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INSIDE

# COMPUTE!'s

# Atari ST

\$12.95  
December 1987  
Issue 8  
Vol. 2, No. 6

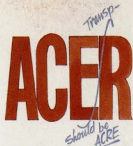
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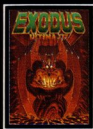
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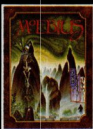
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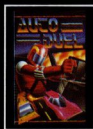
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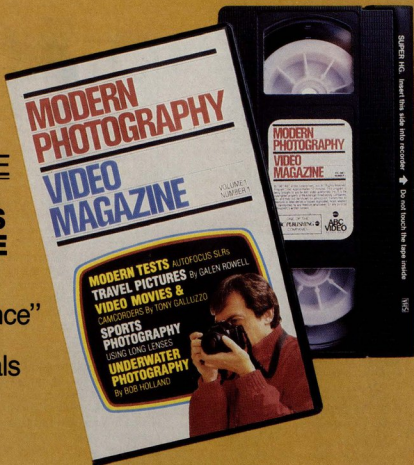


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# The Editor's View

Back in November 1986, an extraordinary submission arrived at COMPUTE!'s Atari ST Disk & Magazine: a software-based Apple II emulator for the Atari ST.

After the initial sensation wore off, however, our testing revealed three insurmountable problems: It was far too slow (only about one fourth the speed of an Apple II); it was incompatible with the vast majority of Apple II software; and it incorporated Apple's operating system code, which is copyrighted. Still, we kept in touch with the author, who was obviously a talented programmer and tireless worker. He told us he was working on an improved version of the emulator that would run eight-bit Atari programs.

A few months later, as promised, the Atari 800 emulator arrived. But again, our testing revealed the same problems: It was too slow (about one fourth the speed of an Atari 800); it was incompatible with virtually all eight-bit Atari software; and it incorporated Atari's copyrighted operating system code. So again, we declined to publish it.

During the ensuing months, the emulator became one of the hottest topics in the ST community. Several user groups and newsletter editors launched an angry attack on Atari when the company refused to allow distribution of the emulator with its operating system code. Finally, Atari agreed. (For more background, see "ST News & Notes," October 1987.)

We weren't surprised by the initial sensation over the emulator. However, we are a bit puzzled that it has persisted so vehemently.

At first glance, the emulator seems like a great idea. Our surveys show that 45 percent of ST users previously owned or still own an eight-bit Atari 400, 800, XL, or XE. An emulator would let these people unclutter their two-computer desktops, and would also open up the ST to the thousands of programs written for the older machines.

Unfortunately, the ST simply lacks the hardware and the horsepower to successfully emulate an eight-bit Atari. You can't reproduce four-channel sound on a three-channel sound chip, or plug an eight-bit cartridge into a non-existent cartridge slot, or hook up an 810 or 1050 disk drive to a completely incompatible interface, or plug paddles and graphics tablets into mouse ports that don't support them. Above all, you can't emulate an eight-bit Atari in software with anything close to full compatibility and full speed on an ST. The ST is a powerful computer, but not that powerful.

As a result, the emulator runs much slower than an Atari 800 and is compatible with very few programs. It could be improved with the addition of enough hardware, but then it would cost about as much as a 65XE system.

We feel that few owners of a 16/32-bit computer really want to run 8-bit software at a fraction of the speed of their old 8-bit computer. The ST has far better word processors, spreadsheets, database managers, communications programs, programming languages, and utilities than the eight-bit machines, anyway. There's really only one category in which the eight-bits still have an advantage: games. However, that's also the category that demands full-speed emulation.

Other hobbyists have now joined the emulator project, working to increase its speed and compatibility. We find it disappointing that while ST programmers are investing man-years in a program to run old-generation software, Macintosh programmers at Apple have written a program called *HyperCard* that heralds the next generation of software.

If ST programmers are looking for a community project, why not a full-fledged ST version of *HyperCard*? Admittedly, it wouldn't be an easy task—but at least it wouldn't be a futile one. And the result would be something the Atari ST community could really embrace.

—Tom R. Halfhill, Editor

**COMPUTE!'s Atari ST Disk and Magazine** is published bimonthly by COMPUTE! Publications, Inc., 825 7th Ave., New York, NY 10019 USA. Phone: (212) 265-8360. Editorial Offices are located at 324 West Wendover Avenue, Greensboro, NC 27408. Domestic Subscriptions: 6 issues, \$59.95. POSTMASTER: Send address changes to: COMPUTE!'s Atari ST Disk and Magazine, P.O. Box 10775, Des Moines, IA 50347-0775. Second class application pending. Entire contents copyright ©1987 by COMPUTE! Publications, Inc. All rights reserved. ISSN 0888-8442.

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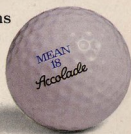
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## Mean 18.



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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.

## The ST Family

Is there such a computer as the Atari 130ST? If so, where can I get it?

Ronald Williams

The ST series includes the 520 and the 1040, which have 512 and 1024 kilobytes (one megabyte) of memory, respectively. The newer additions to the line are the Mega STs, which are endowed with either two or four megabytes. Atari has sold a machine called the 260ST in Europe, but the 260 has never been available in the United States.

There is no Atari 130ST, but there is an eight-bit machine called the Atari 130XE, which has 128K of available memory. The XE is not related to the ST series, nor is it compatible with the ST. The 130XE is similar to (and software-compatible with) the Atari 400, 800, and 65XE computers.

## Changing Calendars

In the August issue, the "Personal Calendar" article contained an error where it said, "By papal decree, the Gregorian calendar replaced the old Julian calendar in 1752."

The Julian calendar was instituted in 46 B.C. by Julius Caesar on the advice of the Egyptian astronomer Sosigenes. It compensated for the fact that the solar year consists of 365 $\frac{1}{4}$  days by giving every fourth year 366 days.

Since the solar year is not exactly 365 $\frac{1}{4}$  days, but a little less, by the year 1582, the Julian calendar and the seasons were apart by about ten days. To realign the calendar, Pope Gregory XIII issued a decree in 1582, which made October 15 the day after October 4. Additionally, the Gregorian calendar required that for a century year to be a leap year, the first two digits had

to be divisible by four. Thus, 1600 was a leap year and 2000 will be a leap year, while the years 1700, 1800, and 1900 were not.

The Gregorian calendar was adopted almost immediately in most Catholic countries, but not in most Protestant and Eastern Orthodox countries. England and her colonies did not embrace the new system until 1752, by which time the calendar and the solar year differed by about 11 days. By parliamentary direction, the day following September 2 was to be September 14.

Thus, the papal decree which established the Gregorian calendar was in 1582, but the parliamentary action by which England and the colonies (us) adopted the Gregorian calendar was in 1752.

Gary A. Weaver

Thanks for the information.

## Variable Types In C

I have been trying to write a small routine to open a file using the GEMDOS functions `Fcreate()`, `Fopen()`, `Fwrite()`, and `Fclose()`. I am using Mark Williams C, version 2.0. I can create a file, but have not been able to write any data into the file. Here is a listing:

```
#include <osbind.h>
main() {
  long handle;
  char string[80];

  strcpy(string, "This is a test string.");
  handle = Fcreate("test.txt", 0);
  Fwrite(handle, (long)strlen(string), string);
  Fclose(handle);
}
```

I don't want to do anything fancy, just an ordinary run-of-the-mill file I can write to. What am I doing wrong?

Rod Falanga

The Mark Williams C manual contains a typographical error. In the section describing `Fcreate()`, it says the function returns the file handle as a long value. But in the example that follows and in

the explanation for `Fwrite()`, the variable handle is an integer. Changing the declaration from long handle; to int handle; should solve the problem.

Here are two other suggestions: Most C programs on the ST should start with a call to `appl_init()`, which initializes a GEM application. Programs should finish up with `appl_exit()`. You might also want to add a new line character to the end of the string. Here's a modified version of your sample program:

```
#include <osbind.h>
main() {
  int handle;
  char string[80];

  appl_init();
  strcpy(string, "This is a test string. \n");
  handle = Fcreate("test.txt", 0);
  Fwrite(handle, (long)strlen(string), string);
  Fclose(handle);
  appl_exit();
}
```

The function `strcpy()` copies the contents of one string into another. In your program, a string constant is copied into a variable.

The next line uses the GEMDOS function `Fcreate()`, GEMDOS 60, to create a file. In this case, the file is called "test.txt", and the file type is 0 (a plain file). This function returns the file handle as an integer value. The handle is used later when the file is accessed.

`Fwrite()`, GEMDOS 64, writes a predetermined number of bytes into the file identified by the handle you received from `Fcreate()`. In this example, `Fwrite()` writes the string called string. The length is determined by the `strlen()` function and cast as a long.

Finally, `Fclose()`, GEMDOS 62, closes the file identified by the handle.

## Back Issues

I own a 1040ST, which I've had for several months, but because of my job—teaching—I've been too busy to spend time learning how to really use it. However, I have enjoyed reading the April and June issues of your magazine and am eager to use the disk in my computer.

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magazine with its disks? In your reviews you refer to articles that have appeared in prior issues, and you refer to past programs given on disks. I would be interested in having a list of the past issues available.

Robert Hochwalt

We've had a considerable number of requests for back issues of COMPUTE's Atari ST Disk & Magazine. The first two issues, October and December 1986, are completely sold out, but there are limited numbers of subsequent issues: February, April, June, August, and October 1987 issues.

If you're interested in ordering any back issues, call 1-800-346-6767 to determine if the ones you're interested in are available. You can then order whatever issues you want for \$12.95 each, plus \$2.00 shipping and handling, during the same toll-free call.

## Monochrome Art Of The Month?

What bothers me about the disk part of your magazine is that for every issue, 32K of disk space is used to store a NEOchrome picture file which I cannot view since I have a monochrome monitor. This could be remedied if you would include, in an upcoming issue, a conversion program to change low-resolution NEOchrome to high-resolution DEGAS format.

Glenn Fralic

You're right, DEGAS will not allow you to load low-resolution color NEOchrome pictures into the hi-res monochrome screen. However, the program called DEGAS Elite is capable of converting between resolutions. Here's what this month's NEOchrome picture looks like in monochrome:



## Too Much Skipping

I'm having a problem with my printer, a Brother M-1709. It spits out three extra pages when it finishes printing a document. It also skips one page before printing the next during a multiple-page printout. I'm not much of a programmer, so digging into a configuration file or creating a custom printer driver can be a real trial. Any assistance would be greatly appreciated.

Steve Moroniak

Although we don't have a manual for that particular printer, we can guess what's probably happening. Some printers have a feature called skip over perforation or automatic paging. When you're printing several pages, the printer keeps track of which line it's printing. Near the bottom of the page, the printer will automatically go to the next page, leaving some white space at the bottom and the top of each sheet. This is a useful feature in cases where you want to avoid printing on the perforation between pages.

You can test your printer for this feature. First, create an ASCII file that's longer than a page. To create an ASCII file from 1ST Word, turn off word processing (WP) mode under the Edit menu. Then save the document. From the GEM Desktop, double click on the text file. When the alert box asks if you want to Show or Print, select Print. If your printer approaches the bottom of the first page and prints some blank lines before continuing on page 2, then it has automatic paging.

Here's where the problem arises. Most word processors (including 1ST Word) control the spacing between pages. They'll often give you options for changing the length of a page and the size of the top and bottom margins.

When the word processor decides that it's finished printing a page, including the page number or other footer, it sends a formfeed. (A formfeed is a special control character that tells the printer to go to the top of the next page.)

Imagine that a multipage document is being printed. As the first page fills up, the printer reaches the point where it decides to skip over the perforation and go to the top of page two. A line or two later, the word processor figures it's about time to close up page 1 (even though the printer has already reached page 2), so the program sends out a formfeed, which moves the paper to page 3. The result is a series of printed pages interleaved with blank pages.

The solution is to turn off the automatic paging feature of your printer. Look in the printer manuals for details. You may have to change a DIP switch in the back, or you may be able to send a command to turn off paging. The command could be embedded in the text file or you could send it with "Desktop Printer Controller" in this issue.

## The 16 Disk Limit

I can initiate the "Recoverable RAM Disk" program with 350K (I have a 520ST expanded to one megabyte of memory) and I can load files into it. After three reads from the ramdisk, the directory goes blank, indicating no files. If I reset the computer, the directory comes back and I can read three files again before the directory says there are no files.

I tried the program on another 520ST with the same results. Is there a bug in the program? Did I get a bad copy of the program or disk? I have enclosed a printout of the configuration file I used. Please help me get this program to work!

Layton Griffith

The configuration file you included with your letter helped us identify the problem. Unfortunately, the article describing the program was not explicit enough about rules for naming disk drives.

You're permitted to call a disk drive anything from A to P, which should be plenty—most ST owners don't have 16 disk drives. We didn't consider the possibility that someone might write a RAMDISK.INF file that creates a disk R. It makes sense that RAM would be disk R—they start with the same letter—but R is an illegal ID. Change the configuration file to one of the letters A-P and the bug should disappear.



# BREACH

"I was moving a squad of four of my best through the *kehst*-beridden jungles of Kiskismok, when suddenly Darrow's detector picks up what looks like a couple of life forms 50 meters out."

"'Nothin' but a couple of those brachiators,' he says to me. Just then Darrow takes it through the chest."

"We all drop into the mud, flipping through our helmet displays trying to find out where the shot came from when I hear this rumbling. More like I *feel* this rumbling. An' then there it is. A battle robot."

"Hsiang shoots the thing in its sensory grid with a bolt, but it doesn't do much good 'cause he's a psionic talent and they don't give 'em half-way decent guns. It starts tracking him with its dual guns and suddenly he takes some hot plasma too. Now it's just me and the kid, Yamaguchi."

"'Guchi,' I said, 'Direct your fire into the lifters so it can't move. These things are pretty lousy about protecting their undersides.' So like he was a vet of 20 drops, he rises to one knee and hits the thing right in the lifters. And then he does it twice more."

"'One battle robot: out of action,' he says. I toss an energy grenade at the hulk just to make sure and then we start the long job of carrying the boys north, where we know the landing boat'll be."



## The Serayachi Campaign—Sgt. Robert Sherwood, FWSF Ret.

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- Up to 40 opponents per scenario—ranging from vicious beasts to marines as intelligent and well-equipped as your own. Six different classes of opponents in all: marine, alien, beast, overlord, autogun, and battle robot.
- Equip your marines with 20 different types of objects—including rocket launchers, demolition charges, first aid kits, and cracking units to break into enemy computer systems.
- Four different classes of marine: marauder, infiltrator, scout, and psionic talent.
- Your squad leader is independent of any scenario—play **Breach** just like a role-playing game or as a single session wargame.
- Build-up your squad leader for special advanced training—all of his combat experience is saved!
- **Breach** includes a **Scenario Builder**—create your own scenarios or modify existing ones!
- Scenarios can have several different victory conditions which can be mixed together to form extremely complex battles.
- Additional scenario disks available soon!



*Breach* is available for the Atari ST and Macintosh. IBM version available soon. Photos are for the Atari ST version.

To order, visit your software dealer. For direct orders (VISA/MasterCard/COD), phone (203) 658-6917. To purchase by mail, send check, money order, or credit card information to Omnitrend Software, Inc., PO Box 733, West Simsbury, CT 06092. Cost is \$39.95 plus \$3.00 for shipping and handling.

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Incidentally, the Graphics Environment Manager (GEM) was developed by Digital Research, Inc. (DRI), which also developed the operating system CP/M. There are parts of GEM that resemble CP/M, including the 16 disk drive limit.

## An Elusive Bug

I loved August's "Art-ST" program, the second-prize winner in the \$10,000 programming contest. But have you tried to use it with the third-prize winner, "Recoverable RAM Disk"? After you quit Art-ST and return to the desktop, the programs have turned into strange files containing Greek and graphics characters.

Gary Mills

Unfortunately, Art-ST and the ramdisk seem to have serious compatibility problems. We have been unable to discover a fix for this bug. Art-ST is apparently scrambling the directory stored in memory (the disk is not affected and will look fine after you reboot the computer). To avoid this problem, we can only suggest that you do not use the two programs at the same time. We regret any inconvenience this may have caused our readers.

## More Than One Way To Print An Address

The "ST Address Book" program in the June issue is truly great. However, when I select the envelope printing option, the address is printed flush with the left side of the envelope, a most unnatural place. My local post office doesn't like to see an address there. Is there any way to move the printed address to the right center of the envelope?

B.F. Almand III

Here are three suggestions:

First, at most office-supply stores you can buy mailing labels on tractor-feed backing. Print the addresses flush left on the mailing labels, then peel off the labels and stick them to the envelopes.

Second, if you own Personal Pascal and are familiar with the Pascal language, you could modify the source code, which was included on the June disk along with the program. Insert a suitable number of spaces before each line and you can print directly on the envelopes.

The third idea is the most direct. Many printers allow you to send a com-

mand that sets the indentation for the left margin. See if your printer manual lists such a command. If your printer supports programmable margins, you can use the "Desktop Printer Controller" program in this issue to temporarily change the indentation to 30 or 40 characters before you print the address on an envelope. When you're done printing addresses, reset the margin to its normal position.

## Appending To Sequential Files

How can I write information to a sequential file, using ST BASIC, without destroying information already contained in that file?

James Stolich

A sequential file stores information in the sequence in which it was written. To access any data, you can read the entire file into memory. Once the data is in RAM, it can be modified, displayed, printed out, or otherwise manipulated.

When you want to add data to a sequential file in ST BASIC, it's necessary to read the information into memory, append the new data, then write the file back to the disk.

Here's a sample program which creates data for a file, then stores the data in a sequential file. The file is read back into memory, some additional information is added to the file, and it's stored on the disk. Although this program doesn't serve any useful purpose, it does demonstrate the principles of sequential file management in ST BASIC. The concept is quite similar in other languages.

Line 10 sets up an array (A\$) of 35 items to store the data.

Lines 40 and 50 create the data for our file, and display it on the screen.

Line 70 opens a sequential file for output. The OPEN statement gives you three options. A file may be opened for output ("O"), for input ("I"), or for input or output to a random file ("R").

The file number (#1) must be in the range of 1-15, and is used in line 80 to direct the output to the proper file (PRINT #1, A\$(I). Each open file must have a unique file number.

Line 90 closes file #1.

Lines 130-180 open the file for reading, placing the contents of the disk file TEST.SEQ into the previously dimensioned array, A\$(i). Notice the use of the WHILE statement in line 140 to check for EOF. EOF is a reserved word which contains a zero until the end of a file is reached, then it contains -1.

The statements between the WHILE and WEND continue to execute until the check for EOF is true, or -1. The file is then closed, with all items of data stored in memory.

Lines 210-240 simply add more data to the file, in this case records 21-35.

Lines 270-290 again write the complete appended file to the disk.

Some versions of BASIC offer the ability to append information to a sequential file, without first reading the file into memory. The version of ST BASIC being used at this time doesn't offer this capability, one of its shortcomings.

GFA BASIC allows sequential files to be appended. In fact, the OPEN statement in GFA permits five options. The command syntax for opening a sequential file in GFA BASIC is:

OPEN "mode", file #, "file name"

Mode Options:

"O" opens a file for output.

