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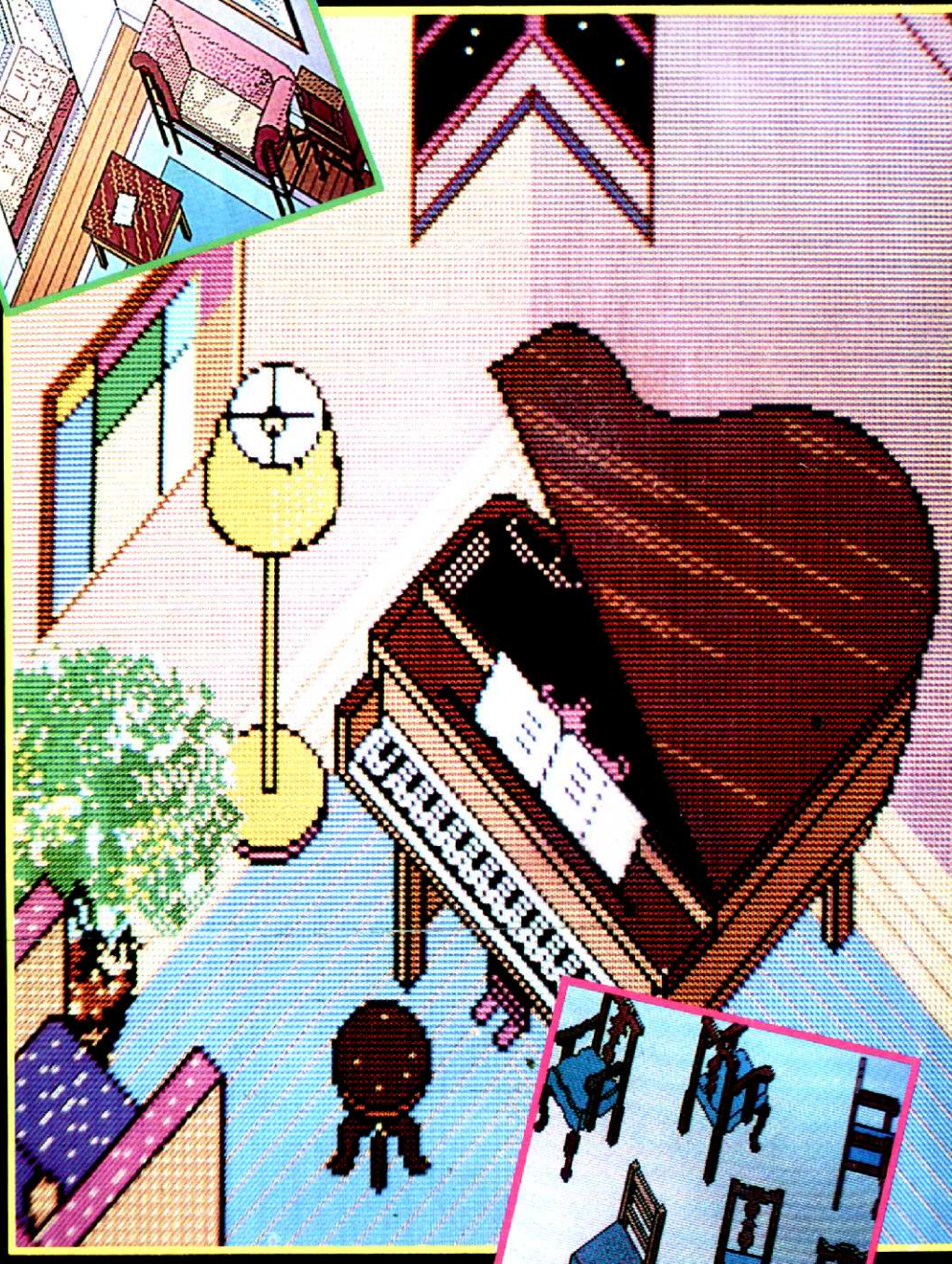

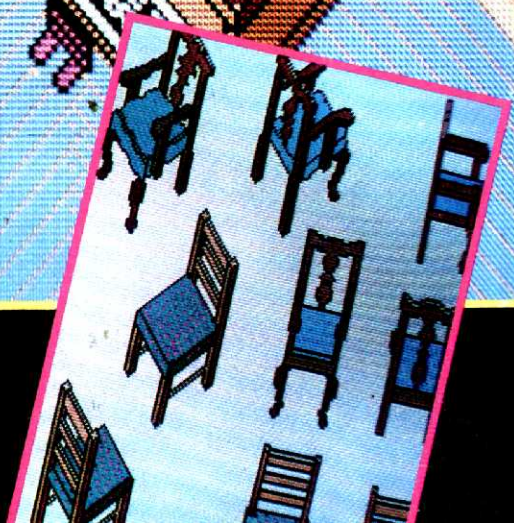

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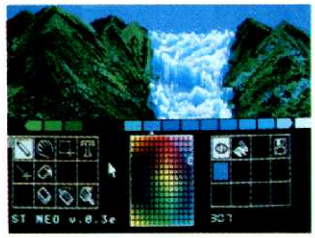

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WINTER 1986

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ATARI EXPLORER is published by Atari (U.S.) Corp., 1196 Borregas Ave., Sunnyvale, CA 94086. Third class postage paid at Chicago, IL. Copyright 1985, Atari Corp.

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For subscription and advertising information call (408) 745-4204.

Subscription: $15 for 6 issues (one year); $39.95 for 18 issues (3 years). For subscription or address changes, please write: Subscription Department, ATARI EXPLORER, Atari Corp., P.O. Box 3427, Sunnyvale, CA 94088-3427. Please submit articles to Editor, ATARI EXPLORER, Atari Corp., 1196 Borregas Ave., Sunnyvale, CA 94086.

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THIS MONTH'S COVER

The striking interior illustrations on the cover of this Atari Explorer are taken from 3D Interiors, a series of indoor scenes that will be marketed for ST computers by Atari Corp. Used with the free Atari paint program, NEOchrome, the pictures allow you to rearrange rooms with many different combinations of furnishings.

INPUT/OUTPUT

The Many Uses . . .

When I wandered into our elementary school's computer room looking for literature to assist me in one of my many computer projects, the computer aide mentioned having read an article in *Atari Explorer* about the many unusual uses to which Atari computers have been put and suggested that I submit my projects to you also. I laughed at the thought that my utilization of my Atari was in any way unique and I promptly dismissed the idea. Later that day or, perhaps, in another day, I found the idea popping into my thoughts unbidden. One project after another began throwing itself to the front of my thoughts despite the fact that I repeatedly tried to ignore them. As if it would force the interruptions to stop, I began to make a list of every use to which I have put my computer recently. The process of putting it to paper revealed that my much-maligned Atari has been supporting a multitude of organizations and people in this town (and others). It has been weaving a web of support which has touched everywhere in the community and, in fact, has stuck tight in some places such that it seems to be indispensable to some groups now, occasionally causing volunteer jobs to stick tight to me, too.

The first use to which I was anxious to apply our Atari after we purchased it was to assist me in maintaining the membership records of the Arboretum across the street from me. Prior to the arrival of the computer, I was hand addressing correspondence to 700 members every month or two months in addition to a card file which was carried everywhere that that membership information was needed. When I saw *Mailing List* on sale quite a while before I had a printer, I picked it up knowing that one day the printer would do all that addressing for me. It was a glorious day when I entered the last name to disk and wandered off to work around the house as the printer did my work for me. With the purchase of *Print Shop*, I ran off headers for the Arboretum's school newsletter and fed the paper back into the printer to use AtariWriter for the text of the newsletter. We use *Print Shop* now, too, to prepare flyers to be distributed around town or hung at the door to announce upcoming special programs at the Arboretum.

As soon as I began using *Mailing List*, I found myriad uses at home and unexpected requests for its services. I immediately used it to enter our name and address (10 identical records) for our return address labels which I had hitherto been ordering from a nearby paper supply store. I also entered the names of my son's postal chess opponents and his return labels for his convenience in replying to moves. Of course, the Christmas card list is on disk now, too. The unexpected request came when the program was put into a campaign for a Student Council office of Treasurer. We couldn't run off enough "Phil for Treasurer" labels for the student population at the Junior High, although it wasn't the slogan that was so desirable, actually it was the little Gumby figure that we drew on each one. The labels were on books and clothing everywhere, though. We ran off a large banner to announce "Phil for Treasurer" as the school gave permission to hang one in the hall. Phil won, by the way!

The most rewarding use of my Atari and my dependable triad of programs has been with young children. It has helped the Girl Scouts earn their computer badge and each girl got a letterhead with her name and a design of her choosing. I used it all to prepare lessons for English and Math classes for the following day when I volunteered as computer teacher for a while. Most special was the young blind, deaf boy who wouldn't leave the Atari when I brought it when I substituted for the teacher in his class. His nose literally touched the keyboard as he tried to see the keys and he touched the screen with his nose as he tried to see if his answers were correct. His attentiveness to the computer (the first he had ever seen, apparently) astounded us all because of the great strain that his handicaps imposed upon his use of the machine. Last week I was asked to tutor another special child on Bank Street Writer and that was how I came to be in the computer room where this all began.

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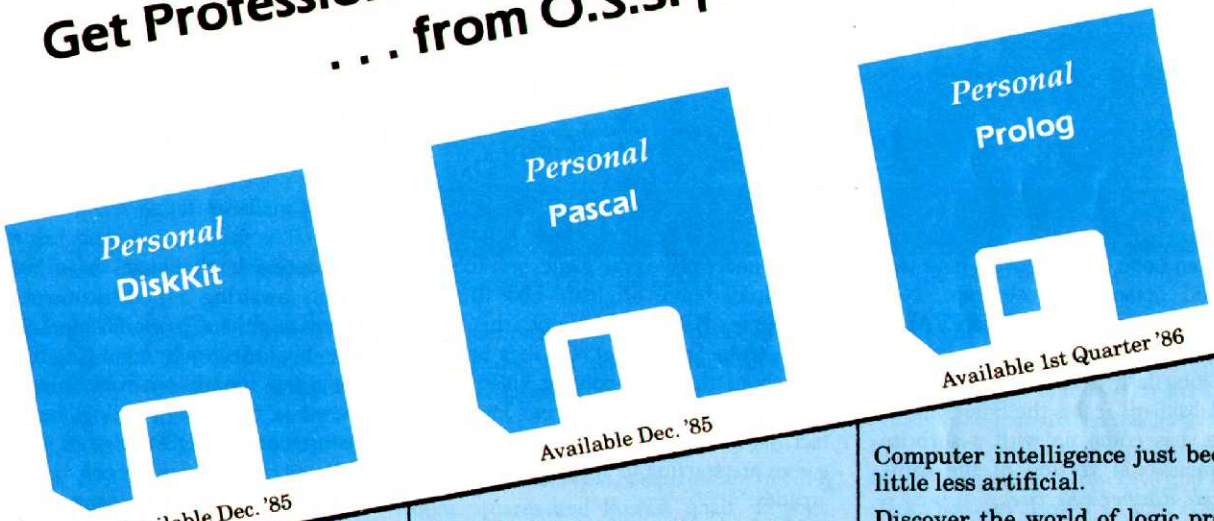

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Lode Runner's Rescue and Championship Lode Runner

Reviewed by David Duberman

Atarian Lode Runner lovers have two good reasons to celebrate. Not only is Broderbund Software's Atari translation of *Championship Lode Runner* now, at long last, available, but Broderbund's subsidiary across the Bay, Synapse Software, has come up with a surprise three-dimensional version of the game called *Lode Runner's Rescue*.

If you know Lode Runner, and many do, you don't need much of an introduction to Championship Lode Runner. If you've never played the game, best to start with Broderbund's original—Lode Runner, of course. Believe it or not, this little game from San Rafael, CA has become just about the most popular video game of all time in, of all places, Japan! In fact, Japanese Lode Runner coin-operated games are starting to appear in American arcades.

No doubt those of you who have actually completed all 150 of the first Lode Runner screens as well as a number of custom-made challenges have been anxiously awaiting a Lode Runner fix for many months. Championship Lode Runner should keep your conniving mind busy for a few months—it took this inept reviewer a full day of trying, on and off, before completing the first of the 50 extremely challenging screens.

Lode Runner's Rescue

In case you're not familiar with the game, here's a brief description. Each screen of Lode Runner consists of a framework of structural elements which you climb around picking up gold chests while being chased by from two to five deadly Bungeling (the prototype Broderbund villains) guards. If you're touched by a guard or otherwise killed (sometimes you must "commit suicide" to get out of an impossible situation), you restart the screen from the beginning with one less man (you start with five). Once you collect all the gold chests in a screen, a ladder appears giving you access to the next level.

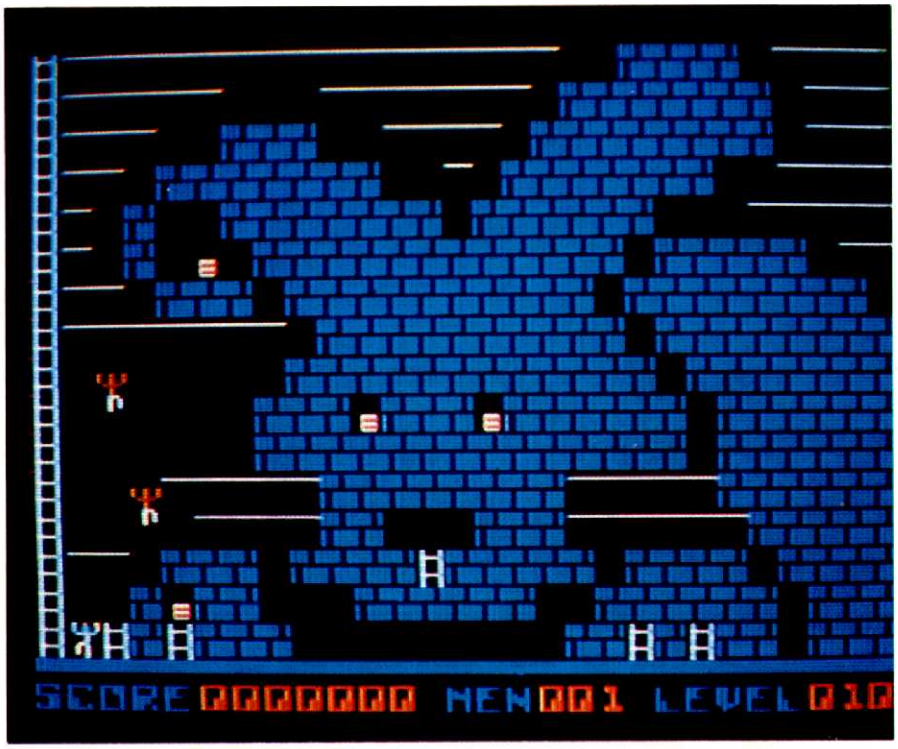
Unlike Lode Runner, Championship Lode Runner has no screen editor—thus you may not "cheat" and play any screen of the 50. You must progress one screen at a time. However, there is a convenient "Save Game" feature, so that once you've completed a screen, you need not repeat it unless you want to.

As the manual says, these are some of "the most intricate and challenging treasury rooms ever designed." If you complete all 50, you receive a password, which you

can send to Broderbund for a Championship Lode Runner Champion Certificate. A hint book is available from Broderbund for $9.95.

Lode Runner is compelling and fascinating, like a purely visual adventure game. Strategy is as important an element in solving the screens, if not more so, than speed and timing. After many frustrated attempts at a screen, followed by a brief break from the computer, you find yourself thinking of new ways to conquer the latest stumbling block. Championship Lode Runner is a challenge not to be overlooked by those who like to use their brains.

No doubt inspired by the original Atari arcade classic, Crystal Castles, talented young programmer Josh Scholar has not only provided us with an entertaining combination that might alternatively have been called "Crystal Lode" or some such, but has also given us an excellent game editor with which to create our own disks full of original 3D mazes to confound and delight our friends.



Championship Lode Runner

Lode Runner's Rescue presents its many intricate mazes in three-dimensional perspective from a 45-degree overhead view, much like that in Crystal Castles or Q*Bert. In fact, like Q*Bert, it's recommended that you rotate your joystick 45 degrees clockwise for more accurate control of your player. To win the game, Lode Runner's daughter must rescue her father from the clutches of the evil Bungeling empire by retrieving all of the many keys strewn throughout all 46 mazes.

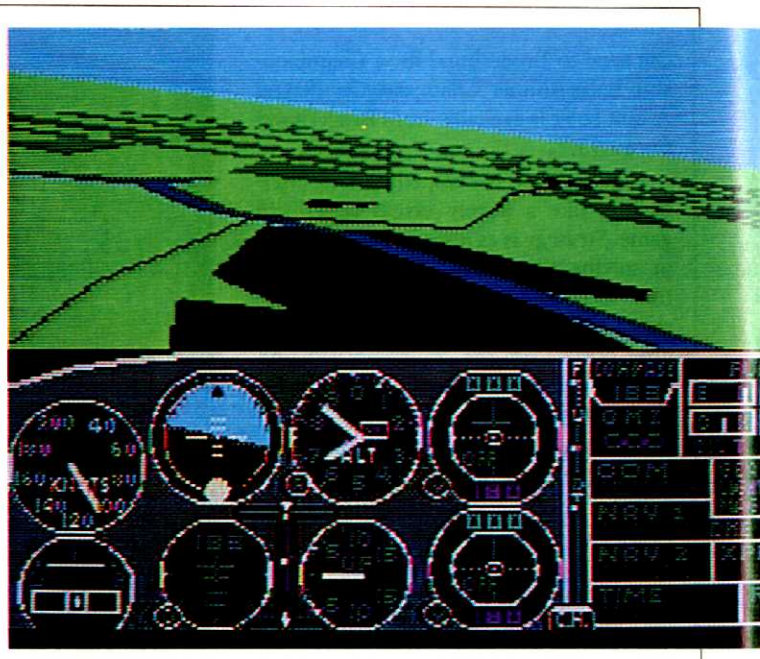
Each screen consists of a number of squares of any height between four steps below ground level and 27 steps above. Your player can jump up and down to a limited extent, but long falls are fatal. Each square fulfills a particular function: plain squares do nothing and elevator squares rise and fall constantly, giving you access to different levels of the maze. Trapdoor squares act as hidden traps, while water squares let you swim (guards don't), and act as cushions for long jumps. Each water square flows in a particular direction which you can set, and against which you cannot swim. Similarly, you set a direction for each guard's starting square—there may be as many as four guards per screen. Since guards follow you anywhere except into water, you sometimes must limit their movement, which you can do with decision squares that contain directional instructions. You can also set a "no decision" square, which tells the guard to continue in the direction he is going if he can. This is one sophisticated game editor!

Other special types of squares are mushroom squares and Restart goals. If you eat a mushroom you grow to double size for a few moments with a corresponding increase in jumping power, in order to reach otherwise inaccessible portions of the maze. Mushrooms are replenished automatically. Once you touch a Restart goal, the next time you lose a life you're returned to that square instead of your starting point, which can mean a considerable time advantage. Unlike Lode Runner, the prizes you've picked up don't reappear when you lose a life. For an additional challenge, a cat can roam each maze, evading your grasp—catch it, if you can, for an extra life. Meanwhile, however, the bonus timer counts down to zero. You can set the starting amount and countdown speed.

If it sounds like I've been describing the game and the game editor simultaneously, that's because they're so well integrated. You can go back and forth between the two with two keystrokes. It's easy to see that Josh put a tremendous amount of work into this program, and it paid off. Little touches like allowing you to "save" the height of the square you're on, then "recall" it to any other square you move to, aid creation of new screens tremendously. The icon-driven design system allows you to design an entire screen simply by using the four arrow keys and the joystick. You can also set all four colors and brightnesses for each screen, or restore default colors. Screen editor commands not previously mentioned include save and load screen, and move entire screen to upper or lower right, upper or lower left, and up or down. There are also separate commands to clear the screen of height settings and of square types. By setting a Lode Runner square in the final screen, you can create an entire original Lode Runner's Rescue sequence to share with others—it'll be great to see disks of new game sequences passed around the prolific Atari User Groups.

Which to buy? If you're a diehard Lode Runner expert, pick up Championship Lode Runner without delay, then move on to Lode Runner's Rescue for variety. If you're a Crystal Castles fan, or found the original Lode Runner a bit too challenging, you'll probably find Lode Runner's Rescue to be loads of fun.

Broderbund/Synapse Software, 17 Paul Drive, San Rafael, CA 94903



Taking Off

Flight Simulators for the Atari

by Arnie Katz & Bill Kunkel

For most of us, flying is a highly theoretical concept. Humans have no natural aerodynamic appendages (i.e., wings) and very few of us ever actually pilot a plane, skydive or hang-glide. The closest most people come to the romance of flight is a seat in coach on a 767.

Perhaps it is the inaccessibility of flight which has caused it to obsess mankind since the dawn of the species. From Icarus to Orville Wright to the X-15, the idea of taking wing and heading off into the wild blue yonder has exerted a powerful influence.

Given this all-consuming fascination, why is it that so few actually kiss the sky? We lack the grit, the Right Stuff, the desire so great it obliterates trepidation. Much as we'd love to streak through the stratosphere, unshackled from that most unyielding of laws, gravity, the dictates of "good sense" keep us Earthbound.

Enter the flight simulator.

Now, with the help of a home computer, users can finally get their aspirations off the ground and vicariously experience the realities of flight.

For many years, simulators have helped train people to drive cars, pilot helicopters and command submarines. The advent of computer technology has advanced the art of simulation exponentially. As a result, today's real-life pilots earn their bones almost exclusively inside computerized cockpits. Mainframes can instantly generate appropriate city-to-city scenarios and situations at any time of the day or night.

In California, a 727 training simulator which was idle during the evening hours has been transformed into an adult entertainment. At approximately $100 an hour, armchair aviators get a brief training session and an hour of flight time in which they are free to taxi, take off, crash into buildings and otherwise amuse themselves.

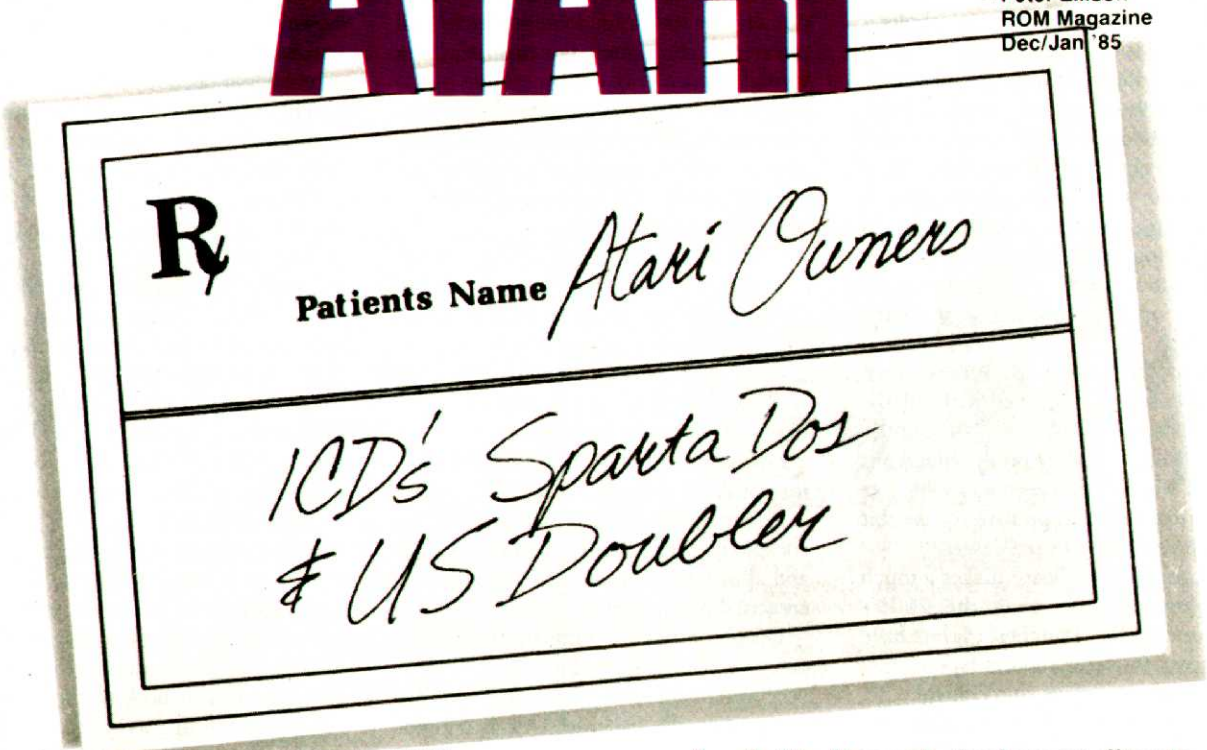
Today's more powerful microcomputers have brought simulators into the home. Their success has been phenomenal. During much of 1984, flight simulator programs dominated the top ten sales charts.

Flight simulators differ from traditional flying games in several respects. The most obvious area of divergence is in the player's point of view. Games such as Defender (Atari), Protector (Synapse), and Aquatron (Sierra) offer the player control of a ship seen from the side. In Zaxxon (Datasoft), Blue Max (Synapse) and Blue Max 2001 (Synapse) a three-quarter perspective is employed. Stealth (Broderbund) uses the on-screen ship as a sighting cursor. Flak (Funsoft) utilizes an overhead vantage point.

But in a true flight simulator, the player is not an external force, manipulating an on-screen ship like some computerized deity. Instead, these programs put the video pilot right into the cockpit. The first-person graphics let the player see the control panel and whatever is outside the

"IT ADDS NEW LIFE TO THE ATARI"

– Peter Ellison
ROM Magazine
Dec/Jan '85



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window, just as though he or she were actually at the throttle.

The first flight simulators for home computers were mostly space games, such as Star Raiders (Atari), in which players piloted a mythical starship of considerable power. Oddly enough, as the technological capacity of microcomputers grew, users became much more interested in entering the cockpits of realistic aircraft. So flight simulators came down to Earth—slowly but surely.

The first big step came with Steve Kitchen's Space Shuttle—A Journey Into Space (Activision, 1984/Cartridge).

Perhaps the most incredible thing about this program is that it was originally created for the Atari 2600 videogame system. Flying in the face of orthodoxy, Kitchen scrapped the joystick-oriented pyrotechnics of videogames of the time. Instead, he opted for an extremely realistic treatment of the subject.

Kitchen's ability to use every input device and toggle on the 2600 was a wonderful design performance. However, it didn't obscure the obvious fact that Space Shuttle was better suited to the computer.

The Atari computer translation is just as challenging as the original, but is easier to play. Unfortunately, the graphics are remained virtually unchanged from the videogame.

Based on the actual spacecraft, Space Shuttle presents the player with all the challenges a pilot would face. The Shuttle must be launched, attain orbit, rendezvous and dock with a troublesome satellite, select re-entry path and prepare for deorbit burn before landing in the desert.

The computer keyboard makes a much better control panel than the 2600's "reset" and "color" switches. Players have total access to status reports (speed, fuel gauges, etc.), as well as ship control.

Much of the enjoyment of flight simulators involves the romance of hitting the button that opens the cargo bay, lowers the landing gear or ignites the engine. Space Shuttle in computer format exploits this element much more successfully than the earlier version.

Space Shuttle offers several play modes. There is an autopilot version in which the computer handles virtually all the navigation and piloting chores. In another, the player handles everything, but the computer intervenes in case of dire emergency. When the armchair astronaut finally feels secure enough to go it alone, he can jettison the training wheels and go for it. But don't be in *too* much of a rush. Just manipulating the three axis controls (X is forward/reverse; Y is left/right; and Z is vertical miles from Earth) will require lots of practice.

The display screen consists of the craft's window, a pair of horizontal gauges and axis grids. As mentioned earlier, the graphic presentation is somewhat stiff and blocklike, but Space Shuttle does visually portray a great many different environments, from deep space to the desert. The graphics may not be state-of-the-art, but when balanced against this program's virtues this becomes a less serious complaint.

Among the visual highlights is the burn-off sequence, which the gamer views through the cockpit's front windows as a series of silver-white ignitions. This scene is further enhanced by a momentary blackout of the status readouts—players will swear they can smell the insulator tiles frying!

Just like the videogame edition, the computer edition of Space Shuttle broke new ground in terms of exploring the possible range of what constitutes computerized entertainment.

The idea of simulation-as-fun was further explored by Bruce Artwick in his classic Flight Simulator, an extremely realistic program for the personal computer marketplace. Spurred by its success, Artwick decided to bring his creation to the computer masses and designed Flight Simulator II (SubLogic, 1984/48K disk) for the Atari systems.

Flight Simulator II puts players in the cockpit of a Piper 181 Cherokee Archer and allows them to do virtually anything an actual pilot could do in that craft.

Documentation is vital in this type of program, and Flight Simulator II does very well in this area. Two handbooks are enclosed in the package. One is a flight manual and the other ("Flight Physics & Aircraft Control") provides background and insight into aerodynamics. There is also a handy-dandy reference card which contains all the keyboard commands at a glance and detailed chart maps of Chicago, Boston/New York, Los Angeles and Seattle (these are the four scenery areas which include some 80 individual airports).

Flight itself is a bit more complicated. Fortunately, there is a demo mode available in which the computer does the flying while leaving the user access to all the command and view-keys. But even before flight is mastered, the user can still control the environment—the weather, time of day and destination are all programmable elements.

As with everything else in this program, the graphics may not represent the ultimate in hi-res chic, but there is plenty to see! Artwick even takes a shot at producing real geographical landmarks such as the Hancock Tower and the Statue of Liberty (pre-renovation). No one will ever mistake these visuals for laserdisk. In light of the ambitious nature of the program as a whole, however, Artwick can be forgiven if his reach exceeded his grasp—we're lucky he bothered to reach at all.

