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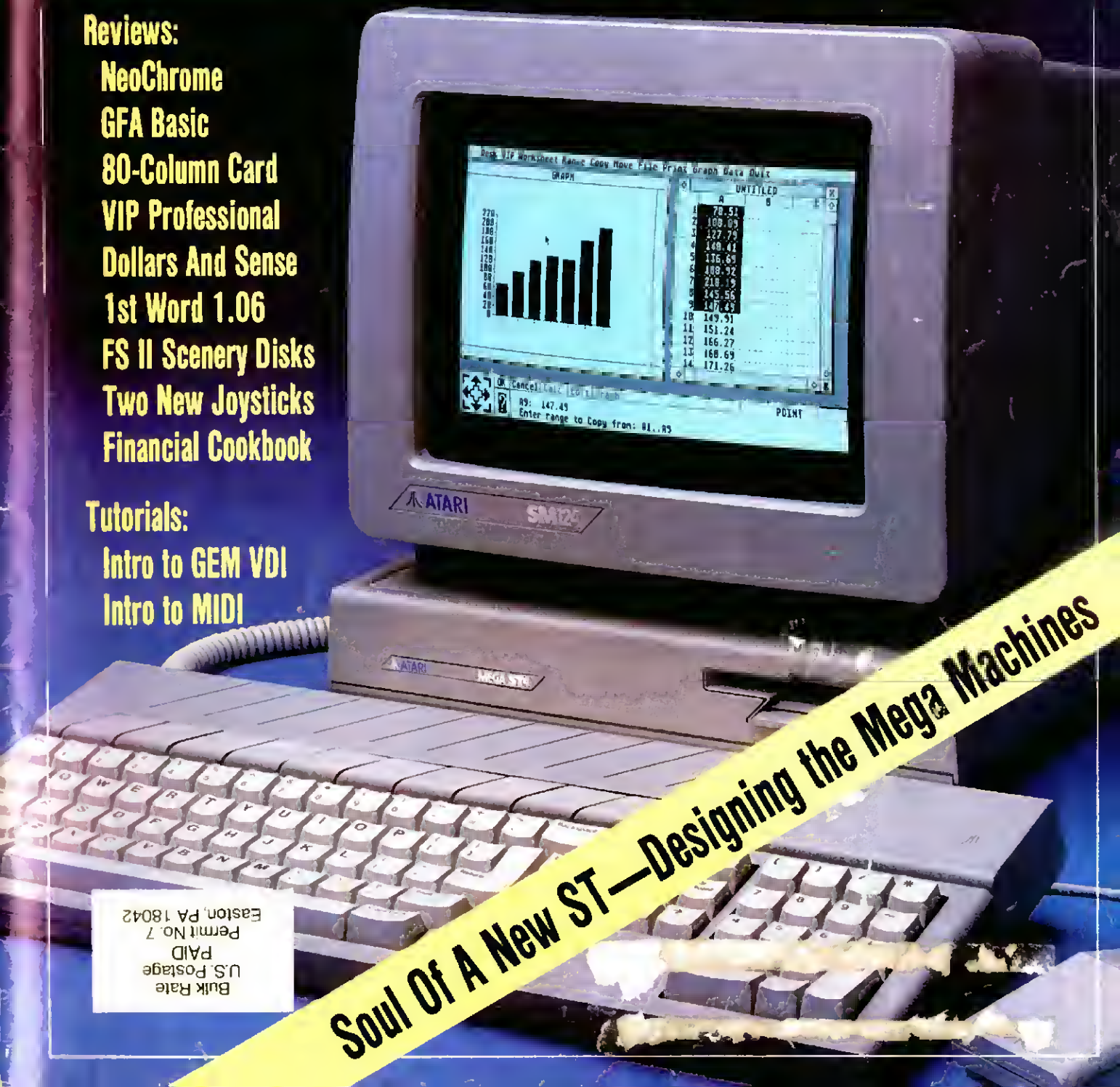
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Dave Staugas and Jim Eisenstein

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- GFA Basic
- 80-Column Card
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- Dollars And Sense
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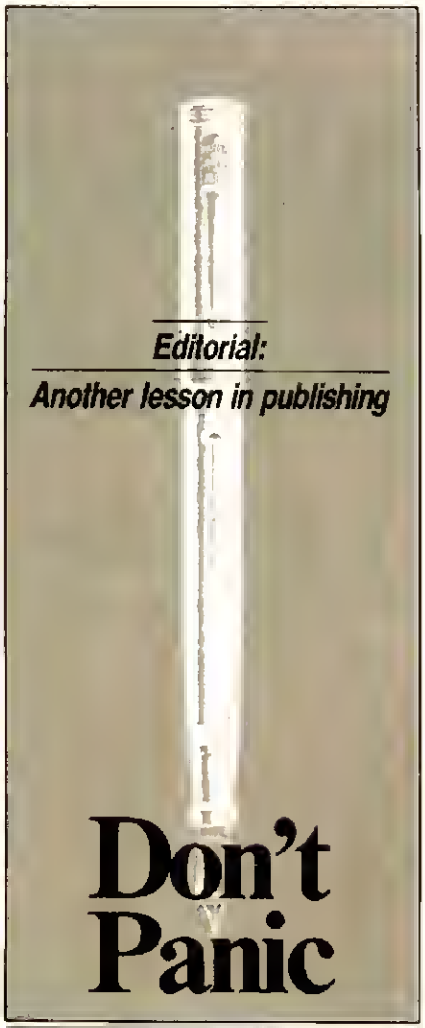
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Editorial:

Another lesson in publishing

Don't Panic

By BETSY STAPLES

If you are among our more observant readers, you have probably already noticed that on the cover of this issue—right where you expected to see "March/April 1987"—it says "Spring 1987."

"Aha!" you might have said to yourself or whoever was standing nearby when you picked up your copy, "I knew they couldn't keep it up. They promised us a bimonthly magazine, and now after only three issues, they're reverting to their slothful quarterly ways."

Well just hold on a minute and let me explain; I'm going to share some our family secrets with you and give you another brief lesson in magazine publishing.

You may remember that in the September/October issue Publisher David Ahl promised a bimonthly (every other month) publication schedule. "We will be making up about one week per issue until subscribers are receiving the current issue during the first week of the cover date, e.g., the March/April issue would be mailed the first week of March," he said.

Well, this is the March/April issue, and I'm sure that even those readers who are frequently outwitted by inanimate objects can see that it was not mailed during the first week of March.

The simple truth of the matter is that we have discovered that it takes our very small (but extremely competent) staff eight full weeks to put one of these little magazines together. We have been working harder than we ever have before—sometimes 'round the clock, it seems—and still that catch-up week eludes us.

"So what's the big deal?" I hear you saying. "Who cares what's printed on the cover; just keep those magazines coming at regular intervals."

In a way, it isn't a big deal—not to the reader, anyway. It may make you feel smug to receive a magazine dated May/June when the daffodils have only begun to push their heads up through the partially frozen mud, but if you think about it for a moment, you realize that the content of the magazine you receive in April will be the same, whether the cover says March/April, May/June, or Thanksgiving.

Another Lesson in Publishing

So, then, what is the problem? The "problem" is with the people who sell the magazine to those of you who have not yet signed on as subscribers. For reasons I don't pretend to understand, the managers of newsstands and bookstores (usually *not* computer stores) that carry magazines need that feeling of smugness; they need to feel part of the *avant-garde*. Magazine dealers, it seems, are offended by the presence of magazines that bear the name of the month in progress; when they enter their stores on the first of May, newsagents across the country will purge their racks of all magazines not dated June, or July, or Thanksgiving. Irrational? Perhaps. But that's the custom.

If you are following carefully, you have already deduced that a bimonthly magazine dated March/April that comes off the press in early April will not enjoy a long sojourn on the stands. The newsagent or bookseller will call "time's up" on May 1, count the number of copies remaining, shred them, and take a large credit on his bill. Which does not make good economic sense for the magazine publisher.

What To Do?

Faced with this situation and faced with the realization that "catching up" was not in the cards, we devised a plan that we hope will satisfy all concerned.

The issue you hold in your hands has been named Spring 1987 and advises newsagents to "Display until June 1," by which time we will have shipped Summer 1987. That Summer issue will be on sale until August 1, when it will be replaced by September/October 1987, and we will finally be back on schedule.

Have you got that? I hope so, but if not, just remember one thing: Don't panic. We are still a bimonthly publication, and we hope that this temporary change in cover date will help us to serve you better.

None of this, by the way, will have any effect on your subscription. The length of your subscription is determined by number of issues, not by cover date.

So that's my lesson in publishing for this month; stick with us, and before long you'll be able to start your own magazine. ■

SPRING 1987

ATARI EXPLORER

THE OFFICIAL ATARI JOURNAL

FEATURES

18 NeoChrome/*Anderson*
Atari's updated graphics program for the ST offers a wealth of features.

24 Soul Of A New ST/*Jainschigg*
We take our first look at the new machines and talk to the people who designed them.

28 The 65XE Game System/*Jainschigg*
Atari introduces a sophisticated, high-end game system designed to attract gamers to the world of personal computing.

REVIEWS

30 Atari XEP-80 Revealed/*Jainschigg*
A new 80-column interface module offers increased flexibility to owners of all 8-bit Ataris.

34 1st Word 1.06/*Staples*
The updated version of Atari's own word processor provides a painless entry point for the beginner and lots of features for the experienced user.

37 LabelMaster/*Ahl*
Design your own labels and maintain your mailing lists with the latest release from Migraph.

38 Flying The Scenic Skies/*Kunkel and Katz*
A look at some new accessories—hardware and software—for SubLogic's Flight Simulator II.

41 Finaneial Cookbook/*Eddy*
Electronic Arts gives you an opportunity to put your money where your mouse is.

42 Golden Oldies/*Ahl*
This disk full of classics—Adventure, Eliza, Life, and Pong—gives new computerists a sense of perspective . . . and fun.

44 Dollars And Sense/*Ahl*
The newest version of this popular financial record-keeping and analysis program offers some useful extras to ST users.

58 Software Survey/*Ahl, Eddy, and Teverbaugh*
World Games, Mail Order Monsters, Theatre Europe, Ogre, Wanderer, Skyfox, Super Cycle, and surprise!—a new joystick.

PROGRAMMING

21 Puzzles & Problems/*Ahl*
How many of these can you solve?

40 Big Printer/*Jainschigg*
Make fancy banners with your Atari—8-bit or ST.

47 Try This!/*Ahl*
Palindromes: For those who like to end at the beginning.

50 Introduction To GEM VDI/*Cockroft*
Part 3: A look at polymarkers, alpha mode, graphic text, and "writing mode."

64 Languages/*Anderson*
GFA Basic: The first Basic to make a case for programming in Basic on the ST.

80 ASDR Generator/*Jainschigg*
Turn your 8-bit Atari into a polyphonic synthesizer.

DEPARTMENTS

2 Editorial/*Staples*
Don't panic! We're not going quarterly.

4 Letters To The Editor/*Readers*
Update from JACS; more on baseball; about the mail; and what ever happened to AMY?

6 Question Mark/*Jansen*
Atari's technical support guru answers your questions about Atari computers.

8 Inside Atari/*Jansen*
An interview with Dave Staugas and Jim Eisenstein, creators of NeoChrome.

11 News & Views/*Ahl*
Optical disk standards; the Lotus suit; and car ads on disk.

12 Bottom Line/*Ahl*
VIP Professional offers a very reasonable facsimile of Lotus 1-2-3 with the added convenience of the GEM interface.

15 Technology/*Ahl*
Floppy disk cameras; superconductivity; and a look back at memory.

16 Atari Classroom/*Staples*
The New Technology Coloring Book helps students understand technological concepts.

70 New Products/*Staples*
The newest hardware and software for your ST or 8-bit Atari.

72 Teletalk/*Anderson*
Braiders of the compressed .ARC; CP/M for the ST; news from Delphi; and an in-depth look at Genie.

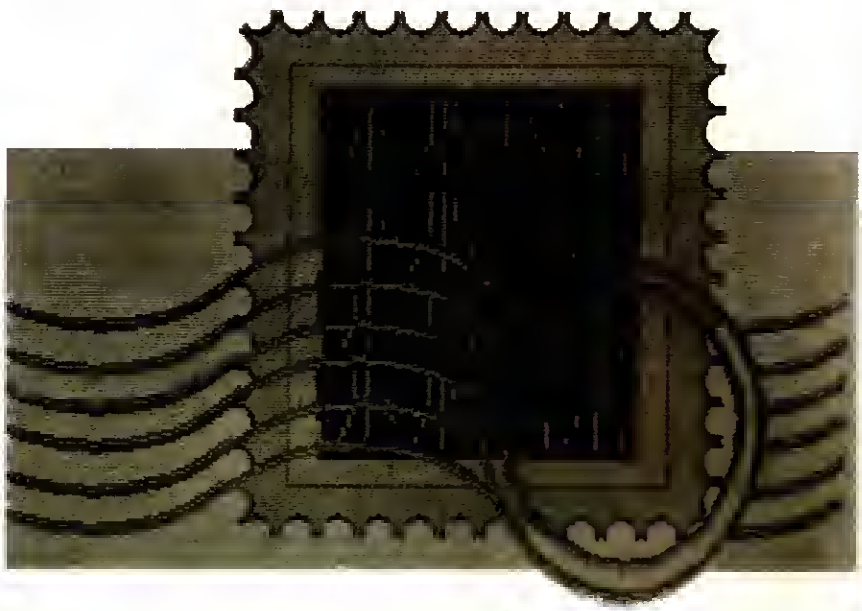
75 Homefront/*Farmanfarmaian*
Setting up a home business with your Atari.

78 Sound Chip/*Jainschigg and Swanson*
Part 2: A nuts and bolts guide to MIDI.

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Letters To The Editor

More On Print Shop Graphics

Dear Editor:

I would like to thank *Atari Explorer* for mentioning the JACS *Print Shop* graphics disks volumes 1, 2, and 3 in your September/October 1986 issue.

Unfortunately, we were not prepared for the tremendous response the article brought, and some of your readers may have experienced a delay of up to ten weeks in receiving the disks they ordered. I apologize. The club member who was in charge of sending out the disks was overwhelmed by the responses, and he has fallen behind in filling the orders.

We have now enlisted more help from within our membership to remedy the problem and have set a new goal of two weeks from receipt of the order to mailing.

If any of your readers have waited more than ten weeks for their disks, they should write to us at:

JACS
Graphics Disks
P.O. Box 710
Clementon, NJ 08021

We are currently completing volume 4 of the *Print Shop* graphics, and all registered purchasers of the earlier disks will be notified when it is ready—which should be sometime in April.

Forrest Blood
President
Jersey Atari Computer Society

Thanks for keeping our readers informed. Now if only you readers would overwhelm our advertisers with similar volumes of responses, letting them know, of course, where you saw their ads, we would be able to increase the size of Atari Explorer and provide more reviews and articles for all to enjoy.

Update for Baseball Fans

Dear Editor:

I have had an Atari computer since 1981. I use it for my business and at home for recreation.

Your Jan/Feb issue had an article on baseball programs for the Atari. I have bought all the programs that were reviewed in that article, but the only one that I found to really simulate a good baseball league and the management of different teams was not even listed. *Monday Morning Manager* from TK Computer Products (P.O. Box 9617, Downers Grove, Il 60515) is by far the best in the field, and the company seems to support the Atari computer line quite faithfully.

MMM lets you manage your favorite teams, create teams, compile season records, make trades, maintain statistics for your own softball or little league team, print out rosters and box scores, and print out league leaders in numerous categories. All these options are on one disk.

I don't wish to sound like I own stock in TK Products, but I don't think you did your readers a service by not including a review of *MMM*—especially those who are real sports fans and want an accurate simulation instead of a fancy pong game disguised as a baseball program.

It is hard to purchase this program, because you don't find it advertised like the programs of larger software publishers, but you would be doing the computer-sports fans a favor by letting them in on this. Thanks for putting out such a top magazine.

Dan Gustwiller
1208 Fallen Timbers
Defiance, OH 43512

You provide the reason for our oversight in your last paragraph: at the time the article was written we did not know about the program. We did, however, receive a copy recently, and hope to run a full review in an upcoming issue.

First Class Publication?

Dear Editor:

It was worth the wait for the Jan/Feb issue of *Atari Explorer*. The issue proves that you want to bring as much information as you can to the reader. The "Comdex" and "Atari Solutions" articles were the best of all.

I congratulate you on a job well done, and I can't wait for your first class mailing permit.

Greg Jones
Star Rte. 3, Box 30B
Owego, NY 13827

Thanks for the compliments. We want to get Explorer to subscribers as quickly as possible, too; we know that under our current third class permit, it can take magazines several weeks to reach the West Coast. While first class isn't an option, we plan to have an application for second class mailing pending by the time you read this. We had to wait until we had published four issues on a regular schedule before we could apply—and this is number four. Don't start looking for your next issue too soon, however; the application process will probably take some time. Just be assured that we are doing everything we can to get Atari Explorer to you in a timely fashion.

Once in Love With AMY

Dear Editor:

I have just finished reading "Who Are You?" in the Jan/Feb issue. Since your survey showed little reader interest in music articles, reviews of music systems, or the "Sound Chip" column, it would follow that little in those areas should appear in your new magazine. I think that decision would be a mistake, and I am writing to tell you why.

The survey does not reflect a lack of interest in being able to write and perform music by computer users. It reflects a lack of hardware and software support for computer sound capabilities by Atari Corp. Atari owners were promised the AMY chip and were given nothing.

Will this policy now be used to justify continuing lack of support in Atari's official journal? Instead, why doesn't Atari get the AMY chip into production as a peripheral for both 8- and 16-bit computers, and why don't you support the sound and music capabilities of Atari computers—not only for present Atari owners but to attract potential buyers?

Benjamin P. Clark
821 Rush Creek Rd.
Spencer, WV 25276

There is currently an enormous body of software available that will do everything from composing to printing out scores using the internal sound capabilities of the 8-bit systems. Among the most popular packages are Bank Street Music Writer from Mindscape, Music Construction Set from Electronic Arts, Music Studio from Activision, and Atari's own Music Composer.

Other manufacturers, including Kawai and Hybrid Arts, offer software and inexpensive hardware add-ons that permit the 8-bit machines to be attached to a wide variety of MIDI-compatible musical instruments. These range from such inexpensive full-featured synthesizers as the Casio CZ-101 to relatively expensive professional systems like the Yamaha DX-7D and others.

All in all, the music capabilities of the 8-bit machines seem to be well provided for by these products—and more come out every day. Which is not to sidestep the AMY issue. The AMY chip is, in fact, currently being tested by a third-party developer, but no date has been set for its release.

As for the ST line, there are already quite a few products on the market that take advantage of the superior music and sound capabilities of the 16-bit machines, and Antic will soon release its very promising Sound Workshop for the ST, which lets you do real-time synthesis and incorporate the results in your programs.

And we have no plans to abandon coverage of music hardware and software in these pages; it would be folly to ignore the outstanding sound capabilities of the entire Atari line. The level of interest indicated by the survey simply caused us to pull in on the reins of certain staff members and contributors who wanted to increase our coverage of music topics to an extent that appears not to be warranted at the moment.

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Atari's Technical Support guru answers your questions about Atari computers

Question Mark



By MARK JANSEN

Welcome to Question Mark. That's me—Mark Jansen—Consumer Technical Support representative for Atari. Each month, I answer hundreds of letters and calls requesting information about Atari hardware and software products—questions ranging from the simple to the obscure. Starting with this issue of *Explorer*, I'll be taking the most commonly asked questions and providing clear, usable answers in this space. If you have a question (or a handy tip) regarding Atari computers, send it to me at: Atari (U.S.) Corp., Attn: Question Mark, P.O. Box 61657, Sunnyvale, CA 94088.

Q I would like to learn Pascal with my Atari ST. Are there any good tutorial books available?

A To our knowledge, there are no ST-specific books on Pascal programming currently available. However, because Pascal syntax is fairly standard, you should have no difficulty learning Pascal from a general-purpose textbook on the subject. Two popular books on Pascal programming are: *Programming In Pascal, Second Edition* by Peter Grogono (Addison Wesley, 1980) and *Oh! Pascal!, Second Edition* by Doug Cooper and Michael Clancy (W. W. Norton, 1985).

If you have not already purchased a Pascal compiler for your ST, take a look at Personal Pascal from Optimized Systems Software (1221B Kentwood Ave., San Jose, CA 95129), which sells for $74.95, and MCC Pascal from Metacomco, plc (26 Portland Square, Bristol, B52 8RZ, England), which sells for $99.95. The most recent upgrade of the latter should be available about the time you read this.

Q I have the version of *STWriter* that was distributed for the ST in 1985. I would like some additional features and capabilities. Are there any later versions?

A The "original" *STWriter* that was distributed by Atari has been in a continual state of revision outside the company. The latest version can be found at local user groups, as well as on the Atari Base BBS at (408) 745-5308.

Q None of the printer drivers on the *1st Word* disk works properly with my printer. What can I do?

A The *1st Word* distribution disk contains drivers for many popular printers, and additional drivers are widely available in the public domain. Many Atari dealers and user groups have amassed collections of *1st Word* printer drivers in their libraries. If you are unable to find what you need there, the Atari Base BBS—(408) 745-5308—has collected a number of printer drivers (written mostly by *1st Word* owners) and makes these available free for downloading via modem.

If you don't have access to a modem, you can get these printer drivers from Atari Customer Relations in printed form. If we have a driver appropriate for your printer, we will be glad to send you a copy. If your printer is listed below, you can request the driver by writing to Atari Customer Relations at the address listed above. Please write: Attn: 1st Word Printer Drivers on the outside of your envelope.

Be sure to specify the brand and model of your printer. When you receive the driver, type it into a text file using *1st Word*, and install it according to the enclosed instructions.

Drivers are available for the following printers:

- ASCII, is a "plain vanilla" printer driver
- Atari SMM804
- Brother HR15
- C. Itoh Prowriter
- Epson RX-80, LX-80, FX-80, and FX-85
- HP Thinkjet (in normal or alternate mode)
- IBM Proprinter
- Micro Peripherals 165
- NEC P2/P3, P6/P7
- Okidata 92, 192
- Panasonic KXP-1092G
- Qume
- Riteman (Model number not specified by author. Caveat emptor!)
- Star Micronics SG-10, NL-10, and Gemini 10X
- Toshiba P321

The ASCII, SMM804, and Qume drivers may be included on your original *1st Word* disk, and the Prowriter, Okidata, Star, and Toshiba drivers exist in several versions.

Please note that these printer drivers were not written by Atari, so we cannot guarantee that all of them work perfectly. If you find a bug in one, let us know so we can try to improve it.

If you need a driver that is not listed here, you may want to leave a message on Atari Base, asking if anyone has it. Also, if you have obtained a *1st Word* printer driver that you are sure is in the public domain, please upload it to the BBS.

Q What is a modem? What does it do? How much does it cost? What benefits does it provide?

A A modem is a device that lets your computer communicate with other computers over the phone lines. Short for modulator/demodulator, a modem accepts data from your computer and translates it into a fluctuating signal that can pass over the phone lines like any other sound. At the other end of the line, a second modem converts the signal back into binary form so that another computer can understand it.

Special software in each computer (called "telecommunications" or "terminal" software) is used to help manage the communication process, much as your word processor helps you use your printer conveniently.

Any kind of data can be transmitted via modem: documents composed on your word processor, spreadsheet files, mailing lists, graphics, even executable programs. What's more, *any* two computers can "talk" via modem, even though they may be incompatible in every other way. This does not, however, mean that they will be able to make use of the data they receive from one another: an Atari 130XE, for example, could never execute a machine language program transmitted to it by an Atari ST. However, certain kinds of data—notably, data composed solely of letters, numbers, and punctuation (like word processor text files)—can be readily transmitted and shared between computers, regardless of brand.

Once you have a modem, you can communicate with other computer users through "electronic mail," and retrieve the latest stock quotes and other news from telecommunications services. These range from local Bulletin Board Systems, which are generally free and run by individuals or user groups, to large commercial networks like CompuServe, Genie, and BIX, which charge an hourly fee for "connect time."

Among the other kinds of information these services provide are programs that you can "download" with your modem, save on disk, and run on your computer. The Atari Base BBS, run by Atari Corporation, has more than 400 programs available for downloading, free of charge. All you pay is the phone bill.

Modems range in cost from fifty to several thousand dollars. The Atari XM301, at $50 retail, is an exceptional value. This modem comes with a complete telecommunications program, full instructions, and coupons entitling you to free connect time on several national information services. The XM301 is designed to work with any Atari 8-bit computer that has a disk drive. (Note: the Atari 1200XL requires slight modification before it is compatible with the XM301 modem. Contact your Atari Service Center for details.)

