armed with a plan for viewing that takes into account Halley's path, the phase of the moon and our location (and a desire to seek out a dark observing site), we shouldn't have too much difficulty finding, observing and perhaps photographing The Comet! Let's see if we can come up with an observing strategy or two. . .

Here it comes!

During September, 1985, you'd need a pretty good-sized telescope to pick up Halley. It's fairly well placed for observation in the wee morning hours, and the moon is out of the way during the middle of the month, but at magnitude 12, it's too faint for most amateur comet hunters. From the middle of October on, however, we should be able to pick out Halley with a small telescope, by either scanning (sweeping) across the constellation of Taurus, or by using right ascension and declination values returned by the program. Proper polar alignment will be necessary to use these values successfully.

Huh? No telescope, and you find these terms confusing? Hang on. From the twelfth of November on, the moon won't be a problem for a while, and the comet should be a dandy site in binoculars. It'll be passing just below the Pleiades star cluster, often termed the "Seven Sisters"—sometimes confused by newcomers with the Little Dipper, although it's nowhere near it. If you haven't been brushing up on your constellations in anticipation of this night, just crank up **Halley Hunter** and you can use the altitude and azimuth output to point you in the right direction.

The comet should appear as a fuzzy ball, quite unstarlike. It's doubtful a tail will be visible at this point without the benefit of a large telescope, though. And congratulations! You've welcomed Halley back from a 76-year voyage, heading for its February rendezvous with the Sun!

In December, Halley will be approaching the naked-eye threshold for observers in dark sky areas with excellent viewing conditions. In the constellation of Pisces, it'll be high in the sky for North American observers by 8 p.m. or so. The moon will be interfering after the third week, so plan your observing sessions for early in the month. Five or six days after Christmas, before moonrise, you may be able to see Halley sporting a short tail when viewed with binoculars.

Get your observing licks in during January, because by month's end Halley will dissolve in the low evening twilight. Earlier this month though, you should notice the comet growing brighter as the days go by. Its proximity to the Sun contributes to the growth of its tail. Do you notice any structure or changes in the coma or tail?

(continued on page 67)

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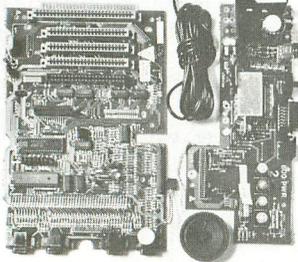
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Topics include graphics indirection, player-missile graphics, display list interrupts, scrolling, sound, the Operating System, the Disk Operating System, ATARI BASIC and CTIA. Extensive appendices, sample programs, display screens, and diagrams generously illustrate the discussions. A glossary defines and explains some less commonly encountered terms.

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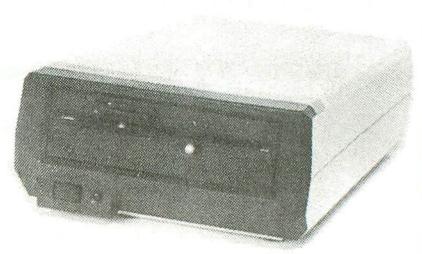
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Halley Hunter *continued*

February 9th is the date Halley loops closest to the sun. Most of the month our view will be blocked, until the comet reappears, this time in the morning sky during the last week of the month or so, depending on your latitude.

Those at 30 degrees north or so will have to wait till the first week in March in order to pick out the comet on a clear eastern horizon, while observers further south will see it earlier. Now the tail should be noticeably longer than when we lost it in the evening twilight, and much brighter.

As the comet heads away from the Sun during March, on its way back to the extreme of its orbit, the Earth's orbit will bring us close to Halley for the second time during this apparition. For North America, Halley will be at its greatest altitude for the rest of this visit during the beginning of the third week of March. Predictions give a tail length of 20 to 30 degrees! It will be very low on the horizon and a difficult sight for observers in New York and Denver, but almost 20 degrees high for Halley hunters in Houston or New Orleans. Which brings us to our advice for observing in April...

Go south, young man!

At the end of the first week in April, Comet Halley will be at its peak drama: magnitude 2 or 3 perhaps, a long, spectacular tail visible to those lucky or prepared enough to see it. If you are in Australia, the comet will be nearly overhead before morning twilight. A similar situation exists for others in southern Africa or lower South America.

A trip to fairweather southern climes will present a magnificent spectacle to those fortunate enough to view Halley against a dark, clear, moonless sky. Many will take advantage of tours and package vacation deals. Not everyone will be among the lucky ones, so it's important to make the most of our conditions. Which brings us to our next topic:

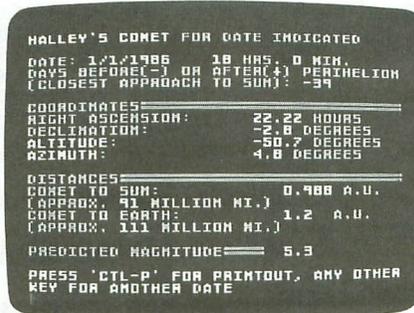
Telescopes, binoculars and the naked eye.

If you don't have a telescope, now is probably not the time to buy one, in spite of all the "Comet" telescopes now jumping at us from advertisements and such. The best views for the average observer, the most dramatic views for professional and amateur alike, will probably be with a low-power, wide-field instrument, such as 7x50 binoculars or the naked eye.

High magnification, cheap quality telescopes will decrease the experience; comets do not lend themselves well to

magnification due to their "wispieness" (for lack of a better word), and the length of the tail after perihelion is apt to be much longer than even the widest field telescope can accommodate.

If you're inspired to pursue a further interest in astronomy and desire a telescope, great. Talk to the members of your local amateur astronomy group or others who are willing to help. But, contrary to popular advertising, you don't need a telescope for Halley, unless you have experience with some of the subtleties of observing or want to follow it when it's faint.



Binoculars are a good bet, since most everyone can get their hands on a pair. They enrich and slightly magnify the image, due to their greater (than the human eye) light-gathering power. A 7x50 lens magnifies 7 times and has a diameter of 50mm, a good, general celestial observing tool. Lenses 10x50 or greater tend to be hard to control, and the slightest trembling or wind causes the image to dance around too much.

The width of the sky viewed through 7x50 binoculars is about 9 degrees. Using the width of the field as a yardstick, you can move around the sky in 9-degree increments when trying to find the comet with the altitude and azimuth output of the program.

The naked eye will reveal the full length of Halley's tail, provided you've taken care to find a dark observing site with a clear, unobstructed horizon, and have arrived early to search for the comet and allow darkness adaptation of your eyes.

Whatever optical aids or techniques are used, dark skies are essential, and a trip 50 miles or so to the country will take most observers far enough away from urban light pollution. A trick used by astronomers to increase the visibility of faint objects is averted vision. Instead of looking directly at Halley, try looking just to the side or away. The light sensi-

tivity of the eye is greater toward the edges, and the object will show more detail and appear to gain in brightness.

A careful plan to prepare for Halley can make this a truly memorable, once-in-a-lifetime event. Happy hunting and clear skies! ☽

The inspiration for *Halley Hunter* is from a routine by Roger Brown, using formulas found in Textbook on Spherical Astronomy (6th edition, Cambridge University Press, 1977.) by W.M. Smart and P. Duffet-Smith's Practical Astronomy with Your Calculator (Cambridge University Press, 1981). Also, The Comet Halley Handbook (2nd edition, available from a Government Printing Office) was invaluable in checking results.

Halley Hunter is available on disk from the author for \$14.95, including postage. Several graphics screens are included, along with more extensive documentation; 32K is necessary. *Halley Hunter*, Capestyle Software, Box 531, RFD #1, Mashpee, MA 02649.

Harry Hammond is an amateur astronomer and computer enthusiast who's been designing and building houses for eight years. An avid astrophotographer, he would welcome correspondence with Atari owners who are also interested in the stars.

(Listing starts on next page)

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Halley Hunter *continued*

Listing 1.
BASIC listing.

```

10 REM *****
20 REM * HALLEY HUNTER *
30 REM * BY *
40 REM * HARRY HAMMOND *
41 REM *****
42 REM
43 REM *****
44 REM * COPYRIGHT (c) 1985 *
47 REM * ANALOG COMPUTING *
50 REM *****
60 REM
70 K1=1:K2=2:DIM R$(K2),DAT$(8),R(K1),
TITLE$(16):TITLE$=" HALLEY HUNTER":T
RAP 3190:GRAPHICS 17
80 FOR I=14 TO K0 STEP -K2:POKE 712,14
4+I:FOR J=K1 TO AB5(I-14):POSITION INT
(RND(K0)*19),INT(RND(K0)*23)+K1
90 ? #6;":NEXT J:X=K1^K1^K1:NEXT I
100 POKE 710,53:FOR X=K1 TO 16:POSITIO
N X,K0:? #6;TITLE$(X,X);"
110 SOUND K0,X,8,8:FOR I=K1 TO 40:NEXT
I:NEXT X:5000 K0,K0,K0,K0:FOR I=K1 T
O 300:NEXT I
120 POSITION K1,21:? #6;"analog compu
ting":FOR I=K0 TO 400:POKE 709,PEEK(53
770):NEXT I:POKE 709,12
125 POSITION 6,8:? #6;"LOADING":POSITI
ON 3,9:? #6;"CHARACTER SET":POSITION 4
,11:? #6;"Please wait"
130 DIM SET$(31),OFF$(18),CUR$(75):FOR
I=K1 TO 31:READ X:SET$(I)=CHR$(X):NEX
T I:SET=ADR(SET$):FOR I=K1 TO 18
140 READ X:OFF$(I)=CHR$(X):NEXT I:OFF=
ADR(OFF$):FOR I=K1 TO 75:READ X:CUR$(I
)=CHR$(X):NEXT I:CUR=ADR(CUR$)
160 POKE K1,208:POKE K2,134:GRAPHICS K
0:POKE 559,K0:POKE 709,137:POKE 712,20
8
170 I=PEEK(16):IF I>127 THEN I=I-128:P
OKE 16,I:POKE 53774,I
180 DL=PEEK(560)+256*PEEK(561):POKE DL
+3,PEEK(DL+3)+K2:FOR I=DL+6 TO DL+28:P
OKE I,4:NEXT I:GOSUB 3230
200 OPEN #K1,4,K0,"K:":IF PEEK(764)<>2
55 THEN GET #K1,DUMMY
210 ? CHR$(125)
220 REM HALLEY EPHEMERIS
230 PI=3.14159:PD180=PI/180
240 PERI=1986.11
250 PERILO=170.011
260 ASCNODE=58.1453
270 PERIOD=76.0081
280 SEMAXIS=17.9435
290 ECCEN=0.967267
300 INCLN=162.239
310 ? " HALLEY HUNTER":?
320 ? " an atari owner's guide"
330 ? " to the 1985-86 apparition"
340 ? " of HALLEY'S COMET":?
360 ? " by"
370 ? " HARRY HAMMOND":? :?
390 DUMMY=USR(SET,CUR)
400 GOSUB 2000:GOSUB 3000
410 ? CHR$(125):? :? "crunching number
s for r;a; and dec;";:?
430 X=PERI:Y=1900+Y
440 IF Y>=1986 THEN Z=1984
450 IF Y<1986 THEN Z=1988
460 IF Y>=1986 THEN S=K0
470 IF Y<1986 THEN S=K1
480 GOSUB 1740
490 DS=N
500 B=(360/PERIOD)*(N/365.25)
510 K=B
520 GOSUB 1870
530 B=K*PD180

```

```

540 E=B
550 Y1=ECCEN
560 Q=E-Y1*SIN(E)-B
570 IF AB5(Q)<=1.7E-05 THEN 610
580 U=Q/(K1-Y1*COS(E))
590 E=E-U
600 GOTO 560
610 V=50R((K1+Y1)/(K1-Y1))*(SIN(E/K2)/
COS(E/K2))
620 U=K2*ATN(U)
630 V1=U*180/PI
640 L=V1+PERILO
650 R=SEMAXIS*(K1-Y1*Y1)/(K1+Y1*COS(U)
)
660 F=L-ASCNODE
670 F2=INCLN
680 F1=F*PD180
690 F2=F2*PD180
700 I=SIN(F1)*SIN(F2)
710 I=ATN(I/SQR(-I*I+K1))
720 P=ATN((SIN(F1)/COS(F1))*COS(F2))
730 P1=P*180/PI+ASCNODE
740 IF F>=90 AND F<=270 THEN P1=P1+180
750 IF P1<K0 THEN P1=P1+360
760 P=P1*PD180
770 R2=R*COS(I)
780 X=1975
790 IF Y>=X THEN Z=1972
800 IF Y<X THEN Z=1976
810 IF Y>=X THEN S=K0
820 IF Y<X THEN S=K1
830 GOSUB 1740
840 T=(360/365.25)*(N/1.00004)
850 K=T
860 GOSUB 1870
870 T=K
880 T1=T*PD180
890 C=0.01672
900 J=T+(360/PI)*C*SIN(T1-0.051943)
910 J=J+99.5343
920 IF J>360 THEN J=J-360
930 IF J<K0 THEN J=J+360
940 H=(J-102.51044)*PD180
950 R1=(K1-C*C)/(K1+C*COS(H))
960 U1=(P1-J)*PD180
970 U2=(J-P1)*PD180
980 IF R2<R1 THEN 1040
990 Q1=R1*SIN(U1)
1000 Q1=Q1/(R2-R1*COS(U1))
1010 Q1=ATN(Q1)
1020 Q2=Q1*180/PI+P1
1030 GOTO 1080
1040 Q3=R2*SIN(U2)
1050 Q3=Q3/(R1-(R2*COS(U2)))
1060 Q3=ATN(Q3)
1070 Q2=Q3*180/PI+J+180
1080 IF Q2>360 THEN Q2=Q2-360
1090 IF Q2<K0 THEN Q2=Q2+360
1100 Q4=Q2*PD180
1110 Q5=R2*(SIN(I)/COS(I))*SIN(Q4-P)
1120 Q5=Q5/(R1*SIN(U1))
1130 Q5=ATN(Q5)
1140 E1=0.40893064
1150 L1=SIN(Q5)*COS(E1)
1160 L1=L1+COS(Q5)*SIN(E1)*SIN(Q4)
1170 M1=ATN(L1/SQR(-L1*L1+K1))
1180 Y2=M1*180/PI
1190 B1=(SIN(Q4)/COS(Q4))*COS(E1)
1200 B1=B1-((SIN(Q5)/COS(Q5))*SIN(E1))
/COS(Q4)
1210 G=ATN(B1)
1220 H1=G*180/PI
1230 I1=INT(Q2/90)
1240 J1=INT(H1/90)
1250 IF I1-J1=4 OR I1-J1=K1 THEN H1=H1
+360
1260 IF I1-J1=K2 OR I1-J1=3 THEN H1=H1
+180
1270 IF I1-J1=-4 THEN H1=H1+360
1280 IF I1-J1=-K2 THEN H1=H1-180

```

```

1290 N1=H1/15
1300 D1=R1*R1+R2*R2
1310 D1=D1-K2*R1*R2*CO5(U1)
1320 D2=5QR(D1)
1330 R3=D2/CO5(I)
1340 K9=R
1350 GOSUB 1960
1360 R=K9:HD=R
1370 K9=R3/10
1380 GOSUB 1960
1390 R3=K9*10
1400 M0=4.1:N=3.1
1410 IF D5<K0 THEN M0=5:N=4.44
1420 MA=M0+5*0.4343*LOG(R3)
1430 MA=MA+N*2.5*0.4343*LOG(R)
1440 MA=INT(10*MA)/10
1450 POSITION K1,19:?"o;k;;;now for a
altitude and azimuth;;;
1460 GOSUB 2430
1470 REM SCREEN OUTPUT
1480 ? CHR$(125):DUMMY=USR(OFF)
1490 ? "HALLEY'S COMET for date indica
ted":?
1510 ? "date: ";M;"/";DAY;"/";Y;" "
;HR;" hrs; ";MIN;" min;"
1520 ? "days before(-) or after(+) per
ihelion"
1530 ? "(closest approach to sun): ";I
NT(D5):?
1550 ? "coordinates*****
*****"
1560 ? "right ascension: ";INT(10
0*N1+0.5)/100;" hours"
1570 ? "declination: ";INT(Y2
*100+0.5)/100;" degrees"
1580 ? "ALTITUDE: ";INT(10
*(H/R1)+0.5)/10;" degrees"
1590 ? "AZIMUTH: ";INT(10
*(A/R1)+0.5)/10;" degrees":?
1610 ? "distances*****
*****"
1620 ? "comet to sun: ";HD;
" a;u;"
1630 ? "(approx; ";INT(93*HD);
1640 ? " Million mi;)"
1650 ? "comet to earth: ";R3;
" a;u;"
1660 ? "(approx; ";INT(93*R3);
1670 ? " Million mi;)"
1690 ? "predicted magnitude**** ";MA
1700 ? "*****
*****"
1710 ? "PRESS 'CTL-P' FOR PRINTOUT, AN
Y OTHER KEY FOR ANOTHER DATE":DUMMY=US
R(SET,CUR)
1720 GET HK1,R:IF R=16 THEN GOSUB 3310
:GOTO 1480
1730 GOTO 210
1740 A=(Y-Z)/4
1750 A1=INT(A+5)
1760 N=365*(Y-X+5)+A1
1770 IF INT(A)<A THEN 1790
1780 IF (M=K2 AND D<29) OR M=K1 THEN M
=N-K1
1790 IF M>K2 THEN 1830
1800 M2=M-K1
1810 M2=31*M2
1820 GOTO 1850
1830 M2=M+K1
1840 M2=INT(30.6*M2)-63
1850 N=N+M2+D-365*5
1860 RETURN
1870 IF K<K0 THEN 1890
1880 IF K>360 THEN 1920
1890 K=K+360
1900 IF K>=K0 THEN RETURN
1910 GOTO 1890
1920 K=K-360
1930 IF K<=360 THEN RETURN

```

```

1940 GOTO 1920
1960 K9=K9*1000
1970 K9=INT(K9+0.5)
1980 K9=K9/1000
1990 RETURN
2000 REM VALID DATE SUBROUTINE
2020 ? :? :? :? " enter a valid
date:"
2030 POSITION 14,19:?"(mo/dy/yr)"
2040 IC=15:IR=18
2050 GOSUB 2100:REM INPUT DATE
2060 POSITION 15,19
2070 ? DAT$
2080 RETURN
2090 REM ENTER VALID DATE
2100 POSITION IC,IR
2110 ? "xx-xx-xx";
2120 POSITION IC,IR:PRINT CHR$(253);
2130 GOSUB 2330:REM MONTH
2140 M=VAL(R$)
2150 IF M<K1 OR M>12 THEN 2100
2160 DAT$(K1,K2)=R$:DAT$(3)="/"
2170 ? CHR$(31);
2180 GOSUB 2330:REM DAY
2190 D=VAL(R$)
2200 IF D<K1 THEN 2100
2210 IF M=K2 AND D>29 THEN 2100
2220 IF (M=4 OR M=6 OR M=9 OR M=11) AN
D D>30 THEN 2100
2230 IF D>31 THEN 2100
2240 DAY=D
2250 DAT$(4,5)=R$:DAT$(6)="/"
2260 PRINT CHR$(31);
2270 GOSUB 2330:REM YR
2280 Y=VAL(R$)
2290 IF Y<K0 OR Y>99 THEN 2100
2300 DAT$(7,8)=R$
2310 POKE 764,255:RETURN
2320 REM INPUT TWO DIGITS
2330 FOR J1=K0 TO K1
2340 GET HK1,R:R(J1)=R
2350 REM BACKSPACE MEANS RESTART
2360 IF R=126 THEN POP:GOTO 2100
2370 REM IGNORE NONDIGIT ENTRIES
2380 IF R<48 OR R>57 THEN 2340
2390 ? CHR$(R);:REM ECHO INPUT
2400 NEXT J1
2410 R$=CHR$(R(K0)):R$(K2)=CHR$(R(K1))
2420 RETURN
2430 REM ALTITUDE AND AZIMUTH
2440 P=3.14159265:R1=P/180
2450 GOSUB 2690:T=5*15*R1
2460 A=N1
2470 R=A*15*R1
2480 A=Y2
2490 D=A*R1
2500 ? :? "input latitude, longitude":
INPUT B,L:LAT=B:LO=L
2510 B=B*R1:L=L*R1
2520 T5=T-R+L:REM LHA
2530 S1=SIN(B)*SIN(D)
2540 S1=S1+CO5(B)*CO5(D)*CO5(T5)
2550 C1=K1-S1*S1
2560 IF C1>K0 THEN C1=5QR(C1)
2570 IF C1<=K0 THEN 2590
2580 H=ATN(S1/C1):GOTO 2600
2590 H=SGN(S1)*P/K2
2600 C2=CO5(B)*SIN(D)
2610 C2=C2-SIN(B)*CO5(D)*CO5(T5)
2620 S2=-CO5(D)*SIN(T5)
2630 IF C2=K0 THEN A=SGN(S2)*P/K2
2640 IF C2=K0 THEN 2670
2650 A=ATN(S2/C2)
2660 IF C2<K0 THEN A=A+P
2670 IF A<K0 THEN A=A+P+P
2680 RETURN
2690 REM GREENWICH MEAN SIDEREAL TIME
2700 REM FROM JULIAN DATE
2710 GOSUB 2880

```

Halley Hunter *continued*

```

2720 D=J-2451545
2730 T=D/36525:T1=INT(T)
2740 J0=T1*36525+2451545
2750 T2=(J-J0+0.5)/36525
2760 S=24110.5484+184.812866*T1
2770 S=5+8640184.81*T2
2780 S=5+0.093104*T*T
2790 S=5-6.2E-06*T*T*T
2800 S=5/86400:S=5-INT(S)
2810 S=24*(S+(F-0.5)*1.0027379)
2820 IF S<K0 THEN S=5+24
2830 IF S>24 THEN S=5-24
2840 RETURN
2850 H=INT(S):M1=60*(S-H)
2860 M=INT(M1):S=60*(M1-M)
2870 REM H=HRS, M=MIN., S=SEC. GMT
2880 REM GREGORIAN INPUT FOR HALLEY
2890 D1=INT(D):F=D-D1-0.5
2900 J=-INT(7*(INT((M+9)/12)+Y)/4)
2910 S=SGN(M-9):A=ABS(M-9)
2920 J1=INT(Y+5*INT(A/7))
2930 J1=-INT((INT(J1/100)+K1)*0.75)
2940 J=J+INT(275*M/9)+D1+J1
2950 J=J+1721029+367*Y
2960 IF F>=K0 THEN 2990
2970 F=F+K1:J=J-K1
2980 REM J IS INT(JULIAN DAY NO.), F IS
FRACTIONAL PART
2990 RETURN
3000 REM FIND UT
3010 POSITION K2,21:? "time to observe
(hr,min)";:INPUT HR,MIN:IF HR>24 OR H
R<K0 THEN POSITION K2,21:GOTO 3010
3020 ? CHR$(125):? :? "is that dayligh
t savings time (y/n)";:GET #K1,DL
3030 POSITION K2,4:? "what time zone a
re you in"?:
3040 ? "(1) eastern"(2) central"
3050 ? "(3) mountain"(4) pacific"
3060 ? " (5) other"
3070 ? :? "select:"::GET #K1,R:IF R<49
OR R>53 THEN 3030
3080 POSITION K2,10:? " "
3090 TZ=R-44:IF TZ=9 THEN GOSUB 3150
3100 IF DL=89 THEN TZ=TZ-K1
3110 UT=HR+TZ:IF UT>=24 THEN UT=UT-24:
D=D+K1
3120 IF UT<K0 THEN UT=24+UT:D=D-K1
3130 D=D+UT/24+MIN/1440
3140 RETURN
3150 ? :? :? "what is the hour differe
nce between your time zone and green
wich (west is +, east is -)"
3160 INPUT TZ
3170 RETURN
3180 REM ERROR HANDLER
3190 ERR=PEEK(195):ERRL=PEEK(186)+256*
PEEK(187):IF ERR=8 OR ERR=3 THEN 3220
3200 GRAPHICS K0:? "UH-OH! ERROR #";ER
R;: "HAPPENED...":? "CHECK IT OUT AND R
ERUN...":CLOSE #K1:CLOSE #K2:END
3220 ? CHR$(253):TRAP 3190:GOTO ERRL
3230 REM LOAD CHARACTER SET
3240 CHSET=(PEEK(106)-8)*256
3250 FOR J=K1 TO 49:READ X:L=CHSET+X*8
3260 FOR I=K0 TO 7:READ A:POKE L+I,A:IF
F X>96 THEN POKE L+I-512,A+A
3270 NEXT I:NEXT J:POKE 756,CHSET/256:
RETURN
3300 REM OUTPUT TO PRINTER
3310 OPEN #K2,0,K0,"P":? #K2:? #K2
3320 ? #K2;: " DATA FOR HALLEY'S C
OMET"
3330 ? #K2;:"AAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAA":? #K2
3340 ? #K2;"Latitude & Longitude:"
3350 ? #K2;ABS(LAT);:IF LAT<K0 THEN ?
#K2;" S ";:GOTO 3370
3360 ? #K2;" N ";