Of course, in this mode, Flight Simulator II is hardly a "game" at all. It is a pure simulation which strives only for realism. There is a secondary program, however, which takes the lessons the silicon Smilin' Jack has learned and puts them to good, old-fashioned, destructive use.

The "World War I Ace" scenario is so good it would certainly have been a success even if SubLogic had released it alone. Of course, it utilizes much of the programming from the main mode, but it streamlines the play mechanic, limits the flying space and mounts a machine gun in your cockpit. (There's even a lovely bit of cheating in that Artwick makes radar available to your circa 1917 biplane.)

In this simulation, players haul their crates into the European skies. They cruise over a river and then select from among the seven possible targets (fuel depots, landing strips, factories, etc.). You can be nice and declare war before crossing the river, but if not, the enemy is only too happy to do it for you once the first bomb lands. The enemy, of course, has planes, too, so the player must drop the explosives and beat it back to the base for refueling and repairs as quickly as possible.

The presence of the WWI scenario on Flight Simulator II comes to grips with the problem most pure simulators face: now that it's simulated, what do I do with it?

The most popular answer, so far, has been to send it to war.

F-15 Strike Eagle (MicroProse/48K disk) represents the most successful combat simulation to date, putting the player in the cockpit of a real engine of destruction, the supersonic jet fighter.

First off, joystick control tremendously simplifies the entire question of flying.

Using this hand control for climbs, dives and rolls frees up the keyboard for less pedestrian functions—like arming missiles, guns and bombs. This is not to say that there aren't plenty of high-tech gizmos on board. Pilots can jam incoming SAMs with a Chaff Dispenser, or fire flares to confuse the heat-sensing mechanisms, and the computer will plot the straightest course to any target at the flick of a button.

F-15 offers seven missions, to such storied locales as Libya ("Eat high-technology lead, Khadafi!"), Haiphong harbor and the Persian Gulf. The excellent documentation provides full military scenarios for each of these rather apocalyptic jaunts, which mitigates the sameness of the missions.

The graphics are acceptable, but do not represent the level of design skill the rest of the program demonstrates. The top of the playfield represents the front cockpit windshield, while the bottom of the screen contains a map of the target area, radarscope (three intensities) and a diagram of the F-15 displaying all available weapons. The icons used to represent airfields, primary targets and SAM launch centers are pretty primitive stuff, mostly X's and squares. Similarly, the ground targets consist of simply line drawings.

Although several of the scenarios ostensibly take place at night, there is no true night-battle visual mode. The sky simply reddens slightly, creating the impression of late afternoon, perhaps dusk. This is really unfortunate, since night scenes don't require the same level of graphic sophistication as daylight drawings, but provide great visual contrast nonetheless.

Finally, the designers fudged the landing phase. That is, there isn't any. When the pilot brings the jet close enough to the runway or the aircraft carrier, the computer assumes the set-down was successful. Obviously this was done in order to avoid the necessary graphics such a landing would require. Again, this is a real shame.

All that said, F-15 is still a very good game, tremendously exciting in the manner of the best combat contests; fleshed out with the realism generated by a top simulator. Its greatest virtue is clearly its non-stop playability, by as many as two players simultaneously (one handles the joystick, the other mans the keyboard).

For the immediate future, combat simulations look to dominate the scene. The next major entry into the simulation sweepstakes is that crafty veteran Bruce Artwick. SubLogic is preparing to release Jet, a program promising the realism of the Flight Simulator series and the excitement of the best air-combat software.

Looking into the more distant future, simulators should get bigger and better as computing power grows. As long as mankind can build machines that fly, you can bet that somewhere there's a designer preparing to simulate it.

Activision, PO Box 7287, Mountain View, CA 94039; SubLogic Corporation, 713 Edgebrook Drive, Champaign, IL 61820; MicroProse Software, 120 Lakefront Drive, Hunt Valley, MD 21030.

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New Products for Atari 400/800/XL/XE Computers

In response to numerous requests, Broderbund Software has announced The Print Shop Graphics Library, Disk 3. Like previous such disks, it provides 120 additional designs, symbols, and pictures in six categories—Christmas, Business, International Symbols, Myth & Fantasy, Seasons, and Animals. For further information on The Print Shop, see the review in this issue of the Atari Explorer. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101.

★ ★ ★

Zork from Infocom is without a doubt the most popular text adventure for microcomputers of all time. While Infocom has only released Zork I, II, and III, some aficionados believe the more recent Enchanter and Sorcerer actually to be Zork IV and V. Infocom remains steadfast in regarding these as a separate series, and indeed they have just announced the final part of the trilogy—Spellbreaker. Containing the most complicated puzzles in the Enchanter series, its resolution ties together the three stories in the trilogy. Author Dave Lebling, an Infocom pioneer, allows the player to add to the game's vocabulary for a unique touch. Spellbreaker will be available for all Atari computers, including the 520ST. Infocom, 125 Cambridge Park Drive, Cambridge, MA 02140.

★ ★ ★

First Star Software has announced the sequel to their best-selling Spy Vs. Spy computer game, called Spy Vs. Spy II: The Island Caper. The new game features the two spies in search of buried missile parts on an exotic tropical island. As in the original, a simultaneous split-screen display is used, allowing two players to observe each other's activities though they may be in different locations. First Star Software, 18 East 41st Street, New York, NY 10017.

★ ★ ★

Strategic Simulations Inc. has announced the release of three new software products for Atari 400/800/XL/XE Computers. Battalion Commander is a real time action strategy war game on the beginner/intermediate skill level. Battle of Antietam is a tactical recreation of the historic Civil War battle of September 17, 1862. U.S.A.A.F. (United States Army Air Force) is a simulation of the daylight bombing of German industry from 1943 to 1945. Strategic Simulations, 883 Stierlin Road, Bldg. A-200, Mountain View, CA 94043-1983.

★ ★ ★

Enthusiasts of greyhound racing ought to be aware of The Greyhound Racing Analysis Package, available on cassette or diskette for Atari 400/800/XL/XE Computers for $29.95. It allows handicapping of greyhound races using past performance information taken from the racing program. There is also an enhanced version with extra features for $49.95. Software Exchange, 2681 Peterboro Road, PO Box 5382, West Bloomfield, MI 48033.

★ ★ ★

Broderbund/Synapse announces the release of Atari 400/800/XL/XE versions of the first three titles in their popular Electronic Novels series of text adventures. Atari versions require two disk drives. The first, Mindwheel, gives you the chance to save Earth from self-destruction by traveling through the minds of four deceased world-movers. Essex involves you in an intergalactic search and rescue mission to prevent the destruction of the universe. Brimstone places you in a phantasmagorical medieval underworld in search of the five words that will enable your escape. Synapse/Broderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101.

★ ★ ★

Microprose Software announces the "Great American Learn to Fly a Real Airplane" contest in cooperation with the Cessna Aircraft Company. Each box of their software, including the programs F-15 Strike Eagle, Solo Flight, and Kennedy Approach, includes a discount coupon allowing the purchaser to take a Cessna "Discovery Flight," including the opportunity to actually fly an airplane, for $20. Additionally, by entering the contest you can win a complete flying course or several other prizes. Microprose, 120 Lakefront Drive, Hunt Valley, MD 21030.

★ ★ ★

SourceView Press has announced that it will publish several new microcomputer-related publications in the near future. Software Developers Monthly is targeted to programmers who are developing software for the commercial marketplace. 68000 Computing is a new magazine for users of the Motorola 68000 microprocessor chip used in the Atari 520ST. Also, the Journal of Software Evaluation: Review & Rating will use responses from all readers for evaluating new software. In addition, the magazine will feature discount coupons that must be honored by its advertisers. The SourceView Corporation, PO Box 578, Concord, CA 94522.

Bank Street MusicWriter

Reviewed by Joyce Worley

There's a little music in all people, yet most of us need some help to turn the songs in our hearts into listenable melodies. Now the process is easier, thanks to some high-tech help from the computer.

Bank Street MusicWriter is a powerful tool for Atari users. It unveils the mysteries of music composition, and provides would-be tunesmiths with muscles to create their own symphonies. Even hopeful harpists who've never strummed a chord can originate an opus, using MusicWriter. But MusicWriter delivers the most fun to composers who can read music; it pyramids a little knowledge so computerists can create complicated four-part compositions otherwise far beyond their capabilities.

The MusicWriter composer arranges notes on a pair of on-screen staffs, using the arrow keys to move a cursor to where the next note, rest, bar line or key signature is to be entered. The name of the note thus selected is displayed at the top of the screen; pressing P sounds that tone. Notes are written onto the staff by pressing a number key corresponding to the length of the note chosen. A whole note is number 1, half note is 2, and so forth up to 32nd notes. Rests are entered similarly, by pressing R and a number to indicate the duration of the pause.

Entering notes by this method is fairly laborious. First move the cursor to the correct spot, watch the pitch indicator for the name of the tone, sound the tone to be sure it's the one desired, then enter the length of note to be written onto the staff. Of course, if the computerist knows music theory, the process is simpler, since there's less testing to make sure the note selected sounds right. But it's a far cry from stroking the old ivorys, and play-by-ear musicians might find these mechanics frustrating.

Yet the system pays dividends, since it allows more leeway in timing and rhythms than simple keyboard tapping permits. There are six note lengths and the same number of rests available. The cursor pinpoints exactly where a pause or a new tone should appear to make the composition sound just right.

Using the note-by-note system, you can compose four separate voices; soprano, alto, tenor and bass, then put them all together. There are five octaves available, so the musician can tickle the digital keyboard through a wide range of tones. You can also write notes stem up or down, use accidental notes, and dotted notes for more subtle timing. Even tied notes, slurs, and triplets are available to dress up the tempo. The program also raises and lowers the volume of music (forte or piano) according to the composer's instructions.

MusicWriter uses word processing techniques such as cut and paste to move sections of the composition from one place to another, or to repeat music without reentering it. Sections can be inserted in new spots, or deleted from the song. Music can be copied, either from one location to another within the same voice, or from one voice to another, or from one location to all voices (to create a barbershop quartet of notes).

The MusicWriter keeps the piece on time, checking the number of beats per measure, and alerting the composer to add or delete any extras.

There are options for varying the sound of the music, the staffs and even the way the music scrolls. By altering the nature of the notes, using six tone-shaping options, the result can sound like different instruments.

Compositions written on Bank Street MusicWriter can be saved to disk or printed out sheet-music style. During playback, each voice can be played separately or combined. It's easy to follow what is being played since each note is highlighted in its own color on the screen as it sounds. Tempo is speeded or slowed during playback with the touch of a key.

MusicWriter comes with several songs on disk, to show what the program can do. These are great fun to play back, and should serve as inspiration to musical hopefuls.

MusicWriter is a versatile tool that provides would-be composers with everything they need to create a masterpiece. The Atari is capable of producing great sounds, and this program certainly does unleash them. On the other hand, it's not as easy to use as some other music programs. The pitch indicator used to show the name of the note being entered is a good idea, but this isn't too helpful unless you have perfect pitch and can hear the sound in your mind just from seeing the name. Therefore, almost every note has to be verified before entry—an extra, time-consuming move that could have been avoided if the note automatically sounded when it was entered. It's also time-consuming to have to choose the length of note for each tone. It would have accomplished the same thing if the composer only had to choose the length once, and each note entered stayed the same until the composer chose to vary the tempo.

But Bank Street MusicWriter, despite its flaws, is a solid winner. The well-written manual guides novices step-by-step through the composition process. Working through the tutorial will teach the computerist a great deal about musical theory, and leave would-be composers ready to make beautiful music.

Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062, 48K disk, $49.95.

Computereyes

Reviewed by Bob Cockroft

Computereyes is a new video acquisition system by Digital Vision that enables an Atari 800, 800XL, 65XE, or 130XE computer to capture real-world images from any standard video source. It uses an innovative slowscan device that connects between the video source and your Atari computer. With the assistance of a controlling program, images are transferred through this device to a high-resolution display. Computereyes can capture images in Graphics 8 for high resolution or in Graphics 7.5 with 4 intensity levels. In addition, the images produced in Graphics 7.5 mode are compatible with the popular graphics tablet programs, most notably Micro Illustrator. Computereyes is warranted to be free of manufacturing defects for one year and can be purchased from Digital Vision for the relatively low price of $129.95.

The Package

The Computereyes package consists of 3 components: the Interface Module, an optional black and white video camera, and the controlling Executive program.

The Interface Module is a hardware device that connects your computer with the video source. It is a small black box with two cables with nine-pin "D" connectors similar to those used for joysticks. These connectors plug into the joystick ports on your computer. On the front of the Interface Module are two dials. The first one of these controls the synchronization between your system and the video source, while the second controls the brightness of the captured image. On the back of the Interface Module is an RCA-type phono jack similar to the one used to connect the computer into the television adapter. The plug is used to connect your system to a video source. How this is done depends on the kind of video source you are using. Computereyes can interface into any source of standard NTSC or industrial video. (A CCIR/PAL model is also available.) Potential sources include:

- Video tape recorders, including home VCRs
- Video cameras—B/W or color
- Videodisks
- TV receivers with video outputs
- Other computers

If you have one, the most cost-effective way to capture images is to use your own videotape recorder. These recorders are fitted universally with some kind of video output connector. Most of the time this connector is labeled Video Out. Unfortunately, a coaxial cable is required to connect the Video Out with the RCA-type phono jack on the Interface Module. I say "unfortunately" because the Computereyes package does not include this cable. Although this may be inconvenient, a coaxial cable can be purchased at most stereo retailers and at some stores that deal in electronics. (Editor's note: Many newer VCRs use a standard RCA-type phono jack for the Video Out connector, allowing you to use any RCA-male-to-RCA-male cable.)

In order to use Computereyes, the video source must produce a still image for at least 6 seconds. In other words, a videotape recorder must either display a constant image (which is not usually the case), or be halted with the pause button. Unfortunately, many older VCRs "blank out" the screen when the pause button is pressed. Under these circumstances, Computereyes has no image to capture.

For those users who do not have access to video equipment, a Computereyes package is available that includes a B/W video camera. This camera includes 10 feet of coaxial cable and appropriate connectors. As a result, the camera can be connected directly into the Interface Module for immediate use. This system costs $399.95.

The Executive is a menu-driven, user-oriented program that allows you to access all the capabilities of Computereyes. It enables you to acquire high-contrast and grey-scale images, store them on disk, and later reload them. Although most of the Executive program is written in BASIC, it uses machine language subroutines to capture images. Because this program is not copy-protected, back-up copies can easily be made. Interestingly, the Executive program is not "auto-booted" from disk when the computer is switched on. In fact, you have to RUN the Executive program from the keyboard. Although this system may seem unnecessary and perhaps even "old fashioned," it does allow disk space not used by the Executive program to be available for other purposes.

The Executive program allows images to be acquired through 5 different techniques. They are Normal capture, four-level capture, eight-level capture, high-level capture, and low-level capture. Normal capture causes the acquired image to be displayed on a Graphics 8 screen. This process takes about 6 seconds. The four-level capture is similar to the Normal capture, except that the image contains four grey levels. The image that is produced by this technique is actually the result of the merger of four high-contrast images taken at different thresholds. This process takes about 25 seconds. The eight-level capture is similar to the four-level capture, except that with this technique, an image containing eight grey levels is formed. As a result, gradation appears smoother. This process takes about 50 seconds. The high-contrast capture allows an acquired image to be displayed on a Graphics 7.5 screen. Although Graphics 7.5 has lower resolution than Graphics 8, the process can produce more pleasing results, depending on viewer taste, of course. This process takes about eighteen seconds. The low-contrast capture is identical to the high-contrast capture, except that it produces an image that has a lower amount of contrast. (Editor's note: We were recently informed of the availability of a new $11 program from the Computereyes people that digitizes an image in Graphics 9 using sixteen grey levels for extremely realistic results. We have not reviewed this program.)

Digital Vision, Inc., 14 Oak Street, Suite 2, Needham, MA 02192, (617) 444-9040.

Desktop Publishing and You

by David Duberman

Desktop publishing is the latest buzzword in the computer industry. Thanks to new sophisticated software and the proliferation of printers capable of printing graphics, personal typesetting is becoming a reality very quickly. Using the latest tools, just about anyone can quickly and easily put together striking, professional-looking newsletters, posters, letterheads, and much much more that would have required expensive professional equipment and highly trained graphic artists only a few years ago. Two excellent such programs available now for Atari 400, 800, XL and XE Computers (at least 48K memory required) are Broderbund's *The Print Shop* and XLEnt Software's *Typesetter.* Both are extremely versatile, but the two are otherwise markedly different from each other.

When Broderbund decided to publish The Print Shop, they discovered a gold mine—it is arguably the best-selling non-game program of all time in the home computing marketplace, with good reason. The Print Shop finally gives people something *useful* they can do with their computers. It enables just about anyone to easily design and print greeting cards, signs, letterheads, banners, and more. You can decorate any of these with small graphic symbols called icons, a good selection of which come with the program. In addition, The Print Shop includes an editor that lets you design your own icons. These charming little pictures have the attraction of rubber stamps, and Atari User Groups have begun swapping disks full of them Broderbund has also released two disks full of professional-looking icons—120 each—called Print Shop Graphics Library.

Much of The Print Shop's popularity undoubtedly stems from its extreme ease of use. The program is almost 100% menu-driven, and use of the menus couldn't be easier. Simply move the on-screen cursor up and down between the menu items with the corresponding arrow keys, and press Return to make your choice. In most cases a different representative picture accompanies each menu item as it is highlighted. You can press the [Esc] key any time to back up a menu.

Main menu choices include Greeting Card, Sign, Letterhead, Banner, Screen Magic (kaleidoscope), Graphic Editor, and Setup. Greeting Card lets you design two message areas, each with its own text, icons, and border, that print out on a sheet of 8½ x 11-inch paper so that you can fold it in four to create a greeting card. The Print Shop program comes with some colored tractor-feed paper for more attractive cards. A sign contains a single large border, message, and icon. For a message area in a sign or card, you first select a border from a choice of ten (including no border), while a sample border on the screen represents the current selection. You can then choose a decorative icon by picture or by number, and determine its size and arrangement on the page, all graphically represented in the menus. Next you choose one of the eight attractive fonts (text styles), or no font. Finally, if you wish, enter a message into the friendliest little text editor I've ever seen. Since most text of this nature is centered, you start off in this mode (it's fascinating to see the text center itself as you type it in!), but you can make each line left or right-justified as well. Text on each line can be solid, outlined, or shadowed (3D), and standard or double-sized. You needn't even center your text vertically—the program will do it for you!

The other Print Shop menu items are equally easy to use. Letterheads let you print different messages and icons in different arrangements at the top and bottom of your stationery. The Banners option obsoletes the old-fashioned way of forming big letters out of lots of little ones—these banners are fancy, with a choice of eight different custom fonts. And designing your own icons is simplicity itself.

Everything about The Print Shop indicates the obviously painstaking effort that went into making the product as easy to use as possible. This is "human engineering" at its finest. The program does much more than we have room to cover in

The Print Shop

this review, and no Atari owner with a graphics printer should be without it. By the way, an extremely broad range of printer drivers is built in, including just about anything (dot-matrix) you can connect to an Atari computer. Sadly, the Atari 1025 is not supported, as it cannot print graphics.

One minor limitation of The Print Shop is its lack of resolution. Since the resolution of the basic Print Shop document is somewhat lower than that which most printers can use on a standard-sized page, the pixels must be enlarged in the printout, resulting in a somewhat blocky-looking final product. It's a small price to pay for Print Shop's fantastic versatility and ease of use, though. If you prefer to go to a bit more trouble in order to take advantage of your printer's full resolution, read on.

Enter Typesetter from XLEnt Software for the ultimate in printer control. By scrolling around a "virtual" screen approximately the "size" of an 8½ x 11" piece of paper with a Graphics 6 window, you control almost every dot on the printed page, something impossible for some much more expensive computers. One important fact you should know right up front is that Typesetter is one of the very first programs to take advantage of the extra memory in the new Atari 130 XE computer—the enhanced version offers both increased graphics resolution and additional features. With the 48/64K version your page is 704 dots (88 columns) wide by 624 dots (78 rows) high, while the 128K version allows a maximum resolution of 768 by 672 dots (96 columns by 84 rows). Both versions come on a single disk in the $34.95 package. Printers supported include Epson and compatibles, NEC Prowriter and compatibles, and Gemini.

If you've ever used a spreadsheet program such as VisiCalc or SynCalc, you have a pretty good idea of what using Typesetter is like. Think of your monitor screen as a window that only shows a small part of a large piece of paper that slides around underneath. You can enter text from the keyboard in various widths and heights anywhere on the page—you're not limited by the usual row and column restrictions, because the text is actually a graphic. You scroll around to different parts of the page with the Control and cursor keys. Rows of disks immediately above and below the window graphically indicate your relative horizontal position on the page, and you also get a numerical row-and-column readout.

Other text-related functions include shifting the entire page up and down a scan line at a time, and left and right by column or pixel increments. You can rotate characters by 90, 180, or 270 degrees, and type in any of the four compass directions. These are useful for creating folded greeting cards and vertical borders. Unfortunately, many commands are in the form of non-mnemonic Control key combinations, mandating many a return trip to the manual. I suppose an ideal first project would be to create a stylized quick reference sheet. Enhancements in the 130 XE version include letting you work on half of the page at a time, requiring less manual cursor movement around the larger page. You can "italicize" or slant from 1 to 21 rows of existing text, and type with horizontal slices taken out of characters for a nice effect. Another enhancement permits insertion and deletion of columns at the cursor position for greater control over layout of your page. This version also lets you clear the current half-page or fill it with a single character. You must clear a 48/64K page a (visible) screen at a time.

Although both versions offer all input/output functions, the 130XE Typesetter uses a handy menu for functions such as loading and saving screens and loading fonts, Graphics 7+ and 8 picture files, and Page Designer screens, while the 48/64K version forces you to use hard-to-remember Control key combinations. You can load 62-sector picture files single width (about half a Typesetter page wide) or double-width. A utility program for translating compressed files from programs such as Micro Illustrator or Atari Artist comes with Typesetter.

For aid in the layout of pages, we recommend use of Page Designer, another XLEnt program that lets you see half of the page at a time, making it ideal for initial layout of Typesetter pages. A Page Designer page consists of two vertically arranged Graphics 8 screens. Page Designer lets you type on the screen with a number of interesting supplied fonts, draw with a joystick, and print your pages. Files from this program can also be loaded in normal (40-column) or double-width.

Text width and height in Typesetter can be set independently from one to eight times normal, but larger sizes look blocky because you're simply enlarging the standard Atari eight-by-eight character set. You can not only type in the standard font or a custom font loaded from disk, but also using the ATASCII Graphics Characters and also a special decorative font that's

ideal for all kinds of fancy borders and effects. You can "sculpt" larger characters by entering Typesetter's Sketch Pad, which must be loaded from the program disk. Sketch Pad lets you draw freehand with a joystick (or KoalaPad or Atari Graphics Tablet with the 130XE version), and use commands to draw circles, spheres, lines, and fills. From this separate screen you can access the main page, scroll to any point with the cursor, then transfer your graphic to the page. For smoothing out rough or blocky edges you can also transfer the visible window to the drawing page, work on it, then move it back again. In effect, the Sketch Pad is a "rubber stamp" onto the Typesetter page, with the additional capability of picking up images from that page. When you're ready to print, you first select a printer, then a print format. Choices are: vertical full height, which fills a sheet of paper; vertical half height, for full resolution; and horizontal full height, which fills a sheet of paper sideways. Vertical half height gives the best results, but you must print two Typesetter pages to fill up a sheet of printer paper. Fortunately, alignment is automatic—there is no paper advance before or after printing.

Typesetter is truly a software gem, cleverly conceived and professionally executed. It makes excellent use of the Atari's special graphics features and proves there's lots of life left in the eight-bit computers—all it takes is some imagination and hard programming work, both of which the folks at XLEnt have shown plenty of throughout the years. If you work on your User Group's newsletter, or have ever envied a friend's MacPaint/MacWrite combination, you can't afford to be without Typesetter. If you don't have a compatible printer, get one—and start setting type!

As this review was being completed, Linda Barnes of XLEnt Software rushed us a preliminary version of Rubber Stamp, a collection of utility programs that adds tremendous graphics processing power to Typesetter. The first utility is the most powerful. It divides a screen 5/6 the size of a full-size Graphics 8 screen into four quadrants, each exactly the size (in pixels) of the Typesetter Sketch Pad screen. The amount of control you have over this quadrant is incredible—you can coarse (column) scroll each pad separately to the right with wrap-around, fine (pixel) scroll 1 and 2 down and 3 and 4 up, fine scroll the whole screen in the four compass directions, and much more. There are *many* text and drawing functions, including the ability to draw circles that actually print out as circles from Typesetter—its own circles tend to look like ovals. Especially nice is the ability to load a full-screen Graphics 7+/8 image and shrink it to Sketch Pad size, although you do lose 1/6 of the image on the bottom. Of course, you can save and load each quadrant separately, and you can even mark off the quadrants with a mask created with Player/Missile Graphics.

There is also a text editor of sorts that lets you use a special 16-by-16 pixel font, and a font editor to create character sets for the editor. This has a lot of potential for highly stylized text, although it is limited by the fact that you can only type on a single Graphics 8-size screen—320 pixels across by 192 vertically. However, it lets you type in *proportional* mode. The final program is a utility that converts Print Shop icons into Typesetter icons—they turn out to be about 2/3 the size of the standard-size Typesetter icon. All three of these programs are well designed and, incidentally, were written in the terrific Action! programming language from Optimized Systems Software, Inc.

Finally, two gentlemen by the name of Johnny Masuda and Ira Brickman offer disks full of helpful material, mostly icons. Johnny's consist of professionally drawn pictures of just about every Atari computer and peripheral ever made, plus military, alphabet, and international icons. One of Ira's disks, called the Layout disk, contains a Typesetter page-size layout grid for both the 48/64K and the 128K versions. The grid is bordered by numbers indicating each row and column position, allowing extremely precise text and picture layout on the printed page. This is an essential tool for newsletter editors, etc., and at $9.95—such a deal! And it's accompanied by some very useful instructions—actually an addendum to the Typesetter manual.

Broderbund Software, 17 Paul Drive, San Rafael, CA 94903
XLEnt Software, PO Box 5228, Springfield, VA 22150

ATARI U.S.A.

VOLUME 1 ISSUE 2 DEMONSTRATION SAMPLE ONLY FOR TYPESETTER & GR. LIBRARY VOL.1 FALL, 1985

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Inside This Issue

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XLENT SOFTWARE'S NEW TYPESETTER A HIT !!!

TYPESETTER is generating tremendous user interest. This is no surprise since the program creates hi-res hardcopy, like this newsletter, with as little as 48K. It is only available for ATARI computers. From New York to California, users' groups are are focusing on TYPESETTER at September & October meetings. (CONTINUED ON PAGE 6)

PIRATE BBS'S UNDER FEDERAL SCRUTINY

Federal officials announced investigations into more than three dozen BBS's in seven states. Theft of software and illegal distribution across state lines. The F.B.I. crackdown began in July with arrests in New York suburbs. A spokesperson refused to reveal the locations of current efforts (CONTINUED ON PAGE 3)

FROM THE EDITOR'S DISK

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Typesetter

ATARIWRITER PLUS AND PAPERCLIP

I marvelled at its functional elegance and simplicity—the way it got the job done without over-complication, fuss, or mystery.

Word processing has become an important topic in our lives. Certainly almost everyone has heard the term, yet the topic may seem complex to the uninitiated. Actually, using a word processor is much like driving a stickshift auto: once you've mastered the routine, the routine becomes automatic.

For an excellent overview of the world of word processing with ATARI Computers, see Arthur Leyenberger's article, "Throw Out the White Out" (ATARI Explorer, Summer 85).

This review concerns a couple of excellent new word processing programs for the ATARI 400, 800, and XL/XE Computers—AtariWriter Plus (from Atari Corp.) and PaperClip (from Batteries Included).

Remembering AtariWriter

AtariWriter was the first word processor for a microcomputer that I used on a regular basis. Since then I've seen and used many—both those designed for ATARI Computers, as well as many of the oft highly touted programs for other computers (programs with venerable names like WordStar and MacWrite).

As my knowledge and sophistication in the field increased, so too did my appreciation of AtariWriter grow. I marvelled at its functional elegance and simplicity—the way it got the job done without over-complication, fuss, or mystery. Given the constraints of 6502 8-bit computing, the program has performed admirably.

And so it was with some trepidation that I received the news that Atari had embarked on a new and improved version of the old standard. ("Why," I asked myself, "tinker with a perfectly satisfactory product?" and secretly wished them bad luck.) Alas, the powers of programming and commerce have rolled on in spite of my small protestations, and now the long-awaited replacement for AtariWriter is upon us. Let's check it out.

Son of AtariWriter—AtariWriter Plus

The motivation behind the development of AtariWriter Plus was to come up with a word processing program that more or less duplicated the features of its predecessor, but then went on to add other, more powerful features. I am happy to report that the programmers at Atari have indeed accomplished this feat.

One difference between the new and the old is that AtariWriter Plus is a disk-based program, whereas AtariWriter was cartridge-based. Atari went to the disk format for an important reason, as John Skruch, AtariWriter Plus Product Manager, told me recently: "We wanted to offer a more advanced word-processing program, yet at the same time provide the consumer with a low-priced package. Cartridge-based programs are much more expensive to produce. Moving to the disk format allowed us to keep the price down and at the same time deliver the customer a more powerful program."

