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Atari ST

DISK & MAGAZINE

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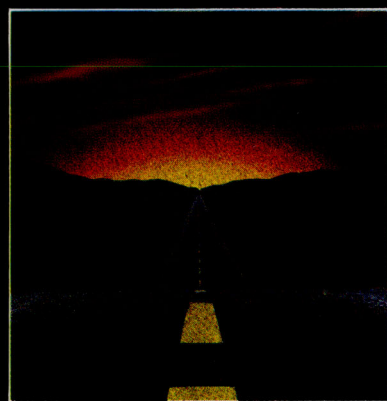
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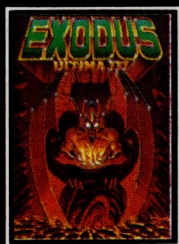
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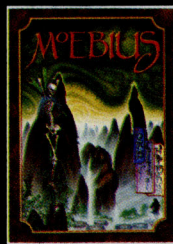
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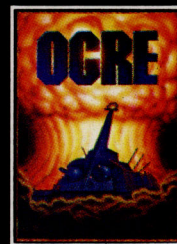
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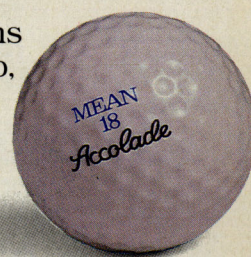
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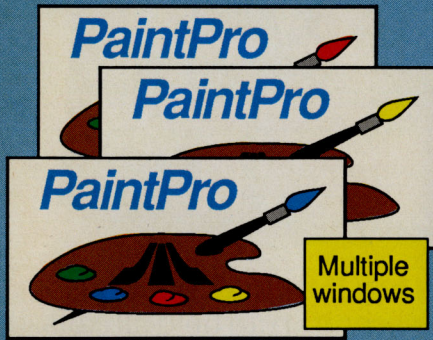
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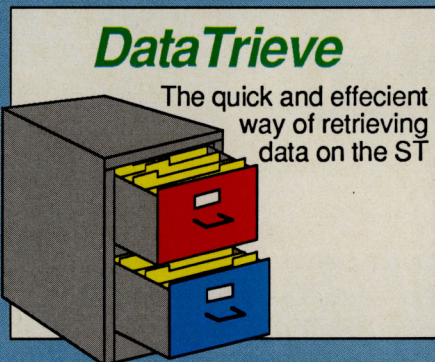
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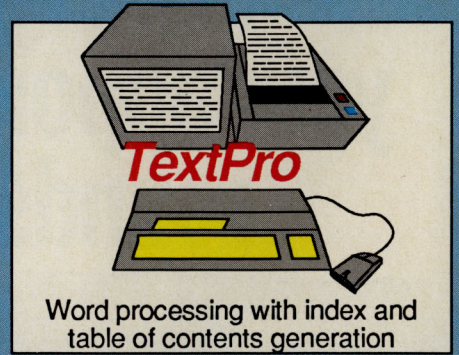
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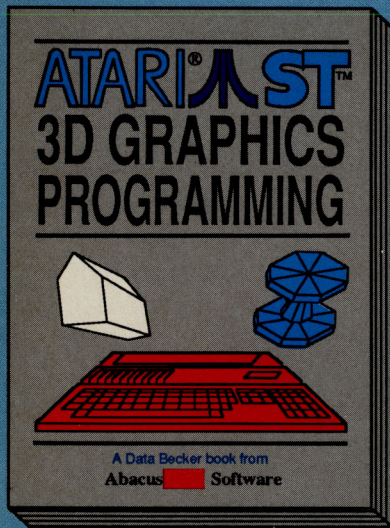
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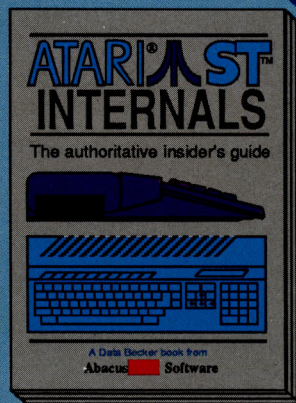


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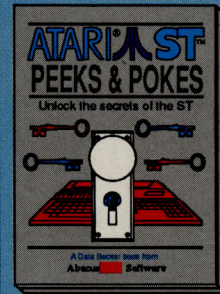
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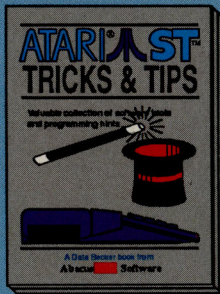


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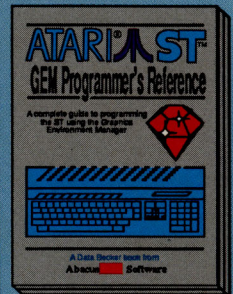
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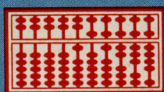
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The Editor's View

Ah, well. You'll recall that last issue we were going on and on about this great experiment of ours wherein we insert these disks, freely and openly, in very small envelopes which in turn are bound or otherwise attached to this new magazine and put right out into newsstand distribution.

Voilà. A major new turning point for magazine and disk distribution.

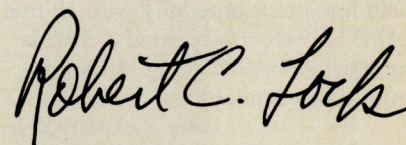
But a funny thing happened on the way to the newsstand. Some newsstand distributors grew very, very concerned about all those disks sitting there in all those envelopes in all those magazines. Some booksellers and newsstand owners also grew very concerned. We discovered that, in many places, our great experiment in the marriage of disk and magazine was quickly being torn asunder—vendors were tearing the disks out, keeping them behind the counter, and putting only the magazine out on the shelf. When one purchased the magazine, one received the disk from out of the depths of the counter.

Now in all fairness, we can't fault the distributors or the newsstands for their concerns. They have to read and react to their markets as they deem appropriate. We only wish we could have had

at least one full issue of testing. But we can adapt. We'll just have to make these covers much more informative, and expect you, our readers, to be able to judge our quality from the cover. Stick with us. You must be doing just that ...since this is the first of our poly-bagged issues.

We thank you for the many letters you've sent reacting to the first issue. Your comments have been greatly appreciated. Keep them coming. By the way, the entries are coming in for our great \$10,000.00 Atari ST Programming Contest. We'll be sharing those with you in the months ahead.

Until next time, enjoy your issue.



Robert C. Lock
Editor in Chief

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Readers' Feedback

Do you have an ST-related question or problem? Have you discovered something that could help other ST users? We want to hear from you. Write to ST Feedback, COMPUTE!'s Atari ST Disk & Magazine, P.O. Box 5406, Greensboro, NC 27403.

Editor's Note: Some of the following letters are composites based on telephone conversations or discussions on bulletin boards and telecommunications services. Signed letters are those received from readers.

The Longest BASIC Program

I'm working on a program in ST BASIC. When I reached the 2049th line, the computer printed an error message: Too Many Lines. I still have plenty of memory left. Why this 2048-line limit, especially with all that RAM? Is there a way around this? Is the new ST BASIC going to fix this unfortunate limitation?

Larry Kirkpatrick, Jr.

We hadn't heard about this limit, so we wrote an eight-line program and expanded it to 2048 lines by repeatedly using RENUM, MERGE, and SAVE commands. Adding one more line yielded the error message you mentioned. The FRE(0) function showed that over 650,000 bytes were still available on the 1040ST, so memory wasn't a problem. ST BASIC apparently doesn't allow programs to be longer than 2048 lines.

There are a couple of solutions to the problem. You could crunch the program to reduce the number of lines. Remove REM statements, combine several statements on each line, rewrite sections of the program to use fewer lines, and so on. Another possibility is to divide the program into several parts, then use the CHAIN command to load the parts separately. You can pass selected variables to the chained program with the COMMON command or use all variables by adding ALL after CHAIN.

At this writing (early September),

we still haven't seen the final working copy of the new ST BASIC, so we can't say if this problem has been remedied.

Desk Accessory Rules

If I put a desk accessory into a folder, will the ST load it when I boot?

No. A few rules apply to desk accessories: They load only from the root directory, no more than six may be in memory at a time, their filenames must end with the extender .ACC, and they should be installed by booting from a cold start (switching the power on) rather than from a warm start (pressing the reset button).

Although desk accessories can be convenient, they do use up memory; you might want to hide accessories you never use in a folder, especially if you have one of the original 520STs and have not installed TOS (the Tramiel Operating System) in ROM (Read Only Memory) chips. Another easy way to keep an accessory from loading is to change the extender from .ACC to .AC.

Desk accessories are intended to be short programs that are accessible from within any other application. Once loaded into memory during bootup, they wait in the background until selected from the Desk menu, the leftmost menu on the title bar. (Sometimes this menu is represented with an Atari logo symbol.) Some programs that don't support GEM (the Graphics Environment Manager desktop) don't allow access to desk accessories. An example is ST Writer. The ST comes with several accessories, including the Control Panel, which allows you to change screen colors, set the time and date, and change various other parameters.

Modem Compatibility

I have a question about my Atari 1200XL computer and my new ST. Will the Atari 1030 modem I use on the 1200XL work with the ST?

Pat Nguyen

One of our editors who owns a 1030 answered your question with three words:

"Not a chance."

The 1030 modem for the eight-bit Atari computers plugs into the SIO (serial input/output) port. This port is not a standard RS-232C serial interface; it's unique to eight-bit Ataris. The Atari STs don't have an SIO port; instead, they have the industry-standard RS-232C interface. Although the 1030 could probably be modified to work with an RS-232C interface, it would not be an easy project.

On the other hand, if you have a modem that works with the eight-bit Atari 850 Interface Module, there's a very good chance it will also work with the ST. The 850 interface has four RS-232C ports for modems and other serial devices. All you'll need is the right cable.

Atari is planning to introduce a modem late this year that will hook up to both eight-bit Ataris and STs. It will work at 300 and 1200 bps (bits per second) and support standard Hayes modem commands. The price is expected to be under \$100.

Reading The Joystick In BASIC

The sample BASIC program below reads the mouse port and prints the values for x location, y location, and right/left button.

```
10 fullw 2: clearw 2
20 for j = 1 to 15
30 gosub READMOUSE
40 gotoxy 5,j
50 print "x, y, button:",
60 print xp;yp;bt
70 next: clearw 2: goto 20
80 READMOUSE: poke contrl,124
90 poke contrl+2,0: poke contrl+6,0:
vdisys(0)
100 xp = peek(ptsout): yp = peek(pt
sout+2): bt = peek(intout)
110 return
```

My question is this: How can I use a similar program to read the joystick port next to the mouse port? Is it even possible in BASIC?

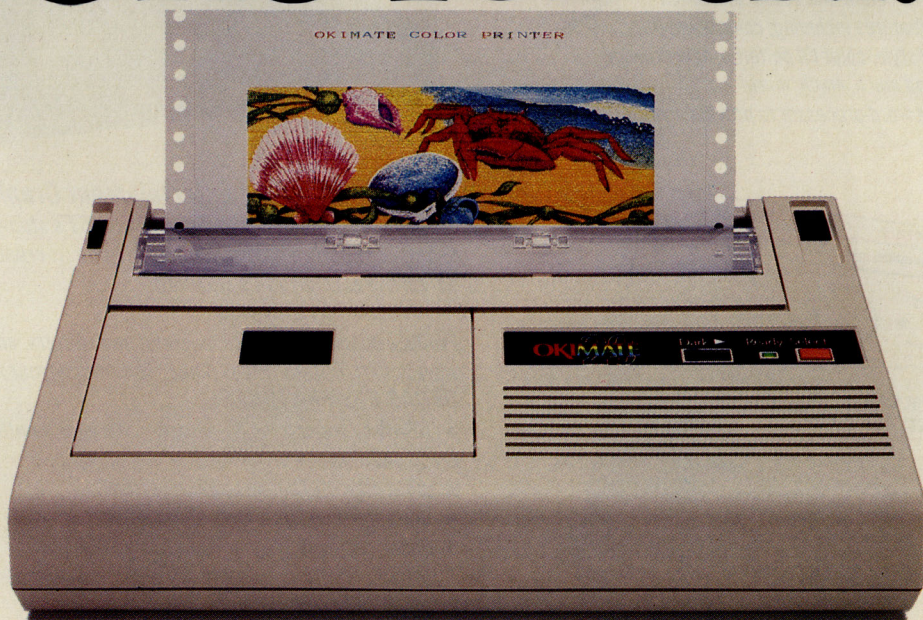
Craig R. Travers

Yes, it's possible. Try the following routine. (Both program examples are on the

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magazine disk under the filenames
MOUSPEEK.BAS and READJOY.BAS.)

```
10 poke &hfff02, &h0012 'turn off mouse
20 poke &hfff02, &h0014 'turn on joystick
30 joy = peek(&hfff02)
40 print joy: goto 30
50 poke &hfff02, &h0008 'turn mouse back on
```

Memory location &hfff02 is one of the registers used by the keyboard controller, which handles communications with the keyboard, mouse, and joystick.

After you have stopped the program (by pressing CTRL-C), type GOTO 50 to reenale the mouse.

ST BASIC Screen Control

How do you print characters in reverse video with ST BASIC? Also, how do you encode cursor movements in PRINT statements? I've had no luck finding out how either of these works.

H.E. Taylor

The following ST BASIC program prints a phrase in reverse video. (It's included on the magazine disk under the filename XOR.BAS.)

```
10 fullw 2: clearw 2
20 gotoxy 0,0
30 rem for j = 1 to 5: print"abcdefg
ijklmnopqrstuvwxyz": next
40 gotoxy 1,0
50 poke intin, 4
60 poke contrl, 32
70 poke contrl + 2, 0
80 poke contrl + 6, 1
90 vdisys(0)
100 print" This should be printed in reverse "
110 poke intin,1
120 poke contrl, 32
130 poke contrl + 2, 0
140 poke contrl + 6, 1
150 vdisys(0)
160 print" This prints normally"
```

Technically, this program doesn't really print in reverse video—it prints in exclusive-OR mode. To see how it actually works, remove the REM from line 30. The characters are printed on top of the alphabet.

Cursor movements aren't easy to encode in ST BASIC. To print a message at a certain location on the screen, try the GOTOXY command. (See lines 20 and 40 in the example above.)

The Developer's Kit

I've heard about the ST Development System and I'd like to have more information. How can I purchase the system? Are there any conditions to be able to buy one? How much does it cost? Can you tell me where to

write for more information?

Jean-Francois Beauchamp

The Atari ST developer's kit is designed to make it easier to develop commercial software. It contains a variety of programming tools and technical documentation. It's designed with the professional programmer in mind and presupposes familiarity with C or assembly language.

The price is \$300. You receive the Alcyon C compiler, a 68000 assembler, a text editor for writing source code, several utilities (including SID, a symbolic instruction debugger), and a complete library of C functions. In addition, there are roughly 1500 pages of documentation on the operating system and GEM.

If you fill out the form that comes with the development system, you'll be registered as an official Atari developer. Developers have some privileges: They receive occasional updates and news from Atari, they're eligible to join the Atari developer's forum on the CompuServe Information Service, and their products are included in lists of software published by Atari.

There are no special conditions or qualifications required to buy the development system. If you have the \$300, Atari will sell it to you. If you can't obtain it through your local Atari dealer, contact Richard Frick at the Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086.

Speech Recognition

I own both a 520ST and an IBM PCjr. I would like a way to interface a Realistic PRO-30 programmable scanner to either of these machines, so that signals received could be logged as text messages on the screen and as an ASCII file on disk. What equipment or software would I need? Can it even be done?

Hugh A. Deweese

Practically speaking, it can't be done. What you're talking about is voice recognition, which is still pretty iffy technology even with very expensive equipment. The PRO-30 (which has been superseded by a newer model) is designed for monitoring various radio bands, particularly those used by state and local authorities. These are voice transmissions, not digital data transmissions, so you'd have to assemble a voice recognition device that could translate the incoming words into English text. Even with a large mainframe computer,

this is not a simple task. To complicate the matter, radio transmissions are of uncertain quality, and today's voice-recognition devices are easily confused by extraneous noise. There's a lot of research going on in the field of speech recognition, but very few commercially viable products have reached the market so far.

It's much easier for a computer to digitize or synthesize speech than it is to recognize and analyze it. Digitizers and synthesizers have been available for several years. A speech digitizer acts like a tape recorder: You speak into a microphone and the words are converted into numbers, which can then be reconverted into audio signals and played back. Likewise, speech synthesizers can convert text into spoken words with a high degree of accuracy, but the reverse is extremely difficult.

To convert speech into text, several steps are required. First, a computer has to sample the incoming sounds and convert them into a series of numbers representing sound levels. Then it has to match this digital information against phoneme patterns (a phoneme is the smallest significant unit of sound within a language). Ideally, a speech recognition program should be able to recognize different regional accents, changes in speed, changes in inflection and intonation, and a host of other variables. There's not a single t or long e sound—a wide range of sounds fits each of these two phonemes.

Furthermore, if you want the word spelled correctly, a whole new level of complexity is added. Even if the phonemes are properly translated, how does the computer decide whether the word spoken is "to," "two," or "too"? How does it distinguish "weakened" from "weekend"? To analyze such homonyms by context would require a level of technology close to true artificial intelligence.

There are a few commercial products that accomplish voice recognition, but they are limited in application. We've seen one hardware/software product that translates speech into words on the computer screen. The user must speak very slowly and clearly into the microphone, after which there's a reasonably good chance that the computer will recognize the word and print the correct spelling. Because of its limited vocabulary, however, this machine is best used for predictable input (such as numbers or a limited repertoire of commands).

Searching For Roots

I bought a 520ST and am having trouble getting 1ST Word to work with my printer. I was able to load one of the printer drivers into 1ST Word and change the hex codes. Then I ran the Install program and it created a file called 1ST_PRINT.DOT. So far, so good. But the instructions say to copy your new driver to the root directory, and I don't know what that means.

If you previously used an eight-bit machine such as the Atari 800 or Commodore 64, you're probably familiar with disk directories that simply list all files on the disk: one disk, one directory. Most 5¼-inch disks don't hold a lot of data—at least in comparison to the ST's 3½-inch disks—so a single directory suffices on most eight-bit computers. ST disks, on the other hand, hold several hundred thousand bytes of data and may contain hundreds of files, which would be difficult to manage with a single directory. To keep things tidy, Atari has implemented subdirectories, which are essentially just directories inside other directories. Subdirectories, in turn, can contain their own subdirectories, up to 16 levels deep (at least in theory).

In keeping with the GEM desktop metaphor, subdirectories are called folders and appear onscreen as file folder icons. If you choose to view the directory as text, folders are denoted by a reverse diamond marker.

A more traditional metaphor regards subdirectories as branches within a tree structure (although the idea of trees growing out of a desktop is admittedly a mixed metaphor). Each branch may contain leaves (files) or additional branches (more subdirectories). From this viewpoint, the main directory that appears when you first double-click on the disk icon is the base of the tree. That's why it's called the root directory; it's the origin of all the branches on the tree.

To specify a particular file that's not located in the root directory, it's necessary to supply a pathname—a path through the various levels of subdirectories. For example, the pathname A:\SOCCER\SCORES\SUNDAY identifies the file called SUNDAY, which is found inside the folder SCORES, which is inside the folder SOCCER, on disk A:. Note that each file or folder is preceded by a backslash (found on the ST keyboard just under Delete). Pathnames are required because

the filename SUNDAY does not give the ST enough information to locate the file. There may be another file with the same name within another directory on the same disk. The rule against duplicate filenames on a disk does not apply to files in different directories. (For more about pathnames, see "Readers' Feedback" in the October 1986 issue of COMPUTE!'s ST Disk & Magazine.)

When you opened the PRINTER folder on your 1ST Word disk, changed the .HEX file, and ran the Install program, a new file called 1ST_PRINT.DOT was created within the PRINTER folder. You must copy this file to the root directory before it will work properly. The easiest way to do this is to drag the file from the folder window to the icon of the drive in which the disk is mounted. For instance, if your 1ST Word disk is in drive A, open the PRINTER folder and drag 1ST_PRINT.DOT to the floppy disk A icon. Another method is to open a second directory window by clicking on the disk icon, then drag 1ST_PRINT.DOT from the folder window to the second window. Both methods make a copy of 1ST_PRINT.DOT in the root directory without erasing it from the PRINTER folder.

Double Precision Doesn't Work

ST BASIC has a problem with large numbers. When trying to write a program for a financial statement (balance sheet, profit and loss, etc.), I had to use double-precision numbers. But they don't seem to work. The statement PRINT 1000100.10# prints 1000100.16. Is there any way to get around this?

Donald Murray

Although ST BASIC includes several commands for handling single- and double-precision variables, double precision is not properly implemented in ST BASIC. There's not much you can do to fix the BASIC you've got, but here are some suggestions.

If your math operations are limited to addition and subtraction, try using an array. The example you used could be split into groups of three numbers: 1, 0, 100, and 10 (millions, thousands, ones, and cents). The pennies should be the first element in the array. To add together two arrays, add the numbers in the same column. If the sum goes past 999 (or 99 in the pennies column), reduce the result by 1000 (or 100) and carry one to the next column.

Initial indications are that the new ST BASIC will support double precision, so when you get the new BASIC, your problem should disappear. And your program should be completely compatible with the new BASIC.

Another possibility is to switch to a different language, such as C or Pascal, in which double-precision variables are implemented properly.

Word Count Mystery

Editor's Note: Very recently we discovered a problem with the "Word Count" desk accessory published in the October issue: It must be installed as the first (uppermost) desk accessory on the Desk menu to work properly. The problem is not in the program itself, but rather in the Personal Pascal libraries that are linked after the program is compiled. At press time, Optimized Systems Software was working on a revised library that should be available on its bulletin board system when you read this. If the source code for Word Count is recompiled and relinked using this new library, the problem should disappear. For those who do not have access to Personal Pascal, we will provide a corrected version of Word Count in the next issue.

Meanwhile, try installing Word Count as the first accessory by saving it on your startup disk after having saved any other accessories (such as the Control Panel) on the disk. Some desk accessories, particularly commercial ones, always seem to install themselves as the first entry on the Desk menu no matter what. In these cases, you won't be able to use Word Count on the same disk.

Note that this problem affects all desk accessories written in the current version of Personal Pascal which follow the recommended procedure for installing an accessory. If you have a public domain accessory written in Pascal that won't work or mysteriously crashes the system, this may be the cause. **ST**

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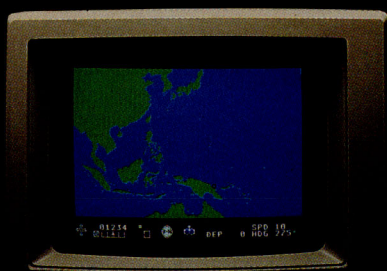
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"Captain's Log, October 1, 1944. 0250 Hours. Fleet submarine USS Hammerhead proceeding Southwest at cruising speed. Our mission: intercept enemy convoy off the coast of Borneo. Disperse and destroy."