```

```

3370 ? #K2;ABS(L0);:IF L0<K0 THEN ? #K
2;: " W":GOTO 3390
3380 ? #K2;" E"
3390 ? #K2;? #K2;"Date: ";M;"/";DAY;"/
";Y;: " ";HR;: " hrs. ";MIN;: " min."
3400 ? #K2;"Days before(-) or after(+)
perihelion"
3410 ? #K2;"(closest approach to sun):
";INT(D5):? #K2
3430 ? #K2;"Coordinates-----"
3440 ? #K2;"Right ascension: " ;IN
T(100*M1+0.5)/100;" hours"
3450 ? #K2;"Declination: " ;IN
T(Y2*100+0.5)/100;" degrees"
3460 ? #K2;"ALTITUDE: " ;IN
T(10*(H/R1)+0.5)/10;" degrees"
3470 ? #K2;"AZIMUTH: " ;IN
T(10*(A/R1)+0.5)/10;" degrees":? #K2
3490 ? #K2;"DISTANCES-----"
3500 ? #K2;"Comet to sun: "
;HD;" a.u."
3510 ? #K2;"(approx. ";INT(93*HD);" mi
llion miles)"
3520 ? #K2;"Comet to earth: "
;R3;" a.u."
3530 ? #K2;"(approx. ";INT(93*R3);" mi
llion miles)":? #K2
3550 ? #K2;"Predicted magnitude----";M
A: ? #K2: ? #K2: ? #K2:CLOSE #K2:RETURN
5000 DATA 104,169,0,141,7,212,169,4,14
1,111,2,104,170,104,168,169,7,32,92,22
8,169,58,141,47,2,169,2,141,29,208,96
5010 DATA 104,169,0,141,2,208,141,240,
2,169,7,160,98,162,228,76,92,228
5020 DATA 216,169,1,141,240,2,169,58,1
41,47,2,169,0,170,157,0,6,202,208,250,
165,85,10,10,24
5030 DATA 105,48,141,2,208,165,84,10,1
0,10,24,105,1,105,31,168,162,8,169,240
,153,0,6,200,202
5040 DATA 208,247,230,0,165,0,74,74,74
,41,1,208,4,165,1,208,2,165,2,141,194,
2,76,98,228
7000 DATA 0,0,0,0,0,0,0,0,0,0
7050 DATA 7,16,16,0,0,0,0,0,0,0
7070 DATA 8,16,64,64,64,64,64,64,16
7080 DATA 9,64,16,16,16,16,16,16,64
7090 DATA 10,0,85,85,0,85,85,0,0
7100 DATA 11,0,32,32,32,168,32,32,0
7110 DATA 12,0,0,0,0,0,32,32,128
7120 DATA 13,0,0,0,168,0,0,0,0
7130 DATA 14,0,0,0,0,0,32,32,0
7140 DATA 15,0,4,4,16,16,64,64,0,16
7150 DATA 0,168,136,136,136,136,168,0
7160 DATA 17,0,160,32,32,32,32,168,0
7170 DATA 18,0,168,8,40,160,128,168,0
7180 DATA 19,0,168,8,168,8,8,168,0
7190 DATA 20,0,8,40,136,168,8,8,0,21
7200 DATA 0,168,128,168,8,136,168,0
7210 DATA 22,0,168,128,168,136,136,168
7220 DATA 0,23,0,168,8,32,32,128,128,0
7230 DATA 24,0,168,136,168,136,136,168
7240 DATA 0,25,0,168,136,168,8,8,8,0
7250 DATA 26,0,0,16,0,0,16,0,0
7260 DATA 27,0,0,0,0,0,16,16,0
7300 DATA 31,0,84,68,4,20,0,16,0
7960 DATA 97,0,16,84,68,68,84,68,0
7970 DATA 98,0,80,68,80,68,68,80,0
7980 DATA 99,0,16,68,64,64,68,16,0
7990 DATA 100,0,80,68,68,68,68,80,0
8000 DATA 101,0,84,64,84,64,64,84,0
8010 DATA 102,0,84,64,84,64,64,84,0
8020 DATA 103,0,20,64,64,68,68,84,0
8030 DATA 104,0,68,68,84,68,68,68,0
8040 DATA 105,0,84,16,16,16,16,84,0
8050 DATA 106,0,4,4,4,4,68,20,0
8060 DATA 107,0,68,68,80,68,68,68,0

```

8070 DATA 108,0,64,64,64,64,64,84,0
 8080 DATA 109,0,68,84,84,68,68,68,0
 8090 DATA 110,0,68,68,84,84,68,68,0
 8100 DATA 111,0,16,68,68,68,68,16,0
 8110 DATA 112,0,80,68,68,80,64,64,0
 8120 DATA 113,0,16,68,68,68,68,16,4
 8130 DATA 114,0,80,68,84,80,68,68,0
 8140 DATA 115,0,84,64,84,4,4,84,0
 8150 DATA 116,0,84,16,16,16,16,16,0
 8160 DATA 117,0,68,68,68,68,68,84,0
 8170 DATA 118,0,68,68,68,68,84,16,0
 8180 DATA 119,0,68,68,68,84,84,68,0
 8190 DATA 120,0,68,68,16,16,68,68,0
 8200 DATA 121,0,68,68,84,16,16,16,0
 8210 DATA 122,0,84,4,16,16,64,84,0

CHECKSUM DATA.
 (see page 10)

10 DATA 524,263,376,303,533,263,846,54
 2,760,839,261,789,281,583,235,7398
 110 DATA 735,248,638,399,753,535,276,4
 22,107,863,534,417,304,431,697,7359
 270 DATA 439,792,346,134,210,667,526,4
 65,768,544,427,416,730,804,230,7498
 450 DATA 394,185,929,832,185,346,248,8
 23,886,239,818,676,850,83,325,7819
 600 DATA 719,824,180,133,239,999,191,8
 14,845,49,800,465,450,98,455,7261
 750 DATA 548,858,197,610,29,125,964,66
 5,825,341,302,841,317,933,819,8374
 900 DATA 21,914,380,128,90,288,509,579
 105,249,114,12,389,715,334,4827
 1050 DATA 495,27,673,344,567,140,506,7
 85,37,137,807,426,659,52,173,5828
 1200 DATA 713,679,129,334,315,87,888,7
 93,666,787,410,239,9,108,259,6416
 1350 DATA 970,906,805,973,792,983,681,
 207,596,682,784,956,368,200,854,10757
 1510 DATA 499,475,960,714,278,982,439,
 366,514,580,31,434,946,10,738,7966
 1690 DATA 917,127,418,42,890,709,264,6
 05,397,403,967,617,784,740,616,8496
 1840 DATA 678,597,809,966,601,602,271,
 750,600,536,740,849,607,866,815,10287
 2000 DATA 230,51,22,253,948,683,318,78
 9,691,806,538,692,477,717,647,7862
 2160 DATA 853,79,940,713,909,890,384,8
 44,621,192,490,40,736,738,991,9420
 2310 DATA 396,817,573,995,498,990,526,
 653,909,705,337,795,64,989,316,9563
 2460 DATA 282,709,318,398,246,397,889,
 764,885,113,438,937,301,585,761,8023
 2610 DATA 852,844,67,622,18,913,440,80
 7,452,662,985,153,122,760,759,8456
 2760 DATA 655,805,590,959,370,486,117,
 55,809,225,97,661,875,289,91,7084
 2910 DATA 223,360,953,346,834,667,397,
 334,817,356,183,252,225,958,103,7008
 3060 DATA 352,959,576,620,524,572,455,
 844,790,537,42,793,361,381,606,8412
 3220 DATA 459,750,629,806,239,34,758,7
 86,180,944,558,908,984,412,736,9183
 3390 DATA 631,943,482,56,802,664,662,2
 61,205,300,446,256,99,573,409,6789
 5010 DATA 452,447,280,70,951,111,859,8
 47,434,721,368,271,258,717,229,7015
 7160 DATA 923,237,970,945,785,81,25,82
 ,967,295,282,430,57,31,37,6147
 7990 DATA 799,765,762,751,782,719,596,
 787,774,799,783,741,766,759,782,11365
 8140 DATA 656,707,795,781,803,749,730,
 944,6165

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 COS: Cosine of an angle in radians
 TAN: Tangent of an angle in radians
 ATN: Arctangent of a number
 EXP: Exponential of a number
 LOG: Logarithm of a number
 LOG10: Logarithm base 10 of a number
 INT: Integer part of a number
 FLOOR: Floor of a number
 CEILING: Ceiling of a number
 ROUND: Round to the nearest integer

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 DELETE: Delete character to left of cursor
 CTRL+DELETE: Delete character above cursor
 SHIFT+DELETE: Delete to end of line
 SELECT+DELETE: Delete to end of line
 START+INSERT: Restore last deleted text

TEXT BLOCKS
 CTRL+X: Place at before and after text block
 OPTION+DELETE: Delete block
 OPTION+D: Duplicate block at position
 OPTION+M: Move block to this location

PRINT PREVIEW
 OPTION+P: Print preview (from edit mode)
 START: Return to edit/create mode
 OPTION+L: Move cursor 28 spaces left
 OPTION+R: Move cursor 28 spaces right
 RETURN: Move cursor to left margin

EDITING
 CTRL+H: All out of line and RETURN after to center text
 CTRL+G: CTRL+G to start at line and RETURN after to block text right
 ESC: Return to menu
 SELECT: Move superscripts and SELECT after
 SELECT: Move subscripts and SELECT after
 OPTION+Z: Free memory check

PAGE FORMAT
 CTRL+M: Left margin in spaces
 CTRL+N: Right margin in spaces
 CTRL+O: Line spacing in lines
 CTRL+P: Top margin in lines
 CTRL+Q: Page length in lines

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 CTRL+J: Header and footer text
 CTRL+K: Header and footer text
 CTRL+L: Header and footer text
 CTRL+M: Header and footer text
 CTRL+N: Header and footer text
 CTRL+O: Header and footer text
 CTRL+P: Header and footer text
 CTRL+Q: Header and footer text
 CTRL+R: Header and footer text
 CTRL+S: Header and footer text
 CTRL+T: Header and footer text
 CTRL+U: Header and footer text
 CTRL+V: Header and footer text
 CTRL+W: Header and footer text
 CTRL+X: Header and footer text
 CTRL+Y: Header and footer text
 CTRL+Z: Header and footer text

KEYBOARD TEMPLATES
 DATA PERFECT
 Version 1

EDIT RECORD FORMAT
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 CTRL+I: Header and footer text
 CTRL+J: Header and footer text
 CTRL+K: Header and footer text
 CTRL+L: Header and footer text
 CTRL+M: Header and footer text
 CTRL+N: Header and footer text
 CTRL+O: Header and footer text
 CTRL+P: Header and footer text
 CTRL+Q: Header and footer text
 CTRL+R: Header and footer text
 CTRL+S: Header and footer text
 CTRL+T: Header and footer text
 CTRL+U: Header and footer text
 CTRL+V: Header and footer text
 CTRL+W: Header and footer text
 CTRL+X: Header and footer text
 CTRL+Y: Header and footer text
 CTRL+Z: Header and footer text

CIRCLE #136 ON READER SERVICE CARD

Line 400 calls CIO to execute the OPEN function.

Line 410 branches to OPNERR if the keyboard OPEN resulted in an error. We'll look at the error handler in a few moments.

If the keyboard was opened successfully, Lines 450-560 print a prompt to the screen, as follows:

Line 450 sets the X-register to \$00, indicating that we're going to work with IOCB #0, the screen editor.

Lines 460-470 will place \$09 in the IOCB command byte, ICCMD, which is the command number for Put RECORD. The record we're going to output is the initial prompt for the program.

Lines 480-510 point the buffer address (ICBAL and ICBAH) to the text string labeled PROMPT. This is defined at Line 1680. Note that, since PROMPT is considered a text record, it must be terminated with an ATASCII EOL character, \$9B.

Lines 520-540 set the text buffer length value to \$FFFF, telling CIO that the longest string we want to write is 65,536 bytes long. Obviously, the PROMPT string at Line 1680 isn't anywhere near 65,536 bytes long, but as long as you place an EOL character at the end of the string you're printing, CIO will stop when it reaches the string's end. Setting the length of \$FFFF is simply an easy way to ensure that the whole string gets printed without actually counting the characters in it.

Line 550 performs a JSR to CIOV to actually print the string on the screen.

Line 560 branches to the PRTER error routine if the print operation encountered an error.

The next section of the program is the main loop. It accepts a text record from the keyboard and prints it back to the user.

Lines 600-620 point to IOCB #1 and set the command byte to \$05, for a GET RECORD operation.

Lines 630-660 point to out text input buffer, INBUF, which is defined at Line 1770. When CIO accepts text, it will be placed in this area of memory.

Lines 670-700 tell CIO that the buffer length is 40 bytes. No mat-

ter how many keys the user types before passing RETURN, CIO won't try to place more than 40 bytes in the INBUF buffer. If more than forty characters are typed, CIO will place thirty-nine of the characters in the buffer, plus an EOL as the fortieth character, then return with the ICSTA byte and the Y-register, indicating a *truncated record* error.

Line 710 performs a JSR to CIO to perform the GET RECORD operation.

Lines 760-880 work just as Lines 450-560 do, except that this time, the record being printed is the text input buffer, INBUF. We also set the text length to the maximum buffer size, 40 bytes.

After the text is printed back to the user, Line 890 loops back to GETTXT, Line 600, to get another line of text.

Lines 960-1080, labeled OPNERR, print an error message if the keyboard couldn't be opened successfully. This operation is just like the opening prompt print operation in Lines 450-560, except that the text to be printed is labeled OEMSG (Open Error Message). After the text is printed, a BRK operation is executed to return control to the debugging program.

Lines 1120-1140 are executed anytime a text print operation fails. They change the screen border color to red, then JMP to FINISH to exit the program.

Lines 1180-1640 are a very important part of this program. They're executed when an error is encountered during a GET RECORD operation from the keyboard, and determine which error was encountered. In our example, the three important errors are ERROR #128 (BREAK key abort), ERROR #137 (truncated record), and ERROR #136 (end-of-file). Other errors are reported as an *unknown error*.

Line 1180 checks the Y-register to see if it contains an ERROR #136 (EOF).

If the error is not an EOF error, Line 1190 branches to NOTEOF to test for the next error.

Lines 1200-1240 are executed if the EOF has been detected. They close the keyboard (IOCB #1) and exit the program with a BRK instruction.

Line 1250, or NOTEOF, checks the Y-register to see if it contains the ERROR #128 (BREAK key abort).

If the error isn't a BREAK key abort, Line 1260 branches to NOTBRK to continue testing.

If the error was a BREAK key abort, Lines 1270-1380 print the BREAK key error message (BRK-MSG), as was done with the main prompt at Lines 450-560, then loop back to GETTXT to get the next text record.

Line 1390 tests the Y-register to see if an ERROR #137 (truncated record) was encountered.

If the error was not #137, Line 1400 branches to NOTTRN (Not Truncated), to report that an unknown error was encountered.

If the record was truncated, Lines 1410-1520 print the TRNMSG text and loop back to get the next text record.

Lines 1530-1640 print the OTHER message text, to let the user know that an error occurred, but the error is not one of the three normal errors. After the message is printed, control is passed back to GETTXT.

Lines 1680-1720 are the text messages used by the program. Note that all are terminated with EOL characters (\$9B).

Line 1760 is the keyboard device string, "K:". It, too, must be terminated with an EOL.

Line 1770 is the program's text input buffer. For this time, it's been set to 40 bytes. You can change this if you like, but be sure to change the text length settings in Lines 670-700 and 830-860.

Testing the program.

When you execute the program, you'll be told to enter text and press CTRL-3 when you want to exit. Type HELLO and press RETURN. The computer will print the word HELLO after you press RETURN. As you're typing, the characters do not appear on the screen. This shows one important thing—the keyboard is an input-only device, and won't echo your characters to the screen as you type. More on this in a moment.

Try pressing the BREAK key once. The computer should scold you for pressing it. Some debugging programs may use the BREAK key, but the Assembler Editor cartridge will allow our program to react properly if the BREAK key

is not pressed repeatedly, too quickly.

Now enter more than forty characters and press RETURN. Once again, an error message will be printed. You can see that we are catching the errors properly, avoiding nasty problems.

When you're done testing, press CTRL-3, and the program will return control to your debugger.

You noticed how the keyboard didn't

echo your keystrokes to the screen—try changing the "K:" in Line 1760 to "E:". This will set up IOCB #1 as a screen editor for input only, and when you run the program, you'll see your text as it's entered.

The K: device should be used to get keystrokes when you don't want them echoed to the screen, and the screen editor should be used at all other times.

Last words.

You can use the principles in this program to create your own text entry routines and error message subroutines. You can modify the text input buffer to accept more characters. Just be sure to change the buffer size in Line 1770.

Next month, we'll expand this idea, and get into disk I/O, so stay tuned! ☐

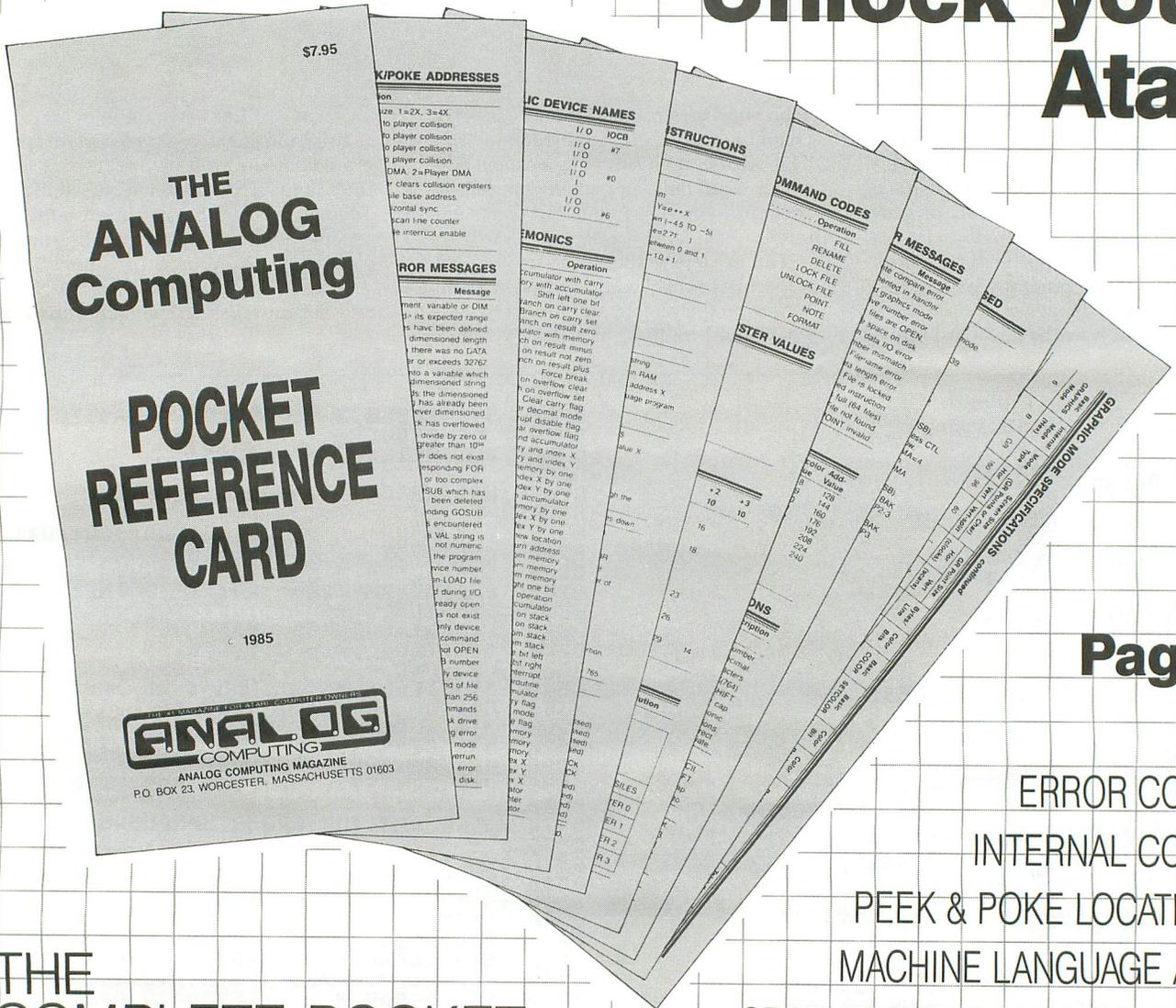
Listing 1.
BASIC listing.

```

0100 .OPT NOLIST
0110 COLOR4 = $02C8
0120 ICCMD = $0342
0130 IC5TA = $0343
0140 ICBAL = $0344
0150 ICBAH = $0345
0160 ICBLL = $0348
0170 ICBLH = $0349
0180 ICAX1 = $034A
0190 ICAX2 = $034B
0200 CIOV = $E456
0210 ;
0220 ;SET STARTING ADDRESS5
0230 ;
0240 *= $6000
0250 ;
0260 ;NOW OPEN KEYBOARD FOR INPUT
0270 ;
0280 CLD ;BINARY MODE!
0290 LDX #10 ;IOCB #1
0300 LDA #503 ;SET FOR...
0310 STA ICCMD,X ;OPEN COMMAND
0320 LDA #KEYBD/256 ;POINT TO...
0330 STA ICBAH,X ;K: TEXT...
0340 LDA #KEYBD&255 ;FOR OPEN...
0350 STA ICBAL,X ;OPERATION
0360 LDA #504 ;SET FILE...
0370 STA ICAX1,X ;FOR INPUT
0380 LDA #500 ;AND CLEAR...
0390 STA ICAX2,X ;ICAX2!
0400 JSR CIOV ;OPEN THE KEYBD!
0410 BMI OPNERR ;BRANCH IF ERR!
0420 ;
0430 ;KEYBOARD'S OPEN, PRINT PROMPT!
0440 ;
0450 LDX #500 ;IOCB #0 (SCREEN)
0460 LDA #509 ;SET COMMAND...
0470 STA ICCMD,X ;FOR PUT RECORD
0480 LDA #PROMPT/256 ;POINT TO...
0490 STA ICBAH,X ;STARTING...
0500 LDA #PROMPT&255 ;PROMPT...
0510 STA ICBAL,X ;MESSAGE
0520 LDA #5FF ;SET FOR...
0530 STA ICBLL,X ;MAXIMUM TEXT...
0540 STA ICBLH,X ;LENGTH
0550 JSR CIOV ;PRINT IT!
0560 BMI PRterr ;BRANCH IF ERROR
0570 ;
0580 ;NOW ACCEPT A STRING FROM KEYBD
0590 ;
0600 GETTXT LDX #10 ;IOCB #1 (KEYBD)
0610 LDA #505 ;SET UP...
0620 STA ICCMD,X ;GET RECORD CMD
0630 LDA #INBUF/256 ;POINT TO...
0640 STA ICBAH,X ;THE TEXT...
0650 LDA #INBUF&255 ;INPUT...
0660 STA ICBAL,X ;BUFFER
0670 LDA #40 ;ALLOW MAXIMUM...
0680 STA ICBLL,X ;OF 40 BYTES...
0690 LDA #0 ;ON THE...
0700 STA ICBLH,X ;INPUT OPERATION
0710 JSR CIOV ;GET TEXT!
0720 BMI GETERR ;OOPS!
0730 ;
0740 ;NOW REPEAT IT BACK TO USER!
0750 ;
0760 LDX #500 ;IOCB #0 (SCREEN)
0770 LDA #509 ;SET UP FOR...
0780 STA ICCMD,X ;PUT RECORD
0790 LDA #INBUF/256 ;POINT TO THE...
0800 STA ICBAH,X ;TEXT THE...
0810 LDA #INBUF&255 ;USER JUST...
0820 STA ICBAL,X ;TYPED IN
0830 LDA #40 ;WE KNOW THERE...
0840 STA ICBLL,X ;WON'T BE MORE...
0850 LDA #0 ;THAN 40 BYTES!
0860 STA ICBLH,X
0870 JSR CIOV ;REPEAT TEXT!
0880 BMI PRterr ;ERROR!
0890 JMP GETTXT ;LOOP FOR MORE
0900 ;
0910 ;HERE ARE THE ERROR HANDLERS
0920 ;-----
0930 ;
0940 ;KEYBOARD OPEN ERROR
0950 ;
0960 OPNERR LDX #500 ;IOCB #0 (SCREEN)
0970 LDA #509 ;SET FOR...
0980 STA ICCMD,X ;PUT RECORD
0990 LDA #OEMSG/256 ;POINT TO...
1000 STA ICBAH,X ;KEYBOARD OPEN...
1010 LDA #OEMSG&255 ;ERROR MESSAGE
1020 STA ICBAL,X
1030 LDA #5FF ;SET LENGTH...
1040 STA ICBLL,X ;TO MAXIMUM
1050 STA ICBLH,X
1060 JSR CIOV ;PRINT MESSAGE!
1070 BMI PRterr ;BRANCH IF ERROR
1080 BRK ;AND EXIT!
1090 ;
1100 ;TEXT PRINT ERROR
1110 ;
1120 PRterr LDA #534 ;PUT RED...
1130 STA COLOR4 ;IN BACKGND COLOR
1140 JMP FINISH ;AND EXIT!
1150 ;
1160 ;INPUT ERROR
1170 ;
1180 GETERR CPY #136 ;ERROR #136?
1190 BNE NOTEOF ;NO, NOT EOF.
1200 FINISH LDX #10 ;GOT EOF...
1210 LDA #50C ;CLOSE THE...
1220 STA ICCMD,X ;KEYBOARD...
1230 JSR CIOV
1240 BRK ;AND EXIT!
1250 NOTEOF CPY #128 ;ERROR #128?
1260 BNE NOTBRK ;NO, NOT BREAK
1270 LDX #500 ;IOCB #0 (SCREEN)
1280 LDA #509 ;PUT RECORD
1290 STA ICCMD,X
1300 LDA #BRKMSG/256 ;POINT TO...
1310 STA ICBAH,X ;BREAK KEY...