130XE: AtariWriter Plus is the first

by J. D. Basovski

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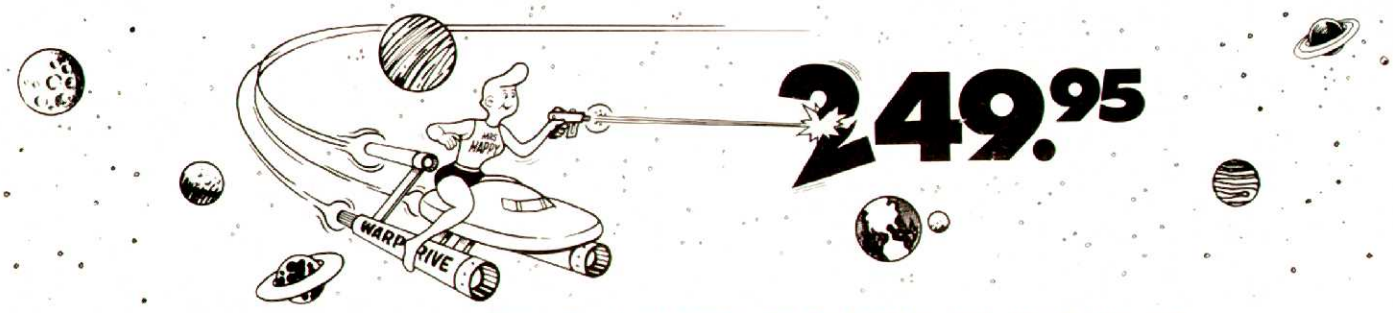

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Those familiar with AtariWriter can walk right into AtariWriter Plus with little need for an adjustment in thinking or habit.

word-processing program designed to exploit the new ATARI 130XE Computer's expanded memory. According to Skruch, enabling the program to successfully mine the 130XE's wealth of memory was a top priority: "We wanted to come up with a program that makes use of the additional RAM. People using computers are more sophisticated these days. They know they've got the memory; they know what it means to have it; they're going to want to use it."

The 130XE version of AtariWriter Plus provides three "banks" of edit space. Each bank can hold something over 15K of text, for a total of over 47K of memory available for any given file (that's about 31 pages, double spaced—fairly impressive). Switching from one bank to the next is a single keystroke away. And when loading a long file, the program automatically divides the file evenly into all three banks.

Both the 130XE version and the 64K version of the program are included in the package on either side of the program diskette. While the 64K version will run on a 130XE, the 130XE version cannot of course run on a 64K machine.

ATARI Proofreader: Perhaps the most impressive new addition is ATARI Proofreader, which checks the words you process for spelling errors. The integration of the Proofreader program with AtariWriter Plus affords you an extremely powerful measure of word-processing capability not found, to my knowledge, in any comparably-priced word-processing program. And because Proofreader uses the same command format as AtariWriter Plus, the program is quite easy to learn and use.

Proofreader is included on the AtariWriter Plus program diskette, appearing as a main menu option. When you want to proofread a text file, you simply choose the Verify Spelling main menu option to load the Proofreader program.

Drawing on a dictionary of over 36,000 words, Proofreader checks the spelling of virtually every word in your AtariWriter Plus text files. You have full control over this "electronic dictionary," including the ability to look up the proper spelling of any word right on your screen.

In addition, Proofreader lets you create your own "personal dictionary" of words that don't appear in Proofreader's basic dictionary—for example, foreign words, legal or medical terms, brand names, proper names, or other expressions that you may have occasion to use in your writing.

With Proofreader you can either highlight errors on screen, providing an overview of the errors in a file; or you can print the errors in a file, as each is highlighted on screen; or you can correct the errors in a file, again as each is highlighted and the program pauses for your correction or decision to keep a given spelling not recognized by the program.

Proofreader is just that—a *proofreader,* not an *editor.* So it can't tell you if you've used a word out of context or if your phrasing is ungrammatical. Nor will it correct your spelling for capitalization. In other words, it won't tell you to write *loose* instead of *lose*, *Florida* instead of *florida*, or *none is* instead of *none are.* Still, it's an extraordinary tool for those who, like me, despise typos, but who, like me, make their share.

ATARI Mail Merge: AtariWriter Plus also includes ATARI Mail Merge, a program that allows you to create customized data bases that contain such data as names, addresses, and other information, then merge these elements into an AtariWriter Plus text file. The Mail Merge program, like Proofreader, is included on the program diskette, appearing as a main menu option.

A Mail Merge data base file is simply a series of records that share a common format. For example, the record format that comes with the program allows you to create an electronic address book. Once names and addresses are entered, you can then merge those records into a text file to produce, for instance, form letters.

In addition, Mail Merge allows you to index, or build a subset, of those records within a file that you wish for some reason or another to separate off from the whole. For example, you may wish to send form letters only to those people whose last names begin with A through J within a given data base. You simply define those parameters and Mail Merge will build that subset from the file.

My one complaint about Mail Merge is that at first blush it strikes one as being somewhat technical, potentially frightening off those less technically inclined. However, working with the program for a time should soon dispel the initial fear. Another problem is that from within Mail Merge one cannot print a subset, obviously a prospectively useful option (but I hear the programmers at Atari are working on that problem).

Some Other Additions and Differences

Compatibility: Those familiar with AtariWriter can walk right into AtariWriter Plus with little need for an adjustment in thinking or habit. AtariWriter files are "converted" to AtariWriter Plus files once loaded and AtariWriter's print formatting line is deleted. Though the two programs use virtually the same print formatting commands and default formatting values, AtariWriter Plus' print formatting parameters now appear on a separate Global Format screen, which you call up from the main menu. Thus there is no need for the old AtariWriter print formatting line at the top of a text file.

The Global Format screen itself adds a

few formatting options which AtariWriter otherwise required to be separately inserted into a text file (like the margin values for double-column printing, page wait, and starting page number). This is certainly a substantial improvement.

AtariWriter Plus' search and replace function works somewhat differently, requiring a few more keystrokes. The search function is case-insensitive, which means that the search phrase will be found whether or not it contains capital letters. AtariWriter Plus also adds a reverse search function, allowing you to search a word or phrase from any point in the file back through to the beginning of the file.

Another impressive new feature is AtariWriter Plus' variable column edit mode. This allows you to increase or decrease the number of characters displayed across one screen line before the program wraps a word to the next line. Your computer, of course, cannot display more than 40 columns at a time. But if you ask for more than 40 columns to be displayed, the program scrolls the display horizontally as you type. This means that you can set the program to display precisely the number of columns you'll be using when you print your work, which is great for setting up tabular matter.

A couple of other nifty additions are an alphabetize function and the ability to count the number of words in a file. The program can automatically alphabetize any list of words or phrases—great for compiling indexes and bibliographies, for instance. The word-count function will relieve many a student and author's anxiety when required to provide a certain number of words of text.

AtariWriter Plus also foregoes, in most cases, the failsafe of having to confirm every user response with a [Return] (for example, after typing Y or N). This seems to me to have been a poor idea, if only because the habit of automatically pressing [Return] is a particularly stubborn one to break (at least it has been for me). However, it does theoretically speed up matters in eliminating a keystroke, and I suppose there is something to be said for that.

DOS: AtariWriter Plus is compatible with DOS 2.OS and the new DOS 2.5. DOS 2.5 is included with the program, although you cannot access DOS from AtariWriter Plus. As a result, you no longer need DOS files on your data diskette—valuable sectors you once had to reserve for DOS files are now free to hold more text.

And because it includes DOS 2.5, the program automatically formats a data diskette in enhanced-density, if a 1050 Disk Drive is being used; otherwise the format is single-density.

AtariWriter Plus is available now from your ATARI Computer retailer. Package includes: program diskette, (130XE and 64K versions), dictionary diskette, quick reference card, and Owner's Manual. Suggested retail price: $49.95.

PaperClip

The PaperClip word processor is quite a program. It's simply packed with sophisticated, easy-to-use features, and it looks great. However, the version that I received for review had one major flaw, which I must reveal at the outset: if you type with any speed at all you'll make an unjustified and incredible number of typos—PaperClip's screen display simply can't keep up. It can't keep up even with, like me, the worst sort of hunt-and-pecker.

(In all fairness, I should mention that late in the review process I received an updated version of the program which corrects the screen-speed difficulty. The new version I received is 1.1A. Be sure you get it, or a later version, but *not* version 1.0. A 130XE version is also promised, but the review copy I received would not boot up.)

When compared toe-to-toe, that is, feature-for-feature, PaperClip might very well strike one as the better program. Of course, it costs about $10.00 more than AtariWriter Plus. But AtariWriter Plus does have an important leg up on PaperClip, and that is the built-in Proofreader program, which, since a plethora of typos is inevitable with PaperClip, would certainly be a welcome, if not necessary, addition.

The Basics

Nowadays almost every word processor delivers the basic functions: word wrap, a choice between overwrite and insert mode, a good set of cursor controls, print-formatting flexibility, search and replace, good file control, and text block move, delete, and duplicate features (that is, cutting and pasting).

Both PaperClip and AtariWriter Plus handle these features and operations with admirable simplicity and competence. I should say that PaperClip probably accomplishes these basic operations, with respect to the user interface, with perhaps more class and elegance: it looks so good.

And yet PaperClip is oddly slow and unresponsive at points. I have already mentioned the program's inability to keep up with a quick keyboard touch. But there is more. Loading a file takes at least 50 percent longer than AtariWriter Plus. Further, moving and duplicating text is quite slow, a line-by-line operation that is also severely limited in the amount of text you can move or duplicate at one time. What's more, watching the line-by-line insertion is vertigo-inducing. Those with weak stomachs may wish to look away.

Those Extra Touches

Part of what makes PaperClip sluggish at points must be the work that's gone into the design of its screen display. The custom screen font is an attractive, almost Old English character set. You can even change the screen's background color from the keyboard, or fiddle with the contrast and brightness of the display.

Windows: One of PaperClip's most impressive "extras" is its unique windowing option. You can split the screen in two and actually work on two files at once, affording you the ability to write, edit, load, or save from either window depending on which the cursor is currently positioned within. A truly impressive feature.

As an example, suppose you're merrily zipping along and suddenly a thorougly profound idea comes to you. You want to add it to your work, but not quite at this point. You can simply open the second window, type in the material, then save

The PaperClip word processor is quite a program. It's simply packed with sophisticated, easy-to-use features and it looks great.

it to diskette. Later, when the material is appropriate, you can merge that file within the body of your text.

Auto-Save: Another neat feature is the Auto-Save function. We all know it's a good idea to save one's work regularly while typing, just in case something terrible happens, like a surprise electrical storm or a power strip's line plug falling from a loose wall socket. Well, with PaperClip, you can actually set the program to automatically save your work after a certain number of characters have been entered—you can set this to any amount between 1,000 to 32,000 characters.

Printer Drivers: PaperClip offers printer drivers for all ATARI Printers and Atari-compatible printers, as well as a host of third-party printers (the Epsons, the NECs, etc.). The custom printer driver provides options for virtually all printer possibilities (the AtariWriter Plus custom printer driver is lacking in this regard, asking instead for some irrelevant and useless options). There's even a print-utility for graphics printouts.

The List Goes On

Another "extra" is the fact that you can make a back-up copy of PaperClip, something you can't do with AtariWriter Plus. The people at Batteries Included can afford to allow you such luxury because you must also have PaperClip's "key," included with the program, plugged into joystick port #2; without the key, the program will not run, so piracy is not a problem. What's nice is that you can copy the program diskette, use the copy when running the program, and thus significantly reduce the chance that you'll inadvertently and irretrievably damage your program diskette. In contrast, should anything ever happen to the AtariWriter Plus program diskette, you'll have to have it replaced. (Incidentally, Atari will, for a small fee, replace a damaged AtariWriter Plus program diskette.)

PaperClip also allows Macros. Macros enable you to store on diskette words and phrases you often use in your work, perhaps a favorite salutation or some technical phrase, for insertion at any point. The program has a Mail Merge function as well, and is, I must say, somewhat easier to use than AtariWriter Plus'. While PaperClip, so too AtariWriter, allows you to chain print files, PaperClip additionally allows you to create so-called "batch" files. These are separate files that include the names of the files you want printed successively. The convenience of this feature is that you don't have to format each file in the chain as a part of the chain, rather you can use the batch-file procedure to chain the files automatically.

Batch files have another use as well. Since they are nothing but text files with special instructions, you can batch together, so to speak, other print formatting instructions for the files batched, without having to go back into the batched files themselves.

One convenience of AtariWriter Plus is that a great deal of print formatting is done on the Global Format screen, but in PaperClip variations from the default print-formatting values all must be inserted with the text file (or within the batch file)—a minor disappointment.

And those little extras just keep coming. PaperClip has what is called a "typewriter mode," essentially transforming your computer into a memory typewriter, a la Xerox or IBM. The typewriter mode allows you to type one line of up to 130 characters and send it directly to your printer. Obviously, this feature is ideal for mailing labels or envelopes.

And yet another: PaperClip will build a table of contents for you, using the headings within your text file that you code as such, and creating a separate file with the table of contents. The procedure is a snap. And PaperClip can perform simple arithmetic—addition, subtraction, multiplication, and division.

There are many other little conveniences built into PaperClip—far too many to go into here. Suffice it to say that it's an ingenious, well thought out program.

Documentation: For awhile, one couldn't find a manual that was geared to the lay end-user. Now, the public having raised its voice in protest, manuals are getting a lot better. PaperClip's documentation is a case in point. It's again, for the most part, a no-nonsense, tutorial-style guide that gets you up and going. It's clear and well organized, though the writer unfortunately is at times a bit too chummy.

One major drawback, however, is its command summary. I found it less than clearly and efficiently laid out. There is no, as there is with AtariWriter Plus, removeable quick reference card. And there are some unfortunate omissions as well. To name only one, the section on moving blocks of text says nothing about the maximum number of screen lines that can be moved at one time. However, there is indeed a limit of about 30 screen lines. Oh well.

PaperClip is available now. Package includes: program diskette, key, and Owner's Manual. Suggested retail price: $59.95.

Atari Corp., PO Box 3427, Sunnyvale, CA 94088. Batteries Included, 17875 Sky Park North, Suite P, Irvine, CA 92714.

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The Atari Bookshelf

by Bill Wilkinson

Okay. Now you have a nice, new Atari 800XL or 130XE computer. What are you going to use it for? Well, there are really only two kinds of things you can do with a computer: You can use programs which other people have written, or you can write your own programs.

Last issue I reviewed several books which purport to tell you what programs are available for your use and/or how well you can use them. This time I'll try and tell you about a *few* of the available books which try to teach you how to program.

If you are new to computing, you may not be aware of the number of different ways there are to program a computer. There are literally dozens of computer languages. Some are so closely related as to appear to be only dialects, much the same way Cockney and Bronx English are related. Others are as foreign to each other as, say, Spanish and Chinese. By no means are all computer languages available for Atari eight-bit computers, but there are more than a half-dozen viable ones out there now. But however much programming purists (myself included, in rational moments) don't like it, the default programming language for these machines is Atari BASIC, especially since it comes built into the 800XL and 130XE. So most of you who decide to learn how to program will end up learning Atari BASIC first. And my (self-appointed) job is to tell you how to learn it quickly and in the best way possible.

There have been *at least* twenty books published which claim to teach the fundamentals of programming in Atari BASIC. I can't possibly review all of them in one column, so I'm going to tell you in general terms what I look for in such a book and then describe a handful in some detail. Let me begin by describing what makes me give a book a high or low score.

1. Too many books try to cover too much. They try to take you from rank beginner to accomplished pro in 150 pages. Maybe a few geniuses can learn something this way, but I think most will be lost within 30 or 40 pages.
2. Atari BASIC has over 75 different keywords, many of which can be used in several ways. Yet you can successfully write interesting programs using as few as five of these keywords. I have strong ideas about which are the most important words for beginners to learn. So even those books which don't try to do too much in too short a space may get points knocked off for presenting the "wrong" words.
3. I have a problem with "cutesy" books. Perhaps a pre-teen or young teenager needs to be entertained with strange cartoons and abortive attempts at humor, but I think older students will be distracted or perhaps even contemptuous. Still, a book which is too dry may be too boring to all but the most serious student.
4. I don't like books which are loaded with unexplained program listings. Every single line of every single program should be understandable to anyone who has worked through the book. Admittedly, books of program listings are sources of cheap programs. But the programs are usually inadequate and probably cost more than a few good disks from a user group's library. Unless you like typing exercises, why buy them?
5. The books must be accurate. They must *not* be obvious makeovers of books written for other computers. They should present the best features of Atari BASIC (and there are many such features).

Tough to get a good grade in my class, right? So tough you might wonder if any book gets even passing marks. Well, I am happy to report that I have some good news. But first the bad news.

COMPUTER TUTOR: ATARI

by Orwig and Hodges, published by Little, Brown and Company, 1983, $15.95.

This book doesn't belong in this column, since it doesn't even attempt to teach BASIC programming (the book simply presents an assortment of drill and practice programs of the dullest kind). I have included it here primarily to warn away others who might be fooled by the title, as I was. It is an example of the worst of all my fears: 25 programs given without any explanation whatsoever, using some of the worst Atari BASIC programming techniques I have ever seen. Obviously a translation from some other computer. Learn how to program the right way from some of the other books given herein, and you can easily write better programs than these.

ATARI GAMES AND RECREATIONS

by Kohl, Kahn, Lindsay, and Cleland; published by Reston Publishing, 1982, $14.95.

This book is at least somewhat honest. The front cover blurb says "For beginners and advanced programmers . . ." Well, forget that beginner part. True, the book

tries to teach BASIC programming. It touches on about 50 Atari keywords in 100 pages before going on to about 200 pages of game listings. Now, if you consider that some words are given four or five pages, it becomes obvious that others are lucky to get a full paragraph.

This might be a good second book or a good starting place if you already learned BASIC on some other computer. After you have mastered the more fundamental parts of BASIC, buy this one and learn some other tricks of the trade. The listings in the second part of the book range from well documented to obscure, but I think the authors manage to teach some nice programming techniques along the way. This won't be an easy book to master, but it might be worth it. The appendices are very nicely done, including even an Atari BASIC reference card you could cut out and laminate (though I wish it was typeset).

(Editor's note: This book is currently out of print. However, there's a good chance you can still find a new copy in your local bookstore.)

ATARI PROGRAMMING WITH 55 PROGRAMS

by Linda M. Schreiber, published by Tab Books, 1982, $14.50

Although the learning process is scattered throughout the book's 55 programs, everything I said about *Atari Games and Recreations* applies to this book as well: too many topics get a single, brief paragraph. Do *not* buy this as your first book, or you will be lost by the time you get to chapter 7, especially if you want to save your programs to disk (a topic relegated to chapter 19). There is too much use of PEEK and POKE for my taste, and the fact that graphics and inverse video characters in the listings are not typeset makes typing the programs difficult at best. Still, the programs are explained on an almost line-by-line basis, and most of the programming techniques are at least adequate. This book is in at least its fifth printing, so somebody out there likes it.

ATARI FOR THE BEGINNING BEGINNER

by Judy and Tom Chamberlain; published by Enrich/Ohaus, 1983, $8.95

The biggest problem with this book is that it can't seem to make up its mind as to what it wants to tell you. There are 20 pages on using the memo pad (which doesn't exist on XL and XE machines), 10 pages of how PRINT works, 20 pages of miscellaneous hardware comments (including much that is irrelevant), more BASIC programming, 15 pages of drivel about other computer languages (including ones not available for Atari computers and a BASIC program example that won't work in Atari BASIC), and . . . well, just not much else. Can you learn from this book? Maybe. Will you be confused by this book? Without someone to guide you, yes. I just don't know what audience this book is for.

ATARI BASIC

by Albrecht, Finkel, and Brown; published by John Wiley & Sons, 1979, $5.95

In the dawn of history, when Atari BASIC was a cartridge packed in its own box, the box included two books: a reference manual and this book, *Atari BASIC*. As you might guess from the copyright date, this book appeared at the same time the first Atari computers did. It is quite obviously a conversion from some other BASIC (it always uses single letter variable names, for example). It is a self-teaching guide, the kind where you are supposed to slide a card down the page, hiding the answers to innumerable questions. And it force feeds you advanced topics (such as doubly dimensioned arrays) for 280 pages, then gives a meager dessert (30 pages) on sound and graphics. But, if you don't mind the tedious and often boring format, it works! In 1979 and 1980, it was the only thing available, and many, many Atari owners go their start in BASIC with it. I can't really recommend it, but at least it won't hurt you.

LET'S LEARN BASIC

by Ben Shneiderman; published by Little, Brown and Company, 1984, $8.95

The subtitle on this volume is "A kid's introduction to BASIC programming on Atari Home Computers." I have mixed feelings about this book. On the one hand, the level of presentation is quite good and the order of presentation is fair or better.

Title	Suitability for: Rank Beginners	Classroom	Self-Study	Relevance to Atari BASIC	Accuracy	Organization	Readability	Overall
Atari for Kids 8 to 80	★★★½	★★★★	★★★★	★★★★	★★★½	★★★	★★★★	★★★★
Dr. C. Wacko	★★★	★★★	★★★½	★★★★	★★½	★★★	See Text	★★★
Armchair BASIC	★★★★	★★	★★★★	★★	See Text	★★★★	★★★★	★★★
Let's Learn BASIC	★★★	See Text	★★★	★★	★★	★★★	★★★	★★½
Atari BASIC	★★½	★	★★★	★★	★★	★★½	★★	★★½
Atari for Beginning Beginners	★	★★½	★½	★★½	★★	★	★★	★★
Atari Programming with 55 Programs	★	★	★★★	★★★	★★★½	★★	★★½	See Text
Atari Games and Recreation	★	★	★★★	★★★★	★★★½	★★★	★★	See Text
Computer Tutor	– Not Rated –			– See Text –				

On the other hand, considering the marvelous graphics capabilities of the Atari 8-bit computers, it is a little disappointing to find not a word about them.

Also, there are seeming inconsistencies throughout the book: Why no usage of meaningful variable names? Why print blank strings between commas in a PRINT statement? Well, actually, the reason is not hard to fathom: This book is just one of a series of like books designed for use on several different popular microcomputers. And most of the example programs will run unchanged (or nearly so) on all these computers, but that implies that the author had to limit usages to things in common among all BASICs covered. (And paragraphs entitled "differences among computers" are found throughout the book.) So, if you are trying to teach a class in BASIC using a variety of computers, this book could well be your best choice. But if you are interested in learning Atari BASIC on your own, keep looking.

ARMCHAIR BASIC

by Annie and David Fox; published by Osborne/McGraw Hill, 1983

Actually, in terms of pure readability with just the right degree of levity included, this is one of my favorite books of all time. Its subtitle is "An Absolute Beginner's Guide to Programming in BASIC," and it is just exactly that. It is over 250 pages long and very chatty, so you'd better like to read. But if you do, you'll even understand the concept of human engineering (as applied to BASIC programs), something I didn't see in any other book. Unfortunately, there is a "but" or two in this book.

But it wasn't designed specifically for Atari BASIC, so some of the programs won't work if they are typed exactly as shown. Now the Fox's are foxy; they anticipated this problem and even included some notes on how to make the programs work with Atari BASIC. This may or may not work for everyone in the beginner audience the book addresses. (Of course, if you use this book with OSS BASIC XL, BASIC XE, or Atari Microsoft BASIC, you can remove this objection.)

But, because the book is not specific to Atari computers, sound and graphics commands are not discussed at all. Especially for kids, this can be a real disappointment. Still, for some rank beginners, none of the other books I have reviewed here will work as well; no other book gives such a painless intro to computing. Follow it up with an intermediate-level, Atari-specific book, and you may have a winning combination.

DR. C. WACKO PRESENTS ATARI BASIC and THE WHIZBANG MIRACLE MACHINE

by Heller and Johnson; published by Addison-Wesley, 1984, $12.95

Besides this book, David Heller and his Dr. C. Wacko character have inhabited the pages of *Atari Connection* and *Atari Explorer* magazines on several occasions. And even if you aren't familiar with his style, the title alone ought to be enough to give you a clue: like cutesy to the max! Yet, despite my introductory comments, I am not overly offended by most of the nonsense in this book. (Though comparing programming to making anchovy burritos for Thanksgiving dinner may be going a little far.)

Now what about the level of presentation? Well, without a teacher to help, I think children younger than twelve or so will get lost. The informal style of presentation sometimes makes it hard to distinguish what is and is not important. Also, while many of the numerous cartoons are strictly for humor, in other places they are an integral part of the text. And, finally, I think some of the examples are more complex than they need be.

The biggest problem with this book is that it includes some stylistic errors which really *should* have been edited out. Sorry, Dr. Wacko, but no way is multiplication "more cosmic" than division (page 29). And why, why, why use a numeric array to hold a word processor's text (page 194)? You could hold six times as much in a string. Still, I think most teenagers and most reasonably intelligent (or warped) adults probably could learn BASIC from this book. So, if learning to "BURP along with Captain Action" seems like fun to you, give Dr. Wacko's very Atari-ish book a try.

ATARI FOR KIDS FROM 8 TO 80

by Zabinski and Scheck; published by Howard W. Sams and Co., 1984, $15.95

Naturally, I've put my favorite off till last. Dr. Zabinski is the founder of the National Computer Camps, and it is obvious that he and Mr. Scheck have successfully taught many people of all ages how to program. The order that BASIC words are introduced is at least good. (I felt that some words were presented earlier than they need be, especially READ and DATA.) The level of presentation is nearly perfect: kids can understand it; adults won't be bored. Designed specifically for Atari owners? Yes, from the very first chapter! Cartoons? Yes, but they aren't obtrusive.

If you are a teacher looking for a good textbook, please give this one a thorough review. And even though this book seems ideally suited for a classroom environment, I think almost anyone willing to spend the time to try every example, work out every exercuse, and digest each morsel of "brain food" will walk away from this book knowing enough Atari BASIC to write fair to middling programs.

OTHER BOOKS

Even though I already warned you that I couldn't possibly review all BASIC beginner's books, I think two more deserve at least honorable mention *if* they are to be used in a classroom situation: *Kids and the Atari* and *I Speak BASIC to My Atari*. The methods of presentation in these books seem to me to be unsuitable if you are studying on your own, but I have taught BASIC courses (to both adults and kids) using each as a textbook and found them very satisfactory. I like Dr. Zabinski's book better, now that I have found it; but with any of these three books in a classroom setting, a good teacher can teach a great introductory course.

Many of the authors of the above and other books seem to think that Atari owners don't buy disk drives. *Let's Learn BASIC* tells you how to SAVE a program to disk but doesn't bother to tell you that you have to turn on the disk before the computer. Even Dr. Wacko buries the SAVEing and LOADing of programs to and from disk in an appendix. I see these and other similar omissions as signs that the authors haven't tested their books on rank beginners.

For all of this, though, it is nothing short of amazing that literally tens of thousands of Atari owners have learned BASIC from exactly these books. So what does that say about some of my carefully constructed prejudices? I don't know. I only hope that you will consider some of my points when you choose your first BASIC book.

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Syn with Pleasure

SynFile and SynApps for Atari

by David Duberman

Synapse Software's SynFile + is a sophisticated but easy-to-use data base management program. It's ideally suited for home applications such as keeping track of your collection of prized knick-knacks, but it's in the business arena that SynFile + really comes into its own. In the most significant improvement over its precedessor, FileManager+, it allows a single file, or data base, to be spread out over as many as 16 disks in any of three densities: single, double, or 1050 "enhanced density." Thus, with an Atari 800 equipped with 160K bytes of random access memory (RAM)—an Axlon 128K Rampower borard plus 32K—SynFile + allows you as many as 15,000 records in a single file.

As a matter of fact, many small businesses around the U.S. (and in a few other countries as well) use SynFile + and its sister SynApps (Synapse Application programs) daily as tools for productivity. Busiiness managers using such programs are often first-time computer users, so there may be a bit of fumbling at the start unless the instructions are excellent. The SynApps' documentation is quite good, but could have been a bit more thorough—some important details are lacking. The purpose of this article is to help fill in some of the gaps, in question-and-answer form.

What's this indexing business all about?

To many beginning users, SynFile +'s most puzzling aspect is its use of the index. After you create a form, and before you can start entering information, you must index your file to determine how the records will be ordered. For instance, in a file of names and addresses, you would normally index on the field containing the last name, which results in a file alphabetized by last name. If you're maintaining a list for national mass mailings, you might index by Zip code for easier sorting. When you open a data file for any reason, SynFile + loads *only the index(es)* into memory, plus a few records. Most of the individual records stay in the disk file and are loaded into memory only when specifically saved on disk. The index is simply a list of the contents of every corresponding index field for all records in the file. Each record entry in the index also contains that record's location on your data disk.

When you index a text field (such as Last Name), you're prompted to enter the length of the index. If you just press [Return] at this prompt, SynFile + indexes the default length of five, which means that only the first five characters in the field are contained in the index. In a name and address file, indexing on the first five characters usually results in a perfectly accurate ordering of records, because there aren't many different last names that share the same first five characters. If your file contains a number of records with the same last name (e.g., Smith), you might also wish to index the First Name field. With SynFile +, you can index in order of priority as many as 16 fields.

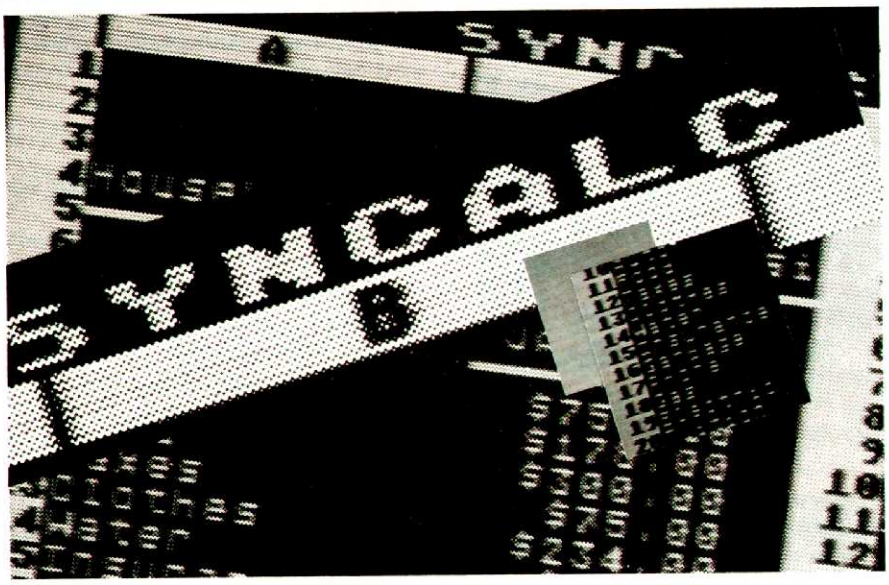
What is SynFile +'s capacity figure telling me?