"0300 Hours. Two hours until dawn. Radar picks up convoy, escorted by two destroyers. We believe that one of the enemy's valuable oil tankers is part of convoy formation."

Captain's Log... War Date 10.01.44

Enhanced
for 520 ST - Better Graphics,
Sound, Play Action!



"0400 Hours. Lookouts on the bridge. Target identification party reports one tanker, 6,000 tons, troopship of 10,250 tons, with two *Kaibokan*-type escorts. Moving into attack position."

Atari 520ST screens shown



"0500 Hours. Sound General Quarters! Battle stations manned. Preparing for torpedo run. Gauge Panel OK. Periscope OK. Charts and Attack Plot Board OK. All mechanical systems OK."



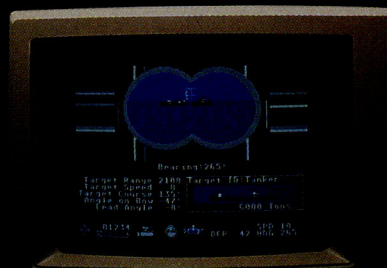
"0525 Hours. Torpedo rooms report full tubes forward and aft. Battery at full charge for silent running. We hope water temperature will provide thermal barrier to confuse enemy sonar."



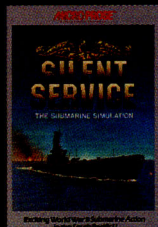
"0600 Hours. We are at final attack position. Convoy moving at 10 knots. Target distance decreasing rapidly... Crash Dive! Escorts have spotted us and are turning to attack! Rig to run silent."



"0700 Hours. Depth charged for one hour. Some minor damage, but repair parties at work. Destroyer propeller noises receding. We'll come to periscope depth for our return punch."



"0715 Hours. Torpedo tubes 1, 2, 3 fired. Two destroyers hit and sinking. One of the enemy's last tankers coming into 'scope view — an ideal target position. On my mark... Fire Tube 4! Fire 5!"



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But Is It The Write Word?

In one of the biggest software developments since the ST was introduced, Atari announced this summer it will market an ST version of *Microsoft Word*, the powerful word processor formerly available only on IBM PC and Apple Macintosh computers.

The announcement capped several months of intense negotiations between Atari and Bill Gates, founder and chief executive officer of Microsoft. To put it mildly, the agreement is considered a major deal—partly because *Word* is such a powerful word processor, and partly because Microsoft is one of the Big Three software houses (along with Lotus Development and Ashton-Tate) whose support is deemed crucial in the computer industry. Microsoft is the originator of the most popular BASIC language used on personal computers and of the MS-DOS operating system used on the IBM PC.

Shortly after the announcement, however, some of the excitement started to fade. There's some doubt about whether the ST version of *Word* will resemble the IBM/Macintosh versions of *Word* or the IBM version of *Write*, a less powerful word processor also published by Microsoft.

The confusion started with Atari's July 7 press release, which referred to the program as *Write*. "Atari Corp. announced today it has signed an agreement with Microsoft Corporation to offer *Microsoft Write* for the Atari 520ST and

1040ST computers," it stated. "*Microsoft Write* is based on the Macintosh version of the market-leading *Microsoft Word* word processing program. The agreement gives Atari Corp. the rights to sell, market, and distribute *Microsoft Write* worldwide."

Sources close to Microsoft indicated that the ST package is based on the IBM PC version of *Write*, which is included with *Microsoft Windows*, a desktop-style user interface for IBM PCs, ATs, and compatibles. On the IBM, at least, *Write* is slower and less powerful than *Word*. There's also a big difference in price between *Word* and *Write*. The IBM version of *Write* is included with *Windows* for \$99.95, while *Word* by itself costs \$450 on the IBM and \$195

on the Macintosh. Atari's price for the ST version of *Write* is expected to be less than \$150.

Microsoft's senior public relations manager, Marty Taucher, explains it this way: "The ST program [*Write*] is probably closer to the Macintosh program [*Word*] than it is to the IBM program [*Write*]. It doesn't have all of the features of the Macintosh program, but it's a full-featured word processor. It's really a separate program."

On the other hand, Atari Product Manager John J. Skruch says, "It's different than both, but it's more like *Write* than *Word*."

Bottom line: We'll have to wait until the program hits the market (late 1986/early 1987) to decide for sure.

L.A. Atari Fest

Atari enthusiasts who dropped by the Los Angeles Atari Fest late last summer got their first look at the long-awaited blitter chip, which is designed to significantly speed up screen graphics on the ST. A blitter-equipped 1040ST was running a demo that sent ten birds simultaneously flapping across the screen. The blitter chip is supposed to make its debut late this year in a new ST machine (most likely the two-megabyte 2080ST).

Although Atari officials say the supply of blitters will be "very limited for a while," they still maintain that both the 520ST and 1040ST can be modified to accept the new chip (an upgrade that has been dubbed "ablitteration" by ST cognoscenti). Some caveats have been added: "It will require a lot of desoldering and soldering around the 68000 chip—a potentially damaging operation if attempted by unqualified persons."

Pundits, however, caution against racing to be the first one on your block to get the blit. They say that with a large number of unablit-tered STs on the market, very little commercial software will be written to take advantage of the blitter's capabilities. As one observer at the show quipped over coffee: "Remember the GTIA chip on the [Atari] 800? You can count all of the commercial software that took special advantage of it on your hands and feet."

The MS-DOS emulator for the ST was not on display at the Atari

Arlan R. Levitan & The Editors

Fest, but it was the subject of much conjecture. Sources at Atari peg the price of the emulator at around \$300, which will not include a floppy disk drive. The emulator will plug into the DMA (direct memory access) port of the ST, and another DMA port on the emulator will allow the use of both the emulator and a hard disk drive.

Many people at the show commented on a demo of Tom Hudson's CAD-3D program that utilized a pair of Tektronix Liquid Crystal Shutter 3-D stereo glasses. The two images required for the three-dimensional effect were alternately displayed at high speed using page-flipping. The animator system, written by Mark Kimball, an engineer at Tektronix, allows animation at 15 frames per second in 3-D or 30 frames per second in ordinary 2-D. The software and glasses should be available in the first quarter of 1987. Estimated price: under \$150.

More Software Developments

Borland International is said to be considering a version of its popular *Turbo Pascal* compiler for the ST. Borland's *Turbo* team spent most of the year polishing rough edges on the recently released Macintosh version of *Turbo Pascal*. Although an Amiga version was intended to be the group's next project, a contingent of internal ST boosters is reported to have been successful in gaining company president Phillippe Kahn's ear.

If you've been pining for business graphics software, you'll have two packages to choose from shortly. Batteries Included is converting its popular *B-Graph* to the ST, and Antic Software's *A-Chart* was scheduled for release in October. Both programs are capable of saving graphs as DEGAS-compatible files for further manipulation and polishing.

Electronic Arts is preparing to

Educational Software Gets A Boost

One of the markets into which Atari hopes to make inroads with the ST is education—traditionally a stronghold of Apple, with lesser penetration by IBM, Commodore, and Tandy/Radio Shack. This effort got a significant boost this summer when Arrakis, a Montreal-based educational software publisher, concluded a deal with Atari to release its entire Arrakis Advantage Series of 17 programs for the ST.

"We've been talking to Atari about this for over a year," says Mel Leitman, vice president of sales and marketing for Arrakis. "We're part of a billion-dollar company [Southam] here in Canada, and we're very conservative. We wouldn't be developing for the ST if we didn't have confidence in the viability—not to mention survivability—of Atari and the ST."

The Advantage Series is designed for use in homes and schools, and is aimed at junior high and high school students. Among the programs are five titles for algebra, two for geometry, one for trigonometry, one for statistics, four for biology, two for physics, and two for chemistry. They sell for \$39.95 each.

The programs have been available for some time on Apple-, Commodore-, and IBM PC-compatible computers. Arrakis used a special method to convert the programs to run on the ST: "We have our own development system called Socrates," explains Leitman. "When we want to develop for a new system, we build a new kernel for Socrates which lets us quickly port over all of our software." The Socrates kernel for the ST is written in C.

"Socrates is not just a name we picked because it sounded neat or was another Greek name like Plato," he adds. "The Socratic approach to learning involves a questioning approach, a dialectical approach, that lets you ask anything at any time and get an answer. We have a very sophisticated parser that incorporates principles of artificial intelligence and provides direct answers to the student's questions."

The Arrakis programs are also notable for their numerous graphics screens and cartoon-like animation. Arrakis uses professional artists and animators to create these screens. Unlike the Apple, Commodore, and IBM versions, the ST programs will store their screens and data files entirely in memory to eliminate the delays caused by disk access. "It's going to operate at lightning speed," says Leitman. "It's probably going to perform better than any other system we're currently operating on."

Arrakis plans to release the first ST titles this fall and have the entire series available by the end of the year.

release a half-dozen new titles for the ST over the fall and winter seasons. According to Bing Gordon, Electronic Arts' vice president of marketing, ST owners will soon be able to add *Skyfox*, *Chessmaster 2000*, *Ultima III*, *Ogre*, *Autoduel*, and *New Tech Coloring Book* to their software libraries.

"We wanted to wait until the market was right and we could deliver high-quality products," says Gordon. "If our new ST packages are received well, you'll see a steady stream of new Atari titles from us."

Meanwhile, Microsoft wouldn't confirm rumors that a version of its popular *Flight Simulator* for the IBM and Macintosh is being readied for the ST. However, either Microsoft or SubLOGIC—a company that specializes in flight simulator software—is known to be working on such a program. Early versions have been in the hands of testers since the beginning of the summer, and the program is expected to be released in time for the holidays. Those who have seen the program say it looks spectacular.

Atari Board Busted

Software pirates, beware: At least 15 companies that publish Atari titles have banded together to stem the tide of software theft, and in August they took their first concrete action. Result: A BBS (bulletin board system) in Cincinnati went offline for good.

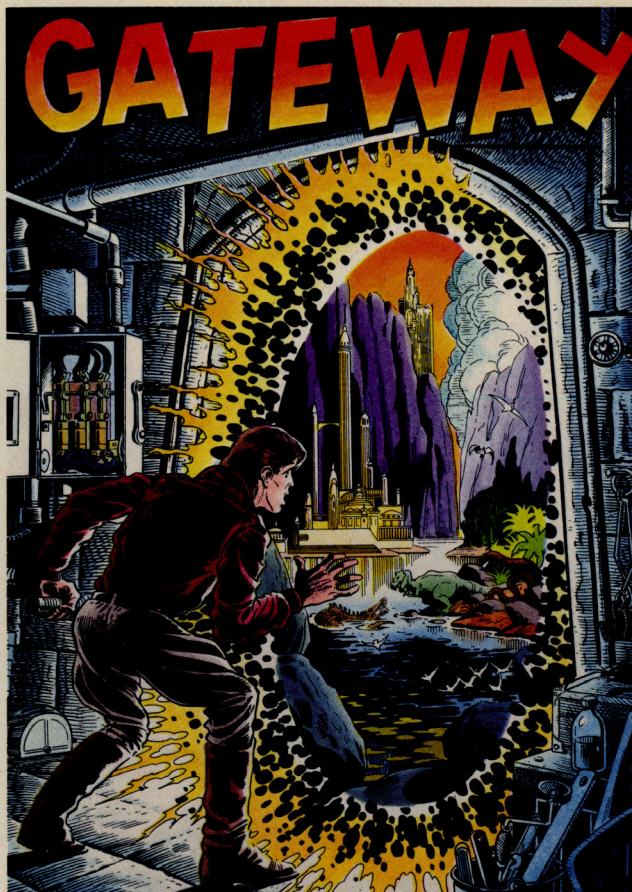
The Star Chamber BBS reportedly offered more than 50 megabytes of copyrighted software for downloading to anyone who called. Among the copyrighted material was a disassembled listing of the Apple Macintosh operating system, which some ST users are trying to acquire so they can build Macintosh emulators for their STs.

Backed by the Software Publishers Association, the software companies appear to be getting serious. Reliable informants report that they swooped down on the BBS with a relentless private detective known as *MadDog*. If you've been around the Atari community since the early Atari 800 days, you may recall *MadDog* from the infamous B. B. Roberts affair.

That caper took place about five years ago when the old Atari hired *MadDog*—a former district attorney from the San Francisco area—to track down B. B. Roberts, an individual who publicly advertised pirated software for sale. *MadDog* eventually found Roberts and put him out of business. To avoid prosecution, Roberts agreed to write a public confession that was widely circulated. Then he promptly faded into obscurity.

Apparently the operator of the Star Chamber will not have to serve a similar penance, but he was confronted personally by *MadDog* and told to shut down or else.

ST



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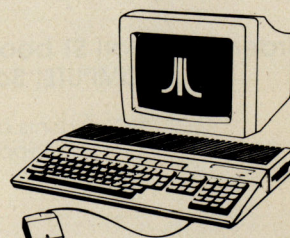
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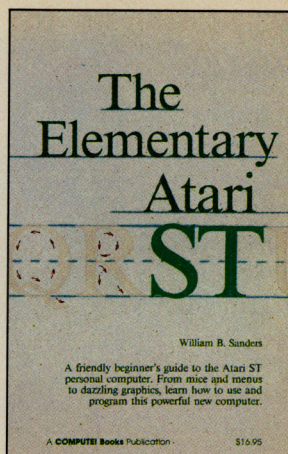
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The Ear

*News, rumors, and gossip
heard around the ST community.*

Power With A Price

While prices have been **steadily dropping** for CD-ROM (Compact Disc-Read Only Memory) players, don't expect Atari to make a move in this area until the prices drop well below \$1,000. That could take a **year or more**. Current models go for an average of \$1,800, and new players to be shown at the Winter Computer Dealer Exposition (COMDEX) in November will be priced below \$1,500. If the market holds true to form, Atari will probably jump back into CD-ROM in late 1987 or early 1988. Meanwhile, **Apple** is expected to make CD-ROM-related announcements in February.

Knights Of The Bargaining Table

An impressive ST version of the classic arcade game *Joust* seems to be bogged down in legal negotiations with Atari. A couple of ST owners in the Detroit area, acting independently, did a great job last spring of converting the eight-bit Atari version to run on the ST. Atari wants the program, but the parties are having difficulty coming to terms. Atari feels it has the **upper hand**, since it holds rights to the title, which keeps the translators from offering it to anyone else. But the translators **want more** than Tramiel & Co. are willing to offer, so it's a Silicon Valley/Motor City standoff. Let's hope that all involved come to a **meeting of the minds**.

Eye To Eye

Will the Amiga versus ST debate never end? Although ST owners are stuck with the Atari SC1224 as their only choice in a color monitor for now, it's not all bad. In a **recent showdown**, the Atari monitor was hooked up to an Amiga and compared side by side with the Amiga 1080 color monitor. **Even Amiga users** had to admit that the Atari screen displayed higher contrast, brighter color, and greater sharpness. However, the Amiga 1080 has some balancing factors in its favor: With inputs for digital RGB, composite video, and separated chroma/luma video, it works with a **much wider variety** of computers than the SC1224 (including eight-bit Ataris and Commodores).

Hard Disk Hard Luck

As of September, Atari's 20-megabyte hard disk drive for the ST remains in short supply. **The Ear** hears that an early batch of 2000 units, shipped during the summer, had to be recalled to correct some **serious glitches**. (A preproduction model purchased by *COMPUTE!'s Atari ST Disk & Magazine* has been working flawlessly for months, however.) The dry supply has left the hard drive field open to other companies, with **Supra** leading the pack. The early Supras were a bit on the noisy side, but a recent switch from 5¼-inch to 3½-inch shock-resistant platters has noticeably quieted things. For storage-starved ST owners, Supra also offers a **60-megabyte** model.

Sounds Of The Baskervilles

Does your pooch **run for cover** whenever you switch on your 1040ST? A recent technical bulletin acknowledges that some units have a problem with a converter chip on the motherboard, resulting in a **high-pitched 16 kilohertz whistle** that can be heard by dogs and reasonably young people not raised on a steady diet of **Quiet Riot** and **Twisted Sister**. If you and your 1040ST are so afflicted, contact the nearest authorized dealer for relief.

Divided Loyalties

Programmer/writer **Russ Wetmore**, widely respected for such works as *Preppie* and *XE Term* on the eight-bit Ataris and *HomePak* on the ST, is now working full-time for **Apple**. He recently picked up his belongings and moved from Florida to Los Gatos, California. But don't fret—**he's not lost** to the Atari community. Under his agreement with Apple, Wetmore is **still free** to write and program for the ST. He's working on a couple of projects right now, in fact.

Unable To Cable, Part 2

An item in **The Ear** last issue described the troubles that a cable manufacturer, Cables-To-Go, was encountering while trying to hook up the Sony KV-1311CR color monitor to the ST. In frustration, Cables-To-Go turned the project over to Sony's engineers, who were anxious to design a cable that would let them hawk the popular KV-1311CR to ST users.

Well, forget it. After wrestling with prototype cables for three months, **Sony has surrendered**. The ST's analog RGB output is so mismatched with the KV-1311CR's requirements that the marriage has been called off. It would have taken an adapter box with its own chips and power supply to make the relationship work—and even then, Sony feared there was a **risk of damage** to the computer. That means Atari still has the market cornered on analog RGB monitors for the ST.

Whisper To The Ear

Got something you want to get off your chest? The Ear wants to hear. Mail missives to The Ear, c/o COMPUTE!'s Atari ST Disk & Magazine, P.O. Box 5406, Greensboro, NC 27403. Or send electronic mail to CompuServe ID 70675,463, Delphi ARLANL, or The Source TCT987. All sources treated confidentially.

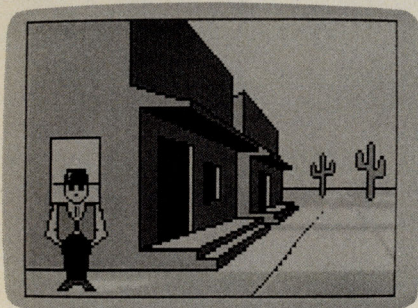
Perspective Drawing With *NEOchrome*

Selby Bateman, Features Editor

Lee Noel, Jr., Assistant Editor, Art & Design

By including NEOchrome with every ST, Atari has made computer art accessible to practically everyone—including those who can't draw a straight line with paper and pencil. The following article shows how even nonartists can master traditional art skills with the help of NEOchrome. It is excerpted from a forthcoming book entitled *COMPUTE!'s ST Artist*, by Selby Bateman and Lee Noel, Jr. (COMPUTE! Books, 1986).

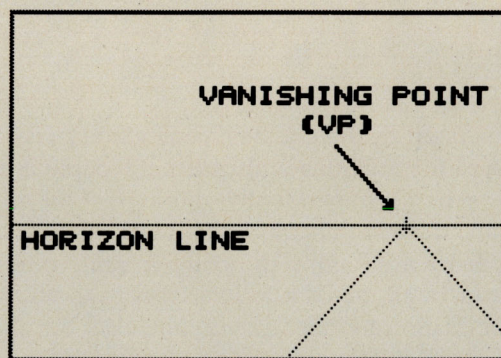
One of the most important elements in learning to draw is understanding and using *perspective*—the art of viewing objects or a scene in a way that shows the relative distance, or depth, as the eye sees it.



A finished perspective drawing, complete with shadows. (Original in color.)

Like so many tools and techniques in the creation of art, perspective requires practice, patience, and thought to be understood and really appreciated.

Figure 1: Vanishing Point



Entire books and courses of study are devoted to the intricacies of perspective as it relates to drawing. While we can't attempt a comprehensive study of perspective, the following project will give you a good idea of just how it works in art and design.

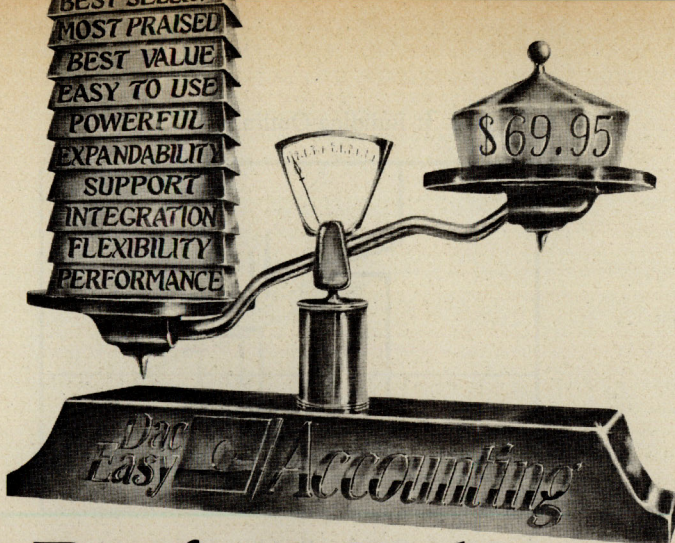
A Western Perspective

Figure 1 is a typical elemental perspective drawing which uses straight lines that converge to a vanishing point (VP) on the horizon.

As you work on this drawing, use one palette block for rendering all perspective-related drawing elements. For example, in Figure 1, the horizon line and the vanishing point are drawn in the same color. This means you can make both images—and any later

perspective details—disappear simply by changing that one palette block to the background color when the picture is completed. The tools that help you now can be hidden once you've finished. (This technique is unavailable when you're using a drawing program in the high-resolution monochrome mode because of the restricted palette.)

If you add a few cactuses, a dotted line, and a Western-style cartoon figure, you'll transform the simple vanishing point and horizon line into the beginnings of a Western scene. Using your tools and studying your work within the Magnify window, create the cartoon figure and the cactuses. Now save these figures to disk. Later, you'll load them from this file into a scene that we've created.



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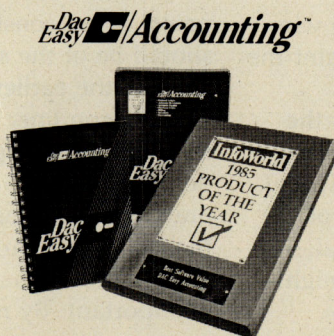


Figure 2: The Artist's Perspective

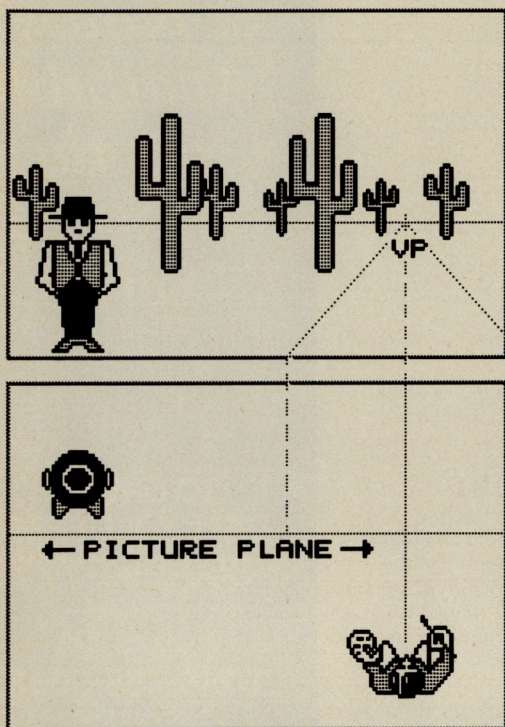


Figure 2 is the scene from two different views. Notice that in the upper rectangle, the horizon line is located near the eye level of the cartoon figure. The height of any horizon line is determined by the height of the observer above ground level. In this case, we're supposing that the artist who is looking at the scene is about the same height as the figure. Horizon geometry then dictates that the line should appear as shown. This can be a useful trick for setting up the relative sizes of objects in a constructed perspective scene such as this one.