The Atari SX212 modem, set for release during the first quarter of 1987, will be priced under $100. It is four times as fast as the XM301, and is compatible with the industry-standard Hayes Smartmodem. This means it can be used with a wide range of software already available for use with Atari computers and Hayes modems. The SX212 is hardware-compatible with both Atari 8-bit and 16-bit systems.

Q I am using *1st Word*, which came with my ST when I purchased it. I understand that there is a newer version. How do I get it?

A The latest revision of *1st Word* is version 1.06. If you received anything earlier than 1.06 with your machine, you can get the latest version, along with a new and significantly improved manual, by sending your original *1st Word* disk, along with a check or money order for $9.95 plus $2.50 to cover shipping to: Atari Customer Relations, Attn: 1st Word 1.06, P.O. Box 61657, Sunnyvale, CA 94088. Include a note specifying that you want the *1st Word* v1.06 upgrade. ■

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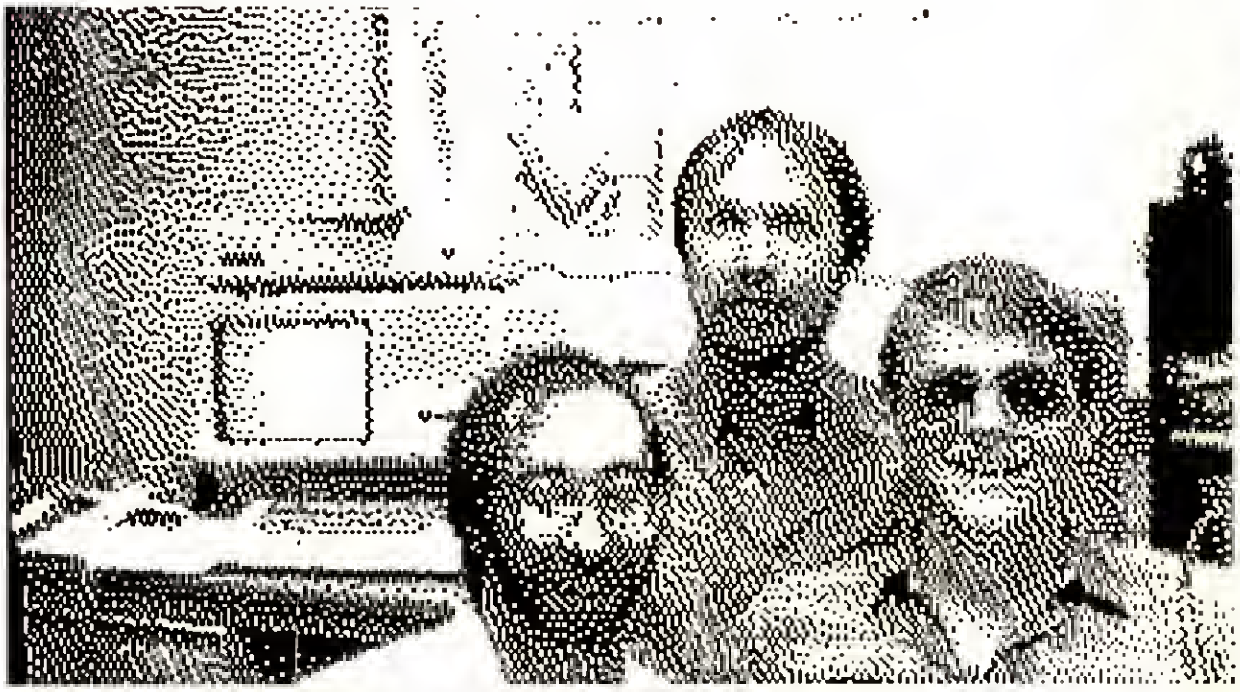
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The Creators: (left to right) Jim Eisenstein, Dave Staugas, Jerome Domurat.

An interview with Dave Staugas and Jim Eisenstein, creators of NeoChrome.

Inside Atari

By MARK JANSEN

Software engineers Dave Staugas and Jim Eisenstein started out as game programmers. They met at a company called Exidy, remembered now for an early personal computer called the Sorceror and for some memorable first-generation arcade classics (including Venture, which Staugas wrote).

From Exidy, the team moved to Atari, where they wrote games and other software for the 2600 and ColecoVision game machines and the 800-series computers.

At the new Atari, Dave and Jim form the core of research and development efforts in computer graphics. Dave's most recent claim to fame is *NeoChrome*, Atari's paint program, which was produced in collaboration with Jim and with Jerome Domurat, a graphic artist.

Early versions of *NeoChrome* were bundled with the ST, forming part of the basic suite of software that helps new ST users get comfortable with the machine and demonstrates some of its graphic power. A new, enhanced version of *NeoChrome* has recently been released in its first commercial incarnation (see the review of *NeoChrome* elsewhere in this issue).

NeoChrome began as an in-house tool, intended to produce art on the ST and probe the power of the ST graphic hardware. But Dave saw the program as more than that. In the end, *Neo* underwent a cycle of revision and improvement—bug fixes, added features, new approaches to old problems—and became a truly intuitive, fast, and friendly paint program, which will continue to grow with the ST.

Dave and Jim recently found time to sit down with me and discuss the past and future of *NeoChrome*. The conversation went like this . . .

MJ: What was your first exposure to the ST?

DS: When we got the first ST prototype up and running in an office in January of 1985, we had to design the "boot screen" that asked you to insert your

system disk (this was before we had the operating system in ROM). I knew it was a great machine, and I started playing around with it. I was really impressed with the speed and power of the hardware, and I wanted to take advantage of it. I thought it was a shame that most people wouldn't be able to see how superior the hardware was, so I wanted to do something that would really show it off.

MJ: How did *NeoChrome* come to be?
JE: Early on, we had been asked to write the specifications for a paint program that we wanted to call ZippyPaint, but we didn't really start *NeoChrome* until we were designing the boot screen. We realized pretty quickly that we were going to need some tools.

MJ: What thoughts went through your head as you started to "get your feet wet" with the ST?
DS: I thought, "It's a shame, we're going to the show (the Hanover Fair in West Germany), and we don't have any software, and people will have no idea what a great machine this is."
JE: That's true. We thought it was a fantastic machine, and Dave wanted to show off its potential, but there wasn't yet anything you could do with it. We needed some software.
DS: There were all these Atari 800 pictures around that Jerome had done, like a snake, a bee, and a guy walking a centipede. I figured out how to transfer those to the ST, but then I wanted to touch them up to show the enhanced resolution of the ST. I wanted to make use of Jerome's eye to make the improvements on the pictures, but we needed a tool. *NeoChrome* was a natural—there was a big vacuum there.
JE: Jerome needed a tool, Dave wanted to do a tool, and I had to do the boot screen—that's the story. Dave did what he wanted to, and I had to do the boot screen. Actually, I enjoyed it, and Dave helped a lot.
DS: *Neo* started off as a primitive pencil to change individual pixels on the screen, with a zoom window to show the image close up—a "fatbits" window. At that time, I called the program "Fat" in honor of the fatbits.
JE: But when we found out that the file table on an ST disk was also called a FAT (File Allocation Table), we needed a new name.

MJ: Who came up with the name *NeoChrome*?
JE: Dave and Jerome wanted to call it "Neo," and I wanted to call it "Chroma." Somebody else wanted to call it "ST Color Paint." Actually, I think Ira Velinsky came up with the name *NeoChrome*.
DS: I wanted a three-letter name. Fat was nice because I could fit that into the three-letter filename extension.
JE: I don't really know exactly where the name came from.
DS: We were all in Jim's office, throwing out names, and somehow *NeoChrome* came out of it. It was a collaborative effort.

MJ: How long was it from the time you first wrote Fat to the time *NeoChrome* 0.5 was released?
DS: I started Fat around February of 1985 and pulled a couple of all-nighters to get enough of it together so that Jerome could get good pictures drawn. Then I wrote the slideshow program to display them at the upcoming Fair in Hanover. That was probably in mid-March. By October or so, *NeoChrome* was out.

MJ: During the time before *Neo* was officially sanctioned, what were your assigned projects?
JE: We were putting the ST operating system together.
DS: . . . and Jerome designed the three system fonts with a tool I created.
JE: Any time a graphics tool was needed, Dave would work all weekend, stay up all night, and throw it together.

MJ: Which features of *NeoChrome* were the most difficult to implement?
DS: Well, having the half and full screen has caused me a lot of grief. Being able to work in both full and half screen, where half screen shows the fatbits area simultaneously, was tricky. That has been a foundation of the program from the beginning. I tried a lot of things before I found a way to use some of the facilities of GEM and still get my little interrupt-driven things going.

MJ: Why does *NeoChrome* support only low-res?
DS: I needed to concentrate on one resolution, to optimize speed in that resolution.
JE: Monochrome graphics you could get on a Mac. Four colors you could do on a PC. We wanted to do something new. Jerome wanted a 16-color paint program. That's where he put the emphasis. Dave was doing a tool primarily for Jerome, who wasn't especially interested in the four-color mode. The impressive stuff was going to have 16 colors.
DS: *NeoChrome* was designed for speed, and to get maximum speed, you sacrifice the generality of support for all resolutions. *Neo* has been "hard wired" to support low resolution.
JE: There are other paint programs that handle all resolutions pretty poorly. We didn't want to be Jack of all trades and master of none.
DS: With *NeoChrome*, we have mastered low-res.
JE: I think *Neo* is a great paint program. Look at the paint programs available for the PC; they are still impossible to use. Even some other paint programs for the ST are more difficult to use than they should be. *NeoChrome* is intuitive.

MJ: How did you choose the user interface for *NeoChrome*?
DS: It was basically the trick with the horizontal interrupts and the magnify window that is always on. Because the program is based around the magnify window, you really need to have a certain amount of space in which to put it.
JE: The important thing is the speed of the program and its interface. If we couldn't make a feature fast, we didn't make it. Poor software can bring even

"Any time a graphics tool was needed, Dave would work all weekend, stay up all night, and throw it together."

the ST to its knees. Jerome had a lot to do with fine-tuning the user interface.
DS: Basically, I would program something, and I'd take it to Jerome, and he would say, "this feels good" or "no, I don't like the way this feels."
JE: "Why did you do it that way? Try doing it this way." Things like that.
DS: Jerome helped develop the user interface. Jerome is a very opinionated guy, and he never hesitated to express his feelings about how *Neo* should work.
JE: And Dave would listen to him.
DS: Sometimes we had arguments . . .
JE: We had a lot of arguments. All three of us would get together and argue, which is usually what happens with a really good product.
DS: There's passion there.
JE: Some programmers have very fixed ideas about what they are going to do and how they are going to do it. Dave is very responsive. Although occasionally he isn't—like the zoom window is not going to change . . .
DS: That was non-negotiable.
JE: But with everything else, I think he was probably more flexible than anyone I've ever worked with.
DS: Jim is very persuasive in the way he presents things, and he really knows what he's talking about.
JE: Sometimes I'd just say, "If you don't do it, I'm not going to talk to you!" That doesn't usually work. If you can't come up with a decent reason for changing something, why change it?
DS: I had the luxury of having guys like Jerome who would really beat on *NeoChrome* and find bugs like no one else could. There are very few guys like Jerome who have both artistic talent and technical expertise.
JE: What is really amazing is the Jack Knife feature, which allows you to cut out a chunk of the image and move it behind the rest of the picture. Jerome just said, "wouldn't it be neat if you could do this?" And I said, "yeah, you could probably do that, but Dave will never go for it, because he's up to his neck in other things." But Dave said, "sure, we can do it." Then I came up with a really fast blit to make it possible . . . to do the cookie-cut.

MJ: Didn't you do the bouncing ball demo for the ST?
JE: Yes. I designed a custom blit for it—the fastest kind of blit I could have.

"If you pick up a pencil, you don't think about it, you just draw with it."

I did some really bizarre things to make that work. I used *Neo* on that one, too. We use *Neo* for everything around here.
DS: Even to debug things.
JE: We used *Neo* to debug the graphic parts of the operating system. That is why the blitter will work with anything: *NeoChrome* showed us the problems we were facing right away.
DS: *Neo* pushes the system to its limits in some ways, really exercises it. The slideshow program also uses some tricks. You can barely do the two-screen wipe effect using a blitter chip, and Neoshow does it without the blitter.
JE: Yeah, you can't do it as fast with a blitter as Dave can in software, because he's cheating like hell.
DS: It was a flash I had one day that took weeks to implement.

MJ: Your goal was to insure everything *Neo* did, it did well, correct?
JE: It had to feel like a natural tool. A lot of things you do on computers are very awkward. That's not the way they should be. If you pick up a pencil, you don't think about the pencil, you just draw with it. You use some paint programs and you can't even find the tool you want, and when you get it, it doesn't *feel* anything like a real tool does.
DS: It took quite a while to get things like the circle to work well and fast. There are plenty of little things like that in the program that we really worked hard on, that users will take for granted.
JE: Doing Jack Knife in color wasn't easy. Jack Knife is the trickiest code I have in there. I figured out how to do it over the course of about three months. Fast scaling was pretty tricky, too. A lot of work went into *Neo* that most people will never know about.

MJ: Where did the name Jack Knife come from?
DS: Oh, our fearless leader.
JE: Yes. That was a natural.

MJ: Now that *NeoChrome* v1.0 is out, what are your responsibilities?
DS: I'm working on the Atari laser printer.
JE: I'm working on the blitter, but Dave and I will probably get together again and do a project.
DS: I have some more ideas for *NeoChrome* . . .
JE: *NeoChrome* has a lot of room to grow. Its speed is still unique, and with a laser printer, there are all kinds of possibilities.

MJ: What new product for the ST are you most excited about?
DS: The laser printer has a lot of potential.
JE: It's so inexpensive . . .
DS: Every ST ever made has the DMA port, which can service a laser printer. That fact alone is remarkable.
JE: It will be a standard printer for the ST. For less than price of a normal laser printer, an Atari buyer can get a computer *and* a printer. Even if you ignore desktop publishing for a minute, there are a lot of other things you can use a laser printer for that you couldn't justify with the old prices for laser printers.

Think about generating forms with the ST and a laser printer, for example. Instead of keeping a stock of a million different forms, you can just sit down and design one when you need it. A low-cost laser printer is really exciting.

MJ: Somewhere I heard that you guys were involved in choosing the "busy bee" icon to show when the ST is busy. What's the story?
JE: We worked hard on that one. Actually, it was Jerome. First, we thought about having a Buddha, but thought that was too esoteric. We didn't want to have an hour glass or a watch, because that would make it looked as though the machine was just making you wait, as opposed to doing work. We joked about having Z's, because we figured, "who would have Z's? That would mean you might as well go to sleep, the machine was so slow." We thought Z's would be terrible, but another computer company thought otherwise. Anyway, Jerome came up with the busy bee to indicate that the machine was busy, not just making you wait.
DS: I liked the bee because Bea is the name of the woman I love.
JE: . . . and I liked it because it wasn't. ■

Optical disk standards, the Lotus suit, and car ads on disk

News & Views

By DAVID H. AHL

A group of 17 U.S. and Japanese companies has proposed a disk format standard for 5.25" write-once optical storage systems. The standard, called the composite/continuous format, utilizes a self-clocking encoding scheme to continuously track the head across the media. Also included is Reed-Dolman error correcting code for longer distances. Major companies supporting this standard include Hewlett-Packard, Western Digital, Emulex, Hitachi, Fujitsu, Matsushita, Mitsubishi, NEC, Sanyo, Sharp, and Toshiba.

A competing standard was previously proposed by Philips-controlled Laser Magnetic Storage International and Sony. Their system is called sampled servo, and requires that the head alternately cross a field of data and a coded servo field.

It appears that the composite/continuous format is capable of higher data transfer rates and storage capacity, while the sampled servo method may have a lower error rate and greater reliability.

A vote by a committee of the American National Standards Institute is expected in March, but that will by no means end the controversy. Optical data storage has stumbled along and made relatively little progress since the first videodises were demonstrated in 1975, and two competing standards are likely to cause further delays in product development. However, the Japanese, anxious to get some products to market, seem willing to go along with both standards, apparently believing that the marketplace will choose the better one.

Negative Impact of Lotus Suit?

Lotus Development Corp. recently filed lawsuits charging that products from two software vendors infringe on the copyright for its *1-2-3* spreadsheet software. The lawsuits charge that *The Twin* from Mosaic Software and *VP Planner* from Paperback Software deliberately recreate the user interface, look, and feel of *1-2-3*. Lotus is seeking $10 million in punitive damages from both vendors.

Broderbund recently won a similar suit against Unison World for copying the functionality of its popular *Print Shop* software.

Although the Lotus suits threaten the survival of the two defendants, their impact will surely be far reaching in the entire software industry and user community. In an effort to make products easier for users to learn and use, software authors generally try to employ similar user interfaces, use the same control keys, and follow the same protocols as other established programs. If the courts rule—as they seem to have done in the Broderbund case—that copyright covers the "look and feel" of the software, software developers will be forced to make applications different—and perhaps less easy to use—just to stay out of court.

This possibility has touched off a virulent debate over the impact of the suits on software development. "What they are saying," says Dan Bricklin, author of *VisiCalc*, "could be interpreted as meaning MS-DOS is an infringement on CP/M, and one Fortran compiler is an infringement on all other Fortran compilers. The implications are horrendous."

Jim Manzi, chairman of Lotus, feels that his suits are simply protecting intellectual property rights. Says Manzi, "While imitation is the sincerest form of flattery, in these two cases it happens to be the sincerest form of theft as well." Manzi sidesteps the issues of ease of use and commonality of user interface, while offering the opinion that protecting intellectual property rights will actually encourage innovation. "In the long run," says Manzi, "cheap imitations hurt our industry."

"In the long run, cheap imitations hurt our industry."

Soft Sell

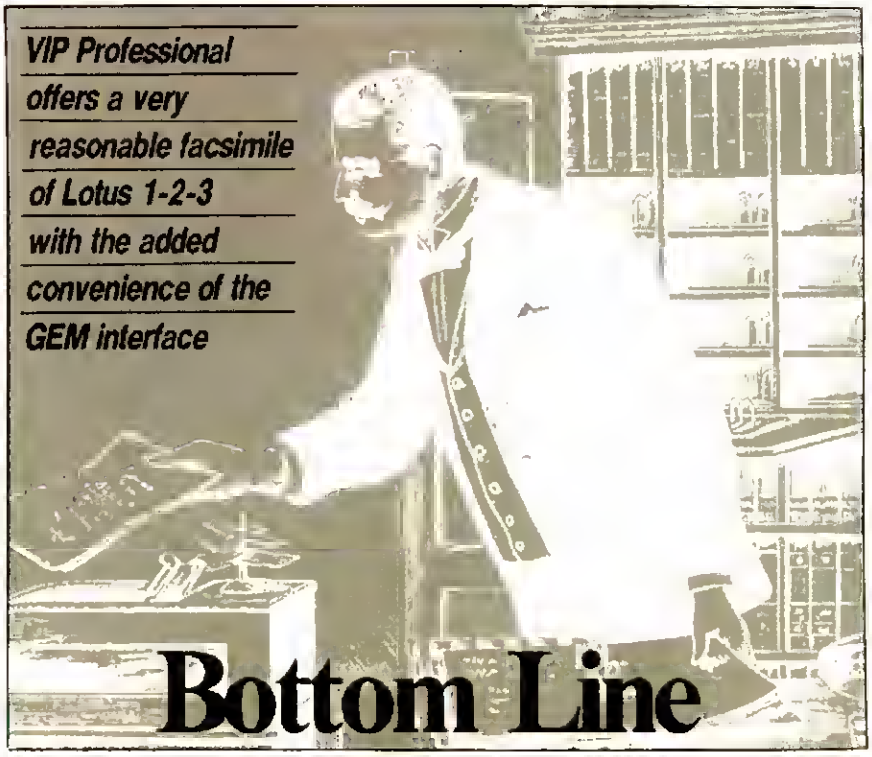
Although manufacturers have been reluctant to place ads in the various floppy disk "magazines," several companies are now releasing their own dedicated advertising floppy disks. Buick, for example, expects to distribute 20,000 floppy disks to prospective customers. The disk has animated drawings of pistons and crankshafts chugging away and shock absorbers bouncing up and down. A few keystrokes allow you to load up the truck with luggage and put stick figures representing your family in the car. You can also compare the features, mileage, standard equipment, and options of a Buick with competitors like Nissan and BMW, as well as calculate monthly payments.

Buick is on the leading edge in the use of a new advertising medium that many marketers and agencies expect to spread widely within a few years. Paula George, president of SoftAd, the Sausalito firm that designed the Buick ad, notes that "software certainly isn't the right medium for selling toothpaste, but it works well for electronic equipment such as VCRs and other expensive products that involve a complex selling message." She also notes that floppy disks reach a very desirable demographic segment of the population; most PC users are college graduates and have a median household income of more than $45,000.

So far, floppy disks are being tested mainly by marketers of automobiles and financial services, although Martin Niesenholtz, vice president of interactive media at the Olgilvy and Mather ad agency, is trying to persuade a client to create a computer disk for one of its cereal brands.

Floppy disk marketing is not cheap. The Buick Division expects that its disk will cost $200,000 or so—about what Lincoln-Mercury spent on a similar effort last year. Software ad disks are generally distributed free, although Lincoln-Mercury is considering a $3 charge for future disks. In addition to Buick and Lincoln-Mercury, you can expect to see disks later this year from Chevrolet, Merrill-Lynch, and Equitable Life Insurance. ■

VIP Professional offers a very reasonable facsimile of Lotus 1-2-3 with the added convenience of the GEM interface



Bottom Line

By DAVID H. AHL

System: Atari ST (1 Mb recomended)
Price: $249.95
Summary: Lotus *1-2-3* clone with added GEM/mouse user interface.
Manufacturer:
VIP Technologies
132 Aero Camino
Santa Barbara, CA 93117
Distributor:
ISD Marketing, Inc.
2651 John St., Unit 3
Markham, ON L3R 2W5
(416) 479-1880

VIP *Professional* is essentially a clone of the popular Lotus *1-2-3* spreadsheet/graphics package for the Atari ST. The original spreadsheet, *VisiCalc*, was written for the Apple II and fit the computer like a glove. However, the program was less satisfactory when it was ported over to the IBM PC, and a new product, Lotus *1-2-3*, which was written especially for the PC, proved to be a much better fit.

Similarly, Microsoft's *Excel* works well on the Macintosh, while other converted products are less satisfactory. Which is all just a long-winded way of saying that the designers of *VIP Professional* have had to make some compromises to make the program work on the ST.

The architecture of the ST is radically different from that of the IBM PC, as are the basic operating system and user interface. Given these differences, the designers of *VIP Professional* have done a marvelous job in producing almost an exact clone of *1-2-3* while adding a mouse interface, pull-down menus, and other ST-specific features.

Graphs are somewhat smaller than those produced by Lotus 1-2-3.

We tested *VIP Professional* in two ways—first, with some real-world business problems and, second, with a tough test designed to evaluate its speed and compatibility with *1-2-3* itself. For the most part, *VIP Professional* performed up to our expectations, although we did encounter some unexpected limitations.

A Clone is a Clone is . . .

When using a spreadsheet, we always look at a few key features, specifically layout and labeling, formulas and functions, windows, and graphics. If you believe that Lotus has come up with the right approach in these areas—we do, by the way—you will be pleased with *VIP Professional*.

Items that appear on any of the eight Lotus command menus can be selected in one of three ways: directly from the Lotus menu itself (called by the familiar slash and cursor keys), by typing a slash and the first letters of the desired commands (the Lotus code letter system), or with the mouse. The eight *1-2-3* command menus are: Worksheet (set formats, titles, windows, and global defaults), Range (set formats and labels for a range of cells), Copy (replicate one or more cells in another part of the worksheet), Move (move one or more cells to another location), File (save and retrieve files), Print, Graph (display or save graphs), and Data (sort, query, and other database functions). All of these commands in *VIP Professional* work precisely as they do in *1-2-3*, and we had no trouble with the user interface.

To set up a spreadsheet with *VIP Professional*, again, you proceed exactly as you would with *1-2-3*. As with any spreadsheet, good planning is desirable, not because you *can't* go back and correct mistakes, add a column, or move a row, but because it is quite time-consuming to do so.

For example, we filled in some formulas and numbers on a fairly small spreadsheet (8 columns by 19 rows) and then went back and entered the labels in Column 1. Using this procedure, the program required a lengthy four seconds to accept each label. Moreover, unlike *1-2-3*, *VIP Professional* does not allow you to enter a series of labels followed by down arrows and expect that the program will eventually catch up with you; theoretically, your keystrokes should be held in the keyboard buffer, but in reality, after the second or third label everything you have typed turns into a mish mash. Our advice: plan ahead.