```

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```

1320 LDA #BRKMSG&255 ;ERROR MESSAGE
1330 STA ICBAL,X
1340 LDA #$FF ;SET FOR...
1350 STA ICBLL,X ;MAXIMUM...
1360 STA ICBLLH,X ;TEXT LENGTH
1370 JSR CIOV ;PRINT IT,
1380 JMP GETTXT ;GO GET TEXT.
1390 NOTBRK CPY #137 ;TRUNCATED?
1400 BNE NOTTRN ;NO, NOT BREAK
1410 LDX #500 ;IOCB #0 (SCREEN)
1420 LDA #509 ;PUT RECORD
1430 STA ICCMD,X
1440 LDA #TRNMSG/256 ;POINT TO...
1450 STA ICBAH,X ;TRUNCATION...
1460 LDA #TRNMSG&255 ;ERROR MESSAGE
1470 STA ICBAL,X
1480 LDA #$FF ;SET FOR...
1490 STA ICBLL,X ;MAXIMUM...
1500 STA ICBLLH,X ;TEXT LENGTH
1510 JSR CIOV ;PRINT IT,
1520 JMP GETTXT ;GO GET TEXT.
1530 NOTTRN LDX #500 ;IT'S ANOTHER...
1540 LDA #509 ;ERROR, 50...
1550 STA ICCMD,X ;LET'S PRINT...
1560 LDA #OTHER/256 ;A MESSAGE...
1570 STA ICBAH,X ;INFORMING...
1580 LDA #OTHER&255 ;THE USER.
1590 STA ICBAL,X
1600 LDA #$FF
1610 STA ICBLL,X
1620 STA ICBLLH,X
1630 JSR CIOV ;PRINT MESSAGE
1640 JMP GETTXT ;GET MORE TEXT!
1650 ;
1660 ;HERE ARE THE TEXT MESSAGES
1670 ;
1680 PROMPT .BYTE "ENTER TEXT, CTRL-3
TO EXIT", $9B
1690 OEMSG .BYTE "*** KEYBOARD OPEN ER
ROR ***", $9B
1700 BRKMSG .BYTE "*** DON'T PRESS THE
BREAK KEY! ***", $9B

```

```

1710 TRNMSG .BYTE "*** TEXT TOO LONG!
***", $9B
1720 OTHER .BYTE "*** UNKNOWN ERROR!!!
***", $9B
1730 ;
1740 ;MISCELLANEOUS DATA
1750 ;
1760 KEYBD .BYTE "K:", $9B
1770 INBUF *=*+40
1780 .END

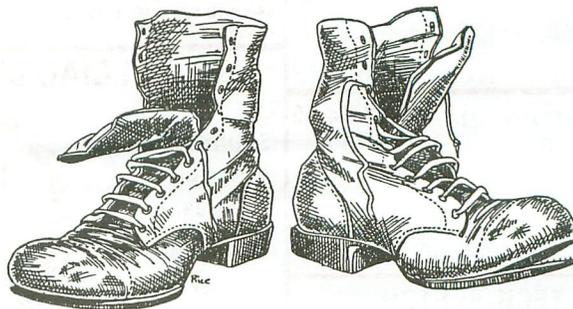
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Mudpies

continued from page 42

During the "challenge rounds," Arnold has to run through a room with no pies. There are special prizes in these rooms which, when retrieved, earn him extra points. As the game progresses, there are more clowns, and they move a lot faster.

Arnold starts out with only three trips to the first aid tent, but extra trips (lives) are awarded for every 10,000 points. Also, for every 20,000 points, a spinning door appears on the screen. Entering this door allows Arnold to play a special "mudslinging round," where he has to clobber as many clowns with **Mudpies** as he can in a limited amount of time.

Arnold can be controlled by either a joystick, the mouse or the keyboard. Personal preference will decide which is

best for you. I prefer using a joystick, but other people I know enjoy using the mouse. A high score screen is presented at the end of the game. If you have a score in the top ten, it can be saved to the disk.

So how do I like all of this clowning around? I think it's great. **Mudpies** is certainly addicting, which is the mark of a truly good game. Carnival music plays during the game, adding to a circus atmosphere. And yes, you can turn the music off for those late-night gaming sessions.

All in all, **Mudpies** is a very enjoyable game that I highly recommend. McKenzie and Sorenson have done an excellent job of both game design and implementation. **A**

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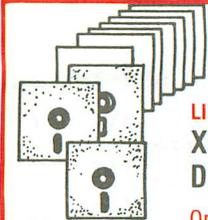
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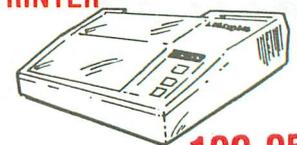


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by **Andy Eddy**

Although there are many names competing in the battle of information services, the "king" will be the one that offers the subscriber the strongest features with an emphasis on user friendliness, at an affordable price. This review will delve into a service that does its best at just that for its customers.

A guided tour.

"Greetings, and welcome to our guided tour. My name is Max, and I'll be your guide on this tour through a wonderful part of the information age called **Delphi**."

This is what begins the journey for the new **Delphi** user. The tour is initiated upon the first log-in and helps the user become familiar with the necessities of the service, such as terminal settings, password usage, and the control characters needed to work efficiently while on-line. Anyone uncomfortable with the on-line world will quickly be put at ease by this accommodation.

To show their understanding of the perils for a new user, the tour actually does *guide* the subscriber through the various functions—by prompting responses and practice of the various functions. To toggle the flow of the data to your screen on and off, for example, the CTRL-S and CTRL-Q keys are utilized. In the tour, you're given an opportunity to see how this works by actual, hands-on practice. This not only shows you how the system works, but forces you to remember the important and often-used keystrokes, through their implementation.

For those of us who are less apt to commit to memory the commands used in **Delphi**, help comes in the form of a manual and command reference card

that can be purchased for \$19.95 (plus \$2.00 shipping and handling).

While I found the manual to be erroneous in some of its information, this is the result of constant updating of the system and its offerings. Items are being moved to different parts of the system and onto different menus to make accessing them easier. Just the same, the manual is very helpful—if not required—in speeding up the user's learning process.

Help is available at any prompt to explain all functions, but takes up valuable on-line time. For more lengthy explanations, the customer service department is just a toll-free phone call away to answer any questions that may arise. It's surprisingly free from long delays.

All of the **Delphi** menus are laid out for maximum simplicity, with English commands that are easy to remember and allow you to get to any desired location in the system in a short time. There are a few features that require extensive knowledge of their usage, with the exception of some specialized databases or services. Again, the HELP documentation will give you most of the information necessary for your efficient operation.

So you want to communicate?

There are many ways to communicate through electronic means, and **Delphi** is chock full of them. Though many of the items on the **Delphi** Mail menu are an added charge, there's much flexibility for someone wanting to send a message to another person. Their intersystem mail service is easy to use, but the innovations don't end there.

The Western Union Telex service enables you the luxury of sending a message to any telex number and gives you access to hundreds and hundreds of businesses worldwide. This is a demonstra-

tion of how useful this service is to the business person.

If by chance the file you wish to send needs conversion to a foreign language, the Globalink translation service is available to solve your problem. Although the service charges 3 cents a character to accomplish the task, a person who deals frequently with other countries might find this more attractive than hiring a translator or learning the language for themselves.

ECOM (Electronically Computer Originated First Class Mail) connects you to the U.S. Postal Service and puts it in your control. Whether you are sending to 1 or 100 addresses, you can generate a letter (with certain limitations) that will be sent through the normal mail chain and delivered in a special envelope, at a fraction of the normal cost to the location(s) of your choice 24 hours a day, 7 days a week. That's what I call putting the government right in your hands!

Another feature called Batch Mailthru interfaces you with the mail services of other on-line networks, such as CompuServe and The Source, to contact users of those systems. Although this feature wasn't available at the time of this review due to changes in the operating system, it should be ready by the time you read this.

For the business oriented.

This network has a definite slant to some of its offerings to attract the business user, and there are some enticements for the modern-day business person to have them within reach during the workday.

Financial news and brokerage services are waiting for those with money on their minds. Quotes are on your screen almost as soon as they hit Wall Street.



The Office Manager selection on the main menu moves you to an area intended for professionals who use computers as an integral part of their work routine. Along with a diary and appointment calendar, a forum is maintained, allowing business people to converse with each other, as well as to view bulletin boards with a business emphasis.

To use some of these features would involve a great deal of on-line time at prime-time rates. The amount of money spent in these endeavors would most likely restrict their usage to corporations and other large-scale business users.

International news, sports and weather are also just a keystroke away. For industry mavens and computer junkies, *The Daily Computer Wire* (the "first on-line daily newspaper") and the *TDC Monthly Newsletter* will give up-to-date scoops on the telecommunications and computer communities.

Whether you're doing research for business, for a term paper, or just out of curiosity, the Library section will come in handy. Stocked with newsletters of varied interests for light research, it is also equipped with the *Kussmaul Encyclopedia* for more extensive entries.

The encyclopedia is accessed through the use of "keywords" that you input. Within seconds, the information pertaining to that subject will come up on your screen. Cross references may be used to "fine tune" a subject to your needs, in case a word doesn't show up in the files of the encyclopedia. In the event that your search fails to turn up sufficient information, you can request a "librarian" to do the research for you, although this will cost more than normal access. You'll be notified of availability through the internal mail service.

Perhaps the strongest of the features in the Library is the offering of the Dialog Information Service, which is run by Lockheed. Through it, you'll have at your fingertips access to over 250 databases on a multitude of subjects. The price for this network is substantially higher than *Delphi's* access costs, and it's somewhat more difficult to operate, as it runs on a different set of commands than *Delphi* itself. It's amazing to think that, with this service, Atari users have the same powers within their grasp as someone using a mainframe computer.

Delphi sells a manual, which can be purchased on-line, to aid in the usage and familiarity of Dialog, but the recommended method is to attend one of the

seminars that are frequently given by the Dialog staff. For information on this wealth of data and the next seminar near you, contact them at 1-800-8282.

Atari users unite!

To bring the computer revolution close to home, user groups were formed, allowing machine-specific users to trade information they've discovered, in the same way that town meetings are used to update people's knowledge of goings-on in the community. Atari users will be happy to know that SIG*ATARI is featured on *Delphi*, but not as a mirror image of its CompuServe counterpart.

One of the more important features of the SIG, which is actually supported throughout the network, is the ability to use the Xmodem protocol in uploading or downloading programs and files.

For those new to telecommunications, Xmodem is a transfer program that uses the same type of concept as the checksum data at the end of **ANALOG Computing** programs. The Xmodem program sends the file, bit by bit, with an included checksum, to be confirmed by the receiving computer (which must also be equipped with an Xmodem program). These days, many terminal programs (for all computers) offer this feature for error-free transmission of data.

Another of *Delphi's* interactive innovations, which also appears in the SIG, is the use of polls to get opinions on questions put forth by users themselves. The polls range from computer subjects to inquiries on politics. This demonstrates the importance *Delphi* puts on subscriber interaction, taking away the impersonal situations that similar networks suffer from.

While the entries to the SIG are somewhat scarce, **ANALOG Computing** has started a section under its name which will contain information and programs pertaining to the Atari computer and its users. This can be found in the databases in SIG*ATARI under the Groups and Clubs entry of the main menu.

Everything under the sun.

While I've just touched on the more important and elaborate features offered on *Delphi*, subscribers can find a service to satisfy almost any taste. For those who intend to use it for communication, there are conversation and mail functions; for business users, there are the financial and international news databases; for recreation, there are games of all kinds—from casino games to adventures. Literary types can be occupied

by the many "collaborative novels" that are constantly in progress, where you add to the chapters of other storytellers, twisting the plot just like stories told around a campfire. Reading these can be as entertaining as participating.

Indeed, this is a service that isn't focused on one group; even nonusers can find information and enjoyment through the simple menus and prompts. That seems to be the nucleus of *Delphi*—comprehensive data and recreation that's easy to use and easy to find.

The most refreshing feature is the low access cost. The first barrier broken is the one that segregates 300 baud users from 1200 baud users. *Delphi* treats all users the same with their "office time" (7:00 a.m. to 6:00 p.m.) rates of \$9.00 per hour, and "home time" (6:00 p.m. to 7:00 a.m.) rates of \$6.00 per hour!

The second hurdle is the time that most networks force you to wait to activate your account. With a credit card, *Delphi* will handle your start-up on the phone and give you your password the next business day, allowing you to be on-line quickly. After all, isn't that why we joined the personal computer revolution...to increase the speed with which we work and play?

For a cost of \$49.95 (plus \$2.00 shipping and handling), you receive a lifetime membership, the above-mentioned manual and reference card and two free hours to familiarize yourself with the system. Those who feel competent in their abilities to work without a manual can get their lifetime subscription for \$29.95, which includes the reference card and one free hour. While this may seem steep, many subscribers sign up through the occasional discounts.

All free time is accounted for usage at "home time" rates. Using your free hours during "office time" will result in a rapid expenditure of that time.

This service, home to over 10,000 subscribers, seems a result of careful scrutiny of other networks, as well as determining the needs of users. I think that they'll give the "big boys" a run for their money in the race for the throne.

Delphi is accessible in many U.S. cities as a local call, through TYMNET and UNINET phone networks, as well as in Massachusetts through their own phone network. To get more information or to sign up, contact *Delphi* at 1-800-544-4005 (in Massachusetts, 1-617-491-3393)...and tell them **ANALOG Computing** sent you! **A**

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by Clayton Walnum

I am sure that those of you with subscriptions to any of the major telecommunications networks (CompuServe, The Source, etc.) remember, in less than favorable terms, the first time you logged on. First of all, there was the problem of just getting on the system. Was that a CTRL-C or a RETURN you ought to have hit? and what was that user number they gave you? Was it 73445,876 or 73544,876? Quick, look it up!

And how about those menus? Layers and layers of menus. You drifted from one to the other, increasingly confused, panic waiting to leap out and grab you, because you just knew there was no way back. Your fingers were bruised and bleeding from pounding on the keyboard, trying to get something to work the way you thought it would. Meanwhile, time (\$\$\$\$) clicked inexorably on.

If you were anything like me, it took about a month before you could work up the courage to try it again.

For all of you who are nodding your heads in sympathy with the above, I've got good news. There's a new kid in town, who's really something.

Games Computers Play is a telecommunications service that lends new meaning to the term "user friendly." You can forget about that maze of menus and those hundreds of commands that were

necessary to function within the other networks. These people did away with most of that. When you log on to **GCP**, you step into a futuristic city that's graphically portrayed on your screen. And I mean a *real* city. There's a customs office, a post office, a games room, a social building, telephones, computer terminals, and even the offices of **GCP** itself.

Welcome to the city.

When you log on, the first thing you'll see is a large set of sliding doors sporting the bold letters **GCP**. The doors slowly part, revealing a portion of The City's customs office, and there you are on the screen, a little robot, or "droid" as **GCP** calls it. You will use your droid to get around in The City, as well as to activate the various icons that control most of the system's functions.

You now enter your log-on name (notice I said *name*, not *number*) and your password. A few seconds pass while you're cleared by customs. If everything checks out, the doors vanish, and the entire customs office comes into view.

In front of you is the customs desk. If you want to see who's currently on the system, just step up to the desk and press your joystick button. The other user's names, as well as where they can be found in The City, appear on your screen. That was easy, wasn't it? No commands. No menus. Just a simple press of a button.

To the left of the customs desk is the cloakroom. It is here that you may exchange the droid you were assigned for a model better suited to your tastes. Use your joystick to wander up and down the rows of unused droids until you find one that strikes your fancy. Press your trigger and you've got a new look.

Now you're ready to enter The City itself. To the right, there's a doorway marked—you guessed it—"The City." To enter, step up to the door and press your trigger.

Once in the city, you use your joystick to guide your droid along the walkways. In your travels, you will see the games building, the post office and the other buildings that make up The City. If there are other users near you, you'll see their droids, as well.

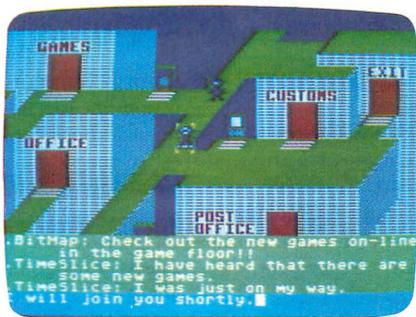
Want to have a little chat with someone? Just move up next to them and type a message on your keyboard. When you hit RETURN, your text is sent. That's all there is to it. No frantically trying to get someone's job number, no weird commands. Just walk up and chat.

As you explore The City, you'll see things that look suspiciously like computer terminals and telephones. Believe it or not, that's exactly what they are.

The terminals allow you to perform such functions as changing your password, getting the directory of your disk, looking for other users on the system, and checking for mail.



There's also a GOTO command available if you want to get someplace within The City quickly. For instance, if you type GOTO GAMES, you will be teleported to the games floor without having to walk there.



Since it can sometimes be a bit tricky to catch up with someone for a chat, there are telephones available. Just step up to one, press your trigger, then activate the call button. As soon as you enter the name of the person you want to speak with, they will be notified and run (we hope) to the nearest phone to answer your call.

The local postal authority.

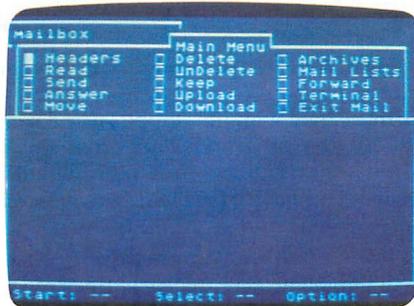
Running a message base is a complex undertaking, especially if you wish to offer subscribers maximum control over the storing and retrieving of their text. Unfortunately, this means that a good deal of compromise is necessary when implementing the message base in an environment such as GCP's.

When you step into The City's post office, the system begins to look a bit like what you would expect from a typical telecommunications service. The menus return (although they are joystick controlled), and there's a series of prompts which must be answered to view your mail.

I've been informed, however, that a new post office is in the works, and that all functions will be icon driven, bringing the message base up to date with the rest of the system. By the time you read this, the new icons will probably be in operation. Even without icons, you'll find that the mail system is much easier to operate than any of the others you've likely had experience with. The necessary commands are clearly visible at the top of the screen, and, with a little experimentation, you can get by—even if you haven't read the documentation.

Games people play.

GCP provides its users with several



games (after all, they do call themselves **Games Computers Play**), all utilizing full graphics. The most popular seems to be **Cybertank**. Here, you select a tank, outfit it, then jump into the fray, battling frantically against other users—whose



sole purpose in life seems to be to place each other into the past tense. Graphics are surprisingly good.

Another game, **Cybership**, is similar to **Cybertank**. You set yourself up with a ship (the ocean-going variety) and cruise the waters of the world, searching for an opportunity to send your worthy opponents on a visit to Davy Jones' locker.

Bio War, based on Conway's game of life, is especially challenging. Here you must plant cells in such a way as to provide maximum growth, while at the same time preventing other players from enlarging their colonies. This game, unlike **Cybertank** and **Cybership**, can be played solitaire.

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Review *continued*

These were the only games that were in operation as of this writing. They do have others in development, such as **Lords of Space**, a galactic exploration game where you equip yourself with a starship and sally forth to use and abuse the universe.

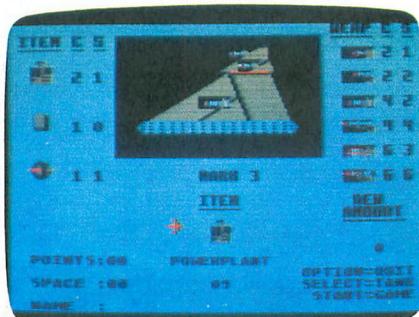
Private socializing.

If you find the need to go off somewhere with a buddy or two for a private conversation, you can all meet up in the social building. Here you'll find a number of rooms, each with their own telephones and terminals, where a group of people can get together and discuss those issues of life-and-death importance that need to be resolved, or perhaps just start an on-line game of D&D. Step into the room and close the door for complete privacy.

If, when you arrive at the social building, you notice that there's already a conversation in progress, you can step up to the door and "knock" (press your trigger). Maybe they'll let you in, and maybe they won't.

Help! Anyone there?

A major source of frustration on most telecommunications services is the inability to contact *immediately* someone in authority with whom to hash out problems. Sure, you could leave a message to the SYSOP, and, if you're real lucky, you may have a reply the next day. I don't know about you, but when I'm tossing out six bucks an hour for connect time, I want answers to problems now, not when someone gets around to it.



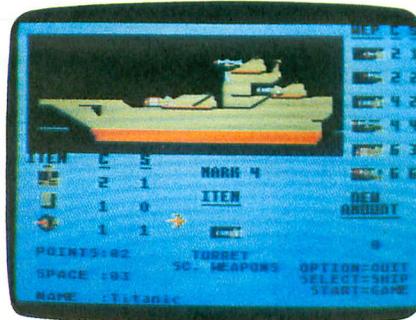
I've never logged on to GCP when there wasn't a SYSOP available. Sometimes they can be found wandering about the city, and sometimes you'll find them in the office building. But when you have a problem, you have access to fast and helpful answers.

Nothing is perfect.

I somehow feel that it is the duty of a reviewer, however distasteful he may

find it (chuckle, chuckle), to scrape up some little tidbit to whine about. I have to admit it's been pretty tough, but I'll give it a shot.

I'd like to see more variety on the games floor, perhaps a board game for those of us who aren't into real-time play or games of the reduce-your-neighbor-to-atoms genre.



Also, the system slows down quite a bit when there are more than a few users on-line. In a couple of cases, I was locked out completely and was forced to hang up and reconnect. Granted, the speed problem is pretty universal among the networks, but having a conversation cut off in mid-dialog for a system lock-up is pretty hard to take.

Summing it up.

In the course of writing this review, it's been difficult to keep up with the people at GCP. The system is in a constant state of flux. Refinements and additions seem to happen weekly as The City grows and matures. In the near future (probably even before this goes to print), GCP's subscribers will find bookcase icons offering help and newsworthy items; bulletin boards on which quick messages of a general nature can be posted; a "bills" door which will allow subscribers access to their account's billing information; a suggestion box for those times when a SYSOP is unavailable (rare); and other nuances too numerous to list here.

The people at GCP are excited about what they're doing, and they have every right to be. The possibilities are boundless, limited only by the imagination and vision of its creators. I predict that The City will grow enormously over the coming years, building a population of users who have at last found a telecommunications system that caters to their needs, and above all allows them to have fun. **A**



Speedski *continued*

```

STA DLIST+9 ;to scrolling
LDA # >SCRN1 ;screen
LDA DLIST+10
LDA #0 ;Reset # scan
STA SCROLLED ;lines scrolled
STA TIMESFLB ;and TIMESFLB
STA TIMES ;+ course scroll
STA SCROLFLB ;Do scrolling
LDA #1 ;Set scroll speed
STA SPEED ;to slow
LDA #0 ;Set
LDA #6 ;clock
I4 STA CLOCK,X ;to
DEX ;#0:00.00
BPL I4
STX CLOCK+2 ;"." character
STX CH ;Reset last key
DEX
STX CLOCK+5 ;":" character
LDA #120 ;Set horizontal
LDA XPOS ;pos of skier
LDA #36 ;Set vertical
STA YPOS ;pos of skier

;-----
;BEGIN GAME
;-----
WAITLOOP LDA CONSOL
ROR A ;START Pressed?
BCC LETS90 ;Yes! start game
LDA STRIB0 ;Trigger pressed?
BNE WAITLOOP ;No, wait
JSR CLEAR3RD ;Clr 3rd line
LDA #4 ;Chg ANTIC 4 line
STA DLIST+7 ;to BR.1 line
STA ATTRACT ;Reset Attract
JSR SCROLLIT ;Start VBLANK

;-----
;INTRODUCTION
;-----
INTRO LDA XPOS ;Position the
STA HPDSP0 ;skier
STA HPDSP1 ;horizontally
JSR ERASE ;Erase skier
LDA # <IM2 ;Tell IMAGEPTR
STA IMAGEPTR ;which image
LDA # >IM2 ;to
STA IMAGEPTR+1 ;draw
JSR DRAW ;Go draw skiers
INC YPOS ;Move down screen
LDA YPOS ;See if skier has
CMP #72 ;reached middle
BEQ MAINLOOP ;of screen? Yes.
LDA YPOS ;Vert position
LSR A ;/2
LSR A ;/4
LSR A ;/8
STA AUDF1 ;Set frequency,
STA AUCD1 ;vol. distortion
LDX #10 ;H/I byte and LD
LDY #0 ;byte of delay
JSR DELAY ;Slow down action
JMP INTRO ;Do it again

;-----
;THE MAIN LOOP
;-----
MAINLOOP STA HITCLR ;Clr Collision
LDA STICK0 ;Read joystick
CMP #3 ;Down and right?
BEQ MP2A ;Go draw skier
CMP #6 ;Up and right?
BEQ MP2
BEQ MP3
BNE MP3
DEC SPEED
JMP RIGHT

MP2A CMP #9 ;Down and left?
BEQ MP5A
CMP #10 ;Up and left?
BEQ MP5
CMP #11 ;Left?
BNE MP4
DEC SPEED
JMP LEFT

MP3 CMP #13 ;Down?
BNE MP7
INC SPEED
JMP STRAIGHT

MP7 CMP #14 ;Up?
BNE MP8
DEC SPEED
JSR TESTSPD
DEC SPEED
JMP STRAIGHT

MP8

CONTINUE LDA XPOS ;Horizontal pos
STA HPDSP0 ;Position P1#
STA HPDSP1 ;Position P1r1
LDA CH ;Last key pressed
CMP #255
BEQ MP9 ;No key pressed
JSR PAUSE ;Activate pause
LDA CONSOL
CMP #6 ;START pressed?
BNE MP10 ;No.
JMP INIT ;Start over

MP9 LDA P0PF ;Check collision
BEQ MP11 ;Nobody crashed
JSR CRASH ;Crash occured
LDX #0
JSR DELAY ;Slow the action
LDA SCROLFLB ;scrolling?
BEQ MP12 ;Yes, continue
JMP ENDBAME

MP10 JSR TESTX ;Skier's X coord
JMP MAINLOOP ;Loop back