The lower rectangle in Figure 2 shows the alignment of the artist (you) relative to the scene in the upper rectangle. The *picture plane* is an imaginary line that gives the artist's viewpoint—something like a plate glass window on which you could paint the image.

The view in Figure 3 is the same as in Figure 1 (before the addition of cactuses and cowboy). This time, you're going to construct buildings there instead. The process is easier than you might first think.

Figure 3: Building Outlines

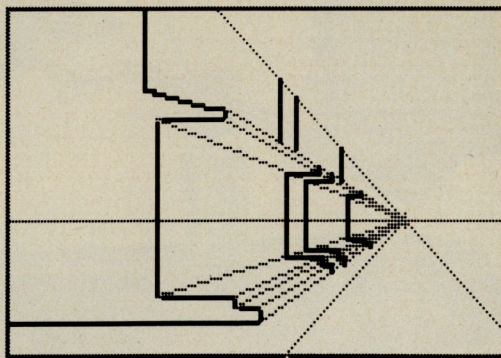


Figure 4: Creating Building Details

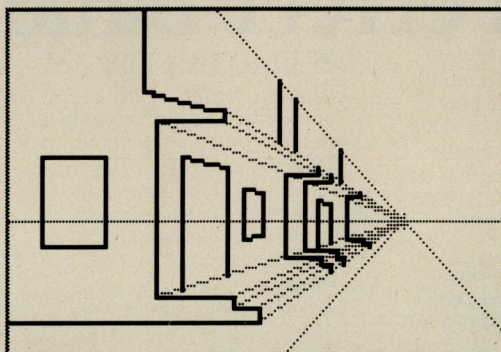
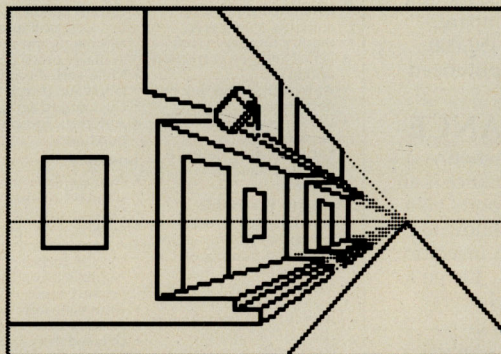


Figure 5: Filling Selected Lines



The dark line in the foreground, appearing closest to you, is drawn first. It represents the first step in drawing a building with a covered porch. Construction lines are then drawn from the corner points, or *vertex* points, of this dark outline back to the vanishing point. Those construction lines should be of the same "vanishing" color as the earlier vanishing point and horizon line. Using the construction lines as guides, finish the design of the two buildings by drawing three smaller versions of the front porch arrangement.

The next phase of the process is important. By now it's probably

apparent to you that some of the construction lines lie within the buildings and are essential parts of the drawing. These sections of construction lines must be converted into the main drawing color; otherwise, they'll disappear when you make the construction lines vanish later on. So, the next step is to add some detail in the darker color (not the vanishing color). The outlines of a couple of doors and windows are drawn—very simple line-draw figures. Study Figure 4 closely and see if you can copy the lines.

As shown in Figure 5, you can continue this process to fill in

Figure 6: Disappearing Lines

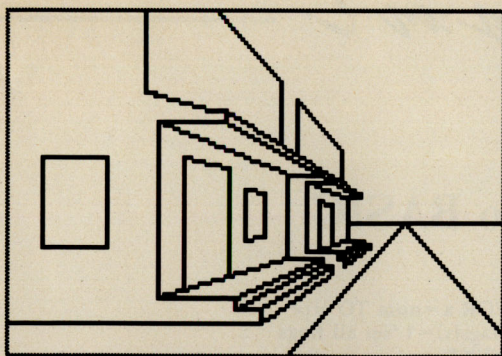


Figure 7: Adding Cowboy and Cactuses

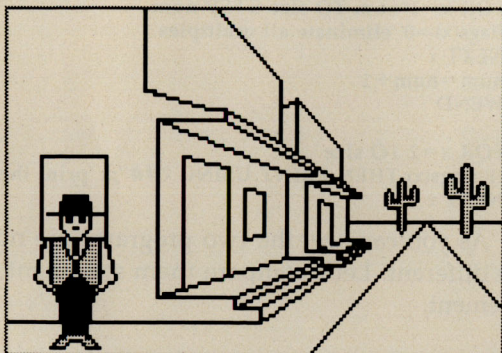


Figure 8: Shading the Scene

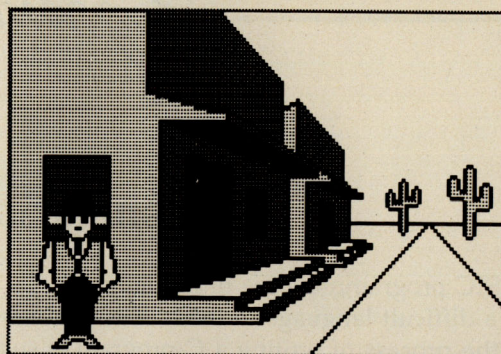
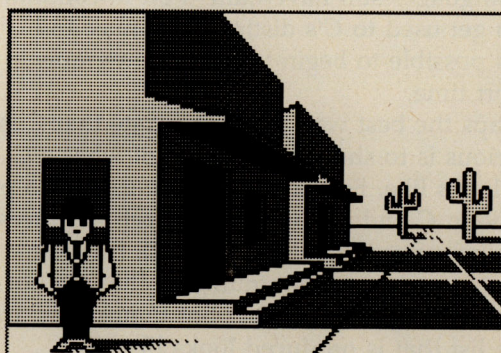


Figure 9: Adding Shadows



some of the lines that connect to the vanishing point. Use the area fill tool to connect the lines. Notice in Figure 5 that the horizon line is still running across the entire frame. What's left of the original lines drawn to the vanishing point remains as well.

Now, compare Figure 6 with Figure 5. The section of the horizon line to the right of the buildings has been colored in. Then, the remaining horizon line—the part that runs through the buildings—has been converted to the background color, causing it to disappear. The same change erases that portion of the vanishing point lines that extend in Figure 5 beyond the end of the buildings. Look carefully at the two figures until you see all of the details that have been changed.

In Figure 7, one or two minor touch-ups have been added to the buildings, and the cartoon figure and a couple of cactuses have been transferred (via the Paste option of the copy block tool) from an earlier file to this present scene.

Here's what you need to do. Save the Western scene to disk.

Reload the cartoon figure and cactuses that you saved earlier. Then use Cut or Copy to place each desired image in the buffer. Now load the Western scene again and Paste the image into position. If you don't have a large, open work space on your screen, you'll probably need to repeat this process in order to separate the various elements from one another.

It will be easier to position these elements in the street scene if you temporarily bring back the vanishing point and the horizon line; they're both still present but invisible. Making them visible again requires just a quick change to the special palette block.

Once you've added the cartoon figure and the cactuses, change the vanishing point and horizon lines to the background color by altering the palette block again.

The next step is to shade the drawing by filling the areas from other palette positions, as shown in Figure 8. When you're adding the shading, it's necessary to fill all the areas marked by the invisible construction lines. Use the

pencil and area fill tools to make these minor changes.

You can avoid this problem by using an alternative way of setting up construction lines. Instead of using a special palette block for all construction lines, draw the lines in any color. Then, you can make them disappear later by filling or redrawing them in the color from the actual background palette position. This procedure erases the construction lines, but it also completely removes them—which can be frustrating if you need to refer to them later.

The drawing acquires a finished look as shadows are added, as shown in Figure 9 and the screen photo at the beginning of this article. Note especially the cowboy's shadow and the way that the right side of the street, or trail, has been reversed in order to cut through the shadows. Here, again, experiment with different colors to discover which elements work best together.

ST

Programming in C

Comparing C To BASIC

Some BASIC programmers are intimidated by C's image as a difficult language to learn. Though it is true that the process of writing a C program is substantially different from writing a program in BASIC, the two languages still have quite a bit in common. Once you get used to C's distinctive syntax and style, it is possible to begin writing C programs in just a short time.

Perhaps the best way to demonstrate that C isn't so mysterious is to show an example of what a C program looks like. Following are listings of two programs, one in C and one in BASIC. Each produces a list of the prime numbers from 2 to 50. (In case you've forgotten, primes are numbers that are not evenly divisible by any number but themselves and one.) The list that is produced looks like this:

```
2
3
5
7
11
```

and so on (up to 47).

First we'll look at the C-language version:

```
/* Sieve.c—Finds the prime numbers from 2 to SIZE */
main()
{
    int num, x, count;          /* declare & initialize variables */
    #define SIZE 50
    char flags[SIZE+1];
    num = 2;
    for (x = num; x <= SIZE; x = x+1)
        flags[x]=1;             /* set all flags */
    while (num < SIZE/2) {
        for (x = 2*num; x <= SIZE; x = x+num)
            flags[x] = 0;        /* eliminate multiples */
        num = num +1;
    }
    for (x = 2; x <= SIZE; x = x+1)
        if (flags[x])
            printf("%2d \n",x); /* print the primes */
}
```

This source code is on the magazine disk as PRIME.C, and the executable object code is on disk as PRIME.TOS. Now, here is the same program in ST BASIC, stored on disk as PRIME.BAS:

```
100 REM Sieve.bas—Finds the primes between 2 and size
110 '
120 DEFINT a-z 'declare and initialize variables
130 size=50
140 DIM flags(size+1)
150 num=2
```

```
160 '
170 FOR x=num TO size
180 flags(x)=1 'set all flags
190 NEXT
200 '
210 WHILE (num<size/2)
220 FOR x=2*num TO size STEP num
230 flags(x)=0 'eliminate all multiples
240 NEXT x
250 num=num+1
260 WEND
270 '
280 FOR x=2 TO size
290 IF flags(x) THEN PRINT USING "##";x 'print the primes
300 NEXT x
```

As you can see, the two programs are not all that different. Let's compare them statement by statement.

Flexible Formatting

To begin with, you'll notice the C program has no line numbers. A single statement can take up one line or many lines. The compiler doesn't get confused because each statement in C ends with a semicolon (;), and multiple statements grouped together as a single block are enclosed in curly braces ({}). The programmer decides how to arrange the statements on each line to make the program neat and readable. It is customary, however, to group the various parts of a C program together in a way that makes them visually distinct from one another.

The first statement, which starts with the slash and asterisk characters (/*), is a remark—identical to the REM statement in line 100 of the BASIC program. In C, a remark can extend over many lines until the closing */ characters. It is especially important to include many remarks in a C program, because the language is compact and each statement can do a lot of work. Without comments, it can be difficult to remember what a line of C code actually does. Furthermore, remarks don't affect the size of the final program in C, since the compiler ignores them. With a BASIC interpreter, REM statements consume memory.

Next comes the line *main()*. This marks the start of a function named *main*. All C programs are made up of functions, which are small subprograms. Every C program has at least one function, called *main*, where program execution begins. The fact that the name *main* is followed by parentheses, but no semicolon, shows that it is a function definition. Some functions use values (called parameters) that are

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passed to them by other functions, and such functions contain the names of these variables listed within the parentheses. Since `main()` is the first function to execute, the only values it can be passed are those in the list of parameters that the user types in when starting a TTP (TOS Takes Parameters) type of program. The example program above is a TOS program, without parameters, so the parentheses after `main` are empty.

After the name of the function comes the curly brace character, `{`. Curly braces are plentiful in C programs—they mark the beginning and end of function definition blocks, and the beginning and end of compound statements within a function. As shown here, most programmers indent the lines to make the source code more readable—indentations help to visually match up left braces with their corresponding right braces.

Defining Variables

After the initial brace come three strange-looking statements:

```
int num, x, count;      /* declare & initialize variables */
#define SIZE 50
char flags[SIZE+1];
```

The first is roughly equivalent to the `DEFINT` statement in line 120 of the BASIC program. It declares that the variables named `num`, `x`, and `count` will be integers, and reserves space for these variables. To tell the truth, though, the equivalent BASIC line was added for instructive purposes rather than out of necessity. BASIC isn't a strongly typed language. Most of the time, you don't have to worry about whether a simple numeric variable is stored internally as an integer or a floating point value (although most BASICs give you the option of specifying which should be used, for those times when it's necessary). Unless you specifically declare a variable type with a `DEF` statement, BASIC assumes a default type and reserves storage space for the variable on its own.

With C, however, declaration statements are not optional. You *must* take responsibility for deciding how much storage space will be allotted for each variable, and you can even specify the particular memory location to be used to store a variable. Each time you want to use a variable in C, you must declare ahead of time whether it should be stored as a long or short integer, single- or double-precision floating point, or text characters. These declarations are usually made in a block at the top of the function definition.

The only case in which BASIC really requires you to declare a variable ahead of time, the way C does, is when a subscripted array will have more than ten elements. In this respect, the `DIM` statement in line 140 of the BASIC program is very similar to the C declaration of the `flags` array.

The Preprocessor

The middle statement in the trio of C lines shown above is somewhat more complicated to explain. Where the BASIC program assigns the value of 50 to a variable called `size`, the C program uses the `#define` statement to define a macro called `SIZE` as the number 50. This is because C has a feature known as the *preprocessor*. This allows you to define symbolic names which are replaced by a larger expression when found in the program by the compiler.

In these two programs, we use the terms `size` and `SIZE` to refer to the size of the group of numbers in which we are looking for primes. This makes it easy to change the size of the group; we need only change the value of the `size` term.

In BASIC, the `size` value must be assigned to a variable—even though its value stays constant throughout the program—because BASIC has no other symbolic way to represent a number. But in C, we can use the `#define` operator to create the symbol `SIZE`. Every time the compiler sees the word `SIZE`, it will substitute the number 50. This allows us to assign a symbolic meaning to `SIZE`, making the program easier to read without wasting storage space in our program by creating a variable for this constant value.

This example, however, gives only the smallest clue to the power of the preprocessor, which can be used for much more sophisticated types of substitutions.

Building Loops

When we compare the bodies of the programs, we find that there are only small differences. The first is that the form of the loop used by each language is somewhat different. The BASIC format declares a loop variable, the starting value of that variable, the terminating value, and an increment value, separated by the keywords `TO` and `STEP`. The increment parameter is optional and defaults to one if omitted.

In C, the starting condition, termination condition, and the condition repeated each time through the loop are enclosed in parentheses and separated by semicolons. Although in this particular program each condition is related to the variable `x`, it is interesting to note that in C, unlike BASIC, the three conditions do not all have to relate to the same variable. We could declare a loop that begins by setting the value of `y` to 0, and ends when `z` is equal to 50, changing the value of `x` each time through the loop. Also, it is possible to leave one or more terms empty; the expression `for(;;)` can be used to set up an endless loop.

The second difference is that BASIC uses the `NEXT` statement to mark the end of a `FOR` loop, while C expects the loop to consist of either a single statement or a compound statement enclosed in curly braces. This compound statement may be com-

posed of any number of lines. The same is true of the *if* conditional statement. The compound *if* statement may stretch over several lines—unlike the BASIC *if* statement that must take up only one line.

Likewise, where BASIC uses the *WEND* statement to define the end of the *WHILE* loop, C accomplishes the same thing by enclosing the whole body of its *while* statement within curly braces.

Screen Output

Another difference is the ways in which the two programs print their results. The C program uses a function called *printf()*, which is not part of the language proper. Instead, *printf()* is part of the standard library of input/output routines that must be *linked* with the program after it is compiled. During the linking stage, these routines are attached to the object code generated by the compiler.

Printf() also is an example of a function that takes parameters. The text and variables upon which a function operates appear within the parentheses that follow the function name. The *printf()* function performs roughly the same task as the *PRINT USING* command in BASIC. The *%* and *d* characters specify that a decimal number is to be formatted, and the number 2 is used to specify that the numbers are to be printed with digits before the decimal place and none after. In BASIC, the *PRINT USING* template *##* does roughly the same thing. However, the C *printf()* function allows for multiple substitutions, while separate BASIC statements would be required for each formatted column.

This example should make it pretty clear that once you get past the formal requirements of function names, curly braces, and variable declarations, C is not as strange as you might have thought. Of course, you should not take this to mean that C is just BASIC in disguise. C has a number of powerful features that distinguish it quite clearly from BASIC. But thankfully, there are enough similarities so that beginning programmers can produce working code right away and can learn to take advantage of C's special features a little at a time.

C Shortcuts

For most BASIC programmers, C's extra features will be quite welcome. For example, C has a multitude of powerful math and logical operators. The statement *x += num;* may be less recognizable at first than *x=x+num;* but it requires a lot less typing over the course of a long program. C allows you to use either form.

As mentioned above, C has a number of features that let you pack a lot into one line. For example, you can make multiple assignments using the *=* operator. The statement

```
a=b=c=d=0;
```

is just fine in C. In most BASICs, it would require four separate statements.

Assignments can also be made to a value that is the result of a function, as well as to a constant value, as in this statement:

```
a=b=c=d=getchar();
```

Here, *getchar()* reads the character from the keyboard and assigns it to four different variables.

You can even make assignments at the same time you make comparisons. For example, the statement

```
if ((a=b)<c) DoThis();
```

first assigns the value of *b* to *a*, then compares that value to *c*, and calls the functions *DoThis()* if the new value of *a* is less than that of *c*.

Admittedly, the C prime-number program shown earlier was to some extent written to look as much as possible like the BASIC program. Here is another version that is a bit more C-like:

```
/* Sieve1.c—Finds the prime numbers from 2 to SIZE */
#define SIZE 50
main()
{
    int num = 2, x, count; /* declare & initialize variables */
    char flags[SIZE+1];
    for (x = num; x <= SIZE; x++)
        flags[x]=1; /* set all flags */
    while (num++ < SIZE/2)
        for (x = 2*num; x <= SIZE; x += num)
            flags[x]=0; /* eliminate multiples */
    for (x = 2; x <= SIZE; x++)
        if (flags[x])
            printf("%2d \n",x); /* print the primes */
}
```

We've taken several C shortcuts here. First, the variable *num* is assigned a value in the line in which it is declared. As stated above, in C you can assign a value to a variable just about anywhere. Also, we use the *+=* operator as explained above. Finally, in three places we use the *++* increment operator. Using this operator, we can say *x++* instead of *x=x+1*.

Note also that the *++* operator can be used to increment one of the variables being compared as part of the condition of the *while* statement. The *++* following the variable *num* means that *after* the comparison has been made to determine whether the *while* loop should continue, the value of the variable should be increased by one. If the *++* came before the variable name, its value would be increased *before* the comparison was made.

Learning C is a big step up from learning BASIC, though perhaps not as big a step as learning to program in machine language. But like any big programming job, writing a C program can be broken down into smaller, more manageable steps. Once you try C, you may discover that taking full advantage of the power of your Atari ST may not be as difficult as you once thought.

ST

ST-Shell

Richard Smereka

Here's a major new feature for your Atari ST—a program that provides disk operating system commands and batch file capabilities. Using more than 30 Unix-like commands, you can run programs, create and delete files and folders, print screen messages, set the system date and time, change screen colors, customize the cursor, check free memory, set up autoboot sequences, and much more. The program works on all STs in medium-resolution color and high-resolution monochrome modes.

The Atari ST relies heavily on the desktop metaphor provided by GEM, the Graphics Environment Manager. Instead of typing in cryptic disk operating system commands, you deal with icons, windows, and drop-down menus. For instance, you never have to use a DIR or CATALOG command to find out what's on a disk; instead, you open or double-click the disk icon. You don't type LOAD or RUN to execute programs; you open or double-click the program icon. You don't manipulate files by typing COPY, ERASE, or DELETE; you drag icons from window to window or to the trash can.

Although designed for convenience, the desktop-style interface can sometimes become a minor nuisance, especially when you perform a certain series of actions every time you turn on the computer. For instance, you might want to start each session by setting the system clock, running a RAM disk utility, and copying certain files from drive A to the RAM disk. What's needed in a case like this is an old-fashioned command-line DOS that supports batch files.

"ST-Shell" is the answer. Like GEM, it's a program that wedges itself as a shell between you and the computer's underlying operating system. But unlike GEM, it's not a graphics-oriented desktop environment. Instead, it's a command-line interpreter similar to MS-DOS, CP/M, DOS XL, and the Amiga CLI. Actually, most of the commands are patterned

after those found in Unix, a popular operating system on minicomputers and powerful micros. With ST-Shell, you enter commands at a DOS prompt to manipulate files, run programs, pass arguments, and execute batch files. You can even set up your system to automatically run a batch file when the computer is first switched on.

Almost any program can be executed from ST-Shell. If the program requires arguments such as filenames or additional commands, you can add them to the command line and they'll be passed along. In addition, ST-Shell allows batch files of just about any size.

ST-Shell is set up for an 80-column screen, as found in the medium- and high-resolution modes. It's possible to run ST-Shell in the low-res mode, but characters past column 40 will not appear on the screen.

Some readers may find the following instructions for using ST-Shell somewhat involved and complicated. If so, they should keep two things in mind. First, ST-Shell is much more than the average utility program; it's a fairly complete, yet compact, disk operating system shell. In all, there are 33 commands for managing disk files and setting up your system, and many of these commands have several variations. If you've never used a command-oriented DOS before, it will take some time to fully master this environment.

Second, remember that the complexity of command-line interpreters like ST-Shell is exactly why Atari chose to equip the ST with GEM. Many of the functions provided by ST-Shell can be performed more easily with GEM, but some can't be performed at all—such as the batch file processing. ST-Shell offers flexibility in return for its complexity.

Preparing ST-Shell

ST-Shell is on the magazine disk as STSHELL.TOS. You can run it directly from the magazine disk (either from the menu program or the GEM desktop), but we recommend copying it to another disk

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and saving the original as a backup. When you copy STSHELL.TOS to another disk, also copy the file called HELP.BAT. (We'll explain why later.)

Note that ST-Shell is a TOS (Tramiel Operating System) application, as indicated by the .TOS filename extender. TOS applications do not support GEM features such as windows, drop-down menus, and the mouse controller. When you run a TOS application, the screen clears, the mouse pointer disappears, and a text cursor is enabled.