Immediately after you index your file, a number showing the maximum size or capacity of your data base (in records) is displayed in the upper right of the screen. What determines this number is the length of your index and the amount of RAM your Atari computer contains. The capacity shown is the total capacity of your data base, spread out over as many as 16 disks.

The capacity is *not* records per disk—the size of the record determines the number of records per disk. If your record is very short and you're using double-density disk storage, you might be able to get the entire file on one or two disks. With large records and single-density disk storage, you may have to use SynFile +'s full 16-disk capacity. With a standard 48K Atari 800 and a file indexed by the first five characters of a text field, SynFile + allows you a total of approximately 900 average-length (100 characters total field length) records in a single file.

An upgraded version of SynFile +, available since March 1985, increases this maximum capacity approximately 70 percent in 64K (and larger) Atari XL and XE computers. Also, versions of SynFile + and SynCalc that support the full amount of memory on the Atari 130XE computer are available now. The record length, which is set when you create your form, can be up to 1,680 characters—21 lines by 80 columns in a horizontally scrolling format.

The rule is: the larger the index, the fewer records you're allowed. If you double the length of your index, either by increasing the number of characters indexed in a single field, or by adding fields,



you approximately halve the data base's capacity. If you try to add more records than you're allowed, you'll get an "Out of Memory" error. When you get this, the only ways to expand your file are to reduce the size of your index or add RAM capacity.

Anyone can shorten the index by reindexing on fewer fields or by reducing the number of characters in each index. However, only Atari 800 owners can expand their computer's memory. You can install three of Mosaic's 64K RAM Select memory boards into an 800's slots for a total of up to a whopping 192K bytes of memory. Axlon's 128K Rampower is also compatible with SynFile +. With the same example data base as before (5-character text index), the Axlon device, for instance, gives you a total capacity of 10,000 to 15,000 records. Note: Contrary to rumor and the statements of some dealers, adding extra memory does not enhance SynFile + speed; it only increases the workspace.

I have two disk drives. Can I use the program disk in drive 1 and the data disk in drive 2?

SynFile +'s use of disk drives differs significantly from FileManager +'s approach. Because the latter program does not permit a data file to exceed one disk in size, it allows you to place the program disk in drive 1 and the data disk in drive 2, eliminating all disk swapping during a session. SynFile +, on the other hand, forces you to open all data files from drive 1. That is, no matter how many disks your file is spread over, you must place each successively in drive 1 when opening the file. Thereafter, while maintaining your data base, you can avoid any disk swapping if you have at least as many disk drives as disks in your file. Thus, if you have four drives and five disks, you'll still have to do some swapping. SynFile +'s system is a compromise that makes life easier for users of larger data bases, but a little less convenient for small users.

How does SynFile + use multiple-disk files?

As you add records to your SynFile + file, it may eventually outgrow its original disk. When this happens, the program senses it and automatically prompts you to enter a new data disk into drive 1. At this point, you should remove the original data disk from the drive and insert a blank disk. If you have two drives (both drives should be on when booting SynFile +) place data disk #1 in drive 2. You'll be given the opportunity to format each new data disk. Thereafter, if you have two or more drives, you can leave the data disks in the two drives, and no disk swapping will be necessary during data entry. If at any time you need to use one of SynFile +'s utilities, such as Create Form, you must reinsert the program disk in drive 1.

As mentioned, a file must always be opened from drive 1. That means every disk in a multiple-disk file, when opened, must be placed consecutively in drive 1. Thereafter, the disks may be placed in different drives for data retrieval and updates. The program prompts you for all disk insertions. SynFile + works with as many as four disk drives at once, but if your data base grows larger than four disks, you'll always need to do at least a little disk swapping during file maintenance.

How do I create a double-density data disk?

If you have one or more double-density disk drives (Indus, Rana, Percom), you can store SynFile + data files in double-density format. Unfortunately, the manual is less than straightforward in its description of how to use this feature. It's simple once you know how.

When you first load SynFile +, use the Density option from the Files submenu to set your drive(s) to double density, then use FORMAT to initialize a blank disk in the correct density. The next step is to create a form, in which you determine the nature of information contained in your database. To do this, you must load the Create Form module from your SynFile + program disk. This module is loaded by attempting to open a file from any disk and selecting *CREATE* from the directory. Since the Create Form module must be loaded from the program disk, the natural tendency is to load the program disk into the drive before activating the Open File command. This works with single density, but not with double. You must activate Open File with your double-density disk in the drive. The disk spins, then the single selection *CREATE* appears highlighted. At this point, SynFile + automatically switches the drive back to single density. Then, and only then, remove your data disk, insert the program disk, and press [Return]. SynFile + loads its Create Form module, and then automatically switches the drive back to double density in order to store your form. If you put the program disk in before activating Open File, the program eventually switches density and successfully loads the module, but it will never switch back to double to save your form—you'll most likely end up with ERROR 144 and some wasted time and effort.

Note: The SynFile + XL and XE upgrade mentioned above fixes this problem by making the Create routine density-smart.

What is SynFile +'s 1050 density format?

This is a special modification of Atari DOS 2.0S that allows full utilization of the Atari 1050 Disk Drive storage capacity for SynFile + data files. It is not at all compatible with DOS 3, and only marginally compatible with standard DOS 2. Use single-density format disks to hold

report files that are to be accessed by other programs such as AtariWriter.

I use DOS 3 with AtariWriter. How can I use SynFile +'s data base merge feature to print form letters?

First use SynFile + to format a blank disk in single density, and then use this disk to store the Labels report you create according to the SynFile + manual instructions. Write down the name you give the file. Then load DOS 3 and use the DOS 3 menu function Access DOS 2 to convert the file to DOS 3 format. Don't forget that SynFile + appends .TXT to the file name for the Labels report.

How do I use printer control codes with SynFile +?

You can enter printer control codes while creating a Lists report at the prompt for the Title. For example, to print your report's title in expanded print and the report in compressed style, type the code for expanded print, and then the report title, and then the code to turn off expanded print, and then the code to turn on compressed print.

You cannot use printer control codes from within SynFile +'s Labels report generator. You can set up the printer beforehand from BASIC with LPRINT statements or any alternative method, but you can't change the printer setup during printing. Once set up this way, the printer remains in this configuration until turned off or reset with other commands.

Of course, you have the ability to send any report from SynFile + to a disk file instead of the printer. You can then load the report into AtariWriter or another word processor, customize it to your liking, and then print it from the word processor.

How can I print Lists reports from SynFile + with my Atari 1027 Printer?

When printing a Lists report, at the end of a page, SynFile + sends the printer a form feed signal to tell it to advance to the top of the next page. Unfortunately, the 1027 printer is designed to use only one sheet of paper at a time, and does not recognize this signal. As a result, SynFile + prints a Lists report continuously on the 1027 without page breaks. One solution is to send the Lists report to disk, then load it into AtariWriter or another word processor for printing.

How can I search a file within a specific range (for example, all names between Jones and Smith)?

There's only one way, and it's somewhat indirect. SynFile + allows you to create a subfile based on one criterion (see manual page 99). In the example above, you'd create a subfile from Jones through Z, and then search that subfile for Jones to Smith (or vice versa).

Sometimes when I'm creating a report a field name disappears or I get an error message when I type it in.

When creating a form, do not type spaces after field names to line up the colons. This causes the problems and should be avoided.

Are there going to be a SynFile + Report Generator or Report Utilities?

Sorry, though some magazine articles mentioned this, it's not true. One review also incorrectly said the FileManager + (Synapse's old data base program) files were directly compatible with SynFile +; it's not true. Synapse does have a conversion program available.

Random Notes

SynFile+'s copy-protection scheme fails if you have a MicroBits Peripheral Products (MPP) modem that connects to the joystick ports attached. This may cause the program to behave unpredictably, such as locking up when activating a Files submenu item. This also occurs if you have remote-control joysticks attached to your computer, and may occur with a Y-adaptor plugged into a joystick port. It's best to unplug all attachments from the joystick ports before using SynFile +. Also, if you replace your 6502 CPU chip with a 65C02, SynFile + does not work for unknown reasons. By the way, there never was a SynFile + without the +, just as there never was a dBase I, only II.

On SynCalc

How can I use double density disk storage with SynCalc?

You can do this only if you have at least two drives and at least one of them is capable of double-density storage. (Note: This may not work with the ATR 8000.) Use your double-density DOS to format a disk in double-density, then set drive 2 to double density and use the formatted disk to store your SynCalc files in drive 2.

How do I turn off the letter and number column and row headings for printouts?

Use the Headings command from the command menu to turn these on and off.

How can I use my Atari CX85 numeric keypad with SynCalc?

Sorry, there's just no way. SynCalc doesn't leave nearly enough room available in memory to hold the keypad handler.

How can I turn off the automatic cursor advance?

It's not in the documentation, but if you want to turn off automatic cursor movement (when pressing [Return]), enter the command /K.

My accounting spreadsheet is "too accurate."

As in Atari BASIC, numbers are often stored with greater precision than they're displayed, which can result in final totals being off by a penny or two. If you're preparing a financial spreadsheet, you may need to use a rounding formula to get correct dollar-and-cents results. To round off an amount, multiply it by 100, take the Integer function, and divide by 100.

How can I imbed printer control codes in my spreadsheet?

As the back page of the manual shows, you can enter them directly into cells as text characters. Many printer control codes require an Escape code (27 decimal) as the first in a control sequence, which you enter as the first character in the cell by positioning the cursor on that cell and pressing [Shift] [Esc] twice. Consult any ATASCII chart for a list of characters and codes. Should you need to enter a code of 28, 29, 30, or 31 (the arrow keys), you must already be in a cell for text entry—use the space bar if necessary, then backspace. Press [Shift] [Esc] once, then press [Ctrl] and the arrow key.

When I move a group of rows containing formulas up or down, the formulas are no longer accurate.

Use Insert Row or Delete Row commands to move groups of rows like that.

On SynTrend

How can I print my SynTrend graphs on my graphics printer?

SynTrend directly supports only these printers: Epson with Graftrax, a Gemini 10X or 15X, NEC/C. Itoh, and compatibles. If your printer is capable of graphics (including the Atari 1020 plotter, but not the Atari 1025 dot matrix printer) and you have a program that can load Graphics 8 (or 8+16) screen files and print them on your printer (also known as a screen dump), you can print out SynTrend graphs. After SynTrend plots a graph, save it on a data disk, then use the screen dump program to print it out. One such program that supports Okidata printers is PrintWiz, advertised in Atari computer magazines.

On SynStock

My modem doesn't use the RS232C interface. How can I download stock quotes from CompuServe?

You cannot use the 1030 modem directly with SynStock to download quotes, because SynStock accommodates only modems that use the Atari 850 Interface Module. However, if you have another program that allows the 1030 to download in Capture mode (such as Disklink or a special version of AMODEM—both available in the public domain), you download quotes with that program, and then load the data into SynStock.

To download with a terminal program for the 1030, first load the program according to its instructions, and then log onto CompuServe. Follow the instructions in the SynStock manual for saving quotes in a file in CIS. At the point in these instructions where you press [Select] to turn MEMSTORE on, instead follow your terminal program's instructions for capturing data, and begin the Capture. Then press [Return], and when new lines of data stop appearing on the screen, turn off Capture and save the captured data to disk—give it the name CISQUOTE. You can then load SynStock and use CISQUOTE to update your portfolio by following the instructions beginning on page 33 of the SynStock manual.

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BITS & PIECES *by Timothy P. Banse*

What You Should Know About ATASCII

Computers don't understand English. Their native language consists of numbers, which they use to communicate and compute at nearly the speed of light. Your Atari computer even uses numbers to tell which key you've pressed, or what it is you want to see on the screen. The letter A, for example, is represented in the computer as the number 65. The lowly space character, which is printed when you press the space bar, is represented as 32. These codes are known as ATASCII, which stands for Atari ASCII. ASCII, which stands for American Standard Code for Information Interchange, is the code used by most microcomputers to internally represent letters, numbers, and punctuation. In Atari BASIC, letters of the alphabet (both lower and upper case), the digits 0 to 9, and special characters like the comma, quote marks and question marks, and graphics characters are all assigned ATASCII values.

If you program PRINT CHR$(65), the screen displays an uppercase letter A. A PRINT CHR$(32) prints a space, and PRINT CHR$(97) causes a lower case letter a to display. Great, you say, but how can I put this system to work? Well, if you've ever tried to display quote marks like this:

```
100  PRINT " "Quote me" "
```

you know that it doesn't work. But this will:

```
100  PRINT CHR$(34);"Quote me";CHR$(34)
```

In case you hadn't guessed, 34 is the ATASCII value for quote marks.

Besides these rather tame offerings there are some really hot items that can make a program sit up and roar. Here's one of them. Let's say you've written a program that asks for a particular tidbit of information. For instance, you'll be driving 2,000 miles and paying $1.40 a gallon for gas, so you write a program that lets you enter the mileage of various cars you might drive and then calculates the total cost of the journey. Sounds simple enough, but what if you've gone to a great deal of work formatting the screen display? Rather than blanking the entire screen each time you want to enter another car's mileage, why not simply blank out the previous entry and nothing else? Well you can, and it's as easy as printing a single ATASCII character.

All you need to do is situate the cursor with the POSITION command at the beginning of the line you want to erase, and then execute PRINT CHR$(156). That's the ATASCII code for line delete.

Here then are some more useful ATASCII code numbers, that when used in conjunction with POSITION lend the programmer complete control over the screen display. Simply insert the code number for the desired function between the parentheses in the PRINT CHR$( ) statement.

ATASCII Code	Function
254	Delete a character
255	Insert a character
156	Delete a line
157	Insert a line
125	Clear the screen
253	Beep the speaker

Here's a short program that tells you the ATASCII value of any key you press. Press the [Break] key to end the program.

```
100  REM *** KEYBOARD ATASCII PEEK ***
110  OPEN #1,4,0,"K:"
120  GET #1, CHAR
130  PRINT CHAR
140  GOTO 120
```

How to Make Programs Easier to Read

Ever try to read and understand a program that seemed to be nothing more than a purposefully constructed maze of PEEK, POKE and GOSUB statements? No matter how hard you try, the program's logic doesn't make any sense at all. One way to prevent that kind of puzzlement in your own program lies in the careful selection of the string and numeric variables. With Atari BASIC, it's legal to use variables up to 128 characters long. That means instead of using plain old X, Y and I, you can label a variable MONEY, INTEREST, or even EMBEZZLE and JAIL. The only penalty you'll pay is that longer variables take up more memory.

Create a Program Trace

Sometimes programs seem to crash for no good reason. Soon our eyes are burning, and our minds grow tired from scrutinizing line after line and still our mind's eye remains blind to the problem. If only Atari BASIC had a TRACE function. An example of this sort of problem is when you've got a PRINT Z7 when you want a PRINT ZZ, or a PRINT B0 when you really mean PRINT BO. With a TRACE utility you can run the program and at least know if it even executed to a particular line number before it died with a whimper. In lieu of a built-in function, here's one you can program. While it's not needed with most programs, it can be a real time and frustration saver when it's needed. Here's how to do it.

Imbed PRINT statements within the program that simply print the number of the line last executed. You don't have to type in a PRINT 100 or PRINT 110 after each line, just every two or three, and then probably only to keep track of the statements you feel are the ones giving you the trouble. Here's an example:

```
100  INTEREST = 20
110  PRINT INTEREST
115  PRINT 110
120  INTEREST = INTEREST + 100
125  PRINT 120
130  PRINT INTEREST
140  GOTO 100
```

This way, every time the program executes lines 110 and 120, the appropriate line number will be displayed on the screen. If said program just isn't working, and you can't find the problem, imbed print commands within the currently executing program line. Work your way through the suspected line numbers monitoring all of the information until you find the bug. However, once it's up and running, you'll want to remove all the extra program statements.

How to Save Time Typing in Programs

Even professional typists shudder at the thought of typing in computer programs. It's a tedious, generally rather boring experience, and the sooner over, the better. Thankfully, due to the design of the wondrous Atari, there is a shortcut.

Its screen is live. That means you can type in a program line that's similar to a few others, and use the cursor positioning keys to change only the line number. Here's what we mean:

```
                100  PRINT
can easily become:
                120  PRINT
or              200  PRINT
or              120  PRINT A
or              200  PRINT LOOP
```

Changing existing program lines is just as easy. LIST the appropriate line number, and as before, use the cursor positioning keys to maneuver around the screen in order to type over whatever it is you desire to change.

How to Keep a Program from Being Listed

The day may come when you don't want one of your programs listed to the screen or the printer. Whatever the reason, you can protect it by branding it a RUN-only file. If you do, you can LOAD or ENTER the program, but you cannot LIST it. The only way to use the program is via RUN "C:" or RUN "D:SECRETS".

When you're ready to protect a sensitive program, enter this as its last line:

```
32767  POKE PEEK(138) + 256 * PEEK (139) + 2,0:
       SAVE"D:FILENAME": NEW
```

Then enter GOTO 32767. Doing so will save the program in its protected form.

Cassette users will use:

```
32767  POKE PEEK(138) + 256 * PEEK (139) + 2,0:
       SAVE"C:": NEW
```

Just as before, enter GOTO 32767 to save the program in protected form. Naturally, you'll need to have a tape ready to go, and the play/record buttons pressed.

To avoid having your program accidentally encounter line 32767, you might want to add another line:

```
32766  STOP
```

One word of caution. You may want to hide an unprotected version of the program, in case you decide later to modify it.

Lightning Fast Programming

All too often typing in programs is a tedious and boring experience. But there is a form of salvation that can greatly reduce the number of keystrokes you need to ply. Almost all of the BASIC commands boast a one, two, or three letter abbreviation that, for instance, lets you type POS. instead of POSITION and ? in place of PRINT. With some programs you can eliminate from thirty to 60 percent of the typing. Once one of these abbreviations is entered, it will be listed as the full command and not as the abbreviation you keyed in. One exception to this is the ? which means PRINT. Use the question mark shortcut and that's what you'll see in place of the PRINT when you list it. Listing 1 is a list of the BASIC commands along with their greatly appreciated abbreviations.

You've probably noticed some of the abbreviations are as long as the commands they're supposed to shorten. Naturally, you won't save time, and would probably in fact end up losing time by either memorizing the useless little whelps or having to look them up every time you code a program line. The obvious answer is to memorize only the abbreviations for long commands such as POSITION/POS. and LPRINT/LP.

Listing 1: BASIC Abbreviations

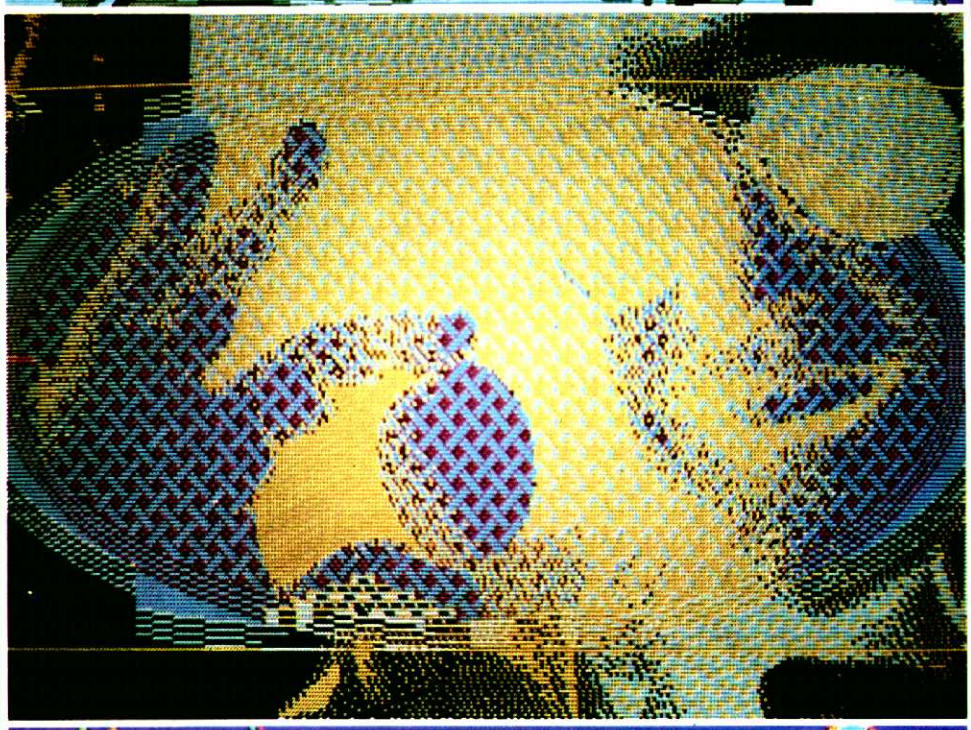
BYE	B.	LPRINT	LP.
CLOAD	CLOA.	NEXT	N.
CLOSE	CL.	NOTE	NO.
COLOR	C.	PLOT	PL.
CSAVE	CS.	POINT	P.
DATA	D.	POKE	POK.
DEG	DE.	POSITION	POS.
DIM	DI.	PRINT	? or PR.
DOS	DO.	PUT	PU.
DRAWTO	DR.	READ	REA.
ENTER	E.	REM	R. or .
FOR	F.	RESTORE	RES.
GET	GE.	RETURN	RET.
GOSUB	GOS.	RUN	RU.
GOTO	G.	SAVE	S.
GRAPHICS	GR.	SETCOLOR	SE.
INPUT	I.	SOUND	SO.
LET	LE.	STATUS	ST.
LIST	L.	STOP	STO.
LOAD	LO.	TRAP	T.
LOCATE	LOC.	XIO	X.

TOPIC: ST

Welcome to Atari Explorer's expanded ST section, now called TOPIC: ST. In each issue we will bring you a complete look at upcoming ST products, thorough reviews of new releases, and the detailed technical information you expect from Atari's own magazine.

The flood of ST software has already started. Almost daily, our mailbox is stuffed with products to review. There are literally hundreds of titles that will be out during the next few months. Atari Explorer will keep you informed.

Next issue we will also start more regular features within this section with information essential to getting the most performance from the system, plus answers to the many questions you send us.



ST NEWS

Free software from Atari Corp. is being made available to ST dealers and users. Two products available now are ST Writer, a powerful word processor compatible with the AtariWriter program for Atari's 8-bit computer line and NEOchrome, a preview version of Atari's powerful color art program. These programs are available from Atari User Groups, Atari ST retail dealers, CompuServe, and other bulletin board systems, and are free for distribution to any ST user—feel free to make copies and give them away!

ST Writer is a full-powered program—this issue of the *Explorer* was composed almost entirely with it. We decided to offer it for free because we're working on a higher powered program that makes full use of the ST's GEM icons, windows, and menus, which ST Writer does not.

NEOchrome is a special advance version that has many features for drawing in the ST's 320x200 mode with 16 colors. We are still planning to add many new functions to this program and to make it an Atari product, but for now we wanted users to have the power of this fine program to use as is. We think you will be very impressed—all the features that are in are only a hint of what's to come.

"The British are coming! The British are coming!" This was the battle cry from Atari Corp. software executives following the recent Personal Computer World show in London, England. The software development community in England has hailed the ST as the answer to the need for a low-cost and high-powered computer system for business as well as personal needs.

The first wave of products from the United Kingdom includes a slew of programming languages, including Pascal, Modula-2, FORTRAN-77, Lisp, COBOL, RPG, C, and assemblers. A horde of accounting packages for small business and vertical markets are available for use with BOS, a popular European operating system that has been converted to the ST from the IBM PC (and 18 other models of computer). Also shown were a local area network system, a desk diary, word processors, spreadsheets, databases, and many games.

M-DISK

★ ★ ★

ST Development Systems Available from Atari Corp.

Complete documentation and development software is available direct from Atari Corp. This package includes over 4000 pages of information on ST hardware and software including chip specifications, GEM VDI and AES calls, a guide to BIOS entry points including the source code, a BDOS and GEMDOS guide, intelligent keyboard specs, and printer specs. Five disks full of software include a C compiler, assembler, linker, resource construction set for building GEM menus, EMACS editor, and utilities.

This is the complete package that is being used by hundreds of ST developers worldwide. To obtain this package, send $300 to Atari Corp, 1196 Borregas Avenue, Sunnyvale, CA 94086, Attn: Richard Frick

★ ★ ★

Software Update

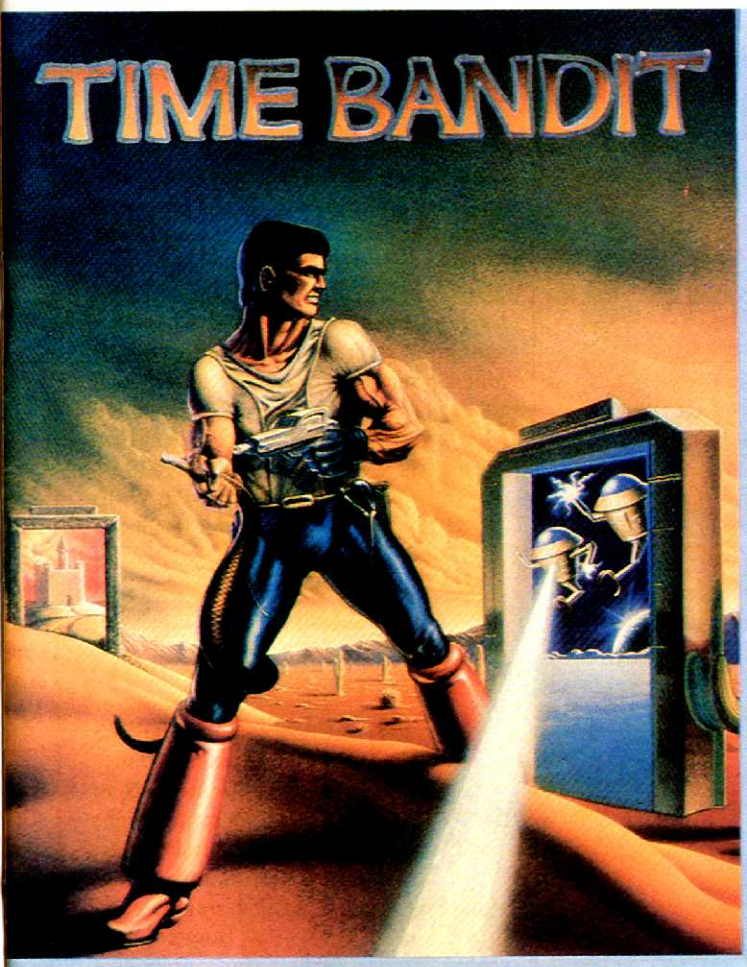
Kuma Computers announce the release of their K-SEKA 68000 Assembler for the Atari 520ST Computer. K-SEKA is a native code compiler that produces either absolute or relocatable code at the rate of 30,000 lines per minute. All functions reside in memory, including the text editor, assembler, debugger, and linker, resulting in very fast turnaround. John Day, Kuma Computers Ltd., 12 Horseshoe Park, Pangbourne, Berkshire, RG8 7JW, England.

★ ★ ★

Lamar Micro has developed a RamDisk program for the Atari 520ST Computer. The program, RAM Overdrive, gives an ST with one megabyte of RAM a 512-kilobyte ultra-fast pseudo-disk drive in memory. In conjunction with this program, Lamar is offering a one megabyte upgrade for your 520ST for $300, which is guaranteed for 90 days. Lamar Micro, 2107 Artesia Blvd., Redondo Beach, CA 90278.

★ ★ ★

The DRAGON Group, who offer a version of the Forth programming language, called 4xForth, for the Atari 520ST, have begun publishing a User News Letter for their customers. The newsletter offers news, tips, hints, corrections, and sample programs for users of 4xForth. The DRAGON Group, 148 Poca Fork Road, Elkview, WV, 25071.



Congratulations!
We're just as excited as you are!

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

Although new to the Atari software field, we at MichTron are natives to the industry. We've written over 70 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: fun, fast, colorful games, and utilities made for speed, efficiency, and simplicity. All reasonably priced, with more coming every day...

Time Bandit: The Arcade Adventure
by Bill Dunlevy & Harry Lafnear

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 on their own windows!

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, somewhen, is a great mystery just waiting to be solved.

Art! This fast arcade game uses all the ST's special features. Unique terrain and creatures 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 with TV or color montitor **$39.95**

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!