```

```

;-----
;Delay subroutine
;-----
DELAY DEY
BNE DELAY
DEX
BNE DELAY
RTS

;-----
;Erase players 0 & 1
;-----
ERASE LDA #0
TAX
MP13 STA PLR0,X ;Erase P1#
STA PLR1,X ;Erase P1r1
DEX
BNE MP13
RTS

;-----
;Start scrolling & clock
;-----
SCROLLIT LDX # >VBI
LDY # <VBI
BNE HALT2

;-----
;Disable VBLANK
;-----
HALT LDX # >SVSVDV
LDY # <SVSVDV
HALT2 LDA #6
JMP SETVSV

;-----
;Subroutine to draw players
;-----
DRAW LDX YPOS ;Set vert pos
LDY #23 ;# bytes to draw
DRAWLOOP LDA (IMAGEPTR),Y ;Set number
STA PLR1,X ;Put it in P1r1
DEY
LDA (IMAGEPTR),Y ;Set another
STA PLR0,X ;Put it in P1#
DEX
DEY
BPL DRAWLOOP ;Do until Y=255
RTS

;-----
;Set skier to right
;-----
RIGHT JSR TESTSPD
INC XPOS
LDA # <IM3 ;Point to
STA IMAGEPTR ;right
LDA # >IM3 ;skier
STA IMAGEPTR+1
LDA #4
BNE LEFT1

;-----
;Set skier to left
;-----
LEFT JSR TESTSPD
DEC XPOS
LDA # <IM1 ;Point to
STA IMAGEPTR ;left
LDA # >IM1 ;skier
STA IMAGEPTR+1
LDA #4
LEFT1 STA AUDF1
LDA #12
LEFT2 STA AUCD1
JSR DRAW
JMP CONTINUE

;-----
;Set skier to straight
;-----
STRAIGHT JSR TESTSPD
LDA # <IM2 ;Point to
STA IMAGEPTR ;straight
LDA # >IM2 ;skier
STA IMAGEPTR+1
LDA #2
STA AUDF1
LDA #8
BNE LEFT2

;-----
;Test scrolling speed
;-----
TESTSPD LDA SPEED
CMP #65 ;Is it > maximum?
BNE MP14 ;No
DEC SPEED ;Make maximum
RTS

MP14 LDA SPEED ;Speed < minimum?
BNE MP15 ;No.
INC SPEED ;Make minimum
RTS

;-----
;Pause subroutine
;-----
PAUSE JSR HALT ;Stop scrolling
LDA #255 ;Reset last
STA CH ;key pressed
LDA CONSOL
CMP #3 ;to be
BNE MP16 ;pressed
JMP SCROLLIT

;-----
;GameOver
;-----
ENDBAME JSR HALT ;Stop scrolling
LDA #121 ;note C
STA AUDF1
LDA #146 ;with pure tone
STA AUCD1 ;and some volume

```

```

LDX #0 ;hold the tone
LDY #0 ;for a while
JSR DELAY
LDA #96
STA AUDF1
LDA #121 ;note C
STA AUDF2
LDA #170 ;with pure tone
STA AUCD1 ;and more volume
STA AUCD2
LDX #128 ;Hold tone half
JSR DELAY ;as long
LDA #81 ;note B
STA AUDF1
LDA #96 ;note E
STA AUDF2
LDA #172 ;more volume
STA AUCD1
STA AUCD2
LDX #192 ;Hold tone
JSR DELAY ;note C
LDA #60 ;note B
LDA #81 ;note B
STA AUDF2
LDA #174 ;more volume
STA AUCD1
STA AUCD2
JSR DELAY ;Hold tone twice
JSR DELAY ;as long as ist
LDA #0
STA AUCD1 ;Turn off
STA AUCD2 ;sound
LDA CONSOL ;See if START
ROR A ;pressed
BCC MP18
LDA STRIB0 ;If trig pressed
BNE MP17 ;start game over
JMP INIT

MP17 ;Crash!
;-----
CRASH LDA #1 ;Stop
STA SCROLFLB ;scrolling
LDA #15 ;Set volume
STA VOLUME ;to loud
MP19 LDA #255
STA AUDF1
SBC VOLUME ;255-VOLUME
STA AUCD2 ;for Freq 2
LDA VOLUME ;dist #+VOLUME
STA AUCD1 ;for Ctr1 1
ADC #192 ;Dist 12-VOLUME
STA AUCD2 ;for Ctr1 2
DEC VOLUME ;Reduce volume
LDX #20
JSR DELAY
LDA VOLUME ;See if VOLUME=0
BNE MP19
LDA # <IM4 ;Point to
STA IMAGEPTR ;1st crashing
LDA # >IM4 ;skier
STA IMAGEPTR+1 ;image
JSR DRAW
LDX #30
JSR DELAY
LDA # <IM5 ;Point to
STA IMAGEPTR ;2nd crashing
LDA # >IM5 ;skier
STA IMAGEPTR+1 ;image
JSR DRAW
JSR DELAY
JSR DELAY
JSR DELAY
LDA #0 ;Enable
STA SCROLFLB ;scroll again
LDA # <IM2 ;stand
STA IMAGEPTR ;skier
LDA # >IM2 ;up
STA IMAGEPTR+1 ;again
LDA #1 ;Reset speed
STA SPEED ;to slow
JMP DRAW

;-----
;Clear screen's 3rd line
;-----
CLEAR3RD LDA #0
LDY #120
MP20 STA (SAVM8C),Y
DEY
CPY #79
BNE MP20
RTS

;-----
;Test skier's X position
;-----
TESTX LDA XPOS
CMP #47
BNE MP21
INC XPOS
RTS

MP21 CMP #196
BNE MP22
DEC XPOS
RTS

MP22

;-----
;VERTICAL BLANK INTERRUPT
;-----
VBI LDA SCROLFLB ;if not 0 do
BNE VBICLOCK ;not scroll

;-----
;Calculate scroll speed
;-----
LDA SPEED ;Current speed
LSR A ;/2
LSR A ;/4
LSR A ;/8
LSR A ;/16 If not zero

```

```

BNE VB1 ;do fine scroll
LDX #1 ;if 0 make it 1
BNE SCROLLON
;
VB1 TAX
;
;-----
;Perform fine scroll
;-----
SCROLLON INC SCROLLED ;lines scrolled
LDA SCROLLED
STA VSCRDL ;put in vscr
CMP #16 ;reached limit?
BEQ COARSE ;coarse scroll
DEX ;No. Scroll until
BNE SCROLLON ;X=0
BEQ VB1CLOCK ;Handle clock
;
;Do a coarse scroll
;-----
COARSE LDA #0 ;Reset the fine
STA VSCRDL ;scroll reg and #
STA SCROLLED ;lines scrolled
LDA DLIST+9 ;DLIST's LD byte
CLC
ADC #40 ;Add 40 (1 line)
STA DLIST+9 ;New LD byte
BCC COMPEND ;Over 256? No.
INC DLIST+10 ;Inc HI byte
;
;Check on scrolling limit
;-----
COMPEND LDA TIMESFLB ;check scrolling
BNE COMPDONE ;DLIST HI byte
LDA DLIST+10 ;DLIST HI byte
CMP # >SCRN4 ;Reached end?
BNE VB1CLOCK ;No, skip this
LDA DLIST+9 ;Examine LD byte
CMP # <SCRN4 ;LD byte limit?
BNE VB1CLOCK ;No, Go on
LDA # >SCRN1 ;Yes!
STA DLIST+10 ;Flip back to
LDA # <SCRN1 ;beginning of
STA DLIST+9 ;course
INC TIMES ;inc # of times
LDA TIMES ;course scrolled
CMP #10 ;times?
BNE VB1CLOCK ;No
LDA #1
STA TIMESFLB ;Set times flag
BNE VB1CLOCK
;
;See if end of scrolling reached
;-----
COMPDONE LDA DLIST+10 ;DLIST HI byte
CMP # >SCRFLIN ;Reached?
BNE VB1CLOCK ;No
LDA DLIST+9 ;DLIST LD byte
CMP # <SCRFLIN ;Reached?
BNE VB1CLOCK ;No
LDA #1 ;Set scroll flag
STA SCROLFLB
;
;Clock routine
;-----
VB1CLOCK INC CLOCK ;Inc the 60ths
LDA CLOCK
CMP #6 ;6/60ths yet?
BNE PRTCLOCK ;No
LDA #0
STA CLOCK ;Reset to zero
INC CLOCK+1 ;Inc 10ths cnt
LDA CLOCK+1
CMP #10 ;10/10ths yet?
BNE PRTCLOCK ;Clock on scrn
LDA #0
STA CLOCK+1 ;Reset to zero
INC CLOCK+3 ;Inc seconds cnt
LDA CLOCK+3
CMP #10 ;10 secs. yet?
BNE PRTCLOCK ;No, branch
LDA #0
STA CLOCK+3 ;Reset to zero
INC CLOCK+4 ;Inc 10s of secs
LDA CLOCK+4
CMP #6 ;60 seconds yet?
BNE PRTCLOCK ;No, branch
LDA #0
STA CLOCK+4 ;Reset to zero
INC CLOCK+6 ;Inc minutes cnt
;
;Print clock on screen
;-----
PRTCLOCK LDY #87
LDX #6
VB2 LDA CLOCK,X ;Get a character
CLC
ADC #208 ;Make screen val
STA (SAVHSC),Y ;Put on scrn
INY
DEX
BNE VB2
JMP SYSVAV
;
;SCROLLING SCRNB DATA
;-----
SCRNBASE .BYTE 0,30,31,32,33,34,0,0,0,0
.BYTE 169,192,0,0,0,207,210
.BYTE 0,0,0,209,210,0,0,0,0,0
.BYTE 0,0,0,0,0,0,0,0,0,0
.BYTE 0,0,0,35,36,37,38,39,0,0
.BYTE 41,0,65,66,67,68,34,35
.BYTE 0,214,0,0,0,0,214,29
.BYTE 30,31,32,33,0,0,71,72
.BYTE 73,74,0,0,0,0,0,0,0,0
.BYTE 49,70,0,0,0,0,41,42,43,0
.BYTE 0,0,37,38,39,0,0,0,0,0
.BYTE 0,0,0,0,0,40,41,42,43,0

```

```

.BYTE 71,0,0,41,64,0,0,0,0,0,0,47
.BYTE 48,49,0,0,0,0,43,0,0,0,0,67
.BYTE 0,0,0,0,0,0,43,0,0,0,0,67
.BYTE 48,49,0,0,0,0,65,66,67,68,0
.BYTE 0,0,0,0,0,0,75,76,77,0,41,64
.BYTE 0,0,0,0,0,0,0,0,41,64,0,0,0,0
.BYTE 0,0,0,0,0,0,0,0,0,0,34,0
.BYTE 35,36,0,0,0,0,28,0,0,0,0,0,0
.BYTE 0,0,78,79,0,0,65,66,67,0,0
.BYTE 68,0,69,70,0,0,65,66,67,0,0
.BYTE 0,212,213,128,0,0,0,0,212
.BYTE 213,0,0,0,0,37,38,39,71
.BYTE 72,73,74,0,0,0,0,0,0,0,0,0
.BYTE 26,27,28,0,0,0,0,71,72,73
.BYTE 74,69,28,0,0,0,41,64,215
.BYTE 0,0,0,0,0,215,0,0,27,28,0
.BYTE 41,42,43,0,0,26,27,28,0,0
.BYTE 0,0,0,29,30,31,32,33,0,0
.BYTE 34,35,36,0,0,71,72,73,74
.BYTE 65,66,67,68,0,0,0,0,0,0,0
.BYTE 0,0,44,45,46,47,48,0,0,0,0
.BYTE 29,30,31,32,33,0,0,0,0,0
.BYTE 0,0,0,0,0,37,38,39,40
.BYTE 41,42,43,0,0,0,0,0,0,0,0,0
.BYTE 0,0,0,0,0,0,0,0,0,0,0,0
.BYTE 41,0,0,0,0,0,34,35,36,0,0,0
.BYTE 41,0,0,0,0,0,0,0,0,0,0,0,44
.BYTE 45,46,47,48,49,0,0,0,0,0,0
.BYTE 0,0,0,0,0,0,0,0,0,27,28,0
.BYTE 0,65,66,67,68,0,37,38
.BYTE 39,0,0,71,72,73,74,71
.BYTE 72,0,3,74,0,0,0,0,210,0
.BYTE 210,0,0,0,128,0,0,210,0
.BYTE 0,0,0,0,71,72,73,74,0,0,0
.BYTE 0,0,34,35,36,0,0,0,0,75
.BYTE 76,77,0,50,51,52,53,54
.BYTE 0,0,0,214,0,0,0,41,60,214
.BYTE 0,0,65,70,0,0,0,41,60,0,0
.BYTE 28,27,28,0,0,37,38,39,0
.BYTE 67,0,0,0,70,79,80,53,56
.BYTE 57,58,0,0,60,61,0,0,0,0,0
.BYTE 0,0,0,0,0,71,72,73,74
.BYTE 65,66,67,68,29,30,31,32
.BYTE 33,0,0,0,71,72,73,0,0,0,0
.BYTE 64,27,28,0,0,0,0,0,0,0,0
.BYTE 0,41,64,0,0,0,0,75,76,77,0
.BYTE 0,0,41,42,43,0,0,0,0,0,0
.BYTE 29,30,31,32,33,0,0,0,65
.BYTE 66,67,68,0,0,0,0,70,79
.BYTE 80,0,0,0,44,45,46,47,48
.BYTE 49,0,0,0,0,0,51,52,53,54
.BYTE 0,0,0,0,0,69,70,0,128
.BYTE 209,210,0,0,128,128,209
.BYTE 210,0,27,0,0,0,0,0,34
.BYTE 35,36,0,0,41,64,0,0,0,0
.BYTE 36,0,71,72,73,74,0,214
.BYTE 0,0,0,0,214,29,30,31
.BYTE 32,33,0,0,0,37,38,39,0
.BYTE 65,66,67,68,0,0,0,41,42
.BYTE 43,35,0,37,38,40,0,41,42
.BYTE 33,0,0,0,0,0,0,0,0,0,0
.BYTE 0,0,0,69,28,0,0,0,27,70
.BYTE 0,0,0,0,0,0,0,0,0,0,0
.BYTE 37,38,39,0,44,45,46,47
.BYTE 48,49,0,0,0,0,0,0,0,0,0
.BYTE 0,0,71,72,73,0,0,71,72
.BYTE 3,74,0,27,70,0,0,0,0,0
.BYTE 41,64,0,0,0,27,70,0,0,0,0
.BYTE 0,0,26,27,28,0,0,0,0,0,0
.BYTE 0,0,0,0,0,0,0,41,64,0,0
.BYTE 0,29,30,31,32,33,0,0,0,0
.BYTE 66,0,0,0,0,0,0,0,0,0,0
.BYTE 76,77,212,213,0,0,0,128
.BYTE 212,213,65,66,67,68,0,27
.BYTE 69,70,0,0,0,0,0,0,0,0,0
.BYTE 70,0,0,0,0,0,0,0,0,42
.BYTE 43,0,0,0,0,0,0,215,0,0,0
.BYTE 215,0,0,0,0,0,215,0,0,0,0
.BYTE 0,71,72,73,74,0,0,0,0,0
.BYTE 29,30,31,32,33,0,0,0,44
.BYTE 45,46,47,48,49,0,0,0,0,0
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.BYTE 27,70,0,71,72,73,74,34
.BYTE 35,36,0,0,212,213,38,39
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.BYTE 74,0,0,0,0,0,71,72,73
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.BYTE 77,0,0,0,0,0,0,0,0,0
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```

*= $02E0
.WORD PRBSTART
.END

```

THE END USER

THIS MONTH:

An interview
with Robert
Pinsky,
author of
Mindwheel.

by Arthur Leyenberger

Robert Pinsky is not your typical software author. His background is in the literary field, having published several books of poetry. He is Poetry Editor of the New Republic magazine and a professor of literature at Berkeley. In addition to teaching writing courses, he also lectures on Shakespeare. His audience is apt to find him in the Saturday Review or Harpers, rather than in a computer magazine.

I recently had the opportunity to chat with Robert and realized that his brand of creativity and imagination are just as much at home in a software text adventure as they are in a book of poems.

AL: *With your background in literature and poetry, what has led you to interactive computer fiction?*

RP: On one level, I was led to it merely by being asked to do it. I have a personality where I like to work with the unknown. The day that Synapse called, I had been doing things for the previous few hours that were so unlike this that it attracted me immediately. I had never played a text adventure game; in fact, I had never even heard of them and knew little about this particular art form.

Synapse wisely suggested that I not play any existing games until I had already generated my idea. I did ask them about the games and was told that a player typically moves from room to room by giving short commands. That

made me want to do something a little bit different. So I thought of the concept of minds, in that you would move from one brain to another.

AL: *The traditional text adventure game goes something like, "you are outside of a house, to the north lies a dark forest, to the south lies a vast ocean . . ." How is your notion different?*

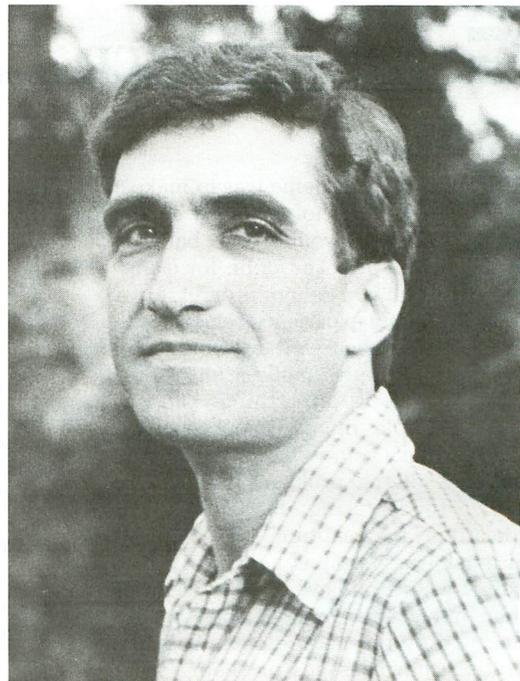
RP: In the classic game, it is quiet and you are the only one there. So I thought that you should start off on a stage, not knowing why you were there and with thousands of screaming people in the audience.

So, you're on this stage, and someone is trying to kill you, and another person is asking you to go with them. There are many people around whom you could either talk to or who'd talk to you, whether you addressed them or not.

It was the challenge of doing something different. Since I write for a specialized audience (three published books of poems thus far), I was intrigued by the thought of writing something that would appeal to more people. Hopefully, people would read it because it appealed to them, rather than because it was virtuous to read.

I was lecturing for a Shakespeare course at the time and I had the greatest example in the language before me, of someone who wrote works of entertainment and wrote the best that he could.

AL: *Many software authors, especially the quality authors, come from a computer or software background. Although*



they're in some ways a cut above the typical "hacker" writing just another shoot-the-aliens game, your background is even farther afield.

RP: I think I am the first person from my world (the literary world) to become involved with writing computer software. Even most of the other Synapse writers are genre writers. I think it worked out quite well. My collaborator, Steve Hales, and I hit it off well immediately. He is a lot younger than I and is unlitrary, so we had a good working relationship. I never worked with a collaborator before and really enjoyed this project.

AL: Have you had any feedback yet from other people in the literary field?

RP: Yes. I have shown it to some of the best American writers, and the poets, especially, love it. Some of the fiction writers have been somewhat suspicious and disapproving. One guy said after he played it for awhile, "You should be ashamed of yourself."

AL: He was probably saying that enviously.

RP: I think some people are also bewildered by it. If you haven't encountered anything like it, people who write difficult works or complicated texts suddenly find themselves dealing with something totally unfamiliar. For me, then, it is a pleasure being in two different worlds. Few people in the computer world know anything about the poetry world or the literary world, and few peo-

ple in the literary world know much about these kinds of things.

AL: What effect do you think this will have? Are you hoping that the two worlds will come together?

RP: I am sure they will eventually come together. No question about it. If I can write a thing that is pretty good, somebody will write a thing that is incredibly good. And, as the software aspects of it get better, there will be more things that the writer can do. This could be the one-reeler that comes before *The Birth of a Nation*, for example.

AL: Do you think this is the medium of the future?

RP: I don't know if it is the medium of the future, but it does have an incredible future. It's words being presented in a new way, and words are just very powerful, very compact. What is so exciting is that nobody can know what the future will hold.

AL: I'm thinking about some of the interactive books that have been published, where you can choose what you want to do, then go to a particular page based upon your decision. How is *Mindwheel* similar to or different from this?

RP: In a way, that's hard to explain. Many people think that *Mindwheel* is like that. They assume that it is only made up of branches. Actually, in *Mindwheel* objects have properties, they have locations; people have properties, and you cannot anticipate what's going to happen.

I was playing the game with my fifteen-year-old, and we got up a tree. There was a lizard at the base of the tree that would repeatedly kill us. I knew that it was random, but we were on a bad run. We also had our friend the frog with us in the tree. So we gave the disk to the frog and said, "Frog, go down and kill the lizard." By God, he did it. And the message appeared that the lizard died spewing blood and pus. The creators of the game didn't know what was going to happen.

I think that there will be amazing works written, and I'm lucky to do one of the first ones. I think nobody really knows what "interactive" means, either. In some ways, interactive fiction is more tyrannical than a book. With a book, you know the rules between you and the author. You either turn the page or not. This game pushes you around. You keep trying things, and it won't let you go until you try the right thing. So, at first, there is the illusion of more freedom for the reader, because you can walk wherever you want and do whatever you want. In some ways, however, the object controls you more, because you have to find your way through it on its terms. It's just a different reader dynamic.

AL: That's an interesting thought. In a traditional book, you have ultimate control. If you get tired or don't like the story, you can stop, put the book down. Here, it can close you down. It really draws you in.

(continued on next page)

THE END USER *continued*

RP: Part of the scheme was to make a lot of variety easy to get, early in the game. . . So you wouldn't be banging your head on a locked door, for example. Although you cannot progress, you still have many experiences early in the game. Then, once we have you really hooked and you've made a lot of progress, more frustrating things happen.

For example, there's this chessboard that you make your way across. Not only are you solving problems, but you're helped by capturing other pieces. But sometimes they capture you, so an additional frustration is added. By that point, you've already invested a lot of time in this world, and we hope you are charmed by the texture of it. You like reading the messages or seeing what joke or emotion is given.

AL: Writing something like *Mindwheel* has to be nontraditional and difficult, and there must be many ways to approach it. For example, you could

have written it in a linear way. How did you go about writing *Mindwheel*?

RP: I've got to admit, I found it easy. I didn't have a linear plot that I had imagined. There are a series of situations that are linked in various ways, and it was like the logic of a dream or a fantasy. First, you picture yourself in a situation—like what if I had a stone; I could hit it in the nose. Maybe the shark would dodge, or maybe I could find two rocks to go between. Or, maybe the hull of a ship would come by, and I would grab it.

Then I would write about all those possibilities. In writing the imagery for all of them, I would write small particles of narrative around a situation. So it became writing little pods or clusters of scenes. I loved writing and filling out tables. I would make dialogue tables for responses to commands that this character would or would not do, or decide if the scenes would come in random or se-

quential order. Writing fifty verbs and executing them successfully, with a hole in the sentence for the object, was difficult but somehow rewarding.

That kind of writing—where the structure is in suspension, and you're just writing texture—is terrific relief. In a poem or a story, I'm always responsible for both. Here, the structure is partly Steve Hales's business, partly mine and partly the business of the reader. Something in my imagination responded happily to the idea that the structure was amorphous or constantly changing, while I was providing texture and ideas.

It was a free kind of writing. I tend to forget the hard part, but much of it was play. You don't have to worry about over-writing. If I write a description of something and the player looks at it, it's because they asked for it and will read the long description.

AL: How long did it take you to write *Mindwheel*?

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RP: I worked on it for almost a year. I was doing other writing projects at the time and teaching my Shakespeare and graduate writing courses. So I was working on it quietly. Most of my friends didn't know that I was doing it. It was probably a lot of work, but it didn't feel like work.

AL: Do you feel at all constrained by the medium, by the computer?

RP: If I do another one, I would like to get more emotion into it. *Mindwheel* has more emotion in it than anything else I've seen. But, in keeping the fantasy, whimsical or Alice in Wonderland quality that is built into the genre, there is a certain amount of artificiality.

Its artificiality is so powerful you can always test it and find its artificial nature. Therefore, it's always going to be somewhat dreamlike. But, within that, the goal is to get some of the penetration of feeling you get when you're sad or when somebody dies in a novel. Then, when a friend sacrifices themselves for you, you feel the deep emotion. That is what I would like to have more of.

I would also like to have more thematic material. Mainly, to get as far away as possible from the idea that this type of interactive literature is meant for children—and still have it be entertaining and fun.

AL: Do you think of *Mindwheel* as educational software?

RP: Yes, but quietly. I'm delighted that they don't call it "educational." There are kids in high school and college who read things by me that their teachers have assigned them to read. And that is gratifying. But to see the playtesters from El Cerito High School looking at the poems in *Mindwheel* and just trying to figure them out because they're having fun and want to do it, is in some ways a greater pleasure.

Since it's not presented as medicine or good for anybody, that's rewarding. I look at it as a work by me; I did the best job I could. So it's sort of "underground" educational software. Not that I'm comparing myself to Shakespeare, but he didn't think he was writing educational plays at the time. He was writing entertainment and just trying to make a buck.

AL: Do you think that, just as I was assigned to read Steinbeck in high school, someday students will be assigned to read interactive computer fiction?

RP: Who knows? I wouldn't want to risk saying "never." Teachers never used to assign movies, but now they do. People laughed at Shakespeare's contemporary, Ben Jonson, when he published his plays. It was thought to be a comical or pompous thing to do, to print the plays. It's not why you make the work. You don't write a poem or a play so that someone will assign it in school. You do it to make something good. To make something that somebody will want.

AL: Who do you see your audience as, and who do you want your audience to be?

RP: I see the audience as smart people who own computers, especially ones who have owned text adventures, but feel slightly bored. People who want more texture, more feeling, more comedy and more sophistication.

AL: Does that mean that *Mindwheel* is not meant for the novice text adventurer?

RP: I think the first-time player might enjoy it more than the more seasoned player, in some ways. As you observed, you get more—right at the beginning. Even if you're not good at adventure games, you get to read many things. It's amusing. I think anybody with a computer wants to have fun.

I don't know much about marketing. I don't necessarily want the literati to get their hands on this thing. It's not uppermost in my mind that *Mindwheel* be reviewed by the *Partisan Review*. In a way, I've already experienced that world. What would please me most is if people who played the game thought they were getting something worthwhile for their money, and thought of it as being closer to a book and less like playing a pinball machine.