"I" opens a file for input.

"A" opens a file for appending to an existing file.

"U" enables reading and writing to an existing file.

"R" opens a random access file.

## Sample Sequential File Handling in ST BASIC

```
10 dim a$(35)
20 fullw 2 : clearw 2
30 print "Creating records:"
40 for i=1 to 20 : a$(i)="This is record #
   "+str$(i) : next
50 for i=1 to 20 : print a$(i) : next
60 clearw 2 : Print "Writing TEST.SEQ to
   disk"
70 open "O",#1,"test.seq"
80 for i=1 to 20 : print#1,a$(i) : print
   a$(i) : next
90 close #1
100 clearw 2
110 i=0
120 print "Reading TEST.SEQ from disk"
130 open "I",#1,"test.seq"
140 while not eof(1)
150 i=i+1
160 input#1,a$(i) : print a$(i)
170 wend
180 close #1
190 clearw 2
200 print "Adding more records:"
210 for i=21 to 35
220 a$(i) = "This is record # "+str$(i)
230 print a$(i)
240 next
250 clearw 2
260 print "Writing appended file to
   disk:"
270 open "O",#1,"test.seq"
280 for i=1 to 35 : print#1,a$(i) : print
   a$(i) : next
290 close #1
```

ST

## A New BASIC For The ST—Or Is It The ST?

Atari's ST BASIC is a lot like the weather: Everybody complains, but nobody does anything about it. Nobody, that is, except a fellow named Hal Hardenbergh.

Industry insiders and hackers have long been familiar with Hardenbergh and his iconoclastic views through reading his newsletter *DTACK Grounded*. The small, now-defunct publication was Hardenbergh's pet project for several years.

Hardenbergh has been an enthusiastic (some might say rabid) supporter of the Motorola 68000 chip since way before the Macintosh made it popular and the ST made it affordable. In fact, the name of Hardenbergh's newsletter was derived from the name of a connector pin on the 68000. The DTACK pin, when grounded, makes the processor run flat out, with no wait states. In addition to publishing *DTACK Grounded*, Hardenbergh also formed a company called Digital Acoustics and began selling 68000 system boards, since almost nobody was making 68000-based computers back in the early 1980s.

Hardenbergh viewed the ST, after its debut in 1985, as a 68000 system that the masses could afford. He soon turned his attention to developing software for the new system. Hardenbergh began to convert *Halgol*—a programming language he developed for his 68000 boards—into *DBASIC*, a super-fast BASIC interpreter for the ST.

This summer, the ambitious project was finally completed and *DBASIC* was ready. Hardenbergh then tackled the next problem faced by everyone who develops something new on a shoestring: Without major backing, how can you distribute your product?

Hardenbergh wasn't the first person to develop an alternative to ST BASIC; among the more successful entries are the *LDW BASIC Compiler* and MichTron's *GFA BASIC*. But none of the independent BASICs has captured a large enough share of the market to become the de facto standard. Despite its numerous foibles, ST BASIC still has a huge advantage—it comes free with every ST. Challengers are overcome by sheer numbers alone. Hardenbergh wanted *everyone* to have a copy of *DBASIC*.

So he decided to give it away.

Hardenbergh—who claims the title of Chief Marketing Idiot for his company—mailed more than 7000 copies of the program and manuals to Atari user groups, former *DTACK Grounded* readers, and magazine editors. (COMPUTE!'s Atari ST Disk & Magazine received 20 copies of the manual and ten program disks.) The idea, said an ironic accompanying note, was to let everyone see "how lousy *DBASIC* is." Hardenbergh also started giving away about 200,000 *DBASIC* disk labels bearing his copyright notice—enough labels for every ST owner in the U.S.

According to Hardenbergh, the odd marketing scheme works like this: The *DBASIC* program disk is not copy-protected, so you're allowed to make and distribute as many copies as you

wish. All you have to do is drop in at your local user group or make friends with anyone else who has a copy. The free stick-on labels lend an official look to your disk, and they also bear the copyright notice. In effect, Hardenbergh is banking on the same efficient network used to distribute shareware in the IBM market to make sure his *DBASIC* reaches every ST owner within a few months.

Hardenbergh hopes to make his money from those who like the language, decide to ditch ST BASIC (or whatever else they're using), and write programs with *DBASIC*. To do this, they'll need a copy of the *DBASIC* manual, which sells for \$39.95. Hardenbergh sums up his marketing plan this way: "Obviously, we don't know what we are doing, since we aren't doing what all the other smart folks are doing. Well, after we go broke, lots of folk will be able to say, 'I told you so!'"

So far, Hardenbergh's unusual scheme is at least achieving the distribution he's after. *DBASIC* is filtering through the ST community with startling speed. Now the question is whether *DBASIC*'s features and performance will convince a significant number of ST programmers to adopt it as a serious development tool.

But here, too, Hardenbergh has departed from the norm. Unlike all other programming languages for the ST, *DBASIC* isn't compatible with the ST. A paradoxical statement, to be sure, but here's what it means: *DBASIC* does not work with the ST's operating system (TOS), its graphics-oriented user interface (GEM), any existing ST software, or even the



ST's standard disk format. In effect, *DBASIC* is a completely new operating environment that transforms the ST into a completely different computer—a 68000-based *DBASIC* computer. The only thing it shares in common with the ST is the hardware. And even some of the hardware isn't compatible with *DBASIC*, such as hard disk drives and the mouse.

Why such an unusual (some might say eccentric) approach? Hardenbergh says everything was sacrificed toward one goal—speed. A sheet of benchmarks which accompanies the *DBASIC* package shows that even though it's an interactive BASIC interpreter, it outperforms most BASIC compilers, and even most C compilers.

In order to achieve this amazing feat, however, Hardenbergh had to make several compromises. To begin with, *DBASIC* doesn't use

GEM, because GEM is too slow. And unlike other ST programs which bypass GEM (such as *ST Writer*), *DBASIC* doesn't even allow GEM to coexist in the machine. To use *DBASIC*, you must reboot the computer from the *DBASIC* disk. *DBASIC* then kicks GEM out of its windows, so to speak, and takes over the entire machine.

*DBASIC* also ignores TOS, the ST's underlying operating system. Instead, it uses its own proprietary filing system which, compared with TOS, is rated twice as fast and stores more data per floppy. Of course, this means *DBASIC* disks are incompatible with regular ST disks and vice versa, so *DBASIC* programs can't be loaded or run from the GEM desktop while the ST is operating as an ST.

Hardenbergh calls *DBASIC* a "dinosaur BASIC," like those found on the old eight-bit comput-

ers. No windows. No icons. No drop-down menus. No mouse. Programs have line numbers, and there's none of this structured programming WHILE-WEND business.

*DBASIC* does have some interesting features, however, such as a series of special commands for manipulating text. These were used to write the text editor that's included with the language. There's also a complete 68000 assembler, which the author characterizes as "blindingly fast." (For a more detailed look at *DBASIC*, see the full review elsewhere in this issue.)

Will *DBASIC* succeed in establishing itself as the most popular BASIC on the ST? The answer hinges on whether ST owners will find enough advantages in *DBASIC* to turn away from GEM and the two-year-old ST standard.

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## The Ear

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

### Happy Days Are Here Again

Atari's financial turnaround continues in **full swing**. Reports for the second quarter showed net income climbed to \$13.5 million, compared to \$9.7 million for the same quarter last year. What's **even more amazing** is that profits increased 39 percent on a sales gain of 16 percent—which means Atari is maintaining **impressive profit margins** despite low retail prices. However, about two-thirds of Atari's sales came from overseas operations, a clear indication that the company is still having trouble cracking the **U.S. market**.

### Commodore Comeback

Atari isn't the only company boasting good financial news. Arch rival Commodore International reported a **75 percent increase** in net earnings last quarter. Net income was \$2.1 million, compared to \$1.2 million for the same quarter last year. It was Commodore's **fifth consecutive quarter** in the black. Nevertheless, Commodore is suffering from a problem similar to Atari's—**weakness** in the lucrative U.S. market. Whereas 66 percent of Atari's sales come from foreign operations, 74 percent of Commodore's sales are overseas. To boost U.S. sales, Commodore is embarking on an aggressive campaign to promote the new **Amiga 500**, offering substantial discounts to Commodore user groups, and coupons redeemable for hundreds of dollars' worth of Amiga software.

### Atari Enters Retailing

Atari, as we all know, is in the computer business. **Or is it?** In a recent move that surprised industry observers, Atari announced it is buying the **Federated Group**, a chain of 65 consumer electronics stores spread throughout California, Arizona, Texas, and Kansas. The stores sell everything from computers and TVs to stereos and videocassette recorders. Drawing on cash raised from healthy stock prices, rising profits, and Eurobonds, Atari is paying \$67.3 million to acquire 55 percent control of Federated. The idea is to **increase domestic distribution** of the ST, which has been a weak point for Atari. But some analysts are skeptical that the plan will work. For one thing, Federated finished its most recent fiscal year **in the red**. For another, computer companies in general have **done poorly** when they've dabbled in retailing. Stewart Alsop, publisher of PC Letter—a respected industry newsletter—told The Wall Street Journal, "Others who have tried this have failed miserably, including IBM. . . . The lesson has been that computer makers should stick to manufacturing, and retailers to retailing." But other observers disagree and believe Atari chief Jack Tramiel is making a **wise move**.

### Pirates (And Parents) Beware

MichTron's crackdown on pirate bulletin board systems is **growing serious**. As The Ear reported last issue, Gordon Monnier of MichTron—fed up with pirate BBS's distributing his commercial software—offered rewards to anyone who gave him phone numbers and passwords for BBS's with his programs. The response to Monnier's rewards of \$200 cash or \$400 worth of MichTron software was **so overwhelming**—more than 75 confirmed pirate boards were turned in—that Monnier had to withdraw his offer. He's now huddling with lawyers to prosecute the most **blatant offenders**. What does he consider blatant? "There was one board whose sign-on message asked users to send \$15 for 'complete access.' That's pretty blatant," Monnier says.

If **teenage pirates** think they're immune from prosecution because they're minors, they'd better think again. In a recent New York case, MichTron's attorneys filed a lawsuit against the **parents** of an underage BBS operator. The suit charges that since the parents supplied the computer equipment and telephone—and allegedly **failed to supervise** their child to prevent him from distributing copyrighted software—they have contributed to the copyright infringement. If MichTron wins this case, it could set a **ground-breaking precedent**.

### 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. All sources treated confidentially.



## Horsing Around

One of the hottest topics in telecomputing these days is the proliferation of so-called **Trojan Horse programs**—that is, public domain programs designed to wipe out disk data after unsuspecting bulletin board downloaders try to run them. Fortunately, the ST community has remained relatively unscathed by Trojan Horses. And up to now, the assumption has been that Trojan Horses were the work of **anonymous vandals**. But in the August 1987 issue of ST Informer, an ST-oriented newsletter, an editorial against software piracy closed with this **ominous notice**: "Frankly, if ST Informer finds such a BBS with copyright programs on board, we will send our 'Trojan Horse' into play, and the offending downloaders will have to call us to use their hard disk again. Fair warning."

## Atari Serenades Musicians

A trade show for the music industry may seem like a strange place for a computer company to set up an exhibit, but Atari had a large booth at this summer's National Association of Music Merchant's (NAMM) show. Because of the ST's ample memory, powerful processor, built-in MIDI ports, and low price, it's fast becoming the computer choice for electronic musicians.

Thanks to MIDI (which stands for Musical Instrument Digital Interface), musicians can use the ST to control a wide array of synthesizers and other gadgets of the electronic music age. Polls taken at the show indicate that more potential buyers are leaning toward the ST than the Apple Macintosh, the former MIDI favorite.

Music software companies have been quick to note the interest in the ST, and they've responded with dozens of high-quality MIDI packages. Sonus showed a professional sequencing program called *Masterpiece*, a less expensive package called *Glass Tracks*, and a scoring program. Hybrid Arts was showing *Smpete-Track ST*, which allows musicians to use the Society of Motion Picture and Television Engineers' time code for precisely synchronizing music to film and video.

Hybrid Arts also has a full line of other MIDI software. Dr. T's Music Software, a pioneer in the field, was showing a wide selection of ST programs as well.

Even the skeptics seem to be coming around. In the February 1986 issue of *Keyboard* magazine, Dave Kusek, president of Passport Designs (the leading manufacturer of MIDI software for the Mac), was quoted as saying, "In that Atari's survival is questionable, we've decided not to invest in software development for that machine. There is very little room in the marketplace for a machine with an independent operating system which is not compatible with anything else." Since then, Passport has changed its tune. The company has translated its widely acclaimed *Master Tracks Pro* to the ST, as well as a lower-priced product called *MIDISOFT Studio*.

Nor is all this activity going unnoticed by music retailers. Atari reportedly signed up about 200 music stores as ST dealers at the NAMM show, and now is setting its sights on recruiting all 5500 music shops in the U.S. If successful, this will significantly boost Atari's distribution, now limited to a few hundred computer dealers.

## Canadian Atari Show

Late this summer, we dropped by a major regional show held in Toronto for Canadian Atari dealers.

There were a number of retail point-of-sale systems on display, including one from American Networks Development and another from Nice and Software of Canada. Though he wasn't there, we understand that Wes Newell, a familiar figure to Atari fans, is also marketing a POS system. There were also a number of computer-aided design packages in evidence. One of the most interesting was Drafix, which John DeMarr of QMI calls the most complete drafting system for the ST yet. This package, which sells for \$500 on the IBM PC, will soon be available on the ST for about \$200. QMI is marketing a professional graphics tablet for use with Drafix and other CAD programs.

WordPerfect Corporation was showing off the new ST version of its popular word processor. The program looks virtually identical to the Amiga version which was released in August, except for the fact that GEM limits the number of active editing windows to four. Although the Amiga version has a list price of \$399, the company reports that they sold almost 6000 copies the first month, which set a company record. They feel this shows that people will be willing to pay higher prices for well-established and well-supported software. In the meantime, there is still no word on a release date for *Microsoft Write*, the big-name word processor due to be released last November. Atari spokesmen report that the program still has a few bugs to iron out.

At the other end of the hall, David Small of Pacific Data was showing off the latest developments in the continuing saga of the *Magic Sac*. Version 4.5 of the Macintosh emulator now supports the various ST hard disks, making the product a much more attrac-



tive and practical proposition. The company claims that the new software protects against the software errors committed by many Mac programs and recovers from those errors without crashing. Dave was also showing off the new Translator One interface box, which allows the ST floppy drives to directly read and write Macintosh disks. The interface works with internal as well as external disk drives and will cost in the range of \$200. It is expected to allow the ST to read all but the most heavily copy-protected programs. Data Pacific still plans to come out with a Mac drive that can be attached to the ST (or other computer) via the serial port.

Practical Solutions, manufacturers of the Monitor Master (a switch box that allows you to easily change from a monochrome to color display), was showing a couple of new hardware pieces—the Mouse Master and VideoKey. The Mouse Master is a switch that allows 1040 owners to easily change from joystick to mouse without reaching under the computer to change the plugs. VideoKey is an RGB encoder that translates the video signals coming out the back of the ST into a composite video signal, which can be fed to a monitor or a VCR. The company hinted that it may produce additional professional video interfaces and/or genlock devices and chroma keys in the future.

Antic demonstrated a new drawing program called *Cyber-Paint..* Lest you think this is just another paint package in a market flooded with them, we should point out that this one was written by Jim Kent, author of the *Aegis* animator package. In addition to being a full paint-and-drawing program, the program facilitates postproduction work on 3-D animations created with the *CAD-3D* and *CyberMate* packages. The *Cyber* series looks as though it's going to turn *CAD-3D* (considered an interesting novelty) into a full-blown super 3-D animation package.

December 1987

## Atari Canada: A New Sales Strategy

Since foreign sales account for the bulk of Atari's revenues, we recently paid a visit to the nearest foreign country—Canada—to discover the secret of Atari's success. We found that Atari Canada is pioneering a new sales strategy that differs markedly from the methods used by most Atari dealers in the U.S.

Rather than selling on price alone, Atari Canada wants its dealers to show customers how the ST can provide affordable solutions to everyday business problems. According to George Blake, Atari Canada's vice president for sales and marketing, the company plans to become much more support oriented. For example, the new Mega STs, which began shipping in Canada in August, come with a full one-year warranty instead of the usual 90-day guarantee. Atari Canada plans to offer dealers training on the new machines, plus additional assistance in the form of joint sales calls, equipment loans, and protected territories in areas where such a policy makes sense.

More importantly, Atari Canada requires that all Mega ST dealers have an outside sales force. This means the sales people must knock on doors at local businesses, rather than sit around the store waiting for business customers to wander in. Meeting this requirement not only demonstrates the dealer's commitment to the product, it also insures that the sales people are knowledgeable enough to fully support it.

The outside sales people will focus on desktop publishing, computer-aided design, education, and retail sales operations. They'll also try to penetrate the Fortune 500 market through employee purchase plans sponsored by those corporations. Although the Atari PC clone will be used to get a foot in the door in some companies, once inside, sales representatives will also try to point out the advantages of

Atari's ST line.

All of this means a big change in Atari's image. Atari's stationery still bears the slogan "Power Without the Price," but Blake says the new motto in Canada will be "The Choice of Achievers." This is designed to emphasize the capabilities of the ST computers instead of their price.

Atari Canada has a fair amount of autonomy, so there's no guarantee that Atari Corporation will adopt the same marketing strategy in the U.S. However, there have been some indications, recently, that Atari intends to use a similar approach here. Neil Harris, Atari's media relations director, stated that Mega ST dealers in the U.S. may be required to maintain an outside sales force as well. Atari also seems determined to keep the Mega STs out of mail-order outlets.

To attack another problem that hurts Atari's U.S. distribution—low profit margins for dealers—Atari has also indicated that suggested list prices for the Mega STs may be a bit higher than anticipated. This would allow more room for dealer markup. At this writing (late August), suggested retail prices were expected to be \$1,699 for the Mega ST-2 with two megabytes of memory and a monochrome monitor, and \$2,399 for the Mega ST-4 with four megabytes of memory and a monochrome monitor. Prices for color systems will probably be about \$200 higher. The Mega ST-1, a one-megabyte version of the computer, has supposedly been dropped.

## Vaporware Vs. Realware: An Atari Status Report

Atari announced a slew of new products at the Winter Consumer Electronics Show back in January, but as of this writing (late August) none of them were shipping in the U.S. Here's a status report on the Mega STs, blitter chip, laser printer, Atari PC, and other projects.

**Mega ST.** The Mega ST-4 (four-megabyte model) began shipping in Canada in mid-August. As expected, foreign markets got the new computers first because they account for a larger portion of Atari's sales, and also because computers sold in other countries don't require inspection and approval by the Federal Communications Commission (FCC). With FCC certification currently taking 45 to 90 days, we should start seeing Mega STs in the U.S. by mid-autumn.