Because *VIP Professional* uses the standard GEM interface, space is allocated on the screen for window borders as well as for cell editing and some icons at the bottom of the screen. This means that the display has only 13 rows instead of the 20 found in Lotus *1-2-3*. As the *Professional* booklet explains, "this is so you can have scroll bars, icons, pull-down menus, and other conveniences of the mouse interface."

We found that with a single window, 13 rows was certainly not onerous. But with a horizontally split screen (two windows), you have only 10 rows. We found this was barely sufficient for some problems. Incidentally, the documentation claims that "the windows may be sized to obtain a total of 20 rows

between the two windows." This suggests that there is a way to do it, but we were unable to figure it out.

Considerably more annoying than the small screen size itself, is the necessity it creates for scrolling as you move about your spreadsheet (assuming it has more than 13 rows). On the IBM PC, scrolling is nearly instantaneous, because the PC uses a 2K text display; when the display is scrolled —which, because of the larger display, happens less often than with *Professional*— only 2K of memory must be updated. Thus, you can run down a few hundred rows in a matter of seconds.

In contrast, the ST uses a 32K bitmapped graphics display, all of which must be updated each time you scroll a single row. Depending upon how "busy" your spreadsheet is, you could spend a great deal of time waiting as you scroll up and down; you don't *ever* want to scroll 100 columns. Fortunately, there are other ways of moving around the spreadsheet—ways with which you will become intimately familiar during your first half hour with *VIP Professional*.

The small window size also means that graphs are somewhat smaller than those produced by Lotus *1-2-3*. In general, this is not a problem, although you might find that graph labels that fit easily on the IBM PC display do not fit on the Atari ST display. (See Figure 1.)

On the other hand, we were pleasantly surprised by the excellent pie charts produced by *VIP Professional*. The first wedge is shown slightly separated from the pie — a nice touch—and clever icons are used to label the other slices. (See Figure 2.)

Speed and Compatibility

We put *VIP Professional* to a tough test of speed and compatibility with Lotus *1-2-3*. We made up a rather complicated spreadsheet that used one or more functions from most of the major categories: Financial (present value and net present value), Logic, Mathematical, Statistical, and Date. We replicated this spreadsheet twice and used starting values one-tenth of one percent higher and lower on the second and third sheets. We ran this on an IBM PC (actually, a clone) and on the ST, and compared numeric results and speed.

First, the good news: the numeric results were exactly the same to as many decimal places as either machine would display.

The bad news comes in two parts: speed and capacity. On the PC, the calculations took 6.2 seconds; on the Atari ST, they took 12.5 seconds, almost exactly twice as long. That is not really as bad as it sounds; after all, compared with pencil and paper it's supersonic, and even compared with first generation personal computers, it seems like lightning.

More disappointing is the fact that the Atari 520ST had enough memory to hold only the original spreadsheet and one copy. While we recognize that GEM takes a considerable amount of memory for screen handling and overhead, we expected to be able to fit more than 376 cells in the machine. Lotus *1-2-3* running on our PC clone with 256K has no problem with a spreadsheet containing more than 4000 cells, yet *VIP*

We were pleasantly surprised by the excellent pie charts produced by VIP

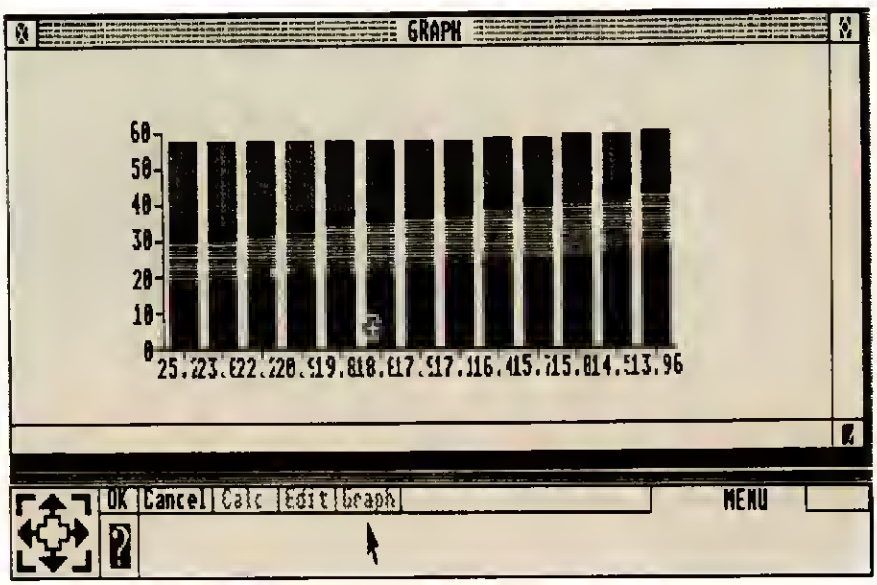


Figure 1. Lotus 1-2-3 graph labels that fit on the IBM PC display may not fit on those produced by VIP Professional.

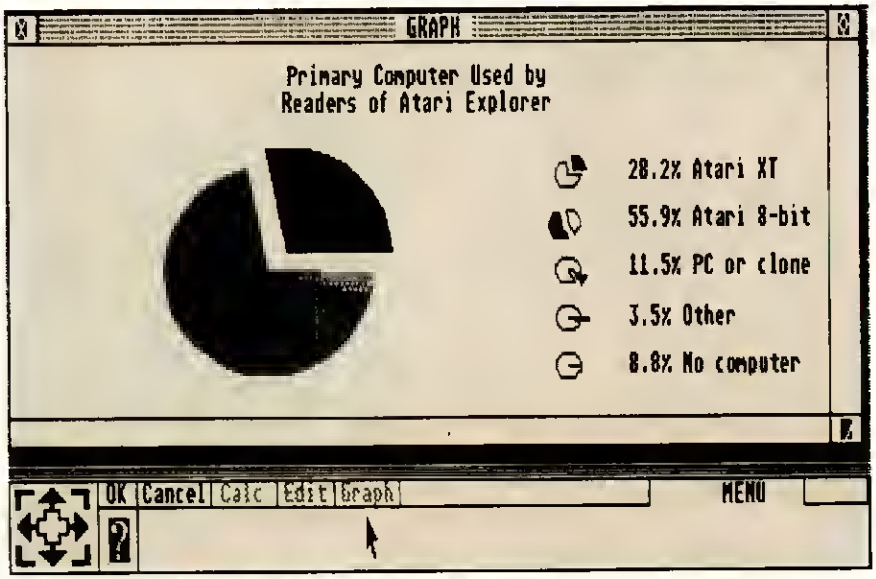


Figure 2. VIP Professional produces excellent pie charts.

Professional on an Atari 520ST with 512K balks at 377 cells!

And balk it does. Upon trying to replicate the spreadsheet, the program displayed a message box saying "1 System Error" and offered a choice of PROCEED or EXIT. Naturally, we selected PROCEED. But from that point on, no matter what we did, similar error message boxes continued to appear.

Unfortunately, these little boxes are not described in any of the documentation. So, finally, in desperation, we pointed to EXIT and clicked. BIG mistake. Goodbye spreadsheet, goodbye program, goodbye everything. No warning, no second chance, no opportunity to save data. (See Figure 3.)

Presumably with a fully expanded (4Mb) 1040ST, it would be possible to use the full rated capacity of *VIP Professional* (8192 rows by 256 columns), although, reasonable size spreadsheets (about 3400 cells) can be developed in a standard 1040ST or expanded 520ST.

As a database manager—really just another way of organizing your spreadsheet—*Professional* has a similar maximum capacity of 8192 records with 256 fields per record. Queries can be made with up to 32 search criteria—more than we can imagine ever needing.

Getting to Know You

Lest you get the idea that we were not satisfied with *VIP Professional*, let us hasten to assure you that overall, we were most impressed.

To get you started, the package comes with an excellent 251-page manual and a 21-page introductory booklet. We recommend starting with the booklet, especially since it includes two and a half pages of corrections to the manual. (The manual is spiral bound, not loose-leaf, so you will have to write those corrections in by hand.)

The first eight chapters of the manual (70 pages) present a tutorial that takes you by the hand through constructing, manipulating, graphing, printing, and saving a home budget. It is an excellent tutorial and will acquaint you with the most-used features of the package. The balance of the manual is a reference guide and describes the commands, functions, operators, and macros in detail.

The package also includes a second disk, which contains help screens and GraphPrint, a program for printing out graphs in a somewhat fancier format than you can get by using just the screenprint facility.

***The designers** of VIP Professional have done a marvelous job in producing almost an exact clone of Lotus 1-2-3.*

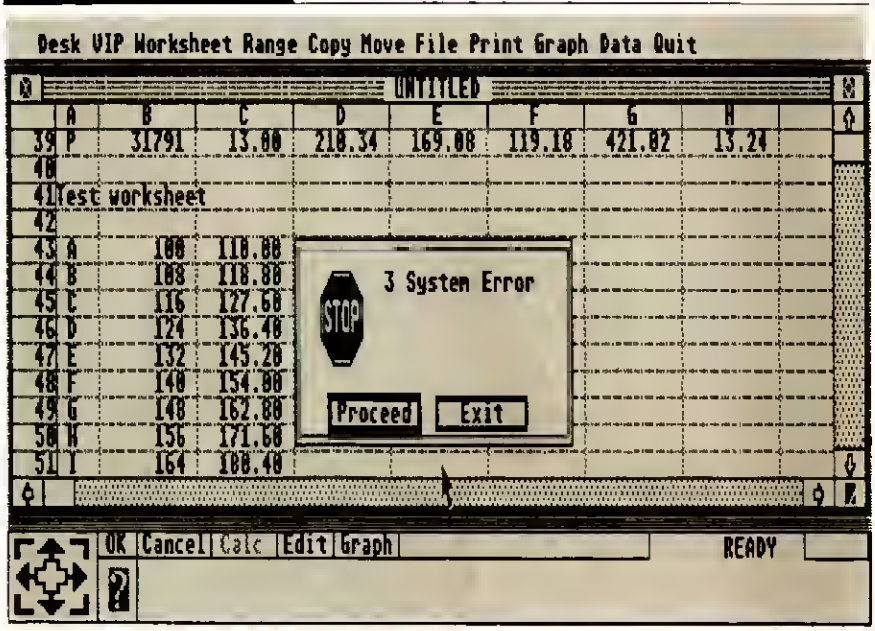


Figure 3. If the system error box appears on the screen, you are in big trouble.

A quick reference "card" is also included. Hardly a card, this is an eight-panel 5 ½" × 8 ½" folder that lists all the key functions, commands, operators, and macros.

In summary, the programmers at VIP have combined the three essential applications of Lotus *1-2-3*—spreadsheet, database, and graphics—with the friendly GEM/mouse user interface in a powerful but easy-to-use package. Although it is very memory hungry and a mite slow, it certainly does the job and gets our recommendation. ■



Technology

Floppy disk cameras, superconductivity, and a look back at memory

By DAVID H. AHL

Several companies are reported to be working on still video cameras, but Konica has been showing their prototypes in public at the last few Consumer Electronics Shows. A still video camera takes single pictures like a 35mm SLR, but instead of recording the image on conventional film, records it on a magnetic medium. Konica uses a video floppy disk capable of storing 25 to 50 images.

The Konica SV-C40 uses a 0.67" CCD image sensor with resolution of 300,000 pixels, or about 550 × 550, the same as a high-resolution video monitor. Its f/1.4 zoom lens and autofocus system are comparable to high-end 35mm cameras like the Minolta Maxxum.

To play back video floppy disks, a companion still video recorder/player has manual forward and reverse random track access, auto advance, playback, and erase. A color video printer, which uses standard photographic processes, is required to make hard copy prints.

Polaroid is also working on a video still camera. Their current unit reportedly has somewhat lower resolution than the Konica. Apparently they are concentrating their efforts on producing a high quality hard copy instant printer which they feel will be very important to customers.

The first video still cameras will probably reach the market in 1988 or 1989.

Superconductivity Heats Up

Although we think of metals like copper, silver, and gold as good conductors of electricity, actually all of them have a small amount of resistance to the current flow. This is caused by the motion of the atoms in the wire; as more and more current flows through a wire, the atoms move more and more violently, colliding with each other and causing heat. This, of course, is how an electric heater works.

However, at very low temperatures near absolute zero, a strange phenomenon occurs in several substances: the atoms stop bouncing around and the substance becomes a superconductor, offering no resistance to current flow whatsoever.

***Subjecting** a chemical compound to extreme pressure raises the temperature at which superconductivity occurs.*

For years, scientists have worked to harness this physical loophole—in computers, reactors, magnetically levitated trains, and power transmission. However, supercooling is difficult and expensive, usually requiring liquid helium to lower the temperature to 24 degrees Kelvin, the point at which superconductivity begins.

In January of this year, two independent groups of researchers announced breakthroughs that might make the task easier. A scientist at the University of Houston reported that by subjecting a chemical compound to extreme pressure, he had raised the temperature at which superconductivity occurs from 24 to 40.2 degrees Kelvin.

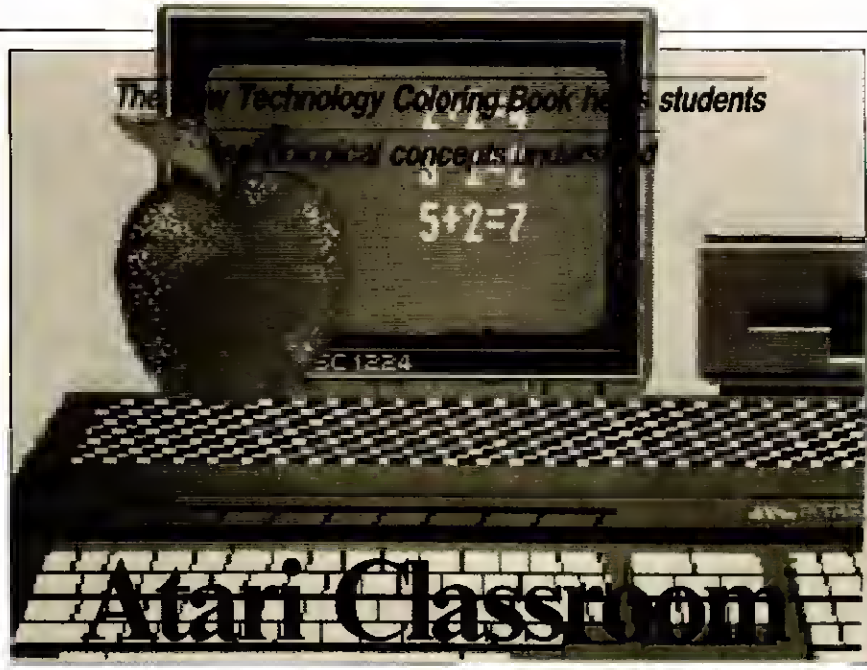
Meanwhile, scientists at Bell Laboratories said they had found an alloy that exhibited superconductivity at 38 degrees under normal pressure. These developments allow the use of liquid hydrogen for supercooling instead of costly liquid helium. If the threshold can be raised a bit further, even cheaper liquid nitrogen could be used for cooling, and superconductivity could leave the realm of the exotic for duty in the real world.

Remembering Memories

The October 1953 issue of the Proceedings of the Institute of Radio Engineers was the first issue devoted entirely to computers. In it was a major article by J.P. Eckert discussing eight computer memory systems: mercury delay line, electrostatic storage tube, magnetic drum, ferromagnetic cell, ferroelectric cell, capacitor/diode, Mellon phosphorescent, and phosphorus drum. At the time, magnetic core storage was in its infancy (the largest operational unit was a 256-bit device built by RCA) and it was not known whether that technology could compete with the proven devices discussed by Eckert. ■



The Konica SV-C40 Still Video Camera



Atari Classroom

By BETSY STAPLES

Illustration by Nicholas Jainschigg and Peter Kelley

The *New Technology Coloring Book* modestly claims to be "a unique tool for unlocking the mysteries of science and the universe."

We were skeptical, particularly after we noted that the documentation was confined to one side of a single 8½" × 11" sheet of paper, but decided to give it a try. We were rewarded with hours of colorful, creative, instructional computer fun.

Upon startup, we were relieved to note that the Info menu offers a short description of the program and how to use it. The Show Catalog command brings to the screen a list of 24 topics, ranging from infrared sensing to acid rain, from interplanetary radar to consciousness technolgy. We chose to learn about Split Brains.

The first image you see when you choose a new topic is an intricate pattern in black and white. You can either color it right away or wait until you have read about it; you are advised to exercise control and color only after you have read the pertinent information.

System: Atari ST
Price: $19.95
Summary: An imaginative, entertaining way to learn more about high technology
Manufacturer:
The Software Toolworks
One Toolworks Plaza
13557 Ventura Blvd.
Sherman Oaks, CA 91423
(818) 907-6789
Distributor:
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
(800) 448-8822
(415) 571-7171

The Text Screens

Choosing Description of Image from the Info menu opens a window that presents several screens of low-res text, which introduce the topic. Clicking on Image Color Key provides a detailed description of the picture you are about to study, discussing in particular, the significance of the different colored areas.

We learned, for example, that on the picture of the split brain the pink area was the *corpus callosum* and the blue represented the left or verbal side of the brain. Unfortunately, it also told us that the right hemisphere was colored green when, in fact, it was gray. We later changed the colors to those you see in Figure 1.

In general, both the Description and the Color Key are written in reasonably clear if stylistiely unremarkable prose. We noticed quite a few typographical errors, however, which causes us once again to drag out the soap box and ask the manufacturers of software in general and educational software in particular why they can't spend a few dollars and a few days of production time to have the text in their programs edited and proofread.

We found that the only way to make a meaningful connection between the information on the text screens and the picture was to print out the text screens and keep them handy for reference when the picture was returned to the screen. There is just too much information on the screens to absorb in one or two readings. Printing is quickly and easily accomplished at the click of a mouse button. The only thing lacking is a title for each sheet—something we began to wish for after we had collected hardcopies of five or six screens.

Coloring the Drawing

After you have dutifully read and, hopefully, absorbed the information contained in the text screens, the fun begins. You return to the picture, click on Color Image if you have not already done so, and study the drawing, identifying the pertinent parts with your Color Key printout.

Each of the colored areas is numbered, so the drawing resembles a paint-by-number exercise, and you can change the colors to suit your fancy or improve your understanding, if, for example, you think it would be easier for you to remember that violet was the color for the verbal side of the brain.

A click on the Change Colors option brings to the screen a stack of colored blocks with corresponding numbers and color names and three color sliders. As you move the sliders, the colors change in the blocks and in any colored areas of the picture that show above or below the Change Colors work area as shown in Figure 2.

When you press OK to exit the Change Colors work area, the entire picture returns to the screen with all of your new colors in place. This process is immensely satisfying and undoubtedly results in learning simply through prolonged exposure.

If you like the new display, you can save it to disk for future use. Unfortunately, the instructions for doing this are virtually nonexistent. We are told that it can be done, but not how.

Given that ability to save drawings with different colors in place and assuming that you can figure out how to do it, we suggest that future versions of the program include the numbers as well as the colors in the Image Color Key, so you can study the pictures you have colored yourself along with or instead of the ones that correspond to the Color Keys.

You can also import *NeoChrome* and *Degas* files into the program and turn them into paint-by-number exercises. And you can save your recolored *Coloring Book* files as *NeoChrome* and *Degas* files.

On one of our 520STs the program would occasionally hang up on the Cat-

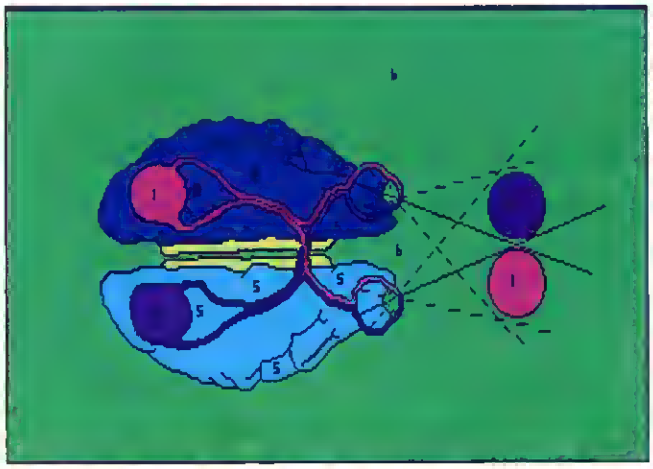


Figure 1. A recolored version of the picture that accompanies the lesson on Split Brains. The original version featured more subdued colors.

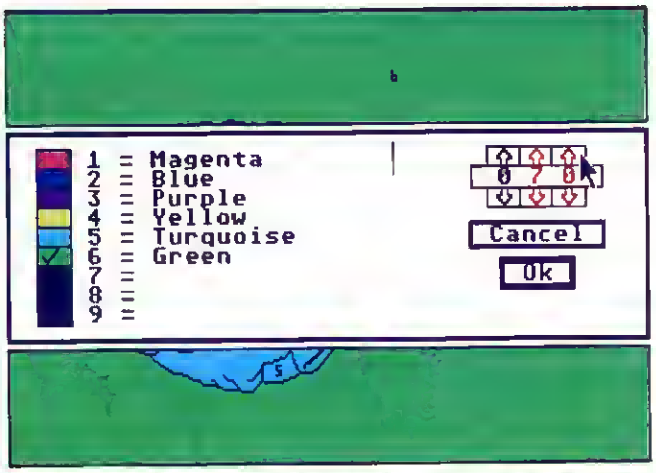


Figure 2. The Change Colors work area displays all the colors used in the low-res picture associated with the lesson. You use the sliders on the right to modify each color to suit your taste.

alog screen. A spokesman for the Software Toolworks told us that the problem occurs only occasionally and only in a few early versions of the TOS ROMs. We ran the program on a 1040 and another 520 and had no problems. We suggest, however, that you make sure that your dealer will let you return the program before you take it home to run on an older 520.

Summary

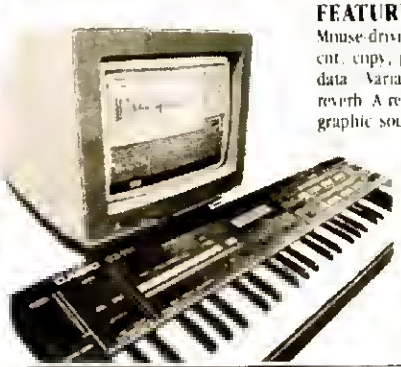
The *New Technology Coloring Book* is obviously intended for older learners—probably high school age through adult. The onscreen introduction says that the program will help you understand technological concepts and increase your awareness of the connections between various technologies. It goes on to point out that "research . . . has revealed that information can be absorbed more easily and profoundly if presented in both verbal and visual form—especially if the hands are used to draw or color the images."

Exactly what the mechanism is, we don't know, but we can assure you that you will learn some fascinating facts and have fun in the process if you buy the *New Technology Coloring Book*. It is not the sort of package that is likely to fit tidily into a school curriculum, but for $19.95, it is certainly worth having on the shelf for kids to experiment with; if one student becomes aware of the hazards of acid rain by using the program, it will have more than paid for itself. ■

ST SOUND DIGITIZER

DIGITAL SOUND PROCESSING:
For professional use or just for fun, the ST Sound Digitizer can be used to create music, experiment with new sounds, edit short commercials, create sounds for use in your own programs or experiment with speech recognition.

HI-QUALITY DIGITAL SAMPLING SEQUENCER:
Digitize real-world sounds from any source (e.g. microphones, guitar, synthesizer, etc.) then play it back with your MIDI keyboard through the ST Sound Digitizer. The computer automatically adjusts the pitch to correspond with the notes played on the keyboard.



FEATURES:
Mouse-driven software features graphic cut, copy, paste and mixing of sound data. Variable real-time echoes and reverb. A real-time oscilloscope displays graphic sound samples as they occur.

THE SPECS
8 bit A/D and D/A. ■ 2.5 µs flash A/D conversion rate allows sampling up to 200,000 samples per second. ■ 1 volt peak-to-peak signal and source. ■ Hardware plugs into cartridge port for high speed data transfer rate.

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Atari's updated graphics program for the ST offers a wealth of features, including a color map and a cure for the jaggies

NeoChrome



System: Atari ST
Price: $39.95
Summary: A versatile paint program with some unique and interesting features
Manufacturer:
Atari Corp.
P.O. Box 61657
Sunnyvale, CA 94088
(408) 745-2367

By JOHN J. ANDERSON

Back when the ST was first born, in the dim recesses of 1984, I made a trip to Sunnyvale to get a look at the new baby. In a sense, Atari as a whole was a brand new baby when I got out there. Everyone was bursting with the pride and enthusiasm of new parents.