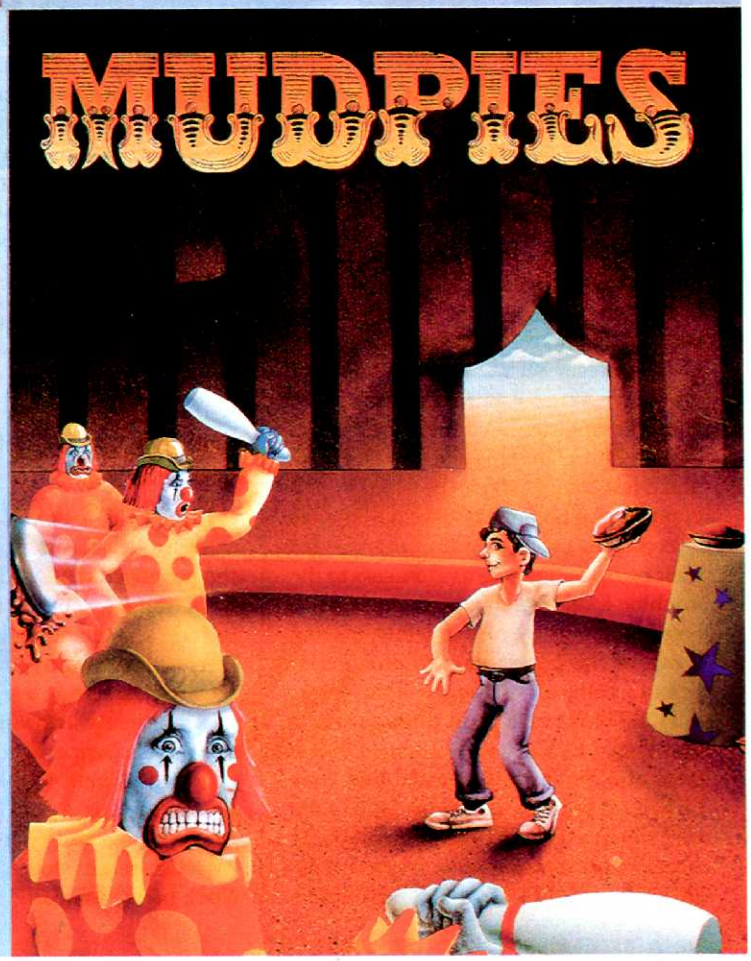
Requires Atari ST with TV or color monitor **$39.95**

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 even suggest one for you. You can switch sides with the computer, and even edit the board for creating your own custom challenges!

Requires Atari ST **$39.95**



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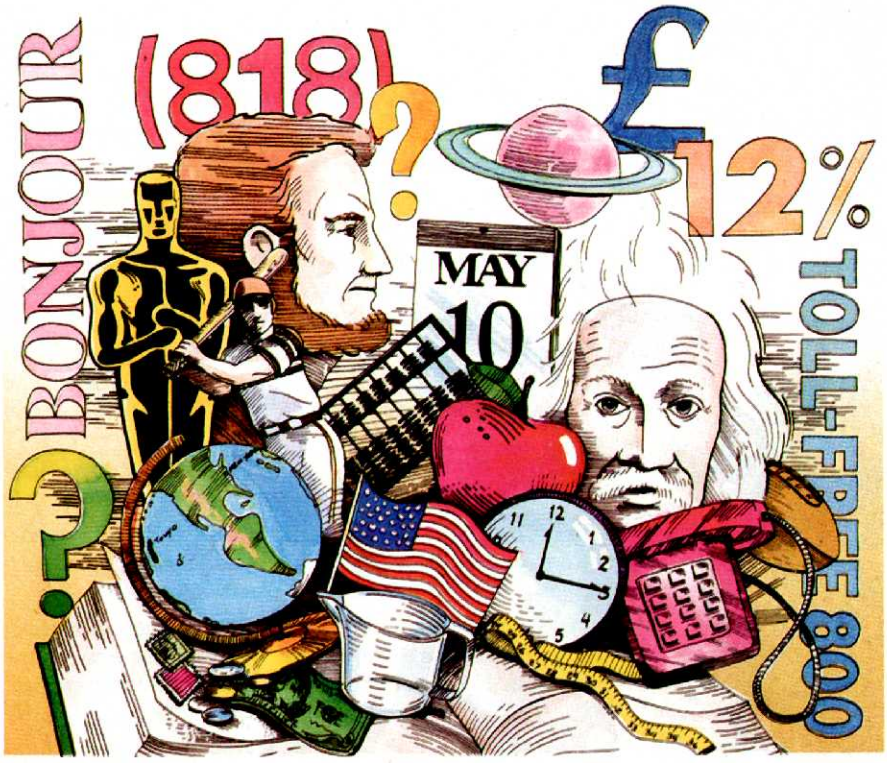

Hippo Computer Almanac

Mirage Concepts, Inc. announces availability of their first 520ST software published under their new "Holmes and Duckworth" label. The Atari ST Toolbox—Volume One ($39.95 sugg. retail) includes five standalone programs: Disk File/Sector Editor; Memory Editor; Fast Format & Copy; Deleted File Recovery; and Directory Print. Also published under the Holmes and Duckworth label is Mirage's Forth programming language for the ST.

4xFORTH is a full-featured Forth-language development system published by the "Dragon Group." This product has been in shipment for over a month now, and has already been used to develop other products such as EXPRESS (see below). Forth is a language often used by engineers for quick programming and for fast execution. New commands can be added by programmers, who quickly develop libraries of commands to extend the language for their own use. Despite its closeness to the machine level (which provides its speed), Forth programs are easy to debug, making it one of the fastest ways to produce efficient, compact programs that work. 4xFORTH is available in three varieties: End User LEVEL 1 with a suggested list price of $99.95, the enhanced End User LEVEL 2 package including GEM support which lists for $149.95, the FORTH Accelerators for even faster execution for an additional $75, and the Developer's System which sells for $500. 4xFORTH is available from the Dragon Group, 148 Poca Fork Road, Elkview, WV 25071. Telephone (304) 965-5517.

EXPRESS from Mirage Concepts is a letter processor with mail-merge and telecommunications features. EXPRESS is for the user who does not need a full-fledged word processor. It excels at producing form letters for mailing, with an easy-to-use mailing-list merge function and the ability to type envelopes. EXPRESS also includes a terminal mode which can capture and transmit text—ideal for electronic mail applications. EXPRESS lists for $49.95 and is available from Mirage Concepts, 4055 West Shaw, Suite 108, Fresno, CA 93711. Telephone (800) 641-1441; in California call (800) 641-1442.

MINCE is a powerful text editor for software developers. It was patterned on the popular EMACS editor used on DEC VAX minicomputers. Its many features include search and replace; cursor movement and deleting by character, word, line, sentence, or screen; a separate editing buffer; multiple windowing; column operations; transposing words and characters; and many others. MINCE is not a word processor, it is a full featured tool that will be appreciated by program developers. MINCE retails for $175 and is from Mark of the Unicorn, 222 Third Street, Cambridge, MA 02142. Telephone (617) 279-5711.

CHAT! is an inexpensive terminal program with full upload and download capabilities. Ideal for users of CompuServe and local BBS systems, CHAT! supports both text buffer capture/transmit and Christensen XMODEM program transfer with error checking. CHAT! is very easy for new users to understand while providing the most essential features of terminal programs. Users of CHAT! will be able to get the latest ST news and demo programs from Atari's own BBS (see below). CHAT! retails for only $19.95 and is made by SST Systems, 3456 Willis Drive, Titusville, FL 32796. Telephone (305) 269-0063.

MUDPIES is the first arcade-style videogame released for the ST. This is a habit-forming game that plays like a cross between "Food Fight" and "Robotron:2084." Working with either the ST's mouse or any standard Atari joystick, MUDPIES pits the player against characters that may be familiar from fast food commercials, to the tune of several ragtime songs. Eight clowns (we nicknamed them Ronalds) chase you around the screen, tossing juggling pins at you. You grab mudpies and fling them at the clowns. Burgers, milk shakes, and what looks uncannily like McDonald's large fries are available when you get hungry—but, in one of the game's most unique twists, eating too much is just as harmful as getting too little. MUDPIES sells for $29.95 and is made by Michtron, 576 S. Telegraph, Pontiac, MI 48053. Telephone (313) 334-5700.

FLIPSIDE is a game based on the "Reversi" board games made popular by Gabriel's "Othello." This game for one or two players features a tough computer opponent, clever animation of playing pieces, adjustable strategy levels, and full use of the ST's drop-down menus. FLIPSIDE lists for $34.95 from Michtron (see above for contact information).

INFOCOM has released three of its perennial favorite text adventures for the ST, with more on the way. The first ST adventures are HITCHHIKER'S GUIDE TO THE GALAXY (based on the hilarious Douglas Adams radio shows, novels, and TV series), ZORK I, the game that started Infocom and still one of the best dungeon text adventures, and the brand new WISHBRINGER magic adventure. The other 13 Infocom adventure games are due out during September as well. Players familiar with these games will be

CONTINUED ON PAGE 65

YOU'VE GOT THE ATARI 520ST

YOU NEED THESE!

HIPPO-C

A Development System for the Atari 520 ST

A friendly, integrated C development system for the Atari ST. Allows for the creation of large standalone Atari ST application programs. The compiler follows the Kernighan and Ritchie C standard (excluding floating-point). You can combine your own assembly routines with C. It allow allows you to view and modify the assembler output from the compiler.

HABADISK 10 MEGABYTE

Atari 520 ST Hard Disk

The HabaDisk for the Atari 520 ST is a 10 megabyte Winchester plug-in hard disk. HabaDisk stores the equivalent of more than 12 dual-sided 800K diskettes and retrieves information in seconds. A necessity for programming and large application uses.

- Self powered
- High speed (3 msec track-to-track access time)
- Atari compatible (including Atari Desktop, GEM DOS and Mouse)

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HABA HIPPO C

REVIEWED BY JODY WINSTON

Dennis Ritchie developed the C programming language while working at Bell Laboratories. The C standard is found in *The C Programming Language* by Brian Kernighan and Dennis Ritchie. This book outlines the specifications for the language and gives numerous examples of good C programs. C's largest advantage is its portability. As an example, Unix is an operating system written in C. Less than five percent of Unix's C source code must be changed on each new computer on which Unix is implemented. C provides the programmer with 28 keywords (see Table 1).

C does not provide any routines or operators for manipulating character strings or arrays. There is no storage allocation, no input/output keywords, no graphics, and no multiprogramming operators. All of these operators are known as functions or bindings in C and the number and the efficiency of these functions are left up to the language designers and users. The short keyword list makes C easy to learn and eases the task of writing a good C compiler.

An example use of C for the Atari ST is interfacing with the Graphics Environment Manager or GEM. These and other graphic routines have been implemented as C functions. Compare this to the use of GEM in BASIC which requires numerous pokes and finally a special call to GEM. A simple C program is presented in Listing 1 to provide you with a feel for the language. Note: Text included between /* and */ are remarks, not part of the program.

C is a compiled language. This means that the programmer must first write the program and tell the computer to translate the program into machine language. This translation of each line of source code only happens one time. This is different from an interpreted language, like BASIC, in which the computer must translate each source line into machine code each time the line is executed. Enhanced speed of program execution is the largest advantage of using a compiler since the computer doesn't have to translate the source code into machine language more than once. The disadvantage is that you do not get the instant feedback from the program as in BASIC's RUN command, since you must perform several steps before running your program.

Hippo C is a complete programming environment for the Atari 520 ST. Haba provides a Unix-like operating system, editor, compiler, assembler, linker, and librarian. The operating system, Hippo Operating System (HOS), resembles Unix in several ways, including supporting output redirection with "<" and ">". The "<" takes the input from the named file in the command line and ">" sends the output to the named file. The only Unix redirection that HOS does not support is "|" which sends the input/output to the named program. Wildcard characters "*" and "?" can be used in the command

line with "*" meaning any match and "?" meaning any character at this position. HOS has 26 commands which range from listing disk directories to displaying the version number of the GEM you're using. Pressing the [Help] key calls up the complete listing of HOS commands. In addition, the HOS command repertoire is extensible by means of compiling short programs in the form of commands and placing them in a special subdirectory.

Other special keys in HOS permit control of data flow on the output device and signalling end of file from the keyboard. HOS also lets you build batch files with up to ten input variables. A special batch file that is executed when entering HOS gives you the opportunity to customize HOS startup. The batch files do not provide for any type of logic testing or logic flow.

The editor supplied with HOS is a full screen text editor that uses the ten function keys and the cursor keys. The editor is RAM-based with a limit of about 2000 lines of C code in a 520 ST with TOS in RAM. The editor does not warn you when you pass this limit, but you can find out how much room is left at any time. The editor accepts files whose lines end in carriage returns or line feeds, which eases the importing of files from other computers.

The compiler is disk based and imposes several limits on the size of your C source code, including number of symbols, number of local and global variables, etc. Few, if any, individual program modules will exceed the maximum of any of these limits. The compiler first produces an intermediate file from the original C program. A second pass of the compiler then translates this file to 68000 assembly language. This method of compiling a C program has the advantage of allowing the programmer to hand-optimize sections of his or her code by manipulating the assembler source. The disadvantage is that an extra step in compilation is made necessary.

The disk-based assembler is used to complete compilation of your program. The assembler uses standard Motorola opcode mnemonics and supports all of the 68000's

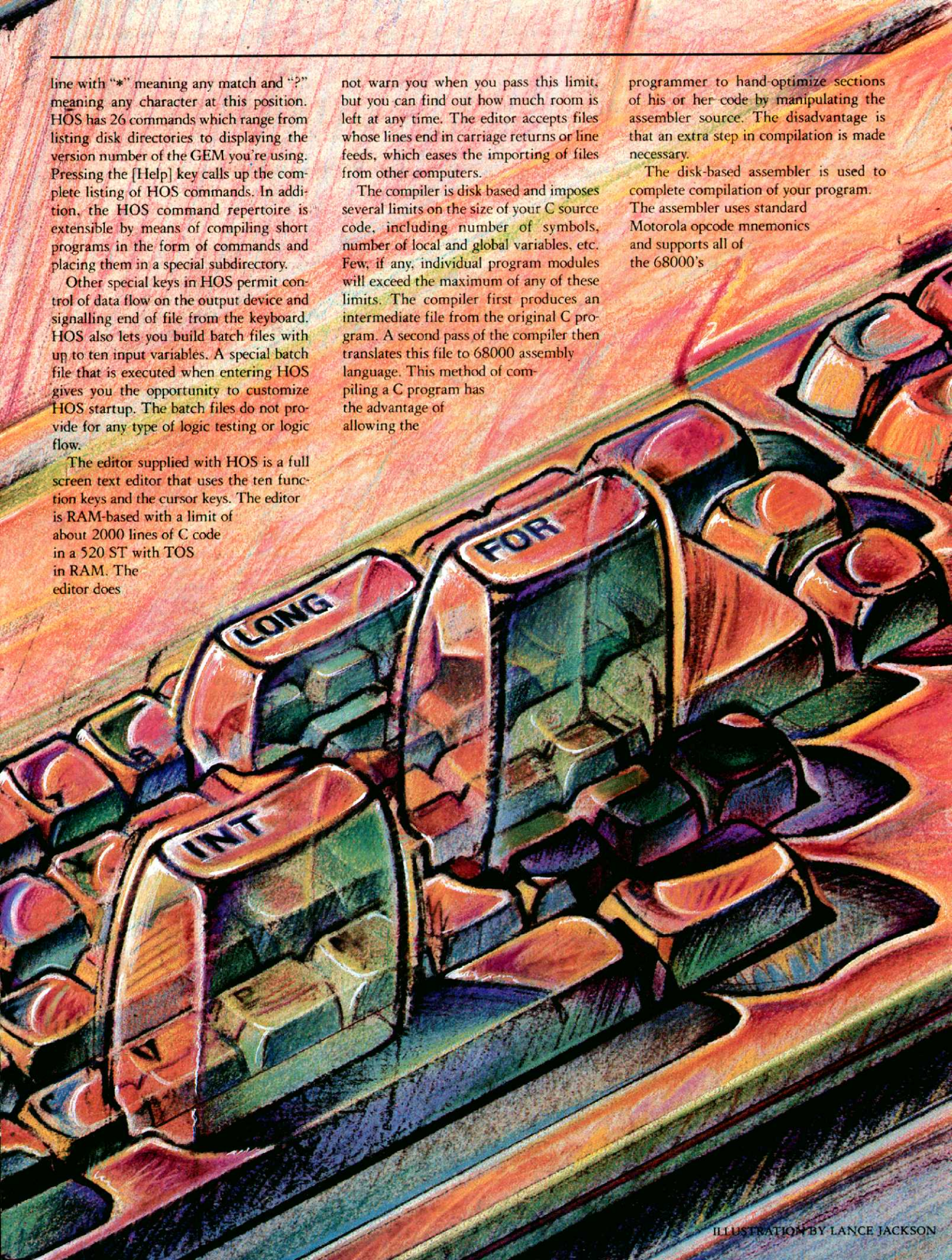

ILLUSTRATION BY LANCE JACKSON

addressing modes. The programmer may use labels of any length with the only restriction being that they must start in column 1. Addition and subtraction are the only expressions that the assembler allows.

Finally, before you can run your program you must invoke the linker. The linker, also disk-based, produces a file that is executable either from HOS or from the GEM desktop. The linker can link as many as fifty object files. The size of the executable program, usually at least 12K, results from the linker including most of the object modules found in the library. On the ST, the only penalty with this approach is the increased file load time before program execution. You need not pay royalties to Hippo or Haba if you develop commercial software with this system.

To help you organize object files, an archive command has been provided. This allows you to compose a list of commonly used object files and to have the linker search these files automatically.

Hippo has provided a number of extensions to standard C to make life easier for the Atari ST programmer. Hippo C allows you to access all input and output devices directly using the GEMDOS routines. Currently, the only output devices not supported are the DMA port and the sound chip. Bindings, or functions, for GEMDOS include file creation, deletion, and modification, input and output, memory allocation, and system date and time. All the VDI and AES bindings, as outlined by Digital Research Inc. in their documentation, are provided.

Hippo C has only one implementation limitation at the present time, the lack of floating point arithmetic. Since floating point is not supplied, many other routines such as trigonometric, log and antilog, and random number generators, are missing. Also, the scanf function that gets line input from input devices is missing, which means the programmer is forced to use cumbersome alternatives. The documentation assumes that the user has programmed in C and has a C programming language book for reference. Only the listing of GEMDOS bindings includes any useful information. As the manual suggests, for further documentation of VDI and AES, you really need to get the $300 Developer's Package from Atari Corp.

On the positive side, all registered users have access to telephone support from Haba. The single-disk operation is a plus since many users currently have only one disk drive. The assembler portion of the software is copy-protected. The protection allows only a few backup copies of the assembler.

In my opinion, Haba Hippo C with HOS is a solid implementation of the C programming language for the Atari ST since it includes all of the VDI and AES bindings. The current lack of floating point seriously hampers serious program development. Another hindrance is the lack of documentation for GEMDOS, VDI, and AES functions.

Table 1

int	extern	else	char
float	typedef	do	double
struct	goto	switch	union
long	sizeof	default	short
unsigned	continue	auto	if
register	for	static	while
return	case	break	entry

Listing 1

```
main()                          /* First C program */
{                               /* Begin */
    printf("hello mom/n");      /* Print on output device */
}                               /* End */
```

Listing 2

No software review would be complete without a benchmark test. I used the Sieve of Eratosthenes and Fibonacci programs—source is available in standard reference works. Compile, link, file size, load, and execution times are as follows:

Program	Compile	Link	Load	Execution	Size (bytes)
Sieve	00:58.4	01:34.6	00:03.8	00:08.4	11942 HOS
	00:58.4	01:37.0	00:04.7	00:08.4	11980 GEM
Fib	00:58.1	01:35.3	00:03.5	00:32.0	11824 HOS
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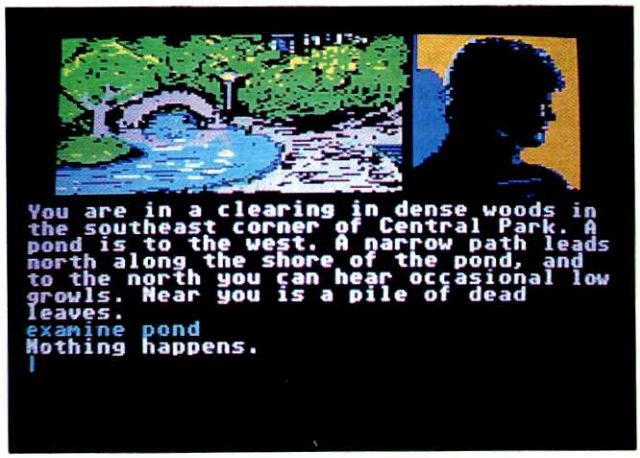

Fahrenheit 451

First Graphics Adventures for the 520ST

Reviewed by David Duberman

Fahrenheit 451 and Perry Mason: The Case of the Mandarin Murderer are the very first releases for the Atari 520ST from Spinnaker Software. The games operate with color or monochrome monitors, but graphics are available only in low-resolution (16-color) mode. Technically, these are produced by Telarium, a division of Spinnaker.

Both fall under the broad category of interactive fiction by presenting you with a "story" in which you participate each step of the way by typing commands at your keyboard. Colorful pictures, music, and provocative sound effects accompany the stories, but do not contain clues. The object is to achieve a certain goal by overcoming a number of intermediate obstacles, and the overall game takes on the aspect of a gigantic, complex, interlocking, ingeniously fabricated puzzle. Both games come on two single-sided 3½-inch disks, and will work with one-drive or two-drive systems. And that's where the resemblance between these two ends.

End Book-Burning Now!

Fahrenheit 451, available for over a year on non-Atari computers, has turned out to be quite popular. It's something of a sequel to the original novel by Ray Bradbury, who collaborated on this version with software designer Byron Preiss. In the story's pessimistic future scenario, the oppressive government quells dissension by destroying potentially subversive ideas; that is, by burning books. It is the elite 451 Corp's duty to rid society of books and those who foster their circulation. You are Guy Montag, renegade Corpsman, now loyal to the Underground fighting against overwhelming odds to maintain a literate society. Your former fellow 451 Corpsmen are on the lookout for you, so

CONTINUED ON PAGE 56

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Forbidden Quest

Reviewed by David Duberman

The programmers at Pryority Software have got to be a sharp bunch. They brought out the first text adventure for the Macintosh that used windowing and pull-down menus, and now they've converted it for the Atari 520ST in record time. Aside from Logo and BASIC, it's the first full-featured GEM-based software of any kind available for our new sixteen-bit wonder computer! And a pretty nifty text adventure, to boot. I'll describe Forbidden Quest's user interface first, then get into the game itself.

If you're using a color monitor, you must set the GEM desktop to medium resolution to play the game—it also works fine with a monochrome monitor. The main display consists of two windows: a larger upper window for program responses to your commands; and a smaller window below in which you type commands. The lower window also keeps track of your score and the number of moves you've made, and contains a 'compass' area that lets you use the mouse to move North, East, South, West, up, or down—just click on the corresponding letter. The top line of the screen holds five menus: Desk, Help, General, Save/Quit, and Inventory, judicious use of which help make for a much more efficient and enjoyable adventure.

The Desk menu contains those accessories which are loaded from your TOS disk at boot-up (or when changing resolutions). Thus you can change the four (medium resolution) screen colors any time during the game with the Control Panel, if present. However, pressing the function keys lets you select from ten different preset background/text color combinations without resorting to the Control Panel.

The Help menu, with three levels of hint from subtle to direct, is likely to get a great deal of use from beginning adventurers—it surely came in handy for this semi-experienced one. You lose points, but you can always replay the game for maximum ponts after you've solved all the puzzles. One problem with the Help function is that there's no way to abort the function if it's accidentally activated—you must take a clue.

The General menu lets you use the mouse to activate the commonly-used commands Look, Wait, Brief, Detailed (descriptions of surroundings), and (send program transcript to) Printer. But you can also enter these, as well as Help, from the keyboard. Save/Quit lets you use a standard GEM window interface for saving and loading an unlimited number of spots in the game (very handy), and return to the GEM desktop when you've had enough. You can also restart from the beginning. Lastly, the Inventory menu instantly shows you all that's in your possession. You can click on an item for its description.

Of course, that part of the user interface that is most often encountered in such games is the parser. This is the part of the program that interprets commands that you enter—the smarter the parser, the more freedom you have in phrasing your input. Unfortunately, the parser is of the relatively primitive two-word sort; indeed, it only looks at the first six letters of the words you type. While this usually isn't too much of a hindrance, I found the program's insistence on a specific word combination to be frustrating in several spots.

The game scenario, although I didn't have the opportunity to make much progress, seems to be a fairly standard science-fiction one. The planets of the Alliance have been crumbling into chaos for half a millenium. To save civilization, you fire up your lonely little spacecraft and start out in search of a rumored lost alien race who just may have the answer. Plot and narrative style succumb to the designer's imperative of incorporating difficult puzzles at nearly every turn, making Forbidden Quest a brain-twister-lover's delight. There are several mazes, marking this as a classic-type adventure, so mapping is strongly advised.

While you don't see pictures on the screen, graphics are still very much a part of Forbidden Quest. Packaged with the game disk and instructions are five 9" x 12" prints drawn in widely varying styles depicting various stages of the adventure. Each of these contains one or more essential clues found *nowhere else* in the game. If you get stuck and require a pictorial clue, a hint will refer to it.

If you've played a few text adventures and love solving the puzzles, I definitely recommend Forbidden Quest. Especially at the group discount rate Pryority is giving to Atari User Groups ($19.95 each for an order of five or more), it's a very good deal. The puzzles are tough, but the hints help a lot. Forbidden Quest is one adventure game that will keep you coming back until you solve it.

Pryority Software, PO Box 221959, Carmel, CA 93922, (408) 625-0125, $39.95

One HEX of a Game

Reviewed by Juli Wade

Here's one I'm *sure* you'll be losing some sleep over—I certainly am! HEX, by Mark of the Unicorn, Inc., is one of the finest graphic strategy games I've seen—graphically *and* strategically!

It is played on an arena of hexagonal shapes. To win you simply (!) turn the arena green. As you move onto a "hex," its color will "flip." The colors have a sequence, and they can be locked together making it possible to flip larger sections of the arena at one time. You gather "energy points" along the way, and play continues until your energy runs out.

The game is not simple. The only time you get a breather is on the very first level—only then is there no opponent to hinder your efforts.

You, the player, appear as a white unicorn which leaps gracefully from hex to hex. Your opponents are numerous—twelve that I've seen, and that doesn't include the "Phantom Partner" who slipped from who-knows-where onto the arena!!

Graphically, the characters are just fantastic! From flying dragons to dancing mushrooms, from the leopard-like Kengar to Phebe the half-horse/half-woman—their moves are wonderfully fluid and life-like (if you can call a dancing mushroom "life-like"!). My favorite is Sir Jake—an invisible man except for his scarf, his hat, the cigarette he's smoking, and the great pair of sneakers he cruises around in!!

Each of these opponents has a unique pattern of activities—your job is to figure out, first of all, what their particular "powers" are, and then how to use them to your advantage. This is where you'll start losing sleep staring at that screen until the wee hours . . .

Magical spells are the other key to the game. These spells are offered to you between play levels, and can be substituted for spells you've chosen previously, or you can continue to play without changing your spell "library." You have a maximum of five spells at your disposal to choose from. To use a spell, select it and then make your move. The "cost" of invoking these spells is displayed on screen and is deducted from your "energy" score when you use them. Spells are complex. You must experiment with them. Pay close attention when you are offered a new spell, and be sure that all of your spells do something different. You will need all the help you can get!

The ten highest scores are stored on diskette, as well as any unfinished games that you'd like to save and return to later. If the score screen fills up, you simply clear an entry to make room for your next game.

Fortunately, as complex as this game is, there *is* some help available. The Demonstration Game is fabulous, and watching closely as the different levels are played can give you all sorts of clues!

Of course, just when you think you've seen it all, that little old guy in the overalls makes the entire arena disappear . . .

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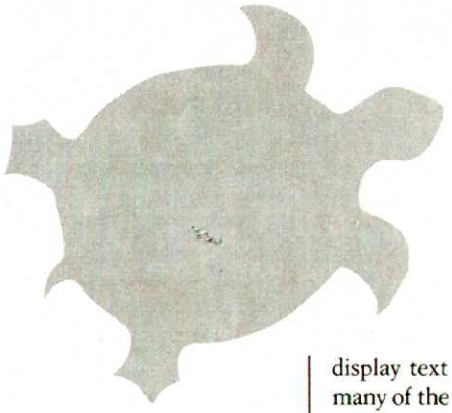
ST

Using 520ST Logo

Logo is a graphics-oriented language, originally designed by Dr. Seymour Papert at Massachusetts Institute of Technology. (Ed. note—Papert's book *Mindstorms* is available in paperback; we recommend it highly to all those interested in Logo.) It was initially intended to be a user-friendly language that enabled children to explore computers on their own. Since then, Logo has grown with the philosophy of employing terms and ideas that are familiar to even non-programmers, to create increasingly sophisticated software. Today, Logo is one of the premier computer languages and is used by both beginners and advanced programmers alike.

The principal attractions of Logo are its simplicity and interactive nature. The language is designed to reflect, as much as possible, the manner in which the mind organizes ideas. Whereas a computer processes instructions sequentially, the mind tends to group related bits of information into individual packages. Logo follows this pattern by grouping the computer's operations into a relatively small but powerful set of instructions. In fact, many tasks that Logo can perform with a single instruction require several instructions in most other languages. In this way, the computer is forced to think like a human, instead of vice versa. As a result, advanced programs can be written in only a relatively few lines of code. In addition, many of these instructions have descriptive names, making programs easy to debug, and their logic is easy to follow.

by Bob Cockroft



These features of Logo are advantageous not only to the beginner; more advanced programmers can take advantage of Logo's structuring capabilities in order to design their own instructions and procedures. It is then a simple task to use these routines as primary building blocks for large multi-function programs. In addition, because these instructions and procedures represent entire sections of debugged code, programming speed is increased, while programming errors are reduced.

In light of the growing popularity of this language, a version of Logo, originally called "Dr. Logo," is provided with every ATARI 520ST computer. Developed by Digital Research, Atari Logo represents the most comprehensive dialect of this powerful language. This article serves as an introduction to the language for beginners and mid-level programmers alike.

Welcome to Logo

Of course, you must load Logo into the computer before you can start programming. Follow the instructions in your Logo Sourcebook that comes with the 520ST. The initial Logo display consists of 3 elements: the Logo Dialogue window, the Graphics Display window, and the Pull-down menus.