The Mega ST-2 (two-megabyte model) is expected in Canada soon, but we were unable to determine whether it will be a duplicate of the Mega ST-4 with half as many memory chips or a wholly different design. If the Mega ST-2 is simply a stripped-down version of the Mega ST-4 (which would seem to make good manufacturing sense), it may be possible to upgrade it by just plugging in extra chips.

Although the Megs have an internal expansion connector, Atari doesn't seem to be involved in the development of a 68020 processor board or an expanded video board at this time. Atari has experimented with a 68881 floating-point math coprocessor, but found that the speed increase was not dramatic. The 68881 was designed to work best with the 32-bit bus of the 68020, not the 16-bit bus of the 68000 microprocessor found in the Megs.

**Blitter chip.** Disappointingly, Canadian Mega STs are shipping without the long-awaited blitter.

(The blitter is a custom chip that improves the ST's performance by speeding up screen operations.) Although the chip is all but done, it seems that it's going to be in short supply for awhile. According to Atari, the first blitters will be earmarked for Mega owners who can simply plug the chip into an empty socket in their machines.

Eventually the blitter will be made available to owners of 520STs and 1040STs, but don't expect anything before early 1988. The upgrade most likely won't involve soldering the blitter chip piggyback-style onto existing system boards. Instead, current plans call for completely new system boards to be installed in 520STs and 1040STs. The boards will also have the new TOS operating system ROM chips. We were unable to determine whether the new boards would include room for extra RAM. Expect the upgrade to cost about \$130.

**Laser printer.** This product appears ready to ship at about the same time as the Mega STs. Unfortunately, it may not be much more than a very expensive daisy-wheel printer for quite a while. Atari still insists that the laser printer's output will be GDOS based, but there is no indication that a good GDOS device driver is imminent. (GDOS stands for Graphics Device Operating System, an adjunct to GEM that supports multiple text fonts and other features.) Prototypes of the laser printer shown most recently printed only text—no full-page, 300 dots-per-inch graphics.

Moreover, even when GDOS support materializes, there is concern about whether the results will match those achieved with more expensive laser printers using the *PostScript* page description language. Although it would be possible to implement *PostScript* on the Atari laser printer,

Atari has reportedly balked at paying Adobe Systems' licensing fee for *Postscript*. With *PostScript* fast becoming the standard page description language, the Atari system would be much more in demand among desktop publishing enthusiasts if it included *PostScript*-compatible software. As things stand, the Atari system is in danger of being underpriced and overpowered by inexpensive IBM PC clones and a new wave of under-\$2,000 laser printers. The Atari laser printer, announced at \$1,500, is now expected to arrive with a suggested list price of \$1,700.

**Atari PC.** These IBM clones are said to be ready "very soon," but probably won't show up until after the Mega STs are shipped. Atari is saying little about the Atari PCs at this time.

**ST-PC emulator.** Although this project has been reported to be dead, Atari insiders claim it's still under development. The appearance of *PC-Ditto*, a software-only emulator from Avant-Garde Systems (see last issue's "ST News & Notes"), has relieved some of the pressure for a hardware-based emulator. Look for the hardware emulator to be a souped-up box offering full-speed performance at a higher price than the software emulator. **ST**



# All About File Selectors

Joseph Kutz

With Tim Midkiff, George Miller, and Sheldon Leemon

*Here's a step-by-step tutorial that explains how to use file selector boxes in your programs. Example programs and explanations are included for C, Pascal, Modula-2, GFA BASIC, ST BASIC, and machine language. A copy of the language is required to run the examples. If you're not a programmer, you can get something from this article, too—see the section entitled "File Selectors in C" for a short utility that prints 1ST Word files without running the word processor.*

In the dark ages of computing, a request for a filename looked something like this:

```
PLEASE ENTER FILENAME  
(RETURN = DIR)
```

A first-time user who knew nothing about computers might well be confused or daunted by such a request. What's more, each program had its own commands for loading and saving files. Every time you tried a new piece of software, you had to learn these commands all over again.

Apple, adapting techniques pioneered by Xerox, sought to put an end to this kind of confusion by enforcing a uniform user interface. The Apple Lisa, and later, the Macintosh, popularized the idea of a standard approach to loading and saving files. Once you learned how to do this routine task with one program, you essentially knew how to do it with all programs.

Digital Research further adapted this concept when it designed GEM (Graphics Environment Manager), the graphics-oriented user interface that's built into Atari ST computers. GEM offers an attractive alternative to the bleak one-line filename prompt. It's called the *file selector box*. If you've never included file selectors in your own programs because you thought they were too complicated to implement, this article is for you. Once you master a few simple techniques, they're not complicated at all.

File selectors have several advantages. For one thing, they're very easy to use. When you need to access a disk file, you simply select Load or Save from a drop-down menu or a dialog box, and the file selector instantly pops into the middle of the screen. After clicking on a filename in the file selector's directory window—or after entering a new filename in the space provided—you need only click the OK button or press Return to load or save the file. If necessary, you can change the pathname to access a different drive. And if you change your mind, you can click the Cancel button to escape.

Another point in favor of file selectors is that programmers don't have to wonder if people know how to use them. Anyone who uses an ST is almost certain to encounter a file selector within

the first few hours, and the manual accompanying the computer explains everything you need to know to use it. As a programmer, you can assume your users will already know how to operate a file selector. This lets you concentrate on more important areas of the program.

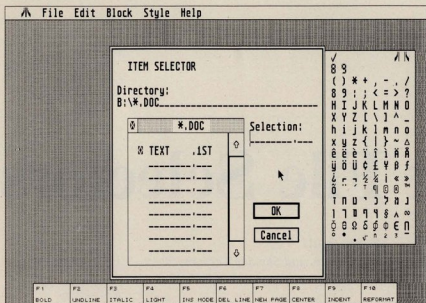
This article explains how to include file selectors in your own programs. It covers all of the most popular languages on the Atari ST: C, Pascal, Modula-2, GFA BASIC, ST BASIC, and machine language. Example programs on the magazine disk demonstrate how file selectors work, and you can easily modify them into subroutines to include in your own programs. After reading the following section, "General Guidelines," just skip to the section labeled for the programming language you're using.

## General Guidelines

There are four parts to a file selector: The pathname, the filename, the buttons, and the disk directory.

The pathname that initially appears at the top is determined by your program. The wildcard characters in the pathname determine which files appear in the directory window. (The question mark wildcard means "any character in this position"; the asterisk wildcard means "any string of characters in this part of the file-





name.") In the example above, \*.DOC forces the selector to list all files ending with a .DOC extension. In *DEGAS Elite*, the default pathname for medium-resolution pictures is \*.P?2, which displays both .P12 and .PC2 (regular and compressed) picture files. If you want all files on the disk to appear in the directory, specify a pathname of \*.\* (all filenames, all extensions).

When using file selectors, remember that some people might be running a program from a drive other than drive A, or from inside a folder (subdirectory). Instead of automatically defaulting to the pathname A: \\*.\*, it's a good idea to display the *current* drive and pathname. Even though users of your program can edit the pathname to display whatever directory they want, it's more considerate to display the current directory for them. The example programs show how to retrieve and display this information.

When the file selector displays the desired directory, users have three ways to select a file. They can click once on a filename to highlight it in the directory, then click the OK button or press Return; they can rapidly double-click on the filename; or they can type the filename in the filename field and either click OK or press

Return.

After the file selector has done its job, your program should check a few things. First, watch for the OK or Cancel buttons and skip the file-opening routine if Cancel was pushed. Second, the user might have changed the pathname, so it's a good idea to rebuild the complete path and filename. Finally, it's possible that a nonexistent filename was typed. This is fine if the program can create a new file, but it leads to an error and possibly a crash if you try to open and read a file that's not there.

### File Selectors In C

The following example of displaying a file selector in C was written with *Megamax C*, but is easily adapted to other versions of C. The example program can be found on the magazine disk under the filename FILESEL.C.

To put a file selector on the screen, you need to declare two string arrays and an integer variable. Then you call the file selector input function, passing the addresses of the three variables:

```
char path[120],fname[15];
int button;
fsel_input(path, fname, &button);
```

Beginning C programmers should remember that the name

of an array is the address of an array. For an *int* variable, the ampersand (&) extracts the address. The three parameters inside parentheses are all variable addresses.

As you may have guessed, you need to set the path before calling *fsel\_input()*. The function returns the filename in the *fname* string and the button status in *button* (0 means Cancel; 1 means OK).

It looks very easy to use—just one line long. But in practice, it's a little more complicated. Which drive and path do you want to access? What do you do with the strings when the function returns?

The following routine, called *set\_directory()*, takes care of all those things for you. To use this routine, the calling function needs to do three things.

First, it must declare an integer variable that will hold the value of the exit button. This is accomplished with the declaration *int exit*;

Second, it needs a character array to hold the filename that will be selected by the user. When the function *set\_directory()* returns, the character array *filename[]* will also contain the drive and subdirectories (if any) that were selected. The declaration for this array is *char filename[120]*;

The array length is 120 because the user is allowed to have folders nested eight levels deep. It's better to make the array a little too long than to have the program crash because the characters overflowed the memory allotted.

Third, you call the function with *exit = set\_directory(filename)*, which passes the address of the array filename. The function returns the exit choice of the user: 0 for Cancel; 1 for OK. In addition, the filename array will no longer be empty, but will contain the drive, the pathname, and the name of the selected file. You can now use *filename* to open a file for printing, loading into an array, copying into another file, or whatever you wish.

## How It Works

The function `set_directory()` is used in the example program `PRNTDOC.PRG`, which you'll find on the accompanying disk. This example program actually does something useful—it prints *1ST Word* documents without having to load *1ST Word* into the computer. It's not as complete as the *1ST Word* printing module, but it's quick and easy to use. The source code file is `PRNTDOC.C`.

Another file is `FILESEL.C`. A commented version of this file appears below. Program lines are in boldface type; comments appear underneath the lines being explained.

```
#include<osbind.h>
#include<stdio.h>
```

The `osbind.h` header file contains the definition for `fsel_input()`, so it must be `#included`. The `stdio.h` file isn't necessary for the file selector, but it defines `printf()`, which is used later in the program.

```
set_directory(file)
char *file;
```

The name of the function is `set_directory`, and the name for the array passed to it is `file`. When the function is done, the full drive, path, and filename specifier will be in the file array.

```
{
int ex_button, n, place, drive;
char directory[120];
char path[120];
char selection[14];
```

These are the local variables used by the function.

```
strcpy(directory, "A:");
```

Start by assuming the drive is A and use `strcpy()` to copy the string A: into the array `directory`. In C, strings are arrays of characters that end with the null character `\0`.

```
drive = Dgetdrv();
```

The `Dgetdrv()` function figures out the current drive, which in this case is the one from which the program was loaded. The function returns an integer: 0 is drive A, 1 is drive B, and so on. We need to build the pathname in

ASCII, however, so 0 should be transformed to 65, 1 should be 66, and so on.

```
directory[0] = drive+'A';
```

Now that the current drive is known, we add the letter A (ASCII 65) and store the character in position 0 of the directory array, which should now hold A:, B:, C:, or whatever the drive is.

```
Dgetpath(path, drive+1);
strcat(directory, path);
```

`Dgetpath()` is like `Dgetdrv()`, except it gets the current path, including folders and subfolders. The path begins with a backslash (`\`), but does not end with one. At the root directory, the path is a null string. Now that we have the drive and path, they are concatenated to the directory string with `strcat()`. The path specifier is almost ready.

```
strcat(directory, "\\*.DOC");
```

This line appends `\*.DOC` to the end of the directory. The backslash has to be typed twice because it's used for special characters such as `\n` and `\0`. A double backslash (`\\`) represents a single backslash character in the string.

We're now ready to call the function that displays the file selector box. The array `selection` will be filled in by the file selector function from input by the user.

```
fsel_input(directory, selection,
&ex_button);
```

This calls the function that puts the file selector box on the screen. The directory string has to be assembled before calling `fsel_input()`, but you don't need to do anything with `selection` or `ex_button`—they'll be filled in by the function.

When the function returns, `directory` will contain the drive and path selected by the user. The string `selection` will hold the filename. There will also be a zero (Cancel) or one (OK) in `ex_button`.

One slight problem is that the array `directory` will still have `\*.DOC` appended to the end of it. Or `.DOC` may have been changed by the user to `.*` or

something else. What we now have to do is copy `directory`, up until the last backslash, into `file`, and concatenate selection to the end of it.

```
for(n=0;directory[n]!='\0';n++)
```

This `for()` loop steps through `directory` one character at a time until a null character is reached. Strings always end with a null.

```
if(directory[n]=='\')
place=n+1;
```

While the `for()` loop runs, the `if()` statement looks for any occurrences of the backslash character. When one is found, `place` is assigned the current value of `n+1`, because in the copy routine, we want to include the slash.

```
strcpy(file, directory, place);
```

This line copies `directory` into the array `file`. It copies the number of characters indicated by `place`. Note that `strcpy()` is not the same as the `strcpy()` function.

```
strcat(file, selection);
return(ex_button);
}
```

Almost finished. The filename in `selection` has to be concatenated to `file`. Then, `return` ends the function, passing it the value of `ex_button`. Because the local variable `file` was actually a pointer to filename from the `main()` routine below, the two strings will be identical.

```
main()
{
int exit;
char filename[120];
appl_init();
exit = set_directory(filename);
if(exit)
printf("You selected %s\n", filename);
else
printf("You pressed CANCEL.\n");
Conin();
appl_exit();
}
```

`Main()` just calls the file selector routine above; then it prints the filename selected. In your own programs, you'd open the file for reading or writing. For a more detailed example, see the `PRNTDOC.C` file on the disk.

## File Selectors In Pascal

The following example of calling a file selector in Pascal is written in *Personal Pascal* from OSS. Brief comments follow each group of program lines. The example program is on the magazine disk under the filename FILESEL.PAS.

```
program fileselector;
```

```
const
  {$i gemconst.pas}
```

```
type
  {$i gemtype.pas}
```

Includes the constants and types needed to access GEM.

```
var
  dum : integer;
  ex : boolean;
  ch : char;
  filename : path_name;
```

These are the global variables used in the program.

```
{$i gemsups}
```

Includes the external subroutines needed to access GEM.

```
function getdrv : integer; gemdos($19);
```

Defines the *getdrv* function as a GEMDOS function.

```
procedure getpath(var str : path_name);
```

This procedure returns the path of the current drive.

```
type dos_name = packed array [1..80] of char;
```

```
var
  i : integer;
  path : dos_name;
```

These are local variables and type declarations used by the *getpath* procedure.

```
procedure getdir(var path : dos_name; drive : integer; gemdos($47);
```

Defines the *getdir* function as a GEMDOS function.

```
begin
  getdir(path,0);
```

The *getdir* procedure returns the current path.

```
i := 1;
while path[i] <> chr(0) do
  begin
    str[i] := path[i];
    i := i+1;
  end;
str[0] := chr(i-1);
end;
```

Pascal stores strings in a different format than GEM. Pascal stores the length of the string in the first character, while GEM stores the string starting with the first character and terminating with a null character (ASCII value of 0). This *while* loop converts the GEM-type string *path* into the Pascal type string *str*. The end of the *getpath* procedure is marked by *end*;

```
function setdirectory(var filename : path_name) : boolean;
```

This procedure gets the current drive and path.

The filename is returned in the filename argument, and the procedure returns the button used to exit the file selector.

```
var
  n : integer;
  exitbutton : boolean;
  directory : path_name;
```

This declares local variables for the *setdirectory* function.

```
begin
  n := getdrv;
  getpath(directory);
  directory := concat(chr(65+n),',',directory,'\'.DOC');
```

This creates the the current directory by combining the drive, path, and extension.

```
exitbutton := get_in_file(directory,filename);
```

This is *Personal Pascal's* implementation of the file selector routine. When the user exits the file selector, the variable *directory* contains the selected drive, path, and extension; the variable *filename* contains the drive, path, and filename; and the variable *exitbutton* indicates which button was used to exit the file selector (OK or Cancel).

```
setdirectory := exitbutton;
end;
```

Exit the *setdirectory* function and return the value of the exit button to the main program.

```
begin
  dum := init_gem;
  ex := setdirectory(filename);
  if ex then
    if filename[length(filename)] = '\ ' then
      writeln('No file selected.')
    else
      writeln('You selected ',filename)
    else
      writeln('You pressed CANCEL.');
```

```
read(ch);
exit_gem
end.
```

The main program calls *init\_gem* to set up the variables used in calling GEM routines; then it calls the *setdirectory* function defined above. Before exiting back to the GEM desktop, the main program prints the filename returned by the file selector box.

## File Selectors In Modula-2

This example of using file selectors in Modula-2 was prepared with *TDI Modula-2*. Brief comments follow each group of program lines. The example program can be found on the magazine disk under the filename FILESEL.MOD.

```
MODULE FileSelector;
```

```
FROM AESApplications IMPORT AppInitialise, AppExit;
FROM AESForms IMPORT FileSelectorInput;
FROM GEMDOS IMPORT GetDrv, GetPath, ConLn;
```

These are the GEM procedures necessary for the program.

```
FROM SYSTEM IMPORT ADR;
FROM Strings IMPORT Length, Insert, Delete, Concat;
FROM InOut IMPORT WriteString, WriteLn;
```

These are the standard Modula-2 procedures



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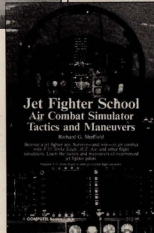
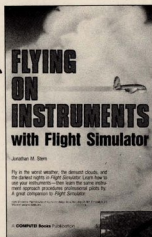
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used by the program.

```
VAR
dum, exit : INTEGER;
ch : CHAR;
FileName : ARRAY [0..119] OF CHAR;
```

These are the global variables that are defined in the main program.

```
PROCEDURE SetDirectory(VAR File : ARRAY OF CHAR) : INTEGER;
```

This procedure gets the current drive and path. The filename is returned in the File argument, and the procedure returns the button used to exit the file selector (OK or Cancel).

```
VAR
n, drive, place : CARDINAL;
ExitButton : INTEGER;
path : ARRAY [0..119] OF CHAR;
directory : ARRAY [0..119] OF CHAR;
selection : ARRAY [0..13] OF CHAR;
```

These are the local variables used by SetDirectory.

```
BEGIN
GetDrv(drive);
directory := "A: \*.DOC"; directory[0] := CHAR(65+drive);
```

The GetDrv procedure returns a number corresponding to the current drive. This number is then converted into the letter used to determine the drive designation for the directory path.

```
GetPath(path,drive+1);
IF ~(path[0] = 0C) THEN Insert(path,directory,2); END;
```

The GetPath procedure returns the path with the backslash at the beginning, but not at the end. Because the backslash already exists, the path can be inserted into the directory starting with the third character. The Insert procedure does not work if the path is empty, so it's not executed if the first character of the path is a null character (0C).

```
FileSelectorInput(ADR(directory),ADR(selection),ExitButton);
```

The FileSelectorInput procedure uses the path previously created to display the file selector box. When the user exits the file selector, the variable directory contains the drive, path and extension selected by the user; selection contains the filename; and ExitButton contains the button used to exit the file selector (OK or Cancel).

```
FOR n := 0 TO Length(directory) DO
  IF directory[n] = "\ " THEN place := n+1; END;
END;
```

```
Delete(directory,place,Length(directory)-place);
```

The extension must be removed so that the filename can be added. The FOR loop searches for the last backslash character in the directory. Then the Delete procedure is used to delete the extension.

```
Concat(directory,selection,File);
RETURN ExitButton;
END SetDirectory;
```

Concat adds the selection to the end of the directory path and returns it in the File argument. RETURN exits the procedure, returning the value of the exit button to the main program. The end of the SetDirectory procedure is marked by END.

```
BEGIN
dum := ApplInitialise();
exit := SetDirectory(FileName);
IF exit = 1 THEN
  IF FileName[Length(FileName)-1] = "\ " THEN
    WriteString("No file selected.");
  ELSE
    WriteString("You selected ");
    WriteString(FileName);
  END;
ELSE
  WriteString("You pressed CANCEL.");
END;
WriteLn;
ConIn(ch);
AppExit;
END FileSelector.
```

First the main program calls the *ApplInitialise* function to prepare for the calls to GEM in SetDirectory. Then it calls the procedure SetDirectory which is defined above. Finally, it prints the filename returned by the file selector, and calls *AppExit* to finish up and return to the desktop.