In some cases, you may want to rename ST-Shell from STSHELL.TOS to STSHELL.PRG to disable it as a TOS application. ST-Shell still won't support GEM features, but it will behave differently in some respects. For instance, if you want ST-Shell to run automatically when you turn on the computer, *you must rename it STSHELL.PRG and place it in a folder named AUTO*. The ST checks for an AUTO folder during bootup and runs any non-GEM programs in the folder that have the .PRG filename extension. The programs are executed in the order in which they were placed in the folder. (GEM programs can't be started from the AUTO folder because GEM is not initialized at this stage of the bootup procedure.)

If you place ST-Shell in the AUTO folder as STSHELL.PRG, you'll notice that the ST wakes up in the low-resolution screen mode if you're using a color monitor. That's because the ST boots up in low-res by default unless you Set Preferences for medium-res and then select Save Desktop. Even if you've done this, however, the ST still boots up in low-res when running ST-Shell from the AUTO folder. Why? Because the DESKTOP.INF file which saves your preferences is not loaded until after all programs in the AUTO folder have finished executing. This is an idiosyncrasy of the ST that you'll have to get used to when booting ST-Shell from the AUTO folder.

You'll also notice that the text cursor does not appear when ST-Shell is booted from the AUTO folder. This is normal; you can turn on the cursor with ST-Shell's CURON command.

It's important to realize that since GEM is not initialized when the ST is running programs found in the AUTO folder, *you can't run a GEM application from ST-Shell if STSHELL.PRG has been automatically started from AUTO*. This means that autobooting batch files cannot run GEM applications—a limitation of the ST, not of ST-Shell.

Running GEM Programs

It is possible, however, to run GEM applications from ST-Shell if STSHELL.PRG has *not* been started from the AUTO folder. If you run STSHELL.PRG from the desktop, you can launch a GEM application simply by typing its filename at the ST-Shell prompt. For example, suppose you want to run *1ST*

Word and load a text file called DIARY.DOC. With STSHELL.PRG active, you can type this command:
1ST_WORD DIARY.DOC

or include this line in a batch file. The computer runs *1ST Word* and loads DIARY.DOC. (This demonstrates ST-Shell's ability to pass arguments—in this case a filename—to an application program.)

If you try to run a GEM application such as *1ST Word* from ST-Shell when it is named STSHELL.TOS (a TOS application), the GEM program comes up on the screen but lacks a mouse pointer. You'll probably have to reboot to regain control. When you run the GEM program from ST-Shell when it is named STSHELL.PRG, the mouse pointer and other GEM features remain available.

You may notice some odd effects when running GEM programs from ST-Shell, however. For instance, the text cursor may remain on the screen, superimposed on the GEM application. Although the cursor usually causes no harm, you can prevent this by turning off the cursor with ST-Shell's CUROFF command before running a GEM program.

Similarly, when you quit the GEM application and exit back to ST-Shell, remnants of the GEM screen and mouse cursor may remain on the ST-Shell screen. You can clean this up by entering ST-Shell's CLS command.

The ST-Shell Screen

When ST-Shell first runs, you'll be greeted with a sign-on message, a text cursor, and a command-line prompt that looks like this:

A:

This prompt indicates that the current disk drive is drive A. In other words, all disk commands entered at this prompt will affect drive A. ST-Shell is now waiting for you to type in a command.

(Note: If you run ST-Shell from a drive other than drive A, that drive identifier appears as the default prompt.)

All ST-Shell commands can be typed in upper- or lowercase characters. You can even mix upper- and lowercase, since ST-Shell converts all input to uppercase before interpreting the command.

An ST-Shell command or a program name *must* appear as the first argument on any new command line. Any following arguments (such as the *1ST Word* document filename shown above) must be separated from the command by one or more spaces. When entering commands at the keyboard, you are limited to one screen line. Commands in a batch file, however, may be longer. (We'll cover batch files in detail below.)

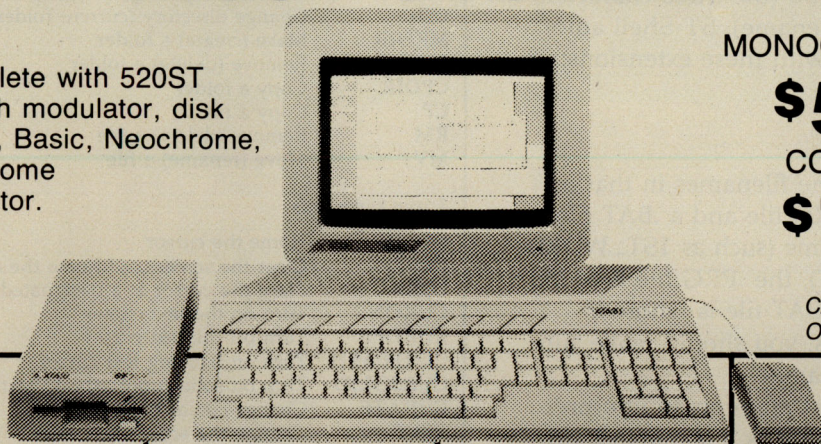
Running Other Programs

To run a program from ST-Shell, all you have to do is type the name of the program followed by any

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arguments that may be optional or required. For example, to run a text editor program named ED.PRГ, type:

ED *filename*

where *filename* is the name of the text file you wish to edit.

When running a program from ST-Shell, do not type in the filename extension (the three characters following the period in a filename). ST-Shell automatically searches for files with these extensions:

.PRG (application programs)
.TOS (TOS applications)
.BAT (ST-Shell batch files)

ST-Shell searches for the filenames in that order. In other words, if a .PRG file and a .BAT file happen to have the same name (such as 1ST_WORD.PRГ and 1ST_WORD.BAT), the .PRG file is found and executed first and the .BAT file is ignored. Therefore, to avoid conflicts, you should make sure your files have unique filenames.

Also, since ST-Shell first attempts to interpret anything on the command line as a command, do not use filenames that are the same as ST-Shell commands. The accompanying table shows the full command set.

Command Syntax

In the following sections, we'll list ST-Shell commands in uppercase type and required parameters in lowercase italics. Optional parameters are listed in lowercase italics enclosed in brackets. *Do not type the brackets.* For example:

RMDIR [*x:*] [*\path*] *foldername* [*-P*]

means the command RMDIR (Remove Directory) requires one parameter, the name of a folder to remove. Optional parameters include a drive identifier (*x:*), a pathname (*\path*), and the characters *-P* (which prevent ST-Shell from warning you if the folder to be deleted contains any files). Remember that all ST-Shell commands and parameters must be separated by spaces.

So, to delete a folder named LETTERS on drive B, and to prevent ST-Shell from alerting you if the folder contains any files, you enter:

RMDIR B: LETTERS \ -P

If the folder LETTERS is contained within another folder on drive B called TXTFILES, you enter:

RMDIR B: \TXTFILES \ LETTERS \ -P

When you're first learning ST-Shell, it's a good idea to experiment with the commands on a scratch disk before using a disk with important files.

Disk Commands

x:

This changes the current disk drive and therefore the ST-Shell prompt which appears on the screen. Nor-

ST-Shell Command Set

Command	Function
---------	----------

Disk commands

x:	Change prompt to the specified drive (A-P).
DF	Display free space on disk in the current drive
LS	List (display) the disk directory
GD	Get directory: display current folder name
CD	Change directory (current folder)
MKDIR	Make (create) a folder
RMDIR	Remove (delete) a folder
CPDIR	Copy a folder
CP	Copy a file
RM	Remove (delete) a file
MV	Move (rename) a file

Screen commands

HOME	Home the cursor
CLS	Clear the screen and home the cursor
PLOT	Place the cursor at a designated location
CURON	Turn on the text cursor
CUROFF	Turn off the text cursor
CURFLASH	Turn on flashing text cursor
CURSOLID	Turn on solid (nonflashing) text cursor
CURATE	Change cursor flash rate
TEXT	Change the screen text color
BGROUND	Change the screen background color
RVSON	Turn on reverse video
RVSOFF	Turn off reverse video
ECHO	Print text or blank line on the screen
WRAPON	Wrap text to next screen line if line overflows
WRAPOFF	Do not wrap overflow lines; ignore overflow text

Miscellaneous commands

MF	Display the amount of free memory (RAM)
BEEP	Beep the monitor speaker
TIME	Get or set current system time
DATE	Get or set current system date
DOC	ST-Shell remark statement
BYE	Exit ST-Shell and return to GEM desktop
EXIT	Exit ST-Shell from a batch file and return to GEM desktop

mally, ST-Shell defaults to the drive from which it was run, and the screen prompt denotes this drive. You can change this to any drive you want—the *x* parameter stands for any drive identifier in the range A through P. On a single-drive system, your drive is always A. The second floppy drive is always B. If you have a RAM disk installed, or a hard drive, you may use the letters C-P. For this command to work properly, nothing else must be on the command line or in a batch-file line.

DF

Display Free disk space. This command displays the total amount of disk space available and the amount of space remaining on the disk in the current drive.

LS [*x:*] [*\path*] [**.**]

List directory. This command lists to the screen the directory of a disk or folder. The default drive is listed unless you provide a drive identifier (*x:*). Note that the wildcard symbols (**.**) are optional only for listing a directory for the current drive. If you are

listing a directory for another drive or folder, you must include the wildcard symbols. Of course, you can change the wildcard symbols to specify that only certain files should be listed. For example, LS B: *.C lists to the screen only those files ending with the extension .C on the disk in drive B.

The optional pathname (*\path*) lets you list the contents of a folder nested to any level. ST-Shell has a simple rule regarding folder pathnames. When using the commands MKDIR, RMDIR, and CPDIR, you may omit the backslashes in the pathname if the folder is not nested below the root level. For example, the command RMDIR TEST is a valid command as long as the folder TEST is not nested below the root directory. If you are in doubt, use the backslashes.

GD

Get Directory. This command displays the current folder (directory) or indicates that the current directory is the root directory.

CD [*\foldername*]

Change Directory. This changes the current directory to the folder specified. If no folder is specified, CD defaults to the root directory.

MKDIR [*x:*] [*\path*] *foldername*

Make Directory. This creates a folder on the default drive, or on the drive indicated (*x:*). ST-Shell displays an error message if the folder cannot be created (for example, if a folder of that name already exists).

RMDIR [*x:*] [*\path*] *foldername* [-P]

Remove Directory. This removes a folder from the default drive, or from the drive specified (*x:*). The folder may contain files and other empty folders. You cannot delete a folder if it contains other nested folders with files in them. If the folder contains files, ST-Shell asks if you're sure you want to delete them. This safety measure may be prevented by using the option -P.

CPDIR [*x:*] [*\path*] *olddir* [*x:*] [*\path*] *newdir*

Copy Directory. This command creates a new folder and copies into it the entire contents of an existing folder. The *olddir* parameter specifies the old directory (existing folder) name. The *newdir* parameter specifies the new folder. The new folder cannot already exist.

CP [*x:*] [*\path*] *oldname* [*x:*] [*\path*] *newname*

Copy a file. Both drives (if they are different) must be separate physical drives or RAM disks. On a single-drive system, you cannot copy a file from drive A to drive B because they are the same physical drive.

RM [*x:*] [*\path*] *filename*

Remove file. This deletes the file specified by *filename* from the current folder in the current drive, or

from the drive and/or folder specified by *x:* and *\path*.

MV [*x:*] [*\path*] *oldname* [*x:*] [*\path*] *newname*

Move (rename) a file. The *oldname* (and optional parameters) refers to the existing filename. The *newname* refers to the new filename. The new filename cannot already exist; if it does, ST-Shell reports an error. Files can be moved between folders, but not between disk drives, with this command.

Screen Commands

HOME

Home the cursor. This command places the text cursor in the home position (the upper left corner) without clearing the screen.

CLS

Clear Screen. This command both clears the screen and homes the cursor.

PLOT *row column*

Plot cursor at specified position. With this command, you can move the cursor to any screen position indicated by *row* and *column*. In the medium- and high-resolution screen modes, *row* can range from 0 to 24, and *column* can range from 0 to 79. Plotting outside these ranges results in an error. PLOT is useful when you are formatting the screen with ECHO commands in a batch file.

CURON [-B]

Cursor On. This command makes the text cursor visible if it isn't on the screen. Normally, when processing batch files, ST-Shell automatically turns off the cursor. You can suppress this feature by specifying the -B option.

CUROFF [-B]

Cursor Off. This command makes the text cursor invisible. This is handy for formatting the screen. The -B option suppresses the cursor only during batch file processing (the default).

CURFLASH

Cursor Flash. This enables a blinking text cursor, the default.

CURSOLID

Cursor Solid. This stops the text cursor from blinking, displaying it as a solid block.

CURATE *rate*

CURATE -N

Cursor Rate. Both of these commands change the rate at which the cursor flashes. Higher values for *rate* make the cursor blink slower; lower values make it blink faster. The useful range for *rate* is 10-50. If you specify a *rate* of 1, the cursor blinks so fast that it appears to be gray. The command CURATE -N restores the flash rate to ST-Shell's

default value, which is approximately equal to CURATE 30. The CURATE command has no effect if CURSOLID has been executed.

TEXT *color*

Change text color. In hi-res, *color* can be 0 or 1; in medium-res, *color* can range from 0 to 3.

BGROUND *color*

Change background color. Allowable values for *color* are the same as for the TEXT command.

RVSON

Reverse On. This causes all subsequent ECHO commands to print in reverse video. If you follow RVSON with CLS, the entire screen is reversed.

RVSOFF

Reverse Off. This disables reverse-video printing.

ECHO [*text line to be printed*]

Print text on the screen. This command is generally used in batch files. If no text is specified, ECHO prints a blank line. ECHO is an exception to the rule that ST-Shell converts all text to uppercase; when processing batch files, ST-Shell prints the text in an ECHO statement as is.

WRAPON

Wrap On. If a line of text overflows a screen line, this command allows the leftover text to be printed on the next screen line.

WRAPOFF

Wrap Off. This command truncates all text after printing on screen-column 80. This is the default when ST-Shell is initialized.

Miscellaneous Commands

MF

Memory Free. This displays the number of available bytes of random access memory (RAM) in the ST.

BEEP

Beep the monitor speaker. This is useful in batch files when you want to grab the user's attention.

TIME [*hh:mm:ss*]

TIME P

Get or set system time. If the TIME command is followed by no arguments, ST-Shell displays the current system time. To set a new time, follow TIME with the new setting. You can omit leading zeros (for example, 9:15:00 does not have to be entered as 09:15:00). The TIME P command causes ST-Shell to prompt the user to enter the time; this is useful in batch files.

DATE [*mm/dd/yy*]

DATE P

Get or set system date. The same basic rules that apply to the TIME command also apply here: You can enter 8/6/86 instead of 08/06/86 or 08/06/1986.

The DATE P command prompts the user to enter the date; again, this is intended for batch files.

DOC [*comment text*]

Document remark. This is like a REM statement in BASIC; it lets you add comments to batch files. ST-Shell ignores any text that follows DOC.

BYE

Exit ST-Shell to the GEM desktop; this command may not be used in a batch file.

EXIT

Exit ST-Shell to the GEM desktop from within a batch file. This command should be on the last line of the batch file.

Batch Files

If you're new to a command-oriented DOS, you may be unfamiliar with the advantages of batch files. A batch file is just a series of DOS commands that are executed in sequence by the computer. The computer reads the commands in the batch file and carries them out, one by one, just as if you have typed them on the keyboard. In effect, a batch file is a program written in the language of DOS commands.

Batch files are extremely useful for automating frequently executed tasks, which is why they were incorporated into the design of ST-Shell. And like any good DOS, ST-Shell is capable of automatically reading and executing a batch file when the computer is first powered up. (We'll cover this in a moment.)

An ST-Shell batch file is identified by the file extension .BAT. A batch file may consist of ST-Shell commands and can even run other programs. Consider this example:

```
ECHO ** This is a batch file test **
MKDIR B:USR
CP TEST.C B: \USR \ TEST.C
NUMBER
```

To create this batch file, you enter these lines exactly as they appear above with a text editor or word processor that can save straight ASCII files (such as 1ST Word with its WP Mode switched off). Suppose you save this text file on disk with the filename BATCH.BAT. To run the batch file, you'll type BATCH at the ST-Shell prompt (remember that you don't have to type the filename extension .BAT).

When BATCH.BAT runs, ST-Shell executes the four commands in the sequence shown above. The first command ECHOes a simple message on the screen. The second command, MKDIR, creates a folder on drive B called USR. The third command, CP, copies the file TEST.C from the current drive (usually drive A) into the folder USR on drive B. The last line in the batch file tells ST-Shell to run the program named NUMBER on the default drive. The program NUMBER can have the file extension .PRG or .TOS.

NUMBER cannot be another batch file, however. A batch file cannot load and run another batch file.

Passing Parameters

ST-Shell lets you pass parameters from the command line to a batch file. For example, you could type this on the command line:

TEST HELP.DOC

TEST could be a batch file which contains this single line:

PRINT %1

This means you'll be executing the program PRINT from within the batch file TEST, and you'll be passing the first (%1) argument found on the ST-Shell command line to PRINT. The specifier %1 replaces the characters found in the batch file with the *n*th command line argument. Command line arguments start from zero, which is the actual program name and cannot be used in a batch file.

Unlike ST-Shell commands entered at the keyboard, a batch file command can be extended past one screen line. The @ character is called the *line-continuation character*. When placed at the end of a batch line, it tells ST-Shell that the next batch line should be treated as a continuation of the first line. You may not continue a line past the second line, however.

This capability is useful if you're programming in a language like C that requires lengthy commands for compiling or linking. Suppose you are linking a program like this:

```
link68 [u,tem[d:]] %1.68k=gemstart,d:%1,osbind,gemlib,libf,@  
vdibind,aesbind
```

Normally, it would be difficult to get this entire command on one line. But when you're using the line-continuation character, the command does not have to be squeezed on one line. Note where the continuation character is placed—between one sub-command and another. Do not chop a command in the middle.

Also, since ST-Shell ignores all leading spaces, notice that you can indent the second line.

Special Notes

Multiple commands on a single line are not permitted in batch files; each line in a batch file may contain only one command or program name.

If you want a batch file to terminate ST-Shell and quit to the GEM desktop, keep in mind that you must use the EXIT command, not BYE. The BYE command is valid only when typed on a command line.

One batch file has a special meaning to ST-Shell. When ST-Shell initializes, it looks for a batch file called AUTOLOG.BAT. If this file is present, ST-Shell automatically executes the file. This lets you

create an autoboot sequence that prompts you for the date and time, customizes the screen colors and text cursor, prints a welcome message, or whatever you want.

You'll find two examples of AUTOLOG.BAT files on the magazine disk; a short one is on the root directory, and a longer one is in the folder named STSHELL. The longer AUTOLOG.BAT demonstrates a typical startup sequence that queries for the date and time. This AUTOLOG.BAT is designed to be executed when ST-Shell is booted from an AUTO folder. For this purpose, it must be on the root directory. *Therefore, you must copy it to the root directory of your boot disk, along with STSHELL.PRG in an AUTO folder, to see how it works.*

If you're not running ST-Shell from an AUTO folder, ST-Shell looks for the AUTOLOG.BAT file in the current directory, not in the root directory. That's why the shorter AUTOLOG.BAT file is executed when you run ST-Shell from the magazine disk.

The magazine disk also contains another ST-Shell batch file: HELP.BAT. This is a help screen for ST-Shell. Simply type HELP at the ST-Shell prompt to load and run this batch file; it consists of ECHO statements that list the complete set of ST-Shell commands. HELP.BAT is also a good example of screen formatting with ECHO. To have this help screen available, you must copy HELP.BAT to any disk on which you copy ST-Shell.

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NEOview

Philip I. Nelson, Assistant Editor

Here are two programs—one written in machine language and the other in C—that let you display NEOchrome pictures without loading NEOchrome. For programmers, the source code demonstrates how to load NEOchrome pictures into your own programs.

NEOchrome, the graphics-design program supplied with the ST, is a powerful tool for artists and doodlers alike. But it can also be a powerful tool for programmers. For instance, if you're writing arcade-style games or other graphics applications, it saves time and effort to draw the background with NEOchrome and then just load it into screen memory, rather than to write a complex routine to create a similar background.

But how do you go about displaying a NEOchrome picture within a program of your own? The example programs accompanying this article provide the answer—in both C and machine language. You should be able to convert them into routines for your own programs with little trouble. And the techniques they illustrate are valuable for anyone interested in writing programs that involve NEOchrome-format files.

In addition, these programs are useful in their own right for anyone who wants a quick look at a NEOchrome picture without running NEOchrome. You don't have to be a programmer to use them.

Viewing With NEOview

Before running either version of "NEOview," make sure the computer is in the low-resolution screen mode. This is the only mode currently supported by NEOchrome.

The machine language version of NEOview is

stored on the magazine disk as NEOVIEW.TTP and runs as a TTP (TOS-Takes Parameters) application from the desktop. When you run a TTP application, the ST opens a dialog box in which you may type information to be passed to the program. In this case, enter the name of the NEOchrome picture you wish to display, using the full drive specifier, pathname, and filename.

For example, to display a picture called MYPIC.NEO on the disk in drive A:, enter A:MYPIC.NEO in the dialog box and press Return. NEOview displays the picture until you press Return again. If a disk error occurs, the program prints an error message and waits for you to press Return. If you have a single-drive system, make sure that NEOVIEW.TTP is on the same disk as the NEOchrome picture you want to display.

The C version of NEOview is stored on the magazine disk as NEOVIEW.TOS and runs as a TOS (Tramiel Operating System) application. When you run the program, it prompts you to enter the name of the file you wish to display. Again, you should enter the full drive specifier, pathname, and picture filename. For instance, you would enter B:PICS\DOG.NEO to load DOG.NEO from the folder PICS on the disk in drive B:. If a disk error occurs, the program prints an error message; otherwise, it displays the picture and waits for you to press any key.

How It Works

In addition to the executable object files described above, the magazine disk includes commented source code for each version of NEOview. If you're a C or machine language programmer, you'll want to study this code to learn how to load NEOchrome pictures with your own programs.