It should be noted that they still are, though their child, the ST, is now going on three, and there have been some new additions to the family since then. But I'll never forget that early feeling of exhilaration as the prototype ST was demonstrated for me in a cluttered corner room on Borregas Avenue.

As is usually the case with newborns, that prototype couldn't really do too very much. It was the promise of the future that had everyone choked up. There were perhaps seven programs to look at—a number which has now been bettered by more than two powers of ten.

The promise was certainly rife, however, and no single program better demonstrated the graphic promise of the ST series than *NeoChrome*, a paint program developed in-house by Dave Staugas (see Mark Jansen's interview with Dave Staugas in "Inside Atari" elsewhere in this issue). *NeoChrome* was a newborn itself then, a little buggy, with a host of unimplemented features, but still the most impressive paint program I had ever seen. The intensity of color, the degree of control of shading and palette, and the ease of use of the product were literally disarming.

Within a few months, a debugged *NeoChrome* was included in the box as a free bonus with new STs. It was also posted on CompuServe, which is how I got my first copy. That a company such as Atari would be so generous with an excellent program application developed in-house was precedent-setting—at least back then. There were still un-



The NeoChrome split screen provides access to all tools, including the Color Map/Magnifier, while you work.

implemented boxes on the tool grid, but *NeoChrome* was already superb product, and it set the standard for all graphics programs to come.

It is heartening to learn that as the ST matured into the superlative machine it is today with GEM in ROM, a graphics blitter, and the capacity for multimegs of RAM, growth has continued for *NeoChrome* as well. A new, full-featured version of the program has been released by Atari at a list price of $39.95. (The original subset version remains available on CompuServe and elsewhere.)

NeoChrome has come into its own. It offers all the powerful features that were missing in the earlier version and then some. The new version of *NeoChrome* is a professional graphics program for the Atari ST—dramatically more powerful than programs for other machines for which the software alone costs more than a fully configured ST.

The Artist's Tools

There are, of course, the tools you would expect to find—the pencil, eraser, paint brush, spray can, and paint bucket. Forty different brush and spray patterns are available, and the paint bucket will fill shapes with 16 colors. The Shapes tool allows you to draw perfect squares, rectangles, circles, ellipses, rounded rectangles, and polygons. Text inserts letters, numbers, and symbols in your picture.

The Options box contains five different text styles, six different text sizes, three alignment options, and two character sets. Grid will constrain your current tool to a graph paper canvas. The Grabber lets you move the screen up or down.

The Copy box allows you to define and manipulate a rectangular picture area. You can Cut it, Copy it, Rotate it, Flip it horizontally or vertically, Trace a border around image edges, Scale its size, Swap its colors, or Overlap it transparently or opaquely.

A new *NeoChrome* tool, the Jack Knife, defines a freeform picture area in order to move or erase it. When you "cut" around an image or picture area, the line you have cut will shrink to fit around the image area. You can then move, copy, cut, or even spray paint with the selected image, once again in transparent or opaque mode.

Another new addition, Miscellany, lets you turn a display of actual x/y coordinates on or off and save portions of your picture in source code format for use in programming. This tool also offers color and palette undo options.

Disk allows you to save the current picture to disk, load another picture onto the screen, or quit *NeoChrome*.

A Unique Color Map

The Color Map/Magnifier on the menu screen displays either an orderly map of the 512 colors available in *NeoChrome*, or a magnified view of your picture showing individual pixels for detailed drawing. The color map appears when the mouse pointer is on or below the color palette. It displays 208 colors at one time and can be scrolled left and right to reveal all 512. You can copy a color from the color map into the color palette.

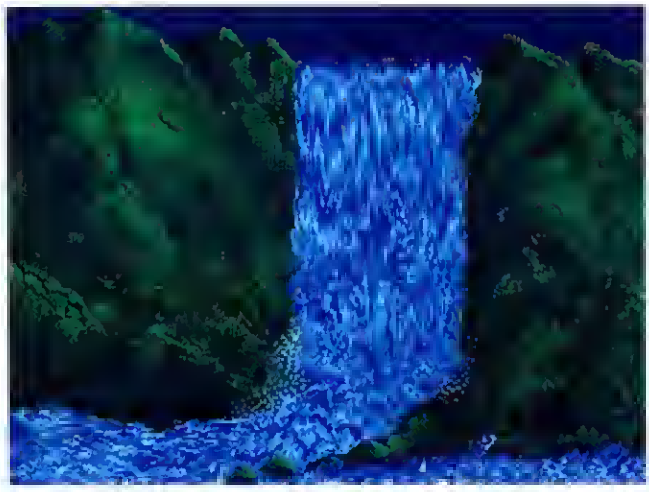
This map is unique to *NeoChrome*—you won't find it in any other graphics program. It lets you see every color that can be put on the screen, and is a sophisticated reference tool.

When you move the pointer onto the canvas, the map transforms automatically into a magnifier. The magnifier displays an enlarged view, five times bigger than the canvas, and the hot spot of the cursor is always dead center. By watching the magnifier, you can position a tool exactly where you want it on the canvas in order to identify a color or paint in precise detail.

The color mixer, on the right hand side of the menu screen, displays a color and its RGB value. You can mix colors by changing the digits in the RGB readout. Every color on the Atari ST is iden-



Text can be added to NeoChrome drawings in a variety of colors, sizes, and typestyles.



An animated waterfall from the NeoShow demo.

tified by its RGB value: three digits representing the red, green, and blue intensities, in that order. RGB 000 is black, and RGB 777 is white.

Scroll arrows on the color mixer let you scroll the color palette left or right, color by color. You also use the arrows to achieve color cycling, which is continuous scrolling. Scrolling the palette rearranges the positions of the palette colors between delimiters that you can specify. Cycling colors can result in blinking effects on the canvas, or if you use it cleverly, even in apparent motion. You can also set the speed of your color cycling.

The Undo box lets you step back one step and undo the last graphics action you took. *NeoChrome* will erase only your last action; you can't undo any actions before that. However, you can undo an undo operation!

The documentation accompanying *NeoChrome* is clear, thorough, and on the whole, quite well-written. It contains a sizable chapter devoted specifically to advanced techniques, including creating special effects, custom brushes, shading, shadowed text, charts and graphs, pattern fills, and more.

Getting Rid of the Jaggies

One of the neatest techniques shown, which can benefit the user of any graphics program, deals with minimizing *aliasing* (known colloquially as "jaggies"). This is the familiar stairstep effect frequently displayed in diagonal lines. The documentation suggests a technique called "corner filling."

First, select a color halfway between the color of the line and its surrounding background. For example, for a light blue line on a black background, you would select a darker blue. Then, using the magnifier, fill in the edges of each jaggy with the selected color. The result: a much smoother-looking line. I for one had never heard of this technique and really appreciated learning it.

The *NeoChrome* program disk contains a slideshow program for viewing your work continuously. You can customize any slideshow to display a specific set of pictures in a specific order—for specific lengths of time and with selected transition effects between pictures. This is another feature unique to *NeoChrome*.

There are other paint programs on the market, and some of them are very good (*Degas Elite*, reviewed in the Jan/Feb issue of *Explorer*, springs to mind). But if you look at the mathematics of the situation, you will quickly see that *NeoChrome* accomplishes 90 percent of the tasks you can do with *Degas Elite* at half the price—and that equals an excellent value indeed.

Then there are the several features that are unique to *NeoChrome*, which will be for many users reason enough in and of themselves to buy the program. If you are heavily into ST graphics, you will not want to be without it.

NeoChrome does not support the ST monochrome mode. It is not copy-protected. And while it will run on a machine without TOS ROMs, some features will not be fully enabled. ■

***As the ST** matured into the superlative machine it is today, growth has continued for NeoChrome as well.*

Puzzles & Problems

By DAVID H. AHL

Some of these problems can be solved in your head, some require pencil and paper, and still others require that you write a computer program.

Answers are on page 74.



Hitchin' a Ride

John decided to hitch a ride from Morristown to Mendham instead of spending two hours to walk the eight miles. So he started walking backwards with his thumb out. He didn't have much luck, and his speed walking backwards was only half his normal walking speed. However, halfway to Mendham, John got a ride and noted that the driver drove 15 times as fast as he normally walked. Did John save or lose time by hitching a ride? How much?

Muriel's Grandfather

Muriel's grandfather invested $1000 in a trust fund for her on the day she was born. The fund earned 8% interest compounded quarterly. Unfortunately, Muriel forgot all about the trust fund until she was 88 years old. How much was the fund worth then? Can you write a program to show what the fund was worth when Muriel was 50, 60, 70, 80, and 88 years old?

Add and Square

The four-digit number 3025 is special. If you take the first two digits (30) and add them to the last two (25), the sum is 55. If you then square 55, the result is the original number ($55^2=3025$). Find all the four-digit numbers that are special in this way.

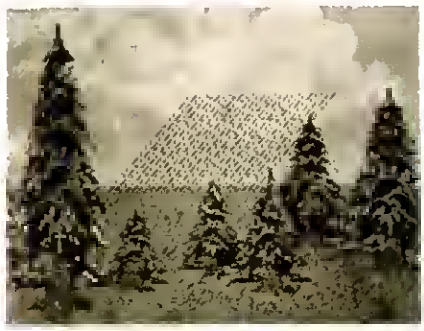
Margie's Mother

Margie was born on January 1, 1987. Her mother, Martha, wants to put enough money into a savings account that pays 5½% interest compounded quarterly so that Margie will have $10,000 when she is 19 years old. How much should Martha put into the account? Make a guess, and then write a program to compute the answer to the nearest dollar.



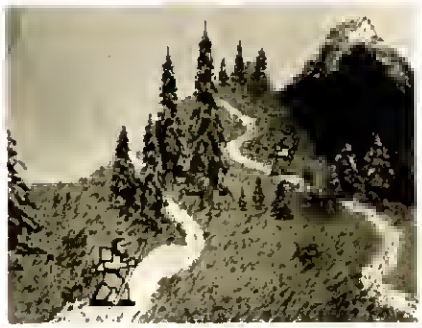
Spruce Tree

A spruce tree when planted was three feet tall, and it grew the same amount every year. At the end of the seventh year, it was one-ninth taller than it was at the end of the sixth year. How tall was the tree at the end of the twelfth year?



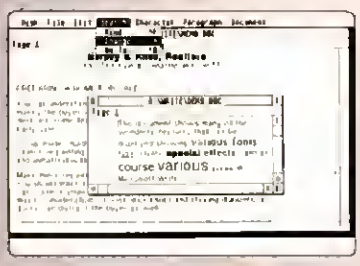
Rainy Vacation

During my vacation, it rained on 13 days, but when it rained in the morning, the afternoon was fine, and every rainy afternoon was preceded by a fine morning. There were 11 fine mornings and 12 fine afternoons. How long was my vacation?



Appalachian Trail

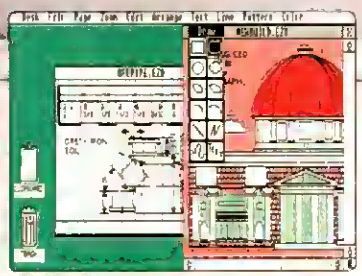
The Appalachian Trail is 2007 miles long and rises and falls an average of 200 feet per mile. As a result of these 200 feet of ups and downs per mile, how much longer is the Trail than it would be if it were on perfectly flat ground?



Word Processing
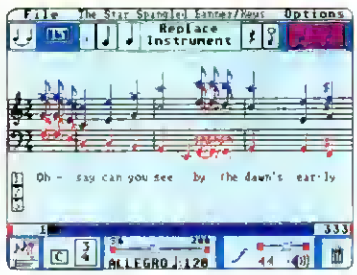
The ST features familiar icons, spectacular graphics, mouse control windows, drop-down menus and on-screen directions for ease of use.

The ST transfers data at 1.33 megabytes per second. Which means it could transfer the entire works of Shakespeare in less time than it takes to read this ad.



Graphics & Design

The ST keyboard is identical to that of standard data terminals, so it's already familiar.



Music Composition



Introducing technology

Finally, there's a personal computer that not only solves problems like other computers, but also solves the one problem other computers created. Affordability.

Introducing the ST™ Computers from Atari: The 520ST™ with a 512K memory and the 1040ST™ with a full megabyte. The ST was designed utilizing the most recent breakthroughs in semiconductor technology, producing a PC that does more tasks with fewer parts.

Which means it costs less to make. And less to buy.

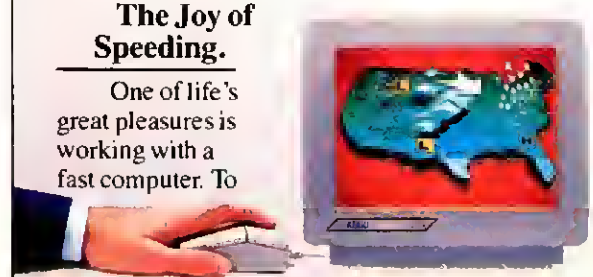
The Joy of Speeding.

One of life's great pleasures is working with a fast computer. To bring the ST up to speed, Atari starts with the Motorola 68000 chip—the same "brain" you'll find in the Macintosh.™ Then, Atari adds the extra oomph of four exclusive chips—specially designed to handle several functions simultaneously. (Other PCs limp along handling one function at a time).



This results in making the ST much faster in the computing process. Faster in moving data within the system. Faster in getting information to the screen.

So now, you can run programs like word processing, database management, and financial planning with more zip and efficiency than ever before. A nice feeling.



Compare Our Components.

A computer is only the sum of its components. So we made each one better. Look at the layout of the ST keyboard, for example. You get a full numeric keypad. Plus a cursor control keypad with editing keys. Plus 10 programmable function keys. Now add the mouse and consider the options.

The monochrome monitor is a beauty. Taking its broad bandwidth signal from the ST's exclusive video chip, it displays a resolution of 640 × 400 pixels. This gives you razor-sharp, jitter-free text display for word processing and CAD work (very easy on the eyes). Or, for stunning color images, add the RGB color



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THE ST COMPUTERS

The ST includes a three-voice sound chip with a range from 30 to beyond 20,000 Hertz. The Amiga™ and Macintosh are limited to a maximum of 7,000 Hertz.

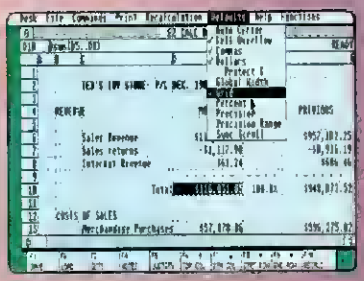
The ST works with a wide range of IBM® compatible printers. Including laser printers and plotters.

The easy-to-read manual will have you working on your ST in minutes.

You can use command keys, or a mouse. It's your choice.

The 3-½ inch encased disk is more durable and easier to work with than the standard 5-¼ inch floppy.

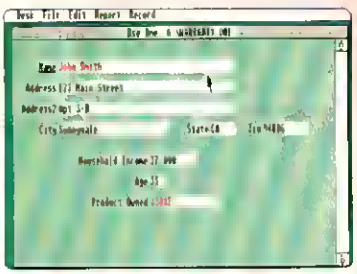




Spreadsheets



Entertainment



Database Management

so advanced, it's affordable.

nonitor. No interface oard needed. Just lug it in. (Try doing hat with a Mac!)

You get an xternal disk drive vith the 520ST. An internal, dou- le-sided disk drive with the 1040ST. Both have a disk peed many times faster than previous PCs. And they're blissfully quiet.

Plus, many of the costly peripherals ou have to add on with other PCs are lready built into an ST. Like the built-in MIDI (musical synthesizer nterface) port. And the ndustry-standard printer port nd modem port. And for even more memory, a port for he SH204™ hard disk drive, with twenty megabytes of storage and the fastest transfer rate in the industry.



With hundreds of software programs already available, an ST can grow with your imagination, or your business. Companies like Microsoft,® Spinnaker,® Activision® and more are continually making contributions to the ST software library. And some popular programs originally designed for other computers are actually being upgraded to take full advantage of the ST's capabilities!

The Price of Power.

Best of all, the cost of an ST is so low, it may come as something of a shock. The 520ST sells for under $800, including monochrome monitor.* The 1040ST, with a full megabyte of memory, for under $1,000. That's less than one dollar a Kbyte.

So now, you don't have to be rich to be powerful.

To see why Infoworld called the ST "The best hardware value of the year" check it out at your Atari dealer. For the one nearest you, call 1 800 443 8020. 9AM-5PM Mon.-Fri., Pacific Time.

*RGB color monitor, $200 additional.



THE ST™ COMPUTERS from ATARI®

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Photograph by Michael Gill.

Impressions of The Mega Machines

The Mega STs—1, 2, and 4—are Atari's new "flagship" machines. Upward-compatible with existing ST designs, the new line sports significant enhancements in functionality and ergonomics that establish new standards for high performance executive workstations.

Small and sleek, the Megas' 14" × 14" system unit and detachable keyboard permit more freedom for the user while occupying considerably less desk and cable-access space than present ST models. Yet, though the Mega ST system unit is diminutive, it contains what is clearly the most powerful and least expensive high-end computing engine available today.

Along with the standard 8-MHz 68000 chip, the Mega machines incorporate a proprietary Blitter—a generalized memory mover that speeds up graphics (and certain other functions involving the movement of information from one place in memory to another) by as much as 16 times over the already blazing speed that can be achieved by the 68000 chip.

Packed with one, two, or four megabytes of memory, a battery backed-up clock with autoboot clock-setting code in ROM, a high quality, custom-designed keyboard, and a built-in, double-sided disk drive, the Mega machines should prove irresistible to executives searching for a high performance alternative to present industry standards; to educational institutions looking for high speed general computing workstations and AI development and delivery systems; and to graphic artists, architects, video post-production houses,

By JOHN JAINSCHIGG

Soul of a New ST

desktop publishers, and other vertical markets looking for a powerful, capable, and affordable system.

The Mega STs were first introduced at the January Consumer Electronics Show, and a news brief describing the machines in some detail appeared in the January/February issue of *Atari Explorer*. Since then, that report has been widely circulated, both in text and electronic form (via BIX, Compuserve, Genie, and other networks), and the response has been enthusiastic. This month, we take you "behind the scenes" at Atari headquarters in Sunnyvale, CA, for a first look at the Mega machines and a talk with key personnel responsible for their development and design.

From the Editor's Notebooks

Atari headquarters at 1196 Borregas Ave. in Sunnyvale is functioning at a frenetic rate in preparation for the roll-out of new products announced at January CES. It is the morning of February 2nd—a sunny, shirtsleeve morning in the full spirit of California winters.

I am sitting in the second floor Research and Development laboratories. On the desk in front of me is a Mega ST4—the 4Mb version of the new ST series—brought out of radio emission testing for the occasion of my visit. Though clearly a prototype, cursory examination of the exterior and a quick pop of the cover reassure me that the machine is very close to being ready for production.

The system unit, about 2" high and 14" square, seems elegantly small to contain the power I know is resident inside. Reinforced with specially designed internal ribs, the case has virtually no flex at all, and the monitor atop it rests comfortably. A disk drive aperture with an angled release button recess protrudes through the right-hand side of the faceplate. The rightward-leaning angle is recapitulated in the product label's parallelogram on the left side of the faceplate, and by the angled function keys and decorative scoring on the separate keyboard unit. The system as a whole is made visually consistent thereby, and given a slightly "racy" feel—quite a bit more interesting than the almost military drab of most business systems.

The keyboard, which connects via a shielded, coiled cable to a telephone-type jack on the left-hand side of the system unit, is solidly constructed and a bit heavier than I expected it to be. Though it has the same layout and is about the same size as the foreplane of a 1040ST, it has its own, distinctive feel—due, I suppose, to the high quality keyswitches inside.

The touch is slightly firmer than that of an ST, though not as percussive as some other high-end keyboards; there is no point in the travel of a key at which it sticks or clicks, but you get a good, solid feeling of having "hit bottom" when the key is pressed all the way in normal typing.

The underside of the keyboard sports two retractable feet for adjusting the typing angle to suit your particular workstyle. The feet are broad and solidly hinged into the keyboard case, making it practically impossible to break them off by, for example, leaning on the trailing edge of the keyboard while the feet are in their extended position.

Mouse and joystick ports, the location of which beneath the right leading edge of the 1040 was a bit problematic, have been moved to individual recesses in the rear edge of the Mega ST keyboard, providing easy access as required. Because controllers can be attached to the keyboard directly, only one cable need run from the system unit to the user's work area.

I switch on the unit and hear the barely perceptible hum of the fan as it comes to life. Listening closely, I can make out its sound in an otherwise empty laboratory, but the whir is soon drowned out by the sound of rustling paper and the swish of a mouse moving across the desktop—very acceptable, particularly as the fan adds that extra measure of reliability to the already sophisticated convection-cooling process of the Mega.

I was disappointed to learn that the machine I was using did not have the Blitter chip installed - understandable, since the first production units of the Blitter had arrived only a week before. Just as well—a full set of performance benchmarks comparing the Mega STs to their predecessors and to other popular machines should, as is proper, wait for production units of the machine. Suffice to say, for now, that the Mega functioned flawlessly as an unenhanced ST.

The new keyboard/mouse combination was convenient and comfortable to use—even when holding the keyboard on my lap and running the mouse back up to the desktop. It is an elegant solution to the footprint problem.

Because I normally use a 1040ST, with its side-mounted drive, I had to retrain my hand before it was comfortable with the process of switching disks in the new, front-mounted configuration of the Mega, but after a little practice, I realized how much more efficient the new arrangement is. For one thing, you can read the edge-label on your disk without popping it from the machine, something I currently do by reflex about 30 times a day. In all, I'm extremely eager to do a formal review of the Mega ST4s.

Mega History

Afternoon: Spoke with a number of people involved in the engineering and design of the Mega series machines. Caught Shiraz Shivji, Atari's director of engineering and the man responsible for engineering the system, between meetings to finalize the schedule for mass production of the Mega ST motherboard. He revealed several interesting items about the history of the new machines.

Apparently, the design philosophy followed in putting together the ST line—including the Mega series—had its origin back in Commodore days, before the personal computing revolution began. Shivji explains:

"In the beginning—and this goes way back to the old, old days at Commodore, almost ten years ago—we had two projects— projects for decimal calculator chips—called the RBP and the GHU. RBP, which stood for Rock Bottom Prices, was a chip that had ROM internally. The other one, GHU, stood for God Help Us. It was really a standard microprocessor with internal registers, and accessed ROM on the outside for its instructions.

"The GHU was, in fact, an extension of the RBP design for more general purpose applications, and it was in doing

the design for these chips that our team developed the skills they used later on in designing the ST line with a consistent and extendable architecture.

"Anyway, the projects were really on the leading edge for that time; RBP and GHU were among the first single-chip microprocessors to be made in volume, and ultimately millions and millions of them were made. In building them, we achieved real breakthroughs in economy of scale. RBP and GHU helped train us so that nowadays we can build STs and sell them for as little as we do.

"When we left Commodore and came to Atari, we took that design philosophy and technique with us. And, sort of as a joke, we took the original project designations—RBP and GHU—along with us, too. When we were first designing the ST, we called it the RBP. And the Rock Bottom Prices designation really represented the whole aim of the ST project, which, as you know, was brought from initial conception to finished product in about six months at less than projected.

"With the RBP, later called the ST, we accomplished very much the same thing we had accomplished with those decimal calculator chips; we designed an architecture that could be brought to market at a very low cost. Moreover, like the original RBP chip, the 520ST was designed to be extensible—we didn't just want to throw away the architecture each time we developed a hardware enhancement, so we designed a logical structure that would serve through successive generations of hardware and product life cycles. From the beginning, the idea of a more powerful—'high-end,' if you will—version of the 520ST was planned—a machine with lots of memory and a detachable keyboard."

From GHU to Mega ST

"We called the Mega ST the GHU at first, and the project really developed in parallel with the other STs. As things went along, we developed other enhancements that will be standard on the Mega machines, but nothing that will detract from their fundamental compatibility with existing systems. For example, the Blitter chip will be standard on the Megas, giving them very powerful, high speed graphics. But because we anticipated the Blitter from the start, the necessary hooks were built into the 520ST, and the basic system software of all ST machines already supports the Blitter automatically, whether it appears as a standard component, as on the Mega systems, or as an upgrade to existing machines.

"As you know, a clock chip with battery backup will be standard on the Mega series; so there is one difference from existing machines that could have been tricky. We're currently writing new ROM code to integrate the clock seamlessly into the system, setting all the various clock registers on power-up, so users won't have to worry about special desk accessories for setting the clock or other time-wasting stuff.