Logo Dialogue and Graphics Display Windows

The Logo Dialogue and the Graphics Display windows occupy the greater portion of the screen. They appear as two empty rectangles bordered by several thin dark lines. A window is an area of the screen used by GEM to display particular kinds of information. If you think of the Logo display as being like a desktop, windows are like sheets of paper on its surface.

The Logo Dialogue window occupies the left side of the screen and is used to display text input. this window performs many of the same functions for the 520ST as BASIC text mode GRAPHICS 0 does for the Atari 400, 800, and XL/XE computers. It acts as a text screen where keyboard input and character output are displayed. As a result, program listing and many text commands often appear in this window.

The Graphics Display window occupies the right side of the screen and is used to display graphics output. This window performs many of the same functions for the 520ST as BASIC high-resolution graphics mode GRAPHICS 8 does for the 400/800/XL/XE computers. It acts as a drawing surface where high resolution graphics displays can be created.

Although the Logo Dialogue and Graphics Display windows have different purposes, they do have some similarities. For instance, both the Logo Dialogue and the Graphics Display windows can be changed to virtually any shape and can be moved to any position on the screen in much the same way as paper can be rearranged on a desk. In this way you can create a desktop arrangement that is tailored to your own particular needs. For example, your custom desktop could be created that consists primarily of graphics —leaving only a small text section for keyboard input.

Perhaps the most appealing aspect of the desktop modification process is its simplicity. All this flexibility can be controlled by using only the mouse. Before a window can be altered, it must be activated by moving the mouse cursor arrow to the center of the desired window and pressing the mouse's left button. If you look closely at the Logo Dialogue window you can see that, unlike the Graphics Display window, it is bordered by several arrows and dots. These indicated that the window is activated and prepared for modification.

Sometimes the information displayed by a window will not fit within its dimensions. You can use the arrows that appear on the sides of an active window for scrolling its contents into view. Position the mouse arrow over a scrolling arrow and press the mouse's left button. The direction of the scroll is indicated by the direction of the scrolling arrow.

You can alter the size of an active window by dragging the Size Box, located in the lower right corner of the window, to a new location. Do this by sliding the mouse arrow to this box and then pressing the mouse's left button. Then, while holding the button down, drag the Size Box around the screen. As you move the Size Box, you can see how the dimensions of the window change. When you have found a size to your liking, release the mouse button to complete the modification.

The active windows can be relocated by dragging their Move Bars to new locations. The Move Bar is the line at the top of the window that contains its title. Relocating a window is accomplished by sliding the arrow over the Move Bar and pressing the mouse's left button. Then, while holding the button down, drag the window to different locations. As you move the window, you are able to see how its position changes. When you have dragged the window to the desired position, release the mouse button to complete the modification.

Drop-Down Menus

Several drop-down menu options appear at the top of the Logo display. These options are grouped into five categories and are represented by the following words:

Desk File Run Edit Setting

Sliding the arrow over each of these words causes a different drop-down menu to be displayed. Because the options provided by these menus are numerous, I will not, at this time, attempt to explain how they all operate. Rather, I will progressively reveal the purpose of some of the significant ones. For now, it is important only that you know that these options exist.

The Logo Editor Window

Logo contains another text-oriented window in addition to the Logo Dialogue. It is called the Logo Editor, and, as the name suggests, is used for editing text. Use this window for correcting programs. Like many other windows, the Logo Editor

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(1) Byte, Nov. 1984, p. 308-310.

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is flexible and capable of the same desktop modification features. The Editor does not appear on the screen when Logo is first loaded into the computer. However, the Logo Editor must be displayed on the screen before being used. There are 2 ways of doing this. The first method is to open the drop-down menu marked 'Edit,' slide the arrow over the 'Workspace' option, and press the mouse's left button. The second is to type the instruction 'ED' and to press the [Return] key. Either one causes the Logo Editor window to appear in the lower left corner of the screen.

Turtle Graphics

Turtle graphics is undoubtedly the most well-known aspect of Logo. Much of its popularity results from the fact that it provides an efficient way to simplify the creation of intricate graphics displays. Turtle graphics was originally designed to teach children about computers. However, its interactive format and meaningful error messages are beneficial to programmers of all ages. The principal component of turtle graphics is, not surprisingly, "the turtle." The turtle appears as a light-colored arrow initially located in the center of the Graphics Display. It is a moveable graphics cursor that is used for creating displays. It acts like an ink pen that can be told by a Logo program to draw or erase lines. Many of the instructions that move the turtle are designed to be as self-explanatory as possible. As a result, they tend to have long descriptive names. Fortunately, many of these instructions have an abbreviated form. The turtle will perform immediately any of the following instructions that you enter into the computer.

The turtle can be set to 1 of 3 possible drawing modes: PENDOWN, PENUP, and PENERASE. PENDOWN (PD) causes the turtle to draw a line in its path of movement. In other words, when the turtle moves, it draws a line behind itself. It is important to note that the turtle is always automatically set to PENDOWN mode whenever Logo is loaded into the computer. PENUP (PU) lets you move the turtle without drawing. Finally, PENERASE (PE) causes the turtle to erase as it moves—in other words, to draw in the background color.

The 4 fundamental instructions that control the turtle's movement are named FORWARD #, BACKWARD #, RIGHT #, and LEFT #. In each case, you must replace the # sign with a number.

The FORWARD # instruction (FD) tells the turtle to advance in the direction in which it is currently pointing. The number that immediately follows this instruction determines the distance that the turtle will travel. For example, the command:

FORWARD 70 to FD 70

causes the turtle to advance 70 spaces. The BACKWARD # instruction (BK) functions in a similar manner, except that in this case, the turtle moves in the opposite direction.

The RIGHT # instruction (RT) tells the turtle to turn to the right. The number that immediately follows this instruction determines how many degrees the turtle turns. For example, the command:

RIGHT 90 or RT 90

causes the turtle to turn to the right by 90 degrees, or one fourth of a circle. The LEFT # instruction (LT) functions similarly except that the turtle turns to the left.

In Logo, as in any other computer language, instructions can be grouped together to produce programs that perform useful tasks. For instance, the following sequence draws a square:

```
FORWARD 40
RIGHT 90
FORWARD 40
RIGHT 90
FORWARD 40
RIGHT 90
FORWARD 40
```

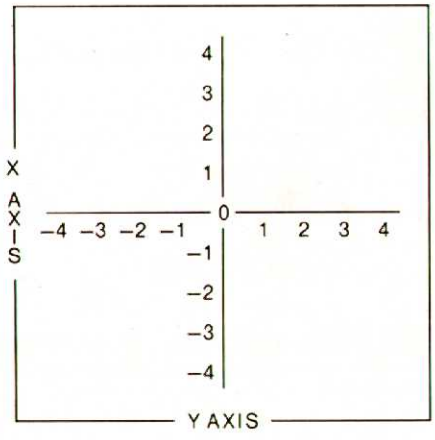
Additional Turtle Instructions

The turtle is by no means restricted to the sometimes cumbersome directional instructions. It can be instantly repositioned anywhere on the Graphics Display. In fact, the turtle can be used to create graphics in much the same manner as the PLOT and DRAWTO instructions do in the ATARI BASIC programming language. But, before these additional turtle commands can be explained, you must understand how the Graphics Display window organizes what it displays.

Although it initially appears to be empty and featureless, the Graphics Display is organized according to the system of Cartesian coordinates. This system assigns to every position within the Graphics Display a unique set of numerical values. These values function as a screen directory by allowing numerical information to be interpreted as particular positions within the Graphics Display. Below is a diagram of the layout of this system.

CARTESIAN COORDINATE SYSTEM

Graphics Display



The Cartesian coordinate system consists of an X and a Y axis. As indicated by the diagram above, both the X and Y axes have values of 0 in the center of the display. The X values increase towards the right of the display, whereas the Y values increase toward the top. Every dot in the Graphics Display is represented by a particular X value and a particular Y value. The X value identifies the dot's horizontal position, and the Y value identifies its vertical position. For example, if a dot were drawn 2 spaces right of and 3 spaces below the center of the Graphics Display, it would have an X value of 2 and a Y value of −3 (X=2, Y=−3).

Logo contains several instructions which use this coordinate system to guide the movement of the turtle. The first of these is called SETPOS [# #]. This instruction moves the turtle to a specified location on the Graphics Display. For example, the sequence

SETPOS [7 14]

slides the turtle to position (X=7, Y=14). The next member of this group is the HOME instruction. This command simply moves the turtle to its starting position (X=0, Y=0).

Logo has instructions which move the turtle parallel to the X or Y axes. For example, the command:

SETX 10

moves the turtle horizontally until it has an X value of 10. The SETY # instruction functions in the same manner except, in this case, the turtle moves vertically.

The SETH # instruction points the turtle to a specified compass heading. Any one of a possible 360 (0-359) different headings can be used in this instruction. A heading of 0 indicated the top of the display, whereas a heading of 90 indicates the three o'clock position. For example, the command:

SETH 0

points the turtle to the top of the screen.

The WRAP instruction restricts the turtle's movement to the surface of the Graphics Display. Should the turtle attempt to move beyond the edge of this window, it immediately reappears on the opposite side. The WINDOW instruction reverses the effects of the WRAP instruction by allowing the turtle to move freely beyond the confines of the Graphics Display.

Clearing Windows

Logo contains several commands for clearing windows. Probably the most frequently used of these is the CS (Clear Screen) instruction. This instruction, as its name implies, clears the Graphics Display window, then resets the turtle to its original position. The second member of this group, the CLEAN instruction, also clears the Graphics Display window, but does not alter the position of the turtle. The third member of this group, the CT (Clear Text) instruction, clears the Logo Dialogue window without erasing its contents. As mentioned earlier, the Logo Dialogue window displays programs, procedures, or any other items that require text output, in much the same way as GRAPHICS 0 does for the ATARI 8 bit computers. The CT instruction merely clears the text screen, leaving all other items intact.

Erasing and Listing

Logo contains several instructions which erase different items. The first of these, the ERALL instruction, erases all that is stored in the Logo Dialogue and Logo Editor windows. It performs the same function as the NEW instruction does in BASIC language. The ERPS instruction erases all procedures, and the ERNS erases all variables in a similar manner.

Unlike ATARI BASIC language, there are several ways of listing programs in Logo. In fact, a program can be displayed on either the Logo Dialogue or the Logo Editor window. For example, the POALL instruction lists on the Logo Dialogue window all the Logo procedures that are stored in the computer. A procedure is a sequence of Logo commands organized so that you can activate it with a single word that you determine. The POALL command performs the same role in Logo as the LIST instruction does in BASIC language. The second member of this group, the POTS instruction, lists the names of all the Logo procedures held in the computer.

All Logo procedures are automatically listed on the Logo Editor window whenever it is opened through the Workspace option. This is done by opening the drop-down menu marked Edit, sliding the arrow over the Workspace option, and pressing the mouse's left button.

Procedures in Logo

Logo attempts to simplify programming by allowing programs to be reduced to a collection of procedures. A procedure is a group of instructions that perform a particular task. For example, one can be written that draws a square on the Graphics Display, or calculates the sum of a list of numbers. These procedures can be stored on disk and later recalled whenever they are required.

There are 4 steps to writing a procedure in Logo. The first is to decide upon a name for the procedure. Although any name using only upper-case letters is acceptable, because it acts a label, it should reflect the procedure's purpose. The second step is to declare the procedure. This is done by appending its name to the instruction TO. For example, the command:

TO SQUARE

declares a procedure named SQUARE.

The third step is to write the list of instructions which comprise the main portion of your procedure. The final step is to close this list of instructions by typing the 'END' instruction at the bottom. The listing below is an example of a procedure which draws a square:

```
TO SQUARE
FORWARD 40
RIGHT 90
FORWARD 40
RIGHT 90
FORWARD 40
RIGHT 90
FORWARD 40
END
```

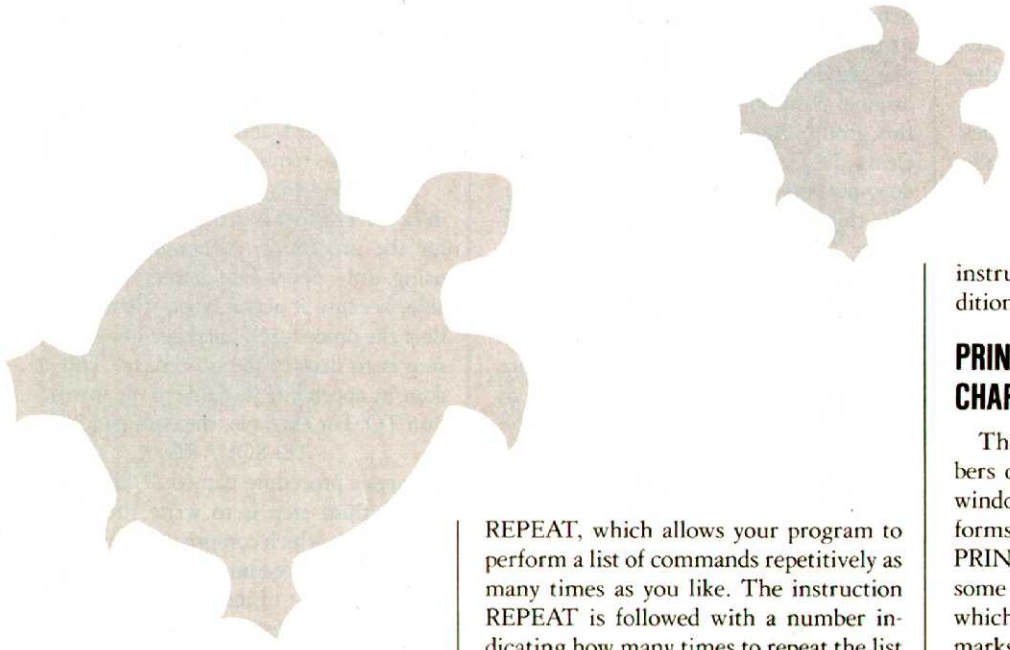
Once a procedure is written, you can use it as many times as you like by simply typing its name. For example, the procedure listed above draws a square that is 40 spaces in length every time you type 'SQUARE.'

Unfortunately, this procedure is unable to draw squares of different sizes and is thus limited in its ability to be used in a wide variety of circumstances. Fortunately, Logo has the capability of creating more generic procedures through the use of variables.

Variables

As you are probably aware, a variable is a storage location that holds values that the computer uses to perform different tasks. As the name implies, the contents of these variables can change during the course of a program's operation.

In Logo, variables must be identified to the computer before they are used or before their contents are changed. This is done by appending the variable's name and its contents to the end of the MAKE



instruction. For example, the command:

MAKE "TOP 15

identifies a variable named TOP that holds a value of 15.

As mentioned earlier, variables can be incorporated into procedures to increase flexibility. This is done by appending a ':' and the variable's name to the end of the procedure's declaration statement and to every other instruction in the procedure which requires this variable. If, for example, you need a procedure that draws squares of different sizes, you might enter the following listing:

```
TO SQUARE :LEN
FORWARD :LEN
RIGHT 90
FORWARD :LEN
RIGHT 90
FORWARD :LEN
RIGHT 90
FORWARD :LEN
END
```

Notice that the colon (:) tells the computer that a variable is to follow. To call this procedure, type in its name and a value for the variable LEN. For example, to draw a square with sides that are 25 units in length, type SQUARE 25.

Other Important Instructions

Even with procedures, it may seem that a considerable amount of typing is required to create intricate displays with turtle graphics; however, this is not the case. Logo has an instruction, called REPEAT, which allows your program to perform a list of commands repetitively as many times as you like. The instruction REPEAT is followed with a number indicating how many times to repeat the list of commands. Finally, enter the list of instructions you intend to repeat, enclosed in square brackets to indicate their purpose.

The capability provided by the REPEAT instruction lets you create designs, which require the repetition of several patterns, with a minimum of programming. For example, the 7 instructions we used to draw a square earlier in this article can be reduced to a single REPEAT sequence as displayed below.

REPEAT 4 [FD 40 RT 90]

The list of instructions consisting of [FD 40 RT 90] tells the turtle to advance 40 spaces and turn 90 degrees to the right. In order to draw the square, the REPEAT instruction causes this process to be repeated 4 times.

Another command of considerable importance is the IF instruction. It functions in a manner similar to its counterpart in the BASIC language. This instruction allows a particular task to be performed only if a specified condition is true. For example, suppose you wish to advance the turtle 50 spaces only in the event that variable :A equals 1. This would be written in a Logo program as:

```
IF    :A = 1    [FORWARD 50]
↑       ↑              ↑
Word  Condition   Set of Instructions
IF
```

Notice that the word IF appears at the beginning of the line and is followed in turn by a conditon (:A=1), and a set of instructions that are performed if the condition is true.

PRINT—ASCII and CHARACTER Instructions

The PRINT instruction displays numbers or characters on the Logo Dialogue window. As you may have guessed, it performs a similar role to that of BASIC's PRINT instruction. However, there are some differences, the most significant of which is the absence of dual quotation marks (" "). For example, if you want to print ATARI, you type:

PRINT "ATARI

Similarly, if you want to print 520, you type:

PRINT 520

The PRINT instruction is also able to display variables. Another way to print 520 is to type:

```
MAKE "NU 520
PRINT :NU
```

The PRINT instruction has a number of variations, the first of which is the ASCII instruction. The word 'ASCII' is an acronym for American Standard Code of Information Interchange. ASCII is a numbering system in which every character is given a particular numerical value. The ASCII instruction returns the ASCII value which corresponds to a character input. For example, the command:

ASCII "A

returns the ASCII value for the letter 'A' which is 65.

The CHAR instruction performs the opposite operation. It returns the character which corresponds to a particular ASCII input. For example, the command:

CHAR 65

returns the character A.

.EXAMINE and .DEPOSIT

The .EXAMINE instruction displays the contents of a specified memory location. It is Logo's version of BASIC's PEEK instruction. For example, the command

.EXAMINE 10000

displays whatever value is stored into location 10000.

The .DEPOSIT instruction changes the contents of a specified memory location. It is Logo's version of BASIC's POKE instruction. For example, the command

.DEPOSIT 10000 1

stores the value 1 into location 10000.

Loading and Saving Programs

Saving is the process of storing on disk all the Logo procedures currently in memory. Once this is done, you may turn the computer off without losing any of what you've entered. You can re-use these procedures later by LOADing them back into the machine.

To save your work, place an initialized disk in the disk drive, then slide the mouse arrow over the drop-down menu marked File. This causes a menu containing several options to appear. Slide the mouse arrow over the option marked Save, and press the mouse's left button. This results in a window entitled Item Selector to be displayed in the center of the screen. To save your work, type in a filename and press the [Return] key. This causes the disk drive to be activated and your file to be saved.

To load your work, place the disk that holds the file you wish to load, into the disk drive. Then slide the mouse arrow over the drop-down menu labeled File. As before, a menu containing several options appears. However, this time, slide the mouse arrow over the option labeled Load, and press the mouse's left button. This causes the window entitled Item Selector to reappear. The file directory is located in the center of the Item Selector. It contains the names of all the Logo files which appear on the disk. To load, slide the mouse arrow over a desired file, and press the mouse's left button twice in rapid succession. This causes the disk drive to be activated and the file to be loaded into the computer.

The Demo Programs

I have included 4 programs/procedures with this article to demonstrate some practical applications of Logo. The first of these is called POL for polygon. It is designed to draw a shape which is defined by 2 input values. The first input value specifies the number of sides the shape will possess whereas the second input value specifies its size. For example, the command:

POL 5 70

draws a shape with 5 sides that are each 70 spaces in length.

The second program is called DARKSUN. It draws a dark sun-shaped figure on a light background. The radius of the sun is specified by an input value. For example, the command:

DARKSUN 300

draws a sun with a radius of 300 spaces.

The third program is called STAR. It draws a light colored star on a dark background. This routine does not have an input value and can be executed by simply typing:

STAR

The fourth and final program is called THREED. It draws a couple of three dimension figures and can be executed by typing:

THREED

Listing 1

```
NOTE: WHEN TYPING THESE IN, DO NOT TYPE MATERIAL IN ANGLE
BRACKETS (<>)

<Program 1: POLYGON>
TO POL :NSIDES :SIZE  ;POLYGON
HT
REPEAT :NSIDES [FD :SIZE RT (360 / :NSIDES)]
END

<Program 2: DARKSUN>
TO DARKSUN :SIZE
HT
REPEAT 90 [FD :SIZE BK :SIZE LT 4]
REPEAT 72 [FD :SIZE BK :SIZE LT 5]
END

<Program 3: STAR>
TO STAR
PD
HT
MAKE "YP 170
SETX -150
SETY :YP
RT 90
REPEAT 341 [MAKE "YP :YP - 1 FD 300 SETY :YP BK 300]
SETX 0
SETY 0
PE
REPEAT 90 [FD 300 BK 300 LT 4]
REPEAT 72 [FD 300 BK 300 LT 5]
END

<program 4: THREED>
TO THREED
MAKE "DEG 118
MAKE "BOX 60
MAKE "SIDE 0
PU
SETPOS [-25 75]
PD
REPEAT :BOX [FD :SIDE LT :DEG MAKE "SIDE :SIDE + 2]
MAKE "DEG :DEG + 1
MAKE "SIDE 0
REPEAT :BOX [FD :SIDE LT :DEG MAKE "SIDE :SIDE + 2]
MAKE "SIDE 0
MAKE "DEG 118
PU
SETPOS [80 -80]
PD
REPEAT :BOX [FD :SIDE RT :DEG MAKE "SIDE :SIDE + 2]
MAKE "DEG :DEG + 1
MAKE "SIDE 0
REPEAT :BOX [FD :SIDE RT :DEG MAKE "SIDE :SIDE + 2]
END
```

ST GRAPHIC ADVENTURES

CONTINUED FROM PAGE 42

you daren't relax for a moment . . .

You begin at the south end of Central Park in Manhattan at the northern end of the area you're allowed to roam—Fifth Avenue, approximately from 42nd Street north to the Park. From there, the game mostly involves walking around and meeting fellow Underground members, from whom you obtain literary quotes and essential materials, and then passing same on to other conspirators. The trick, of course, comes in knowing where to get what, and who needs to hear which quotations. Authors quoted or mentioned in the game include Shakespeare, God (the Bible), Machiavelli, Plato, Thoreau, and William Blake. This is how the Underground keeps the literary tradition alive. As you explore this forbidding futuristic world, you obtain many valuable clues from the people you meet, and you can't afford to ignore any of them.

Fahrenheit 451 is a fair, but by no means easy adventure. There are a few simply encoded clues in the rule book, which cleverly masquerades as a guidebook for new members of the Underground. The element of surprise, skillfully employed by the designers, adds a lot to the game, and I'm not about to spoil it by revealing any more. You'll just have to buy it and find out for yourself.

Courtroom Capers

If your secret fantasy is to be an invincible, if somewhat overweight, attorney with a steely glare, then Perry Mason: The Case of the Mandarin Murderer may be the answer to your prayers. Even if you're just a fan of all those great old TV shows with Raymond Burr and the great supporting cast, still as prevalent on the airwaves as I Love Lucy reruns, you're bound to like this game.

A brand-new release from Telarium, The Case of the Mandarin Murderer is about as different from a standard adventure game as it can be and still belong to the genre. It's not even similar to the Infocom detective-type adventures such as Witness. In most adventure games, you move around a lot, exploring territory and seeking objects such as treasure. This one, however, sticks quite closely to the action found in a typical episode of the TV show; a brief prologue, followed by an extended courtroom battle.

The plot is much too complicated to go into; of course, there's been a murder and there's a host of likely suspects. Your client is the defendant, and to win, you must get her off. If you're really good, you'll also unmask the real murderer. As the inimitable courtroom warrior, you have a formidable battery of legal and theatrical weapons upon which to call. Paul Drake, your private investigator, is available to seek out vital evidence, and Della Street, your trusty right hand (and secretary) is also a big help. You're the star, though, and the real work is up to you.

As prosecuting attorney Hamilton Burger calls each witness to the stand, you listen to the questioning and object when necessary. Among possible grounds for objection are irrelevancy, hearsay, leading, opinion, unqualified, and browbeating; all are well-explained in the manual. In fact, the manual even includes a sample multiple choice "bar exam" with a hypothetical courtroom exchange, with answers and explanations. Then comes your turn—the cross-examination. To aid you, the manual includes a clever foldout "Chinese menu." You choose an optional interrogative pronoun (e.g. when) from column A, a verb (e.g. did) from column B, and so on. Also, you can introduce evidence and show it to witnesses to try for a reaction. Last, but by no means least, you can unleash the infamous Perry Mason sneer on anyone you like, as well as smile at, curse, or whirl towards someone, and so on. There really isn't a whole lot in a real episode of Perry Mason that isn't in this game!

So, if you're a dyed-in-the-wool Perry Mason fan, it's safe to say you'll love this game, even if you've never played an adventure game. If you liked the Infocom detective-type adventures, you'll likely also enjoy this one. Or if you're tired of running around looking for lost treasure, give it a try. If, however, your idea of heaven is Zork MCXXVIII, well . . .

Features of both games include an extensive vocabulary, the ability to save ten versions of a game in progress on a disk (you can format the disk if necessary), and as mentioned, sound and graphics. The format for pictures is an unusual one, with many filling only a third of the picture area, which itself is a third the size of the screen, horizontally at the top or vertically at either side. In this way, different small pictures are combined to create many more different-looking scenes than would be available were each picture full-sized. The pictures are attractive and colorful, though not taking full advantage of the ST's resolution, and as such enhance game play. However, the loading time for each new scene's pictures slows down the game considerably. Fortunately, a PICTURESOFF command providing for text-only adventuring speeds things up quite a bit.

If these two fine games are any indication, we have a lot of good things to look forward to from Spinnaker. In development for the ST and due out by early 1986 are several more games from the Telarium series, two from the Windham Classics series of adventure games based on literary classics for young people, and the Homework Helper educational series. Looks like Spinnaker Software and the Atari 520ST make an unbeatable combination!