The machine language source file is named

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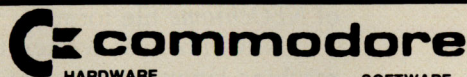
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NEOview: Commented C Source Code

```

/* SHOWNEO.C */
/* Display a NEOchrome picture. This program runs as a TOS */
/* application from the desktop. Enter the filename of the */
/* NEOchrome file you wish to display. If the file is found, */
/* the program resets the palette, displays the picture, and */
/* waits for you to press any key. If the file doesn't exist, */
/* or if a disk error occurs, the program displays a terse */
/* error message. Because NEOchrome currently works only in */
/* low resolution, the program assumes you are already in low */
/* res before you run. To save space, the program doesn't do */
/* checks like scanning the extender to make sure it's .NEO */
/* or checking the file size before reading to make sure it's */
/* 32128 bytes. */
#include <osbind.h>
char namebuff[40];
char errmsg[] = "A disk error occurred. Press any key....";
char prompt[] = "Enter NEO filename: ";
int savepal[16], newpal[16], junkbuff[46], *screen;
main()
{
    int i, filehandle;
    namebuff[0] = 37;
    Cconws(prompt);
    Cconrs(namebuff);
    namebuff[namebuff[1]+2] = '\0';
    if( (filehandle = Fopen(&namebuff[2],0) )<0 ) {
        error();
        return(0);
    }
    /* Make the flashing cursor disappear. */
    Cursconf(0,0);
    /* Save current color palette */
    for(i=0;i<16;i++) savepal[i] = Setcolor(i, -1);
    /* Read and throw away first two words. */
    if( (i = Fread(filehandle, 4L, junkbuff) )<4 ) {
        error();
        return(0);
    }
    /* Read 16 words of palette data into newpal array. */
    if( (i = Fread(filehandle, 32L, newpal) )<32 ) {
        error();
        return(0);
    }
    /* Tell system to use the new color palette */
    Setpalette(newpal);
    /* Read and throw away 46 words of color cycling data */
    if( (i = Fread(filehandle, 92L, junkbuff) )<92 ) {
        error();
        return(0);
    }
    /* Find screenbase */
    screen = (int *) Physbase();
    /* Read screen image into screen memory. */
    if( (i = Fread(filehandle, 32000L, screen) )<32000 ) {
        error();
        return(0);
    }
    /* Close the file. */
    Fclose(filehandle);
    /* Wait for a keypress */
    Bconin(2);
    /* Restore original palette */
    Setpalette(savepal);
} /* main ends here */
/* Print error message and wait for any key to be pressed. */
error()
{
    Cconws(errmsg);
    Bconin(2);
}

```

NEOVIEW.S, and the C source file is named NEOVIEW.C. You may want to look at NEOVIEW.S even if you're not interested in machine language, since that file contains detailed comments on each program step as well as an explanation of *NEOchrome* file format.

NEOview was written first in machine language using *AS68*, the 68000 assembler included with the Atari ST development system. It was then translated with *Alcyon C*, the C compiler that comes with the development system. Minor changes may be needed to compile and link the C source code with other C compilers.

To facilitate comparison, both versions of the program perform essentially the same tasks in the same order. After they have accepted the filename, the programs save the current color palette, read the color-palette data from the *NEOchrome* file, and reset the ST's palette with the new colors. Then they read the screen-image portion of the file directly into the computer's screen memory, close the disk file, and wait for the user to press a key. Finally, they restore the original color palette and return to the desktop.

These programs illustrate only the bare essentials needed to get the job done. If you decide to incorporate any of these techniques in a program of your own, you will probably want to add more error-checking or convenience features.

NEOview: Machine Language Source Code

```

* SHOWNEO.S
start:
* Enter supervisor mode
clr.l    -(sp)
move.w   #320,-(sp)
trap     #1
addq.l   #6,sp
move.l   d0,savesp
* Save color palette
move.w   #32,d0
move.l   #savepal,a1
move.l   $ff8240,a0
sv:
move.b   (a0)+(a1)+
dbra     d0,sv
* Disable cursor
move.w   #0,-(sp)

```



```

move.w    #21,-(sp)
trap      #14
addq.l    #6,sp
* Find command tail
lea       start,a0
sub.l     #128,a0
clr       d0
move.b    (a0),d0
adda.l    #1,a0
* Reject null name
tst.w     d0
beq       exit
* Zero-terminate tail
move.b    #0,0(a0,d0)
* Open for read
move.w    #0,-(sp)
move.l    a0,-(sp)
move.w    #3d,-(sp)
trap      #1
move.w    d0,filehandle
add.l     #8,sp
tst.w     d0
bmi       errout
* Discard rez info
move.l    #junkbuff,-(sp)
move.l    #4,-(sp)
move.w    filehandle,-(sp)
move.w    #3f,-(sp)
trap      #1
add.l     #12,sp
tst.w     d0
bmi       errout
* Read palette data
move.l    #newpal,-(sp)
move.l    #32,-(sp)
move.w    filehandle,-(sp)
move.w    #3f,-(sp)

```

```

trap      #1
add.l     #12,sp
tst.w     d0
bmi       errout
* Use new palette
move.l    #newpal,$45a
* Discard cycling info
move.l    #junkbuff,-(sp)
move.l    #92,-(sp)
move.w    filehandle,-(sp)
move.w    #3f,-(sp)
trap      #1
add.l     #12,sp
tst.w     d0
bmi       errout
* Get screen base
move.l    $44e,savescr
* Read screen image
move.l    savescr,-(sp)
move.l    #32000,-(sp)
move.w    filehandle,-(sp)
move.w    #3f,-(sp)
trap      #1
add.l     #12,sp
tst.w     d0
bmi       errout
* Close file
move.w    filehandle,-(sp)
move.w    #3e,-(sp)
trap      #1
add.l     #4,sp
tst.w     d0
bmi       errout
* Wait for Return
wait:
move      #1,-(sp)
trap      #1

```

```

add.l     #2,sp
* Restore palette
exit:
move.l    #savepal,$45a
* Back to user mode
move.l    savesp,-(sp)
move.w    #320,-(sp)
trap      #1
add.l     #6,sp
* Exit to desktop
move.w    #0,-(sp)
moveq.l   #0,d0
trap      #1
* Error handler
errout:
move.l    #errormsg,-(sp)
move.w    #9,-(sp)
trap      #1
addq.l    #6,sp
bra       wait
errormsg:
.dc.b 13,10,"A disk error occurred. Press Return..."
.bss
savepal:
.ds.w 16
savescr:
.ds.l 1
savescr:
.ds.l 1
screen:
.ds.l 1
filehandle:
.ds.w 1
newpal:
.ds.w 16
junkbuff:
.ds.w 46

```

ST

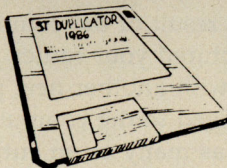
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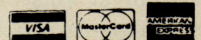
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QuikFlip

David J. Bohlke

Here's a fast-paced strategy game patterned after the popular board game Reversi. It pits you against the wits of your Atari ST, and two methods of scoring help to keep the game challenging even for experienced players. The program is written in ST BASIC and runs on any ST in any screen mode: low- and medium-resolution color, and high-resolution monochrome.

Every computer deserves a decent Reversi game, and "QuikFlip" is a BASIC version for the Atari ST. It lets you play against the computer, prevents illegal moves, and keeps score in both the traditional fashion and in another way that lets expert players time their games.

You'll find QuikFlip on the magazine disk under the filename QUIKFLIP.BAS. Since ST BASIC is not on the magazine disk, you'll need to copy QUIKFLIP.BAS to a BASIC disk or load the game from the magazine disk after running ST BASIC. Before running BASIC, however, we recommend switching to the low-resolution screen mode by selecting Set Preferences from the Options menu. Although QuikFlip works in all screen modes, the screen was designed to look best in low-res color.

Playing QuikFlip

The game board is an 8 × 8 grid of squares occupied by four playing pieces. The two green pieces are yours and the two red pieces are the computer's. If you're using a monochrome monitor, different fill patterns are used to distinguish your pieces from the computer's. The object of QuikFlip is to capture the maximum number of your opponent's pieces until no more moves are possible.

Play always begins with the four pieces centered on the board. The computer randomly chooses which player gets the first move. The program indicates whose turn is next: A prompt appears on the title bar at the top of the screen, and in color modes

the screen background changes to green when it's your turn and dark red when it's the computer's turn. The title bar also shows the current score. For example, a score of 10 to 6 means you have 10 pieces and the ST has 6. The third number on the title bar is for another method of scoring, as we'll describe in a moment.

When the game starts, you and the computer take turns putting new pieces on the board. To make a move, point the mouse cursor to an empty square and click the left mouse button. Your new piece appears on that square.

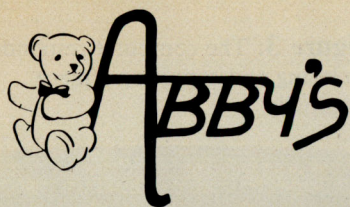
QuikFlip has one basic rule to keep in mind: Each move you make must capture at least one of your opponent's pieces. Otherwise, you forfeit your turn. (The program indicates on the title bar when you've made an illegal move and then gives you another chance. In the color modes, the screen also turns black when you make an illegal move.) To capture enemy pieces, you have to enclose them on two sides—either vertically, horizontally, or diagonally—with your own pieces.

Making Moves

For an example, look at Figure 1. It's the first move of the game, and it's your turn. Let's say you decide to capture the computer's lower left piece by placing a new piece just below it. Figure 2 shows the result—the computer's piece changes to your color. Notice how the score has changed on the title bar.

Figure 3 shows the result of the computer's countermove. It has captured your center piece by enclosing it diagonally with another new piece. The captured piece has changed to the computer's color.

As you'll discover, as many as an entire row of pieces can be captured in a single turn. It's even possible to capture more than one row of pieces simultaneously by making a move that encloses opposing pieces in more than one direction. That's why the traditional name for this game is *Reversi*—a player's fortunes can quickly reverse as pieces change hands. Even when one player is winning grandly, the outcome of the game remains in doubt until the last few turns.



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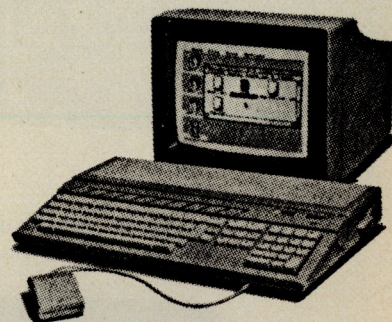
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Figure 1: A game of "QuikFlip" starts. Your first move will capture the computer's lower left piece.

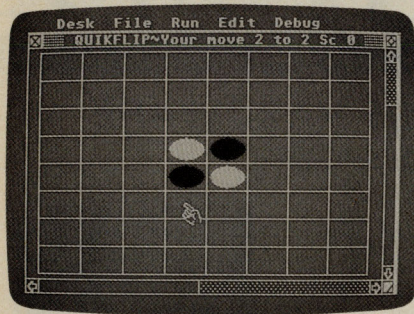


Figure 2: The first move is completed. Now it's the computer's turn.

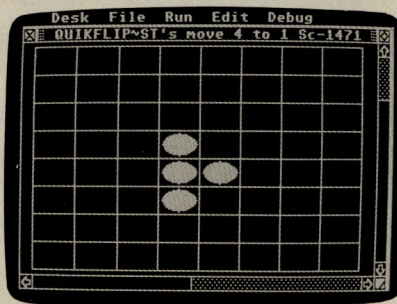


Figure 3: The computer responds by enclosing and capturing a piece diagonally.

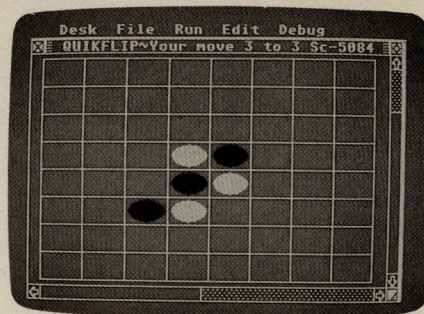


Figure 4: "QuikFlip" in the medium-resolution screen mode.

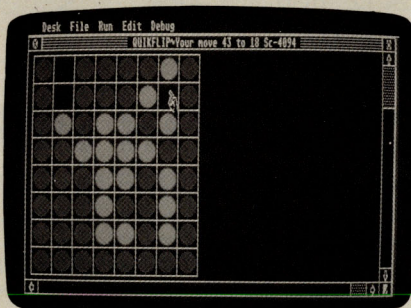
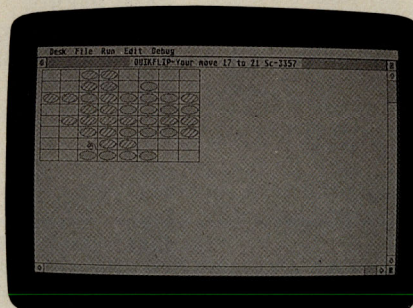


Figure 5: "QuikFlip" in the high-resolution monochrome mode.



If you have no possible move, click the left button three times in a square that represents an illegal move; the computer will then take its turn. If you attempt an illegal move three times in a row, the computer will assume that you have no legal move. When the computer has no legal move, it also forfeits its turn. Usually, this won't happen until near the end of a game.

Occasionally, neither player will have a legal move before all the squares are occupied. If this happens, press Control-C to exit the program; then type RUN to start another game.

Two Ways To Score

When a game ends, QuikFlip displays the final score and changes the screen background to blue (color modes only). You can start a new game by clicking the left mouse button.

In addition to displaying the traditional score—the number of pieces possessed by each player—QuikFlip also keeps track of the elapsed time during your turn. If you're new to the game, you'll probably just want to concentrate on developing a winning strategy. But once you're able to beat the computer consistently, you might want to pay attention to the other score displayed on the title bar. This score is calculated from the number of pieces possessed by each player *plus* the length of time you take to make each move. You'll have to move very quickly and

accumulate more pieces than the computer to achieve a positive score. A total in excess of 4000 can be considered exceptional. You can also use this score to compete with other human players—to see who can do the best against the computer.

The ST is certainly no slouch when it comes to fast thinking. Although QuikFlip is written in BASIC, the program is quite fast. The computer generally makes its move within a few seconds. If you move the mouse while the computer is thinking, however, the program slows down dramatically. This is a fault of ST BASIC, not QuikFlip.

QuikFlip is designed to work in the low-res color mode. It works fine in the medium-res and hi-res modes, but the game board occupies only part of the screen due to the higher resolution (see Figures 4 and 5). If you attempt to reposition the output screen in these modes, the program may not respond properly.

There are a few techniques in QuikFlip which you may find useful in your own programs. For instance, I encountered problems with ST BASIC's GOTOXY statement, so I placed all of the screen PRINT statements in the BASIC title bar. The routine at TITLE (line 9000) accomplishes this. Just put whatever you need to print in the variable M\$ and then execute GOSUB TITLE. Another useful routine is SETCOLOR (line 9200), which changes the ST BASIC screen colors.

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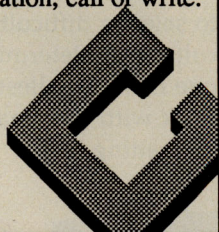
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Maze Master

David J. Bohlke

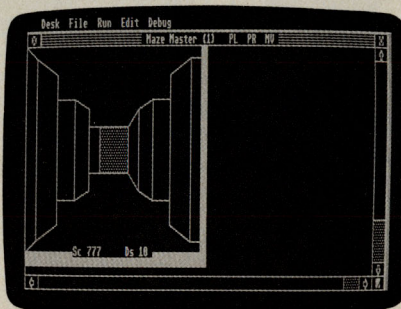
Here's a simple 3-D maze game that puts you inside a network of intersecting hallways in search of hidden treasure. Written in ST BASIC, the program runs on all ST computers in all screen modes: low- and medium-resolution color, and high-resolution monochrome.

works in all screen modes, the screen was designed to look best in low-res color.

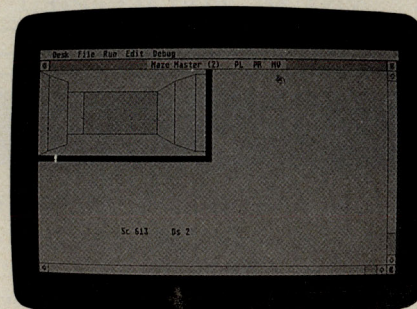
Before your quest begins, the program asks you to select a difficulty level from one to five. The difficulty level determines the size of the maze, and level one is the smallest (and therefore easiest) maze. Stick with the smaller mazes at first unless you enjoy getting lost.



"Maze Master" in low-resolution color, the recommended screen mode.



"Maze Master" in the medium-resolution color mode.



"Maze Master" in high-resolution monochrome.

Have you ever felt like a mouse in a maze? You will when playing "Maze Master." Using convenient mouse controls, you must grope your way through a randomly generated three-dimensional maze that's different for every game. But the reward you're searching for isn't just a piece of cheese—it's a gleaming pyramid of emeralds. To become a Master of the Maze, you must locate the emeralds in the shortest possible time and with the fewest steps.

Maze Master is stored on the magazine disk under the filename MAZE.BAS. Since ST BASIC is not on the disk, you'll need to copy MAZE.BAS to a BASIC disk or load the game from the magazine disk after running ST BASIC. Before running BASIC, however, we recommend switching to the low-resolution screen mode by selecting Set Preferences from the Options menu. Although Maze Master

After you select the difficulty level, the program randomly draws the maze on the screen. You'll get a bird's-eye view of this process as it happens—your only chance to see the maze in its entirety. As soon as the maze is completed, you and the emeralds are randomly placed and the bird's-eye view disappears. From this point on, your view is restricted to the corridor in which you're located.

Moving With The Mouse

Now the real challenge begins. You must search as quickly as possible through the maze until you find the pyramid of emeralds.

All movement is controlled with the mouse. On the title bar at the top of the screen, you'll notice three direction indicators: PL, PR, and MV. These abbreviations stand for Pivot Left, Pivot Right, and

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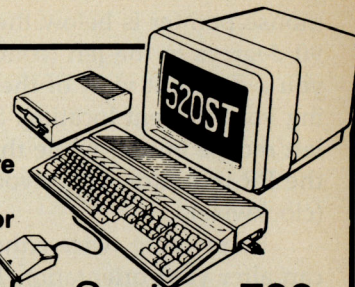
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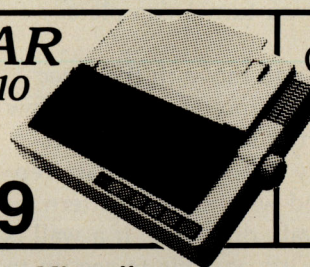
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Move. If you click the left mouse button while the mouse pointer is below the PL indicator, you pivot 90 degrees to the left (counterclockwise). This gives you a different view of the corridor without changing your present location. Similarly, if you click the left mouse button while the mouse pointer is below the PR indicator, you pivot 90 degrees to the right (clockwise).

By pivoting twice either to the left or right, you can alter your orientation 180 degrees and wind up facing in the opposite direction. If you pivot four times in a single direction, you turn a complete circle.

To take a step forward and move in the direction you're facing, position the mouse pointer below the MV indicator and click the left mouse button.

Walls which are directly in front of you are represented by a rectangle filled with a hash pattern. You can't walk through a wall, of course. If a wall is not directly in front of you, it's possible to see up to nine steps ahead. The 3-D view also reveals intersecting corridors which branch off to the left and right as you are looking forward. Pivot left or right to look into these corridors.

Visual Clues

After walking around for a while, you may notice small circles on the floors of some corridors. These are footprints you've left behind. They make it easier to retrace your steps if you get lost, and also save you the trouble of wandering down blind alleys that you've already explored.

At the bottom of the screen is another useful clue—the distance indicator. Labeled Ds, this number represents the shortest straight-line distance in steps between your current location and the pile of emeralds. Naturally, this number will be deceiving at times, because the shortest straight-line distance may lie through one or more walls. You may be 1.3 steps away from the treasure, but it may take 10 or more steps to wind around the connecting corridor. Generally, though, you'll want to move in a direction which decreases the distance between your location and the emeralds.

Next to the distance indicator is your current score. Although you don't need a certain score to win the game, it's useful for comparing your progress to past efforts or to those of other players. Basically, your score starts at 1000 and decreases with each step or pivot. The score also decreases if you stay in one location too long.

When you spot the emeralds, you must walk straight into the pyramid to end the game. To start a new game, click the left mouse button. The program asks you to press the N or S key and press Return. If you press N, you'll get a new random maze and a chance to change the difficulty level. If you press S, the maze remains the same, but the treasure is moved to a different location.

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ST-Graph

Michael P. Cohan

Now you can quickly and easily generate graphs to display all kinds of data for home or business. Vertical and horizontal bar graphs, pie charts, line graphs, scatter-dot charts, and numerous variations can be compiled with a few mouse clicks. The program works on all STs in either medium-resolution color mode or high-resolution monochrome.

It's said that a picture is worth a thousand words, and for good reason: Sometimes a powerful photo can convey more information about a dramatic moment than a pageful of prose.

Likewise, a good graph can sometimes reveal more information than a pageful of numbers. Numerical relationships that are lost in columns of figures often pop into sharp focus when displayed in chart form. But until computers came along, constructing graphs was a tedious process that didn't lend itself to instant manipulation and experimentation.

Now you can quickly and easily display graphs on your Atari ST with just a few mouse clicks. "ST-Graph" is an easy-to-use application program that rapidly generates all the common types of graphs based on values you supply. It supports all features of GEM (the Graphics Environment Manager), including drop-down menus, dialog boxes, mouse controls, and adjustable screen windows. It runs in either the medium-resolution color mode or the high-resolution monochrome mode. (It looks best in monochrome, because it was designed for that mode and takes advantage of the greater resolution.) Written in compiled Pascal, ST-Graph is both fast and efficient.

Getting Started

You'll find ST-Graph on the magazine disk as STGRAPH.PRG. An important related file is STGRAPH.RSC. Commonly known as a *resource file*, STGRAPH.RSC contains data required for STGRAPH.PRG to function. Therefore, if you copy ST-Graph to other disks, make sure to copy both

STGRAPH.PRG and STGRAPH.RSC to get a fully working program. Another file on the magazine disk, STGRAPH.PAS, contains the *Personal Pascal* source code for STGRAPH.PRG; this file is mainly of interest to programmers who wish to study how ST-Graph works. Two additional files—STGRAPH.I and STGRAPH.DEF—are also for programmers. STGRAPH.I is an include file required for compilation, and STGRAPH.DEF is the definition file for STGRAPH.RSC.

You can run ST-Graph from the magazine disk either by selecting it with the menu program or by double-clicking on its icon/filename on the GEM desktop. Note that if you attempt to run ST-Graph in the low-resolution color mode, an alert box informs you that the program does not support this mode, then returns you to the GEM desktop.

When ST-Graph runs, you should see three windows labeled *Bar Graph*, *Data*, and *Information*. Any of these windows may be dragged to any part of the screen. The Graph window may be resized or expanded to a full screen. The Data window also has what appears to be a full-screen button, but this has a different effect that will be explained in a moment.

The Graph window, as its name implies, displays your graph. The name of this window changes to reflect the different types of graphs which can be displayed. If no data is available, the Graph window is empty (as seen when the program first runs).

The Data window displays the data you have entered. Each graph may contain up to 12 items of data. Each item has three parts: a value (an integer from 0 through 999999), a label (up to six characters), and an Enabled/Disabled button (which controls whether this item is displayed on the graph). All three parts are shown in the Data window. If an item is enabled, it is accompanied by a square filled with the pattern that keys it to the matching item on the graph. If the item is not enabled, the space next to the value and label is blank.

If you don't wish to see items which are not enabled, you can click on the Data window's full-screen button. The window resizes itself and shows only those items which are enabled. If no items are

enabled, the window will be empty. To see all the items again, click once more on the full-screen button.