AL: Given that *Mindwheel* is going to be available for just about every computer, who do you think will flock to it the most?

RP: I don't know too much about the different machines, but I understand that Apple users are reported to be family oriented, whereas IBM users are more business oriented. Perhaps that means that Apple users will comprise the most of the market. A little more than a year ago, I knew absolutely nothing about all of this. At first, I used to write with a pencil, but now all prose is written on my IBM compatible.

(continued on next page)

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THE END USER *continued*

AL: Do you still write verse by hand?

RP: Yes. It's a physical thing, because when I write poetry, I am listening so hard with my ears I just can't picture writing on a keyboard. Some people will not use a computer to write with, as a principle. For me, it's the way it feels. With a pencil, I have a warm tool in my hand.

After having some experience using a word processor to write prose, I am starting to get some physical sense of what that involves. After a while, the *computer feels warmer*—because you can see and know what it is doing.

AL: What qualities about yourself do you feel will make *Mindwheel* a success?

RP: I think I seem to have the kind of imagination that allows me to create dreamy, freaky kinds of things. For example, one of my characters is a slightly surreal, bald female motorcycle rider. I hope people will like that. I also hope that I've been clever about adapting dialogue to finding solutions to a thing. I have defects as a writer, too. Like finding fakey little fixes that make things look plausible. Spewing out images is the way that my writing overlaps with the game.

AL: How do you think this experience will affect your writing?

RP: I think it will make it a little bit weirder.

AL: How was the result of *Mindwheel* different from what you had first envisioned?

RP: The first idea was the wheel, and that the minds would spin. Each time you started off with Doctor Virgil, you would be in a different mind. It would be a maze that you never entered at the same point. You may need to get to someplace that you started at in another time.

For technical reasons and because we felt that nobody had quite done what we were doing anyway, we wanted to get the project done sooner. So we stopped the wheel and had the player travel around it. Also, I think I was a little too ambitious to get even more dialogue into the story. If I did another one, I would probably rely on characters even more.

It has come pretty close to what we wanted. It was also partly a scheme to get something done, something that would work. I feel like I got a little carried away.

AL: Isn't that part of the object, though—to get carried away and see where that takes you?

RP: Sure. That's one of the big pleasures of the whole thing.

AL: This must be very rewarding to you—to see it finished, and as a quality game.

RP: Yes, it is. As I say, watching those playtesters get totally involved in it was terrific. Usually, when you write prose or poetry, people will say "I read your book or your poem and I liked it," but you don't see them doing it. It's fun to see people interacting with it. It must be what it's like to write a play or make a film.

AL: What is your next project?

RP: I'm working on a prose book. They'll probably ask me to do another one of these, sooner or later. In a way, I want to see what happens with *Mindwheel*.

AL: Aside from what particular computer a person has, or their experience, what age level do you think this will appeal to?

RP: I think something interesting is happening. I may be talking through my hat, because it's not a world I know, but one thing I am interested in is the way

this type of game has evolved. Many of the programmers I worked with were playing *Dungeons and Dragons* five years ago and doing video games three years ago. Two years ago, these same people were doing primitive text adventures. They are getting older. It's not just going through fads.

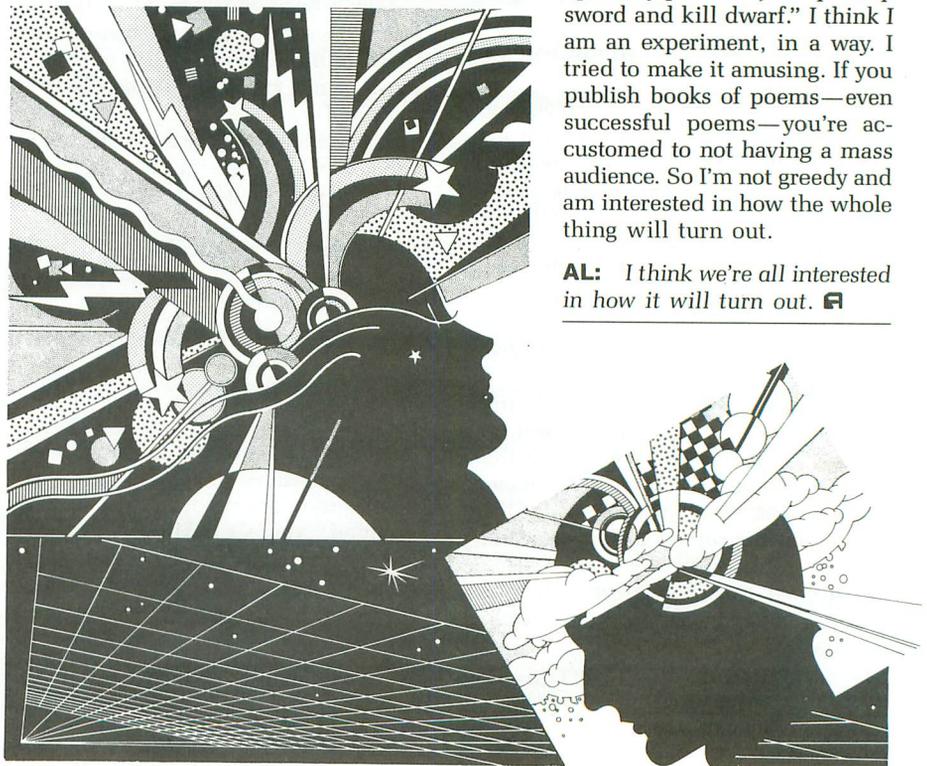
They may be in their mid- to late twenties now. They read a lot, like science fiction. In a way, it is an age group that's changing. That first computer generation. They're hungry for things that are more and more complex and have more and more to do with human experience. So it will be interesting to see what art those people make and what art those people watch. Especially in relation to their machines. That's an interesting group to me.

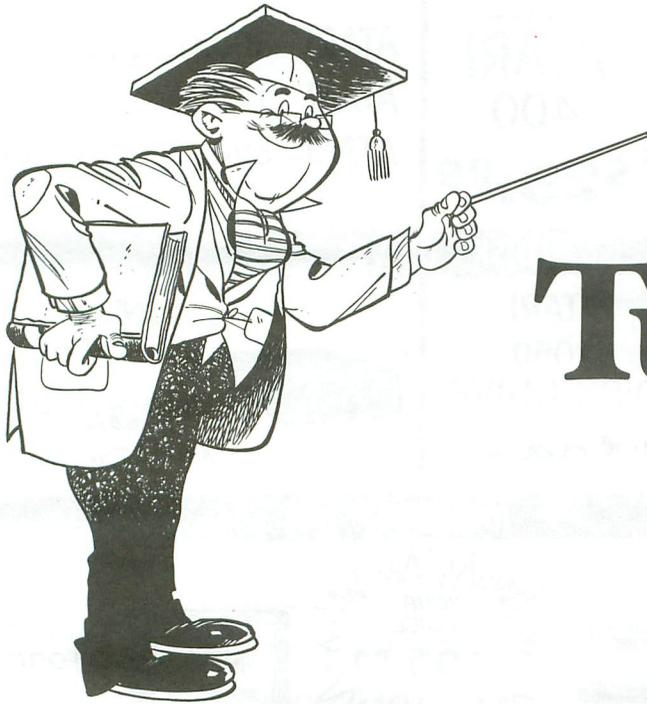
AL: What do you think you would be doing if you lived 100 years ago?

RP: More than most people alive today, I would be doing the same thing: I would be writing poems. The equivalent thing to this might be getting involved with the magic lantern which made images move—the early experiments with movies.

In a way, this is an invasion of poetry into technology, just as movies use writing. The whole thing may be a terrific flop. People may prefer to just "pick up sword and kill dwarf." I think I am an experiment, in a way. I tried to make it amusing. If you publish books of poems—even successful poems—you're accustomed to not having a mass audience. So I'm not greedy and am interested in how the whole thing will turn out.

AL: I think we're all interested in how it will turn out. **A**





Forem Tutorial

by Matthew J.W. Ratcliff

Probably the most popular Bulletin Board System (BBS) for Atari computers is **Forem**, by Matthew Singer. With his BBS software package come forty-three pages of documentation files on how to run a **Forem** BBS.

The average user at the other end of the modem has very little access to information about this BBS and all of its powerful features.

This tutorial is presented so that you can get the most out of the **Forem** boards that you will call. We'll guide you from your first log-on through some of the advanced features of the **Forem XL BBS**, and help you to avoid the mistakes new users often make. With the aid of Jim Bucholtz, System Operator (SYSOP) of Gateway City BBS (St. Louis, Missouri, 314-647-3290) and Mr. Singer's documentation (**Forem XL**, version 2.2, revision 1.0), we are pleased to present the complete **Forem Tutor**.

Your first call.

The first time you call a BBS, you may not even know if it's a **Forem**. The most common mistake newcomers make is "not doing anything." When you call a new BBS number and make the connec-

tion, wait a few seconds. If nothing happens, then press your RETURN key a time or two. Some versions of **Forem** wait for you to send a carriage return to decide what baud rate you're using, before they send anything.

Once you have the board's attention, make note of the first few lines sent. If it's a **Forem**, it will be stated as such. If so, make a note of the version number. This guide refers specifically to version 2.2. Most commands presented herein are available on all versions of **Forem**. Some of the more advanced features covered may not be on the board you call, if it's running an earlier version of the BBS.

You are first prompted to set your terminal to ATASCII (Atari ASCII) and press RETURN. Your password is then requested, a four-character code that only you should know. If it's your first call to this BBS, you will be required to fill out an "on-line password application." The prompt will request **PASSWORD OR RETURN**. Just press RETURN to access the password applica-

tion. From this point on, read *very carefully*. Follow the instructions for entering your "real" name, age and phone number (some boards may ask for a little ad-

ditional data). Most SYSOPs will call to verify your information before "validating" you for full system access.

Once you have applied, you're typically given 14 minutes of connect time for this visit. This amount increases with your access level. For your "unvalidated" visit, you are generally allowed to read "unlocked" messages in the MAIN or PUBLIC message base, and to access the "database." When you log off with the G (good-bye) command (or run out of time), you'll be prompted to save your password for future use.

This is where the second most common mistake is made by a new user. Quite often he will answer N (no) or just press RETURN, which defaults to no. This "flushes" your password application out of the system. If you plan to call back, then answer Y (yes—press the Y key only). Be sure to write down your password in a safe place.

If you were just exploring, then type N for no. Don't waste the SYSOP's time and disk space keeping a password you don't intend to use. The Gateway board has over 400 "validated" users, but only about 60% of them are active (calling once a month or more). SYSOP Jim re-

(continued on page 93)

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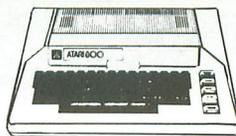
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views his password file once every 60 days and "purges" all users who've been inactive more than a month, as well as active "abusers"!

SYSOPs usually validate new applications within 48 hours. The next time you call, you may get longer connect time and access to more features. You might even have "mail waiting."

How to skip it.

When accessing **Forem**, you'll get to read the BBS welcome, or title message, and a bulletin (usually updated weekly or monthly). The title screen seldom changes. The next time you log on, try pressing CTRL-C. This interrupts the "send-file" routine of **Forem**. It will then move on to the bulletin. It should be read at least once, so you can keep abreast of the latest changes in the operation of the BBS.

It usually begins with a "date line," so you know immediately whether to use CTRL-C around it or not. Use CTRL-S to pause the bulletin while reading; CTRL-Q will restart it. These same control key functions hold true in the message bases and electronic mail. The CTRL-C will significantly reduce time spent looking at "old information," allowing you to make the best of your connect time.

*Go for it.

Finally, you'll be at the *GO prompt of **Forem**. You're now controlling someone else's computer system. So what next? Well, as a new kid on the block, it might be best to find out the commands used to trek through this particular BBS.

First, put your terminal program in the C (capture) mode (SELECT, C, D: README.TXT, the RETURN command sequence on most Atari terminal programs). Check the state of your capture buffer with the OPTION key, to be sure it's toggled on. Now type a question mark, (?) and press RETURN. **Forem** will send you its help file, giving you a brief summary list of all its valid commands. You can review the README file later—and possibly convert it to a quick reference card with your word processor.

The database.

Most "casual" users don't realize that the **Forem** has a database. It's usually a collection of information files, current telecommunications programs and "handlers," plus all-time favorite public domain programs. Many SYSOPs allow nonvalidated callers to access this area

of the board. (This is determined by a SYSOP selected new-user default access code.)

Hit an asterisk (*) at the *GO prompt, to go to the database menu. Type the number which indicates the topic of interest and press RETURN. You will then be sent another file. This may be an information file, program, or another database submenu.

For example, the database may list *Modem Programs* as option number 3. When selected, another menu is displayed, with a new series of numbers, showing the latest versions of AMODEM and TSCOPE, possibly.

You'll be prompted to type the number associated with the files. If the number is followed by the letter D, that should be typed, as well. When you get to the file of interest, you will be asked if you're using XMODEM. You may use the typical XMODEM download procedure for your terminal program to put this file on disk.

If this is the case, get your machine ready to START downloading. Then type Y for yes. **Forem** will prompt you when the database file is ready to transfer. You should then press your START key.

If you just want to read or capture a text file then answer N. **Forem** will prompt you to press RETURN to begin. Once it starts sending, you may press CTRL-C to quit early. If you should accidentally select XMODEM transfer, just press CTRL-X to abort it. Some users run into this problem and keep pressing CTRL-C and finally hang up in frustration. (Think of it this way: CTRL-C aborts character files, and CTRL-X aborts XMODEM files.)

The message bases.

Did you know that a **Forem** BBS can have more than one message base? Many users don't. To select a message base, enter a Z at the *GO prompt. **Forem** will give you a list of all the bases allowed at your access level. Some of the boards have "adults only" bases that have a very limited access. This is why your age is requested in the password application (which the SYSOP will verify).

Most boards have one or more "techie talk" bases, a popular hangout of local Atari software and hardware gurus. Other message bases may have adventure games advice, local Atari Computer Enthusiasts (ACE) news, local SYSOPs-only information exchange, serial story

bases, and more. One of Gateway's more unusual message bases is for "Detectives Only," run by a remote SYSOP who's a member of the St. Louis police force. He starts a who-done-it, giving clues for the users. Readers can post messages sharing their analysis of some clues and guesses as to who committed the crime.

The possibilities for message bases are endless. SYSOPs typically consider those who upload files "good users" and those active in the message bases "excellent users." Don't be afraid to ask questions (even when you think they're dumb—we were all beginners once) and share ideas.

Most SYSOPs and remote SYSOPs really enjoy helping other people. BBS expenses are almost entirely defrayed by the SYSOP (disks, phone bills, and repairs run \$40-\$100 a month, depending on system size). They do it for the joy of it, not for money. So don't ever be afraid to jump in.

Reading message bases.

Once you've selected a message base of interest, the commands change and different control key functions are available. You will now see a SELECT: (or COMMAND: or similar) prompt for control of the current message base. Its title, first and last message numbers, and total messages for this particular base will be printed upon entering the base. Enter a question mark here, for a short menu.

Scan.

When you first enter a message base, the system prompts to SCAN? for messages addressed to you. Press Y or N as desired. If yes, the program will list the numbers of all messages in this base addressed to you. It will only flag new messages that you haven't read yet.

Read.

Type R and press RETURN to read messages in this base. You'll be asked for a number or range of messages to read. You can enter a + (plus) to read forward through the message base from the very first one. My preference is to enter a - (minus) to read backwards through the messages, from the newest to oldest. It's a bit confusing to read messages in reverse order sometimes, but it's handy to keep reading new messages until you run into an old one, and then press CTRL-C to get back to the SELECT: prompt. If you wish to read a specific range of messages, type the first and last numbers of interest separated by a minus (i.e., 5 - 10). You may also enter a list

of message numbers you want to read, separated by commas, such as: 1,6,9. This comes in handy to simply read through the messages found with the scan function above.

Read stacking commands.

You may stack commands here, and in other places in **Forem**, to make use of the system much more quickly. At the *GO prompt, just enter R; - to read reverse through the current message base. You can change bases and go directly to reading from the *GO prompt, as well. For example, Z;2;- will send you to message base number two and go to the read in reverse mode.

Using Z;2;+ will perform the same function, but will go to read in forward mode. If you have an earlier version Z;2;R;9999- will work on those.

Once you're familiar with the bases in the system and have memorized these stacked commands, you can get in and out in a real hurry.

Reply or Continue.

When you've reached the end of a message read, you have a mini menu of options. More or less options will be listed, depending on access level. While reading a message, press CTRL-C to exit reading mode and go back to the SELECT: prompt. Another control key is available here too; CTRL-N tells the **Forem** to skip to the next message. The mini menu at the end of the message may include:

- A — Read message again.
- N — Get next message (RETURN only does the same).
- M — Exit to the main menu (*GO prompt).
- D — Delete this message.
- R — Reply to it.
- P — Print this message on the SYSOP's printer (a special feature for remote SYSOPs, usually).

At this mini menu, you may stack some commands, as well. Use D/R to de-

lete this and reply to it at the same time. Note that you should use a slash (/) and not a semi-colon (;) for stacking commands at this mini menu. If you would like to return to the main menu when done, then use D/R/M.

Titles.

To find messages of interest, use the T command. The number range selection is the same as for the Read function. Titles only will display the message number, subject and date entered. After looking at each title, you'll be asked to mark it for future retrieval. Up to sixteen can be tagged for later reference. Once you've seen all the titles, the SELECT: menu will include a M (marked) command. Always use this command next, to read all the tagged messages. Use any other command between the T and M, and you'll lose the markers.

Brief.

Use the B command at the SELECT: prompt to see a brief summary of the messages. This information will include the number, date, addressee, sender, line count, subject and received flag. If the addressee has read his message, a *rcv* flag will be displayed at the end of the message number line.

Quitting.

At the end of a message read, use M to go back to the main menu. At the SELECT: prompt, to go directly from one base to another, completely bypassing the *GO prompt. If you've entered or deleted any messages, it may take a bit to exit. The **Forem** program must update all your changes to this base on the disk, before loading another. Be patient.

Enter - Send.

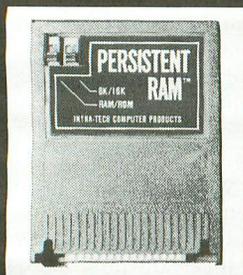
At the *GO prompt, use the E (enter) command to enter a new message into the current base. At the SELECT: prompt, use the S (send) command to send a new message. It can get confusing at the various menus and submenus of **Forem**, the way the commands often change around.

You can go directly to a new base and enter a message with the command Z;3;E. The message entry edit functions will be outlined shortly.

E-Mail.

Electronic mail (E-Mail) is just another special message base. If you have mail waiting at log on, it's flagged. Once at the *GO prompt, enter the M (mail) command to retrieve it. The number of letters waiting will be shown, along

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with the familiar **SELECT**: message base prompt. You have only three options here, however: Read, Send, or Quit to the main menu.

If you Read, you'll have one of three options (depending on access level). You may read mail sent (1) *to you*, sent (2) *from you*, or (3) *all*. Enter your choice to continue. It's a good idea to always D (delete) mail once you've read it, whether you plan to reply or not. Mail, old or new, is flagged for you every time you log on. You must delete the old letters yourself.

Leave SYSOP message.

If you wish to leave a private message to the system operator, use the L command at the *GO prompt. The input of text here is the same as for other message bases. This text will be sent to the SYSOP's printer, which he or she reviews frequently. This is the only way to leave a completely private message to the SYSOP.

Remote SYSOPs, with a high enough access level, can read every message and letter in the system. They may even find the name of the sender of "anonymous" messages! Even when you send an anonymous message, your name is still hidden in the text. It can be accessed at any time by the SYSOP or some remote SYSOPs. Many troublemakers don't realize this and type their way into permanent loss of their passwords.

Message entry.

You send text to other users or to the SYSOP through the message bases; E-Mail, or the L function. They all have the same text editor in common. This part of **Forem** has a submenu and set of commands all its own.

A message is entered as a block of 15-line, 80-column or 30-line, 40-column text. Most Atarians will use the latter, by setting their terminal width to 40 (see Profile, below). When Sending or Entering a message, you're first asked for a subject. Pressing RETURN only will abort the message entry and send control to the main prompt.

The next prompt is for the addressee. Press RETURN only to send it to ALL. If you're not sure how to spell a name, just enter a ? here. You'll be prompted to search for the first name to match.

Type the first name, or part of it, to use in the search. (Enter CHARLES for all people with that first name. Enter C to search all people whose first names begin with a C.) **Forem** will search its user base for names that match your in-

put. When a possible match is found, you are prompted to press 1-ok or 2-continue searching.

If you get in too big a hurry and press RETURN for the first name, then every name will be matched. If you get stuck in this situation, just accept any name, then /A (abort—see below) the message and start over. If no search is desired at this time, just type the name and press RETURN.

You may also use names like SYSUSR:1 through SYSUSR:25, indicating system users with access levels of the number shown or above (if allowed at your access level). Users with a lower access level than the number in the SYSUSR name will not be able to read it.

If the message is not sent to ALL, you'll be prompted to make the message readable only by that person, a locked or private message. You should always answer Yes to this if you're using the

SYSUSR name. (Don't use the SYSUSR names in the E-Mail base. Everyone will get flagged for mail, but will not be able to Receive it.) Answer Yes or No, as desired. Spelling is important, especially in E-Mail. If you spell your friends' names incorrectly, they may never get the message.

You're prompted to leave the message anonymously, if you have been given this privilege by the SYSOP. Answer Y or N as desired. Remember that the SYSOP can get your name out of any anonymous message you might leave.

Next, you'll be presented with a mini menu of / (slash) commands, followed by a 1). You're at the first line of your message. Type continuously if you like, since **Forem** has word-wrap, as most word processors do. At 300 baud I find this feature very frustrating, however. Slow typists might like it. As usual, you

(continued on next page)

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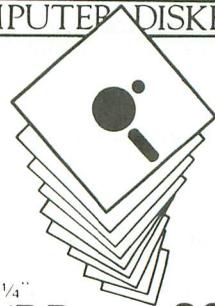
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may backspace over typing mistakes. The rest of your message entry is carried out with the **Forem** editor's slash commands.

/Abort: — If you change your mind about sending this message, just enter */A* at the beginning of a new line to abort it.

/Save: — Use the */S* command on a new line to save this message. See the */B* (bottom) command for a few precautions.

/? or /Help: — When you're lost or confused, just enter a */?* or */H* command for help. A command summary—more complete than the brief one presented at first—will be displayed. You might wish to capture it to the printer for future quick reference. Any invalid slash command will invoke this help feature. Viewing the help file will not affect the message entry in progress.

/List lines: — Use */L* to list the entire message. */L5* would list five lines, starting at the current edit line.

/Goto a line: — Use the */Gnn* command to go to a specific line (noted by *nn*) for editing. */G1* would list out the first line of the message and then print a *1)* prompt for you to edit.

/Change string: — Often, you'll be typing away and notice a mistake in one of the lines already entered. Use the */G* command to go to that line. You may then retype it or use the */C* command. The command format is: */C/string1/string2*. The first text string will be replaced with the second. The changed edit line will then be relisted, and you will be prompted by the current line number.

/Bottom: — Use the */B* command to go to the bottom or last line in this message. You should always use this command before */S* (saving), if you have used any of these commands: */G*, */N*, */U*, */D*, */T*. When a message is */Saved*, the Lines 1 through the current edit line are saved only. If you type ten lines, use */G5* to change that line, then immediately use */S*; only Lines 1-5 will be saved. Use */B* then */S* when in doubt, so the message won't get chopped off.

/Top: — Go to the top of the message for editing with the */T* command.

/Up lines: — The */U* command will send you up one line for editing. Use */U* followed by the number of lines you wish to move up if more than one is desired (i.e., */U5*).

/down Lines: — The */N* command will send you down one line. Follow it with a number to move down a multiple of lines.

/Delete lines: — The */D* command deletes the message's next line. Follow it with a digit if more than one line is to be removed.

/Insert Line — Use the */I* command to insert text at the current line. The remaining lines will be moved down one.

That covers the message entry commands. With a little practice, it comes very easily. One thing to keep in mind while editing is the **Forem** "auto timeout" feature. If the BBS waits on you for a key input for more than three minutes, it will log you off the system automatically. If you stop to review your message or think about what to type next, keep the BBS busy. I suggest that you press *SPACE* and *BACKSPACE* alternately (once every few seconds). This keeps the BBS busy with your inputs, while you have a chance to think.

File directory.

You may find what files are available for download from the BBS with the *F* command at the **GO* prompt. Use *F;A* to see "all" files available at your access level. Use *F;G* to see all game files. Other file type characters may be used as well. Just enter the *F* command only, to see a list of these.

Download a file.

Use the *D* command at the **GO* prompt to download a file using *Xmodem* protocol. You will be prompted for filename. You may also "stack" the filename with the *Download* command, separated by a space or semicolon (;), if you like. It's assumed that you know how to perform a download with your terminal program of choice.

Upload a file.

If you wish to send a file to the BBS, use the *U* (upload) command. This may be stacked with the filename, as well. One of the prompts here will be for file size. **Forem** requests the size of the file you plan to send (single density sectors), so that it may check that against the disk space it has left. If you aren't sure of its size, just estimate. It's wise to intentionally overestimate. If you send more sec-

tors than you told **Forem**, it will protect itself from an "out of disk space" error by aborting your send of the file.

Before sending the file, you're asked to input some file "tags," which indicate the program language and subject (such as *S* for *SAVED Atari BASIC* and *G* for game). When you see the tag letter of interest, just press *CTRL-C* to abort the rest of the list and get to the input prompt. Once all is set up at both ends, **Forem** will indicate that it's ready to receive. Press *START* at your end to execute the transfer.

ASCII/ATASCII switch.

You can log on to **Forem** in *ASCII* or *ATASCII* (Atari) mode. You may use the *A* command to change from one to the other while on-line.

Yell.