"Other differences: the Mega STs have a fan. Originally, we thought we could get away without one, and, frankly, we haven't had any problems with prototype systems that weren't equipped with fans, but because the Mega motherboard is so much more compact (about 11″ × 11″) than the ST motherboard, we knew it would throw off more heat and discarded the idea of pure convection cooling because we wanted to add that extra measure of reliability.

"The keyboard is different, too. We designed it with high quality keyswitches that give a very nice tactile and auditory feedback. The mouse now attaches to one of two nine-pin ports installed in the underside of the keyboard, so you only have one cable connecting the input devices to the system unit, and the mouse can go where the keyboard goes. This enhancement was also designed in from the beginning—that is to say, it's implicit in the design of existing STs—because mouse input is processed by the intelligent keyboard controller.

> ***"We didn't want to throw away the architecture each time we developed a new hardware enhancement."***

"And of course, there's the bus extension. Essentially, the 68000 bus, plus several interrupt lines, are made available to the outside world via a port mounted on the Mega ST motherboard. There's actually room and fixtures built inside that case to support one internal circuit board, and we've been designing things to fit that space.

"For example, we have a 68881 floating point mathematics coprocessor board ready to go, and a networking card is in the works. After that, it makes sense to take the bus outside the system unit into an expansion box, which we're also designing. Conceivably, the bus could be used to supply the Mega ST with something like 16Mb of extra RAM. It should be noted, however, that extra memory attached to the bus will not be in the same address space as the display."

Professional Workstations

"The Mega STs were designed as professional workstations—general purpose computers for use by executives who want something much more powerful and less expensive than your standard PC, AT, or Macintosh.

"The things that set the Mega STs apart from run-of-the-mill systems—things like the Blitter and the enormous memory—give it great potential in a number of specialized markets, too. Early on when the ST was first produced, we got letters from some people at MIT Lincoln Laboratories, who needed a 68000 box for artificial intelligence applications. The machine they described was fairly close to what we now have in the Mega ST, and I would say that the Mega ST has good potential as a low-cost delivery system for AI-based products. The large memory and fast processor speed are good for running AI languages like Lisp and Prolog, which tend to use memory at an alarming rate.

"Desktop publishing is clearly another area in which the Mega STs will shine. The memory and speed are useful there, too, because they will give software the elbow room to do things "on the fly" in RAM that have to be done off-board in present systems."

The Software Front

Talked to Leonard Tramiel, Atari's director of software, in his office, while he was in the process of evaluating the most recent version of Microsoft *Write*, an ultrapowerful, multifont word processor for the ST, which is due for release at approximately the same time as the Mega series.

"Look at this," he said, gesturing at a screen filled with sharply-defined, high-resolution text in a variety of typefaces and point sizes. "This is an example of the kind of software that will be running on the Mega STs. In fact, it will be running on all STs, once the GDOS is finished and delivered.

"In *Write*, all the relationships be-

tween commands given from the mouse and keyboard and precisely what people want to accomplish on the system have been thought out. There is no using the mouse just for the sake of using the mouse, or using the keyboard in situations where the mouse is a better tool. Dialog boxes aren't just static things, here—they change with context, and with your responses.

"I think that when the Mega STs are released, we'll be seeing software for the ST line that is far more sophisticated and better engineered than even the best of software currently available."

Revising the Operating System

Mike Schmall, Atari system programmer involved in upgrading the ST operating system, talked about how the new OS revision will affect Mega system performance:

"Basically, we've taken the original operating system and shrunk it down, filling the extra space with special primitives that work with the Blitter chip. In the process we've improved the operating system in a number of areas—made several routines substantially more efficient.

"For example, we've improved the speed of memory clears, speeding up the launch of applications, fixed some problems with RS-232 flow control, improved some of the minor AES functions like appl_trecord( ) and appl_tplay( ), and fixed a minor bug in the original OS that sometimes affected the contents of DESKTOP.INF files on the hard disk.

"In addition, we've made some changes that overcome natural limitations of the original OS, such as the 40-folder limit. In general, the new OS is tighter and even more reliable, and makes better use of the hardware. For example, the speed of floppy disk formatting, reads, and writes should be about 25% faster on the new system, which should make people very happy.

"The nice thing is that we've accomplished the upgrade in such a way as to eventually be able to make it available to all ST owners. When the Blitter upgrade is eventually made available to present owners as an add-on, they will be able to plug in the new ROMs and enjoy much the same level of performance as Mega owners will."

Desktop Publishing

Dave Staugas, Atari programmer and author of *Neochrome*, talked with me about new developments in "txtblt" (pronounced "text-blit") operations: functions of the Blitter chip pertinent to text manipulation on the Mega series.

"From where I sit, I've had a good chance to see what the advantages of a Mega ST are going to be, specifically in relation to desktop publishing. At the moment, our application philosophy for Mega ST desktop publishing and the Atari laser printer is to use the extra memory, speed, and bit-blit power of the Mega ST to do a lot of things inside the computer that are now being done by laser printers.

"We'll be seeing software that is far more sophisticated and better engineered than even the best software currently available."

"Most of the work I've been doing lately centers around developing specialized blit operations for text and graphics that will permit whole high-resolution pages or parts of pages to be made up in the memory of a Mega ST; this graphic information will then be sent directly to the laser printer. At the moment, a demonstration program that does just that, using *1st Word* as a front end, is working at the Hanover Fair in West Germany.

"We think this is a better approach than conventional desktop publishing systems use—it gives more freedom to developers of desktop publishing applications and lets us keep the cost of the laser printer hardware way down by eliminating the loads of RAM, superfast processors, and complicated operating systems they usually have in them. I've been told that certain well-known laser printers are actually better computers than the computers that drive them.

"Anyway, the software that will make possible a full Mega-based desktop publishing system for under $3000 is in place and working fine. In fact, extensions to that software that will permit STs with less memory to perform most all the same kind of functions are coming along well."

Accessing the Blitter

Jim Eisenstein, Atari graphics programmer, told me about the coding of interface routines designed to access the Mega ST's Blitter chip in more general ways:

"The Virtual Device Interface—the part of GEM that does lower-level, general graphics functions—will be able to access the Blitter directly for almost everything it does. Specifically, the Blitter chip is a component designed to handle memory in terms of two-dimensional arrays, or rasters.

"Having a Blitter installed is like adding a special-purpose instruction to the 68000. A 68000 has commands that permit programs to move information very rapidly from one set of consecutive memory addresses to another. Say, I have a group of numbers stored in memory locations from address 1000 to address 1500 and I want to move this 500 bytes to memory starting at address 2000; I can do that with a single 68000 instruction.

"The Blitter takes this capability one step further—suppose I have one group of bytes running from address 1000 to address 1250 and another group of bytes running from address 1500 to address 1750, and I want to move both groups up by a thousand bytes so that they end up at 2000 and 2500 respectively. The blitter does this with a single instruction, very fast, all in hardware. In fact, it's capable of moving far more than two separate series of bytes at once—it can move many; enough so that an entire screenful of information, or any rectangular area within that screen, can be moved in under a frame.

"What this comes down to is that with a Mega ST (or a standard ST upgraded with the Blitter chip), the speed of most of the normal, everyday GEM functions: moving windows around, sizing rectangles, screen-flipping, rectangular fills, and so on, will be much, much faster than it is on an unenhanced machine. And present software that is written in conformance with GEM rules will be able to take advantage of the blit on any machine that has it.

"The performance on some software will be very noticeable—for example, with *Neochrome*, picking up part of a picture and moving it around the screen looks a little rough on a regular ST. On a blit machine it looks like a sprite, or a player—it moves totally without flicker, no matter how fast you move the mouse."

As this issue went to press, latest word was that the Mega STs would begin shipping in late spring of this year. Stay tuned to *Atari Explorer* for further developments and updates. ■

A thing of beauty is a joystick forever . . .

The Atari XE Game/Computer



As a long-time 8-bit Atari owner, lost among strange fruit and big blue frogs, I have occasionally been called upon to justify my choice of a personal computer.

"Isn't it just a game system?" people ask. "Game system?" I cry, scornfully. "The Atari 8-bit line includes the most sophisticated 6502-based computers on the market today! Up to 128K RAM, a 1.72 MHz CPU, graphics co-processing, smart peripherals, and an operating system that's a model of clarity and flexibility . . . that doesn't add up to a game system!"

But, of course—and this is just between you, me, and the lamppost—it does. From the engineering viewpoint, the formula for a bang-up game system—loads of memory; multicolor, multimode, hardware-enhanced graphics; hot sound; lots of user-interface options; and the capacity to accept both cartridge- and disk-based software—is exactly the same as the formula for a high-performance personal computer.

It's just a question of where you put the emphasis: the Atari 8-bits are inexpensive, powerful, general purpose machines that can run your business, perform a variety of domestic data processing tasks, help educate your children, and, incidentally, improve your eye-hand coordination and split-second decision-making skills with a few challenging rounds of *Pole Position* . . .

. . . while, in stark contrast, the new Atari XE game system is just that—everything the sophisticated game player needs in one box. Priced at around $150, the XEGS includes 64K of RAM for the most exciting animated graphics ever.

Contained in a compact, postmodern cartridge-console with pastel buttons that is easily connected to any color television, the XEGS comes with a joystick and a light pistol for fast-action arcade-style games and a detachable, "game playing keyboard," (high-quality, full-stroke) for those more cerebral games that require keyboard interaction.

Adding an optional XE disk drive (about $99) allows the XE/GS to run sophisticated disk-based games and educational software. From there, buyers can move on to word processing, spreadsheets, telecommunications, and much, much more.

Essentially a complete Atari 65XE 64K computer system in a redesigned housing, the XEGS is the most sophisticated game machine ever made. First shown at the January Consumer Electronics Show in Las Vegas, formally introduced at New York's American/International Toy Fair in February, and expected in stores by early fall, the system has been enthusiastically received by dealers as a sure-fire winner in the high-end, dedicated game system market.

Ultimately, however, the XEGS may prove to be a breakthrough product in more than just that area. It may well go down in history as the product that unified the home entertainment and personal computing markets once and for all.

The basic idea isn't new: make a game system that turns into a computer

Essentially, a complete Atari 65XE 64K computer system in a redesigned housing, the XEGS is the most sophisticated game machine ever made.

By JOHN JAINSCHIGG

System

and use the perception of added value and versatility to capture a larger market share than a truly dedicated game system could. A great concept—yet the history of game systems that turn into computers has been fraught with failure.

Mattell's Aquarius and Intellivision and the Coleco Adam Family Computing System (marketed as an enhancement to the successful ColecoVision game console) all bit the dust with repercussions that forced their manufacturers out of both the video game and personal computing markets.

Why? Because luckless consumers quickly discovered that the "added value and versatility" offered by their expandable systems was both expensive and largely insubstantial. Engineered first as game machines and only later kludged into general purpose systems, these post-facto hybrids were crude in comparison with contemporary "real computers."

Users were frustrated by, or quickly outgrew, their capabilities. Third-party software and hardware support was not forthcoming, and ultimately, the grassroots support needed to turn the hybrids into useful tools was never established.

Now that video games are in the news again, Atari is trying the "value added" gambit once more—but with several significant differences. First, because the XEGS is internally identical to an Atari 8-bit computer—long acknowledged to be the world's best game-playing machine—it can take advantage of almost six years of software development already committed to that architecture. It thus comes to market with not tens, not hundreds, but thousands of games and entertainment products already available—several times more product than is available for all competing systems combined.

Second, because it comprises a real, time-tested, high performance computer system, users who choose to take advantage of its general purpose capabilities will find support already in place: hardware and software from Atari and third-party manufacturers, a nationwide user group network, reams of literature and information—in short, an environment ready and eager to bring them rapidly and comfortably into the wider world of entertainment, education, and increased productivity made possible by a home computing system.

The XE Game System will have a positive impact on the existing Atari 8-bit world as well. Peripherals designed for use with the XEGS—most notably, the light pistol—will interface directly to existing 8-bit computers, and all of the raft of new entertainment software now being developed and converted for the game system (an impressive version of *Battlezone* is among the packages due for release shortly) will work on current machines.

Conversely, the growing number of XEGS users will represent an added temptation to manufacturers to increase support of the Atari 8-bit market as a whole, since they can do so at no added development cost. At first, this will naturally result in an increased supply of entertainment product. Later on, as XEGS users become accustomed to their systems and start exploring their general purpose capabilities, their enthusiasm will encourage development of more substantial applications and enhancements, and all Atari owners will reap the benefits.

"We see this as a very positive development," says John Skruch, Atari's associate director of computer software, "both from the perspective of the high-end game system user and from that of present 8-bit owners. The 'game system image' problem that Atari 8-bit computers have suffered from should be somewhat eased by the fact that the superlative gaming capabilities of the XEGS will attract that kind of attention away from the 8-bit line.

"On the other hand, the XEGS offers us a way to get the vast majority of potential computer users—people who still find computers a little threatening—involved with a system that offers full compatibility with an existing base of personal computing products, as soon as they're ready to take that step." ■

The Atari XE Game System at a Glance

- 64K RAM
- Atari Basic, plus an as-yet-unannounced bonus arcade game, in ROM
- 1.72 MHz 6502 processor
- Antic graphics co-processor supporting 3 text and 11 graphics modes, plus mixed modes and player-missile graphics (sprites).
- Four independent sound voices, each with five-octave range and individually-adjustable volume and distortion.
- Console with cartridge port; Start, Select, Option, Reset, and Power buttons; and two general purpose controller ports, compatible with joystick and light pistol, as well as specialized controllers such as trak-balls, paddles, light pens, flying yokes, steering wheels, and mice. Three RCA jacks—one for direct R/F output to television and a pair carrying composite video and audio, for use with dedicated color monitor. Atari serial port for optional disk drive hookup.
- 57-key, full-travel, detachable keyboard with Help button
- Joystick and light pistol
- Three additional games included in package: SubLogic's *Flight Simulator* for use with the keyboard, a fast-action joystick game, and a new shooting game for use with the light pistol.
- About $150 list price
- Available fall 1987



Photograph by Jeff MacWright

A new 80-column interface module offers increased flexibility to owners of all 8-bit Ataris

Atari XEP-80 Revealed

System: Any Atari 8-bit Home Computer
Price: $79.95
Summary: An easy, inexpensive way to upgrade your system
Manufacturer:
Atari Corp.
P.O. Box 3427
Sunnyvale, CA 94088
(408) 745-2000

When the Atari 8-bit line was first released, it offered substantial price and performance advantages over contemporary systems. Here was a computer designed to produce a co-processed, multimode, DMA-enhanced display through a standard color television set—no special monitor required. The Atari's 40- and 20-character text modes were designed to permit easy reading on color TV screens, and were considered quite advanced for the time, both technically and ergonomically.

They still are. Yet, as the nature of personal computing has changed in intervening years, Atari owners—some of them, at least—have come to feel the lack of an 80-column text display as something of a shortcoming. In truth, while far from disqualifying the Atari 8-bit line in the arena of "professional computing," the lack makes certain text-intensive applications such as word processing, spreadsheeting, and telecommunications, marginally less convenient than they could be.

No longer. The release of the Atari XEP-80 80-column interface module provides *all* Atari systems—even discontinued early models—with an inexpensive upgrade path to high-contrast, 80-column monochrome text, monochrome graphics display, and Centronics parallel printer compatibility, all in one low-priced package.

By JOHN JAINSCHIGG

An 80-Column Overview

Over the past six years, a number of third-party vendors have unveiled products offering 80-column capability. Most of these products were based around internal or external hardware add-ons, and tended to be compatible with only one group of similarly engineered 8-bit systems: the 400/800 line, the XLs, or the XEs.

Other products were based in software, generating a "pseudo-80-column" display in high-resolution graphics. This approach required a lot of memory, was typically quite slow, and didn't really produce the kind of image that true 80-column monochrome buffs hankered for.

A combined software/hardware system, the Atari XEP-80 board bypasses the shortcomings of both the hardware-only and the software-only approach. It provides an external device containing a hardware character generator and a substantial amount of screen RAM along with video chips capable of driving a standard, high-contrast monochrome display.

A software interface, or "handler," mediates communications between the operating system and the device via a joystick-port connection—something that any Atari can manage. John Skruch, Atari's associate director of computer software, waxes eloquent on the advantages of this approach:

"We could have taken the easy way out and added 80-column capability as an internal modification to any one group of systems, or we might have developed a plug-in device for the XE user port, or something similar. But that would have left some customers out in the cold and created incompatibilities up and down the line. It took a little longer to do it this way (via a joystick port connection), but we thought it was important to give all Atari owners access to this kind of significant upgrade."

Using the XEP-80

The XEP-80 is unobtrusive; about 4″ wide, 8″ long, and 1″ deep, it occupies slightly less space than an 850 interface.

Setting up the unit is a snap—just plug it into an unused joystick port (either will do), plug in the enclosed power supply, and run a standard RCA-type video cable from the unit to any composite video monitor.

To engage the card, you boot your system from the enclosed disk, which contains the XEP-80 handler in the form of an AUTORUN.SYS file. In a few seconds, a familiar READY prompt and cursor appear on the 80-column display, the characters glowing with etched clarity against a totally black background.

Naturally, only a green or amber monochrome monitor can take full advantage of this high-quality output, although a color monitor works better than expected, displaying bright white characters against a black background with only slight fuzziness and color fringing. Because of overscan, however, characters at the borders of the screen may be obscured when certain color monitors are used. Setting the software screen margins prevents this.

Looking closely, you can just make out the fact that each character is seven pixels across by ten pixels high—produced by the card instead of the Atari 8 × 8 internal character set map. The taller, more slender and symmetrical characters are well suited to the proportions of the wider display. Exploring further, you swiftly discover that all normal screen editing functions are supported in the enhanced mode. Most users will swiftly and easily adapt to working with the expanded display.

In fact, all of the characteristics of the GRAPHICS 0 E: device have been extended into this new domain: OPEN, CLOSE, GET, PUT, and STATUS work correctly in Basic and assembly language. Screen control via escape/character sequences is fully supported.

POSITION statements work correctly, across the entire screen. Even standard screen-control POKEs function normally, permitting control of margins, cursor visibility, and other editor attributes.

String and character I/O to and from the 80-column screen is fairly rapid in the normal operating mode of the XEP-80. Using a FOR/NEXT loop and single character output, the screen can be filled in just under nine seconds; with 80-character strings in under four seconds. For ultrafast I/O, applications can access a "burst mode," bypassing the handler and sending text directly to the XEP-80 under assembly language control.

The XEP-80 is called an 80-column card by convention, because it can display 25 lines of 80 characters each. In reality, however, the XEP-80 display is an 80-character-wide window on a 256-character by 25-line display screen. Text can be placed anywhere in this area under Basic or assembly language control, and editor functions work normally across this broad space. Using special commands, the 80 × 25 display screen can be scrolled horizontally to display any portion of this vast screen RAM.

Graphics With the XEP-80

Because the XEP-80 doesn't support normal Antic graphics modes, most GRAPHICS statements don't function when the card is engaged. In lieu of standard graphics, the XEP-80 offers three interesting options: ATASCII and international character sets, a double-high character mode, and a bit-mapped, monochrome display mode.

This last is engaged by issuing a GRAPHICS 8+16 call in Basic, or via its assembly language equivalent. Under the graphics display mode, data sent to the device is streamed onto the screen from upper left to lower right, the "on" bits in each byte displaying as lit pixels in a 320 × 200 raster display, centered on the screen, and occupying about half its total area.

Note that standard graphics commands like PLOT and DRAWTO are not supported under this system. However, because the display mode has the same resolution and bitmap scheme as a mode 8 screen, graphics can be dumped by screens to the card with little difficulty.

A particularly intriguing aspect of the XEP-80 is that it uses none of the Atari's built-in display facilities in normal operation. Because I/O to and from the card is time-critical, in fact, the Antic graphics chip, which normally steals processor cycles, is turned off when the XEP-80 handler is engaged. This permits processor-intensive programs to run faster than before.

Commands are provided, however, to disengage the handler and re-enable the normal graphics capabilities of the system under program control—the XEP-80 sustaining its own display quite nicely during this interim. The result is to make possible a two-monitor system, maintaining 80-column text on one display and, perhaps, graphics on the other. Software is sure to be developed to take advantage of this new capacity.

It should be noted that the XEP-80 has no way of producing sound through the composite monitor. If your 80-column application requires sound, you will have to leave a color monitor or TV set plugged in in the normal way while the XEP-80 is in use.

XEP-80 Printing

In addition to its considerable display capabilities, the XEP-80 is outfitted to act as a Centronics compatible parallel printer interface. The XEP-80 handler supports this function by replacing the normal OS P: device. By pressing the SHIFT key while booting the system, the graphic facilities of the handler can be disengaged, permitting you to use the XEP-80 as a printer interface with your normal monitor. Alternatively, it is possible to use the XEP-80 as a monitor handler while keeping your present printing facilities intact.

Because it replaces normal OS printing channels, it should be possible to use the XEP-80 as a printer driver with any software that uses these channels exclusively.

Documentation and Packaging

The XEP-80 comes with a power supply, a manual, and a distribution disk. The disk contains the XEP-80 handler in AUTORUN.SYS (self-loading) format—just hook up the unit and monitor, put the disk in your drive, and turn the system on. The disk also contains 6502 source code for the handler and the memory management utility that installs it, example programs in Basic demonstrating how to access the XEP-80 features in your own programs, and a number of .DOC files containing full technical documentation suitable for those who wish to develop XEP-80 compatible applications. Hackers should be

***Because of the way** the XEP-80 was designed, no significant tradeoffs are required when you add its features.*

delighted with the variety and depth of information included. In the words of John Skruch: "we put all the goodies we could think of on this disk."

The manual, on the other hand, is designed for non-technical users. Clearly written, it leads the new XEP-80 owner carefully through the not-very-difficult procedures involved in setting up and using the device.

According to Skruch, the XEP-80 is currently being manufactured in quantity, and should be available at dealers by the time you read this.

The Software Question

The XEP-80 system will add considerable functionality to Atari 8-bit computers. Moreover, because of the way the XEP-80 is designed, no significant tradeoffs are required when you add its features. Most important, both because the device is supported by Atari (and is thus an "official" peripheral) and because it is compatible with all Atari systems capable of booting its handler from disk, the XEP-80 is expected to gain wide popularity and be accepted as a standard.

All these factors will contribute to influence third-party software manufacturers to support the capabilities of the XEP-80 in future products. Manufacturers, including Timeworks, Batteries Included, Broderbund, Xlent, and OSS, are already considering support of the XEP-80 in future software releases.

Atari is supporting the XEP-80 in software, as well. *Atariwriter 80*, a new revision of Atari's standard word processor, and an 80-column version of *Silent Butler*, an integrated software package, are due to be released shortly. After that, Atari plans to support the XEP-80 as an option in all future releases of text-oriented software. Meanwhile, Basic, DOS, the Assembler/Editor cartridge, and many other "OS legal" products already work. ■

***The XEP-80** provides all Atari systems—even discontinued models—with an inexpensive upgrade path.*

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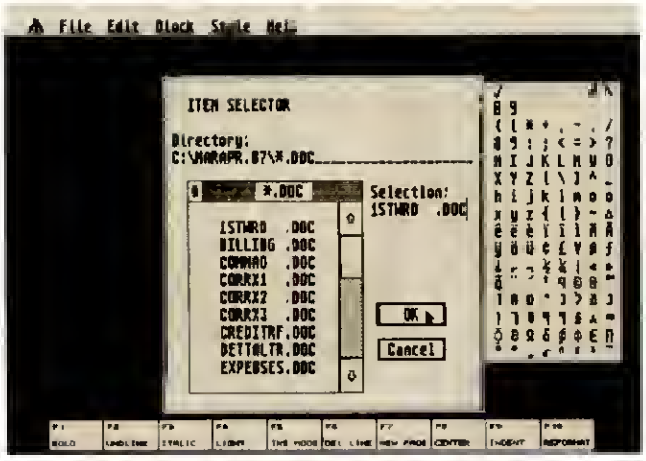
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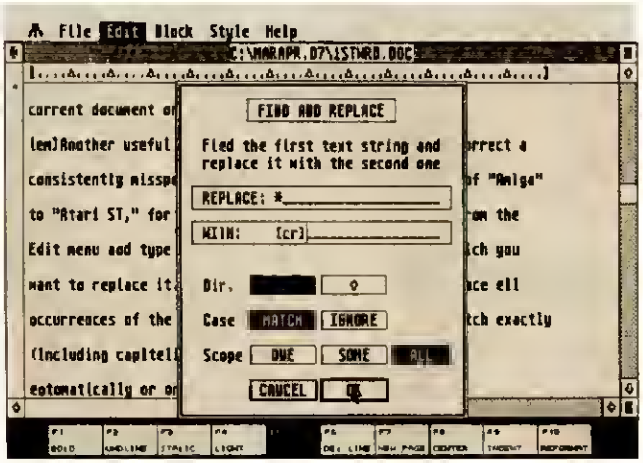
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1st Word v1.06

The updated version of Atari's own word processor provides a painless entry point for the beginner and lots of features for the experienced user



To open a file, you can double-click on the name of an existing file, type in the name of an existing file, or type in the name of a new file when the GEM Item Selector appears. To the right of the Item Selector is part of the Atari Character Table.