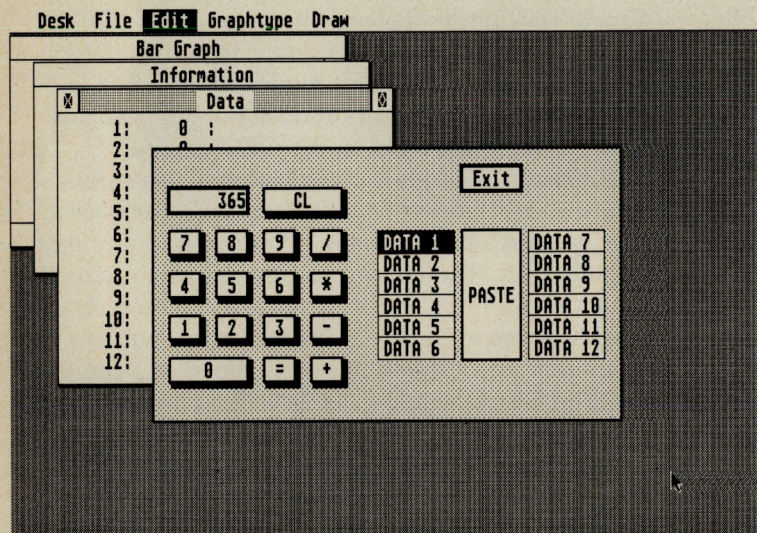
The Information window consists of eight lines of text that you type into a dialog box. This lets you add miscellaneous information (such as the name of the chart) before printing out the screen.

Creating A Graph

Now you can begin constructing a graph. The first step is to enter your data with the pop-up calculator.

Drop down the Edit menu and select the Calculator option. Instantly, a four-function calculator pops open on the screen. (See Figure 1.) To enter numbers, point to a button and click the mouse. ST-Graph does not support negative numbers or fractions, but if you want to graph values such as 2.3 and 5.8, all you have to do is mentally shift the decimal point to make them whole numbers. For example, enter 2.3 and 5.8 as 23 and 58, respectively; the proper numerical relationship is reflected on the graph. (Of course, to enter whole numbers such as 23 and 58 on the same graph, you'd have to shift *their* decimal points, too, entering them as 230 and 580.)

Figure 1: "ST-Graph" has its own pop-up calculator.



On the right side of the calculator are two columns of buttons labeled Data 1 through Data 12, and a large button labeled Paste. These buttons let you copy the number on the calculator's display into the Data window of your chart. Simply click on one of the Data buttons to indicate the data item (1-12) and then click on the Paste button. Note that this automatically enables the item, so it appears on the graph. To close the calculator, click on the Exit button.

When you exit the calculator, a graph appears in the Graph window, corresponding to the data you entered. If it isn't exactly the graph you want, don't worry; it can be instantly changed by selecting a

menu option, as we'll see shortly. You can also resize the Graph window, making it as small or as large as you want. The graph automatically rescales itself to fit the new window. (Sometimes the graph does not rescale when you make the window smaller; if this happens, just select Plot Graph from the Draw menu to force a redraw.)

If you need to erase all the data and labels, as well as the contents of the Information window, drop down the File menu and select Clear. An alert box asks you to confirm this operation.

Editing Labels

After entering data, you'll probably want to label it. These labels will appear next to the numbers in the Data window. Also, occasionally you may want to disable some of the data you've entered to keep it from appearing on the graph. You can do all these things by dropping down the Edit menu and selecting the option called Edit Labels.

This option opens a dialog box with 12 editable text fields. The text fields are for the labels. Point to the field you want to edit and click the mouse.

When a thin cursor appears, you can start typing.

You can move within this field with the left and right cursor keys, and erase mistakes with the backspace key. To change fields, point to the desired field and click the mouse again.

Each text field has an Enabled button.

These buttons control whether each data item is displayed on your graph. If the button is selected (displayed in reverse video with white letters on a black button), the item is enabled. Click on the buttons to change their state.

The row of 12 numbered buttons across the top of the dialog box controls which of the 12 fields are used by ST-Graph when you exit the dialog box. Normally, when the program starts, all these buttons are selected (displayed in reverse video). This means ST-Graph uses both the labels and Enabled buttons for all 12 fields when you exit. If you click on a numbered button to *deselect* it (it appears in normal video with black numbers on a white button), ST-Graph ignores the corresponding label and Enabled button. The label and button state is retained the next time you pick the Edit Labels

option.

This might seem confusing at first, so here's why the numbered buttons are provided. The label fields always contain whatever you last typed into them, even when you load a previously saved graph with new data and labels. The new labels are shown in the Data window, but not in the label fields. Thus, if you load in a new graph and labels, then want to change only one label, you should select only the button of the label you want to change so that the others aren't reset also. (If this still sounds confusing, it will become clearer as you work with the program.)

When you've finished editing labels, exit

the dialog box by clicking on the Exit button. If you change your mind and decide you'd rather leave the labels and Enabled buttons as they were before you opened the dialog box, click on the Cancel button instead.

Dollars And Cents

Besides editing the labels, there's one other way to modify the display in the Data window. When you drop down the Edit menu and choose the option called Show Data as Dollars, all the numbers you've entered are divided by 100 and displayed to two decimal places (81 becomes .81, and so on). Therefore, if you want your graph to reflect dollars-and-cents figures, enter an amount such as \$23.47 as 2347 and select this option.

To turn off the option, drop down the menu and select it again. A checkmark indicates when the option is active.

Note that Show Data as Dollars affects only the display of the Data window—no decimal point is available on the calculator.

Changing Graph Types

Once you've entered your data and labels, you can specify which type of graph should be displayed in the Graph window. Simply drop down the Graphtype menu and select the type you want. The graph is instantly redrawn and the name of the Graph window changes to reflect your choice. Also, a checkmark on the Graphtype menu shows which graph is currently selected.

Note that you can change any graph option at any time, even when the Graph window is not the active window.

ST-Graph offers the following types of graphs:

Pie Chart: Your data is translated into slices of the pie in a clockwise direction. (See Figure 2.)

Horizontal Bar: Your data matches the bars from top to bottom. (Figure 3.)

Vertical Bar: Your data matches the bars from left to right. (Figure 4.)

Stacked Bar: A variation of the vertical bar; see below.

Line: Your data matches the points on the line from left to right. (Figure 5.)

Dot: Your data matches the dots from left to right. (Similar to Figure 5.)

In addition to these different types of graphs, you have several options available for modifying the graphs. One is the Grid option, which superimposes the graph upon a grid. Toggle this option on and off by selecting it from the Graphtype menu; a checkmark indicates when it is active. (Note that Grid is dimmed on the menu when you're displaying a pie chart, since it's not meaningful to superimpose a pie chart on a grid.)

Figure 2: A pie chart created with "ST-Graph."

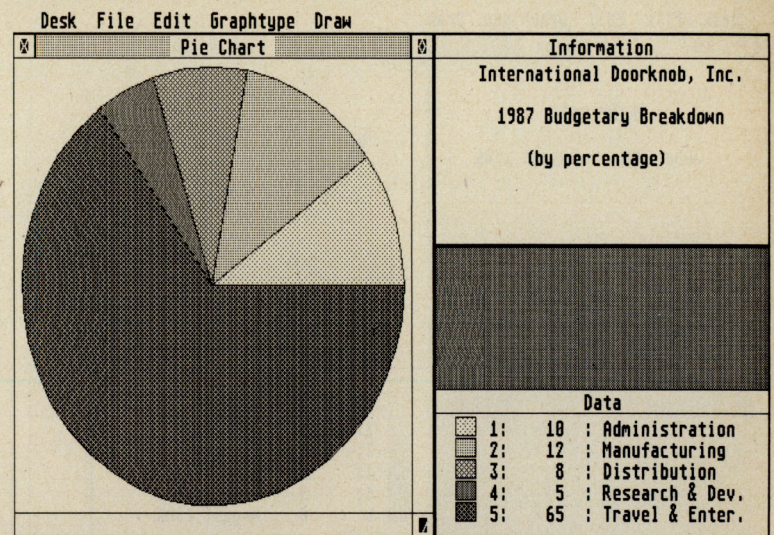


Figure 3: A horizontal bar chart.

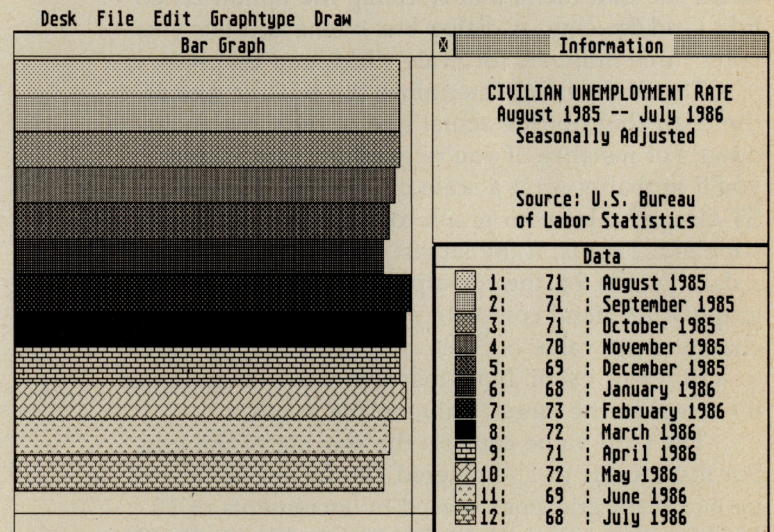


Figure 4: A vertical bar chart.

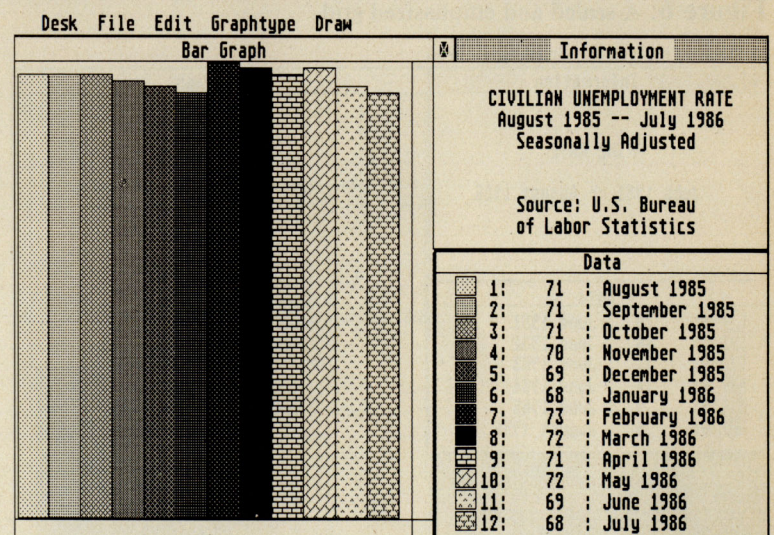
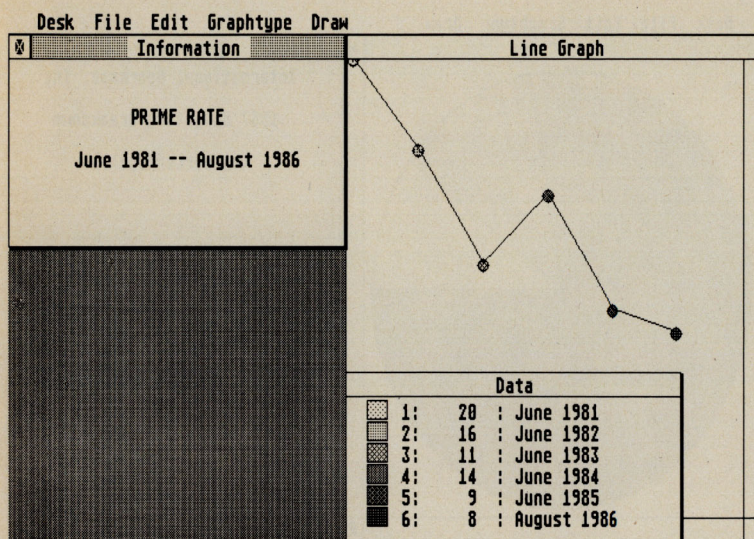


Figure 5: A line chart.



You can adjust the scale of the grid by dropping down the Edit menu and selecting the option called Edit Grid Spacing. A dialog box opens and lets you enter three numbers for Scale, Grid, and Emphasize.

The Scale value determines the relative size of the chart (but not the actual size of the Graph window). For instance, if you're graphing percentages, you'll probably want a scale of 1 to 100. Normally, ST-Graph scales your graph to the largest data item supplied. That is, if the largest number you enter for a data item is 94, the corresponding bar on a bar graph will extend completely across the window. By changing the value of Scale, you can scale the graph to a different value. Note that this value is ignored if it's *less than* the largest value in the graph.

The Grid value controls the spacing of the grid. For instance, if you've entered 100 for the Scale value and want grid lines spaced by increments of 10 (representing values of 10, 20, 30, 40, 50, 60, 70, 80, and 90), enter a Grid value of 10. If you want grid

lines spaced by increments of 20 (20, 40, 60, 80), enter 20. If you want to set the Scale but don't want to display a grid, enter 0.

The Emphasize value lets you highlight some of the grid lines. If you enter 5, for instance, every fifth line becomes a solid line instead of a dotted line. If you don't want to emphasize any lines, enter 0.

So, putting this all together, let's say you want a vertical bar chart ranging from 1 to 20, superimposed on a grid spaced by ones, with every fifth grid line emphasized. You'll enter 20 for Scale, 1 for Grid, and 5 for Emphasize. The result can be seen in Figure 6.

Bar Grouping

Beneath the Grid option on the Graphtype menu, you'll see another set of options, labeled Bar Grouping. These options are: None, Groups of Six, Groups of Five, Groups of Four, Groups of Three, and Groups of Two. A checkmark indicates the currently selected option. These options are available only when displaying bar graphs—horizontal, vertical, or stacked.

These options let you group the bars together and use the same fill patterns for each group. For instance, let's say you're comparing the performance of four companies over a three-year period. You will enter the first-year figures for the companies as data items 1–4, the second-year figures as data items 5–8, and the third-year figures as items 9–12. Then you'll choose the Groups of Four option with either the horizontal or vertical bar graph. (A grid can be added, too, if you wish.)

The result can be seen in Figure 7; the bars are grouped together in three sections, four bars per section, with the same four fill patterns used in each section. The correct fill patterns are also displayed in the Data window.

The bar grouping feature works with stacked bar charts as well. Continuing with our previous example, select the Stacked Bar option with Groups of Four. Instead of displaying three groups of four bars, ST-Graph displays only three bars. The first four data items are stacked atop one another in the first bar, the next four items are stacked in the second bar, and the last four are stacked in the third bar. (Figure 8.)

If you don't have much experience with business graphs, you'll probably have to experiment with this feature awhile to learn why it's useful. Try some different values and grouping options; then compare the graphs that result when you select the Vertical Bar option versus the Stacked Bar option.

Printing The Chart

ST-Graph's Information window lets you add a title and any other information you deem necessary before printing out a finished copy of the chart.

Figure 6: A scaled and emphasized grid.

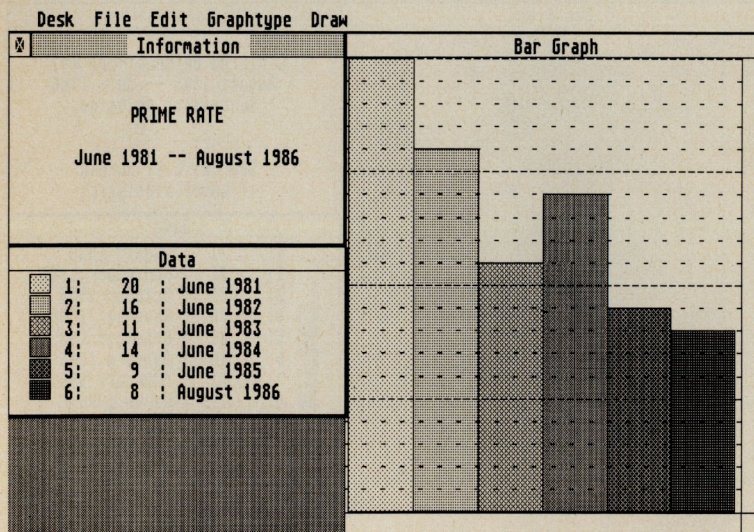


Figure 7: An example of bar grouping.

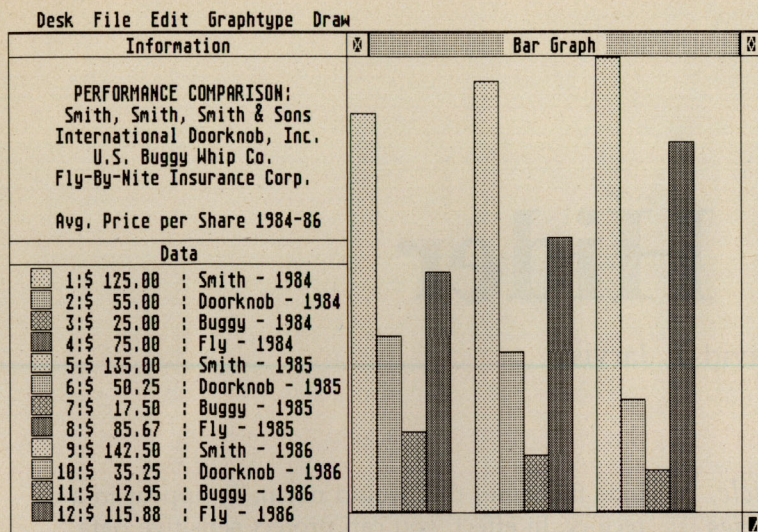


Figure 8: A stacked bar chart.

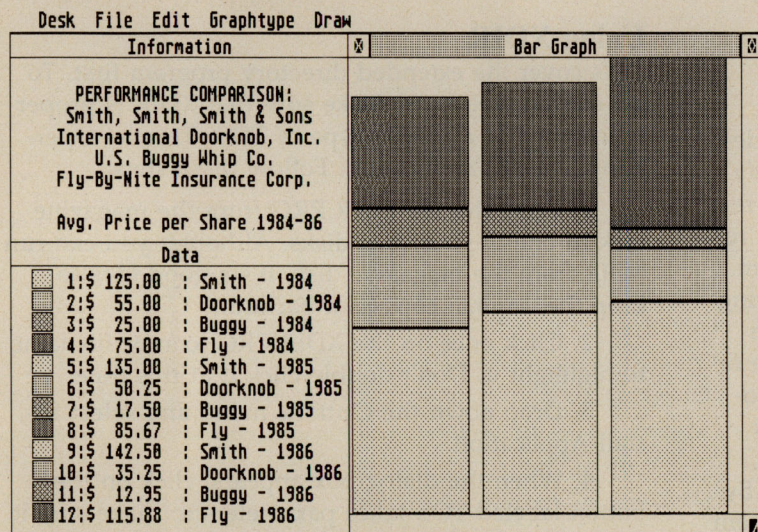
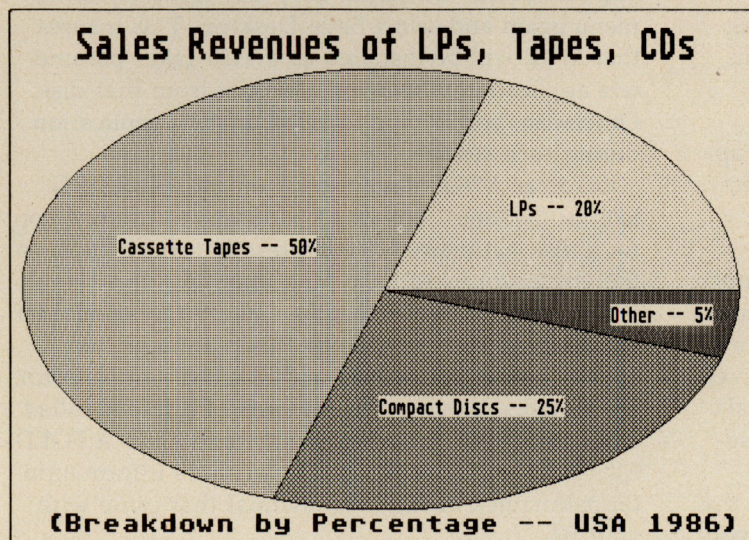


Figure 9: This chart was created with "ST-Graph," captured on disk with a snapshot utility, and modified with a drawing program.



Up to eight lines of text can be displayed in this window. To enter the text, choose the Edit Information option from the Edit menu. A dialog box opens with eight editable text fields. Click on the line you want to edit; then enter the text you want. Click on the Exit button when you've finished, or click on Cancel to retain the previous contents of the Information window.

The row of eight buttons across the top of this dialog box have the same effect on the text fields as the similar buttons in the Edit Data box.

Once you've designed your chart and arranged the Graph, Data, and Information windows on the screen for an attractive display, you can press the Alternate and Help keys simultaneously to dump the screen to a graphics printer. (The ST is set up for an Epson or Epson-compatible, but it's possible to use other printers by making adjustments with the Install Printer desk accessory that comes with the ST.)

Alternatively, you can capture the ST-Graph screen on disk with one of the commercial or public domain snapshot-type programs. One such program, by Russ Wetmore, is available on the Atari Corporation's bulletin board system in Sunnyvale (408-745-5308), and on other BBSs as well. Most of these snapshot utilities save the screen in a format that can be loaded by graphics-design programs such as *NEOchrome* or *DEGAS*. This lets you modify the chart further before making a printout. (See Figure 9.)

Saving And Loading Graphs

Another ST-Graph option lets you save a graph on disk. The actual screen layout won't be saved, however—only the contents of the Data and Information windows. You'll still have to arrange the screen as you want it. To use this option, select Save from the File menu.

To bring in a previously saved graph, select Load from the File menu. Both options take advantage of the standard GEM item selector, so you can save and load files on different disks and in different folders. When you select Load, ST-Graph looks for filenames with the extender .DAT, so you might want to append this extender to any graphs you save.

Remember that loading a previously saved graph does not change the text fields in the Edit Information/Edit Labels dialog boxes—only in the Information and Data windows themselves. If you wish to change only one line of text or one label, make sure all the buttons across the top of these dialog boxes are deselected, except for the one corresponding to the field you wish to change.

To leave ST-Graph and return to the GEM Desktop, you can click on the close buttons of any of the three windows or choose Quit from the File menu. An alert box requests you to confirm the action.

ST

File Hider

David T. Jarvis

With the two programs described in this article, you can render disk files invisible on directories to protect them from snoopers, restore them to visibility, call up extended directories of disks, and more. The programs work on any ST in any screen mode: low- or medium-resolution color, and high-resolution monochrome.

"Reinventing the wheel" violates a basic rule of design: *Don't waste time doing something that's already been done well.* But sometimes it can be useful to reinvent a wheel now and then. Benjamin Franklin reportedly taught himself to write by rewriting, from memory, works of other writers and then comparing his results to the originals. You can take the same approach with programming. It can be instructive to write programs that perform functions already provided by your computer's operating system; what better way to learn how the system works?