## File Selectors In GFA BASIC

The following example shows how to implement file selectors in MichTron's GFA BASIC. Brief comments follow each group of program lines. The example program is on the magazine disk under the filename FILESEL.LST (an ASCII file).

```
path_name$=SPACE$(64)
CLS
```

Reserve plenty of space for the pathname and clear the screen.

```
drive=GEMDOS(&H19)
```

Call GEMDOS function \$19, Dgetdrv, to get the current drive. The value is returned in the variable drive, where 0 = drive A, 1 = drive B, 2 = drive C, and so on.

```
ptr=VARPTR(path_name$)
```

Define the pointer to the string variable

```
path_name$.
```

```
VOID GEMDOS(&H47,L:ptr,W:drive+1)
FOR i=1 TO 63
  IF ASC(MID$(path_name$,i,1))=0
    path_name$=LEFT$(path_name$,i-1)
    i=63
  ENDIF
NEXT i
d$=CHR$(drive+65)+" "+path_name$+" \*. "*
```

Call GEMDOS function \$47, Dgetpath. Pass the pointer to the buffer to hold the pathname as a long word, and pass the drive to be used as a word. GEMDOS \$47 returns the pathname, a null terminated string, at the address pointed to by ptr. The FOR loop searches for this null byte and defines path\_name\$ as the characters to the left of the null character.

```
FILESELECT d$,b$,filename$
IF filename$<>" "
```

FILESELECT uses the variable d\$ as the search path, using the hierarchical file system. The default filename b\$ will appear in the selection box if it is de-

file. In this case, it's an empty string. The variable filename\$ contains the name of the file selected. If no filename is selected, this is a null string.

```
@have_file
IF is_it=-33
  alrt$="File doesn't exist!"
  ALERT 1,alrt$,1,"OK",b
  filename$=""
END
ENDIF
ENDIF
```

If a file was selected, make sure it's on the disk. A typo in the selection window could create havoc for your program. The variable *is\_it* contains the value returned from the error-checking procedure.

```
IF filename$<" "
  alrt$="You selected:\"+filename$
  ALERT 1,alrt$,1,"OK",b
ELSE
  alrt$="You pressed CANCEL"
  ALERT 1,alrt$,1,"OK",b
ENDIF
END
```

These lines tell the user which file was selected and/or which exit button was pushed. In your own program, of course, you'd most likely substitute lines to load or save the file.

```
PROCEDURE have_file
  is_it=GEMDOS(&H4E,L,VARPTR(filename$))
RETURN
```

These instructions use GEMDOS function \$4E to check for a file, and then they pass VARPTR to filename\$ as a long word. The program returns -33 if the file does not exist; otherwise, expect a 0.

## File Selectors In ST BASIC

Many people are surprised to learn that file selectors can be called from ST BASIC. The technique is clumsy, but it *is* possible, as the following example program demonstrates. The program is excerpted from Chapter 6 of *COMPUTE!'s Technical Reference Guide—Atari ST, Volume Two: GEM AES* by Sheldon Leemon (COMPUTE! Books, 1987). The program file is on the magazine disk under the filename FILESEL.BAS.

To set up a file selector in ST BASIC, you must call the same fsel\_input() routine used by other languages. This is done with the GEMSYS command. There are limitations, however. Since the current version of ST BASIC does not permit the necessary GEMDOS calls to determine the current path, the default path is set to A:\\*.\*. This problem (and many others) may be corrected in the upcoming revision of ST BASIC.

```
50 apb# = gb60: CONTROL = peek(apb#)
70 GLOBAL = peek(apb#+4)
80 GINTIN = peek(apb#+8)
90 GINTOUT = peek(apb#+12)
100 ADDRIN# = peek(apb#+16)
110 ADROUT# = peek(apb#+20)
```

Declares variables for the GEMSYS call to the file selector routine.

```
120 fullw 2
```

Opens a full-screen window.

```
130 PATHS="A:\*.*"
140 PATHNAMES=PATHS+string$(58,chr$(0))
```

Sets default pathname to A:\\*.\* and uses null characters to pad out the string to 64 characters.

```
150 FILE$="" + string$(12,chr$(0))
```

Sets filename to 13 nulls.

```
160 poke ADDRIN#,varptr(PATHNAMES)
170 poke ADDRIN#+4,varptr(FILE$)
180 gemsys(90)
190 exitbtn = peek(GINTOUT+2)
200 X = 1
```

Calls fsel\_input() routine with the GEMSYS command (line 180) to set up the file selector.

```
210 while (ASC(mid$(FILE$,X,1))<>0)
220 X=X+1
230 wend
240 FILE$=left$(FILE$,X)
```

Truncates the filename.

```
250 X = len(PATHNAMES)
260 while(mid$(PATHNAME$,X,1)<>"\")
270 X=X-1
280 wend
290 PATHNAME$ = left$(PATHNAME$,X)
```

Truncates the pathname after the last backslash.

```
300 clearw 2:gotoxy 10,10
310 print PATHNAME$+FILE$
```

Clears screen and prints the selected pathname and filename.

```
320 gotoxy 10,12:"Press any key to end. . .":X=inp(2)
330 clearw 2: end
```

Ends the program with a keypress.

## File Selectors In ML

This example of using file selectors in machine language was written with the assembler included in the Atari software developer's package, but it is easily adapted to other 68000 assemblers. Brief comments follow each group of program lines. For more details, see the section on using file selectors in C.

```
move.l a7,a5
move.l #ustk,a7
move.l 4(a5),a5
move.l $(a5),d0
add.l $14(a5),d0
add.l $1(a5),d0
add.l #$100,d0
```

Initializes the program.

```
shrink:
move.l d0,-(sp)
move.l a5,-(sp)
move d0,-(sp)
move #$4a,-(sp)
trap #1
add.l #$,sp
```

Calls the *shrink* routine to free unused memory.

```
jsr start
```

Goes to the beginning of the program.

```
term:
move.w #0,-(sp)
trap #1
```



The program returns to *term* when it's finished and ready to return to the GEM desktop. *Term* simply pushes a zero onto the stack, and then it calls GEMDOS with a trap.

```
start:
  jsr init_aes
```

Builds the control array for setting up an application under AES.

```
applinit:
  move.w #10,control
  move.w #0,control+2
  move.w #1,control+4
  move.w #0,control+6
  jsr aes
```

Places the necessary values in the control array and calls *aes* to initialize the application.

```
getdrv:
  move.w #25,-(sp)
  trap #1
  add.w #2,sp
  add.w #65,d0
  move.b d0,dir
  move.b #58,dir+1
```

Calls GEMDOS to get the current drive number and stores it in the string dir.

```
getpath:
  move.w #0,-(sp)
  move.w #dir+2,-(sp)
  move.w #71,-(sp)
  trap #1
  add.w #8,sp
```

Calls GEMDOS to get the path of the current drive, which it appends to the drive specification.

```
addxt:
  move.l #dir+2,a0
extlp:
  tst.b (a0)+
  bne dirloop
  move.w #6,d0
  move.l #ext,a1
  sub.l #1,a0
```

```
join:
  move.b (a1)+(a0)+
  dbeq d0,join
```

Appends the extension to the end of the directory specification.

```
fil_sel:
  move.w #90,control
  move.w #0,control+2
  move.w #2,control+4
  move.w #2,control+6
  move.l #dir,addr_in
  move.l #sel,addr_in+4
  jsr aes
```

Calls *aes* to display the file selector box.

```
copydir:
  move.l #dir,a0
  move.l #file,a1
```

```
dirlp:
  move.b (a0)+,d0
  cmp.b #92,d0
  bne cont
  move.l a1,a2
cont:
  move.b d0,(a1)+
  bne dirlp
```

Copies the directory string to the file string and finds the beginning of the file extension.

```
addsel:
  move.l #sel,a0
  add.l #1,a2
  sellp:
  move.b (a0)+(a2)+
  bne sellp
```

Replaces the file extension with the selected file.

```
output:
  tst.w int_ou+2
  beq cancel
  tst.b sel
  beq nosel
```

Branches to *cancel* if the Cancel button was selected; branches to *nosel* if no file was selected; or falls through to ok.

```
ok:
  move.l #filese1,a0
  jsr conws
  move.l #file,a0
  jsr conws
  jmp necin
```

Prints the name of the file selected.

```
nosel:
  move.l #nofile,a0
  jsr conws
  jmp necin
```

Prints the no-file-selected message.

```
cancel:
  move.l #filecan,a0
  jsr conws
```

Prints the cancel button message.

```
necin:
  move.w #8,-(sp)
  trap #1
  add.w #2,sp
```

Waits for the user to press a key.

```
writeln:
  move.w #13,-(sp)
  move.w #2,-(sp)
  trap #1
  add.w #4,sp
```

Uses a GEMDOS call to print a carriage return.

```
applexit:
  move.w #19,control
  move.w #0,control+2
  move.w #1,control+4
  move.w #0,control+6
```

```
jsr aes
move.w int_ou,d0
rts
```

Calls *aes* to exit AES, and returns to *term*.

```
aes:
  move.l #control,_c
  move.l #_c,d1
  move.l #200,d0
  trap #2
  rts
```

This portion is used throughout the program to call AES through the GEM trap.

```
init_aes:
  move.l #control,_c
  move.l #global,_c+4
  move.l #int_in,_c+8
  move.l #int_ou,_c+12
  move.l #addr_in,_c+16
  move.l #addr_ou,_c+20
  rts
```

Initializes the control array for AES calls.

```
conws:
  move.l a0,-(sp)
  move.w #9,-(sp)
  trap #1
  add.w #6,sp
  rts
```

Uses a GEMDOS call to print strings.

```
ext:
  dc.b '\*.DOC'
  dc.b 0
nofile:
  dc.b 'No file selected.'
  dc.b 0
filese1:
  dc.b 'You selected '
  dc.b 0
filecan:
  dc.b 'You pressed CANCEL'
  dc.b 0
```

*EXT* is the default extension used in the fileselector; *nofile*, *filese1*, and *filecan* are the messages printed by the program.

```
bss
even
  ds.l 256
  ds.l 1
  ds.l 5
  ds.w 12
  ds.w 30
  ds.w 30
  ds.w 45
  ds.w 12
  ds.l 6
  ds.w 5
  ds.w 16
  ds.w 16
  ds.w 7
  ds.l 2
  ds.l 1
  ds.b 120
  ds.b 13
  ds.b 120
```

This last section reserves space for the program variables.

**ST**

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and protected.

A status box keeps you informed of the size of the worksheet and the available memory left in your computer.

A quick-entry system saves time when entering dates, days of the week, or some other calendar unit. You simply enter the first date, hit the F8 key, and move the cursor. *SwiftCalc ST* automatically adds the next date in that cell. This keeps repeating until you press the Return and Esc keys.

Using one of the Format options, you can define your own custom numerical display format. You can select a combination of inserted commas, a dollar sign prefix, parentheses-enclosed negative numbers, blanked cells for values of zero, rounding, up to 15 decimal places, and a scaling factor. One unusual twist is an option to display values as a bar chart simulation within a cell using asterisk (\*) characters. Cell entries can be flush left or right, but there's no centering option for text entries.

*SwiftCalc ST* comes with a sideways-printing utility for making hardcopies of very wide spreadsheets on continuous-form paper. You have to create a special worksheet file to do this, but the results are well worth the extra effort.

## Graphs And Charts

Like most good spreadsheet programs, *SwiftCalc ST* allows you to display worksheet data as bar charts and graphs. Vertical and horizontal histograms include straight bar, overlay, stacked, or ranged charts. The vertical chart also lets you display high-low-close stock prices.

Another type of chart is the line graph, which connects the dots of single- or multiple-data sets. A summed-line model fills the space between the lined data sets, and line charts can be plotted on an X-Y grid. Pie charts are provided, too.

The graphing functions have been loaded with additional op-

tions to increase flexibility. All graph types allow titles, descriptive labels, and axis labels. One type of chart can be transformed easily into another type. Graphs can be saved on disk or reproduced on a printer or plotter.

For making hardcopies, *SwiftCalc ST* supports the Epson FX, RX, and MX series printers; the C.Itoh Prowriter; Gemini 10X and 15X; a large number of Okidata printers; the IBM Graphics Printer and Proprinter; the IDS Prism; Toshiba 1340; Epson LQ1500; and the Hewlett-Packard Thinkjet.

## Slow Scrolling

All programs have their weak points, and *SwiftCalc ST* is no exception. The first problem you notice is that it scrolls the worksheet *very slowly*. It makes other spreadsheet programs look lightning fast. The programmers who wrote *SwiftCalc ST* must have been aware of this because they provided a way to freeze the display, scroll by means of a cell-position indicator, and then redraw the window with the proper contents. If you work with large worksheets, this is the way to go.

*SwiftCalc ST* has an odd problem with menus that call dialog boxes. Sometimes the drop-down menu does not disappear when a dialog box follows. When you click off the dialog box, it leaves an unresponsive menu behind. If you move the cursor to the menu, it starts erasing part of this debris. A fluke? Probably not—it happened within the first 30 minutes of testing. Will Timeworks fix it in the next revision? Maybe. However, the bug is fully described in the manual. To restore the screen to normalcy, the manual suggests clicking on the window's resizing or full-screen box. It works, but you wonder why this redraw couldn't have been done by the program.

The manual contains a few recommendations which should be ignored. For example, *SwiftCalc ST* comes ready for medium-resolution color screens. If you have a

monochrome monitor, the manual says you should select the high-resolution option from the GEM desktop before running the program. But this is completely unnecessary, since it's not possible to use any other resolution with a monochrome monitor—it's permanently set for high resolution. Also, the manual suggests that you use *SwiftCalc ST* to load a text file called UPDATE.CAL, from the program disk, to read late-breaking information that couldn't be included in the manual. A much better way is to read the file from the GEM desktop, since *SwiftCalc ST* scrolls so slowly.

Another little irritant is *SwiftCalc ST*'s type-ahead buffer. If you try to scroll too quickly with the cursor keys, you'll buzz right by the cell at which you wanted to stop. Timeworks' companion program, *Word Writer ST*, does not share this problem.

## Lots Of Potential

*SwiftCalc ST* is a spreadsheet program with great possibilities. A big factor in its favor is the integration with *Word Writer ST* and *Data Manager ST*. Worksheets can be saved as plain ASCII text files for merging with *Word Writer ST* documents, or as .DIF files for use with *Data Manager ST*. There are several other features you just won't find in other spreadsheet programs for the Atari ST. The manual is well written and easy to understand with its example worksheets—all enclosed in a nice three-ring binder and slipcase.

At the same time, there are definitely areas that need improvement. Still, all things considered, it's a powerful program, and its price is considerably lower than comparable programs of this type.

SwiftCalc ST  
Timeworks  
444 N. Lake Cook Rd.  
Deerfield, IL 60015  
\$79.95

# DBASIC

Todd Heimarck  
Assistant Editor

*Requirements: Any ST with color or monochrome monitor and the TOS operating system in ROM.*

*Toto, I don't think we're in Kansas anymore.* With those words, Dorothy recognized that she'd been transported to a strange, new place. Munchkins with squeaky voices, a road paved with yellow brick, exotic flowers, and the sudden transition from black-and-white to color reinforced her opinion.

You might know how Dorothy felt if you've used any of the software emulators available for the ST (CP/M, IBM PC, Macintosh, or 6502 Apple/Atari). The computer still looks like an ST, but the screen indicates that you've entered a new land—an environment that's distinctly IBM-ish or Macintosh-like.

You'll experience the same sense of *jamais vu* (the opposite of *déjà vu*) if you try DBASIC, a new version of BASIC for the ST. DBASIC isn't an ST language in the usual sense. ST languages generally give you a core of commands and statements, plus access to the hundreds of routines built into the TOS operating system and GEM graphics environment manager. DBASIC offers the usual BASIC commands, but it also uses its own completely new operating system. The disk operating system (DOS) is new, too, which means DBASIC disks aren't compatible with other ST disks. When you run DBASIC, you leave TOS and GEM back in Kansas.

DBASIC gives your ST a radically new personality. You don't use the mouse at all. You don't point and click to look at a directory; you type CAT. You LOAD and SAVE programs instead of opening them from the GEM desktop. There are no drop-down menus, windows, or icons. In effect, your ST isn't an ST anymore.

People who try DBASIC for the first time usually either love it or hate it. If you've programmed on an Apple, Commodore, or Atari eight-bit computer, you may be comfortable with the text-oriented display and keyboard controls. On the other hand, you may regard it as a backward step to the early days of microcomputing.

## It's Free—With A Catch

DBASIC isn't distributed like other commercial software. You can't buy it at your local computer shop or from a mail-order dealer. Instead, several thousand DBASIC disks were sent out for free this summer to user groups and former subscribers of the now-defunct *DTACK Grounded* newsletter (which was published by the chief designer of DBASIC, Hal Hardenbergh). DBASIC is covered by copyright, so it's not in the public domain, but anyone is allowed to make copies for free. You can obtain it from Atari user groups or bulletin board systems. Included on the disk are backup and copy programs, so it's not difficult to make copies. Nearly 200,000 DBASIC disk labels have been passed out, also for free, so your copy can look official.

What's the catch? There is none, if you simply need a copy of DBASIC to run DBASIC programs. But if you want to write programs in DBASIC, you'll need a manual. For \$39.95 plus \$3 shipping and handling, you receive the 281-page manual and the latest version of DBASIC on disk.

This unique form of distribution means you can legally experiment with DBASIC before deciding whether or not to buy the manual. At \$43, DBASIC is low-priced compared to other languages for the ST. (For more background on the origin of DBASIC, see this issue's "ST News & Notes" section.)

## World's Fastest BASIC?

The most outstanding feature of DBASIC is its speed. DBASIC is written entirely in 68000 machine

language and is optimized for speed. That's primarily why the designers of DBASIC threw out TOS and GEM; they felt the ST's existing system software is a harness on the hardware.