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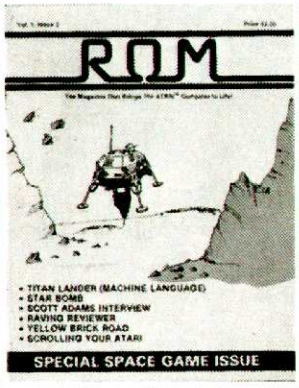

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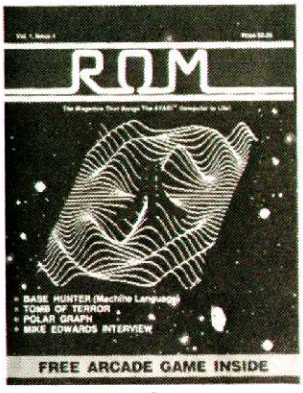

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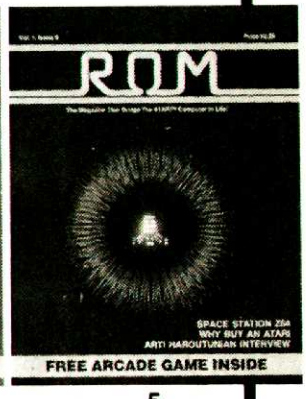

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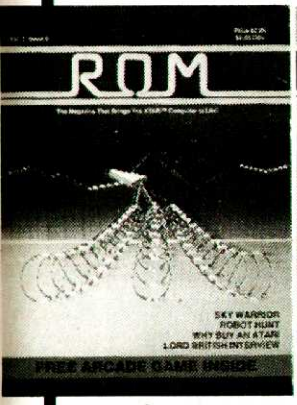

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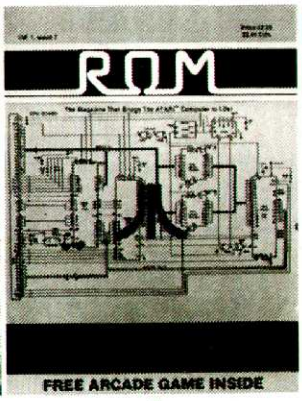

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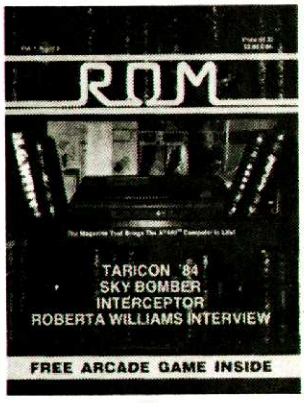

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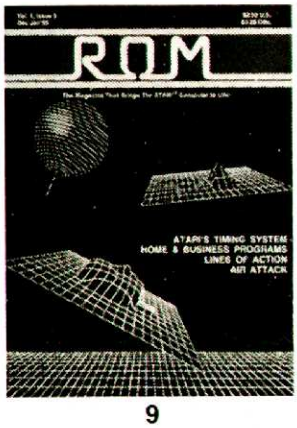

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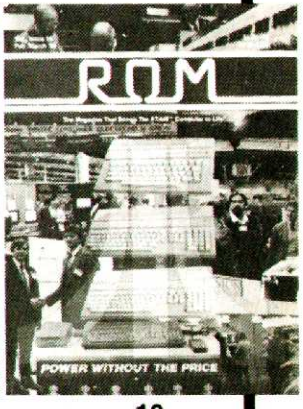

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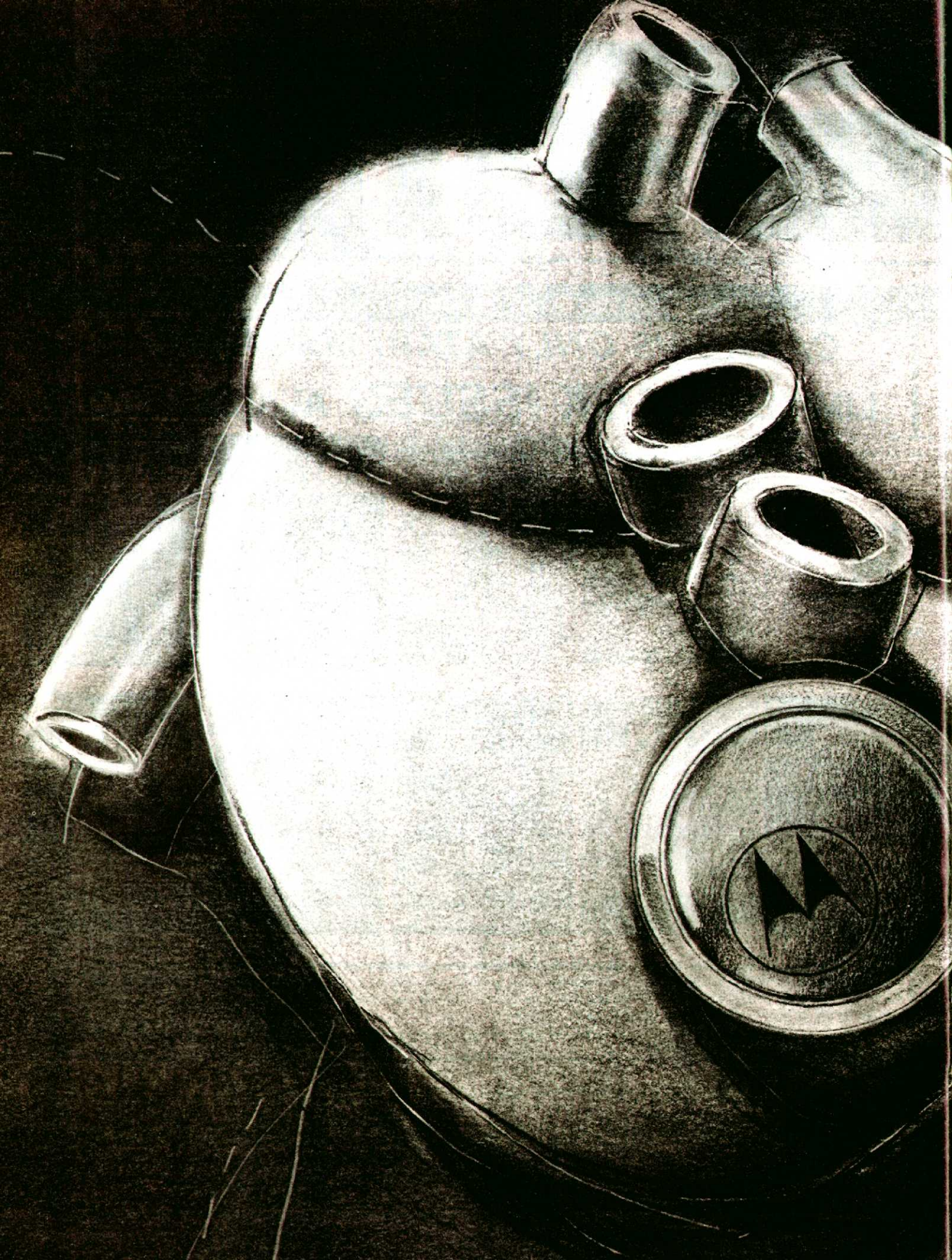
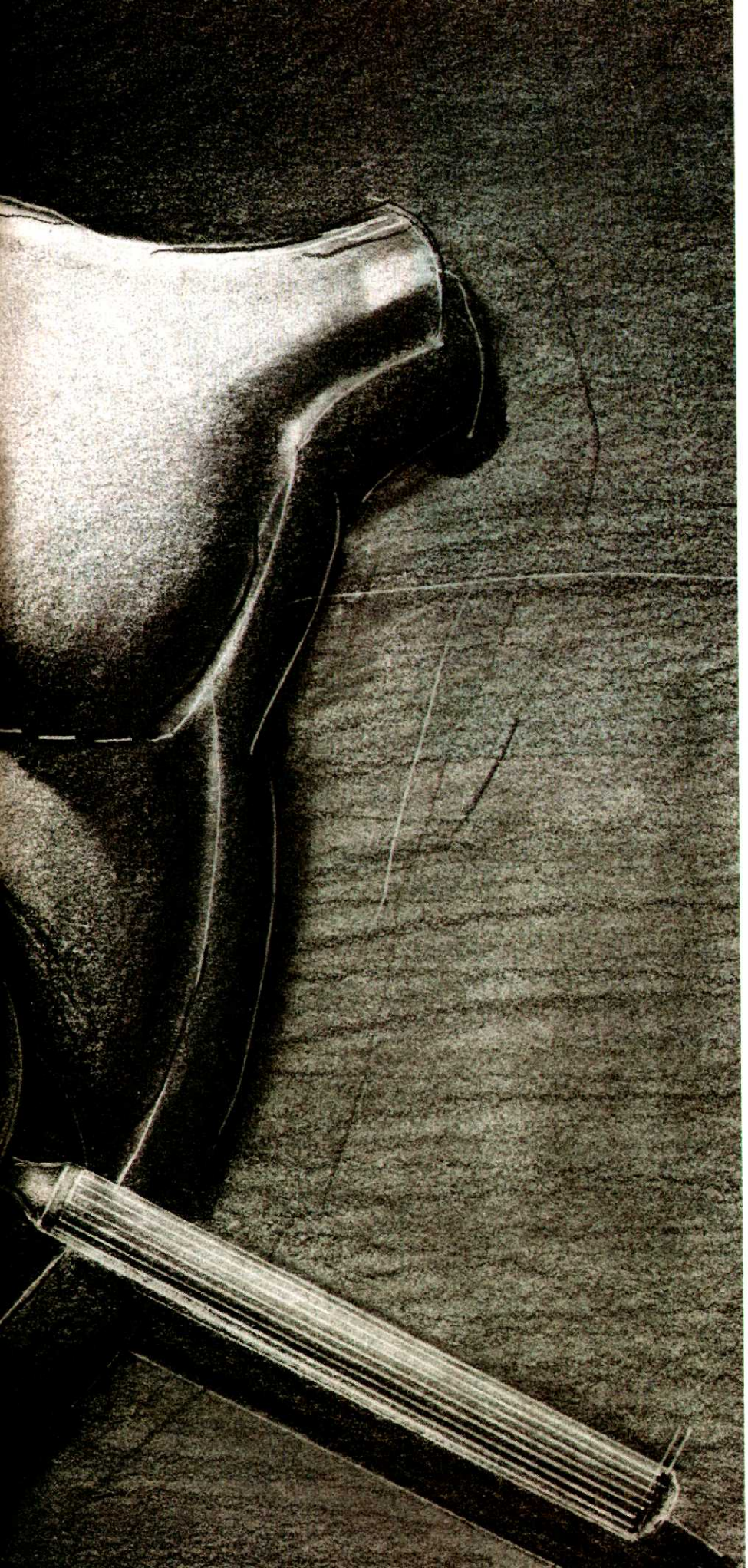




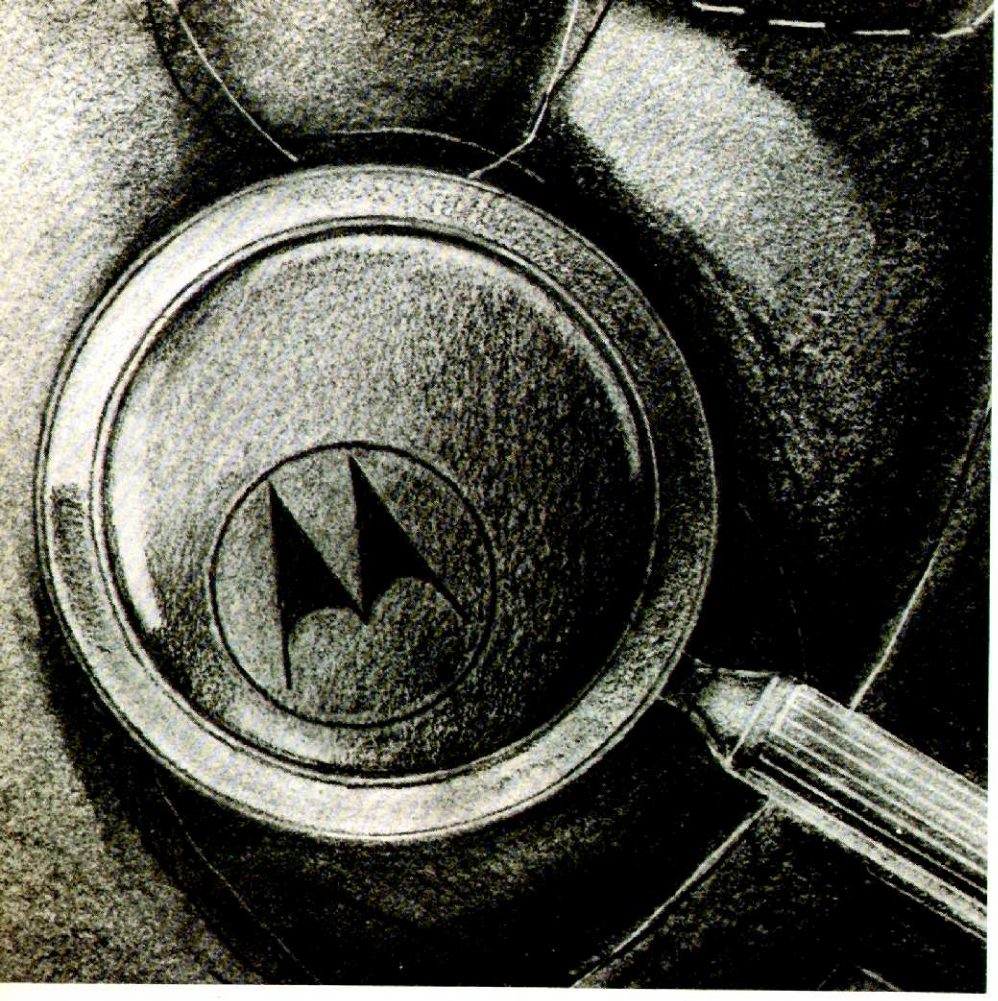
WARD SCHUMAKER

The 68000 Microprocessor

The introduction of the Atari 520ST marks the beginning of a new era in microcomputing. Its combination of high performance and low price makes it clearly the industry leader. The heart of this new super-computer is the 68000 microprocessor, released by Motorola in 1979. In design, the 68000 is a 16 bit chip with 32 bit internal architecture, hence the name ST which stands for Sixteen/Thirty-two. It contains a 23 line address bus and a 16 line data bus. The processor is capable of addressing 16 megabytes of memory, supporting multitasking, and multiprocessing. And it's fast—very fast. The version of the 68000 used in the 520ST operates at 8 MHz! Best of all, the 68000 is relatively easy to program. The assembly language contains only 56 basic instructions. Most of these use data in chunks of 8 bits (byte), 16 bits (word),

Our technical editor presents a brief introduction to the 68000 microprocessor used in the Atari 520ST. To get the most out of this article, you should be somewhat familiar with the 6502 microprocessor used in earlier Atari computers.

by Bob Cockroft



The combination of high performance and low price makes the Atari 520St the industry leader. The heart of the new supercomputer is the 68000 microprocessor...

or 32 bits (long word) at a time. In addition, the 68000 interprets peripheral devices as memory locations. As a result, the types of instructions that transfer data in and out of memory are the same as those that transfer information to and from peripheral devices. The 68000 also has a special 'trace mode' used for debugging programs.

Internal Registers

The 68000 contains 17 general purpose registers that are 32 bits wide, a 32 bit program counter, and a 16 bit status register. Of the 17 "general purpose" registers, 8 are data registers, 7 are address registers, and 2 are stack pointers. See Figure 1.

Data Registers

Data registers (D0-D7) are high-speed RAM (random-access memory) locations within the processor that are employed as temporary storage slots for data. Although the data registers are 32 bits long, they can also be accessed as 8 bit (byte), 16 bit (word), and 32 bit (long word) registers. In other words, the 68000 can use part of a data register without affecting the remainder. When accessed as a byte, only the lowest (rightmost) 8 bits are used; bits 8-31 are unaffected. When accessed as a word, only the lowest 16 bits are used; bits 16-31 are unaffected. When accessed as a long word, all 32 bits are used. This capability of moving four bytes at a time greatly increases program execution speed while reducing the number of instructions required by a program. Each assembly langauge instruction tells the 68000 whether to access data as a byte, word, or long word. (Note: Not all instructions use data registers.) This is done by appending the letter ".B", ".W", or ".L" to the end of the name of an instruction. These letters represent byte, word, and long word, respectively. As a result, if an instruction altered the contents of a data register and ended with a ".B", it would affect only the first 8 bits.

Each of the instructions in Figure 2 moves data from data register 0 to data register 1. In each case, D0 is the source operand (from which data is moved), and D1 is the destination operand (to which the data is moved).

Address Registers

The address registers (A0-A7) are high-speed RAM locations within the processor that tell the 68000 where in memory to receive or to send information. If your program is to access a particular memory location very often, it's convenient to place that address in an address register and simply refer to the register. For example, if register A1 contains $500 (the $ sign indicates a hexadecimal number) the instruction:

MOVE.L(A1),A0

would move four bytes starting at memory location $500 to address register 0. The parentheses indicate an indirect mode of addressing, and tell the 68000 to take the data from the address contained in that register, rather than directly from the register.

Modes of Operation

The 68000 has 2 modes of operation—supervisor mode and user mode, used respectively for system control and for normal operations. Although all instructions can be executed in supervisor mode,

there are a few 'privileged' instructions that cannot be executed in user mode. This prevents a user program from corrupting systems software or hardware registers whose state must be carefully controlled. Supervisor mode and user mode each has its own stack. Address register 7 (A7) is used as a stack pointer for either mode, depending on which you're in, of course. Internally, A7 is actually two registers so you can switch back and forth between modes without losing track of the stack in either.

The Program Counter

Like most microprocessors, the 68000 exeuctes a program by fetching an instruction from memory, executing it, and then fetching the next instruction. Under normal circumstances, this process is repeated continuously until the program ends. The program counter provides the 68000 with the address of the next instruction. The program counter is 32 bits long, although only the low 24 bits are used. Even with the reduced size, the program counter can still access 16 megabytes (2 to the 24th power).

The Status Register

The status register is an internal 16 bit memory location which is used to keep track of the effects that instructions have on the 'status' of the 68000. Each individual bit within this register is called a flag, and each flag indicates the presence or absence of a certain condition. The status register is divided into 2 bytes—the

Figure 1

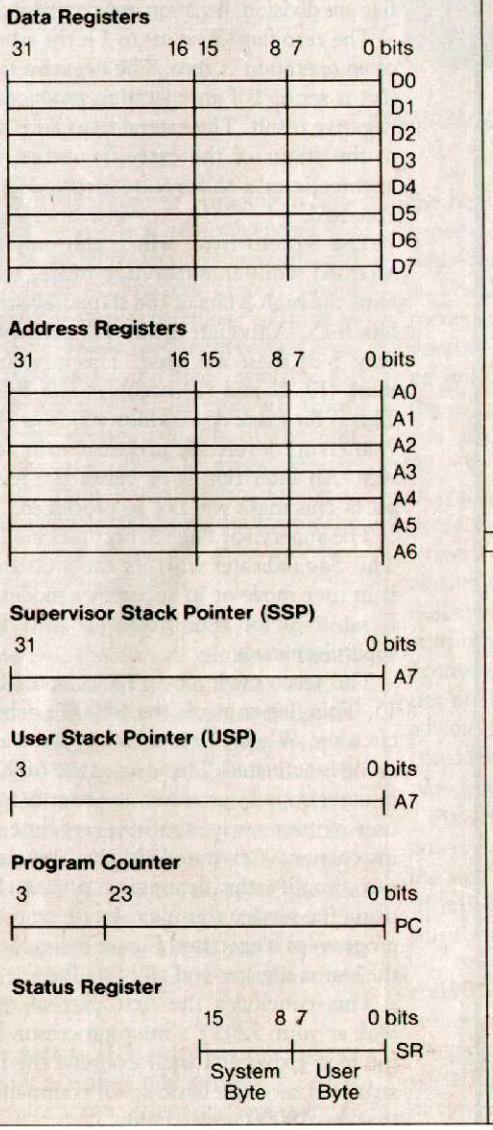
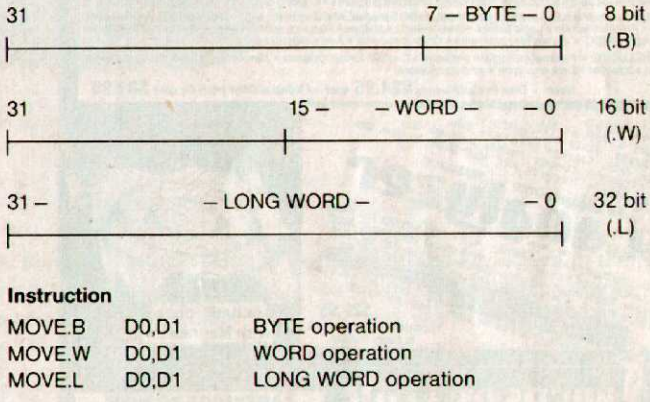


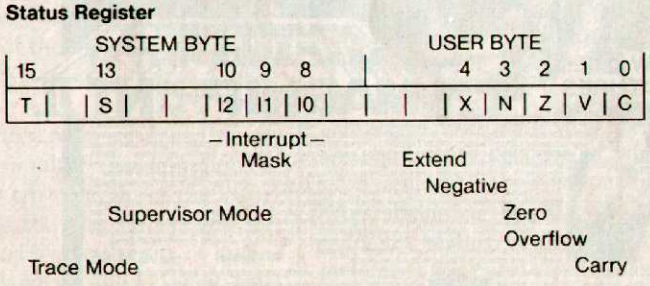
Figure 2

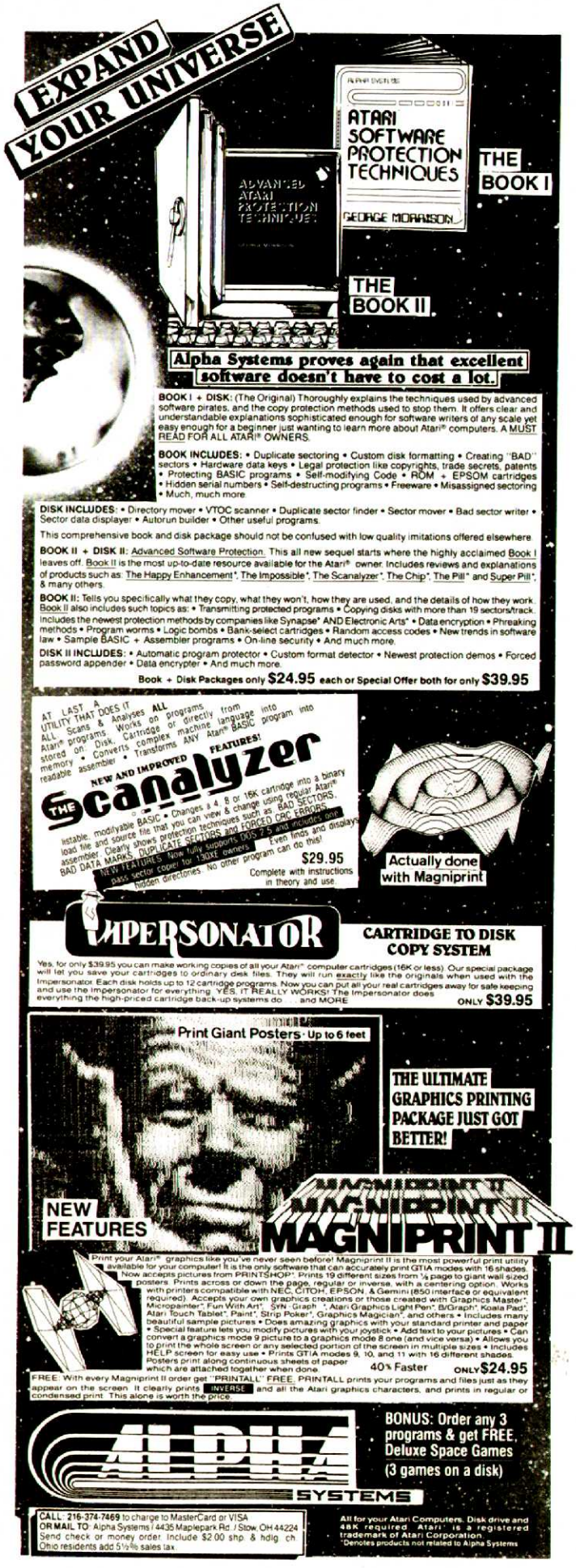


Instruction

MOVE.B	D0,D1	BYTE operation
MOVE.W	D0,D1	WORD operation
MOVE.L	D0,D1	LONG WORD operation

Figure 3





user byte, and the system byte.

The user byte contains many flags that should be familiar to 6502 assembly language programmers. The first of these is called the carry flag (C). When an addition produces a carry or a subtraction causes a borrow, this flag is set to 1. (Note: This differs from the 6502, in which a borrow during subtraction sets the carry flag to 0.) Also, the carry flag can hold a bit that has been rotated or shifted out of a data register.

The overflow flag (V) is set to 1 if the result of an addition or subtraction exceeds the operand's range. It is also set to 1 if the most significant bit of an operand is changed by an arithmetic shift operation. Other operations that may affect this flag are division, negation and comparison.

The zero flag (Z) is set to 1 if the result of an operation is zero. The negative flag (N) is set to 1 if an operation produces a negative result. The extend flag (X) is set to the status of the carry flag when an arithmetic or a shift-rotate instruction is executed.

The System Byte, which can only be accessed while in supervisor mode, contains the high 8 bits of the status register; bits 8-15. Although 8 bits are available, only 5 of these are used. The interrupt mask (I0, I1 and I2) occupies bits 8-10. This 3 bit mask determines which of the 7 interrupt levels the processor will service. An interrupt at or below the level set by this mask will not be processed.

The supervisor flag (S) occupies bit 13. This flag indicates whether the processor is in user mode or in supervisor mode. It is set to 0 for user mode, or to 1 for supervisor mode.

The trace mode flag (T) occupies bit 15. This flag controls the 68000's debug circuitry. When (T) is set to 1, the trace mode is activated. This causes the 68000 to enter supervisor mode and to trap to a user-written service routine every time an instruction is executed. In this way you can simplify the debugging process by using the service routine to examine your program as it executes. Figure 3 diagrams the status register and all of its flags.

This concludes the first part of our look at your 520ST's microprocessor. In the next Explorer I shall examine the instruction set—the basic set of commands that the 68000 understands.

A Mind Forever Voyaging

Reviewed by David Duberman

"A Mind Forever Voyaging" is Infocom's first text adventure for sixteen-bit computers only, and over 260,000 characters of text (more than twice that in "Hitchhiker's Guide to the Galaxy") confirm this necessary evil. Were the game to be made available for the Atari 400, 800, XL and XE Computers, the limited capacity of the first Atari disk drive, the 810, would necessitate placing this much information on at least three disk sides (plus a fourth for the actual program), resulting in an awkward game-playing experience.

The game is quite unique. Please bear in mind that this sort of game is difficult to review without giving away some of the plot, and of course uncovering the plot is a large part of the enjoyment of interactive fiction, as Infocom calls it. In fact, A Mind Forever Voyaging (AMFV) is much more information-intensive and less puzzle-solving oriented than any previous offerings from the company. So you may just want to skip this review, buy the game, and discover its many secrets at your own pace. The curious, however, should read on.

The year is 2031, artifical intelligence is finally a reality, and you are it. After many false starts, scientists have come to the realization that true machine intelligence can only be nurtured from a "blank slate" beginning, much as a human being's is. Thanks to recent technological achievements, the scientists have been able to develop such a "learning machine" with an uncanny degree of verisimilitude. As the game begins, your inventors disabuse you of the notion that you are a normal 20-year-old male named Perry Simm—in reality you are an 11-year-old computer project named Prism (Perry Simm—Prism), and are informed of such rather abruptly. Apparently the shock wears off quickly, for you soon agree to cooperate in research for the Plan, a "combining of the economic freedom and strong moral values of the 1950's with the technological advancements of the 21st century" under consideration by world political and business leaders.

As the world's most advanced computer, you can simulate a small portion of the world after ten years under the Plan. In order to test the Plan's effectiveness, you simulate and live in the city of Rockvil, South Dakota of 2041. When you enter the simulation, it is as if you are a real person—you can go anywhere within the city limits by various modes of transportation (the subways are free), visit any of the city's buildings (of which there are many), and interact with the citizens. While in the simulation you can turn on a recorder to allow others in the real world to later share your experiences. Those in the real world who need to contact you still may, and you can abort the simulation at any time.

When not in the simulation, you have four other modes of operation. Communications mode allows you to view and communicate with humans in various parts of the Prism project building complex, including your "inventor," Dr. Perelman, an all-too-human computer scientist. Additionally you have direct access to the World News Network Feed, a compilation of more-or-less relevant material. Library mode, a simple menu-driven file retrieval system, provides you with such resources as access to Perelman's personal file section, a recording of messages to you, and other goodies. Interface mode gives you control over various remote devices, including the Rockvil traffic computer, the heating, cooling, and ventilating systems of the Prism complex, and others. Devices are added to your control as the story proceeds. Finally, sleep mode lets you kill six hours. I haven't quite figured this one out yet.

When AMFV begins, you have access

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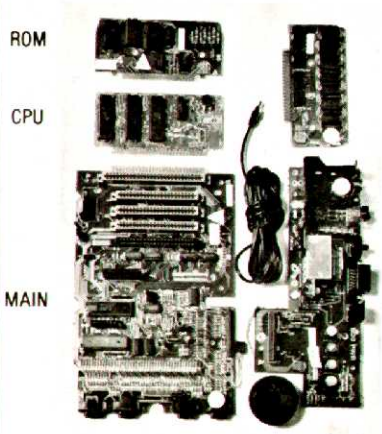

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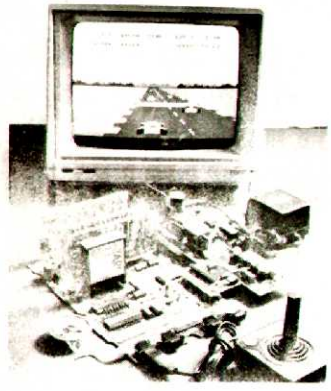

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to all modes but the simulation, which gives you some time to explore the documents in the library and check out the other modes. Soon Perelman authorizes you to enter the simulation and gives you an assignment. You are to explore the Rockvil of 2041 and experience a number of everyday events while recording so that an analysis and determination of effectiveness of the Plan can be made. These include attending a court in session, seeing a movie, talking to a public official, and visiting your own home. None of these is by any means difficult to achieve, but there are many locations in Rockvil and the goals are spread out, so it takes time. Once you complete this relatively simple assignment—by the way, mapping is essential, even though one is included with the game material—the game really starts to get interesting. And I refuse to give any more of the plot away. Well—suffice to say that the new data enables further extrapolation . . .

Infocom opted to use the GEM mouse-based operating system solely for game saves and restorals, which is quite convenient. Otherwise, gameplay is strictly keyboard oriented. The basic game commands are familiar to Infocom aficionados, with one very handy addition, namely OOPS. If you type, for instance, GET THE BETR AND THE AXOLOTL, and the program doesn't recognize the word BETR, you can simply type OOPS BEER and voila, the program understands and carries out the original command—saves lots of retyping.

Although author Steven Meretzky (Planetfall, Sorcerer) seems to have lost some of his sense of humor here—the narrative style is a bit dry—he can still be credited with creating a facinating new computer entertainment. Infocom ranks AMFV at the Advanced level of difficulty, so it should give even experienced adventurers a good number of hours of fun. Keep in mind, however, the earlier caveat—if you love nothing more than one mind-bending puzzle after another, this may not be the game for you. Though there are puzzles here, they are fewer and more complex—you need as much information as possible on which to act. Infocom's entry into the realm of "serious science fiction" is a creditable one—text adventure junkies, rejoice!

Infocom, Inc., 55 Wheeler Street, Cambridge, MA 02138

CONTINUED FROM PAGE 36
impressed by the response speed, thanks to the ST's super-fast floppy drives. Three games—no waiting! HITCHHIKER'S GUIDE, ZORK I, WISHBRINGER, and the others have retail prices between $39.95 and $49.95 (depending on the level of difficulty) and come from Infocom, 55 Wheeler Street, Cambridge, MA 02138. Telephone (617) 492-1031.

PC/INTERCOMM is a terminal program with many features for modem users. This package is Mark of the Unicorn's second release for the ST following MINCE. Based on their popular program for the IBM PC, PC/INTERCOMM is compatible with most error-checking protocols including XMODEM and Kermit, with many menu-driven selections that permit the ST to communicate with almost any computer system over the telephone while capturing and/or printing data. PC/INTERCOMM even lets you save the configurations for each computer you speak with. Programmable function keys, on-screen help, status line with real-time clock, and a host of additional functions. Mark of the Unicorn, 222 Third Street, Cambridge, MA 02142, phone (617) 576-2760, list price $124.95.

M-DISK gives the ST a RAMdisk for even faster access to data. The RAMdisk sets up as drive C in memory, which appears to the user as another floppy disk. You can choose the size of the RAMdisk desired. Programs and data can be stored and retrieved from the RAMdisk, especially handy for telecomputing and other disk-intensive activities. M-DISK, $34.95, is available from Michtron (see MUDPIES above for company information).

HIPPO COMPUTER ALMANAC is an amazing compendium of facts that are retrieved using simple questions in plain English. A megabyte of text information has been compressed onto a single floppy disk, including information on geography, history, conversion factors, and much more. Not jsut a party program, the HIPPO COMPUTER ALMANAC is appropriate for students and for anyone who is interested in exploring the world through their Atari ST personal computer system. HIPPO COMPUTER ALMANAC is sold directly by Hippopotamus Software Inc., 985 University Ave., Suite #12, Los Gatos, CA 95030, phone (408) 395-3190, for $34.95 retail list.