Use the *Y* (yell) command at the **GO* prompt if you wish to chat with the *SYSOP* on-line. The *SYSOP* has the option at his end of the line to be available or not. When you *Yell*, **Forem** will inform you that the *SYSOP* is being paged and may cut in, or that he is unavailable. It's not a good idea to yell more than twice for a *SYSOP*.

All the commands you use while on-line are logged to the printer and the *SYSOP*'s screen. A Yelling pest often get the "plug" pulled at the *SYSOP*'s end of the line. If the *SYSOP* doesn't answer your page, then assume he is busy. If you're a first-time user, it's a good idea to try Yelling once. If the *SYSOP* is around, he may validate you right then and there. This will give you instant access to the BBS features your first time on the system—if you are lucky (and polite).

Profile.

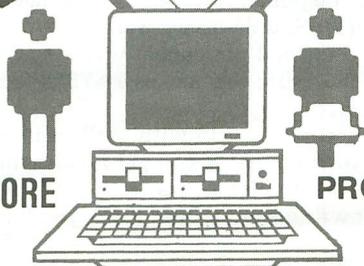
Use the *P* (profile) command at the **GO* prompt to see your current status on this BBS. The following information will be displayed: number of times called, first call date, last call date, number of messages entered, number of files received, number of files uploaded, system time/access level, the *ASCII* clear screen code number, the decimal line length, clock display on/off flag, user phone number, and user log in name.

You're then given the option to change the password, phone number, terminal settings (line feeds, line length or clear screen code), and clock display control. If you think someone has stolen your password, this is where you can change it. Your phone number can be changed to letters if you wish, for added security.

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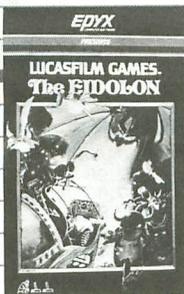
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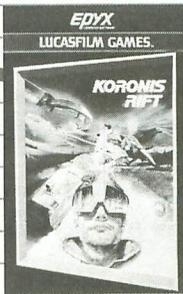
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Good-bye.

Use the G (Good-bye) command at the *GO prompt to log off the system. Your first time on the system, be sure to read all the prompts through the log off procedure. After entering Good-bye, you're prompted to be sure (Y/N) to exit. This may be stacked as well—G;Y for a quick exit. You should allow the BBS to hang up first, to be sure it has completed its log off procedure.

Final do's and don'ts.

Do upload a file once in a while to help keep the BBS current. Do not upload copyrighted files. You can get yourself and the SYSOP in trouble for that. Enter messages and ask questions. Always be polite. Never use foul language on a BBS, unless you want your password deleted permanently. Never hang up on a BBS; this makes a SYSOP very upset.

Don't call a BBS with "call waiting" on your phone. If you get a call while on-line, it will cause a "loss of carrier" that will make the BBS think you hung up on it. This, too, upsets SYSOPs.

Board crashers try different hang-up techniques in effort to crash a BBS. If your call waiting hangs up on a board often enough, the SYSOP will always assume you are a crasher. Normally, **Forem** recovers nicely from hang-ups, so this isn't usually a problem—unless they occur very frequently.

Don't lock nonpersonal messages. Let others in on your conversations, so everyone can share. Never post your address or phone number in an unlocked message or in a locked message to someone you don't know. You could be in for some really weird phone calls if you do.

Log off.

That covers all the features of the **Forem** BBS system. Remember, when all else fails, just type a question mark and press RETURN at almost any prompt in the **Forem** system. Usually, it will result in a help file of some sort.

Study this guide; learn how to stack commands effectively. This is the real key to making most out of your limited access time on any **Forem** BBS. **A**

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CIRCLE #153 ON READER SERVICE CARD



A Master Disk Directory

by Jason Leigh

Another disk directory?! Before you flip to this month's machine language program, have a look at this disk directory.

By now, you've heard about (and probably seen) the new ST line of Atari computers. "Jackintosh," the nickname given to the STs, came from the fact that these new computers use a very similar operating system (OS) to that of Apple's Macintosh. This OS is unique in that programs and data are retrieved simply by using a "mouse" to select pictorially represented commands.

Based on my previous experience with the Macintosh, I decided to write a utility (**Master Disk Directory**, hereafter the **MDD**, for brevity) which implemented a Macintosh-like OS.

MDD is a disk filing program which is, in many ways, similar to many commercial filing programs—except that this filer uses a joystick to select commands, which are represented graphically by icons like the one on the top corner of this page.

The system requirements for this program are: an Atari 400, 800 or XL computer with a minimum of 32K RAM, a joystick, one disk drive, an optional printer, and BASIC.

Loading Master Disk Directory.

There are three program listings that need to be typed in and **SAVED** before execution: Listing 1 (Creator) is used to create a machine language file which

will automatically load the main directory menu; Listing 2 (**MDD** itself, the Master Menu) is the main directory menu which allows you to select the folder you wish to work on; and Listing 3 (Master Filer) loads automatically under the control of the main directory menu. This program is what actually does the filing of your disks.

After you've typed in the three programs, check them with **Unicheck** (see page 10). Do not attempt to **RUN** any of the programs until you've got all three completely typed and checked. **SAVE** all three programs on a new disk with **DOS.SYS** and **DUP.SYS**, using the following filenames: for the Creator, type **SAVE"D:CREATOR.DIR"**; for the Master Menu, type **SAVE"D:MASTER.DR1"**; and for the Master Filer, type **SAVE"D:MASTER.DR2"**.

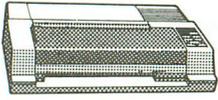
With all three programs **SAVED**, **RUN** the Creator by typing **RUN"D:CREATOR.DIR"**. Follow the instructions on the Creator, and it should write an **AUTO-RUN.SYS** file on your disk, which will automatically load up the Master Menu. When the Creator has completed its task, reboot your computer. The Master Disk Menu should load up and execute.

Master Menu instructions.

The Master Menu should show four icons and a directory of the disk currently in the disk drive. Using a joystick, you can select a command by pointing the cursor at the appropriate icon and pressing the fire button.

(continued on next page)

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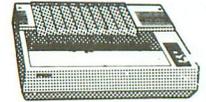
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Master Disk Directory *continued*

The icons.

In case you can't recognize what the icons are supposed to represent, you can read their names next to them. The "trash" icon, indicated by a trash can, allows you to delete (trash) an unwanted directory folder. The "new" icon, indicated by a pen on a pad, allows you to create a new folder. The "dir" icon, indicated by a floppy disk, allows you to retrieve the directory of the disk currently in the drive. The "quit" icon, indicated by an END sign, exits the menu.

Trash — To trash a file, select the trash icon; the word *TRASH* should flash. Move the cursor over to point at a file and press the fire button. The file should flash. If it isn't a folder, it will not allow you to trash it. To see more of the disk directory, point at the downward arrow in the directory window and press the fire button. The directory menu should scroll in its window. To escape from the trash mode, point the cursor anywhere an icon does not exist and press the fire button. The *TRASH* should stop flashing, and you should hear a beep.

New — Selecting this icon will allow you to open a new folder. You'll be prompted to enter a name for your folder, which must not exceed eight characters in length or contain extensions. You will be alerted if a folder with such a name already exists on the disk. At that point, you may write over it or return to the main menu.

Dir — This allows you to update the Master Menu's directory listing when a new disk is inserted.

Once a new folder has been created, you may start putting directory listings into it. To do so, select the folder listed in the directory window. The dir icon should illuminate and transfer you to the Master Filer.

Note that, before passing control to the filer, the Master Menu will create a file called *OPTION.DIR*. This file contains the name of the

folder you've selected to edit. I suggest you do not delete it; without this file, you cannot enter the Master Filer.

A final icon exists on the top left-hand corner of the screen. Selecting this diamond-shaped icon reveals a pull-down display which indicates the version and release date of the Master Menu.

Notes on semantics: a *file* is defined as simply a file in a normal DOS 2 disk; a *folder* is defined as a collection of directory listings. Folders are created and erased in the Master Menu, whereas directory listings are written into and removed from folders in the Master Filer.

Master Filer instructions.

This is the program you actually use to file all your disks. The Filer operates under three pull-down menus: Edit, Display and File.

To select an option, move the ball-shaped cursor down to the desired menu and hold the fire button down. A menu should open out vertically, displaying a new set of commands.

Menu: Edit.

This menu has four commands: "escape," "insert," "update" and "delete."

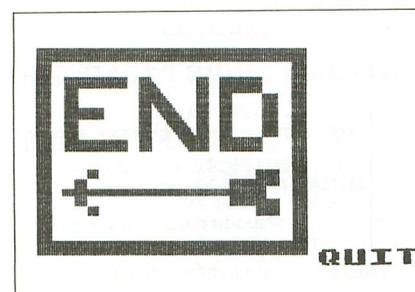
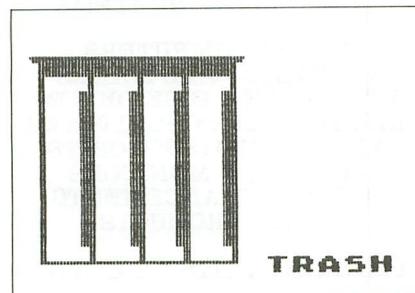
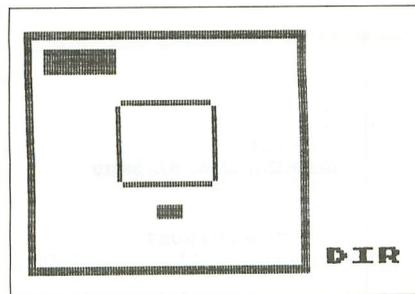
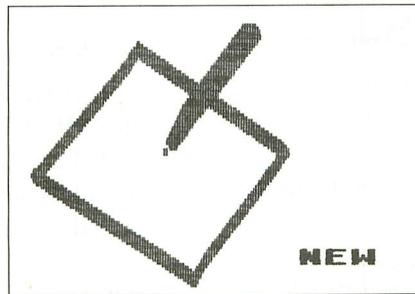
Escape — Exists in all three menus and is used to close the menu.

Insert — Used to file a new disk into memory. You will be prompted for a name to call the disk before the directory on your disk is filed. To escape from this, press RETURN without making any filename entries. Throughout the entire program, RETURN will be used to escape from a command, except where otherwise indicated by the Filer.

Update — Used to change the old directory listing to the new listing.

Delete — Erases a disk file from memory.

Note that none of the above commands actually write to disk until



Master Disk Directory *continued*

quit is selected from the file menu. So, if you've made a "fatal" mistake, simply power up your system and restart.

Menu: Display.

This menu contains the commands: "escape," "catalog," "diskdir" and "search."

Catalog — Displays disk directories stored in the memory.

Diskdir — Displays the directory of the disk currently in the disk drive.

Search — Searches for a single program file and tells you which disk the file is on. This is useful when you have a large number of disks and need to find a program amongst them.

Menu: File.

This contains the commands: "escape," "print" and "quit."

Print — Makes a hardcopy of single or multiple files in memory on the printer. If you don't like the format of the printouts, you can edit

them with the **AtariWriter**, BASIC, Assembler Editor, or any other program that uses a standard Atari text editor.

To retrieve the file, use the enter command in BASIC or Assembler Editor, then list the data to the printer.

Quit — Saves the current memory onto the disk folder you've been working on and returns you to the Master Menu.

I hope you've been able to keep up with me. In case you're completely confused, follow through the procedures below to get a folder working.

1. Power up your computer with BASIC and the MDD.
2. Insert a joystick into the leftmost port. After a few seconds, the Master Menu should load. If it doesn't, check for any typos and try again.
3. With the Master Menu loaded, guide the finger (cursor) with the joystick over to the new icon and press the fire button. The menu screen will

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scroll off and open to a new screen. Enter the folder name FOLDER1 and press RETURN.

4. Type Y to the prompt Are you sure (Y) and press RETURN. The disk drive should whirl for a moment, and you should be returned to the Master Menu again.

5. Now move the cursor over to the directory window and select the folder FOLDER1. If you cannot see it on the window, point at the downward arrow to scroll the directory window. When you've selected the correct folder, it should flash three times before the disk drive starts turning. After a few seconds, the Master Filer should load up.

6. With the Master Filer loaded, move the cursor over to the edit menu and hold the fire button down.

7. With the fire button still held down, pull down on your joystick to move the cursor to the insert option, and release the fire button.

8. The screen should open out to another one titled "insert." Enter any name for the disk you wish to file (e.g., DISK1) and press RETURN.

9. Insert the disk named DISK1 into the drive and press RETURN. The screen should blank and display a WAIT message.

10. Eventually, a prompt should appear, asking you to press the fire button on your joystick. Doing so should return you to the main filer menu.

11. Now, move the cursor over to the display menu and, again, hold down the fire button. Move the cursor down to the catalog option and release the fire button.

12. Type * and press RETURN. If you have a large number of disks and wish to see all disks with names starting with an A, for example, enter A as the filename, and all the disk directories with names that start with A will appear.

13. Eventually, the listing will stop. Follow the instructions issued by the filer to return to the filer menu.

14. Direct your cursor to the file menu and hold down the fire button. Select the quit option and respond Y to the prompt Save changes (Y), then insert the MDD disk back into the disk drive. Press RETURN and wait. After a while, you should be returned to the Master Menu.

15. Finally, in the Master Menu, move the cursor to the quit icon and press the fire button. The screen will scroll off, returning you to BASIC. End of session.

Expanding the directory.

Eventually, your disk will be full of folders containing many program names. You may find that you've run out of disk space. When this happens, you may expand the directory by using DUP.SYS to format a new disk and copy the files AUTORUN.SYS, MASTER.DR1 and MASTER.DR2 onto it. With this fresh disk, you can once again create many new folders. □

Jason Leigh graduated two years ago from King George V School in Hong Kong. He is now a Computer Science student at the University of Utah. He's been working with the Atari since being a pupil at Kowloon Junior School.

Listing 1.
Creator listing.

```

10 DIM A$(1):GRAPHICS 0
20 ? " MASTER DISK DIRECTORY CREATO
R"
30 ? :? "WARNING: THE MASTER DISK DIRE
CTORY MUST BE NAMED MASTER.DR1 FO
R THE FILE TO LOAD AUTOMATICALLY."
40 ? :? " THIS PROGRAM WILL CREATE
AN AUTORUN.SYS FILE TO LOAD MAS
TER.DR1 "
45 ? "
"
50 ? :? " INSERT DISK WITH MASTER
.DR1 AND PRESS RETURN";:INP
UT A$
55 ? :? " PLEASE WAIT "
60 TRAP 100:CLOSE #1:OPEN #1,8,0,"D:AU
TORUN.SYS"
70 FOR T=1 TO 82:READ A:PUT #1,A:NEXT
T
80 CLOSE #1
90 ? :? " DONE!!! "
:END
100 ? :? " ERROR ";PEEK(1
95)
110 ? :? " CORRECT THE PROBLEM & RE-RU
N PROGRAM":END
10000 DATA 255,255,0,6,69,6,165,88,133
,203,165,89,24,105,1,133,204,162,0,160
,0,173,198
10010 DATA 2,141,197,2,185,53,6,129,20
3,230,203
10020 DATA 165,203,201,0,240,8,200,192
,16,208,238,76,47,6,230,204,76,34,6,16
9,13,141,74
10030 DATA 3,96,50,53,46,2,36,26,45,33
,51,52,37
10040 DATA 50,14,36,50,17,0,224,2,225,
2,0,6

```

CHECKSUM DATA.

(see page 10)

```

10 DATA 915,156,633,870,140,623,59,239
,951,506,76,690.21,695,913,7487
10020 DATA 957,985,687,2629

```



Master Disk Directory *continued*

Listing 2.
Master Disk Directory listing.

```

0 K1=1:K2=2:K3=3:POKE 842,12
1 DIM A$(20),DISK$(960),B$(20),MEM$(15
),DSK$(7),INVDISK$(7),NDISK$(7),QUIT$(7)
,TRASH$(7),INVTTRASH$(7)
100 GOSUB 10000
105 MEM$=A$
110 LENGTH=LEN(DISK$)/11-K2
1000 IF START=K1 THEN RUN
1001 GOSUB 32000
1003 POSITION K2,7: CHR$(96):POSITION
14,7: ? "MAIN MENU"
1005 POSITION K3,10: ? " ";CHR$(
20)
1010 FOR T=K1 TO 4: ? " →→→→→→→→":NEX
T
1035 ? " ";CHR$(21):POSITION
12,19: ? MEM$
1040 GOSUB 3900
1045 POSITION 30,15: ? DSK$;" DIR":POSI
TION 30,10: ? NDISK$;" NEW"
1047 POSITION 18,10: ? TRASH$;" TRASH":
POSITION 18,15: ? QUIT$;" QUIT"
1048 IF TRASH=K1 THEN POSITION 21,11: ?
"TRASH"
2000 S=STICK(K0):IF TRASH=K1 THEN GOSU
B 2900
2001 IF STRIG(K0)=K0 THEN 3000
2005 IF S=15 THEN 2050
2010 IF S=14 OR S=6 OR S=10 THEN Y=Y-K
1:IF Y<6 THEN Y=6
2020 IF S=13 OR S=9 OR S=5 THEN Y=Y+K1
:IF Y>22 THEN Y=22
2030 IF S>4 AND S<8 THEN X=X+2:IF X>36
THEN X=36
2040 IF S>8 AND S<12 THEN X=X-2:IF X<2
THEN X=2
2042 IF X=X0 AND Y=Y0 THEN 2000
2045 LOCATE X,Y,Z1:LOCATE X+K1,Y,Z2:PO
SITION X0,Y0: ? CHR$(Z01);CHR$(Z02):X0=
X:Y0=Y:Z01=Z1:Z02=Z2
2050 POSITION X,Y: ? CHR$(18);CHR$(19):
GOTO 2000
2900 IF V=K1 THEN POSITION 21,11: ? "TR
ASH":V=K0:RETURN
2910 V=K1:POSITION 21,11: ? "TRASH":RET
URN
3000 IF (Z01>12 AND Z01<18) OR (Z02>12
AND Z02<18) THEN POSITION 30,15: ? INV
DISK$:RUN
3003 IF Z01=96 THEN 4100
3005 IF Z01>19 AND Z01<22 THEN 3200
3007 IF X<12 AND X>K3 AND Y>10 AND Y<1
5 THEN 3500
3010 IF Z01=23 OR Z01=25 THEN 3700
3020 IF Z01=5 OR Z01=7 THEN FOR T=K0 T
O 23:POSITION K0,T: ? "
":NEXT T:END
3030 IF Z01=9 OR Z01=11 THEN 3800
3100 FOR T=K1 TO 20: SOUND K1,100,10,5:
NEXT T: SOUND K1,K0,K0,K0:TRASH=K0:GOTO
1000
3180 POSITION 30,15: ? DSK$:Z01=32:Z02=
32:X=X+K2:X0=X:GOTO 1000
3200 IF Z01=21 THEN 3300
3210 L=L-K1:IF L<K0 THEN L=K0
3220 GOTO 1000
3300 L=L+K1:IF L>LENGTH-K3 THEN LENG
TH=L-K3
3320 GOTO 1000
3500 A$=DISK$((Y-11+L)*11+K1,(Y-10+L)*
11-K3)
3510 FOR R=K1 TO K3:POSITION 4,Y:FOR T
=K1 TO LEN(A$): ? CHR$(ASC(A$(T))+128)
:NEXT T

```

```

3515 POSITION 4,Y: ? A$;:NEXT R
3516 FOR T=K1 TO 8:IF A$(T,T)<>" " THE
N B$(T,T)=A$(T):NEXT T
3517 A$=B$
3518 IF DISK$((Y-11+L)*11+9,(Y-10+L)*1
1)<>"DRR" THEN POSITION 25,17: ? "TITLE
FILE"
3519 IF TRASH=K1 THEN 3850
3520 POSITION 30,15: ? INVDISK$:A$(LEN(A
$)+K1)="DRR":B$="D":B$(3)=A$
3530 TRAP 3600:CLOSE #K1:OPEN #K1,8,K0
,"D:OPTION.DIR": ? #K1;B$:CLOSE #K1
3540 RUN "D:MASTER.DR2"
3600 POSITION 25,17: ? "ERROR ->";PEE
K(195)
3610 FOR T=10 TO K0 STEP -2:POSITION 3
0,15: ? DSK$:GOSUB 4000:POSITION 30,15:
? INVDISK$:GOSUB 4000
3615 SOUND K1,250,10,T:NEXT T:SOUND K1
,K0,K0,K0
3620 POSITION 30,15: ? DSK$;CHR$(30);CH
R$(17):FOR R=K1 TO 200:NEXT R:POSITION
25,17: ? "":GOTO 1000
3700 FOR T=K0 TO 20:POSITION K0,23: ? "
":NEXT T:GRAPHICS K0:POKE 710,112
3705 POKE 756,RAM
3710 ? "K
3720 ? : ? : ? "Please do not use extend
ers or spaces"
3730 ? : ? "ENTER 8 LETTER FILENAME->";
:INPUT A$
3735 IF A$="" THEN RUN
3737 IF LEN(A$)>8 THEN ? : ? " F
ILENAME TOO LONG":GOSUB 4010:GOTO 3710
3740 FOR T=K1 TO LEN(A$):IF A$(T,T)="
" OR A$(T,T)=" " THEN ? : ? " IL
LEGAL FILENAME":GOSUB 4010:GOTO 3710
3750 NEXT T
3755 FOR T=K1 TO LEN(A$):A=ASC(A$(T)):
IF A<48 OR A>90 THEN ? : ? "USE ONLY CA
PITAL LETTERS":GOSUB 4010:GOTO 3710
3756 NEXT T
3760 ? : ? "FILENAME " ;A$;"DRR"
3770 ? : ? "ARE YOU SURE":INPUT B$:IF
B$(K1,K1)<>"Y" THEN RUN
3780 B$="D":B$(K3)=A$:B$(LEN(B$)+K1)=
"DRR":START=K1
3785 TRAP 3790:CLOSE #K1:OPEN #K1,4,K0
,B$:CLOSE #K1: ? : ? "WRITE OVER OLD FO
UNDER":INPUT A$:IF A$<>"Y" THEN RUN
3790 TRAP 3600: ? : ? " WRITING NEW
FILE TO DISK":LIST B$,K0:RUN
3800 POSITION 18,10: ? INVTTRASH$:TRASH=
K1
3810 GOTO 1000
3850 B$="D":B$(3)=A$:B$(LEN(B$)+K1)="
DRR"
3860 CLOSE #K1:TRAP 3600:XIO 33,#K1,K0
,K0,B$:RUN
3900 TRAP 2000:FOR T=K0 TO K3
3910 POSITION 4,11+T: ? DISK$((L+T)*11+
K1,(L+T+K1)*11-K3):NEXT T:RETURN
4000 FOR R=K1 TO 10:NEXT R:RETURN
4010 FOR T=15 TO K0 STEP -0.4:SOUND K1
,90,10,T:NEXT T:FOR T=K1 TO 200:NEXT T
:RETURN
4100 POSITION 9,4: ? "
4110 POSITION 9,5: ? " Copyright 198
5
4120 POSITION 9,6: ? " ANALOG Computi
ng
4130 POSITION 9,7: ? " By Jason Leig
h
4140 POSITION 9,8: ? " Version 1.0
4150 POSITION 9,9: ? " 14th May 1985

```

```

4160 POSITION 9,10:? "
4170 IF STRIG(K0)=K0 THEN 4170
4190 FOR T=9 TO 5 STEP -K1:POSITION 9,
T:? "
4200 POSITION 9,T+K1:? "
      ":NEXT T:POSITION 9,5:? "
      ":GOTO 1001
10000 GRAPHICS K0:POKE 710,112:POKE 75
2,K1
10005 ? " MASTER DISK DIRECTORY
":?
10006 ? " COPYRIGHT 1985 ANALOG COMPU
TING"
10007 ? ,"BY JASON LEIGH":?
10008 ? ,"PLEASE WAIT"
10010 RAM=PEEK(106)-8:RAMI=RAM*256
10020 FOR T=RAMI TO RAMI+16:SUM=SUM+PE
EK(T):NEXT T:IF SUM=120 THEN 10050
10030 POKE 1790,K0:POKE 1791,RAM:RESTO
RE 30000:FOR T=1536 TO 1583:READ A:POK
E T,A:NEXT T:X=USR(1536)
10040 RESTORE 20000:FOR T=K0 TO 167:RE
AD A:POKE RAMI+552+T,A:NEXT T
10050 ? "K":POKE 756,RAM
10060 RESTORE 21000:FOR T=K1 TO 7:READ
A,X:DSK$(T)=CHR$(A):INVDISK$(T)=CHR$(X
):NEXT T
10065 FOR T=K1 TO 7:READ A:NDISK$(T)=CH
R$(A):NEXT T:FOR T=K1 TO 7:READ A:QUIT
$(T)=CHR$(A):NEXT T
10068 FOR T=K1 TO 7:READ A:TRASH$(T)=C
HR$(A):NEXT T:FOR T=K1 TO 7:READ A:INV
TRASH$(T)=CHR$(A):NEXT T
10070 X=34:Y=20:Z01=32:Z02=32:X0=X:Y0=
Y
10080 POSITION 30,15:? INVDISK$
10085 TRAP 10200
10090 DISK$="" :CLOSE #K1:OPEN #K1,6,K0
,"D:*. *":M=K1
10100 INPUT #K1:A$:DISK$(M,M+10)=A$(K3
):M=M+11:GOTO 10100
10110 RETURN
10200 IF PEEK(195)=136 THEN RETURN
10210 FOR T=K1 TO 110:DISK$(T,T)=" ":N
EXT T:DISK$(12,20)="NO FILES":GOTO 110
20000 DATA 255,128,186,163,186,162,186
,128
20010 DATA 255,1,89,85,213,85,89,1
20020 DATA 128,136,144,191,144,136,128
,255
20030 DATA 1,5,29,249,29,5,1,255
20040 DATA 127,63,36,45,45,45,45
20050 DATA 255,254,146,182,182,182,182
,182
20060 DATA 45,45,45,45,45,45,36,63
20065 DATA 182,182,182,182,182,182,146
,254
20070 DATA 255,128,188,188,128,131,132
,132
20080 DATA 255,1,1,1,1,193,33,33
20090 DATA 132,132,131,128,129,129,128
,255
20100 DATA 33,33,193,1,129,129,1,255
20110 DATA 33,33,193,14,144,144,32,224
20120 DATA 127,128,124,16,14,4,3,0
20130 DATA 224,24,7,7,5,31,224,0
20140 DATA 255,231,195,129,231,231,231
,255
20150 DATA 255,231,231,231,129,195,231
,255
20160 DATA 192,192,192,192,192,192,192
,192
20170 DATA 1,2,4,8,16,32,64,128
20180 DATA 131,71,46,28,56,116,98,129
20190 DATA 128,64,32,16,8,4,2,1
21000 DATA 13,141,14,142,29,29,30,30,3
0,30,15,143,16,144

```

```

21010 DATA 23,24,29,30,30,25,23
21020 DATA 5,6,29,30,30,7,8
21030 DATA 9,10,29,30,30,11,12
21040 DATA 137,138,29,30,30,139,140
30000 DATA 104,216,173,254,6,133,203,1
73,255,6,133,204,169,224,133,206,169,0
,133
30010 DATA 205,162,0,161,205,129,203,2
30,203,230
30020 DATA 205,165,205,201,0,208,242,2
30,204,230,206,165,206,201,228,208,232
,248,96
32000 POSITION K2,K0:FOR T=K1 TO K3:?
DSK$(K1,6)::NEXT T:? DSK$(7):" MAST
ER DISK DIRECTORY"
32010 POSITION K1,4:? "
      ":RETURN

```

CHECKSUM DATA.