The README file on the DBASIC system disk includes several benchmark tests that illustrate how fast DBASIC really is. For comparative purposes, six other BASICs and two Cs are listed. DBASIC doesn't win every race, but when it doesn't win, it comes close. It's much faster than other BASICs, interpreted or compiled, and even beats compiled C in many cases.

And yet DBASIC acts like an interpreted BASIC. You simply type in the program lines (or LOAD a program from disk) and type RUN. DBASIC isn't a compiler, so it's not necessary to save a source file to disk and compile it into an executable program. According to the manual, DBASIC is a cross between an interpreter and a compiler; it's *incrementally compiled*, which means each line is scanned after you type it in. Commands and variables are translated into tokens and pointers, so the command processor runs faster.

If you want to run a DBASIC program at the fastest possible speed, you can use integer variables wherever appropriate. FOR-NEXT loops, for example, don't usually need floating-point variables for counters.

## Other Pluses

Speed alone would make DBASIC a worthwhile language to have around. But it offers other useful features as well:

- *Double-precision math.* Floating-point numbers are stored in eight bytes—64 bits—which slows down calculations involving fractions, but only slightly. (Again, if you want speed, use integers.) The smallest possible number in DBASIC is 4.78748873048E-1234, where E-1234 means times 10 to the -1234th power. This is the equivalent of one divided by a



one followed by 1234 zeros.

- *Functions for text manipulation.* *DBASIC* offers several line-oriented functions for manipulating text. These functions are useful for writing text editors and database applications. The system disk even includes a simple but useful text editor written in *DBASIC*. You can modify it to add your own commands if you wish.

- *A full-featured assembler.* *DBASIC* supports direct calls to machine language (ML). If you want to start experimenting with ML, there's a complete 68000 assembler on the system disk and some source code to study. The assembler compiles 77K of source code into a 7K object file in less than five seconds, which is incredibly fast.

- *Roughly 350K of memory.* That's how much random access memory is available to the *DBASIC* programmer on an unexpanded 520ST. If you have a 1040ST, there's even more memory for programs and variables. Applications that need to quickly manipulate large amounts of data would benefit from the *DBASIC* environment.

- *An entertaining and informative manual.* A large portion of the manual is devoted to a command-by-command explanation of how the keywords work. Each command has at least one example. The opening section goes into great detail about the various rules for writing *DBASIC* programs. For example, you can't mix integer and floating-point calculations. The `FLT()` and `FIX()` functions allow you to translate from one format to another. Once you understand the rules, the language makes more sense.

The author of the manual was also the chief programmer (Hardenbergh), so the limitations and rules are not just listed, they're explained. You don't need to know how variables are stored in memory or how the disk sectors are arranged to maximize speed, but if you're curious, the

information is there. If you've ever thought about writing your own version of BASIC (or any other language), the *DBASIC* manual is worth studying. It does a good job of explaining how and why certain design decisions were made. The overall goal was a fast BASIC, so if a certain feature would have made programming a little easier but also slowed down the language, the feature was omitted from *DBASIC*.

## Serious Drawbacks

*DBASIC*'s speed and interactive environment are attractive, but there are several drawbacks to keep in mind while making your decision whether or not to try the language. It's fast, to be sure, but you pay a price for that speed. Above all, remember that the *DBASIC* operating system is completely new and utterly incompatible with any other language or software on the ST. This incompatibility affects every aspect of using the computer.

For instance, call you say you have a few useful desk accessories or utilities you like to keep handy while you program. You can't use them with *DBASIC*. Or suppose you want to experiment with the assembler, but you'd prefer to create the source code with your favorite word processor instead of the line-oriented editor that's supplied. You can't. It's not compatible.

*DBASIC* offers no support for the ST's sound chip or the RS-232 serial port at this time. If you're well versed in the various input/output registers, you may be able to write your own machine language driver to get around this problem. If you can't, then you won't be able to access the RS-232 port. That means no modems, serial printers, or other serial devices.

Do you use a hard disk drive? Not if you're programming in *DBASIC*. It doesn't support hard drives or even ramdisks. Are you interested in controlling music synthesizers or other MIDI de-

vices? Forget it. *DBASIC* doesn't provide access to the MIDI port.

## An Unusual Language

The *DBASIC* manual is written in a lively and entertaining style (as you might expect if you've ever read the *DTACK Grounded* newsletter). But at times, author Hardenbergh goes off on odd tangents, attacking or berating languages like C or other BASICs. At one point he calls a certain computer the "Fruity-II." Microsoft BASIC is labeled "Bellevue BASIC," apparently a two-edged reference to the city of Bellevue, Washington (where Microsoft is based) and an infamous psychiatric hospital in New York.

In a discussion of where to locate ML programs, Hardenbergh provides three valid suggestions and then continues, "For damb-rained idiots only, there is a fourth place to put your assembly routine..." and goes on to explain why it's dangerous to use the BASIC workspace. This sort of writing will amuse some people and annoy others.

Does *DBASIC* deserve a recommendation? There's no pat answer. Yes, because it's amazingly fast and interactive; no, because it's incompatible with standard ST hardware and software. If you like programming in BASIC, then *DBASIC* is undeniably an attractive alternative to ST BASIC. And when you need to write a program that does lots of calculations in a short time, you can reach for *DBASIC*.

But for GEM-based applications, and for programs that make the most of the ST's features, you'll need to keep your other languages around. There are many wonders in the land of Oz, but for some purposes, there's still no place like home.

*DBASIC*  
*DTACK Grounded*  
1570 Pacheco B-7  
Santa Fe, NM 87501  
\$39.95 + \$3 shipping



# DeskCart—The Desk Accessory Cartridge

David Plotkin

*Requirements: Any Atari ST, color or monochrome.*

DeskCart is a cartridge-based desk accessory package which packs 14 desk accessories into about 100K of memory (80K if you don't need the calculator). The cartridge also includes a clock, so that you can place the correct time-and-date stamp on your files. Because DeskCart is a cartridge, its functions are quickly accessed, yet take up less memory than similar packages. It only occupies a single slot in the ST's Desk menu, leaving room for five other accessories. This will become especially useful when the new high-memory Mega STs become generally available.

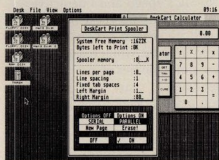
Activating DeskCart functions is easy—just click on the DeskCart item in the Desk menu. A small window listing the functions appears and then you click on the one you want. The functions include a calendar, notebook, card file, scientific and programmer's calculator, typewriter, address book, VT-52 terminal emulator, keyboard macros, ramdisk, disk utilities, print spooler, control panel, screen dump, memory test, and the amount of free memory.

## Dates And Appointments

The calendar automatically opens on the current month and year. Using the arrows and scroll bars, you may move forward and back through the months and years. Click on a specific date, and appointments for that day appear in an appointment-book window. This window shows the date, time, and subject of the appointment, as well as providing an area for comments. There is also a series of buttons to add, update, delete, print, clear, find a particular appointment, or scroll through appointments.

If you want to search for appointments matching a particular

criterion (for example, a certain date or all dental appointments), you enter the criterion on the appropriate line in the window and click on Find. You can search for any string in any field, but searches on the index (the time/date field) are the fastest because the index field is held in memory. Once the search is complete, you can move through the records with the scroll arrow buttons.



DeskCart's accessories include a print spooler, a calculator, and an onscreen clock.

The appointment book also supports alarms. Preface the appointment subject with an exclamation point, and when the time arrives, the screen will flash and the ST's bell will sound. If your ST is not on at alarm time, the next time you turn it on, any unsounded alarms will come up.

The Print option allows you to print the current record alone or all records which match the search criteria. To print all records, you must enter a blank search criteria, click on Find, and then select Print. This is somewhat clumsy. Also, in order to simply scroll through all the records in the database (rather than just those that match the search criteria), you again must enter a blank search criteria and use the scroll arrows to move through the records.

Two of the accessories in DeskCart use virtually the same layout as the appointment book. These are the Address Book and the Card File. The address book has fields for recording names, ad-

resses, and phone numbers. It also has an extra button to dial a phone number using a Hayes-compatible modem. The other controls are virtually identical to those of the appointment book.

The Card File is set up with a subject field and a series of lines for data, but again, everything else works the same as the appointment book. This similarity between the three functions makes learning them easy.

## Notes And Calculations

The Notebook accessory is like a scratch tablet where you can type free-form notes. It opens in its own window and can contain up to 12 pages of information. You move through the pages using the vertical scroll bar. Icons to load, save, print, find (search for a string), and erase the notebook are available at the bottom of the notebook window. The window cannot be resized, so there is a strict limit on how much information you can enter.

If, however, a notebook gets full, you can just save it and open a new notebook file. The Print function allows you to print just the current page or the whole file, and notebook files are standard ASCII files, so they can be imported into any word processor.

The calculator accessory takes up about 20K of memory, but it does not need to be loaded if you don't need it. This modular option is especially valuable if memory is getting short. To remove the calculator once it is installed, however, you must reboot. The calculator supports the standard four functions, memory, log and trig functions, hex/decimal conversions, and square roots. If you choose hex notation, you have access to a whole range of useful programming functions, including shifts, AND, OR, XOR, and twos complement negation.

The typewriter accessory allows you to send the current line of type directly to the printer, which is handy for envelopes. The

VT-52 emulator is a bare-bones telecommunications program, which is, however, fully configurable for baud rate, parity, and other parameters. The Disk Utilities item allows for copying, deleting, formatting a disk, renaming a file, and obtaining the status of any drive in your system. The Screen Dump sends a copy of your screen to the printer when you press Alt-Shift-Help, just like with GEM, but *DeskCart* lets you load alternate printer drivers and choose whether you want the dump done horizontally or vertically on the paper.

## Macros And Print Formatting

The Keyboard Macros accessory enables you to define sequences of keys which will automatically be typed when you press the single activating key. For example, you could define Alt-Shift-W as the string *Welcome to DeskCart*. When you press this sequence, the words *Welcome to DeskCart* will appear on the screen. There is even a way to bring up *DeskCart* accessories directly from keyboard macros without using the Desk menu. You may define macros and save them in the notebook, or you may use the macros window to load a macro file, save one, add to a current file, list the current macros, or erase them from memory.

The two accessories which set aside portions of memory are the Ramdisk and the Print Spooler. You can set up a single ramdisk up to about 1.5 megabytes in size (the limit is TOS, not *DeskCart*). You can set up the ramdisk anytime and even change the size, although I recommend doing this only when the memory is empty, since I don't know what might happen otherwise.

The print spooler sends what you want to print to a section of memory instead of directly to the printer; then it frees up the computer for other tasks while the spooler program feeds lines to the printer as fast as it can take the data. This lets you use the com-

puter almost immediately, provided you have set up a large enough spooler in memory. You can also configure the spooler printout, setting up such things as margins, lines per page, and whether to print through the parallel port or the serial port (handy for sending through your modem). You can also turn all options off, so that the formatting done by your word processor is not defeated. You can configure *DeskCart* to automatically set up both a ramdisk and a print spooler when you boot up.

*DeskCart's* control panel performs the same functions as Atari's, with a few extras. You can set the clock in the cartridge and turn a screen clock display on or off. It is also from the control panel where you load or save the configuration you want *DeskCart* to have. Multiple configuration files can be created, although the file called "DESKCART.INF" in the DESKCART folder is automatically loaded when you boot.

*DeskCart* also provides its own version of the File selector box, which is much easier to use than GEM's. You can click in a box to select which drive you want to use, select multiple files (for copying, and so on), move to the top directory, and sort on various criteria. You can type in filenames using wildcards, as well.

*DeskCart's* manual is generally well done, although it does contain some errors and suffers from some strange organization. The introduction states that you should probably leave the sections on database functions (address book, appointment book, and card file) for last and then promptly launches into an explanation of one of those sections. The database control buttons are not explained until an appendix at the very back of the manual, although the database explanations are sprinkled throughout the manual.

There are also some sections which could be written more clearly. On the other hand, there is a complete explanation of ram-

disks and their pitfalls, and also telecommunications terms. Actually, *DeskCart* can be learned almost without a manual, since its design is quite intuitive. One final note: *DeskCart* uses a "permanently installed" lithium battery to keep time. This means that when the battery life runs out, you must return the cartridge to QMI for a new one. No charge for this service is mentioned, although I don't imagine it will be free.

*DeskCart* is the most powerful and comprehensive set of desk accessories I have seen for the Atari ST. Because it is cartridge based, includes a clock, and is relatively memory efficient, it is a good value, especially for those with one-megabyte machines (or larger). I know I'm attached to mine.

*DeskCart*—The Desk Accessory Cartridge  
Quantum Microsystems  
PO Box 179  
Liverpool, NY 13088  
\$99.95

## HardBall!

Neil Randall

*Requirements: Any ST with a color monitor; joystick optional.*

Available for more than a year on Atari and Commodore eight-bit computers, *HardBall!* was recently released for the Atari ST. Don't classify it as one of those quick translations, though—the ST version of *HardBall!* is definitely new and improved.

For those unfamiliar with the eight-bit versions, *HardBall!* is a pitch-by-pitch baseball simulation with superbly realistic graphics. Most of the game revolves around the classic baseball duel between the pitcher and batter, and *HardBall!* provides a better feel in this all-important area than any other baseball game I've seen.

As a pitcher, you can choose from four different pitches (fastball, slider, curve, change-up), and you can aim at nine different zones over or near the plate. And



there's some randomness built in, so sometimes a sweeping curveball will catch the outside corner, while the same pitch later in the game (especially when the pitcher tires) will miss. A fastball often crosses the plate before the batter starts to swing, but two pitches later you can fool the batter completely with a long, slow change-up. In other words, *HardBall!* provides the essential elements of real pitching.

When you bat, the pitcher becomes your enemy. Somehow you have to outguess him, trying not to swing at pitches outside the strike zone and trying to swing at the right time. You can swing straight across the plate or outside, inside, low, or high. Where you swing and whether you swing depends on how well you pick up the ball as it leaves the pitcher's hand. Just as in real baseball, though, having a good eye doesn't always mean success. A wicked sinker ball can leave you swinging at nothing.

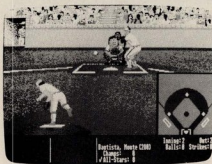
Other options available to the batting team include base-stealing (you control each base runner separately) and bunting.

## Playing The Field

The fielding portion of *HardBall!* is adequate, but clearly secondary to the pitching and hitting game. After a hit, the program automatically activates the appropriate fielder, whom you move toward the ball. Fly balls can be caught for outs (unlike many baseball simulations, catching isn't particularly difficult in *HardBall!*) and ground balls can be thrown to any base you choose. A display screen lets you alter your fielding strategies. You can set your infield at double-play depth, shift your outfield left or right, or pitch an intentional walk.

Despite this wealth of options, *HardBall!* has some strange omissions. On offense, you control base-stealing, but the computer handles the catcher's throw. In fact, the base-running game is the weakest part of this program.

Pitchers have no pick-off move, and once a runner starts for another base he keeps going no matter what. And considering the detail lavished on the pitcher-catcher aspect of the game, *HardBall!*'s lack of wild pitches, passed balls, and hit batters is both surprising and unfortunate.



Another unrealistic oddity is that *HardBall!*, like *Star League Baseball* and *The World's Greatest Baseball Game*, allows the left fielder to throw out a runner trying to reach first base.

## Better Graphics

One major improvement immediately noticeable in the ST version of *HardBall!* is the superb graphics. The screens are much crisper than those on the eight-bit Atari or Commodore 64, and the pitcher's animation is a little more detailed. Standing in the dugout is the batting team's manager, who chews gum and blows a bubble after each pitch (no chewing tobacco here). The text screens are much easier to read, too. The music and sound effects are similar to the eight-bit versions.

Most importantly, the game plays quite differently. The fast ball has been slowed down, while a hit ball travels more quickly. The effect of this is significant: Strikeouts are far less frequent, and the fielding game is far more demanding. In the Commodore 64 version, many more runs seemed to be the result of home runs, not base hits. Now, the home run seems downplayed in favor of the base hit—as it should be.

The ST version can be played with either a mouse or a joystick

(or both, in a two-player game). Some of you game-hardened fans are probably thinking that a mouse is nice for a word processor or painting program, but rarely cuts it as a joystick substitute. *HardBall!*'s mouse control, though, is so well-designed that I found myself using it instead of the joystick. The mouse seems to demand a little less physical dexterity. Whereas the joystick forces you to aim and fire—often too quickly for comfort—the mouse lets you see what you're doing. I found it easier to choose pitching, hitting, and even throwing options with the mouse. The only weakness of the mouse is moving fielders; sometimes you run out of space on the desktop.

*HardBall!* for the ST shows that a translation of an existing game need not be a slavish imitation of the original. It's basically the same as the eight-bit version, but Accolade has enhanced it in more areas than just the graphics. Certainly, more features could have been added, but translations as a whole steer clear of wholesale changes.

If you're looking for a great sports game for your ST, pick up *HardBall!*—even if you have an earlier version. Its rewards are many.

Hardball!  
Accolade  
20833 Stevens Creek Blvd.  
Cupertino, CA 95014  
\$39.95

**ST**



# Personal Spelling Checker

Delmar E. Searls

*If you've always wondered whether a spelling-checker program would improve your writing, here's a chance to find out. "Personal Spelling Checker" efficiently proofreads any text file for questionable words and lets you correct the inevitable misspellings and typing errors. You can create your own custom dictionary, too. It works on any ST system, color or monochrome; printer optional.*

A spelling-checker program can be very helpful for rapidly proofreading letters, articles, reports, memos, and other documents for spelling and typographical errors. Spelling checkers aren't foolproof, but they can save you from making potentially embarrassing mistakes. If you don't have complete confidence in your spelling—or your typing—a spelling checker may be the ideal supplement to your word processor.

"Personal Spelling Checker" is designed to fit most people's needs for a spelling-checker program. On a one-megabyte ST, Personal Spelling Checker can handle a dictionary of up to 30,000 words. Although this isn't as large as the dictionaries in most commercial programs, it's more than enough to store the words you most frequently misspell. And it's easy to customize the dictionary for your own specialized purposes.

The program itself is very easy to use. It's GEM-based and takes advantage of windows, alert boxes, dialog boxes, and the mouse. It's also pretty fast.

As Personal Spelling Checker scans your text, it highlights each questionable word in context—the line in which the word appears and the preceding

five lines are displayed on the screen. You have a choice of adding the word to either the dictionary or the list of misspelled words. When the entire document has been checked, you can save the updated dictionary on disk and send the list of misspelled words to a printer. By using your word processor's search command, you can easily locate the misspelled words to make corrections, or use Personal Spelling Checker's own editing features to fix mistakes as you find them.

Personal Spelling Checker works best when proofreading plain ASCII text files—that is, files without special formatting codes inserted by word processors. You can check non-ASCII files—such as those created by *1ST Word* in word-processing mode—but the screen display will look a little strange. For best results, you may want to proofread a document before preparing the file with special type styles and page formatting.