NEWS

ST Consumer Notes

What do consumers think of the ST? Here is a note from Steven Bobulsky that was posted on CompuServe: "Well, I've had my ST for a month now, and was beginning to think that I might have made an error in not waiting for and buying an Amiga. Ah, victim of HYPE . . . I had a couple of hours with the Amiga today, and while the Amiga was good: nice graphics and all . . . It sure was not worth the price difference between it and a similar ST. I thought the INTUITION system screens were 'messy' to look at; GEM on the ST is much more pleasant to look at and work with. The monitor output on the ST seems cleaner to me. The fabled Mandrill picture on the Amiga was impressive, but the flicker was distracting. All of the sudden, this Atari ST looks awfully nice to me. I think I'll take the extra $1100 I just realized I saved and buy some nice software (what the heck; I can wait) and maybe a nice MIDI instrument to play with the ST. Nice work, Jack and Atari! I won't havta sleep with an inferiority complex."

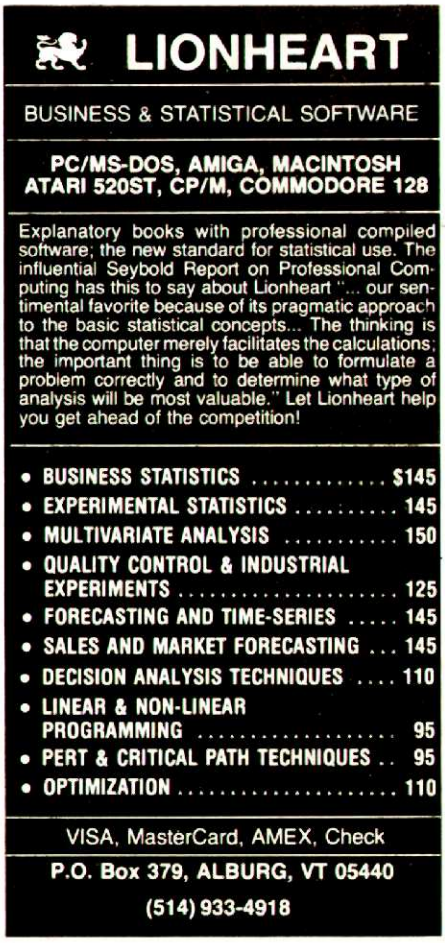
And a letter to *Atari Explorer* Magazine from Joseph D. Calo: "As a soon-to-be owner of an Atari 520ST, I thought that I'd write and say that it's about time someone—Jack Tramiel et al—came out with a state-of-the-art computer at an affordable price. I've already sold my Commodore 64 system and can't wait to get the 520 home early next year. It's a fantastic machine! I'm looking forward to using it as a word processor—the major reason for which I purchased a computer in the first place . . . Also, some of my friends have already or are selling their systems to purchase this unit. In fact, many that had planned to purchase the new Commodore 128, have changed their minds and have either already purchased it or will be purchasing the 520 in the future. Thanks again to Jack and to all those who helped develop this excellent computer."

And here are some notes received on Atari Corp's BBS (408) 745-5308:

David Swobodax: "Keep up the great work. The ST is the best thing in years."

Ron Cox: "I own an Atari 800XL and several programming tools for it and have enjoyed using it for over a year now. But as much as I have liked it, I can't wait to purchase a 520ST. Ever since I had heard of its release I have wanted to get my hands on it. Thanks, Atari, for providing your users with the most complete and powerful computers in the world."

Dave Lockwood: "I have to admit, I was worried when Atari was bought by the former leader of Commodore, but after seeing the new and highly competitive products that Atari has released, and will release, I've been impressed. If I had said 2 years ago that Atari would put out a 16-bit computer with fast graphics for under $1000, it wouldn't have been believed. Keep up the good work."



ST Product List

This includes many of the products now out or expected by the year's end. Products marked with an asterisk (*) are available now.

Productivity

*ST WRITER, *Atari Corp.* An easy to use word processor based on the popular AtariWriter system.

*NEOCHROME, *Atari Corp.* A full-color drawing program with many advanced features.

THE MANAGER, *Atari Corp.* A full-featured database manager with on-screen forms and report writer.

DESK DIARY, *Antic Software.* A personal time management package.

K-CALC, *Antic Software.* Spreadsheet package for forecasting and financial planning.

DEGAS, *Batteries Included.* A drawing and design program for color and monochrome graphics.

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*A MIND FOREVER VOYAGING, *Infocom.* Futuristic adventure in the mind of an intelligent computer.

*PLANETFALL, *Infocom.* Humorous science fiction adventure on an alien world.

*SEASTALKER, *Infocom.* Undersea adventure in the Aquadome.

*SORCEROR, *Infocom.* The sequel to ENCHANTER makes you find the master magician.

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*ZORK I, *Infocom.* The game that started Infocom, as you wander through the Underground Empire.

*ZORK II, *Infocom.* Meet the Wizard in new underground depths.

*ZORK III, *Infocom.* The Dungeon Master draws you into the deepest dungeon depths.

*HEX, *Mark of the Unicorn.* An interesting strategy game with magic and a Q-Bert-like field.

*MUDPIES, *Michtron.* A funny video game with McDonaldland characters.

*FLIPSIDE, *Michtron.* A reversi (or Othello) strategy game for one or two players.

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*FORBIDDEN QUEST, *Pryority Software.* A science fiction adventure that uses the ST's mouse, windows, and menus.

ULTIMA II, *Sierra.* The ultimate fantasy role playing quest game.

KING'S QUEST II, *Sierra.* A fully animated, 3-dimensional graphic adventure game.

FLIGHT SIMULATOR, *SubLogic.* The classic program with spectacular ST graphics and speed.

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*FAHRENHEIT 451, *Tellarium.* The text adventure game based on Bradbury's science fiction novel and movie.

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*PRINTERS, *Epson, Okidata, etc.* Most PC printers work with the 520ST's bi-directional parallel port.

*MODEMS, *Hayes, Racal-Vadic, etc.* Any standard modem will plug into the ST's RS232C port.

Software Vendor List

These are the names, addresses, and phone numbers for software companies that have shipped products or announced imminent shipment of ST software products.

Atari Corp.
1196 Borregas Avenue
Sunnyvale, CA 94086
(408) 745-2021

Antic Software
524 Second Street
San Francisco, CA 94107
(415) 957-0886

Batteries Included
30 Mural Street, Unit 9
Richmond Hill, Ontario L4B 1B9
Canada
(416) 881-9941

The Dragon Group
148 Poca Fork Road
Elkview, WV 25071
(304) 965-5517

Electronic Arts
2755 Campus Drive
San Mateo, CA 94403
(415) 571-7171

Haba Systems
6711 Valjean Avenue
Van Nuys, CA 91406
(818) 901-8828

Hippopotamus Software
985 University Avenue
Los Gatos, CA 95030
(408) 395-3190

Infocom
125 Cambridge Park Drive
Cambridge, MA 02140
(800) 448-8822

Mark of the Unicorn
222 Third Street
Cambridge, MA 02142
(617) 576-2760

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

Microprose
120 Lakefront Drive
Hunt Valley, MD 21030
(301) 667-1151

Migraph, Inc.
720 S. 333, Suite 201
Federal Way, WA 98003
(206) 838-4677

Mirage Concepts
4055 W. Shaw #108
Fresno, CA 93711
(209) 227-8369

Oasis Systems
7907 Ostrow Street, Suite F
San Diego, CA 92111
(203) 658-6917

Omnitrend
8 Huckleberry Lane
West Simsbury, CT 06092
(203) 658-6917

Optimized Systems Software (OSS)
1221-B Kentwood Avenue
San Jose, CA 95129
(408) 446-3099

Penguin Software
521 Hamilton Street
Geneva, IL 60134
(312) 232-1984

Philon
641 Avenue of the Americas
New York, NY 10011
(212) 807-0303

Progressive Computer Applications
2002 McAuliffe Drive
Rockville, MD 20851
(301) 340-8398

Quantum Microsystems, Inc. (QMI)
PO Box 179
Liverpool, NY 13088
(315) 451-7747

Regent Software
7131 Owensmouth, Suite 45A
Canoga Park, CA 91303
(818) 883-0951

Sierra
PO Box 485
Coarsegold, CA 93614
(209) 683-6858

Spinnaker/Tellarium
1 Kendall Square
Cambridge, MA 02139
(617) 494-1200

SST Systems
3456 Willis Drive, Box 2315
Titusville, FL 32781
(305) 269-0063

SubLogic
713 Edgebrook Drive
Champaign, IL 61820
(800) 637-4983

VIP Technologies
453 Ravendale Drive, Suite 1
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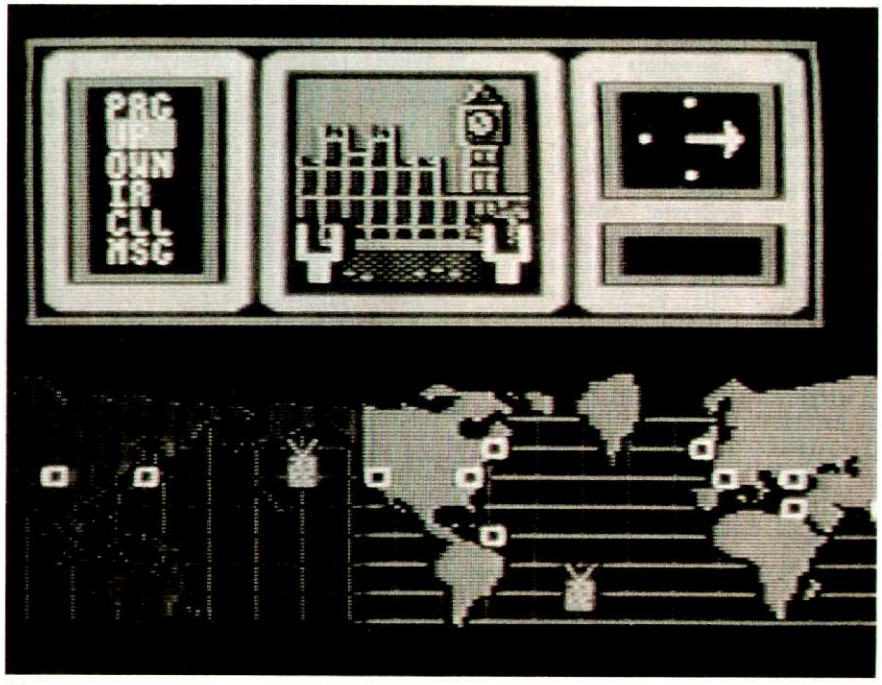
Activision Roundup

by David Duberman

Activision started big back in the heyday of video games as an unauthorized offshoot of Atari Inc. by introducing some very good and best-selling game cartridges for the Atari 2600 Video Computer System (VCS). They later translated some of these into so-so conversions for the Atari 400/800 Computers, and more recently introduced such unique titles as Steve Kitchen's Space Shuttle for both machines while undergoing the financial tribulations common to many computer game companies since 1983.

In 1985 Activision has resurfaced with style, adopting record-style packaging, à la Electronic Arts, for a flashy new varied line of quality entertainment software. From Mindshadow, a graphic adventure game, to Master of the Lamp, a weird combination action game, to the totally off-the-wall and highly entertaining Hacker, Activision has come up with the Right Stuff for almost everyone.



Hacker

Hacker

Hacker is a fiendishly difficult and a deviously clever game. If you love nothing better than a surprise, PLEASE skip the next few paragraphs, because there's absolutely no way to talk about this game without giving away some of its secrets. That's because the whole game is a secret! The instructions tell you how to load your disk, and that's it. If you're curious and would like to know a bit more about Hacker before spending your hard-earned dollars, read on. Otherwise, if you love solving clever puzzles, buy it and play it—it's a gas!!

Hacker's title cashes in on the recent unfortunate misuse of that word in the mass media, relating to wayward youths who break into high-security computer installations by telephone with their home computers and modems. The whole game is a simulation of an online session with a computer belonging to a private industrial firm, Magma, Ltd., which has a horribly dangerous and greedy plot up its corporate sleeve. It's pretty much a graphics-oriented adventure game oriented around retrieving various objects and finding their proper locations.

As the hacker who has stumbled onto the Magma computer, you are first prompted to log on in a canned "interactive" sequence that begins the game. Once past this minor obstacle, there is a simple "arcade" sequence in which you must identify, using your joystick and a cursor onscreen, various parts of a picture of the "subterranean remote unit" (SRU) that you'll be using throughout the game, including the "Phlamson Joint" and the "Thelman Port." There's no speed involved here, only logical thinking and accuracy. You must identify all five parts without error to proceed.

Here's where the game really starts. The bottom screen of the new display holds a world map, underlaid with a grid, with various cities highlighted. The grid represents a network of tunnels through which your SRU can travel from city to city. Many of the tunnels are blocked, however—you must map the network in order to travel successfully. The top half

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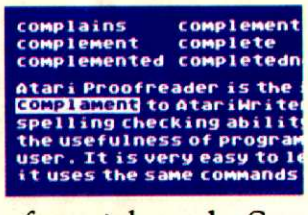

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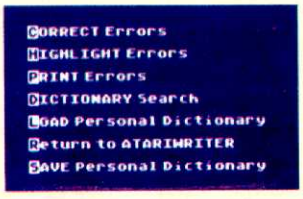

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of the screen contains a control panel, which you must learn to operate successfully with both keyboard and joystick. Among functions are answering messages, traveling through the tunnels, visiting cities, and calling spies.

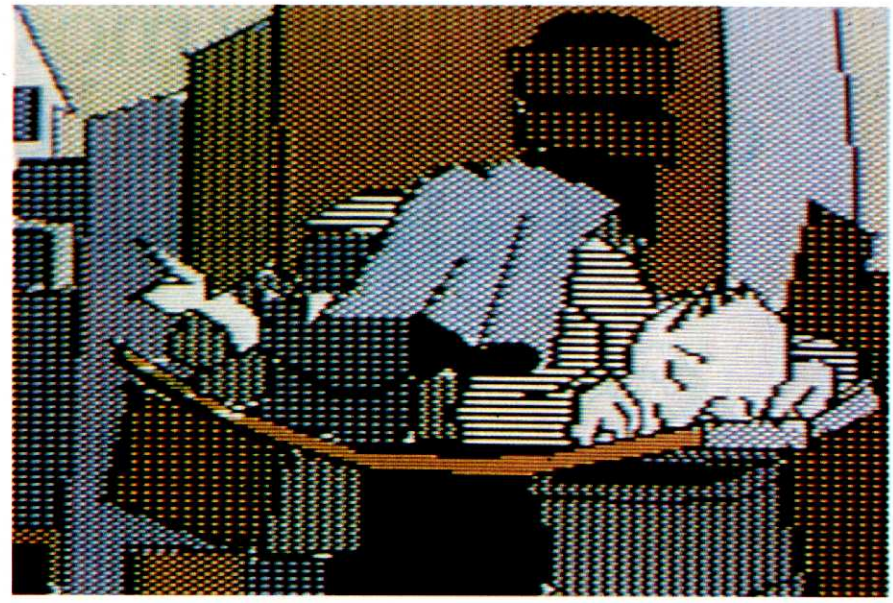
Spies in all eleven cities each have something or things you need, and you can get stuff they want. The game involves a lot of traveling around and wheeling and dealing. Magma thinks you're on their side, so the system keeps giving valuable information, but it also keeps checking on your security, so you need to keep careful track of everything that goes on. To win, you must foil Magma at their evil game and take a valuable item to Washington D.C.

Hacker is an ingeniously programmed piece of entertainment software, provocative, stimulating, and highly addictive. It takes a while to play, so it's unfortunate that you can't save a game. Nevertheless, there are loads of clever touches, like having spies in each city speak their native language. In all, a more cleverly designed program has yet to appear on home screens.

The Great American Cross-Country Road Race

The Great American Cross-Country Road Race is a creditable racing game in the tradition of Pole Position with an added strategic twist. At the start of the game you select a field of opponents and a race course, typically a cross-country journey from, say San Francisco to Washington D.C. You're competing against ten top computer racers as you sprint from city to city. At each city, including the starting point, you're presented with a map of the USA showing your current position. From this you can select one of two or more cities in the general direction you're traveling as your intermediate destination. Here's where the strategy comes in. As your cursor moves over each possible destination, a ticker tape across the top of the map describes road conditions, including foggy and snowy, both of which can really slow things down. You can set your starting time at the beginning of the trip to avoid such obstacles as rush hour traffic.

If you bump into another car or a roadside sign or gas pump, you instantly slow to a stop, and must reaccelerate. Other obstacles include radar traps, running out of gas (there are pumps every 100 miles), and burning out the four-speed transmission. If either of the latter two occurs, you must push your car to the next service station by rapidly pumping the "acceleration" (joystick) button.



Mindshadow

As you approach each city along your route, a more-or-less familiar attractively-drawn cityscape slowly rises from the horizon, and then "Welcome!" flashes over the skyline. At the end, if you've finished the race in the top ten, you can enter your name and the date, which will be saved to disk. Eight of the racing fields are "expandable," which means that as your racing skills improve, you can record your new standings. You're disqualified, however, if you fail to reach any city along the route in the prescribed time. You can travel as fast as 200 mph, but watch those slippery snowy curves! The Great American Cross-Country Road Race is not, as its name suggests, particularly educational, but it is a diverting computer action/strategy entertainment.

Master of the Lamps

Master of the Lamps consists of two somewhat disparate segments—a joystick-twisting three-dimensional flying carpet ride alternating with a Simon-like game with color and sound. The standard game consists of 21 succeedingly difficult such segments, divided into three groups of seven. The idea is that you must lure three genies back into their lamps. Each time you successfully complete seven segments, a genie returns to his lamp.

You start by climbing onto your favorite flying carpet and zooming away into the first of the 21 tunnels. Diamond-shaped gates follow a sinuous and treacherous course across the galaxy against a starry background. You must maneuver this course at top speed with your flying carpet while simultaneously watching the nearest and farthest gate, and planning your course accordingly. The gates start small and become large very quickly, and there is some margin for error, but not much. As a warning, the colorful gates become white if you come close to their edges. If you miss a gate, you return to the start of that tunnel.

Finish a tunnel and you enter the genie's den, where you find seven gongs, each with its own color and tone. You can practice as long as you like, or summon the genie at any time. He then sounds from two to twenty-one random tones, depending on the level, which line up at the top of the screen as he strikes them, then come spiralling down the screen one at a time straight at you. You must strike each note in the same order as the genie, but cannot begin until the genie has struck the last note and the first note begins to spiral down. This, unfortunately, is not clearly explained in the instructions, and caused me a bit of confusion.

In the first seven rounds of the standard game, the colors of the notes the genie

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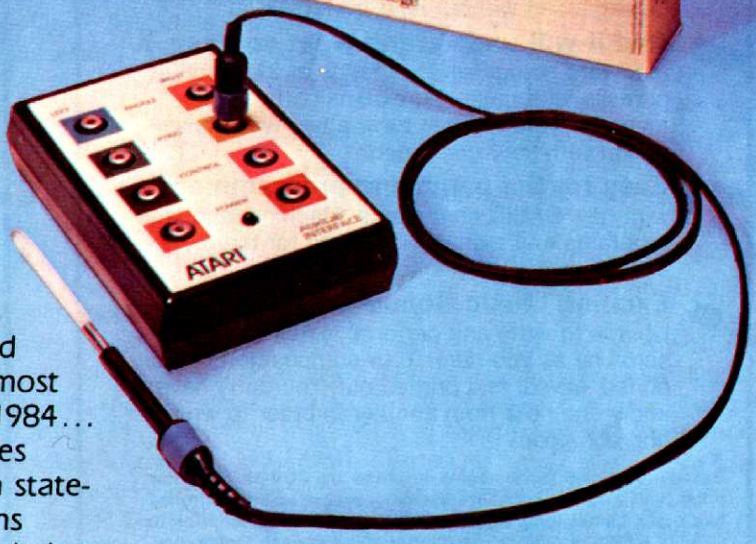

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strikes disappear as soon as he strikes the last one, so you must memorize the order as he strikes them. In the second seven, only the colors of the tones he strikes appear, and in the final seven, you only hear the sound—no colors. A severe test of memory, to be sure.

If you don't care to play the memory game, you can simply fly the tunnels, in any order you choose. The first few are deceptively simple, and after the fourth or fifth you may find yourself restarting often. There's also a novice version with easier tunnels and a slightly easier version of Simon. Master of the Lamps may not appeal to everyone, but its peculiar conglomeration of features may just strike your fancy. Try to get a demo at your local software store.

Mindshadow

Mindshadow is a graphics adventure game, or as Activision puts it, an illustrated text adventure. As you progress from scene to scene, new pictures depicting your surroundings load from disk and appear on the screen. In a nice touch, the programmers have added animation to some scenes, such as the string of Z's that floats upward from the mouth of a sleeping man. Also, the pictures contain clues not described elsewhere.

Like most such games, Mindshadow consists of a series of puzzles which you must solve in order to progress through the game's scenario. At the story's outset you find yourself on a desert island, equipped with nothing but your ingenuity. If you're successful in escaping the island, you travel to London and Luxembourg.

The parser is better than that found in many graphic adventures—you can enter such sentences as "Get the book and examine it." And the puzzles certainly are tough—I wouldn't have made it through the game without the cheat sheet Activision provided (available for $1). There is a hint facility built into the game, but it keeps track and only gives you a limited number of hints. Unfortunately, the end of the game seems to be as much of a mystery as the rest of it, unless I missed something. In short, I can recommend this only to the most hard-core adventure game enthusiasts—for the rest, there are too many more enjoyable alternatives in the genre.

Activision, PO Box 7287, Mountain View, CA 94039

Catch Football Fever

Pigskin Programs for Your Atari Computer

by Bill Kunkel & Arnie Katz

Has football replaced baseball as America's national pastime? Despite much media argument pro and con, the jury is still out.

Software publishers appear to favor Abner Doubleday's creation. The number of pigskin programs currently available for the Atari home computer is relatively small compared to the selection of hardball titles.

This seeming prejudice against the gridiron is an illusion. The real reason for the disparity is that football is harder to simulate than baseball, especially the graphics. The complexity of moving 22 players—11 per side—has defeated more than one attempt to accurately portray football on the computer gaming screen.

If the choice is limited, at least the quality is good. All of the football programs for the Atari rate well, though none qualify as state-of-the-art.

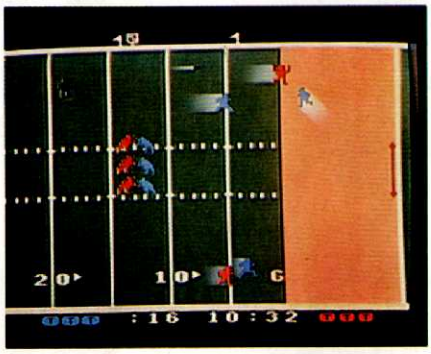
Starbowl Football

Designed by Scott Orr & Dan Ugrin
Gamestar/32K disk

When *Starbowl Football* made its debut on the Atari in 1982, computer sports gamers proclaimed it the finest action-oriented gridiron simulation available for any home system. And though Starbowl Football owed much of its "instant classic" status to the lack of competition, its own, undeniable excellence keeps it entertaining and challenging today.

The game features a crisply rendered horizontally scrolling playfield which allows ample room for maneuver. A too-narrow field turns football into pass-and-catch by denying running backs room to avoid potential tacklers.

Each team consists of six on-screen athletes. Starbowl was the first game which incorporates such plays as punts, blitzes, screens, dumps, field goals and quarterback keeps into the simulation. No previous program had put enough men on the field to make these tactics possible.



Starbowl Football

One or two human coaches observe the proceedings from the classic videogame perspective. The display shows the field from overhead and the individual men from the side. The gridders are monochrome red and blue, hardly more than humanoid outlines, but the lifelike animation overcomes this handicap. The overall effect is surprisingly realistic as the little guys jump around on the screen blocking and tackling.

The scrolling routine used in Starbowl Football puts even some of the latest programs to shame. The view of the fields "pans" to follow the development of the play in progress, and the shift is as smooth as silk.

A coach employs a simple, joystick-actuated command scheme to construct a play. The computerist can program pass routes for two receivers and set blocking assignments for the line as a whole.

Pushing the red button to hike the ball gives it to the quarterback, who turns black to indicate possession. Moving the stick causes the back to run in the corresponding direction.

Throwing a pass is a much more intricate process. In fact, this overly complicated play-mechanic is the only serious drawback in Starbowl Football.

Once the center snaps the ball to the quarterback, you must press and hold the joystick button to order a pass. Now it gets a little strange. The receiver is always in the correct spot on the field to catch the ball, because wideouts operate under the computer's control after the gamer has programmed their patterns. The quarterback is also under the machine's direction when the gamer releases the button to send the pigskin on its way, so the ball always heads in the right direction.

The net effect is that the coach can't do anything but watch from the time he or she initiates a pass until the ball is nearly in the flanker's grasp. The gamer must press the action button again at the exact instant the ball touches the intended target to complete the aerial.

The traditional method, which transfers control from the quarterback to the receiver the second the pass is in the air, is preferable. Such games require the compu-coach to pass in a specific direction and use the stick to get the receiver to the right spot in time. That's both more challenging and more fun than letting the whole play ride on a single button-press.

A smaller defect is that Starbowl Football has only a rudimentary running game. There are no other backs to take a handoff, and the ease of tackling makes it almost impossible for the quarterback to scamper for a big gainer.

The skipper of the team on defense controls the free safety with the joystick during the play. Prior to that, the coach programs moves for two cornerbacks and the defensive line with the joystick.

Despite the drawbacks, Starbowl Football is still the best arcade-style football contest with a solitaire option available for the Atari.

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Football

Atari/Cartridge

Superior graphics and animation are the greatest strengths of this action-oriented football game. The players are beautifully drawn and animated. They're also small enough, relative to the size of the horizontally scrolling playfield, to allow lots of cuts and fakes on running plays.

Tackling calls for precision. Lunging for the legs doesn't cut it in Atari *Football*. A defender must go for the head or torso or else the ballcarrier just keeps going.

The offense uses the joystick to select a play and a formation. The defense, at the same time, employs the other stick to choose any of several formations.

Once both sides have their orders, the machine pauses for a few seconds. This gives the team with the ball the opportunity to call an audible and change the play at the line of scrimmage.

After the snap, the wide receivers run their pre-selected patterns, subject to bumps from defenders encountered along the way. Movement of the stick determines the direction of the toss. Control switches to the pass catcher, who must be positioned properly to haul in the throw.

Interceptions are a potent threat in Football. This is one of the few pigskin programs for any computer which allows the defender who broke up the play to run with the ball after the catch. A bit of joystick artistry against a disorganized and momentarily confused foe can put quick points on the scoreboard.

Coaches in this head-to-head contest will miss the kicking game. Punts, kick-offs, field goals and extra points are handled abstractly or just omitted.

Football can't be played solitaire, always a minus. There is a "practice" mode, but it requires the lone gamer to pick a defensive set. And the middle linebacker, normally under player control, remains motionless throughout the play. As might be expected, this prevents "practice" from functioning as anything more than a means to practice the timing needed for the passing phase.

For face-to-face competition, however, Football fills the bill pretty well. It lacks some of the subtleties of larger-memory games, but it's the obvious choice for Atari owners who want a cartridge program.

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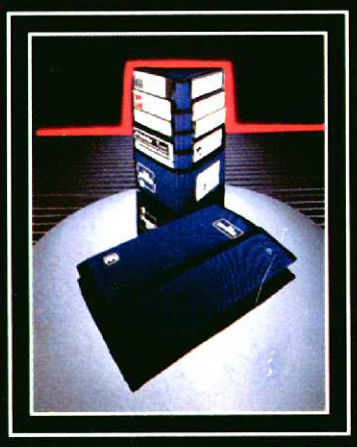
THE PYRAMID™



The Pyramid holds up to 24 5¼" floppy disks with a storage design that allows the user to quickly read each disk label at a glance. Designed for the executive, professional or student who is on the move. Available in cordura with a beautiful variety of colors. $21.95.

THE POCKET PAK™

This useful product will hold up to 10 3.5" Microdisks and is small enough to fit inside a coat, jacket or purse. Ideal for students, professors or executives on the move. Available in nylon with a beautiful variety of colors. $13.95.

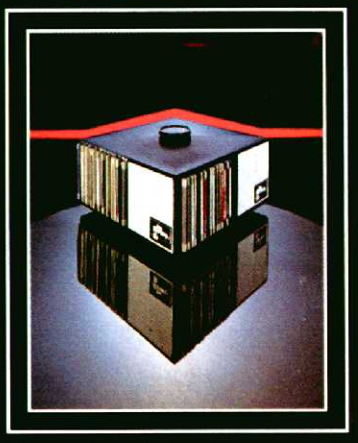
THE DISC DIRECTORY™

Designed for professionals who have a need to transport and display more than 30 3.5" Microdisks. Easily fits in a briefcase. Reinforced with Mylar plastic. Velcro closure keeps diskettes safely in their pockets. Available in nylon with a beautiful variety of colors. $29.95.

All products are made of the highest quality antistatic materials.

Call toll free for information.
Dealer inquiries welcome.

THE LIBRARY™



Geometrically designed to categorize, index and store 80 3.5" Microdisks. The Library rotates 360° and has the capability of holding two more modules on top with final storage capacity of 240 disks. Designed for the corporate office. $49.95.

THE EASEL™

The world's most popular portable disk handler. Holds 20 3.5" Microdisks. Folds to a thickness of 1 in. Now shipping our new improved model. Available in nylon with a beautiful variety of colors. $19.95.

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Our appreciation to all software publishers and disk manufacturers who supplied products in this ad.

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