(see page 10)

```

0 DATA 620,552,990,375,624,254,179,870
,839,624,649,944,766,632,309,9227
2000 DATA 506,662,858,982,789,984,706,
125,97,775,887,635,517,922,107,9552
3007 DATA 888,432,384,906,108,890,896,
621,708,902,711,693,400,956,158,9653
3517 DATA 439,549,142,777,982,977,719,
955,882,661,454,169,581,87,898,9272
3735 DATA 662,75,133,547,770,559,410,2
59,296,173,341,518,725,103,133,5704
3900 DATA 653,425,677,794,248,328,655,
379,967,908,413,698,210,714,388,8457
10005 DATA 99,785,333,506,560,301,757,
692,57,551,75,163,166,72,232,5349
10090 DATA 187,10,43,349,562,575,942,5
67,465,830,587,869,600,566,437,7589
20090 DATA 565,936,9,865,432,555,539,6
04,587,277,634,745,539,62,306,7655
21040 DATA 740,155,107,470,732,560,276
4

```

Listing 3.

Master Filer listing.

```

0 K1=1:K2=2:K3=3:K4=4:K5=5:K6=6:K10=10
:POKE 842,12
1 PAUSE=9600:BEEP=9700:SCREEN=9800:KEY
=9900:DIM A$(30),FILE$(20),B$(30),D$(3
0),DOT$(K1):Z0=32:X=K2:Z=32
5 DOT$(CHR$(20)):GRAPHICS K0:POKE 710,K
0:POKE 709,K0
10 TRAP 9930:CLOSE #K1:OPEN #K1,K4,K0,
"D:OPTION.DIR":INPUT #K1:FILE$(CLOSE #
K1
15 ? "K":POSITION K2,10:? "ENTER FILE$
":POSITION K2,15:? "G.16":POSITION K2,
K0:POKE 842,13:STOP
16 RESTORE 9995:FOR T=K0 TO 93:READ A:
POKE 1536+T,A:NEXT T
20 POKE 842,12:GRAPHICS K0:A$="" :B$=""
:D$="" :SETCOLOR K4,K5,K5:POKE 711,160:
POKE 752,K1:POKE 710,K0:? "K"
30 DLIST=PEEK(560)+PEEK(561)*256:POKE
DLIST+K3,PEEK(DLIST+K3)+K5:POKE DLIST+
K6,K6
35 L0=PEEK(560):HI=PEEK(561)
40 POSITION K2,K0:? " master filer

```

Master Disk Directory *continued*

```

50 POKE 752,K1:POSITION K1,K1:? "
EDIT      DISPLAY      FILE      "
60 POSITION 12,K10:? "FILES IN MEMORY="
";RESTORE 10000:READ A:? A:POKE 764,1
24
65 IF FRE(K0)<500 THEN POSITION 15,13:
? "FOLDER FULL"
70 POKE DLIST+23,K6:POSITION K3,17:? "
BY Jason Leigh"
75 POSITION K5,15:? "FOLDER NAME->";FI
LES$
80 IF STRIG(K0)=K0 THEN 80
900 IF STRIG(K0)=K0 THEN 2000
1000 5=STICK(K0):IF 5<>7 AND 5<>11 THE
N 1200
1030 IF 5=7 THEN X=X+K1:IF X>38 THEN X
=38:GOTO 900
1040 IF 5=11 THEN X=X-K1:IF X<K2 THEN
X=K2:GOTO 900
1050 LOCATE X,K1,Z
1200 POSITION X,K1:? DOT$:POSITION X0,
K1:? CHR$(Z0):Z0=Z:X0=X
1210 GOTO 900
2000 CP=K1:IF X>K3 AND X<12 THEN 3000
2020 IF X>15 AND X<25 THEN 6000
2025 IF X>28 AND X<37 THEN 8000
2027 GOSUB BEEP
2030 GOTO 900
3000 POSITION K4,K2:? " |Escape|"
3010 POSITION K4,K3:? " |Update|"
3020 POSITION K4,K4:? " |Insert|"

```

```

3030 POSITION K4,K5:? " |Delete|"
3035 POSITION K4,K6:? " |Delete|"
3040 5=STICK(K0)
3050 IF STRIG(K0) THEN 3200
3060 IF 5=14 THEN CP=CP-K1:IF CP<K1 TH
EN CP=K1
3070 IF 5=13 THEN CP=CP+K1:IF CP>K4 TH
EN CP=K4
3080 POSITION K5,CP+K1:IF CP=K1 THEN ?
"Escape"
3090 IF CP=K2 THEN ? "Update"
3100 IF CP=K3 THEN ? "Insert"
3110 IF CP=K4 THEN ? "Delete"
3115 IF 5=15 THEN 3040
3120 GOTO 3000
3200 GOSUB 5SCREEN:ON CP GOSUB 20,4500,
5000,4000
3210 GOTO 20
4000 ? "K          DELETE FILE":A=K0
:RESTORE 10000:READ DISK5
4010 ? :? "Disk name";:INPUT A$:IF A$=
"" THEN GOTO KEY
4015 GOSUB 8900:IF ERR=K1 THEN 4010
4020 B$=""":B$(K2)=A$
4030 RESTORE 20000:A=K0:POKE 560,L0:PO
KE 561,HI
4040 TRAP 4055:READ A$:IF A$(K1,K1)=">
" OR A$(K1,K1)=DOT$ THEN A=A+K1
4045 IF A$(K1,LEN(B$))=B$ THEN 4070
4050 GOTO 4040
4055 IF PEEK(195)=K5 THEN 4040
4060 GOTO KEY
4070 ? :? "Delete ";A$;" (Y)";:INPUT A
$:IF A$<"Y" THEN 4040
4080 LINE=20000+65*(A-K1):POKE 560,K0:
POKE 561,K6
4090 ? "K":POSITION K2,K5:? LINE;"DATA
":POSITION K2,K10:? "10000 DATA";DIS
K5-K1:POSITION K2,15:? "G.4100"
4095 POSITION K2,K0:POKE 842,13:STOP
4100 POKE 842,12
4110 FOR T=K1 TO 63:? "K":POSITION K2,
K5:? LINE+T:POSITION K2,K10:? "G.4120"
:POSITION K2,K0:POKE 842,13:STOP
4120 POKE 842,12:POKE 712,T:NEXT T:? "
K":POKE 709,K10:SETCOLOR K4,K5,K5:GOTO
4030
4500 ? "K          UPDATE OLD DISK":
A=K0
4510 ? :? "Previous Disk name";:INPUT
A$:GOSUB 8900:IF ERR=K1 THEN 4510
4520 B$=""":B$(K2)=A$
4530 TRAP 4545:RESTORE 20000+A:READ A$
:IF A$=B$ THEN 4550
4540 A=A+65:GOTO 4530
4545 GOTO KEY
4550 ? :? "INSERT DISK";A$:? "      &
PRESS RETURN":INPUT A$
4560 TRAP 4570:CLOSE #K1:OPEN #K1,K6,K
0,"D:*.*":FOR T=K1 TO 65:INPUT #K1,A$:
NEXT T
4570 IF PEEK(195)<>136 THEN ? "ERROR="
":PEEK(195):GOTO KEY
4600 LINE=20000+A:RESTORE 10000:READ D
ISK5:DISK5=DISK5-K1:GOTO 5077
5000 ? "K          INSERT NEW DISK FILE"
5005 IF FRE(K0)<500 THEN POSITION 15,K
10:? "FOLDER FULL":GOTO KEY
5010 ? :? "Name of new disk";:INPUT A$
:GOSUB 8900:IF ERR=K1 THEN 5010
5012 B$=""":B$(K2)=A$
5015 IF A$="" THEN GOTO KEY
5020 TRAP 5040:RESTORE 20000
5030 READ D$:IF D$=B$ THEN ? "Name alr
eady used":GOTO KEY
5035 GOTO 5030

```



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```

5040 ? :? "INSERT DISK";B$:? :? " ) P
RE55 RETURN TO START";:INPUT A$
5050 TRAP 5060:CLOSE #K1:OPEN #K1,K6,K
0,"D:*.":FOR T=K1 TO 65:INPUT #K1;A$:
NEXT T
5060 IF PEEK(195)(<)136 THEN POKE 709,K
10:?"[ERROR]";PEEK(195):GOTO KEY
5070 RESTORE 10000:READ DISKS:LINE=200
00+DISKS*65
5075 TRAP 5077:FOR T=20000 TO 32767 ST
EP 65:RESTORE T:READ A$:IF A$=DOT$ THE
N LINE=T:GOTO 5077
5076 NEXT T
5077 POKE 560,K0:POKE 561,K6
5078 ? "K":POSITION K2,K10:?"10000 DA
TA";DISKS+K1:POSITION K2,15:?"G.5080"
:POSITION K2,K0:POKE 842,13:STOP
5080 POKE 842,12:?"K"
5085 TRAP 5060:CLOSE #K1:OPEN #K1,K6,K
0,"D:*.":
5090 ? "K":POSITION K2,K10:?"LINE;"DAT
A";B$
5100 POSITION K2,20:?"G.5150":POSITIO
N K2,K0:POKE 842,13:STOP
5150 POKE 842,12
5160 FOR T=K1 TO 64:?"K":TRAP 5175:IN
PUT #K1;A$:POSITION K2,K10:?"LINE+T;"D
ATA";A$:POSITION K2,15
5162 ? "G.5180":GOTO 5170
5165 POSITION K2,K10:?"LINE+T;A$:POSIT
ION K2,15:?"G.5180"
5170 POSITION K2,K0:POKE 842,13:STOP
5175 A$="":IF PEEK(195)(<)136 THEN 5060
5176 GOTO 5165
5180 POKE 842,12:POKE 712,T:NEXT T
5200 ? "K":GOTO KEY
5400 END
6000 POSITION 16,K2:?" |Escape |"
6010 POSITION 16,K3:?" |Catalog |"
6020 POSITION 16,K4:?" |DiskDir |"
6030 POSITION 16,K5:?" |Search |"
6035 POSITION 16,K6:?" |"
6040 5=5TICK(K0)
6050 IF STRIG(K0) THEN 6200
6060 IF 5=14 THEN CP=CP-K1:IF CP<K1 TH
EN CP=K1
6070 IF 5=13 THEN CP=CP+K1:IF CP>K4 TH
EN CP=K4
6080 POSITION 17,CP+K1:IF CP=K1 THEN ?
"Escape"
6090 IF CP=K2 THEN ? "Catalog"
6100 IF CP=K3 THEN ? "DiskDir"
6110 IF CP=K4 THEN ? "Search"
6115 IF 5=15 THEN 6040
6120 GOTO 6000
6200 GOSUB 5SCREEN:ON CP GOSUB 20,7000,
7500,6500
6210 GOTO 20
6500 ? "K SEARCH"
6530 ? :? "Filename";:INPUT A$
6540 RESTORE 20000:TRAP KEY
6550 READ B$:IF B$(K1,K1)=")" THEN D$=
B$
6555 IF B$(K1,K1)="*" THEN B$=B$(K3)
6560 IF A$=B$(K1,LEN(A$)) THEN ? "Disk
name";D$:?"Filename";B$:?
6570 GOTO 6550
7000 ? "K DISK CATALOG":A=K0
7005 ? :? "TYPE * TO DISPLAY ENTIRE C
ATALOG"
7006 ? :? "TYPE Q TO EXIT"
7007 ? :? "PRESS RETURN FOR PROMPTED
CATALOG"
7008 ? :? "PRESS FIRE BUTTON TO PAUSE
LISTING"
7010 ? :? "Disk name";:INPUT A$:IF A$=
"Q" THEN GOTO KEY
7015 IF A$="*" THEN 7200

```

```

7016 GOSUB 8900:IF ERR=K1 THEN FOR T=K
1 TO 100:NEXT T:GOTO 7000
7020 B$=")":B$(K2)=A$
7030 RESTORE 20000+A
7040 TRAP 7400:READ A$:IF A$(K1,LEN(B$
))(<)B$ THEN A=A+65:GOTO 7030
7045 ? :? "Catalog disk";A$;" (Y)";:I
NPUT A$:IF A$(<)"Y" THEN A=A+65:GOTO 70
30
7050 TRAP KEY:RESTORE 20000+A
7060 READ A$:? A$
7070 READ A$:IF A$(K1,K1)=DOT$ OR A$(K
1,K1)=")" THEN A=A+65:GOTO 7030
7080 ? A$:GOSUB PAUSE:GOTO 7070
7200 RESTORE 20000
7210 TRAP KEY:READ A$:IF A$=DOT$ THEN
7210
7220 IF A$(K1,K1)=")" THEN ?
7230 ? A$:GOSUB PAUSE:GOTO 7210
7400 5=PEEK(195):IF 5=K5 THEN A=A+65:G
OTO 7030
7410 GOTO KEY
7500 ? "K DISK DIRECTORY":?
7510 TRAP 7530:CLOSE #K1:OPEN #K1,K6,K
0,"D:*.":
7520 FOR T=K1 TO 65:?" " "":INPU
T #K1;A$:? A$:GOSUB PAUSE:NEXT T
7530 IF PEEK(195)(<)136 THEN ? :? "[ERR
OR]";PEEK(195)
7540 GOTO KEY
8000 POSITION 29,K2:?" |Escape |"
8010 POSITION 29,K3:?" |Print |"

```

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CIRCLE #159 ON READER SERVICE CARD



Master Disk Directory *continued*

```

8020 POSITION 29,K4:?"Quit"
8030 POSITION 29,K5:?"Quit"
8040 5=5TICK(K0)
8050 IF STRIG(K0) THEN 8200
8060 IF 5=14 THEN CP=CP-K1:IF CP<K1 TH
EN CP=K1
8070 IF 5=13 THEN CP=CP+K1:IF CP>K3 TH
EN CP=K3
8080 POSITION 30,CP+K1:IF CP=K1 THEN ?
"Escape"
8090 IF CP=K2 THEN ? "Print"
8100 IF CP=K3 THEN ? "Quit"
8115 IF 5=15 THEN 8040
8120 GOTO 8000
8200 GOSUB 5SCREEN:ON CP GOSUB 20,9000,
8500
8500 ? "K QUIT"
8510 ? :? "Save changes (Y)";:INPUT A$
:IF A$(Y) THEN 8540
8520 ? :? " PUT DISK WITH FILE ";FIL
E$ :? " IN DRIVE 1 & PRESS RETURN";:
INPUT A$
8530 ? :? " PLEASE WAIT"
8535 TRAP 8550:LIST FILES,10000,32766
8540 TRAP 8550:GRAPHICS K0:RUN "D:MAST
ER.DR1"
8550 ? "ERROR";PEEK(195):GOTO KEY
8900 IF A$="" THEN ERR=K0:RETURN
8905 FOR T=K1 TO LEN(A$):IF A$(T,T)="",
" THEN ? :? " DO NOT USE COMMAS
IN NAME":ERR=K1:RETURN
8910 NEXT T
8920 IF LEN(A$)>20 THEN ? :? "
NAME TOO LONG":ERR=K1:RETURN
8930 ERR=K0:RETURN
9000 ? "K PRINT DISK CATALOGS"
9010 ? :? "Print Entire or Separate ca
talog";:INPUT A$
9020 IF A$(Y) AND A$(S) THEN GOTO
KEY
9030 IF A$="S" THEN 9200
9040 ? :? "PREPARE PRINTER & PRESS RET
URN";:INPUT A$:TRAP 9050
9045 CLOSE #K2:OPEN #K2,8,K0,"p":? #K
2;"ENTIRE DIRECTORY LISTING":? #K2:GOT
O 9080
9050 ? "ERROR";PEEK(195):GOTO KEY
9080 RESTORE 20000
9090 TRAP KEY:READ A$:IF A$=DOT$ THEN
9090
9095 IF A$(K1,K1)="" THEN ? #K2
9100 ? #K2:A$:GOTO 9090
9200 ? :? "Disk name to print";:INPUT
A$
9210 IF A$="" THEN GOTO KEY
9220 B$="":B$(K2)=A$
9230 ? :? "PREPARE PRINTER & PRESS RET
URN";:INPUT A$
9240 TRAP 9050:CLOSE #K2:OPEN #K2,8,K0
,"p:"
9250 A=K0
9260 TRAP 9400:RESTORE 20000+A:READ A$
:IF A$(K1,LEN(B$))=B$ THEN 9300
9270 A=A+65:GOTO 9260
9300 RESTORE 20000+A:A=A+65
9310 TRAP 9260:READ A$:? #K2:A$:READ A
$:IF A$(K1,K1)="" OR A$(K1,K1)=DOT$ T
HEN 9260
9320 ? #K2:A$:GOTO 9310
9400 IF PEEK(195)=K5 THEN 9270
9410 GOTO KEY
9600 IF STRIG(K0)=K0 THEN 9600
9610 RETURN
9700 SOUND K1,100,K10,K5:FOR T=K1 TO 2
0:NEXT T:SOUND K1,K0,K0:RETURN
9800 GRAPHICS K0:POKE 710,K0:SETCOLOR
K4,K5,K5:RETURN

```

```

9900 POKE 842,12:CLOSE #K1:CLOSE #K2:P
OKE 709,K10:SETCOLOR K4,K5,K5:POKE 560
,LO:POKE 561,HI
9905 ? :? " COMMAND COMPLETED
"
9907 ? " PRESS FIRE TO RETURN TO M
ENU"
9910 IF STRIG(K0) THEN 9910
9920 GOTO 20
9930 POKE 842,12:GRAPHICS K0:POKE 710,
K0:POSITION 15,K10:?"ERROR";PEEK(19
5)
9940 ? :? " RETURNING TO MAIN MEN
U":TRAP 9930:RUN "D:MASTER.DR1"
9995 DATA 112,112,112,66,11,6,2,2,65,0
,6
9996 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
48,44,37,33,51,37,0,55,33,41,52,0,0,0,
0,0,0,0,0
9997 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,36
9998 DATA 47,0,46,47,52,0,48,50,37,51,
51,0,34,50,37,33,43,0,0,0,0,0,0,0,0,0,
0,0,0,0,0
10000 DATA 0

```

CHECKSUM DATA.

(see page 10)