## Getting Started

You'll find Personal Spelling Checker on this issue's magazine disk under the filename CHECKER.PRG. You can run it from the disk menu or the GEM Desktop like any other program. Before running the program, however, it's a good idea to reboot the computer without installing any unnecessary desk accessories or ramdisks. The maximum allowable size of the dictionary depends on the amount of free RAM available—the more free memory, the larger the dictionary can be. Freeing up memory is especially important on unexpanded 520STs.

Personal Spelling Checker runs in either the medium-resolution color mode or high-resolution

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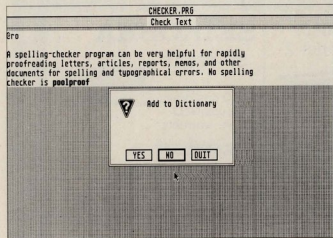


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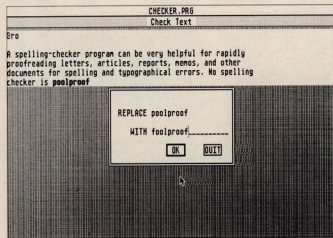
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**Figure 1:** "Personal Spelling Checker" spots a misspelled word.



**Figure 2:** Using the program's built-in editing feature, you can correct misspelled words on the spot.



monochrome mode. If you attempt to run the program in low resolution, it displays an alert box with an abort button. After clicking on the button, drop down the Options menu on the GEM Desktop and choose Set Preferences. Switch to medium resolution and rerun the program.

The first thing you'll see is the copyright notice. Click on the OK button or press Return to continue. Next you'll see a standard GEM file selector box requesting the name of the dictionary file. The program defaults to the current directory with the filename, DICT.LST. A short sample dictionary with this filename is included on the magazine disk. You can use this dictionary as the basis for your own dictionary, or you can create an entirely new dictionary from scratch, as we'll describe in a moment.

The file selector box in Personal Spelling Checker works like any other GEM file selector. If you need to change the pathname (for instance, if the dictionary file you want to load is not in the current directory), consult the manual that came with your ST to learn how to use a GEM file selector.

After you select a dictionary file, the mouse pointer will change to a bee to indicate that the program is busy; there's a short pause as the program reads the dictionary and stores it in memory. The longer the dictionary, the longer the pause. As long as the mouse pointer can still be moved, rest assured that the computer hasn't locked up.

When the dictionary is loaded, another file selector appears. This time you must specify the text file you want the program to proofread. Again, the current directory is the default pathname. Incidentally, clicking on the Cancel button in this or the dictionary file selector will terminate the program.

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## Built-In Editing

The final step before proofreading the file is to choose whether or not to use the built-in editing feature of Personal Spelling Checker. This option allows you to correct misspelled words as they are encountered in the text file. This saves you the trouble of reloading the file into your word processor to make corrections.

If you select the editing option, you'll be asked to specify a filename for the edited text file. The program assumes you want to save the edited file in the current directory. If you don't, include a new pathname when you enter the filename (such as B:NEWTEXT.DOC). If you specify an existing filename, Personal Spelling Checker asks you to confirm the choice before overwriting the existing file. You can also change your mind about using the editing feature by clicking on the Cancel button instead of entering a filename.

You'll probably want to use the built-in editing feature most of the time, but there are two circumstances in which you shouldn't. If the text file you're checking contains lines longer than 80 characters (or if the edited file will contain lines this long), don't use the editing feature. And if the text file you're checking contains lines which are flushed against the right margin (as is sometimes the case in *157 Word* files), the editing feature could easily mess up this formatting if a character is added or deleted during correction.

How do you correct misspellings if you don't use the built-in editing? After Personal Spelling Checker is finished proofreading your text, it asks if you want to print out a list of the misspelled words. Using this list and the search function of your word processor, you can quickly find and correct all of the mistakes in your document.

## Proofreading Text

After you choose whether or not to use the built-in editing feature, Personal Spelling Checker begins proofreading your document and opens a window labeled Check Text. Nothing shows up in the window unless the program encounters a word that isn't in the dictionary. When that happens, the program displays the last six lines read from the text file so you can see the context in which the word appears. The questionable word is highlighted in red on color monitors, or in boldface type on monochrome monitors.

Remember, just because a word is highlighted *does not* necessarily mean it's misspelled. Spelling checkers always flag words they can't recognize, because they have no way of knowing whether a word is spelled correctly unless it's listed in the dictionary. That's why they always give you a choice of skipping the word, correcting the word, or adding it to the dictionary.

Personal Spelling Checker works the same way. After it flags a questionable word, it asks if you want

to add the word to the dictionary (Figure 1.). If you do, and you're *certain* the highlighted word is correctly spelled, click on the Yes button. The program then continues proofreading your document.

If you click on the No button (or press Return), Personal Spelling Checker adds the highlighted word to its list of misspelled words. Then, if you aren't using the built-in editing feature, the program continues proofreading. If it encounters the same misspelled word again, it won't bother to ask you about it a second time.

## Making Corrections

If you are using the editing feature, Personal Spelling Checker gives you a chance to replace the misspelled word with the correct word. By default, the program initially displays the highlighted word as the replacement word. If you click on the OK button or press Return without making any changes, therefore, the program won't replace this occurrence of the word with something different. This allows you to skip words that, for some reason, you've decided not to add to the dictionary, although they aren't necessarily misspelled. (Don't forget that the size of the dictionary is limited by memory.)

Let's say the word actually *is* misspelled, as seen in Figure 2. In that case, make your corrections to the replacement word with the usual editing keys (Backspace, Esc, and so on). Then click on OK, or press Return.

Personal Spelling Checker resumes proofreading. If it encounters the same misspelled word later in the document, it again asks you to replace the word. (It won't ask you a second time if you want to add the word to the dictionary.) This time, however, the default replacement word is the *corrected version* you entered earlier. This feature makes it easy to correct multiple occurrences of the same error.

Notice in Figures 1 and 2 that a Quit button is also provided. You can click this button at any time to abort the spell-checking process. There's one thing to keep in mind, however: If you're using the built-in editing option, *the new text file saved on disk will end at the point where you abort the program.* If the filename you specified for the edited text file is the same as the original text file, the truncated file replaces the original file. This means you can lose the last part of your file if you don't have a backup copy. To be safe, always specify a different filename for the edited file.

## The Home Stretch

When Personal Spelling Checker has finished proofreading the document, it asks if you want to print the list of misspelled words (assuming any were found). If you've used the built-in editing option, this probably won't be necessary; just click on the No button. If you haven't used the editing feature, click on the Yes button or press Return. The mis-



spelled words are printed in the order they were first encountered in the text. If they were encountered more than once, they'll appear only once on the list. Remember this when searching for and correcting them with your word processor.

Next, Personal Spelling Checker redisplay the file selector for choosing a text file. This lets you check another text file without rerunning the program. Both the dictionary and the list of misspelled words are retained when you check additional files. Enter a new filename or click on the Cancel button to terminate the program.

When you click on Cancel within this file selector, the program asks if you're ready to save the updated dictionary (assuming you've added at least one new word). Click the OK button or press Return. The program asks you to specify a filename and then saves the updated dictionary on disk. If you click on Cancel here (or on the previous screen), the updated dictionary isn't saved.

Be patient while the program saves the updated dictionary; it takes a few moments, especially for longer dictionary files. When the program is finished, you're returned to the GEM Desktop. If you didn't use the editing feature, you can now run your word processor to find and correct any misspelled words.

### Additional Notes

There are a few things to keep in mind when using Personal Spelling Checker. If you attempt to use a nonexistent or null filename—either a dictionary file or a text file—the program terminates.

Don't forget, the built-in editing feature can be used only if the text file you're checking has no lines wider than 80 characters. This usually isn't a problem, because no more than 80 characters fit on one line of the ST's medium- or high-resolution screen. However, some word processors (including *1ST Word*) let you scroll the text window horizontally to create longer lines. These lines are processed correctly if you don't use the edit option, but misspelled words beyond the 80th character are not displayed in context.

If you accidentally use the edit option when proofreading a file with lines longer than 80 characters, the spelling is checked properly, but the program truncates the lines to 80 characters when saving the edited file to disk. Extra characters do not appear in the file. Again, though, this 80-character limitation should not be a problem with the vast majority of text files.

Keep an eye on the size of your dictionary, especially if you have an unexpanded 520ST. Remember that the size of the dictionary is determined by the amount of free memory available in the computer, and that ramdisks and desk accessories can eat up a lot of memory. If the program runs out of memory and you try to add a new word to the dictionary, you'll be warned by an alert box. Personal

Spelling Checker continues proofreading your text, but no new words can be added.

If the dictionary-full alert box appears while loading a dictionary file, you should probably terminate the program and free up some memory by disabling desk accessories or ramdisks. If there still isn't enough free memory, you'll have to make the dictionary smaller by editing it with a word processor.

The program defines a word as any sequence of characters that starts and ends with a letter or a numeral and contains letters, numerals, hyphens, periods, colons, or apostrophes. The largest word the program can handle is 19 characters. If a longer word is encountered, it won't be processed correctly. However, no error message is displayed. This shouldn't cause any problems in normal use.

### Expanding The Dictionary

The dictionary supplied on the magazine disk is rather small. This conserves disk space for other programs in this issue and also leaves plenty of room for you to add your own frequently misspelled words to the dictionary. When you first begin using the program, you'll find that the checking process is interrupted quite often by unrecognized words. As you use the program more and more, you need to add words less frequently. Remember that the maximum size of the dictionary on a one-megabyte ST is 30,000 words.

How much text will 30,000 words cover? According to linguists, Shakespeare's works contain about 900,000 words, of which 29,000 are different. Shakespeare could have used Personal Spelling Checker without filling up the dictionary.

There's a faster way to expand the dictionary without proofreading files and adding the words one at a time. Begin by running your word processor and loading the dictionary file (DICT.LST) as if it were a text file—which it is. Notice that each word in the dictionary is entered in lowercase characters in alphabetical order on a line by itself, followed by a carriage return.

Add new words by simply typing them at the top of this file. Don't use any uppercase letters, and press Return after entering each word on its own line. Don't worry about putting them in alphabetical order.

When you're done adding words, save the dictionary back to disk. *Important: Be sure to save the dictionary as a plain ASCII text file without any special formatting codes from your word processor.* Most word processors have this capability; if you aren't sure how to do it, check the manual that came with the software. In *1ST Word*, for instance, you switch off the word-processor mode.

After the dictionary file is saved on disk in ASCII format, run the program DICTSORT.PRG found on this issue's magazine disk. This program is designed to sort any ASCII text file into alphabetical order by the first character of each line. When DICT-



`SORT.PRG` runs, it asks you to specify the file you want to sort. It then loads the file you specify, sorts it, and allows you to save the sorted version back to disk. Allow several minutes for this process, especially for longer dictionaries.

One way to get around the size limitation of the dictionary—especially if you have an unexpanded 520ST—is to create different dictionaries for different purposes. Remember that Personal Spelling Checker allows you to load any dictionary file you want when it first runs. For instance, a dictionary for checking business letters might be customized with commonly used business terms; a dictionary for checking technical articles might be customized with the technical terms of your profession.

## Notes For Programmers

Personal Spelling Checker was written with *Personal Pascal* from Optimized Systems Software. This is a good language for software development on the ST because it comes complete with an integrated text editor, compiler, and linker. Furthermore, the language contains a library of procedures and functions that allow programs to use almost all of the features of GEM, such as alert boxes, dialog boxes, windows, graphics, and so on. The Pascal source code is included on the magazine disk under the filename `CHECKER.PAS`. By studying this source code, you'll find a couple of interesting techniques.

For instance, Pascal requires the programmer to declare the maximum size of any string variable. Each word in the Personal Spelling Checker dictionary is declared as a string of up to 19 characters. This, plus the byte needed to store the actual length of the string, means that every word requires 20 bytes of storage regardless of how long the word really is. Thus, a dictionary of only 1,500 words would require 30,000 bytes of memory. Since *Personal Pascal* limits the size of any one data structure to 32K (32,768 bytes), it's obvious that we can't use a single data structure to store a dictionary of meaningful size.

Instead, the dictionary is implemented as an array of 20 pointers (numbered 0-19), each pointing to a set of 1,500 words. This gives us room for a dictionary containing up to 30,000 words. Logically, the dictionary is treated as a single array with an index that starts at 0 and goes up to a maximum of 29,999. Given an INDEX into this logical dictionary, the proper set of words is given by `INDEX div 1500`. The location of the word within the set is `INDEX mod 1500`. For example, suppose we wanted to find `WORD[4765]`. The word would be at location `265 (4765 mod 1500)` in set `3 (4765 div 1500)`.

In addition to getting around the 32K limit on data structures, this method allows the program to use only small amounts of memory for small dictionaries. Memory is allocated for a new set of words only as necessary. A 10,000-word dictionary would

need only seven sets (210,000 bytes), while a 30,000-word dictionary requires all 20 sets (at 600,000 bytes). With the 10,000-word dictionary, there would be room to add 500 more words before the program would have to allocate more memory.

## A Reasonable Compromise

There are some practical consequences of this. If you're using an unexpanded 520ST or a 1040ST with a large ramdisk, you'll have to limit the size of your dictionary to avoid running out of memory. For personal use, this shouldn't present any significant problems. Of course, on a 1040ST with no ramdisk or desk accessories, you can go all the way up to 30,000 words.

Before attempting to allocate memory for a new set of words, the program makes sure there is enough memory left to do so. If not, an alert box informs the user that there is not enough memory. The full-dictionary flag is set to TRUE when this happens.

The list of misspelled words is kept in a linked list. A dummy head node (pointed to by `BadList`) is used to simplify list operations. When a word isn't found in the dictionary, the program searches the list of misspelled words by traversing the list. If the word isn't in this list either, the `AddWord` module is called to add the word either to the dictionary or to the misspelled list.

Each node in the list has a field for the misspelled word and a second field for the replacement (which is used if the edit option is in effect). The contents of the replacement field can be altered by the user whenever necessary. For example, if the misspelled word appears at the beginning of a sentence, the user must be able to capitalize the first letter of the replacement.

One of the advantages of modular programming is that the various modules can be used in other programs. The `DICTSORT.PRG` sorting program makes use of many of the modules found in Personal Spelling Checker. The sort is done with a heapsort algorithm. I chose a heapsort because it is reasonably fast, even under worst-case conditions.

The implementation of the heapsort was complicated by the way the dictionary is stored. Specifically, a greater-than-normal number of arithmetic calculations is required to access dictionary elements. As a result, the sorting takes a little longer than it would if the program could create a single array large enough to hold the entire dictionary.

Personal Spelling Checker was written using *Personal Pascal* from Optimized Systems Software. Portions of this program (the linked libraries) are copyrighted 1986 by OSS and CCD. Used by permission of OSS.

# Desktop Printer Controller

Marc Ruby

*This clever desk accessory gives you full control over your printer from the GEM Desktop or from within any GEM application program. You can select special type fonts and styles supported by your printer, even if the application normally won't let you access those features. It works on all ST systems in all resolutions, color or monochrome.*

Virtually all good word processors let you embed commands for printing text in italics, underlining, boldface, double-strike, near letter quality, condensed mode, or whatever other special fonts and styles your printer supports. But many other programs lack this capability, and even a word processor might require a special printer driver to work just right with your printer. Wouldn't it be nice if there were some way to control the printer independently of the application program?

That's the idea behind "Desktop Printer Controller." It displays a control panel on the screen that allows you send any series of commands to your printer. You can switch the printer into any special mode with a few keypresses and mouse clicks. You can even create customized control panels and help screens for any number of different printers. And because Desktop Printer Controller is a desk accessory, it's always available from the GEM Desktop or from within any GEM application.

Desktop Printer Controller works with any ST-compatible printer in any screen mode: low- or medium-resolution color, and high-resolution monochrome.

## Installing The Accessory

You'll find the following files on this issue's disk for Desktop Printer Controller: PRINTER.AC, the desk accessory; PRINTLOW.RSC, the resource file for use in the low-resolution mode; PRINTER.RSC, the resource file for use in the medium- and high-resolu-

tion modes; PRINTER.BTN, a sample button file for the Gemini 10X printer; PRINTER.HLP, the Gemini help file; and PRINTER.C, the C source code.

Because Desktop Printer Controller is a desk accessory, you must install it on your system before you can use it. Follow these steps:

1. Copy the file PRINTER.AC from the magazine disk to your boot disk (the disk you insert in drive A when switching on the computer). Do not put the file into a folder (subdirectory) on your boot disk—it must be on the root (main) directory. If the ST system you're using has a hard disk drive, copy PRINTER.AC to the root directory of drive C instead of drive A.
2. Rename the file from PRINTER.AC to PRINTER.ACC. Click once to highlight the file in the directory window. Select Show Info . . . from the File menu, and type the new name. Then click on the OK button.
3. If you're going to be using Desktop Printer Controller in the low-resolution color mode, copy the file PRINTLOW.RSC from the magazine disk to your boot disk. If you're going to be using Desktop Printer Controller in the medium- or high-resolution modes, copy the file PRINTER.RSC to your boot disk. Copy both files to your boot disk if you think you might be using the program in both low and medium resolution. Do not put either file in a folder; make sure each is copied to the root directory. (If the ST system you're using has a hard disk drive, put the files in the root directory of drive C instead of drive A.)
4. Switch off or reset the computer with the boot disk containing PRINTER.ACC in drive A. (If you're using a hard disk, put your normal boot disk in drive A; the desk accessory will be loaded from drive C.) A second way to load an accessory is to change resolution from low to medium or vice versa. Accessories are loaded from drive A (or drive C if you have a ramdisk or hard drive).
5. When the GEM Desktop appears, drop down the



Desk menu. You should see the selection Printer on the menu.

Remember that the current version of the ST's operating system does not allow you to install more than six desk accessories at a time. The Control Panel/Install Printer accessory (named CONTROL.ACC) that came with your ST counts as *two* accessories. If Desktop Printer Controller won't install properly, make sure you haven't exceeded this limit. Also, keep in mind that desk accessories consume RAM, and an unexpanded 520ST with several large accessories and

a ramdisk might run out of memory. If you have this problem, try disabling some accessories by renaming the program with some filename extension other than .ACC and rebooting the computer.

If you have an early 520ST without the TOS operating system in read only memory (ROM), you'll have to rename PRINTER.ACC to DESKx.ACC, where x is a number from 1 to 6 that does not conflict with other accessories on your boot disk. Example: DESK5.ACC.

Figure 1.

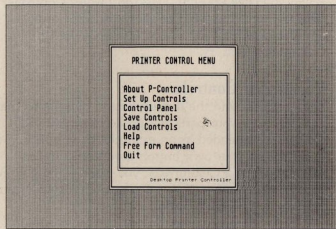


Figure 2.

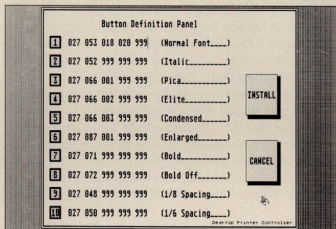
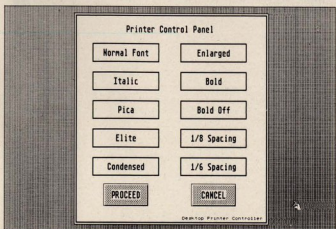


Figure 3.