There can also be practical results from this. By rewriting basic system functions, you can tailor them to your own needs or preferences. On the Atari ST, for instance, you might occasionally want to enter system commands with an "old-fashioned" command line interpreter instead of using the mouse controller and GEM (Graphics Environment Manager) desktop. (If so, see "ST-Shell" elsewhere in this issue.) Or, more to the point, you might want to modify the disk directory function so that certain files you'd like to conceal from certain eyes don't appear in a directory window. Writing a custom directory program is an important step toward accomplishing this goal.

Such a program can be found on the magazine disk under the filename XDIR.PRG. As we'll describe in more detail in a moment, "XDIR" provides an extended directory listing of a disk by calling low-level routines within the ST's operating system. It reveals information about a disk which isn't normally available in a standard GEM directory window.

The other program is "File Hider," stored on the magazine disk as FILEHIDE.PRG. File Hider lets you

hide filenames that would normally appear in a directory. In effect, you can protect sensitive data against casual snoops by rendering the file invisible.

Using XDIR

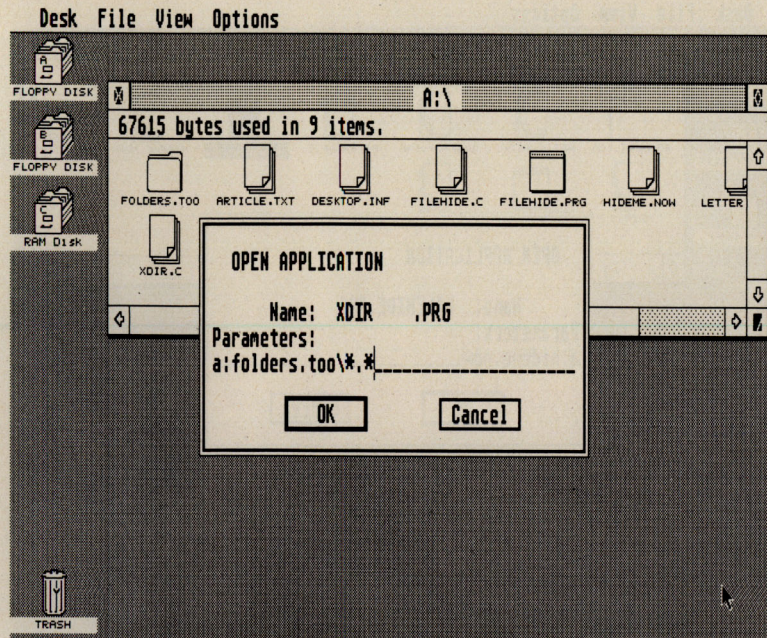
Let's cover the extended directory program first. To get started, you must make sure that XDIR is properly installed as a special type of TOS (Tramiel Operating System) application. Follow these steps:

1. Copy the file XDIR.PRG from the magazine disk to one of your own disks. Although you can run XDIR from the magazine disk, it's a good idea to keep the original copy as a backup.
2. Click once on the XDIR.PRG icon or filename to highlight it. Don't double-click it at this time.
3. Drop down the Options menu and select Install Application.
4. When the dialog box appears, click on the button labeled TOS-takes parameters to make sure it is selected. Then click on the OK button.

XDIR is now installed and ready to run. If you want to avoid repeating steps 2 through 4 whenever you reboot the computer, drop down the Options menu again and select Save Desktop. This insures that XDIR will be installed as a TOS-takes parameters application whenever you boot from that disk. Otherwise, you'll have to select Install Application during each session.

To run XDIR, double-click on the XDIR.PRG icon or filename. A dialog box opens to prompt you for a disk pathname. If you press Return or click on the OK button without typing anything, the default is the usual *.* , which displays every file and folder on the disk. You can change this pathname, of course, just as you would with a GEM item selector. For instance, to view the contents of a folder called FOLDERS.TOO on disk A, you would enter A:FOLDERS.TOO \ *.* (see Figure 1). For more information on pathnames, consult the manual that came with your ST.

Figure 1: Entering the pathname with "XDIR."



When you press Return or click the OK button, XDIR clears the screen and displays the disk directory. To exit the directory and return to the GEM desktop, press any key.

File Attributes

You'll notice that the XDIR directory provides a few pieces of information normally missing from a GEM directory window: the amount of free space on the disk, the disk label, and any special *attributes* of each file, as we'll explain in a moment. In addition, folders (subdirectories) are denoted with <DIR> and the letter *D*, and files concealed with the File Hider utility are marked with an *H*. If you're viewing the contents of a folder, the first few entries in the directory tell you how deep you are in the directory structure. You'll see a period and a <DIR> for each directory level, including the root (main) directory.

File attributes are special characteristics of disk files on the ST. A file's attributes are encoded in one byte; a particular attribute is given to a file by setting the corresponding bit of the attribute byte. With the current version of TOS, a file may possess the following attributes:

Attribute Value	Characteristic
1	Read-only; file cannot be altered.
2	A hidden file; filename won't appear on normal directories.
4	System file.
8	The file is a disk label (always an empty file).
16	The file is a subdirectory (folder).
32	Used for archival purposes.

A file can have more than one attribute. For example, a file with an attribute byte containing the value 3 would be a read-only, hidden file. A file whose attribute byte is 0 has no special attributes.

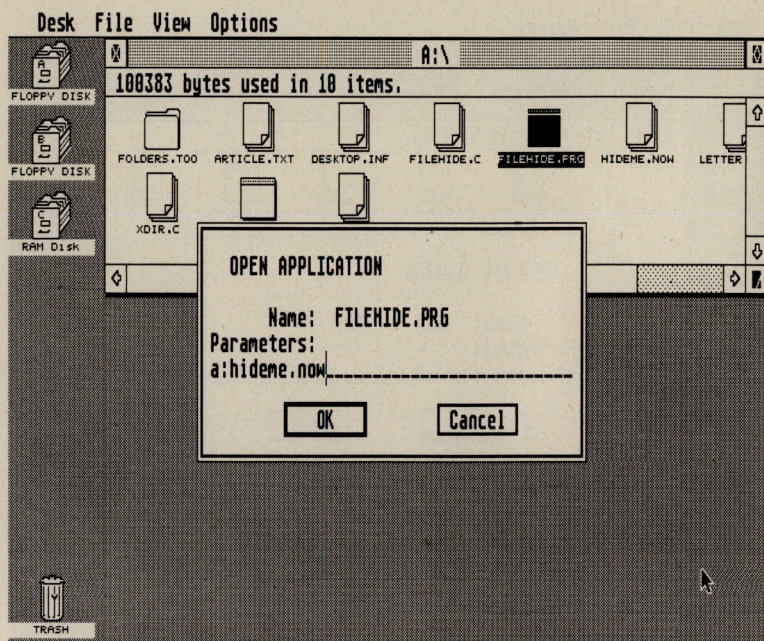
Examining a file's attributes is interesting, but being able to change the attributes is much more useful. You can change the read-only attribute from the GEM desktop by clicking on a file and selecting Show Info; then click on the Read-Only button in the dialog window which appears. But other attributes, such as the one for hiding a file, are not accessible from the desktop. Fortunately, TOS contains a low-level call to read or change a file's attributes. That's how File Hider works—it calls this routine to let you set or clear the corresponding attribute bit.

Hiding Files

Before using File Hider, you must install the program in the same manner as you did with XDIR. Copy FILEHIDE.PRG to another disk, click once on the icon/filename, select Install Application from the Options menu, click on the button labeled TOS-takes parameters, and then click on the OK button. Again, you may want to select Save Desktop to avoid the trouble of reinstalling the application in the future when booting from that disk.

To run File Hider, double-click on the icon/filename. A dialog box opens to prompt you for the pathname and filename of the file you want to hide. For example, to see how to hide a file called HIDEHIDE.NOW on the root directory of drive A, look at Figure 2.

Figure 2: Making a file invisible with "File Hider."

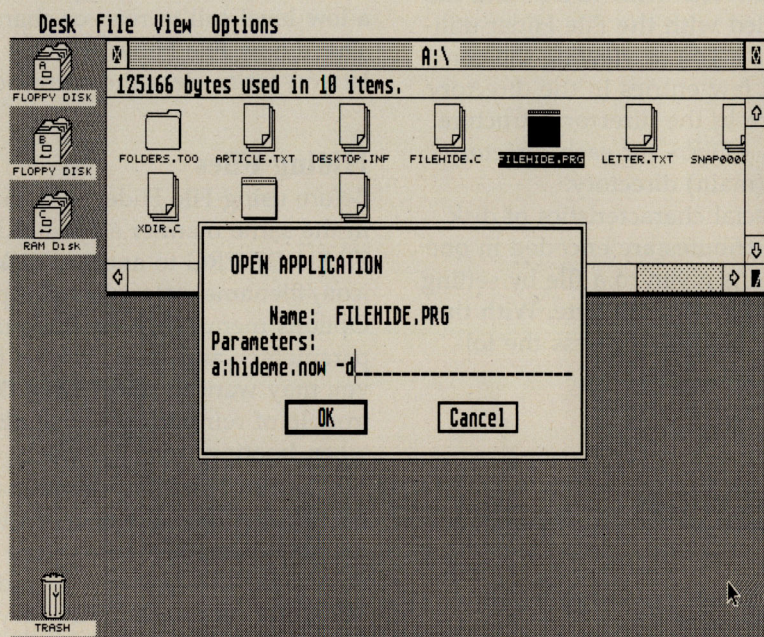


After you enter this information and press Return or click on the OK button, File Hider clears the screen and attempts to render the file invisible. If it succeeds, you'll see a verification message; press any key to exit back to the GEM desktop. You can confirm that the file is hidden by opening (or reopening) the directory window for that disk. Or you can run

XDIR and observe that the hidden filename is denoted with an H.

To reverse the process and make a file visible again, rerun File Hider. But when you enter the pathname and filename, add a space character and the parameter `-D` to the end of the filename. See Figure 3 for an example.

Figure 3: Making a file visible again.



This restores the file to visibility as if nothing had happened.

Analyzing XDIR

The following discussion is for programmers who'd like to learn more about how these two programs work. The source code for XDIR can be found on the magazine disk under the filename XDIR.C, and the source code for File Hider is named FILEHIDE.C.

Both XDIR and File Hider were written and compiled with *Lattice C*; most full-featured C compilers for the ST should handle the source code with some modifications. To avoid portability problems with compilers that define data types as different-sized data structures, I used the constants WORD, LONG, and ULONG (which are defined in the header file PORTAB.H) in variable declarations, instead of short int, int, and unsigned int, respectively. The last three would have worked fine with *Lattice C*, but not, for example, with the *Alcyon C* compiler included in the Atari Developer's Package. Other problems may occur when you use other versions of C. For instance, extensive rewriting is necessary to recompile the programs with *Megamax C*.

Two important data structures are defined near the beginning of XDIR.C: `dta_str` and `fds_str`. `Dta_str` is a portion of memory that will be used as the disk transfer address. During the directory search, this area of memory stores information about each file, as well as some things that TOS needs to continue the search. `Fds_str` holds information about the amount of free disk space after the program calls the appropriate TOS routine for this purpose. `Dta` and `Fds` are the actual variables declared to hold these items.

When XDIR first runs, it checks for the user input, if any. `Argc` contains the number of arguments entered, including the command itself (even though you probably clicked on an icon or filename to run the program). `Argv[]` is an array of strings containing the actual arguments. The only permissible argument for XDIR is the file specification—the pathname and/or filename. The file specification may include wildcard characters such as the asterisk or question mark. (At the file level, TOS is very much like MS-DOS, the operating system for IBM personal computers and compatibles.) If the user does not enter a file specification, XDIR assumes the specification `*.*` to read all files. If no pathname is specified, XDIR defaults to the current drive.

Seeking Information

After XDIR dissects and acts on the parameter line, it initializes some values. It calls the function `set_dta()`; it invokes the macro `Fsetdta()`, telling TOS to use my variable `dta` as its disk transfer address; and it calls `Fsfirst()`. This asks TOS to return the first file on disk which matches the file specifica-

tion. This particular call to `Fsfirst()` is special—it asks TOS to give us the volume label of the disk. As with all calls to `Fsfirst()`, the information is returned in the DTA.

`Dfree()` gets information about sectors, bytes, and allocation units. This stuff is too complicated to go into here, but the program calculates the number of bytes left available on the disk after calling `Dfree()` and puts the result in the variable `free`.

The real guts of the directory listing are contained in the following seven or eight lines of code. The program calls `Fsfirst()` again using the file specification and the search criteria defined in the variable `s_attr`. This program has set up `s_attr` so that the directory listing will include hidden files, system files, directories, and read-only files, as well as normal files. The result of this call is placed in `flags`. If a matching file is found, the variable `flags` contains a zero; if not, `flags` contains a negative number.

To find the rest of the matching files, the program makes calls to `Fsnext()`. The resulting information is still placed in the DTA and the search criteria are the same as those used in the last call to `Fsfirst()`. Calls are made to my function `print_dta()` to print each line of the directory; and this function, in turn, calls smaller functions to print each part of the directory line. Those functions are, for the most part, self-explanatory.

Analyzing File Hider

FILEHIDE.C starts with a switch statement to evaluate the parameter line entered by the user. In this case, two parameters besides the command itself are possible: a filename and one option. If the `-D` option is included, it means delete the hidden attribute, making the file visible. If no parameters are supplied, the program prompts the user for a filename.

Besides `main()`, the two significant functions in FILEHIDE.C are `hide()` and `find()`. As might be expected, `hide()` makes a file hidden and `find()` makes it visible again. Both take one argument: a pointer to a filename. Both call the macro `Fattrib()` defined in the include file `#OSBIND.H` to read the current attributes of the file and change it accordingly. It's important to read the attribute first so that other attribute bits are left undisturbed.

ST

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LogiKhron Clock Module

Tom R. Halfhill, Editor

Requirements: Any Atari 520ST or 1040ST.

A minor but annoying omission on the ST is the lack of a realtime system clock backed up by battery power. If you want your disk files accurately time- and date-stamped—an invaluable aid for keeping track of the latest versions—you have to set the system clock yourself every time you switch on the computer. Although this is easy to do with the Control Panel desk accessory, it's also easy to forget. And while it's possible to write a program that prompts you for this when the machine boots up, it's still a bother.

It didn't take long for manufacturers to fix the same deficiency on the IBM PC and Commodore Amiga by introducing plug-in clock cards, and now you can buy a similar product for your ST. The LogiKhron Clock Module, from Shanner International, is a battery-powered clock that plugs into the ST's cartridge port.

The LogiKhron module consists of a circuit board sandwiched between two slabs of rigid, white plastic. Installation requires two simple steps: You plug the module into the cartridge port, then prepare your system startup disk as described below. Nearly anyone can be up and running with the module in minutes.

Three Ways To Boot

The eight-page LogiKhron manual outlines three ways you can pre-

pare your startup disk to work with the clock module. Various tradeoffs are involved with each method.

The desk accessory method requires copying two files onto your startup disk from the LogiKhron disk included in the package. From then on, whenever you boot your ST with this startup disk in drive A, a desk accessory named Clock is loaded into memory. Like any desk accessory, it's available from the Desk menu within any application program that supports GEM (the Graphics Environment Manager).

To set the LogiKhron module, you open the Clock accessory and enter the current date and time within the dialog box that appears. When you close the dialog box, the clock is set.

The advantage of this method is that you can check the time whenever you want by opening the Clock accessory. But there are two disadvantages. Like any desk accessory, Clock eats up memory, and it also occupies one entry on the Desk menu (you're limited to six). Also, Clock more or less duplicates the date and time functions available on the Control Panel.

Manual And AUTO Methods

The second method of using the LogiKhron module is the so-called manual method. Again, this requires copying two files from the LogiKhron disk onto one of your own disks (it doesn't have to be the startup disk). One of these files is simply a stand-alone program that you run in order to set the clock.

The advantage of this method is that you conserve memory and

accessory space on the Desk menu. The disadvantage is that the current time and date are not instantly available, unless you install the Control Panel or some other accessory that displays this information.

Finally, the third method involves the AUTO folder. Whenever you switch on an ST, the computer's operating system looks for a folder named AUTO in drive A and automatically runs any non-GEM programs stored there. After you've copied a file named AUTO-TIME.PRГ from the LogiKhron disk into an AUTO folder on your startup disk, the module automatically sets the system clock whenever you switch on the computer. You can still check the current time by opening the Control Panel.

Hard Disk Mystery

Testing the unit revealed only two minor problems with the LogiKhron Clock Module. The first problem cropped up when the module was being used on a 1040ST with an Atari hard disk drive—occasionally the system would inexplicably lock up or crash. Of course, crashes aren't an uncommon occurrence on a system that's heavily used for program development and testing. But after unplugging the module, we experienced fewer crashes.

These kinds of glitches are extremely hard to isolate, so it's not fair to blame the module—there could be an unusual interaction between the hard disk's boot software and the module's installation program, for example. In fact, we've noticed that some other autobooting programs sometimes misbehave when a hard disk is used. At any rate, the

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crashes were rare, and the module has been working flawlessly on floppy disk systems.

The second problem is the size of the module itself—it's about four times the size of a digital watch and juts out more than two inches from the computer's case. You have to be careful not to bump the module, because a sharp jolt could damage the fragile motherboard (main circuit board) inside the ST. Plugging or unplugging the module while the computer is turned on isn't a good idea, either.

The module's physical configuration brings up another point—it isn't designed to let you replace the battery. According to the manual, the lithium battery should last for at least three years, and you should return the entire module to the manufacturer for a new battery when it dies. (This service costs \$5, including postage and handling.) It's easy to reach the battery by removing four screws to peel apart the case, but you

have to desolder some connections to remove the battery and then find the right replacement.

Despite these slight drawbacks, the LogiKhron Clock Module is definitely worth considering if you rely upon time- and date-stamping to help keep track of your files.

LogiKhron Clock Module
Shanner International
453 Ravendale Drive
Mountain View, CA 94043
\$49.95

MacroDesk

Andy Eddy

Requirements: Any Atari ST. Printer and Hayes-compatible modem optional.

Have you ever found yourself word processing, then suddenly wished you had a calculator to add up some critical figures? Or have you ever been so absorbed in a telecommunications session

that you lost track of the time, stranding your spouse at the airport waiting for a ride? To the rescue comes *MacroDesk*, a memory-resident desk accessory that's available from within any application program that supports GEM (the Graphics Environment Manager, or desktop user interface).

MacroDesk is similar to *Sidekick*—the popular memory-resident program for the IBM PC—except it's not quite as powerful. Like other desk accessories, *MacroDesk* loads into memory automatically when you first switch on your ST, then waits in the background until called from the Desk menu (the leftmost menu on the title bar). When activated, *MacroDesk* opens up as a window without disturbing the underlying application program. When closed, the *MacroDesk* window disappears and lets you pick up where you left off.

Since *MacroDesk* offers several common functions, you may be able to discard two or more single-function desk accessories that

you're already using. (This is an important consideration, because the ST is limited to only six accessories in memory at a time.) Let's take a look at these functions in more detail.

Dual-Mode Calculator

When *MacroDesk* is first activated, it prompts you to enter the date and time. Once that information is entered—either manually or automatically by means of the Logi-Khron Clock Module (see accompanying review)—the main window opens. This contains a full-function calculator; the date and time (including the day of the week as calculated by a perpetual calendar); a pointing-hand mouse cursor; and four buttons labeled Cards, Events, Alarms, and Info. Clicking the mouse cursor on any of these buttons or pressing the indicated key sets the main part of *MacroDesk* into motion. (The Info button credits the author and publisher of the program, as is customary on the ST.)

The 11-digit, 18-function calculator can be operated by either clicking on the buttons with the mouse cursor or pressing the key that corresponds to the number or first letter of the function you're selecting (such as *I* for inverse or *S* for sine). A tap on the space bar toggles the calculator from the standard algebraic configuration to reverse Polish notation, which is explained well enough for the uninitiated in the accompanying manual.

The calculator provides most functions found on real calculators these days, including square roots and geometric functions like sin, cos, tan, radians, and degrees. There's also a nine-number memory.

MacroDesk's Card and Event options are for creating and accessing databases patterned after files of index cards. The databases use identical blank cards for data entry. You can type in a name, phone number, and three 24-character lines of addresses or other information. The usual edit-

ing keys active in GEM dialog boxes are available. When the card is completed and saved—each database can store up to 2000 cards—it is automatically alphabetized and time-stamped.

After you've created a database, you can retrieve a record by filling in the desired name on a blank card and clicking on the Find button. You can view the card onscreen or make a hardcopy in one of three different formats, depending on the information you wish to print out. If you have a Hayes-compatible modem hooked up, you can automatically dial any of the phone numbers. Tone and pulse dialing are supported, and you can access long-distance services by inserting pauses.

Cause For Alarm

Perhaps the most innovative and useful tool in *MacroDesk* is the Alarm function. Using the database, you can enter a message to appear at a certain time and date, such as a reminder about an important event you don't want to miss. When activated, the alarm opens up a dialog box, displays the message, and sounds a loud, continuous tone. The alarm doesn't release control of the computer until you acknowledge it by clicking on the OK button.

The alarm does have two limitations—both of which are imposed by the ST. First, like other *MacroDesk* functions, it works only when you're running GEM applications. Second, the alarm's dialog box won't appear if there's already another dialog box on the screen. Even in this rare case, however, *MacroDesk* keeps tabs on the situation and displays the alarm at the next available opportunity.

If you want, the alarm message can be repeated daily, weekly, monthly, or yearly. *MacroDesk* alphabetizes the alarm records so you can scan them, but a more logical method would have been to log the entries chronologically so you could visualize your schedule a bit better.

MacroDesk contains a few minor annoyances. For instance, the program insists on using 24-hour (military) time. If you're not accustomed to this, it takes a little getting used to. Also, erasing records from the database is as simple as clicking on a button labeled Remove—no verification is requested. Firm believers in Murphy's Law—"If something can go wrong, it will"—should be extra careful to guard against unintentional deletions.

Judging from its features, *MacroDesk* is strongly oriented toward business use. Unless your ST sees mostly full-time duty, you'll miss some of the usefulness that it offers. The Alarm function, for example, won't do you much good if the computer is switched off most of the time. It's intended for those who keep an ST at their desk and work near it all day—perhaps not a majority of ST users at this point, but a segment that is growing as more business software becomes available. In this type of environment, however, *MacroDesk* can help make you more productive and efficient.

MacroDesk
Shanner International
453 Ravendale Drive
Mountain View, CA 94043
\$19.95

Mean 18

David Hensley, Jr.
Programming Assistant

Requirements: Any ST computer with TOS in ROM and a color monitor. Printer optional.

Like many sports, golf is a seemingly simple game that is actually very complex. It demands precision, concentration, and attention to detail—perhaps more than any other professional sport.