1st Word does not have macros, but the Find and Replace function, used creatively, can save a great many keystrokes. Here, the temporary * is about to be replaced with [cr], which will tell the typesetter to insert a carriage return at the end of each paragraph.

By BETSY STAPLES

A word processor is a very personal thing. Taste in word processing programs, like taste in food, develops early; just as no one's coq au vin compares with Mom's, no word processor ever really compares with the first one you learned to use—the program that liberated you from the tyranny of the typewriter or the drudgery of penmanship.

The only word processing program I ever really loved was *Electric Pencil*—first on a bright blue vintage 1976 Processor Technology Sol 20 and then on a pale grey machine with bright blue initials. Originally written by Michael Shrayer in 1975, *Pencil* was the first word processing program for microcomputers. Over the years, it was refined and embellished, but it remained a basic, easy-to-use program that did everything I wanted it to do. I understood it, and it never let me down.

Electric Pencil was never released in an Atari version, so it was with a mixture of chagrin and hostility that I faced the task of switching my typographical allegiance to the ST. The only program available at the time was *1st Word*, which had come with the machine. So I booted it up, and sure enough, I hated it.

I hated it because it wouldn't do what I wanted it to do—at least not in the *way* that I wanted it to. In retrospect, I realize that a large part of my problem was that I was simply not yet comfortable with GEM; it annoyed me to have to take my hands off the keyboard to issue a command.

Quite honestly, it took me several weeks to shed my old word processing habits and don new ones, but as I grew more familiar with the ST and GEM, *1st Word* too began to make sense. And now that Atari has released a refined version 1.06, I think I can provide an objective review, so here goes . . .

Getting Started

1st Word can be used with either a monochrome or a color monitor in low, medium, or high resolution. The following comments are based on my use of the program with a monochrome monitor.

When you boot 1ST_WORD.PRG from the desktop, the GEM Item Selector appears, and you can double-click on the name of an existing file, type in the name of an existing file, or type in the name of a new file to begin working on a document.

When the text window appears, you see a screen with File, Edit, Block,

Style, and Help menu headings displayed across the top. On the second line is your filename, complete with directory path, and below that the ruler line, which shows left and right margins and tab settings. Along the bottom of the screen are icons for the ten function keys.

You can begin creating your document immediately. The default condition for text entry is insert mode, which means that characters are inserted into your text at the cursor position. If you prefer overwrite or strikeover mode, which allows you to type over existing text at the cursor position, you need only touch the F5 key.

Text entry is smooth and straightforward; no matter how fast you type, *1st Word* keeps up and never drops a character. The only trouble I have ever had with characters appearing and disappearing at other than the intended location occurs when I change a single character in existing text and then move quickly to another location with the mouse. Occasionally, the change is not made quickly enough, and I find a letter where I wanted a bracket or a hyphen where I wanted number. This is perplexing, but not seriously troublesome.

When it comes to deciding how your final document will look, you can go to the Style menu and choose whether to have your text justified or ragged right, single- or double-spaced. Individual words or blocks of text can be printed out in bold, underlined, or italic type by pressing the appropriate function key prior to typing the word or words to be highlighted. Or, you can select the text with Start and End Block markers or the mouse "rubber band," press the appropriate function key, and then choose Restyle from the Style menu. Superscripts and subscripts are also invoked from the Style menu.

Block Moves

The functions you can invoke from the Block menu are among the most useful and well-implemented features of *1st Word*. To mark irregularly shaped blocks of text, you use the Start Block and End Block options from the menu. To mark part of a line or one or more full lines, it is usually quicker to use the rubber band feature, dragging the mouse pointer over the text you want to mark.

Once the text is marked, it can be copied, moved, deleted, cut, or pasted. If you cut a block, it remains in a buffer until you overwrite it with a new block or exit the file. From the buffer, it can be pasted to different locations within your current document or transferred to another file.

Text entry is smooth *and straightforward; no matter how fast you type, 1st Word keeps up and never drops a character.*

Another useful feature is the Replace command. To correct a consistently misspelled word or change all occurrences of "Amiga" to "Atari ST," for example, you simply choose Replace from the Edit menu and type in the word used and the one with which you want to replace it. You can then choose whether to replace all occurrences of the word or phrase or just those that match exactly (including capitalization) and whether to replace them automatically or only at your command.

1st Word does not have macros, but I have found that the combination of Replace and Paste used creatively serves quite well and saves me a great many keystrokes. I include typesetting codes in the articles I write, and instead of typing, for example, [cr] to indicate a carriage return at the end of every paragraph, I put in an asterisk. Then when the article is finished, I simply Replace all the asterisks with [cr]s. Similarly, if I know I will be using the name of a program frequently in a given article, I save the name and the appropriate typsetting codes in the buffer and Paste the whole thing into the text each time I want it to appear.

If the replaced symbol results in a line that is too long or too short, a touch of the F10 key or Reformat on the Style menu reformats the paragraph.

System: Atari ST
Price: $49.95
Summary: A good, all around, easy-to-use word processor.
Manufacturer:
Atari Corp.
P.O. Box 3427
Sunnyvale, CA 94088
(408) 745-2367

Saving and Printing

Files can be saved in either *1st Word* or ASCII format. *1st Word* is the default format; to save in ASCII, you must remember to uncheck WP Mode on the Edit menu before clicking on Save. Sometimes, but not always, a message appears to warn you that your document will be saved without format.

Saving a file clears the screen and returns you to the startup screen from which you must then pull down the File menu, click on Open, and reselect your file from the Item Selector. If you have not exited *1st Word* in the interim, the name of the file on which you last worked appears on the selection line, and you have only to press Return or click on OK to recall your file. Then you must find the point at which you left off, so you can resume your writing.

The process is quite simple and ought not be onerous, but it is annoying to anyone who has ever been on intimate terms with a word processor that could save a file without closing it. Given all the things that can cause loss of data, designers of word processing software should make saving a file swift and painless. Reloading your file after each save is not particularly painful; neither is it swift.

Each save after the first causes the previous version of your document to be saved with the extension .BAK—a nice safety feature. If you want to save several versions of the same document, you can use the Save As command, renaming them and even placing them in different folders or on different disks.

You must save a document before you can print it. This is another nice safety feature, which spares you the awful sinking feeling that strikes right after you tear the last sheet of an unsaved document from your printer and just as your finger hits the power switch.

After you have saved a file and sit facing the startup screen, you can print by pulling down the File menu and clicking on Print. The Item Selector appears, and, again, if you have not exited *1st Word*, the name of the file on which you most recently worked appears on the selection line. To print that file, you

either click on OK or press Return. The Print File form appears, giving you an opportunity to specify which pages to print, which page number to start with, how wide to make the left margin, whether to swap left and right headings on alternate pages, and whether to print in draft or NLQ mode.

These choices are self-explanatory, but it should be noted that NLQ mode simply causes the printer to print over each line twice, resulting in somewhat bolder, but by no means letter quality output from most Epson-like printers.

And speaking of printers, the *1st Word* disk contains drivers for the following printers: Brother HR-15/25 daisywheel, Epson LX80, Espon RX/FX80, Qume Sprint daisywheel, Atari SMM804, and ASCII-only. Atari promises that new printer drivers will be made available as they are written.

Installing a new printer driver is probably the most confusing thing you will ever do with *1st Word*, which is a comment more on the simplicity of the other functions of the program than on the complexity of the printer driver installation process. All the information you need is there, and the process will work if you follow the directions in the manual carefully. It just isn't as intuitively obvious as other aspects of the program.

***Designers** of word processing software should make the process of saving a file swift and painless.*

Twelve pages at the end of the manual explain how to create and install a custom printer driver. We suggest you leave that to the pros and simply ask your dealer if your printer is compatible with one of those listed above. My Star Micronics NL-10, for example, thinks it is an SMM804 and has worked like a charm from the moment I plugged it in.

Other Features

1st Word has many other features, most of which I rarely use. Just in case one of them is the feature on which the utility of a word processing program hinges for you, some of the more unusual ones are listed here.

With *1st Word* you can indent blocks of text; create hanging indents; insert onscreen (but not print) special characters from the Atari Character Table; work with up to four windows/files at once; size those windows; insert hard, soft, and conditional page breaks; right justify and center text; print headers and footers at the right, left, or center of the page; specify paper length; and set up to four position markers in the text.

The 74-page spiral bound User's Manual provides detailed descriptions of all the features of the program. It is profusely illustrated with sample screens and should have even rank word processing beginners feeling comfortable within an hour or so of booting the program.

Suggestions For V2.0

I would desperately like to be able to change the default style from justified single-space to ragged right double-space, the format I use most often. It seems to me that at the very least the program should be able to store your style preferences with each document; *Electric Pencil* could do that eight years ago. I find it very annoying to have to reset the style each time I open a file—particularly when I almost always use the same setting.

I would also suggest to the designers that they give some thought to the printing of labels. Although it is theoretically possible to print labels with *1st Word* as with any word processor, no amount of experimentation on my part could yield more than a single tidy page of labels.

All things considered, however, *1st Word* is a good word processing program. It is straightforward and easy to use—even for the novice—and offers most of the features experienced users have come to expect in a word processor.

And because of its wide distribution, it has become the de facto standard among Atari ST users. If you want to be able to send formatted files on disk to ST-using friends, business associates, or magazine editors, you almost have to have *1st Word*, because it is the program you are most likely to have in common.

If you have an earlier version of *1st Word*, you can get v1.06 and the new manual by sending your original disk, along with a check or money order for $9.95 plus $2.50 to cover shipping, to Atari Customer Relations, P.O. Box 61657, Sunnyvale, CA 94088, Attn: 1st Word 1.06. ■

Puzzles & Problems

By DAVID H. AHL



Illustration by Nicholas Jarschigg

Amicable Numbers

A famous king thought of himself as quite a mathematician. He told a prisoner, "Give me a problem to solve. You may have your freedom until I solve it. But as soon a I have the answer, off comes your head!"

Now the prisoner was pretty clever himself and presented the following problem to the king: 220 and 284 are called amicable numbers. The sum of the proper divisors of 220 equals 284, and the sum of the proper divisors of 284 equals 220. Find the next pair of amicable numbers.

The story goes that the prisoner went free and finally died of old age, because the king died of frustration, never having solved the problem. But the king didn't have a personal computer, and you do. Can you solve the problem?

Proper Divisors of 220

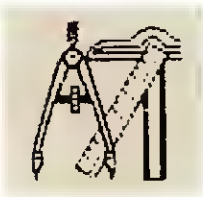
1
2
4
5
10
11
20
22
44
55
110
284

Proper Divisors of 284

1
2
71
142
220

Answers on page 74





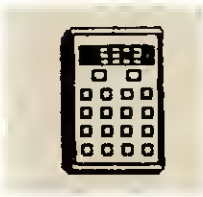






Figure 2. Sample LabelMaster designs.

LabelMaster

LabelMaster is billed by the manufacturer as "a fun, easy-to-use GEM-based label maker and mailing list manager. Labels may be printed with designs from the graphics library on disk or you can create your own designs using the Design editor."

We certainly had to agree that *LabelMaster* was easy to use. You can learn to use the program in considerably less time than the disk takes to load. When you load a file—new or existing—the file editor shows the first label in the file (see Figure 1). You can enter data or edit any of the fields in the label and move around using the mouse, tab key, or arrow keys, whichever is most comfortable for you. In addition to entering the name and address, you must also flag the label as a business or personal label. Pressing Return saves the new or revised version of the label.

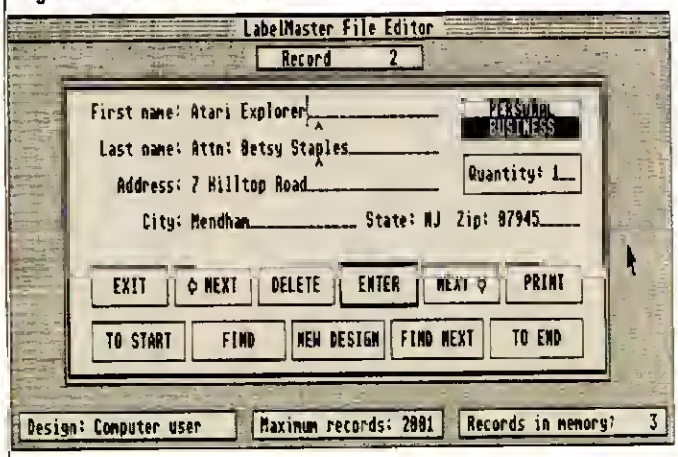
Using the 11 boxes at the bottom of the screen, you can skip to another point in the file, delete a label, find a specified label, or add a graphic design to your entire label file.

The graphic design feature is probably the niftiest part of *LabelMaster*. With it, you can select any one of 84 pictorial designs or one of 26 stylized letters to appear on the lefthand portion of your label (see Figure 2). No, you cannot attach a different design to each label; your entire file must utilize the same design, although you can change it for different mailings.

In addition to using the existing designs on the disk as they are, you can alter and save them or even make up your own designs from scratch. The Design editor is particularly easy to use once you master the rubber band function of the mouse.

Labels can be printed in the order in which they are stored in the file, or in any order as specified in the sort menu, say alphabetically by company name or in zip code order (see Figure 3).

Figure 1. File editor screen.



Design your own labels and maintain your mailing lists with the latest release from Migraph

System: Atari ST
Price: $39.95
Summary: Mailing list manager with ability to produce pictorial labels
Manufacturer:
Migraph, Inc.
720 S. 333rd St.
Federal Way,
WA 98003
(206) 838-4677

A Few Limitations

LabelMaster is not without its limitations, most of which are not onerous, but simply things of which to be aware. First, the program assumes you will always use one-up, 1″ × 4″ labels. While this is a common size, some label programs allow you to use four-up (standard data processing format) labels, or labels of a different size (say, 2″ × 4″ preprinted with a return address).

Second, because of the design on the left, somewhat fewer characters are allowed for the name and address itself than on labels where you can use the full width. For example, you could not fit a company name like Technical Design Consultants, Inc. without using some abbreviations. Actually, there is another way around this problem using the "freestyle" printing feature in which each line of the label can be assigned its own printing attribute (extended, normal, or condensed).

Third, we initially thought we could combine two business lists into one by flagging one set "Business" and the other "Personal." No go. Personal labels are printed in a three-line format and business labels in a four-line format.

But all in all, *LabelMaster* is a versatile, interesting product. It won't replace your Roladex file or customer database, but it is a nice way to keep names for mailings, and it certainly produces the most eye-catching labels around. ■

By DAVID H. AHL



```
Migraph, Inc.
Attn: Liz Mitchell
720 S. 333rd St., Suite 201
Federal Way, WA 98003
```



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Atari Explorer
Attn: Betsy Staples
7 Hilltop Road
Mendham, NJ 07945
```

Figure 3. Sample labels.

A look at some new accessories—hardware and software—for SubLogic's Flight Simulator II

Flying The Scenic Skies

Flight Simulator II from SubLogic has proven to be one of the most durable pieces of entertainment software in home computer history: it has been on the best seller lists for almost half a decade.

Author Bruce Artwick would be a shoo-in for any Sofware Designer's Hall of Fame, and the reason is clear: few games combine strategic challenge and relentless action as effectively as this brilliant simulation.

SubLogic's Star Scenery Disks are among the new support products that keep *Flight Simulator II* fresh. These disks interface with the original program and add new locations to the *FS II* universe.

And for those pilots who crave even greater realism, there is now a joystick designed exclusively for use with *Flight Simulator II* and Atari 8-bit computers. Armchair pilots can sit back and fly with an honest-to-goodness joystick/throttle in their hands, activating commands that formerly required the keyboard.

But before we discuss the controls, let's take a look at the new air space that has been opened to Atari fliers. SubLogic Scenery Disks are optional add-ons that can be used only in conjunction with the original program. SubLogic has divided the U.S.A. into 12 areas and released a Scenery Disk for each. The recently introduced Star Scenery Disks cover smaller areas and offer a higher



Mt. Fuji as seen on the Star Scenery Disk of Japan.

Star Scenery Disks

System: Any Atari 8-Bit Home Computer
Price: $19.95
Summary: An inexpensive way to extend the range of your simulated aircraft
Manufacturer:
SubLogic Corporation
713 Edgebrook Dr.
Champaign, IL 61820
(217) 359-8482
(800) 637-4983



A view Fisherman's Wharf from the San Francisco Star Scenery Disk.

By BILL KUNKEL and ARNIE KATZ



The MicroFlyte ATC Joystick

concentration of scenery, including buildings and other structures as well as topographical features and major airports.

The disks allow you to fly over and crash into attractive new terrain. You can also sharpen your landing skills at a variety of airports that present a variety of different conditions to challenge your growing expertise.

Japan and San Fran

The latest Star Scenery Disk releases cover Japan (Tokyo and Osaka) and San Francisco and the Bay Area. Both are beautiful, incorporating such well-known landmarks as Mt. Fuji and the Golden Gate Bridge.

The graphics employ an art style that falls somewhere between realism and iconography. SubLogic's design staff has continued to refine the technique of creating believable scenery. As a result, the latest Scenery Disk areas look significantly better than the four cities (New York, Chicago, Los Angeles, and Seattle) included in the original *Flight Simulator II* package. Objects hold together quite well as you approach them, although some of the larger landmarks lose depth at very close range, and from some angles some points of interest look like giant cardboard cutouts.

Each Star Scenery Disk package includes a sectional directory, which lists all airports and navigational aids, and a detailed flight chart.

If you are like me, each time you boot a new scenery disk, you ask the same question: what will happen when I soar beyond the boundaries of this disk? Will the Piper 181 Cherokee Archer float off the edge of the simulated Earth? Or, as happens in some graphic adventure games, will it be instantly yanked back to the point of departure?

Actually, nothing so surreal occurs. When the aircraft moves into a geographical area not contained in memory, the program sends you to a default locale chosen from a library of locations. It is, however, possible to sequence the scenery disks, loading them "on the fly" with a simple keyboard command.

The mention of keyboard commands brings us to the subject of the *Flight Simulator II* control system. Because of the number of different commands needed to activate the flaps, throttle, landing gear, and other features, it was impossible for the designers to assign all control functions to the joystick. Therefore, you must enter your commands via the keyboard. This is slow going at first, especially for computerists who have no actual flight experience. With some practice and the help of SubLogic's handy command summary card, however, novice aviators can eventually abandon the "training wheels" of autopilot (demo flight), grab the metaphorical throttle, and take 'er up.

Flight Control for the ST

Microcube has recently released a version of the MicroFlyte joystick for the Atari ST.

The ST version, which plugs into the mouse port, features a completely new design and sells for $119.95. Watch these pages for a complete review.

Flight Simulator II is available for the ST (see the review in the Nov/Dec issue of *Atari Explorer*), but SubLogic has made no announcement concerning availability of the Japan and San Francisco Star Scenery Disks for the ST.

MicroFlyte ATC

System: Atari 800 XL and XE Computers
Price: $59.95
Summary: The ultimate Flight Simulator joystick—with some limitations
Manufacturer:
Microcube Corporation
P.O. Box 488
Leesburg, VA 22075
(703) 777-7157

You Take the Stick

Most computer pilots are soon perfectly comfortable with keyboard entry; some will never find the experience truly satisfying without a joystick controller. For these people, and for those who just want a more realistic flight, there is the Microcube MicroFlyte ATC Joystick and software driver.

Microcube pulled out all the stops in its quest to bring joystick control to *Flight Simulator II*. If anything, this controller suffers from overkill. For one thing, it is not quite a "plug and play" device. You must first boot the driver software, which sets the stick for the requirements of the simulator. The software boot is a painless step, however, and this method will allow Microcube to produce subsequent driver disks for other games, like *F-15 Strike Eagle* from MicroProse.

It is even possible for amateur programmers to take advantage of the MicroFlyte ATC in their own game programs; the simple Basic routines are printed in the documentation.

The joystick is very sturdy and reminiscent of the superb Kraft Apple and IBM joysticks, including vertical and horizontal trim controls. The stick itself is metal with a scalloped plastic cap at the tip of the 2″ shaft. The joystick assembly is sunk into a metal casing (5¼″ × 4¼″, 2¾″ high at the back, just under 1½″ in the front), which also houses a power light, reset button, and throttle and flaps controls. "Flaps down" does triple duty, because it also controls the brakes and serves as the gun trigger in the excellent World War I dogfight scenario.

Many players will question the ergonomics of the MicroFlyte controller. The unit is not comfortable for flyers who want to hold the base in one hand and manipulate the stick with the other. The device is really too large to hold in

hands any smaller than Kareem Abdul-Jabbar's.

Worse, the controller is oriented for the convenience of left-handers. Four of the five command triggers are positioned on the right side of the base with the joystick on the left. This will come as a pleasant surprise to left-handed gamers, but righties will find their fingers in a hopeless tangle as they try to manipulate the stick with the right hand and press the buttons with the left.

Some players may also find the automatic centering feature of the Micro-

With some practice, novice aviators can eventually abandon the "training wheels" of autopilot, grab the metaphorical throttle, and take 'er up.

Flyte, which prevents the pilot from simply entering a direction change and moving on to other business, a bit awkward. The stick must be held in place—not an easy task against the tug of the centering springs—for as long as the command is valid. This makes every bank, dive, and climb a nail-biting challenge. Takeoffs, for example, which are virtually automatic under the keyboard command system, are a good deal more difficult with the MicroFlyte controller.

Finally, the suitability of this controller for use with other entertainment packages is debatable. *F-15 Strike Eagle*, the likely choice for the next software driver, doesn't appear to need such a sophisticated command device. The only benefit would be that a few keystroke commands, such as those for radar and the bomb site, would be handled by the buttons on the controller. But *F-15*, unlike *FS II*, requires few such orders during the course of a mission, so the impact on actual game play might not be very significant.

Given its limitations, the MicroFlyte controller may not be for all *Flight Simulator* fans. It will greatly enhance the experience for some; others may find it unwieldy.

The latest Star Scenery Disks, on the other hand, are an unalloyed blessing for any avid flier of Bruce Artwick's electronic skies. ■

Big Printer

EXAMPLE

Big Printer turns your Atari (and printer) into a banner-making machine. Eight text sizes make it easy to create attractive banners, attention-getting signs, and unforgettable greetings. Big Printer is a cinch to use. Just type the program in as shown, save it on disk, put some paper in your printer, and type RUN. Happy printing!

ATARI KEY

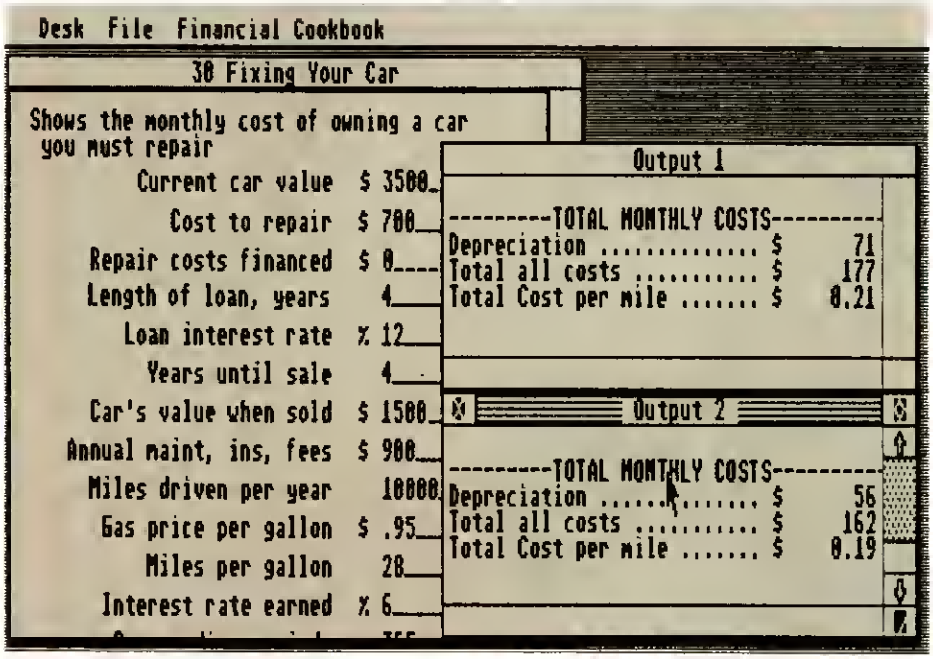
- Any Atari 8-Bit Home Computer
- Atari Basic
- Printer