## The Eight Options

Pull down the accessories menu (usually called Desk, but sometimes labeled with the Atari logo), and click on Printer. Desktop Printer Controller pops onto the screen. You'll see a list of eight choices. (See Figure 1.)

### About P-Controller

This option doesn't really do anything except list my name and the copyright information. Click on the fish to exit.

### Set Up Controls

Select this option to define a button set. You may create up to ten control buttons, each of which holds up to five bytes of control information. The button panel appears as shown in Figure 2.

At this point, you'll have to reach for your printer manual and look up the codes for the various printer commands. If the manual lists both decimal and hexadecimal, ignore the hex numbers.

Enter the decimal equivalent for each byte. If the command contains less than five bytes, insert 999 as the last byte. This tells Desktop Printer Controller to stop sending to the printer. You must enter leading zeros—for example, type 027 instead of 27 for the Escape code. Then enter the message you want to see on the button. The PRINTER.BTN file on the accompanying disk has been set up for the Star Micronics Gemini 10X. This is the data that will appear when you first select this option. Use it as a model for setting things up for your own printer.

### Control Panel

This is where you send control messages to the printer. Use the mouse to select whatever control sequences you wish to send (as many as you wish), and then click on Proceed. (See Figure 3.)

Desktop Printer Controller is not very bright. It will send all the control sequences you select to the printer. If they happen to contradict each other, it's up to your printer to sort them out.

### Save Controls

Use this option to save a set of button controls. Printer Controller always loads PRINTER.BTN when it's installed as an accessory, but you can create and save other button files. If your printer has many features, you won't be able to fit all the codes into the ten buttons available. It's a good idea to gather similar functions into button files (font changes in one



file, line spacing commands in another, and so on).

### Load Controls

This option lets you load a previously defined set of button controls for use. Both Save and Load display a file selector from which you choose a filename.

### Help

Use the help screen to avoid leafing through your printer manual every time you want to know the format of a command. When Printer Controller loads up, it attempts to read a file called PRINTER.HLP into memory. If PRINTER.HLP is not on the root di-

Figure 4.

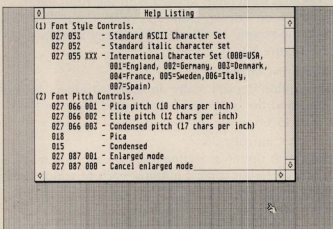
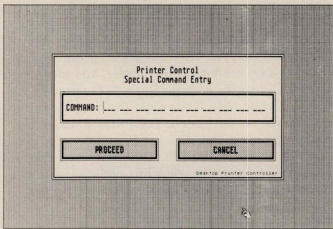


Figure 5.



rectory when you boot or reset the computer, no help file is loaded and the menu option is disabled.

The help file on the December disk describes Gemini 10X commands. (See Figure 4.) When you select help, the utility will open up a window in which you can read through the file. There are a few simple rules for creating your own help file.

First, don't use any special control characters like tabs. The display function either ignores these or does weird things with them. You can have up to 200 lines of 60 characters each. Characters beyond column 60 may be ignored, or Printer Controller may try to cope with them. Either way, the results will be a bit odd.

Second, use a text editor that breaks up lines with a carriage return and a linefeed. This is how the C language tells that it got a new line. Also, if you use a word processor like *1ST Word*, turn off the WP mode and save the help file as pure ASCII.

### Free Form Command

This option allows you to send any one command—up to ten bytes long—to the printer. The rules for entering numbers are identical to the rules for setting up the standard controls. If you send fewer than ten codes, remember to add 999 as the last number in the line. This screen is shown in Figure 5.

### Quit

When you click on Quit, Desktop Printer Controller returns you to the GEM Desktop or to the application that was running when you called the Printer Controller accessory.

### Customized Controls

The accessory and the default button definitions may not work with your particular printer. The PRINTER.BTN file is intended as an example for you to follow in setting up your own button definitions. If you happen to own a Gemini 10X, you can use the buttons without modification. If you don't own a Gemini, you may create your own button files.

Save the ten commands you use most often on your boot disk under the name PRINTER.BTN. This is the file that's automatically loaded when the desk accessory installs itself. You can give any name to button definition files, but you should include the extension BTN. Whatever definitions are in memory will remain there when you exit to the Desktop or to an application that's currently running.

At the same time you create the button definitions, you should use a word processor to write a help file that lists the commands for your specific printer (you could also include notes to yourself or even telephone numbers). Keep in mind the limits of the help file—200 lines of 60 characters each. Save the file with the name PRINTER.HLP on your boot disk.

The button and help files are optional, but they make Desktop Printer Controller both easier and more convenient to use.

ST

# MONTGOMERY GRANT

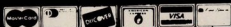
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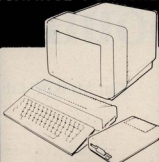


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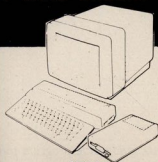


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# Sound Editor

Tim Midkiff, Editorial Programmer

*This innovative program puts a sound-effects laboratory at your fingertips, giving you complete control over the ST's programmable sound chip. Programmers can experiment with the chip registers, tweaking them to create just the right sound. And nonprogrammers will enjoy just playing around with blats, booms, and shushes. "Sound Editor" works on all STs, color or monochrome. We've also included example sound programs written in Modula-2, Pascal, C, GFA BASIC, and machine language.*

Compiled languages like Modula-2, Pascal, and C are great, but have you ever tried to create a sound effect with one? To change just one parameter, you have to load the text editor, modify the source code, save it, run the compiler and linker, and (finally) test the sound. This kind of trial-and-error approach to programming works well in interpreted BASIC. But with a compiler, you're faced with the edit-compile-link routine every time you want to make a change.

"Sound Editor" was written to make it easier to experiment with sound. It provides complete access to all the registers on the ST's sound chip. In addition, it supports all the commands provided by the ST's XBIOS Do-Sound routine and has the ability to sequence up to ten different sounds. Sound data can be saved

to disk in a format that makes re-creating the sounds easy.

## Sound Shapes

First, a little background. A pure sound wave is defined by two features: frequency and volume. The frequency (or pitch) is low for bass notes and high for treble notes. A sound with a high volume is louder than one with a low volume.

If you keep the volume constant, but vary the frequency from high to low, the result is an ambulance-siren effect (see Figure 1).

If you hold the frequency steady, but change the volume, the sound's envelope changes, becoming louder and softer (see Figure 2).

A noise waveform that gradually grows in volume and then gradually decreases in volume gives you a sound like waves crashing on a beach.

The ST's sound chip has three channels or *voices*, enough to play a three-note chord. Each voice can produce a tone, a noise sound, or both. The frequency and volume are independently selectable for each tone generator. Plus, there are a variety of envelope shapes that can change the personality of the sound.

## Sound Editor Menus

Sound Editor works in any screen resolution on any kind of monitor.

It can be found on this issue's magazine disk under the filename `SEDIT.PRG`. You can run it just like any other program, either from the disk menu or the GEM desktop. If you copy `SEDIT.PRG` to another disk, be sure to copy the file `SEDIT.RSC` to the same disk or folder as `SEDIT.PRG`. `SEDIT.RSC` is a resource file that's required by `SEDIT.PRG`.

After running Sound Editor, you'll see a blank screen with four menus at the top. All menus and options are selected with the mouse, with one exception: When you load or save a new sound, you must type the filename into the file selector box.

A description of each menu and its options follows. Three dots following an item indicate that a dialog box will appear to provide a secondary menu.

## Desk:

**About SOUND EDIT** Displays the title of the program. Any desk accessories you may have installed are also available under this menu.

## File:

**Open...** Loads sound definitions (.SND files) from disk by use of a file selector box.

**Save...** Uses a file selector box to save sound definitions (.SND files).

**Quit** Exits program and returns to the GEM desktop.



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## Options:

Most items on this menu appear in shadowed (disabled) text until a sound has been created with the Edit menu. After you've defined a sound, the following options will store it to memory, to the sequencer, or to disk (as a .TXT file).

**Put** Stores the current sound to memory, where it remains until another Put is selected.

**Get** Retrieves the sound from the last Put operation.

**Put mem...** Allows you to save the current sound to memory. Up to ten sounds can be stored by selecting one of the boxes labeled S1-S10 and exiting with OK. A sound may be accessed (with its S1-S10 label) from the next two functions.

**Get mem...** Retrieves one of the sounds from memory. Boxes not containing a sound will be displayed with shadowed (disabled) text. In other words, you can only Get from boxes in which you've previously Put sounds.

**Play mem...** Plays a melody or a series of sound effects stored in the boxes S1-S10. You select the sequence of sounds to be played. The order of sounds is displayed as box numbers separated by dashes. UNDO sets the sequence back by one sound each time it is selected. RESET clears the entire sequence. PLAY plays the sounds in the order you've chosen. A sound is terminated when none of the voices are enabled (see the description of programming sound) or by clicking the right mouse button once. When a sound is terminated, the next sound in the sequence is played.

**Decimal** Output of sound data (the final option in this menu) is formatted in decimal digits.

**Hex** Output is formatted in hexadecimal digits.

**Output...** A file selector window appears and you enter a filename to save sound data to disk. The data is saved in ASCII for-

Figure 1

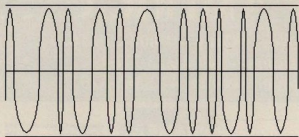
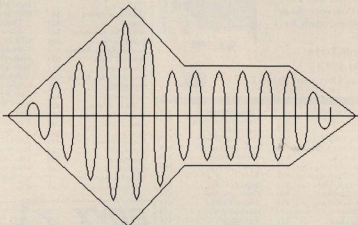


Figure 2



mat, which can be printed or displayed from the GEM desktop or loaded into most word processors or text editors. See below for more information on how to use this data.

## Edit:

Each item in this menu uses a dialog box with at least three options: PLAY, OK, and CANCEL. Other options are discussed under each item. PLAY plays the sound as it's currently defined. Select the OK button to exit and keep these changes, or exit by clicking CANCEL to restore the sound to its original values. Where numerical input is used, the high and the low range are listed. If a number is outside the given range, the program sets the number to the maximum allowed. All numerical data is entered by the mouse. Click on a digit to increment it by 1; hold down the ALT key while selecting a digit to decrement it.

**Frequency...** Sets the frequency for each of the three channels. Contrary to common sense, a high number gives you a low frequency and a low number yields a high frequency. To calculate the number from a given frequency in hertz (cycles per second), multiply the frequency by 16 and divide the result into 2,000,000. For example, middle C is 262 Hz;  $2,000,000 / (262 * 16)$  gives a result of 477. So you'd store a 477 to hear middle C.

**Envelope...** Controls the shape and period of the sound envelope, which modifies the volume over a period of time. Select the up arrow to cycle through the available envelopes; the envelope's number and shape are displayed. Envelopes are not active when voices are set to a constant volume (see Volume, below). The Period option controls the speed of envelopes that repeat.

**Period...** This value deter-



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mines the period of the noise waveform. Tones aren't affected by this option. Low numbers result in high-pitched noise (radio static or a snare drum). For lower-pitched noise (ocean waves), set the period to a higher number.

**Volume...** Sets the volume for each of the three channels. If the CONSTANT button is highlighted, the sound will have a constant volume at the level which is set. If CONSTANT is not highlighted, the volume is controlled by the envelope selected above.

**Control...** Allows the selection of tone or noise waveform for each of the channels.

**Commands...** This allows you to enter and edit commands available from the DoSound routine. As many as 100 commands can be entered. See below for more details.

## Testing A Few Sounds

To clarify how the program works, let's try creating some sample sounds. Using the first four options under the Edit menu, enter these values:

```
Frequency  A: 200
            B: 202
            C: 300
Envelope    Shape: 14
            Period: 2000
Period      16
Volume      A: 10
            B: 10
            C: 10
            (leave CONSTANT on)
```

While you're setting up this sound, you may be tempted to click on the PLAY button. It doesn't hurt to try, but you'll hear nothing.

For the final step, open the Control window under the Edit menu and click on one or more of the tone controls. Now you can select PLAY to hear the tones and/or noises.

Now leave all three A, B, and C tones on and the noises off, and exit the Control window by selecting OK. Go back to the Volume option under the Edit menu. Turn the CONSTANT button on and off for various tones, remembering

to select PLAY after each change. Notice the difference?

The CONSTANT button controls whether one or more of the voices has a constant volume or has volume set by the waveform. With CONSTANT turned off for all voices, exit this menu and return to Envelope. Experiment with different waveforms and different waveform periods. The Period menu affects only noise sounds; to hear how it works, set the noises on and tones off (in Control) and change the values (in Period).

## Saving Sounds

After creating an interesting sound, you can stash it temporarily in memory by moving to the Options menu and selecting Put. To retrieve it, click on Get.

To hear as many as ten sounds in order, click on Put Mem. Choose one of the ten boxes labeled S1-S10. After storing one or more sounds, you may use Play Mem to play them in sequence. Note that repeating sounds will continue forever; to terminate a repeating sound and hear the next one, press the right mouse button.

Now move to the File menu and select the Save option to save a sound. Sound Editor will create a disk file ending with the extender .SND (these files can be reloaded into Sound Editor at a later time).

If you'd prefer to incorporate the sound into one of your own programs, click on Output from the Options menu. This creates an ASCII file. Directions for using this file are covered below.

## The Sound Chip Registers

The following sections are mainly of interest to programmers who want to incorporate the sounds they create with Sound Editor into their own programs. We'll provide examples of how to make sounds in Modula-2, Pascal, C, GFA BASIC, and machine language.

There are 16 registers in the ST's sound chip, laid out in the

following fashion (x indicates a bit that is not used):

Register	Bits	Description
0	76543210	Frequency A LSB
1	xxxx3210	MSB
2	76543210	Frequency B LSB
3	xxxx3210	MSB
4	76543210	Frequency C LSB
5	xxxx3210	MSB
6	xxxx3210	Period (noise)
7	76-543-210	I/O, Noise, Tone
8	xxxx-3210	Const, Volume A
9	xxxx-3210	Const, Volume B
10	xxxx-3210	Const, Volume C
11	76543210	Period (envelope) LSB
12	76543210	Period (envelope) MSB
13	xxxx3210	Envelope
14	76543210	I/O Port A
15	76543210	I/O Port B

Registers 0-5: These registers control the frequency of the sound for each of the three channels. The registers are paired so that two registers are combined to give the frequency, with a resolution of 12 bits. The low register holds a value in the range 0-255, and the high register holds 0-15. The combined range for the frequency is 0-4095.

Register 6: This register controls the period for the noise waveform. If no noise is enabled, this register has no effect on the sound. The upper three bits aren't used, giving a range of 0-31.

Register 7: This register enables tone or noise output on each of the channels. Bits 0-2 control tone for channels A-C and bits 3-5 control noise for channels A-C (bits 6-7 control the data direction on ports A and B and should be left as they are). Tone or noise for a channel is enabled by setting the corresponding bit to 0. A value of 63 (binary 00111111) disables all sound.

Registers 8-10: These registers determine the volume of the sound for each channel. The volume can range from 0 to 15. If bit 4 of the register is set, the volume is determined by the envelope.

Registers 11-13: These registers control the envelope shape and its period. Registers 11-12 are combined to determine the period (how quickly it repeats), which may range from 0 to 65535. The envelope shape is selected by register 13. This register ranges from

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Figure 3

REGISTER 13

Decimal	Control Bits				Selected Waveform Shape
	3	2	1	0	
	Continue	Attack	Alternate	Hold	
0	0	0	-	-	
4	0	1	-	-	
8	1	0	0	0	
9	1	0	0	1	
10	1	0	1	0	
11	1	0	1	1	
12	1	1	0	0	
13	1	1	0	1	
14	1	1	1	0	
15	1	1	1	1	

0 - Off  
1 - On  
- - Not Used

← Envelope Period  
(duration of one cycle)

0 to 15, but there are only ten different shapes.

Registers 14-15: These registers are used for input/output and not for sound.

### Using The Commands Menu

The sixth option under the Edit menu is Commands, which gives you even more control over the sound chip. By itself, Commands could replace all the other items in the Edit menu. For example, instead of selecting Frequency and picking a value for voice B, you could go to the Commands window and use the LOAD command to store values into registers 2-3.

Up to 100 commands, numbered 0-99, can be entered. You may review the commands already entered by selecting the up arrow and down arrow to move through the list. Both the index number and the command are displayed.

The three editing commands are INSERT, DELETE, and EDIT. The first opens a space for a command at the current index. DELETE deletes the space at the current index. EDIT brings up a

second dialog box for entering or editing a command.

While in the Edit menu, you have three choices. DURATION provides a delay (measured in units of 1/50 second) before the next command is processed. Thus, the value 150 would be equivalent to three seconds. LOAD displays the register to load and the value to be loaded. See the list of registers above for more about how the registers function. CHANGE is a powerful option; it lets you dynamically modify sound chip registers while the sound is playing. You'll see four values: the register, the change, the starting value, and the ending value. The change can be positive or negative.

The starting value is stored in the register and the change is added until the register holds the ending value. Note that if you start at an odd number and count by 2's to an even number (setting the frequency to slide from 201 to 100 in steps of -2, for example), the target will never be reached. When a value of 0 is reached, the register wraps around to 256 and continues. This means you can set

up an endless loop, with some very interesting effects.

### Adding Sound To Programs

The XBIOS DoSound routine is relatively easy to use in your own programs. You begin by creating an array of words (a word is a two-byte quantity). Each word has two parts. The high byte is a command. The low byte is a value associated with the command. There are three types of commands, listed below. Note that hexadecimal notation is sometimes indicated by a trailing H (Modula-2), a leading 0x (C), or a leading \$ (machine language). Thus, 0AH, 0x0A, and \$0A all represent the same quantity in hexadecimal.

Commands 0-15 (hex 00-0F). The command number represents the register to load. The next byte contains the value to be loaded into the register.

Commands 128-129 (hex 80-81). These commands work together to change the contents of a register. Command 128 takes one argument, which is stored in a temporary register. Command 129 takes three arguments. The first argument is the register to change. The value from the temporary register is loaded into this register. The second argument is added to the register until it is equal to the third argument.

Commands 130-255 (hex 82-FF). These commands insert a delay before the next command is executed. The argument determines the length of the delay, measured in time slices of 20 microseconds (1/50 second). An argument of 0 terminates sound processing.