Mean 18, a new golf simulation from Accolade, preserves with remarkable authenticity all of these traits as well as many of golf's other engaging facets. It combines good sound and graph-



ics with excellent playability and realism to deliver one of the best golf simulations available today.

Mean 18 offers many alternatives and leaves all the decisions to you. The package comes with two disks: the program disk and the famous-course disk. The program disk contains the game program itself, a course-architect program (more about this in a moment), and a simulation of an imaginary golf course, the Bush Hill Country Club. The famous-course disk contains simulations of three world-renowned golf links: the legendary St. Andrews, Pebble Beach, and Augusta National (home of the Masters Tournament). The Bush Hill course is a tough test of golf that only the best can master.

Practice For Perfection

After running the program and entering the players' names (you can play solo or with others up to a foursome), you have the option of playing from the pro or the regulation tees. Then you select either the beginner or expert level. At the beginner level, you're provided with the correct line to the hole and a recommendation for the best club. Expert players must choose their own clubs and hit more accurately. Finally, before play starts, you select the manner of scoring. There are three choices: stroke or medal play, two-player match play, and two-team/four-player best ball (lowest score for team wins).

In real golf, it's always advantageous to hit a few balls and practice putting before your round. *Mean 18* takes this into consideration. On the practice tee

you can try every club in your bag except the sand wedge. After every practice shot, the program indicates the total distance your ball traveled and the deviation from the center of the fairway. This helps when you try to execute a hook, draw, fade, or slice (the manual offers tips on how to hit these shots). A practice green is provided for you to hone your putting skills, and you can even practice a hole before beginning the game.

Once out on the course, you have to contend with almost all of the aspects of golf found on real courses. You even control your backswing and wrist snap at impact. Careful control is crucial when playing severe doglegs and avoiding deep rough, out-of-bounds areas, and those ever-present hazards. The troublesome shots out of menacing sand bunkers play a key role in shooting low scores.

Mean 18 has a couple of features that set it apart from most other golf simulations. For instance, before teeing off, you're shown the overhead layout of the hole. After each stroke, you can call up the overhead view again and see a replay of every shot you've hit on that hole. (See Photo 2.)

Whenever you want to know where you stand, you can click on a scorecard icon. If time prevents you from finishing a game, you can save the game on disk—up to the last hole completed. After your best rounds, you may want to enter your score in the *Mean 18* Hall of Fame and print your scorecard for posterity and bragging rights.

Video Landscaping

If you tire of playing the four courses provided, you can design your own with the course-architect program. This program lets you modify the existing courses (be sure to back them up first) or design a completely new course from scratch. To modify an existing course, you can simply adjust the tees and flagsticks to add a little variety. At the other extreme, you can fashion a course of your own with total control over the entire layout. Special features include a fill option and a zoom mode.

The architect program makes *Mean 18* even more enjoyable. It is both fun and easy to use. The possibilities are endless. Try reproducing your home course or country club. You can design a course with a breathtaking view for a relaxing round, or create a monster that pushes your limits.

Mean 18 does have a few minor drawbacks. The absence of wind removes some indecision over which direction to aim. Although the overhead view of the green that appears before putting is interesting, some players may find it a bit annoying after a few games. And during match play, the program could declare the winner (with an option to continue) before you've actually finished all 18 holes.

Overall, though, the many variations and powerful features make *Mean 18* a program you'll use time and time again. I recommend it for pros, amateurs, and nongolfers alike.

Mean 18
Accolade
20833 Stevens Creek Blvd.
Cupertino, CA 95014
\$49.95

ST



China Waterfall

Maryann E. Raeder

Each issue, COMPUTE!'s Atari ST Disk & Magazine features a screen of computer artwork contributed by an ST artist. The screen is stored on the magazine disk in NEOchrome format under the file-name ART.NEO. It can be loaded into any graphics-design program compatible with NEOchrome files. (Programs to convert NEOchrome files to other formats are widely available in the public domain.) If you want to contribute a screen of your own, send the disk to COMPUTE!'s Atari ST Disk & Magazine, P.O. Box 5406, Greensboro, NC 27403. All artwork must be completely original and previously unpublished in any form. Screens should be drawn in the low-resolution color mode. If you wish, you may include several paragraphs of text describing the artwork and any special techniques employed. We pay \$100 for each screen accepted for publication. Artwork accepted for publication becomes the property of COMPUTE! Publications, Inc.

Notes From The Artist

"China Waterfall" started out as a request from a relative to do some Oriental art with a waterfall so that he could play with the color rotation functions of *Paintworks*. Activision's *Paintworks* is his favorite art program because it allows him to attach his music and special effects to my art (via *The Music Studio*, also marketed by Activision).

First I studied all the paintings, drawings, and photographs I

COMPUTE!'s Atari ST Disk & Magazine

could find of waterfalls and Chinese art styles. Then, using *DE-GAS*—the drawing program I prefer—I set the colors, saving three for rotation of the waterfall. I also used these colors for stars in the sky.

Next, I sketched the outline of my interpretation of a waterfall and drew a Chinese landscape behind it. I used the K-Line and Fill functions for the major part of the drawing, and did the rest pixel by pixel in Zoom mode. The finished picture was loaded into *Paint-works*, and color rotation was added for the waterfall and the sky. You can recreate the color cycling in *NEOchrome* if you wish, but it may take some tinkering.

ST

THE ATARI TEN COMMANDMENTS

II

"We shall create a computer that is as smart as the people who buy it." *Just Imagine*
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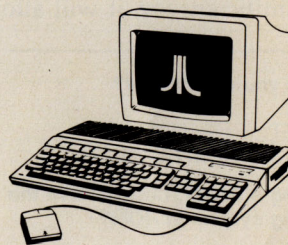
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COMPUTE!'s

Atari ST Disk & Magazine

Readership Survey

What do you like about *COMPUTE!'s Atari ST Disk & Magazine*? What don't you like? What kind of Atari ST system do you use, and what are you interested in doing with your ST?

In order to make *COMPUTE!'s Atari ST Disk & Magazine* as useful to you as possible, we're exploring different directions and new approaches. Our goal is to make *COMPUTE!'s Atari ST Disk & Magazine* the top publication in its field.

Please take a moment to fill out and mail us this questionnaire (photocopies are fine). Although this isn't a scientific survey, it will allow us to draw some

general conclusions about you, our readers.

Some of the questions may require you to check more than one answer (if, for example, you have both a monochrome and a color monitor). Also, we're interested in hearing from you even if you don't own an Atari ST; perhaps you're reading our magazine because you're thinking about buying one, or perhaps you use an ST at your office or school.

Please mail the questionnaires to Readership Survey, *COMPUTE!'s Atari ST Disk & Magazine*, P.O. Box 5406, Greensboro, NC 27403. We'll publish the results in an upcoming issue.

Which ST do you own or use?

- ☐ Atari 520ST
- ☐ Atari 1040ST
- ☐ I don't own or use an ST yet

If you're using a 520ST, does it have the TOS operating system in ROM?

- ☐ Yes
- ☐ No
- ☐ Not sure

If you own an ST, is it your first computer?

- ☐ Yes
- ☐ No

If you previously owned (or still own) another computer, what kind is it?

- ☐ Atari 400, 800, XL, or XE
- ☐ Commodore PET, VIC-20, 64, 128, Plus/4, or 16
- ☐ Apple II, II+, IIe, IIc
- ☐ Apple Macintosh
- ☐ IBM PC, PC/XT, PCjr, AT, or compatible
- ☐ Texas Instruments TI-99/4A
- ☐ TRS-80/Tandy/Radio Shack
- ☐ Other: _____

Which ST monitor do you own or use?

- ☐ Monochrome
- ☐ RGB color
- ☐ Composite color
- ☐ TV

Which ST disk drives do you own or use?

- ☐ Single-sided floppy
- ☐ Double-sided floppy
- ☐ Hard disk
- ☐ Two or more disk drives

Which peripherals do you own or use with your ST?

- ☐ Dot-matrix printer
- ☐ Letter-quality printer
- ☐ Color printer
- ☐ Laser printer
- ☐ 300-bps modem
- ☐ 1200-bps modem
- ☐ 2400-bps modem
- ☐ MIDI synthesizer
- ☐ Audio digitizer

☐ Video digitizer/camera

☐ Other: _____

Which types of ST software have you purchased?

- ☐ Graphics design
- ☐ Word processor
- ☐ Programming language
- ☐ Telecommunications
- ☐ Educational
- ☐ Games
- ☐ Business applications
- ☐ Other: _____
- ☐ None

In which languages do you program on the ST?

- ☐ BASIC
- ☐ Logo
- ☐ C
- ☐ Pascal
- ☐ Assembly/machine language
- ☐ FORTRAN
- ☐ Forth
- ☐ Other: _____
- ☐ I don't program on the ST

Which types of articles and programs would you like to see in this magazine?

- ☐ General-purpose home applications
- ☐ Business applications
- ☐ Utilities
- ☐ Telecommunications
- ☐ Programming explanations and tutorials
- ☐ Educational programs for youngsters
- ☐ Game/entertainment programs
- ☐ Graphics
- ☐ Sound and music
- ☐ Hardware modifications and projects
- ☐ General-interest feature articles and interviews
- ☐ New products
- ☐ Latest news and rumors
- ☐ Other: _____

Which types of new product reviews would you like to see in this magazine?

- ☐ Home applications
- ☐ Business applications
- ☐ Educational software

- ☐ Games/entertainment
- ☐ Programming languages
- ☐ Utilities
- ☐ Hardware
- ☐ Other: _____

Which article in this issue of the magazine do you like best?

Which article in this issue of the magazine do you like least?

If you saw our first issue, which article did you like best?

If you saw our first issue, which article did you like least?

Do you think the inclusion of program source code on the disk is useful?

- ☐ Yes
- ☐ No
- ☐ No opinion

Do you like the idea of an Atari Art picture on each issue's disk?

- ☐ Yes
- ☐ No
- ☐ No opinion

What other things would you like to see on the disk?

How did you happen to see this issue of *COMPUTE!'s Atari ST Disk & Magazine*?

- ☐ I subscribe
- ☐ I bought the issue from a newsstand or a dealer
- ☐ I borrowed the issue

Additional comments:

ST

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Atari ST BBS Program

1ST Base Software has introduced a new bulletin board system, *ST-BASE*, for the Atari ST. The program offers up to 16 file transfer and message base areas, online games, an online questionnaire, up to 35 editorials for reviews and advertisements, and a never-ending story option with dictionary support.

The file section features commands such as Browse, Locate, and Read Directory, while the message editor includes commands such as Bring Deleted Messages Back, Scan Headers, and Locate Messages. Hourly usage and other BBS stats are updated on the 80-column graphic display. The program maintains a report of the last 20 callers with infor-

mation on how many messages were posted, how many files were up- or downloaded, the baud rate, and more.

ST-BASE supports Xmodem protocol and all RAM disks. It works with any Hayes-compatible modem.

The suggested retail price for *ST-BASE* is \$50 in U.S. currency.

1ST BASE Software, 48 Amherst Crescent, Nepean, Ontario, Canada K2J 1V9.

Circle Reader Service number 211.

Realtime Clock/Calendar

Timekeeper from Navarone is a real-time clock/calendar for the Atari ST. This plug-in, battery-powered cartridge comes with programs that operate as a desk accessory or from the AUTO folder. A connector on the car-

tridge allows *Timekeeper* to remain installed while using other cartridges.

Timekeeper automatically sets the correct time and date on the system clock when the computer is switched on, then disengages to avoid interfering with other software. Time is displayed in a 12- or 24-hour format. The desk accessory program has an alarm feature.

The *Timekeeper* software is not copy-protected and is written in compiled C. The cartridge includes a battery and is 3½ × 5½ × 1 inches.

The retail price of \$39.95 includes the *Timekeeper* module, program disk, and instructions.

Navarone Industries, 21109 Longeway Road, Suite C, Sonoma, CA 95370.

Circle Reader Service Number 212.

ST BASIC Tools

Accusoft has released *ST Tools*, a disk which contains libraries of over 60 ST BASIC subroutines that allow users to incorporate GEM file selector and dialog boxes and most VDI graphics into their own ST programs. The company has also announced *ST Demos*, a disk with six compiled demos of music, graphics, games, and utilities, plus the original ST BASIC code.

The programs on both disks are compatible with the *LDW BASIC* compiler, and each disk includes documentation and tips.

Retail price for each disk is \$12.95.

AccuSoft, P.O. Box 02214, Columbus, OH 43202.

Circle Reader Service number 213.

Leader Board Add-On

With *Tournament Disk #1* from Access Software, you can add four new 18-hole golf courses to the ST version of *Leader Board*, a golfing simulation. *Tournament Disk #1* offers new sets of trees, sandtraps, and rough, and adds a higher degree of difficulty. It also has provisions for computerized

THE ATARI
TEN COMMANDMENTS

III

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ST01 ♦ Forth Language, public domain Forth 83 with example files and utilities.
ST02 ♦ 68000 Assembler. Create your files with the powerful EMACS editor, also on this disk. Includes example programs.
ST03 ♦ Pictures & Music. Pictures in NEOCHROME format and music to use with Music Studio.
ST04 ♦ A handy collection of desktop accessories, including a very powerful scientific calculator, calendar, a puzzle, ramdisk, file editor and more.
ST05 ♦ A super terminal package allows you to communicate with Compuserve, our bulletin board, or hundreds of others. Full upload & download capabilities. Easy to use!
ST06 ♦ Games I. A half dozen good games ready to play. Very nice!
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ST16 ♦ XLISP, learn this exciting language of artificial intelligence. Includes language, documentation files, and 11 sample programs.
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scoring, a handicap system, and strategy decisions involving clubs, distance, and other golfing variables. Tournament Disk #1 requires Leader Board.

The suggested retail price of Tournament Disk #1 is \$19.95. Leader Board is \$39.95.

Access Software, #A 2561 S. 1560 West, Woods Cross, UT 84087.
Circle Reader Service Number 214.

Prospero's Pascal, FORTRAN

Prospero Software has introduced the Pro Pascal Compiler and the Pro FORTRAN-77 Compiler for the Atari ST.

Pro FORTRAN-77 is a complete ANSI X3.9-1978 FORTRAN compiler which can be used to compile programs transferred from minicomputers, mainframes, and public domain software libraries. The compiler has 7- and 16-digit precision floating point math, 4-byte integers, and full GEM AES and VDI bindings to take advantage of the GEM user interface and the graphics capabilities of the ST's operating system.

Pro Pascal is a complete ANSI 770X3.97 standard Pascal compiler with extensions including strings, 7- and 16-digit precision floating point math, separate compilation, 4-byte integers, and more. Pro Pascal also has full GEM AES and VDI bindings.

The suggested retail price is \$149 each. They come with 230-page manuals and are not copy-protected. Check with your local software dealer for information regarding American distribution.

Prospero Software, 190 Castelnau, London SW13 9DH, England.
Circle Reader Service Number 215.

Chess Game

Szabo Software is releasing TechMate, a chess program for the ST. The package is oriented more toward experienced chess players than those who want to learn how to play.

Szabo Software says TechMate includes a more intelligent game play algorithm, fast and easy-to-use response, an easy to read two-dimensional color display, and two onscreen clocks that are adjustable from three hours to a few moments (for variable handicapping), among other features. Game play is controlled with the mouse.

The suggested retail price is

\$49.95 (\$5 extra for international orders).

Szabo Software, P.O. Box 623, Borrego Springs, CA 92004.
Circle Reader Service number 216.

MaxThink Idea Processor

MaxThink is an idea processor for the ST that's designed to help you generate, organize, and outline your thoughts and ideas. The package includes organizing functions in 12 different styles of thinking (managerial, conceptual, linguistic, structural, and so on). There are also many formats and commands within text, list, and outline structures to match your thinking processes.

The MaxThink files are in ASCII format for easy interchange with existing word processors, databases, and telecommunications programs. Printer options cover all page, outline, and numbering formats.

The suggested retail price for MaxThink is \$59.95.

MaxThink, 230 Crocker Avenue, Piedmont, CA 94610.
Circle Reader Service number 217.

Mailing List Package

Mighty Mail from Michtron is a mailing label program with a database manager that lets you store names, company names, addresses, and telephone numbers from which reports or mailing labels can be generated. A search function is included, and there are 16 user-definable flags to mark customer types or mailings.

The suggested retail price is \$49.95.

Michtron, 576 S. Telegraph, Pontiac, MI 48053.
Circle Reader Service number 218.

Budget Software

A number of inexpensive game, educational, and personal productivity programs for the ST have been introduced by Key punch Software. Titles include Trivia Master, The Gambler, Strategy Games, Cards Cards Cards, Mind Games, Personal Finance Pak, Executive Data Pak, and Finance I and II.

Each program sells for \$9.99.

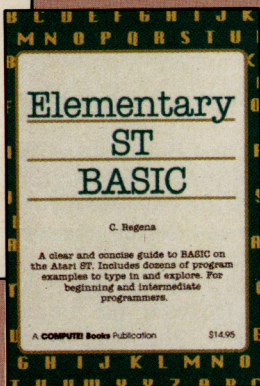
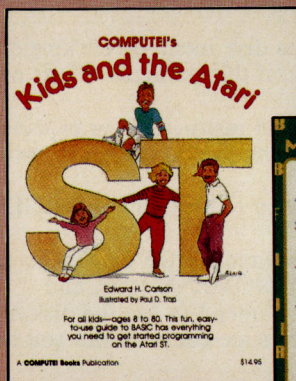
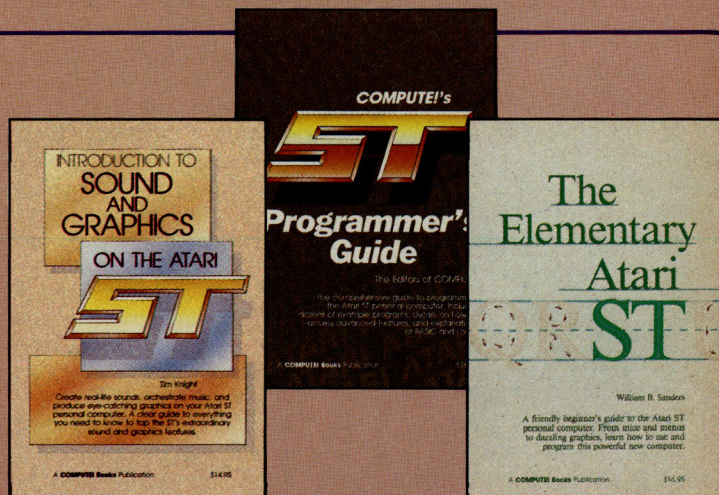
Key punch Software, 1221 Pioneer Bldg., St. Paul, MN 55101.
Circle Reader Service number 219.

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William B. Sanders, 272 pages

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How To Use The Disk

Every issue of *COMPUTE!'s Atari ST Disk & Magazine* includes a 3½-inch microfloppy disk as part of the package. If you experience a problem with the disk, please contact us at (919) 275-9809 from 8:30 a.m. to 4:30 p.m. (Eastern Time), Monday through Friday.

To use the disk, simply insert it in a drive and click on the appropriate file-drawer icon to display the directory window. If you wish, you may boot up your ST with this disk by inserting it in drive A and switching on the computer, but normally it contains no active desk accessories.

There are two ways to access programs and files on the disk. You can simply run or examine the files from the GEM desktop. Or you can use the custom menu program on the disk that contains descriptions of each file as well as special instructions. To run the menu program, double-click on the file named *DISKMENU.PRG*. It works in all screen modes: low- and medium-resolution color, and high-resolution monochrome.

DISKMENU.PRG displays a directory of files on the disk, one screen at a time. Click on the lower buttons labeled *Prev* or *Next* to display the previous or next screens.

At the top of the disk menu are three buttons labeled *Description*, *QUIT*, and *Run program*.

The *Description* button calls up a screen which describes the program or file. At the bottom of this screen is the filename and two buttons labeled *MENU* and *RUN*. Clicking on the *MENU* button returns you to the disk menu. Clicking on the *RUN* button loads and runs the program. However, if this particular file is not an executable program (for example, a source code or data file), the *RUN* button is dimmed and disabled.

You can also run a program directly from the disk menu by clicking on the *Run program* button at the upper right. However, if this particular file is not an executable program, you'll be alerted to this fact.

Note that many files on the disk require special instructions or explanation; please refer to the corresponding article before attempting to run a program or access a file.

Clicking on the *QUIT* button on the disk menu returns you to the GEM desktop.

There are four files on the disk which are required for the disk menu program: *DISKMENU.PRG*, *DISKMENU.RSC*, *MONOMENU.RSC*, and *CONTENTS.DEC*. Do not delete these files if you intend to use the disk menu. If you plan to use the disk menu, be sure these files are copied when you back up the disk.

Our disk is not copy-protected. You are encouraged to make a backup of the disk as soon as possible. However, the contents of the disk are copyrighted and may not be used by anyone other than the owner of the magazine. Since the writers and programmers whose work appears on this disk are paid, in part, according to the volume of sales, we ask that you respect the copyright.

Special Notes

The "File Hider" article in this issue describes several steps required to install the programs *XDIR.PRG* and *FILEHIDE.PRG* as TTP (TOS-Takes Parameters) applications before use. A shortcut is to rename the files to *XDIR.TTP* and *FILEHIDE.TTP* on your disk. This saves you the trouble of installing them as TTP applications from the desktop each time you use the computer.

Some readers experienced problems with the "Word Count" desk accessory published in the October issue. Check this issue's "Readers' Feedback" column for an explanation of the problem and a suggested solution.

ST

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THE PAWN

A movie poster for the film 'The Pawn'. At the top, a brown banner with the title 'THE PAWN' in black, serif, all-caps font. The central image is a dramatic illustration. A wizard with a long white beard, wearing a purple robe with red trim and a red hat, stands on a narrow wooden bridge. He holds a long, thin staff. A large, muscular hand from the right side of the frame grips the bridge's railing. In the background, a massive, purple, horned demon face with glowing red eyes looms over a landscape of snow-capped mountains. To the left, a small figure in a hat and orange tunic sits on a rock. To the right, two figures in medieval-style clothing are visible. The overall color palette is dominated by purples, blues, and reds, creating a dark and ominous atmosphere.

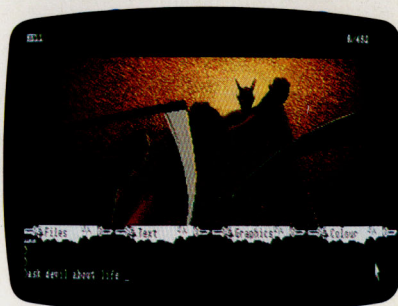
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FOREST GALLERY

There is a tree stump here.
It's in the stump.

ATABIST SCREENSHOT

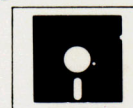
'The Pawn' understands **plain English**, it knows the size, volume and weight of the game objects, their texture, and their magical properties (in fact the program stores 135 pieces of information for each object).



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