```

0 DATA 901,584,624,851,449,768,787,443
,898,764,397,44,414,758,368,9050
80 DATA 508,565,174,181,575,407,459,89
3,659,840,865,92,891,495,534,8138
3020 DATA 539,489,179,350,316,110,125,
560,320,348,285,865,711,792,625,6614
4000 DATA 342,105,204,413,869,114,831,
724,594,55,322,888,38,907,153,6559
4110 DATA 484,23,713,656,428,858,643,7
8,461,552,294,887,384,544,324,7329
5012 DATA 418,390,666,285,735,224,534,
495,550,53,544,580,405,756,598,7233
5090 DATA 385,964,160,302,107,379,900,
205,766,510,653,273,754,856,800,8014
6030 DATA 745,289,356,325,116,131,111,
81,97,909,877,726,812,631,981,7187
6530 DATA 245,695,900,6,711,758,117,33
,522,996,417,447,748,872,419,7886
7030 DATA 509,649,976,744,8,259,327,38
6,290,187,328,975,68,390,605,6701
7520 DATA 543,378,74,490,487,297,162,3
60,331,120,130,536,228,56,885,5077
8120 DATA 736,433,959,712,825,276,583,
955,660,205,574,559,871,896,428,9672
9010 DATA 687,940,828,863,594,647,392,
318,537,652,390,394,429,948,532,9151
9250 DATA 279,176,655,411,739,647,619,
72,710,814,56,993,428,925,650,8174
9910 DATA 374,659,396,37,503,658,956,7
67,561,4911

```



Index to ANALOG Computing

ISSUES 15-36

by Lee Pappas

Way back in issue 15, we ran an index of back issues, covering the first fourteen issues of **ANALOG Computing**.

This listing follows the same basic format: Feature Articles, Reviews and Program Listings. The latter

category is further subdivided into Disk Utilities, Education, Entertainment, Graphics, Programming Aids and Miscellaneous.

Titles appear in chronological order, with all articles in a given issue listed in page sequence. Columns, reader comments and other regular sections of **ANALOG Computing** are not included.

FEATURE ARTICLES

AUTHOR	TITLE OF ARTICLE	ISSUE	PAGE
Moriarty, Brian	Inside the New Atari 600XL	15	32
Bucholz, Claus	Transporting Programs to the 5200	15	59
Harberg, Allen	Software Piracy: A Survey	15	64
White, Jerry	Disk Users: Don't Let This Happen to You!	15	94
Peacock, Kyle	Fine Scrolling - Part 3	15	104
Moriarty, Brian	Index to ANALOG Computing Issues 1 to 14	15	131
Swanson, Paul	Build a Low-Cost Printer Interface	16	36
Peacock, Kyle	Fine Scrolling - Part 4	16	98
Higgins, Dan	How to Live without DOS	17	58
Moriarty, Brian	New Disk Drives for the Atari	17	73
Long, Michael	Communications for the Handicapped	18	15
Parker, Clinton	Introduction to Action! - Part 2	18	91
Staff	Darkness at Noon	19	7
Staff	Bulletin Board Systems	19	46
Bachand, Charles	A Look at Modems	19	48
Bachand, Charles	Low-Cost Printer Interface Additions	19	49
Messina, Tony	Public Domain Terminal Software	19	51
Herring, Richard	Educational Computer Games	19	63
Thomas, Noel & Kim	Want to Be a Sysop?	19	74
Staff	The Winners — Our Favorite Games	20	11
Leyenberger, Arthur	The Atari 7800	21	8
Panak, Steve	Selecting Your Perfect Printer	21	21
Des Chenes, Michael	The ANALOG Printer Survey	21	87
Leyenberger, Arthur	The New Atari (CES Report)	22	47
Dolbeare, R.T.	Another BASIC Bug	23	56
Leyenberger, Arthur	AtariCon Report	24	17
Staff	Bopotron Construction Layout Sheet	24	69
Leyenberger, Arthur	An Interview with Free Fall Associates	24	97

Altman, Philip	An Atari BASIC Tutorial - Part 1	25	65
Leyenberger, Arthur	Atari Stocking Stuffers	25	69
Pappas, Lee	Guide to Atari Publications - Part 3	25	80
Bell, Jon A.	Atari 1985	26	13
Walters, Chester C.	Painless Player Mover - Tutorial	26	37
ANALOG Readers	Bopotron: The New Levels	26	54
Altman, Philip	An Atari BASIC Tutorial - Part 2	26	59
Pappas/Leyenberger	Winter CES Report	28	4
Leyenberger, Arthur	Winter CES - Part 2	29	4
Barton, Michael Alan	XL Expansion Connector	29	48
Brilliant, Lee, M.D.	Cheep Talk: Build Your Own Speech Synthesizer	29	59
Bell, Jon A.	Atari at Comdex	32	4
Hudson, Tom	Atari 520ST: Our First Look	32	51
Dunion, Jim	Programming as if You're Your Own Worst Enemy	32	57
Leyenberger/Pappas	Summer CES	33	4
Patchett, Craig	An Introduction to MIDI	33	13
Perdue, Mario	Keyboard Encoding for Music Applications	33	63
Rooney, Wm. J., Jr.	Science Arcade	34	22
Perdue, Mario	Keyboard Encoding for Music Applications - Part 2	34	67
Leyenberger/Pappas	Summer CES - Part 2	34	85
Hudson, Tom	The ANALOG Computing Pie Chart Demo	35	38
Pirisino, Jim	Printers Revisited	35	61
Dunion, Jim	The Solid Gold Input Routine	36	90

PRODUCT REVIEWS

AUTHOR	TITLE OF ARTICLE	ISSUE	PAGE
Kelly, Tom	Professional Business Graphics - B/Graph (Batteries Included)	15	14

PRODUCT REVIEWS *continued*

AUTHOR	TITLE OF ARTICLE	ISSUE	PAGE
Griffin, B.E., M.D.	SAT Preparation Series (Krell)	15	24
Messina, Tony	Magic Storybook (Amulet)	15	28
Pappas, Lee	Rally Speedway (Adventure Internatl.)	15	28
Kelley, Patrick J.	Star Trek Simulator (Sega)	15	30
Bever, Edward	Eagles (Strategic Simulations)	15	48
Griffin, B.E., M.D.	Koala Micro Illustrator (Koala)	16	24
Griffin, B.E., M.D.	Paint (Reston)	16	24
Griffin, B.E., M.D.	Fun with Art (Epyx)	16	24
Griffin, B.E., M.D.	Crossword Magic (Softsmith)	16	28
Bachand, Charles	Gateway to Apshei (Epyx)	16	34
Moriarty, Brian	Action! (OSS)	16	54
Thorns, C.J.	Prisoner II (Edu-Ware)	16	62
Pappas, Lee	Solo Flight (Microprose)	16	96
Leyenberger, Arthur	Paint (Atari)	16	106
Kelley, Patrick J.	Oil's Well (Sierra)	16	115
Kelley, Patrick J.	Drol (Broderbund)	16	115
Kelley, Patrick J.	Orc Attack (Thorn-EMI)	16	115
Moriarty, Brian	Pascal 1.5 (Draper)	17	16
Griffin, B.E., M.D.	Success with Math Series (CBS)	17	22
Griffin, B.E., M.D.	Galaxy Math Facts (Random House)	17	24
Griffin, B.E., M.D.	Survival Math (Sunburst)	17	26
Griffin, B.E., M.D.	Whole Numbers (Plato)	17	22
Kelley, Patrick J.	Operation Whirlwind (Broderbund)	17	44
Pappas, Lee	Lode Runner (Broderbund)	17	53
Gluck, Joel	Joust (Atari)	17	62
Trunzo, James	Silicon Warrior (Epyx)	17	65
Peacock, Kyle	Ms. Pac-Man (Atari)	17	67
Firman, Carl	Encounter (Synapse)	17	77
Pappas, Lee	Atari Book Reviews	18	12
Griffin, B.E., M.D.	Simulated Computer (Carousel)	18	22
Griffin, B.E., M.D.	D-Bug (Electronic Arts)	18	25
Panak, Steve	Ultima I (Sierra)	18	36
Chaput, Cliff	Ultima III (Origin Systems)	18	41
Kelley, Patrick J.	Gruds in Space (Sirius)	18	42
Peacock, Kyle	Robotron: 2084 (Atari)	18	75
Berube, Ray	Saigon: The Final Days (Adventure International)	18	76
Des Chenes, Michael	The Return of Heracles (Quality)	18	89
Firman, Carl	Planetfall (Infocom)	18	96
Messina, Tony	Smartmodem 1200 (Hayes)	19	17
Berube, Ray	Microram 64K memory board (MPP)	19	28
Messina, Tony	Teletari (Don't Ask)	19	60
Curtin, Bob	Chancellor of the Exchequer (Mach-Ins)	19	65
Des Chenes, Michael	Bruce Lee (Datasoft)	19	67
Kelley/Pappas	MI6 Alley Ace (Microprose)	19	78
Riggs, Robert L.	BASIC XL (OSS)	19	80
Martin, Robert T.	Dimension X (Synapse)	19	88
Curtin, Bob	Star League Baseball (Gamestar)	19	91
Griffin, B.E., M.D.	Mastertype (Lightning)	20	15
Griffin, B.E., M.D.	Type Attack (Sirius)	20	15
Griffin, B.E., M.D.	Typo (Romox)	20	16
Griffin, B.E., M.D.	Touch Typing (Atari)	20	16
Hudson, Tom	Boulder Dash (First Star)	20	19
Berube, Ray	Universe (Omnitrend)	20	33
Leyenberger, Arthur	Seven Cities of Gold (Electronic Arts)	20	66
Curtin, Bob	Movie Maker (Reston)	20	98
Berube, Ray	Jungle Hunt (Atari)	21	12
Griffin, B.E., M.D.	Word Flyer (Electronic Arts)	21	15
Griffin, B.E., M.D.	Safetyline/Storyline (Maximus)	21	17
Leyenberger, Arthur	Atspell (Atari)	21	25
Leyenberger, Arthur	Spell Perfect (LJK Enterprises)	21	25
Leyenberger, Arthur	Spell Wizard (Datasoft)	21	25
Leyenberger, Arthur	Cut&Paste (Electronic Arts)	21	71
Griffin, B.E., M.D.	Atari Speed Reading (Atari)	22	7
Leyenberger, Arthur	The New Letter Perfect (LJK Enterprises)	22	10
Bachand, Charles	MPP-1150 Printer Interface (MPP)	22	31
Bachand, Charles	Ape-Face (Digital Devices)	22	31
Hudson, Tom	Gyruss (Parker Brothers)	22	89
Griffin, B.E., M.D.	The Incredible Laboratory (Sunburst)	23	9

Griffin, B.E., M.D.	AtariLab Starter Set (Atari)	23	10
Stone, Ruth Ann	Casadapter (Sar-An)	23	17
Curtin, Bob	Family Finances (Atari)	23	55
Bachand, Charles	TOP-DOS (Eclipse)	23	75
Shen, David	Donkey Kong (Atari)	23	79
Altman, Philip	ATR-8000 (Southwest Microcomputer)	23	85
James, Stephen	Dr. Wacko's Guide to Your Atari (Addison-Wesley)	23	88
Griffin, B.E., M.D.	Seastalker (Infocom)	24	8
Griffin, B.E., M.D.	Dragon's Keep & Troll's Tale (Sierra)	24	10
Griffin, B.E., M.D.	Tonk in the Land of the Buddy-Bots (Mindcape)	24	11
Panak, Steve	Pengo (Atari)	24	27
Panak, Steve	Infidel (Infocom)	24	28
Panak, Steve	Mr. Robot (Datamost)	24	29
Panak, Steve	Flak (Funsoft)	24	30
Panak, Steve	Questron (SSI)	24	31
Kelley, Patrick J.	Archon II: Adept (Electronic Arts)	24	83
Hudson, Tom	Ramrod XL (Newell)	25	10
Luks, Ron	HomeTerm (Batteries Included)	25	13
Griffin, B.E., M.D.	Music Construction Set (Electronic Arts)	25	18
Ratcliff, Matthew	XL Boss (Allen Macroware)	25	21
Bachand, Charles	U-Print (Digital Devices)	25	38
Bachand, Charles	Interfast I (AID)	25	38
Panak, Steve	One on One (Electronic Arts)	25	50
Panak, Steve	Summer Games (Epyx)	25	51
Panak, Steve	The Arcade Machine (Broderbund)	25	53
Panak, Steve	Cohen's Towers (Datamost)	25	54
Panak, Steve	Cosmic Tunnels (Datamost)	25	55
Panak, Steve	Puzzle Panic (Epyx)	25	55
Leyenberger, Arthur	Financial Cookbook (Electronic Arts)	25	83
Griffin, B.E., M.D.	Big Bird's Special Delivery (CBS)	26	23
Griffin, B.E., M.D.	Ducks Ahoy (CBS)	26	24
Griffin, B.E., M.D.	Seahorse Hide 'n Seek (CBS)	26	24
Griffin, B.E., M.D.	Ernie's Magic Shapes (CBS)	26	25
Griffin, B.E., M.D.	Big Bird's Funhouse (CBS)	26	26
Hillman, Matt	Enchanter and Sorcerer (Infocom)	26	49
Bachand, Charles	Okimate 10 Color Printer (Okidata)	26	66
Kelley, Patrick J.	F-15: Strike Eagle (Microprose)	27	40
Haney, Jim	Flight Simulator II (SubLogic)	27	58
Griffin, B.E., M.D.	CompuServe and Education	28	11
Kelley, Patrick J.	Field of Fire (SSI)	28	15
Leyenberger, Arthur	HomePak (Batteries Included)	28	29
Wieggers, Karl E.	Tax Advantage (Continental)	28	33
Curtin, Bob	Your Personal Net Worth (Scarborough Systems)	28	37
Curtin, Bob	Homework (Sierra)	28	59
Curtin, Bob	Super-Text (Muse)	28	60
Curtin, Bob	Writer's Tool (OSS)	28	62
Valenza, Keith	Smoothwriter (Digital Deli)	28	65
Leyenberger, Arthur	Citywriter (Software City)	28	66
Panak, Steve	Spelunker (Broderbund)	28	86
Panak, Steve	Cutthroats (Infocom)	28	87
Panak, Steve	Galactic Adventures (SSI)	28	88
Panak, Steve	Quest of the Space Beagle (Avalon Hill)	28	89
Panak, Steve	S.S. Achilles (Beyond Challenging)	28	90
Griffin, B.E., M.D.	Math Magic (Blackmagic)	29	9
Griffin, B.E., M.D.	Math Mileage (CBS)	29	10
Griffin, B.E., M.D.	Playful Professor (Screenplay)	29	11
Berube, Ray	Suspect (Infocom)	29	47
Leyenberger, Arthur	Software Movies: Visualizer (Maximus)	29	89
Griffin, B.E., M.D.	Tink's Adventure (Mindcape)	30	14
Griffin, B.E., M.D.	Tuk Goes to Town (Mindcape)	30	16
Hauptert, Russell	US Doubler (ICD)	30	54
Wieggers, Karl E.	Tax Command (Practical Programs)	30	66
Panak, Steve	Realm of Impossibility (Electronic Arts)	30	69
Panak, Steve	The Scrolls of Abaddon (Access)	30	70
Panak, Steve	Beach-Head (Access)	30	70
Panak, Steve	Spy vs. Spy (First Star)	30	71
Panak, Steve	Serpent's Star (Broderbund)	30	71
Curtin, Bob	Enhancements to BASIC (First Byte)	30	82
Haney, Jim	Astra 1620 (Astra Systems)	31	39

PRODUCT REVIEWS *continued*

AUTHOR	TITLE OF ARTICLE	ISSUE	PAGE
Panak, Steve	Stealth (Broderbund)	31	67
Panak, Steve	Bounty Bob Strikes Back (Big Five)	31	68
Panak, Steve	Conan (Datasoft)	31	68
Griffin, B.E., M.D.	Agent USA (Scholastic Wizware)	32	11
Oldfield, Frederick D.	Magniprint II (Alpha Systems)	32	13
Curtin, Bob	War in Russia (SSI)	32	68
Mumford, Randy	Dragonriders of Pern (Epyx)	32	91
Griffin, B.E., M.D.	Movie Musical Madness (CBS)	33	17
Griffin, B.E., M.D.	Coco-Notes (CBS)	33	18
Griffin, B.E., M.D.	Halftime Battlin' Bands (CBS)	33	18
Griffin, B.E., M.D.	Bank Street Music Writer (Mindscape)	33	19
Patchett, Craig	Midimate & Miditrack (Hybrid Arts)	33	26
Panak, Steve	Moon Patrol (Atari)	33	51
Panak, Steve	Trolls and Tribulations (Creative)	33	52
Panak, Steve	Blue Max 2001 (Synapse)	33	52
Panak, Steve	Dallas Quest (Datasoft)	33	53
Panak, Steve	Zone Ranger (Activision)	33	53
Hudson, Tom	Mince (Mark of the Unicorn)	33	55
Leyenberger, Arthur	Rescue on Fractalus & Ballblazer (Lucasfilm/Epyx)	33	81
Griffin, B.E., M.D.	Astro-Grover (CBS)	34	12
Griffin, B.E., M.D.	Letter-Go-Round (CBS)	34	12
Panak, Steve	Ghostbusters (Activision)	34	51
Panak, Steve	Ghost Chaser (Artworx)	34	52
Panak, Steve	Mr. Do (Datasoft)	34	52
Griffin, B.E., M.D.	Dr. Seuss Fix Up the Mix Up Puzzler (CBS)	35	13
Griffin, B.E., M.D.	Timemasters (Natural Software Solutions)	35	14
Panak, Steve	Sargon II (Hayden)	35	18
Panak, Steve	Chess (Parker Brothers)	35	19
Panak, Steve	Chess (Odesta)	35	19
Panak, Steve	Dig Dug (Datasoft)	35	21
Panak, Steve	Spy Hunter (Sega)	35	22
Weaver, Mark	Megafont II (Xlent)	35	30
Van Leeuwen, Jim	SG-10 Printer (Star Micronics)	35	32
Kennedy, A.J., Jr.	Home Accountant (Continental)	35	33
Leyenberger, Arthur	Computer Eyes (Digital Vision)	35	53
Opitz, Robert	1027 Printer (Atari)	35	59
Griffin, B.E., M.D.	PQ-The Party Quiz Game (Suncom)	36	13
Griffin, B.E., M.D.	Trivia Quest (Royal)	36	14
Griffin, B.E., M.D.	Trivia Mania (Xlent)	36	15
Eddy, Andy	Reviews from the Bargain Bin	36	17
Panak, Steve	Hitchhiker's Guide to the Galaxy & Wishbringer (Infocom)	36	23
Panak, Steve	Space Shuttle (Activision)	36	24
Panak, Steve	The Halley Project (Mindscape)	36	25
Panak, Steve	Colossus Chess 3.0 (English)	36	27
Leyenberger, Arthur	Express (Mirage Concepts)	36	31
Kelley, Patrick J.	Combat Chess (Avalon Hill)	36	63
Bank, Monte	Hex (Mark of the Unicorn)	36	65
Bachand, Charles	Powerstar (Pandora)	36	87

PROGRAMS — DISK UTILITIES

AUTHOR	TITLE OF ARTICLE	ISSUE	PAGE
Halman, Sait	Disk Miser	17	39
Banks, Gordon	AlterDOS	20	57
Luce, Robert	XL-DOS	24	51
Chan, Roland S.	Extending Your DOS Directory	27	31
Lord, Walter D.	MicroDOS XL	28	16
Albrecht, Bob	MaxiCopy	29	25
Altman, Philip	Revive: A Disk File Recovery Utility	29	55
Jones, Matthew	Access III	32	15
Moore, Rich	C:COM	33	57
Hollinger, James G.	Resident DOS 2.0 Mod.	34	49

PROGRAMS — EDUCATION

AUTHOR	TITLE OF ARTICLE	ISSUE	PAGE
Linson, Larry W.	What Is It?	20	51
Rybczyk, Ed	Spelling SAM	22	13

Nocella, Larry	Spanish Study Guide	22	21
Miller, Manny	Math Attack	22	23
Murphy, Steven T.	Word Scramble	22	52
Abell, William, Jr.	Typing Evaluator	22	60
Moncada, F.R.	Mathman	22	85
Rybczyk, Ed	The Reading Program	22	91
Groll, Stephen D.	Word Adventure	27	52
Ratcliff, Matthew	Lazer Type	31	51
Filskov, Alfred H., III	Multiple Choice Vocabulary Quiz	34	15
Linson, Larry W.	Dragon's Breath	34	39
Clark, David L.	Number Catch	34	81

PROGRAMS — ENTERTAINMENT

AUTHOR	TITLE OF ARTICLE	ISSUE	PAGE
Willard, Bruce	Knights and Chalice	15	74
Robson, Gordon	Bricklayer's Nightmare	15	110
Fox, Dennis	Shooting Stars	16	87
Bachand/Hudson	Planetary Defense	17	83
Moriarty, Brian	Crash Dive!	18	44
Comeau, Mark	Munch'In Climb'In	18	84
Thomits, Lew	Battle in the B-Ring	19	35
Raffel, Glen	Siege	19	84
Karp, David	Buzz-zap!	20	29
Peacock/Hudson	Bacterion!	20	35
Bennett, Tommy	Avalanche	21	35
Comeau, Mark	Spy Plane	21	75
Hearin, Larry G.	Micro-Puzzler	22	34
Sheck, Scott	Air Attack	22	39
Murphy, Donald P.	Money Hungry	22	63
Hanke, John	Climber	23	24
Peacock/Hudson	Fire Bug	23	39
Peacock, Kyle	Bopotron!	24	33
Peacock, Kyle	Bopotron Construction Set	24	63
Bachand, Charles	Race in Space	24	72
Plotkin, David	Reckless Racer	25	34
Bohlke, David	Androton	25	40
Schulze, Randy	Miner Jack	25	73
Sloatman, M. and K.	Popcorn	26	27
Kormos, Charles	Robot Raid	26	81
Hudson, Tom	Adventure at Vandenberg A.F.B.	27	73
Bullok, Dan	Demon Birds	28	42
Tatge, Conrad	TwoGun	28	73
Simms, Neil	Cascade	28	80
Walnum, Clayton	Dragonlord	29	38
Butler, David H.	Basic Burger	30	35
Price, Mark	Boulder Bombers	30	56
Stortz, Mike	R.O.T.O.	31	25
Coulson, Michael J.	Lunar Patrol	31	41
Guber, Sol	Color the Shapes	32	35
Roey, Phil	Cosmic Defender	32	41
Burgess, Philip	Supereversion	32	70
Snyder, Jon	Syntron	33	39
Caprilli, Fred	Elevator Repairman	34	73
Peck, Greg	Hide and Seek	35	23
Hague, James	Bonk	35	67
Plotkin, David	Sneak Attack	36	33
Price, Mark	Maze War	36	39
Rosko, Chuck	Rafferty Run	36	71
Walnum, Clayton	Nightshade	36	78

PROGRAMS — GRAPHICS

AUTHOR	TITLE OF ARTICLE	ISSUE	PAGE
Patchett, Craig	Stars 3-D	16	16
Newdome, Thomas P.	Bar Chart Subroutine	16	30
Budgell, Peter	Graphics 10/7 Painter	16	48
Hudson, Tom	Solid States	16	119
Hudson, Tom	Solid States Revisited	19	93
Glover, Donald E.	Stars 3-D in Action!	20	82
Hodge, Ron	Scredit	20	92
Miller, Robert E.	Graph E's	21	59
Hudson, Tom	Son of Solid States	22	79
Sheck, Scott	P/M Creator/Animator	23	33

PROGRAMS *continued*

AUTHOR	TITLE OF ARTICLE	ISSUE	PAGE
Mikowski, Michael & Bernard	Magic Palette	26	52
Brenner, Jeff	Atari Graphics Overlay	26	67
Gluck, Joel	PuLse in Action!	26	79
Bader, David	Z-Plotter	30	46
Potter, Graham L.	Two-Fifty-Six	30	85
Comeau, Mark	ATASCII Animation	31	80
Guber, Sol	LOGO Demos	36	67

PROGRAMS — PROGRAMMING AIDS

AUTHOR	TITLE OF ARTICLE	ISSUE	PAGE
Fine, Bob	BASIC Cassette Recovery	15	18
Howard, Steven	Alternative Keyboard Handler	15	96
Mohos, Istvan & Hudson, Tom	C:CHECK/D:CHECK	16	20
Erceg, Vince	Create-A-Font	16	72
McCaa, S.J., Jr.	Fast Repeat Key	16	112
Kalagher, Richard	Binary File Menu Loader	17	32
Hudson, Tom	H:BUG	18	78
Wiley, Sam	Auto Line Renumbering	20	59
Garringer, E.K.	Create-A-Font Datamaker	22	57
Hudson, Tom	Graphics 8 Character Generator	23	57
Hudson, Tom	BOFFO!	24	58
Hudson, Tom	Unicheck	24	90
Gartner, Doron	No More Key Click	25	77
Prokopchuk, Steve	Adding BASIC Function Keys	25	87
Giambra, Angelo	Instant Renumberer	27	18
Mastel, Vern L.	Screenmaker	27	36
Prokopchuk, Steve	English Error Messages in BASIC	27	49
Alexander, Ken	RAM Operating System for Atari XLs	29	22
Giambra, Angelo	B-Line	29	73
Walters, Chet	BASIC AUTORUN.SYS File	30	11
Hudson, Tom	Unicheck - Version 2	31	13
Altman, Philip	V: A Memory Storage Device	31	71
Giambra, Angelo	BASIC Bug Exterminator	33	20

PROGRAMS — MISCELLANEOUS

AUTHOR	TITLE OF ARTICLE	ISSUE	PAGE
Collier, Ken	Music Synthesizer	15	83

White, Jerry	XLDEMO	16	84
Hill, Norman	File 'em	18	97
Loniewski, Edward	Super Sine	19	30
Bachand, Charles	The Saturday Night Special	19	54
Hudson, Tom	Touch-Tone Dialer	19	57
Bachand, Charles	Default	19	81
Mastel, Vern L.	ConTEXT	20	72
Plotkin, David	Bounce in Action!	20	86
Browne, Richard J.	Proset	21	28
Hudson, Tom	Touch-Tone Dialer Update	21	28
Ratcliff, Matthew	Matt * Edit	21	51
Plotkin, David	The ANALOG Card File	21	83
Ferguson, John C.	The Fergee File Printer	21	95
Boegelein, Bill	Balldrop	22	18
Carmody, John	Sound FX	22	72
Hudson, Tom	A No-Frills Alternate Cursor	23	15
Bohlike, David	Minicomp	23	29
Amidon, Kenneth & Underwood, Wayne	Dark Horse	23	65
Constan, Randolph	Circuit Database	24	39
Johnson, Harold	Cassette Compressor	24	55
Newman, Steven B.	Weather Forecaster	25	30
Buckheit, Jonathan	Numeric Keypad	27	13
Gluck, Joel	More Fun with Bounce! (in Action!)	27	43
Walnum, Clayton	Microcheck	27	81
Krohn, Amy H.	Monthly Mortgage Calculator	28	26
Walnum, Clayton	Microcheck - Part 2	28	49
Giambra, Angelo	RAMCHECK	29	30
Cherf, Donny	Extended Calculations	29	30
Schmidt, Marty	Loan Shark	30	76
Gautney, Wayne	Personal Planning Calendar	31	57
Buckheit, Jonathan	Atari Clock	31	74
Giambra, Angelo	Home-made Translator	32	28
Welker, C.D.	AtariWriter Printer Driver	32	76
Rosko, Chuck	Note Master	33	28
Wieggers, Karl E.	Assemble Some Sound - Part 1	33	83
Wieggers, Karl E.	Assemble Some Sound - Part 2	34	25
Torborg, Ron	Musorqa	34	89
Johnson, Charles F.	G: A Printing Device for Epson/ Gemini Printers	35	81
Leigh, Jason	Turtle 1020	35	88

Stocking Stuffers *continued from page 32*

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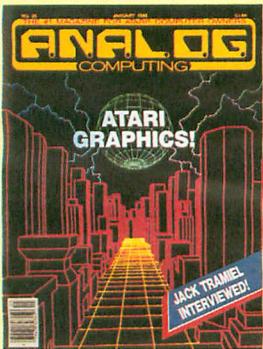
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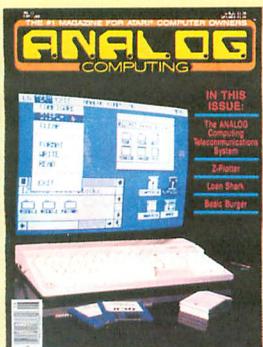
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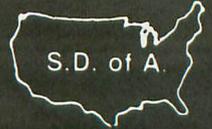
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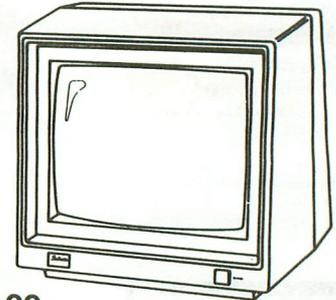
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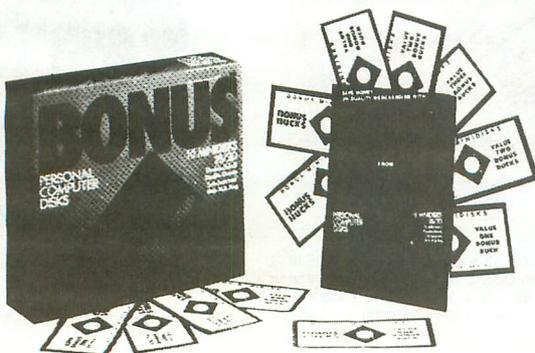
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INDEX TO ADVERTISERS



READER SERVICE #	ADVERTISER	PAGE #	READER SERVICE #	ADVERTISER	PAGE #
124	Abby's Discount	48	122	Gizmoz	46
121	Advanced Interface Devices	41	151	G.T. Enterprises	95
150	Advan Language Designs	95	133	Happy Computers/B&C	66
143	Allen Macroware	88	145	HSU Software	89
101	Alpha Systems	5	140	ICD/Spartan	IBC
132	American TV	64	112	InSoft	24
—	ANALOG Publishing	IFC,	116	Integrated Computer Equipment	34
141	Applied Computer Assoc	82	148	Intra-Tech	94
108	Astra Systems	15	119	Kyan Software	39
136	At-A-Glance	71, 98	154	Lycu Computers	100
107	Atari Corp.	OBC	125	Megamex	50
144	Athena Software	89	115	Micro League Sports Assoc	28
152	Big Ben Games	98	109	MichTron	17
128	Big L	54, 55	127	Migraph	52
135	CAL COM	71	155	Misty Mountain Software	102
113	Centurian Enterprises	25	102	New Horizons Software	6
129	Compu-Club	57	158	Pandora Software, Inc.	106
110	Computability	19, 97	149	Pickled Software	94
105	Computer Creations	12	130	Protecto	58, 59, 60, 61
164	Computer Eyes	114	163	Puget Sound	114
111	Computer Games Plus	21	—	Senecom	82
147	Computer Mail Order	92	146	Serious Software	89
138	Computer Palace/Royal Software	76	162	Softview Concepts	114
117	Consumer Electronics Store	67	161	Software Discounters	114, 115
120	COVOX	40	156	Southern Software	102
123	D.M.I. Services	46	131	SST	64
126	Draper Software	50	114	Supra Corp	26
118	Eclipse Software	37	137	TNT Computing	75
159	Electronic One	107	134	Turbo 4th	67
157	Elfin Magic	102	153	Wedgwood Rentals	98
103	End-Users-Group	7	139	White House Computers	79
104	Games Computers Play	8	106	Xlent Software	13

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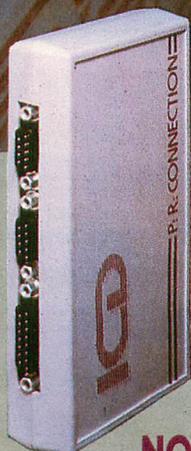
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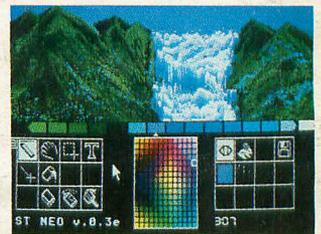
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