For example, if you want to set the volume of voice A to 9, you'd need to store a 9 into register 8. The command stored in the array would be the word \$0809. To delay for 1.5 seconds, use a number in the range 130-255, followed by a 75 (\$FF4B). To make register 0 slide from 5 to 10 in steps of 1, the sequence of commands is \$8005 \$8100 \$010A. The 128 (\$80) precedes the initial val-



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### Program 1: TDI Modula-2

```

MODULE Sound;
FROM XBIOS IMPORT DoSound;
FROM SYSTEM IMPORT ADDR;
VAR
  i : LONGCARD;
  Snd : ARRAY [0..28] OF CARDINAL;
BEGIN
  Snd[0] := 0DDH;
  Snd[1] := 101H;
  Snd[2] := 2E2H;
  Snd[3] := 301H;
  Snd[4] := 4EEH;
  Snd[5] := 500H;
  Snd[6] := 60FH;
  Snd[7] := 7D8H;
  Snd[8] := 810H;
  Snd[9] := 910H;
  Snd[10] := 0A06H;
  Snd[11] := 0B44H;
  Snd[12] := 0C48H;
  Snd[13] := 0D08H;
  Snd[14] := 0FF64H;
  Snd[15] := 800FH;
  Snd[16] := 810AH;
  Snd[17] := 0FF00H;
  Snd[18] := 0FF64H;
  Snd[19] := 800FH;
  Snd[20] := 810AH;
  Snd[21] := 0FF00H;
  Snd[22] := 0A10H;
  Snd[23] := 0FF64H;
  Snd[24] := 73FH;
  Snd[25] := 0A00H;
  Snd[26] := 800H;
  Snd[27] := 900H;
  Snd[28] := 0FF00H;
  DoSound(ADR(Snd));
  FOR i := 0 TO 100000 DO END;
END Sound.

```

ue (5). The 129 (\$81) is followed by three bytes: the register (0), the step value (1), and the endpoint (10).

Once you've created the array, pass its address to the DoSound routine and the sound will be played.

The data created with the Save option contains the numbers needed by DoSound to play the sound. The Output option provides the same values, each on a separate line. A duration of zero indicates the end of sound processing for the DoSound routine and is automatically appended to every sound by Sound Editor.

The DoSound routine does not provide for playing sounds in sequence. It processes the current sound until it terminates or until another sound is passed to it. Sound Editor accomplishes its sequencing by polling the control

### Program 2: Personal Pascal

```

program sound;
type
  sndtype = array [0..30] of integer;
  sndptrtype = ^sndtype;
var
  sndptr: sndptrtype;
  i, j: integer;
Procedure DoSound(var sndptr:
  sndptrtype);
  Xbios(32);
begin
  new(sndptr);
  sndptr[0] := $00DD;
  sndptr[1] := $0101;
  sndptr[2] := $02E2;
  sndptr[3] := $0301;
  sndptr[4] := $04EE;
  sndptr[5] := $0500;
  sndptr[6] := $060F;
  sndptr[7] := $07D8;
  sndptr[8] := $0810;
  sndptr[9] := $0910;
  sndptr[10] := $0A06;
  sndptr[11] := $0B44;
  sndptr[12] := $0C48;
  sndptr[13] := $0D08;
  sndptr[14] := $FF64;
  sndptr[15] := $800F;
  sndptr[16] := $810A;
  sndptr[17] := $FF00;
  sndptr[18] := $FF64;
  sndptr[19] := $800F;
  sndptr[20] := $810A;
  sndptr[21] := $FF00;
  sndptr[22] := $0A10;
  sndptr[23] := $FF64;
  sndptr[24] := $073F;
  sndptr[25] := $0A00;
  sndptr[26] := $800;
  sndptr[27] := $900;
  sndptr[28] := $FF00;
  DoSound(sndptr);

```

```

  for i := 1 to 1000 do
    begin
      for j := 1 to 1000 do
        end;
    end;
end.

```

### Program 3: Megamax C

```

#include <osbind.h>
unsigned boing[] =
{
  0x00dd,0x0101,0x02e2,0x0301,
  0x04ee,0x0500,0x060f,0x07d8,
  0x0810,0x0910,0x0a06,0x0b44,
  0x0c48,0x0d08,0xff64,0x800f,
  0x810a,0xff00,0xff64,0x800f,
  0x810a,0xff00,0xa10,0xff64,
  0x073f,0xa00,0x800,0x900,
  0xff00
};
main()
{
  long i;
  /* call the Dosound routine, passing the address of the array */
  Dosound(boing);
  /* now a delay loop, so the sound isn't cut short */
  for(i=0;i<1000000;i++);
}

```

register (register 7) on the sound chip until no channels are enabled. The contents of the control register should be read before DoSound is used and restored to the original value after sound processing. This will avoid loss of disk access, which is controlled by bits 6 and 7 of this register. Registers can be accessed by use of the GIRead and GIWrite routines in the XBIOS library.

### The Bell Tone

An example sound is provided as a demo on the magazine disk. The file, BELL.SND, was created with Sound Editor and looks like this:

#### Sound Edit Output

```

Command DDH
Command 101H
Command 2E2H
Command 301H
Command 4EEH
Command 500H
Command 60FH
Command 7D8H
Command 810H
Command 910H
Command A06H
Command B44H
Command C48H
Command D08H
Command FF64H
Command 800FH
Command FF64H
Command 800FH
Command 810AH
Command A10H
Command FF64H
Command 73FH
Command A00H
Command 800H
Command 900H
Command FF00H

```

To use this in your own program, store the commands in an array and pass the address of the array to DoSound, also called XBIOS routine number 32. The example programs below illustrate how this is done in a variety of languages. Note that a delay loop is sometimes necessary to allow the sound to finish before the program ends and returns to the GEM desktop.

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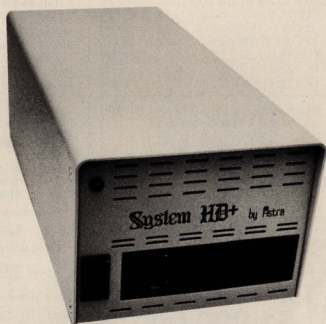
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### Program 4: GFA BASIC

Dim A%(20)  
For J=0 To 14  
  Read A%(J)  
Next J  
Void Xbios(32,L:Varptr(A%(0)))  
Data &h00dd0101, &h02320301  
Data &h04ee0500, &h060f07d8  
Data &h08100910, &h0a060b44  
Data &h0c480d08, &hfff6480f  
Data &h810aff00, &hfff6480f  
Data &h810aff00, &h0a10ff64  
Data &h073f0a00, &h08000900  
Data &hfff00000

### Program 5: Machine Language

\* DOSOUND.S      Show how to call Dosound in assembly language.

\* Hide mouse pointer  
.dc.w    \$a00a      \* Line A exception

\* Submit sound array to sound demo  
move.l   #sound\_array,(-sp)      \* Push address of sound array  
move.w   #32,-(sp)      \* Opcode for Dosound, XBIOS 32  
trap      #14      \* Do an XBIOS trap  
addq.l   #6,sp      \* Clean up the stack

\* Delay so we can hear the sound  
move.w   #2,d1      \* Do a couple of these  
wait:  
move.l   #\$\$\$\$ff,d0      \* And a bunch of these

delay:  
subi.l   #1,d0      \* Inner loop  
bne      delay      \* Outer loop  
dbra     d1,wait

\* Show mouse again  
.dc.w    \$a009      \* Line A exception

\* Terminate program and return whence we came  
clr.l    -(sp)      \* Push opcode for Term, GEMDOS 0  
trap     #1      \* GEMDOS trap

\* Initialized data segment

```
.data
sound_array:
.dc.w $00dd
.dc.w $0101
.dc.w $02e2
.dc.w $0301
.dc.w $04ee
.dc.w $0500
.dc.w $060f
.dc.w $07d8
.dc.w $0810
.dc.w $0910
.dc.w $0a06
.dc.w $0b44
.dc.w $0c48
.dc.w $0d08
.dc.w $fff6
.dc.w $800f
.dc.w $810a
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.dc.w $0900
.dc.w $ff00
```

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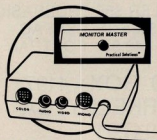
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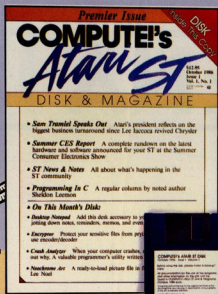
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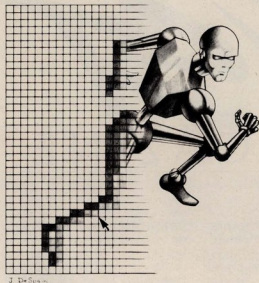
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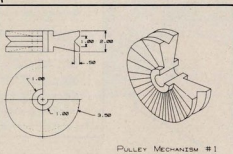
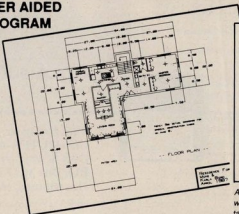
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# Marsh Mist

Maryann E. Raeder

Each issue, COMPUTE!'s Atari ST Disk & Magazine features computer artwork contributed by an ST artist. This issue's screen is "Marsh Mist" by Maryann E. Raeder. You'll find the NEOchrome-format file on the magazine disk under the filename ART.NEO. It can be loaded into any graphics-design program compatible with NEOchrome files.

If you want to contribute a screen, 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 in either NEOchrome or DEGAS format. You may include a paragraph or two of text describing the artwork and any special techniques employed. We pay \$100 for artwork that is accepted for publication, plus disk royalties for artwork included on the disk. Accepted artwork becomes the property of COMPUTE! Publications, Inc. Only those disks accompanied by a self-addressed, stamped mailer will be returned.

## Notes From The Artist

I am a free-lance artist who has come to appreciate the computer medium as a means of expression. The ST is truly the easiest medium I have ever worked with; it allows for many mistakes. No longer do I have to smell turpentine and worry about curious little fingers smudging wet paint. I don't have to run to the art-supply shop to replace colors I've run out of. The canvas is always there. The supply of colors never needs replenishing.

"Marsh Mist" is a study in blue. While passing through North Carolina, I took a photograph of a picturesque swamp. I then translated the photo to the ST in shades of blue.

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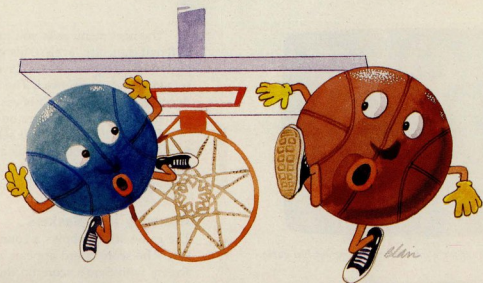
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# Basketball Sam & Ed

Rhett Anderson, David Hensley, Jr., and Tim Midkiff

*This is no ordinary basketball simulation in which players try to sink the ball through the hoop. In this game, you are the ball, playing one-on-one against another basketball. You score points by bouncing off your opponent and hurtling through the air, arms akimbo, hoping to plunge through the net. "Basketball Sam & Ed" is one of the best games ever published for Atari ST computers. It runs on any ST with a color monitor and two joysticks.*

In the land of Basketballia, Basketball Sam and Basketball Ed are the two best players who've ever lived. When they face off in a one-on-one game, the eager crowds bounce to the coliseum from miles around.

That's right—they bounce. The people of this strange land are round and inflatable; as a matter of fact, they look like basketballs with little feet and hands. So it's not surprising that their favorite sport is a version of basketball in which they try to launch themselves through one of three hoops suspended over a gym floor.

The hoops are too high to leap through with a single bound, so the main move is a sort of ricochet. One player runs full speed at the other. A properly timed jump sends him sailing through the air to land on his opponent, which gives him enough bounce to reach the net. Players are awarded two points each time they score a basket.

Of course, there are many other tricks and strategies in this game, for both offense and defense. You can try your hand at this odd version of basketball by taking control of Basketball Sam or Basketball Ed with a joystick—and you don't even have to travel to Basketballia.

## Getting Started

"Basketball Sam & Ed" is on this issue's disk under the filename `SAMED.PRG`. You can run the two-player game from the disk menu or from the GEM Desktop like any other program. It requires two joysticks and a color monitor, but it doesn't matter whether you run it from low resolution or medium resolution; the program automatically adjusts the screen.

When making a backup copy of Basketball Sam & Ed on another disk, be sure to copy the data file `SAMED.DAT`, too. The game won't run without the data file. If you store `SAMED.PRG` in a folder (sub-directory), put `SAMED.DAT` in the same folder.

Basketball Sam & Ed was originally written in machine language for the Commodore 64 and published in a sister magazine, *COMPUTE!'s Gazette*. The ST version takes advantage of the Atari's more advanced graphics and speed. Although it's written in a high-level compiled language, Modula-2, it's as fast as the ML version on the 64.

The source code, in the file `SAMED.MOD`, is included on the magazine disk for programmers who want to see how the program works. Additional functions can be found in the folder `SAMED.LIB`. None of the functions or the source code are required to play the game.

The game program and data file occupy only about 50K on disk, but the graphics routines eat up a lot of memory. As a result, the program needs approximately 380K of RAM. If you're using a 520ST, you'll probably have to boot up with no desk accessories or ramdisks to make sure enough memory is available.



*Sam & Ed face off for a one-on-one championship game.*



*Ed reveals his strategy: the full-court bounce.*



*Sam gets the rebound and sails through the net for two points.*

## Beginning The Game

When you run *Basketball Sam & Ed*, you're greeted with the title and menu screen. It takes the program a few moments to set up the variables, so you can use this pause to unplug the mouse and insert the two joysticks.

To select an item from the menu, press the up- or down-cursor keys to highlight your choice, and then press Return. The first menu allows you to choose the duration of the periods: two, four, six, or eight minutes. A game consists of four periods which are measured in realtime.

The next menu asks you to choose one of three different difficulty levels. This gives you the opportunity to handicap an expert player who is playing someone less experienced. The three levels are Expert, Average, and Beginner. It is easier to score on the Beginner level, harder to score on the Expert level.

The highlighted default settings for these options are four-minute periods and the Average level for both players. Simply press the Return key three times in succession if these settings are acceptable.

## Bouncing Into Baskets

The game screen shows a court framed by three baskets. The score board appears at the top of the screen, with Sam's score on the left and Ed's on the right. Centered at the top of the score board is the game clock and small circles that indicate the current period.

Sam, the orange ball, begins on the left side of the court. Ed is blue and starts on the right. Sam is controlled by the joystick in port one (the mouse port); the joystick in port two controls Ed.

The object of the game is to score the most points before the end of regulation time (four periods). You can't simply jump into the basket, however; you must jump on top of your opponent to bounce into the goal. Move the joystick left and right to run. Press the fire button to jump. In general, you should jump while you're running.

You have control over Sam or Ed only while their feet are on the ground. When they're flying through the air, you have to wait for gravity to bring them back down before you can run or jump again. Most of the time you'll have to jump when your opponent is in the air.

When you get a good leap, you may bounce on the rim a couple of times before falling through. More accurate shots will "swish" without hitting the rim. It is possible to jump upward through the net and rim, but you won't score until you fall downward through the basket. Each time you score, you're awarded two points on the scoreboard. The referees are very lenient and never call fouls, so you'll never shoot a free throw or foul out of a game.

## Playing To Win

A buzzer sound indicates the end of a period. Any player with both feet on the ground freezes, but players in motion continue to bounce around until they come to rest. This allows any player in the air to score. Therefore, any basket made after the buzzer will count.

Regulation time is over at the end of the fourth period. If the score is tied, the game automatically goes into overtime. Overtime periods continue until a winner is declared.

At the end of the game, all action ceases and a menu appears. The menu selections are Same Game, New Game, or Quit. Selecting Same Game starts a

new game with the same options (duration of periods and skill levels) chosen for the previous game. If you wish to change the options, select New Game. Quit returns you to the GEM Desktop.

At any time during a game, you can pause the action by pressing the Return key. To resume the action, press Return again. Pressing the Esc key stops the action and brings up the end-of-game menu. At this point you can play a different game or quit. If you decide to resume the game you were playing, select Same Game. This restarts the interrupted game from the exact point where it was paused.

A few hints: Time your jumps carefully. A miscalculated jump often gives points to your opponent. To land on top of your opponent, you must jump as he is descending. If you time it precisely, you can try to jump as soon as he leaves the basket after scoring. If you're lucky, you can eliminate the two-point deficit and create a swing of two or more points in your favor. This is possible because the other player can't move until he stops bouncing. This gives you enough time to bounce on his head more than once. Keep an eye on the clock, and don't forget to make one last scoring attempt just as time runs out.

### Notes For Programmers

Basketball Sam & Ed is written in TDI's Modula-2 along with some machine language routines. The

program requires a larger stack than the 8192-byte default. The stack size should be 9956 bytes or more. It can be set before linking by using the Modula-2 desk accessory or after linking with the stacksiz utility. The optimization button on the Modula-2 desk accessory should be clicked on before linking.

There are three additional modules which must be linked to the main program. These are contained in the SAMED.LIB folder on the magazine disk. These modules can be linked by setting the query options in the desk accessory and selecting the appropriate file when requested or by adding the SAMED.LIB directory to the M2 paths list in the Modula-2 desk accessory.

Two possible errors you may encounter are File Not Found and Out of Memory. File Not Found occurs if the main program cannot find the data file. If this happens, make sure both programs are in the same folder. Out of Memory occurs if there isn't enough room to load the data file or for the graphics routines to expand the images. Normally, you will only see this error if you have too many desk accessories installed. If you see this error, reboot and make sure there are no desk accessories or ramdisks installed.

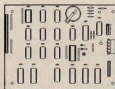
Incidentally, the sound effects in Basketball Sam & Ed were designed with "Sound Editor," a handy utility found elsewhere in this issue. **ST**

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Every issue of COMPUTE's Atari ST Disk & Magazine includes a 3½-inch micro-floppy 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 then 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 as usual. Or you can use the custom disk 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, color or monochrome.

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

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 are 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 a runnable 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 a runnable program, you'll be alerted to this fact.

Note that many files on the disk require special instructions or explanations; 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. These files do not appear on the disk menu itself. Do not delete them 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, with royalties according to the volume of sales, we ask that you respect the copyright.

## Special Notes

"Basketball Sam & Ed" cannot be run from our disk menu. Instead, run it from the GEM desktop like any other program as described in the article. We elected to disable "Basketball Sam & Ed" on the disk menu because there isn't enough memory in an unexpanded 520ST for both the game and the menu program. The game works fine on a 520ST if run from the desktop with no desk accessories.

"Sound Editor" can be run from the disk menu, but after exiting the program you'll see an alert box with the message *Can't run SEDIT.PRG*. The message is meaningless and can be safely ignored. It doesn't appear when "Sound Editor" is run from the GEM desktop.

Because there is no free space on this issue's disk, do not attempt to create any files on the disk with "Sound Editor," "Personal Spelling Checker," or "Desktop Printer Controller." We recommend copying these programs to another disk before use.

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IBM-EGA screen shown.

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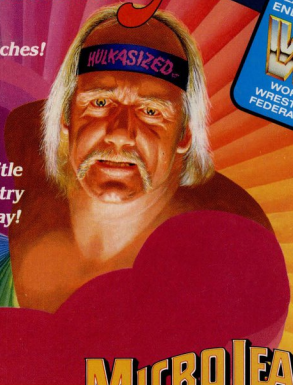
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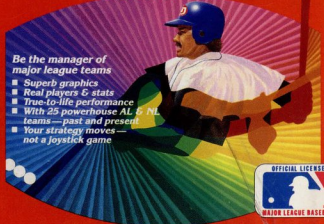
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