```
10 DIM M$(128),BIN(7)
19 REM --"POWERS OF TWO" ARRAY FOR BIT VALUES--
20 FOR I=0 TO 7:BIN(I)=2^I:NEXT I
29 REM --SCREEN MEMORY BASE ADDRESS--
30 SC=PEEK(88)+256*PEEK(89)
39 REM --CHARACTER SET MEMORY BASE ADDRESS--
40 CS=PEEK(756)*256
50 OPEN #1,4,0,"K:"
60 PRINT CHR$(125)
70 POSITION 11,0:PRINT "***BIG PRINTER***"
80 POSITION 2,2:PRINT "PLEASE ENTER YOUR MESSAGE."
90 PRINT "USE NO MORE THAN 128 CHARACTERS"
100 PRINT "AND DO NOT USE COMMAS."
110 PRINT :PRINT "MESSAGE";:INPUT M$
120 IF M$="" THEN 110
130 PRINT :PRINT "PRESS A NUMBER KEY TO SELECT"
140 PRINT "PRINT SIZE: (0=SMALL ; 9=LARGE)";
149 REM --CONVERT ASCII TO DIGIT--
150 SET #1,SZ:SZ=SZ-47:IF SZ<1 OR SZ>10 THEN 150
160 PRINT " ";SZ-1:PRINT :PRINT
170 PRINT "TURN ON YOUR PRINTER AND PRESS"
180 PRINT "ANY KEY WHEN READY.";
190 GET #1,K:POKE 752,1:OPEN #2,8,0,"P:"
200 PRINT CHR$(125):POSITION 14,10:PRINT "PRINTING:"
209 REM --FOR EACH CHARACTER IN MESSAGE ...--
210 FOR CHAR=1 TO LEN(M$):POSITION 24,10:PRINT M$(CHAR
,CHAR);
219 REM --FIND ITS BITMAP--
220 MAP=PEEK(SC+424)*8+CS
229 REM --ACCESS IT, BITWISE--
230 FOR BIT=7 TO 0 STEP -1
240 FOR DEPTH=1 TO SZ/2
249 REM --FROM BOTTOM TO TOP--
250 FOR BYTE=7 TO 0 STEP -1
259 REM --DETERMINE IF BIT IS SET OR NOT--
260 SET=INT(PEEK(MAP+BYTE)/BIN(BIT)):SET=INT(SET/2)<>S
ET/2
269 REM --AND PRINT STARS OR SPACES AS APPROPRIATE--
270 FOR LNGTH=1 TO SZ
280 PRINT #2;CHR$(32+SET*10);
290 NEXT LNGTH:NEXT BYTE:PRINT #2:NEXT DEPTH:NEXT BIT:
NEXT CHAR
300 CLOSE #2:POKE 752,0:GOTO 60
```

By JOHN JAINSCHIGG

Financial Cookbook

Putting your money where your mouse is



If you had a hard time assembling your 1986 financial records in preparation for figuring your taxes this year, you probably realize that now is the time to start getting things under control for next year. Whether you need help planning for your retirement or just deciding how much to spend on groceries next week, *Financial Cookbook* from Electronic Arts is the program that can help you do it.

Financial Cookbook, which is available for both 8-bit and ST computers, consists of a 32 forms or *recipes* designed to help you get the most from your money. Actually miniature spreadsheets with fill-in blanks for dollar amounts and percentages, these recipes cover such areas as home mortgage vs. rental, IRAs, savings accounts, and car ownership.

Bringing up the list of recipes, choosing one with your mouse, and clicking on the OPEN box will display the requested form. Entering the pertinent information (i.e., tax rate, inflation rate, interest rate, etc.) and clicking on the COMPUTE box yields the results for that set of numbers. By returning to the main recipe (without closing the first result), you can change the parameters of the recipe to answer any "what if" questions you may have.

Let's look at a specific example: the "Living on Your Savings" recipe, which requests information on your initial savings balance, monthly withdrawals, interest rate, and other facts to establish how long your savings account will last if you should retire or lose your job. To help explain its conclusion, the program provides an annual breakdown of amount withdrawn, balance remaining, and interest paid, and tells how inflation may cause you to alter the amount of your withdrawals. Changing any of the original figures and recalculating can give you a good idea of how much latitude you have in your spending and how various items in your budget affect that latitude.

Financial Cookbook is very easy to use, because it takes full advantage of the GEM environment. Across the top of the screen, you see the standard menu bar with Desk, File, and Financial Cookbook headings. Cursor manipulation is a simple matter of point-and-click, and dialog boxes appear at every decision point.

All menus, recipes, and their computed results are placed into individual windows that can be opened and closed, sized, scrolled, and moved about at will. You can have four windows open at once, which makes it easy to have two sets of results available for side-by-side comparison, and each successive computation window is numbered, so you can keep track of your results. All screens can be saved to disk and printed out for later reference.

System: Atari Home Computers: ST
Price: $39.95; $49.95
Summary: Money management made easy
Manufacturer:
Electronic Arts
2755 Campus Dr.
San Mateo, CA 94403
(415) 571-7171

By ANDY EDDY

Documentation

The *Financial Cookbook* manual is an invaluable aid to your understanding of how everything works. It assumes that you need help (Why else would you have purchased the package?) and explains things in easy-to-understand, non-technical language.

Any terms you don't understand can be found in the glossary, which defines in plain English the words you have always wanted to ask an accountant to explain but were afraid to pay him for.

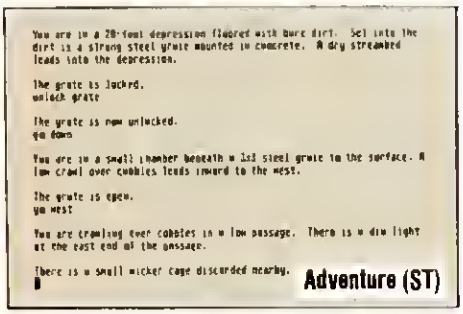
The recipes are discussed in detail, as are the formulas that underlie them, and the index helps you choose which recipe fits the problem you want to solve, since many different circumstances can be covered by one formula.

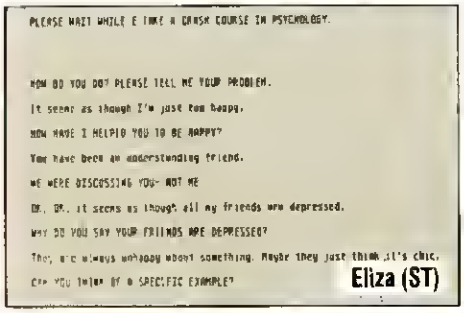
Perhaps the most useful feature of this program is the ability to store your financial "profile." In the profile, you can store such frequently used information as state and federal tax rates, inflation rate, and interest rates. Then, when you call up a recipe, these variables are automatically filled in. The profile can either be kept in memory for a single session or saved on disk to be available for future work.

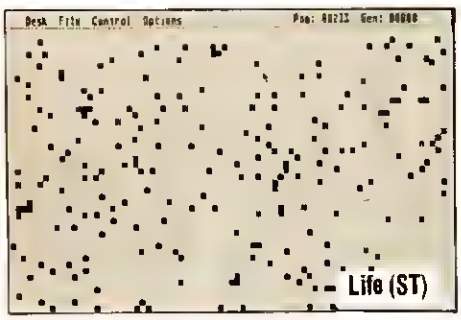
Summary

Financial Cookbook makes it very simple to keep track of your money, to put your financial situation in perspective, and to test a variety of scenarios for feasibility. The usual caveats about professional advice apply, of course, but the program can help you get a hold on your finances and give you an understanding that will at least help you talk intelligently to your accountant. Electronic Arts has done a fine job—as usual. ■

Golden Oldies









Electronic Arts introduces new computerists to the classics



According to the jacket notes, "*Golden Oldies, Volume I* is a collection of four of the greatest game programs of all time—in their original, uncut, officially endorsed versions." The four games are *Adventure*, *Eliza*, *Life*, and *Pong*.

Having been on intimate terms with computers and computer enthusiasts since long before even these games burst on the scene, I can attest to the tremendous impact that each of them had on the industry when it was released. Yet, I am always amazed when I speak at a show or convention and make a passing reference to *Eliza* or *Pong*, assuming everyone is familiar with these classics, and then several young enthusiasts come up to me afterward and ask, "What is *Eliza*?

System: Atari Home Computers; ST
Price: $29.95 and $34.95(ST)
Summary: Faithful renditions of four classic computer games.
Manufacturer:
Software Country
9713 Santa Monica Blvd.
Beverly Hills, CA 90210
(213) 278-8450
Distributor:
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
(800) 448-8822
(415) 571-7171

Adventure

Adventure by Willy Crowther and Don Woods is the granddaddy of the popular adventure genre that consumes so much of gamers' time these days. Originally written on a monster DEC PDP-10 timesharing system, *Adventure* has been compressed, massaged, and reworked to fit nearly every computer ever made with at least 48K of memory. (I once saw a cleverly compressed version that fit into an old Atari 800—no, I no longer have a copy.) There was even a CP/M version by Claude Kagan that could be played in either English or French.

In *Adventure*, you explore the magic realm of the Colossal Cave. You are the adventurer seeking fabulous treasures, mythical adversaries to overcome, and initiation into the secret spells that operate within the cave. This fantasy world is brought to you totally in text, but it is as vivid and gripping as the classiest Hollywood special effects.

Can you find the way out of Witts End?

Eliza

Joseph Weizenbaum at M.I.T. wrote *Eliza* as a sort of joke, naming it after G.B. Shaw's cockney lass, Eliza Doolittle, because as he explained, "the program could be taught to speak increasingly well, although like Miss Doolittle, it was never clear whether or not it became smarter."

Essentially, *Eliza* is a caricature of a Rogerian (non-directive) therapist. Thus, she needs no knowledge of the real world to keep up her end of the conversation. If you say, "I hate my boss," *Eliza* will simply reply, "Why do you hate your boss?" The program recognizes certain key words having to do with self, emotions, and family and often makes startlingly perceptive remarks.

"Hello, what's on your mind today?"

By DAVID H. AHL

Life

Life is not exactly a game; rather, it is a disarmingly simple set of rules laid down by British mathematician John Conway pertaining to the birth, survival, and death of cells on a checkboard-like field. The general principles are that isolated cells die of loneliness and crowded cells die as a result of overpopulation; favorable conditions generate new cells and keep old ones alive—not too different from life itself.

The implementation of *Life* on the Atari is a dramatic improvement over the PDP-12 monochrome displays available at Digital Equipment in the early 70's when we would spend hours watching the results of a new seed pattern, each new generation taking several seconds to develop. *Life* on the Atari is in living color, and new generations develop in microseconds.

On the other hand, *Life* is the only one of the *Golden Oldies* that seems to have bugs. In particular, the Freeze, Color toggle, Store, and Escape keys frequently did not work, leaving *Life* to zip along oblivious to my pounding on the keyboard.

Pong

Pong was not, as is often thought, Atari's first game. That honor belongs to Computer Space, a game that was too complex for the coin-op environment. *Pong* was, however, Atari's first successful game: a megahit, you might say. But do you remember the original *Pong*?

I am probably one of a very few people to have an original operational (almost) coin-op Pong at home. I say "almost," because the display gave out some time ago. ($5.00 goes to the first reader who can show me on a schematic where to insert the Pong video output signal into a standard TV set or monitor. No, it is not a composite video signal.)

Pong is simplicity itself. Each player has a paddle that moves up and down the right or left side of the screen. As the ball approaches, you simply move the paddle to hit it—that's it. Well, not quite; the ball speeds up after the fifth, ninth, and thirteenth bounce, and the angle of return changes as the game progresses. It's a bit tricky to get the hang of moving the paddle with a mouse instead of a rotary control—it took me about ten seconds to adjust.

Beep . . . boop . . . beep . . . boop . . . razzzzzzz.

Documentation

The impressive 42-page book that comes with the package includes historical data and other interesting facts about the games.

Pages are included for mapping *Adventure* and keeping track of your *Life* colony, which is handy. About half the pages are reserved for "notes," which seems unnecessary—perhaps the publisher needed 42 pages to make a book of a particular size and shape.

Superfluous pages notwithstanding, *Golden Oldies* is a worthwhile package – for those who have never played the games and for those who haven't played them in years. ■

COMING SOON FOR YOUR ST

Battlezone

POWER WITHOUT THE PRICE

ATARI ST BONANZA

STAR RAIDERS
The Classic Game for Your ST
Is Now Available

ATARI ST COMPUTER SOFTWARE

DS5027	NEOChrome (Final version)	$ 39.95
DS5045	Chrystal Castles (color monitor required)	$ 29.95
DS5019	ST Star Raiders (color monitor required)	$ 29.95
DS5026	Joust (color monitor required)	$ 29.95
DS5004	DB Master One	$ 49.95
DS5034	dBMan	$149.95
RS5035	VT-100 Emulator	$ 39.95
DS5029	1ST Word (1.06)	$ 49.95

ST EXTRAS

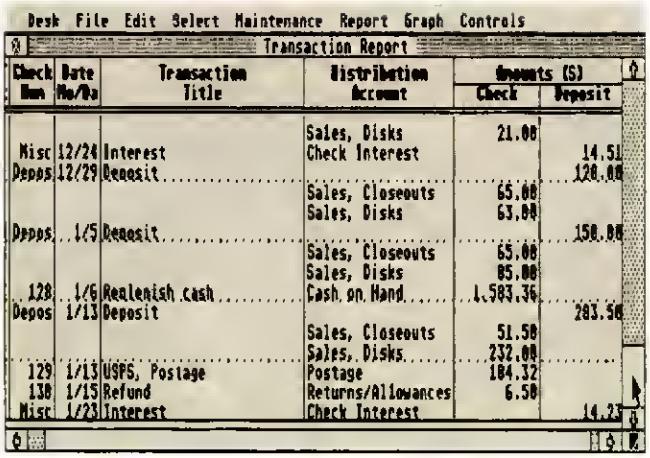
SF354	Single Sided Disk Drive	$199.95
SMM804	80 CPS Dot Matrix Printer	$229.95
CO70263	Ribbon for the SMM804	$ 12.95
CO26224	Blank Disks, 3.5″ Double Sided (box of 5)	$ 16.95

To order, send check, money order, or VISA/MasterCard number (including expiration date) to:

Atari Bonanza, Dept. SP
P.O. Box 61657
Sunnyvale, CA 94088

Shipping and handling (under $50, add $2.50; over $50, add $5.00)

No COD's, please.
California residents, add 7% sales tax.
Outside USA, add $10 for shipping.
Please allow 6 to 8 weeks for delivery.



Desk File Edit Select Maintenance Report Graph Controls

Transaction Report

Check Num	Date Mo/Da	Transaction Title	Distribution Account	Amounts ($) Check	Deposit
			Sales, Disks	21.00	
Misc	12/24	Interest	Check Interest		14.51
Depos	12/29	Deposit			120.00
			Sales, Closeouts	65.00	
			Sales, Disks	63.00	
Depos	1/5	Deposit			150.00
			Sales, Closeouts	65.00	
			Sales, Disks	85.00	
128	1/6	Replenish cash	Cash on Hand	1,583.36	
Depos	1/13	Deposit			283.50
			Sales, Closeouts	51.50	
			Sales, Disks	232.00	
129	1/13	USPS, Postage	Postage	184.32	
130	1/15	Refund	Returns/Allowances	6.50	
Misc	1/23	Interest	Check Interest		14.23

Figure 1. Portion of a transaction report.

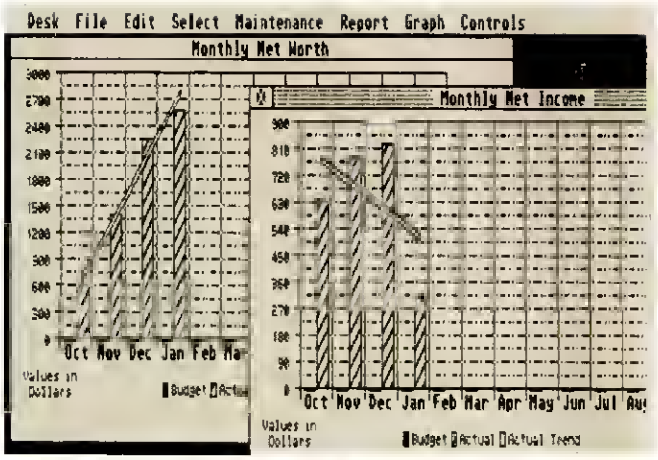


Figure 2. Graphs showing monthly net worth and monthly income from a small business.

The newest version of this popular financial record-keeping and analysis program offers some useful extras to ST users

Dollars and Sense

System: Atari ST
Price: $99.00
Summary: Sensible financial record-keeping and analysis program
Manufacturer:
Monogram Software, Inc.
8295 S. La Cienega Blvd.
Inglewood, CA 90301
(213) 215-0355

In general, the world can be divided into two types of people, those who are neat and tidy and those who thrive on chaos. For the most part, I fall into the former category—except when it comes to financial records where cigar boxes of receipts and cancelled checks are the mainstays of my record keeping "system." Hence, it was with a sense of anticipation that I unpacked *Dollars and Sense*: perhaps this program could bring some order to my financial affairs . . . perhaps I could get my income tax done before midnight April 15th . . . perhaps I could get a handle on my investments.

To cut right to the bottom line, *Dollars and Sense* can certainly do all the things I expected of it, but successful use of the program requires some real commitment on the part of the user. It will not automatically make a disorganized person into a tidy one, nor will it make your financial decisions for you. If you couldn't make your monthly payments before getting *Dollars and Sense*, you won't be able to make them afterward either—although you might have a better idea where your money is going and why you are in the hole.

For me, the most pleasant surprise about *Dollars and Sense* was that it can perform some very useful ancillary functions. For example, it can help you prepare travel expense reports for business, manage a stock portfolio, or handle customer billing for your (or your spouse's) small side business.

What is Dollars and Sense?

Dollars and Sense is a financial management package that stores financial records in an organized collection of accounts. It uses double-entry bookkeeping, so called because an entry in one account almost always affects at least one other account in the opposite direction. Done manually, keeping a double-entry ledger can be a laborious task; with *Dollars and Sense*, the task is much easier. Because double-entry bookkeeping is at the heart of *Dollars and Sense*, it is important to understand how it works.

For example, suppose you write a check for $125 at the supermarket, $100 of which is for groceries and $25 for cash. When you record the payment in Personal Checking, the system subtracts $125 from your checking account balance and adds $100 to your monthly food expenditures and $25 to cash. If you wish to itemize your cash expenditures further, you can do so, or you can simply leave them as miscellaneous cash outlays.

The program provides for five types of accounts: assets, liabilities, income, expenses, and checking. In total, you can have 120 active accounts. In addition to actual transactions, you can enter budgeted amounts for each account. I found it was easier to enter only actual transactions for a while so I could get some idea of where money was coming from and going to before trying to establish budget amounts. I also did not try to put all of the financial transactions of my life into *Dollars and Sense* initially; rather I started with just the transactions of a small moonlighting business.

You can set up your own customized accounts on *Dollars and Sense*, or you

By DAVID H. AHL

can start with one of the three standard account templates on the disk: household, business, or tax preparation. These sets of accounts are not fixed but can be modified for your own particular requirements. In general, it is probably easier to start with one of these standard sets, adding and deleting accounts as necessary, than to start from scratch.

As you define your accounts, you can also enter budget amounts for each account, although, as mentioned earlier, this is not necessary and may not even be desirable. At the outset, you must also record some important details about your checking account such as bank name, branch, and the number of the first check to be used. Once you have defined a set of accounts, you are ready to start entering transactions.

Using the Program

To enter transactions, you first select a "base account." This is usually a checking account, but may be any asset or liability account. For each transaction, you enter the check number; if you are entering checks in order, the system will automatically provide the numbers and you just press Tab or Return to go to the next field.

You then enter the date; again, the system automatically shows the last date used, so usually you have to change only one character. The Description field of the transaction can be either the item for which the check was written or, if you plan to use the automatic check-writing feature, the name of the payee.

You must then determine in what account(s) the amount of the check is to be distributed. *Dollars and Sense* has a very nifty feature here which allows you to press a single letter, say C, and then use the right and left arrow keys to step through the possible accounts, say Cash, Check Charges, Clothing, and Credit Card-Visa. Last, you enter the amount of the check. Deposits, miscellaneous charges, and credits are entered in a similar manner.

When you enter amounts in multiple accounts as in the grocery and cash example cited above, *Dollars and Sense* automatically subtracts the amount of the first account from the total and allows you to enter the remainder in the second account with no additonal keystrokes. Of course, if you are distributing a transaction among three or more accounts, you will have to alter these automatic balances. Another helpful feature in multiple account entry is the refusal of the program to go onto the next account before the current one balances.

Make no mistake about it, simply entering all the transactions relating to one aspect of your financial life will force a degree of order on your affairs that may be quite revealing. In a sense, you will look at everything twice, and in the process, scrutinize your affairs more closely than ever before. But the real strength of *Dollars and Sense* lies in its ability to generate reports in both tabular and graphic form.

Financial Reports

Dollars and Sense generates seven different kinds of reports. The most detailed is a transaction report, which lists in chronological order all of the transactions in a specified account (see Figure 1). When you enter data, you don't have to enter it in any particular order; if you find a wad of credit card charge slips at the bottom of your suitcase from a trip three months ago, no problem—you simply enter them, specifying the correct original date, and the transaction report will display everything in the right order.

More useful than the detailed transaction report are the monthly and year to date (YTD) reports. These reports can be specified for any account, although chances are you will be most interested in a few key accounts.

In addition to monthly and YTD reports by individual accounts, income statements, balance sheets, and cash flow analysises by quarter, full year, or year to date can be called up. These, of course, are standard business reports and are extremely beneficial if you are using *Dollars and Sense* to assist in your management of a small business.

All reports, except the detailed transaction summary, show both actual and budgeted amounts, and deviation from budget. In addition, the summary reports show percentage distribution of the amounts comprising the income and expense accounts.

Monthly net income (actual, budgeted, and trend line) and monthly net worth can also be displayed graphically (see Figure 2). Three other graphs contrast actual amounts with budgeted amounts in various ways, while another graph creates pie charts showing the contribution of individual amounts to a composite account.

More Than Budgeting

The *Dollars and Sense* package was written several years ago for Brands A and I computers. Although originally written as a budgeting and analysis tool, over the years people have developed many other interesting applications for the package. Some of these are described in the excellent manual accompanying the Atari ST version of the product.

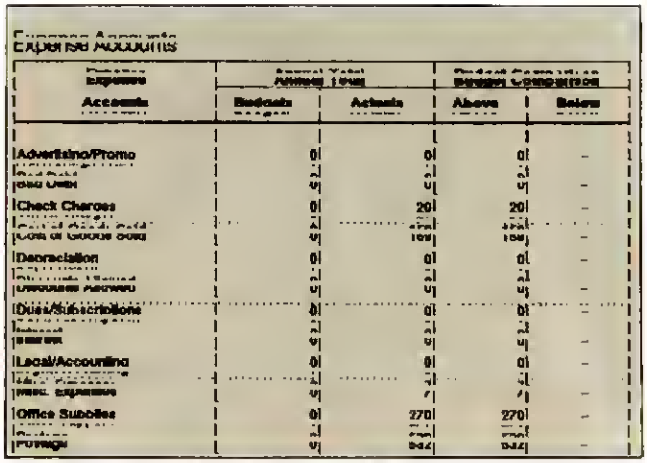
Professionals with small service-oriented businesses—physicians, lawyers, accountants, consultants, and independent insurance agents—will find that *Dollars and Sense* can be used for client billing. Most of the accounts needed are provided by the business template, but you will have to add a gross receipts account and an accounts receivable asset account for each of your clients.

If you do much traveling or entertaining for business, writing expense reports can take a great deal of time and (for some people) self-discipline. *Dollars and Sense* makes this job much easier—although you still must keep track of and enter the data at some point. Once your data is entered, the program automatically produces an account summary which can be submitted to your employer.

Investing in the stock market may not be everyone's idea of a sure-fire way to make money, but one thing is certain: meticulous record-keeping and timely reports can improve your chances of coming out ahead. *Dollars and Sense* allows you to keep accurate records and can produce reports and graphs that give a good overall view of how your investments are working out.

Other applications of *Dollars and*

***Done manually, keeping a** double-entry ledger can be a laborious task; with Dollars and Sense, the task is much easier.*



Expense Accounts	Budgets	Actuals	Above	Below
Advertising/Promo	0	0	0	-
Check Charges	0	20	20	-
Depreciation	0	0	0	-
Dues/Subscriptions	0	0	0	-
Legal/Accounting	0	0	0	-
Office Supplies	0	270	270	-

Figure 3. Occasionally, the print routine produced bizarre output.

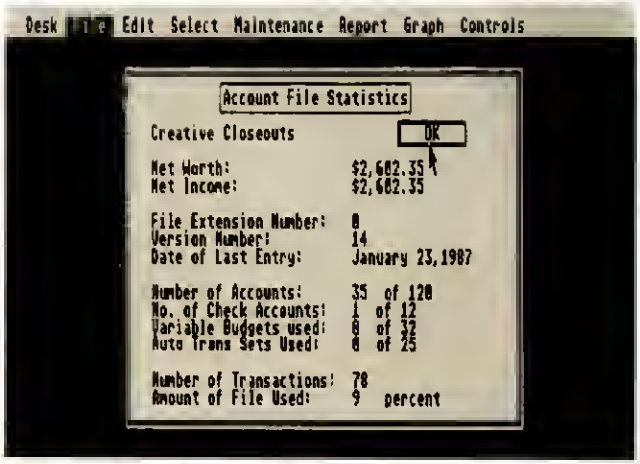


Figure 4. When a file is loaded, Dollars and Sense displays statistics about the file.

Sense that are described in the manual include credit card management, paying routine bills, and keeping household inventories.

The Down Side

Although *Dollars and Sense* has been around for several years, the user interface had to be substantially redesigned and rewritten for the Atari ST. For the most part, the programmers have done their job well, implementing the mouse and cursor key controls in an intuitive and sensible manner.

Furthermore, the manual has been completely rewritten and reillustrated for the Atari ST. A few small errors have crept in. For example, the manual says you can back up from field to field by pressing the @ and B keys simultaneously. Sorry, that doesn't work; you simply use the mouse to back up — or to move anyplace on the form for that matter. For the most part, however, the manual is accurate and well-written.

The report that produces monthly account totals can be a bit unsettling. If you don't go out of your way to specify otherwise, the monthly totals are actually moving six-month totals. For example, January is actually the total of January through June, February is the total of February through July, and so on.

However, the biggest problem with *Dollars and Sense* is with the print drivers and print routines. In the current release, only one print driver—for the Atari SMM804 printer and its close cousins — is included.

Checks are printed in text mode and zip off the printer at a good speed. However, everything else is printed in the graphics mode with the default set at Final or overstrike. Thus, a single report or graph can take as much as ten minutes to print. It helps if you set the printer default at Draft when you start the program, but it would have been nicer if Monogram had implemented the text mode of printing for all numeric reports.

While we had no serious problems printing on a 1040ST — except for a bizarre tendency to occasionally add extra spaces (see Figure 3) — printing on a 520ST was considerably less successful. When we checked Output to Printer and specified a report to be printed, we got the message, "Unable to open printer device #21. Check GDOS and ASSIGN.SYS installation."

At this point, the only option available is OK. Click it, the disk whirs, a message appears that the file is being prepared for printing, and then, if you are lucky, it will print. However, the much more common result for me was a return to the error message. The only way of exiting this endless loop was to turn off the computer, reload, and start over. Actually, for most reports where the entire report fits on the screen, we found it quite adequate to simply use the screen print utility (Alternate and Help keys).

The Monogram technical people tried to help, but admitted to having some small problems to be sorted out in the printing routines. For now, if you think you will need to print long reports, we would have to recommend the program be used on a 1040ST. If you plan to print only checks or short reports and graphs, a 520ST will be fine.

Occasionally, for no apparent reason, a message appeared on the screen reading, "Modula-2 Run-time Error" with an OK box to check. When this occurs, you are *dead*. This is the ultimate wipeout from which there is no recovery. Lesson to be learned: save your work frequently.

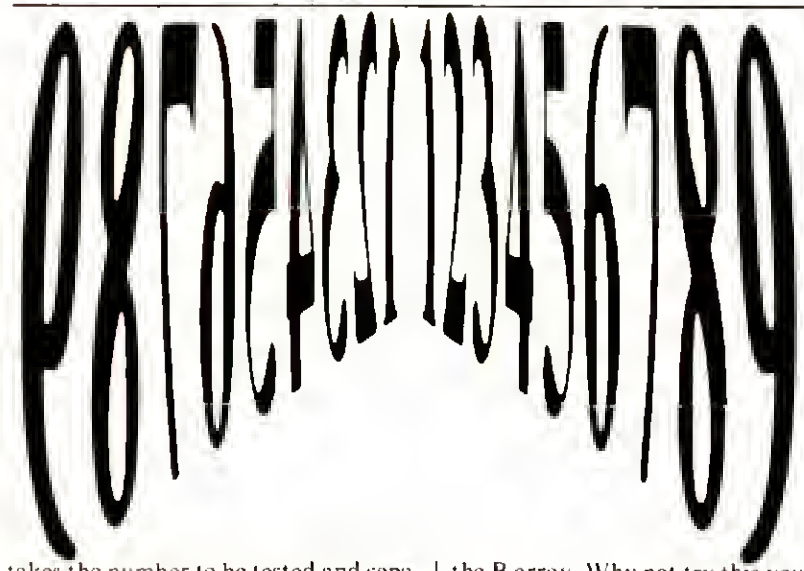
A Sensible Choice

All in all, *Dollars and Sense* is a well-designed financial record-keeping and analysis program. Used correctly and with diligence, it can save you time, drudgery, and maybe even money. At the least it will tell you where your money is going and perhaps relieve you of the anxiety of not knowing exactly where you stand financially. It will enable you to try out "what if" scenarios and better manage your financial affairs by providing useful reports, graphs, and projections. ■

***Simply entering all the transactions** relating to one aspect of your financial life will force a degree of order on your affairs that may be quite revealing.*

Try This!

Palindromes: For people who like to end at the beginning



By DAVID H. AHL

A palindrome is a word, phrase, sentence, verse, or number that reads the same backwards and forwards. For example, the words *mom and eye* are palindromes. So are all of the following:

A potato, Pa?
Too hot to hoot.
Was it a bar or a bat I saw?
Doom an evil deed, liven a mood.
Harass sensuousness, Sarah.
Golf? No sir, prefer prison flog.
Ban campus motto, "Bottoms up, MacNab."

The unit in a palindrome might also be a word, as in this example:

Men wanted warning before police approached; squealer approached police before warning wanted men.

Palindromes using words can be quite long. For example, the palindromic Greek poem "Ethopoiia Karkinikie" is over 400 lines in length. However, our concern is with numeric palindomes, which are, of course, numbers that read the same backwards as forwards. Among two-digit numbers, only those with identical digits (22, 33, 44, etc.) are palindromic. Hence, of the 90 two-digit numbers, nine are palindromic. Before reading on, think a minute and decide whether you would expect this ratio (one in ten) to hold when we get into three-digit and longer numbers.

Consider three-digit numbers. Between 100 and 200, the following numbers are palindromic: 101, 111, 121, 131, 141, 151, 161, 171, 181, and 191. Indeed, in each group of 100 numbers, ten are palindromic. Hence, of the 900 three-digit numbers, 90 are palindromic or, again, one in ten. You might be interested in continuing this exercise with four- and five-digit numbers, but before doing so, write down your prediction of the ratios of four- and five-digit palindromes. You may be surprised.

If you want to explore palindromes beyond four-digit numbers, you may find it easier to write a short computer program to search them out and do a count for you. To write such a program you will need a routine that can test whether or not a number is palindromic. Our program to examine and tally palindromes is shown in Listing 1.

The first key routine (Lines 70-100) takes the number to be tested and separates it into individual digits, which are put into array B. Then, the routine in Lines 130-160 iterates through half of the digits and compares them, first the leftmost with the rightmost, then one in from the left and right, and so on until the center number is reached. If the digits on both sides are the same, the number is a palindrome.

Think of other ways to determine whether or not a number is palindromic. You could, for example, take the digits of the right half, reverse them, and subtract the result from the digits of the left half. Can you think of other methods?

If you run this program, you will find that for ranges of numbers of more than five digits, it is rather slow. You could increase the speed of the program dramatically by eliminating the number disection routine in Lines 70-100 and simply adding 1 to the previous value in the B array. Why not try this yourself?

Palindromes That Are Powers

Consider all palindromes that can be written in the form N^k where N and k are positive integers. Would you expect N to be a palindrome? Consider the case of k=2; two palindromes that can be written in the form N^2 are:

$484=22^2$

$14{,}641=121^2$

Both 22 and 121 are palindromes. Is this always true? And what about other values of k; is the cube root of a palindromic cube also a palindrome? Is the fourth root of a palindromic fourth power also a palindrome?

These questions are of interest because only partial answers to them are currently known. For example, when k=2, if N^2 is a palindrome, then N is often, but not always, a palindrome. The smallest non-palindromic root is 26, the square root of 676. The largest three-digit non-palindromic square root is 836, its square being 698,896. The

latter number is interesting for two other reasons: it is the smallest palindromic square with an even number of digits, and when turned upside down, the number remains palindromic.

Cubes and their roots are generally both palindromic, the only known exception being 10,662,526,601 with a cube root of 2201. But there may be others just waiting to be discovered by a clever Atari owner.

When k=4, all known palindromic fourth powers have fourth roots that are palindromes, but, again, there may be some exceptions. When k=5, the situation is more difficult, because there are no known palindromes that can be written in the form N^5.

The Notorious 196

A conjecture regarding palindromes raises another question. The conjecture is as follows: begin with any positive integer. If it is not a palindrome, reverse its digits and add the two numbers. If the sum is not a palindrome, treat it as the original number, and continue the procedure. The process stops when a palindrome is obtained. For example, beginning with 78:

```
   78
  +87
  165
 +561
  726
 +627
 1353
+3531
 4884
```

The conjecture, often assumed to be true, is that this process will always lead to a palindrome. And, indeed, that is what usually happens. Most starting values of four or fewer digits produce palindromes in fewer than 24 additions. Of two-digit numbers, 89 takes the most

PALINDROMES Listing 1.

ATARI KEY

- Any Atari 8-bit or ST computer
- Atari Basic or ST Basic

```
20 DIM B(50) : REM  B array holds the current number being tested
30 PRINT "Number of digits"; : INPUT D
40 PRINT "Starting value"; : INPUT NS
50 PRINT "Ending number"; : INPUT NE
60 FOR N=NS TO NE : A=N
70 POR C=D TO 1 STEP -1 : REM  Go through the digita left to right
80 A1=A/10 : A=INT(A1)
90 B(C)=10*(A1-A) : REM  Store the rightmost digit in the B array
100 NEXT C
110 REM
120 REM  Test to see if number in B errsy is palindromic
130 POR C=1 TO INT(D/2) : REM  Iterate through one-half of the digits
140 IP B(C)=B(D+1-C) THEN 160 : REM  Same digit front and rear?
150 GOTO 230 : REM  If digits are different, exit the test loop
160 NEXT C
170 REM
180 REM  Print the number
190 POR C=D TO 1 STEP -1 : REM  Go through the digits left to right
200 PRINT CHR$(B(C)+48); : REM  Add 48 to get the right ASCII cheracter
205 REM  Atari 8-bit statement 200 is simply PRINT B(C);
210 NEXT C
220 T=T+1 : PRINT " "; : REM  Running totsl of palindromes
230 NEXT N
240 PRINT : PRINT "Total palindromes =";T
```

Listing 1 sample run.

```
Number of digits? 3
Starting value? 100
Ending number? 999
101 111 121 131 141 151 161 171 181 191 202 212 222 232 242 252 262 272 282 292
303 313 323 333 343 353 363 373 383 393 404 414 424 434 444 454 464 474 484 494
505 515 525 535 545 555 565 575 585 595 606 616 626 636 646 656 666 676 686 696
707 717 727 737 747 757 767 777 787 797 808 818 828 838 848 858 868 878 888 898
909 919 929 939 949 959 969 979 989 999
Total palindromes = 90
```

PALINDROMES Listing 2.

ATARI KEY

- Any Atari 8-bit or ST computer
- Atari Basic or ST Basic

```
20 DIM B(50) : REM  B array holds the current number being tested
30 PRINT "Number of digits"; : INPUT D
40 PRINT "Starting value"; : INPUT NS
50 R=0 : REM  Set reversal counter to zero
60 A=NS
70 POR C=D TO 1 STEP -1 : REM  Go through the digits left to right
80 A1=A/10 : A=INT(A1)
90 B(C)=10*(A1-A) : REM  Store the rightmoat digit in the B array
100 NEXT C
110 P=0 : REM  Turn palindrome indicator on
120 REM  Test to aee if number in B errsy is palindromic
130 FOR C=1 TO INT(D/2) : REM  Iterate through one-helf of the digits
140 IF B(C)=B(D+1-C) THEN 160 : REM  Same digit front and rear?
150 P=1 : GOTO 180 : REM  If digits are different, exit the test loop
160 NEXT C
170 REM
180 REM  Print the number
190 FOR C=D TO 1 STEP -1 : REM  Go through the digits left to right
200 PRINT CHR$(B(C)+48); : REM  Add 48 to get the right ASCII character
205 REM  Atari 8-bit statement 200 is simply PRINT B(C);
210 NEXT C : PRINT
220 IP P=1 TNEN 240 : REM  If no palindrome, keep going
230 PRINT : PRINT "Total reversals =";R : PRINT : GOTO 30
240 R=R+1 : REM  Increment the reversal counter
250 IF D/2<=INT(D/2) THEN 270
260 B(INT(D/2)+1)=2*B(INT(D/2)+1)
270 POR C=1 TO INT(D/2)
280 B(C)=B(C)+B(D+1-C) : REM  Add digits at left end
290 NEXT C
300 POR C=1 TO INT(D/2)
310 B(D+1-C)=B(C) : REM  Sum at right end is same as that at left
320 NEXT C
330 B(D+1)=0
340 FOR C=1 TO D
350 B(C+1)=B(C+1)+INT(B(C)/10)
360 B(C)=B(C)-10*INT(B(C)/10) : REM  Lop off the tens place from sum
370 NEXT C
380 IF B(D+1)<=0 TNEN 110 : REM  Is there another digit?
390 D=D+1 : GOTO 110
```

```
Number of digits? 2
Starting value? 17
71
88

Total reversals = 1

Number of digits? 2
Starting value? 22
22

Total reversals = 0

Number of digits? 2
Starting value? 78
87
165
726
1353
4884

Total reversals = 4

Number of digits? 3
Starting value? 196
691
887
1675
7436
13783
52514
94039
187088
1067869
10755470
18211171
35322452
60744805
111589511
227574622
454050344
897100798
1794102596
8746117567
16403234045
```

The study of palindromes requires no more than a basic knowledge of high school algebra.

reversals—24—to produce a palindrome (8,813,200,023,188). A starting value with the digits reversed—98—requires the same 24 reversals to yield a palindrome.

Of all the three-digit numbers, 90 are palindromes, 228 require just one reversal to produce a palindrome; 270 require two reversals; 143 require three; 61 require four; 33 require five; and the remaining 75 require more than five.

These remaining 75 numbers can be divided into just a few groups, the members of which after one or two reversals produce the same number and are therefore essentially the same. One of these groups consists of the numbers 187, 286, 385, 583, 682, 781, 869, 880, and 968, each of which when reversed once or twice forms 1837, and eventually forms the same palindrome as 89 and 98.

The most interesting group of numbers consists of 196, 295, 394, 493, 592, 689, 691, 788, 790, 887, and 986, all of which form 1675 after a few reversals but apparently fail ever to produce a palindrome. Thus, the conjecture that repeated reversals and additions will eventually form a palindrome remains just that, a conjecture rather than a proof. Incidentally, the longest known run of this procedure starting with 196 was done by Lynn Yarborough in 1975. Three hours on a CDC 660 and 79,098 reversals produced a number of more than 31,000 digits—which was not a palindrome.

We have extended our palindrome testing program to reverse and add numbers (see Listing 2). It does not print the reversed number but prints only each new total. Study the program so you can understand how it works. You may want to insert print statements after Lines 280, 310, 350, and 360 to print the values of C and the B array, so you can see exactly what the program is doing.

While a starting value of 196 will not produce a palindrome—at least not on an Atari computer—you might want to modify the program to examine the reversals as the program runs. For example, for each reversal, your program could count the palindromic digits and calculate that percentage of the total digits. You will find that some reversals come quite close to being palindromes. The second 44-digit reversal is one such number; only eight digits are not palindromic, and they are only one integer apart. To go beyond 50 digits, be sure to enlarge the dimension of the B array in Line 20.

Another aspect to explore is the frequency with which each of the ten digits appears in the reversals as the process continues. It seems, for example, that 1 and 9 appear much more often than 3 and 6. Why should this be? Furthermore, complementary digits (1 and 9, 2 and 8, etc.) appear with roughly equal frequency. Why is this?

The study of palindromes requires no more than a basic knowledge of high school algebra, yet it provides a rich source of topics for creative computing. Have fun. ■

```
178933153004223942677886140312400461329 96
878164793046354359565648633536403974728 67
164643958609270772803130816807280794934745
712083455691979390834439093880187654281206
131426591247306778176887187859384208661423
455593393731265559955754906546312640428555 4
911175798352630120901510902102526379768110 8
171236259571515024180302180420615176952522 27
893488856286675264992332994625766936478843 98
178697760268335052998466598925153376306768796
876565363941686582894131498175687238374565667
164313083777447315478826299646137338773813134 5
707444921560820480178089187097511816511844480 6
131588973312263205925628727420591462302478895 13
447577715344905156172906992715615084436277746 44
894055441689710321345903085432130178871455503 88
177711098347842063369170618086336035873290100886
865712190726372697049986690049696284617180218657
162252427244285539399008337999049255824427143622 5
684886599687140833498981718098442814068699568848 6
136977319937318265798806343708787661824739913769 72
```

Almost a palindrome.

Part 3,

a look at polymarkers, alpha mode, graphic text, and "writing mode"

An Introduction to GEM VDI

By BOB COCKROFT

In the first two articles in this series, we explained most of the essential graphics functions of the GEM Virtual Device Interface (VDI). In this third installment, we conclude our introduction to the VDI with a discussion of polymarkers, alpha mode, graphic text, and VDI "writing modes."

Polymarker Functions

Polymarkers are graphic symbols used to mark points on a geometric figure. Computer-aided drafting applications, for example, often use polymarker-type symbols as "handles" for stretching polygons or forming spline curves under mouse control. Like line style, width, and color, polymarker type, height, and color are workstation attributes. The functions used to modify these characteristics and draw polymarkers resemble, in most respects, the related functions for lines.

Polymarker Type

The function vsm_type( ) is used to select the kind of polymarker you want to draw. Six choices are available:

1. Dot
2. Plus sign
3. Asterisk
4. Square
5. Diagonal cross (×)
6. Diamond

The default polymarker type is number 1 –a dot. To change this, use:

```
vsm_type(handle,style);
```

where "handle" is your workstation handle (returned by a call to the AES function graf_handle( )) and "style" is an integer from the list above.

The dot polymarker cannot change size; it remains one pixel high regardless of conditions. However, the other polymarkers can be produced in a variety of sizes. Because the system is capable of drawing polymarkers only at sizes that map accurately to the screen, only eight effective sizes are available. To set polymarker size, use:

```
actual_size = vsm_height(handle,height);
```

where "height" is an integer between 11 and 88, divisible by 11, which represents the desired polymarker height in pixels. The polymarker size actually set by the system is returned in the variable "actual_size."

If you choose one of the "working" values, 11, 22, 33, 44, 55, 66, 77, or 88, variables "height" and "actual_size" will be equal after the call. If another value is selected, the system will set marker height to the highest working value that does not exceed the value you have chosen. Variables "height" and "actual_size" will then differ after the call.

The next step is to assign a color register for use in drawing polymarkers. As you may remember, the number of available color registers depends on graphics mode: two registers (0 and 1) are available in high-resolution; four (0-3) in medium resolution, and sixteen (0-15) in low resolution. To choose a color register for polymarker drawing, use:

```
vsm_color(handle,color_index);
```

where "color_index" is the number of an available register in your present graphics mode. If you call the function with an out-of-bounds value, register 1 will be set as a default.

Finally, the v_pmarker( ) function is used to draw the polymarkers themselves, either individually or in groups. Polymarker coordinates are passed to the function by means of an input array—exactly the same type of array that is used to specify the endpoint or vertex coordinates of a polyline or polygon. The similarity makes it easy to draw a polygon or other complex figure, and then, by passing the same input array to v_pmarker( ), mark each of its vertices with a polymarker.

The input array must be of type integer, and its name is arbitrary. The following example uses v_pmarker( ) to draw a triangular arrangement of polymarkers:

```
/* Declare input array */

int pxyarray[6];

/* x-coordinate of first polymarker */

pxyarray[0] = 100;

/* y-coordinate of first polymarker, etc.... */

pxyarray[1] = 100;
pxyarray[2] = 200;
pxyarray[3] = 100;
pxyarray[4] = 150;
pxyarray[5] = 150;

/* Draw three polymarkers */

v_pmarker(handle,3,pxyarray);
```

Note that the second argument passed to v_pmarker( ) defines the number of polymarkers for which (x,y) coordinate pairs are provided in the input array.

VDI Text

The VDI can display text in a simple alpha mode or a more complex graphic mode. Alpha mode text treats the screen as if it were a standard "glass teletype," divided into a character grid: 40 × 25 in low resolution, or 80 × 25 in medium or high resolution.

VDI alpha mode functions provide entry to and exit from alpha mode, control of the alpha cursor, and means to enter and remove text from the alpha screen. They are self-explanatory, and we will only list them here.

```
v_enter_cur(handle); /* Enter alpha mode. Make alpha cursor
                        visible and move it to the upper left-hand
                        corner of the screen (home position) */
v_curtext(handle,string); /* Print alpha mode text at present
                             cursor position. */
v_exit_cur(handle); /*  Exit alpha mode. Hide alpha cursor. */
v_curup(handle); /* Move alpha cursor up one character cell */
v_curdown(handle); /* Move alpha cursor down one character cell */
v_curleft(handle); /* Alpha cursor left */
v_curright(handle); /* Alpha cursor right */
v_curhome(handle); /* Home alpha cursor */
v_eeol(handle); /* Erase from current alpha cursor position to
                   end of line. */
v_eeos(handle); /* Erase from current alpha cursor position to
                   end of screen. */
v_curaddress(handle,row,column); /* Move alpha cursor to specified
                                    screen location */
v_rvon(handle); /* Print subseqent alpha text in reverse video */
v_rvoff(handle); /* Turn off reverse video */
```

***The VDI** can display text in a simple alpha mode or a more complex graphic mode.*

Two additional "inquire" functions are provided to allow a program to determine parameters of the alpha mode screen. The first, vq_chcells( ), returns the number of rows and columns in the alpha mode screen for the current resolution. It is used as follows:

```
vq_chcells(handle,&rows,&columns);
```

where "&rows" and "&columns" point to integer variables that will be used to store the values retrieved by the function call.

The vq_curaddress( ) function reports the current (row, column) location of the alpha cursor. It is called like this:

```
vq_curaddress(handle,&row,&column);
```

where "&row" and "&column" reference integer variables that will be used to store the values retrieved.

Listing 1 is a program called Alpha Text Generator, which demonstrates most of the VDI alpha text commands described above. Instructions for compiling and running the program can be found at the end of this article.

VDI Graphic Text

VDI graphic text can be placed at any location on the screen; it is not restricted to a character grid. Beyond this, graphic text can bear attributes such as underlining, italicization, etc.; can be produced in many sizes and colors; and can be printed vertically and upside down, as well as horizontally in the normal fashion. Consequently, graphic text is ideal for artistic displays, labeling of geometric figures and diagrams, and other applications in which graphics and text are mixed.

The essential function for putting graphic text on the screen is v_gtext(), used as follows:

```
v_gtext(handle,x,y,string);
```

where x and y are coordinates determining where text will be placed on the display, and "string" is a character pointer to the null-terminated string you want printed.

Graphic Text Alignment

The function vst_alignment( ) lets you change the way text is positioned with respect to the point specified in v_gtext( ).

Three horizontal alignment options are available: left-alignment (the default), where the leading edge of the first character in the string abuts the point specified; centering, where the string is (naturally enough) centered over the point; and right-alignment, where the trailing edge of the last character abuts the point.

Six vertical alignment options are also supported: the point specified in v_gtext( ) can be made to align with the base (the default), half line, ascent line, bottom line, descent line, or top line of characters printed. Figure 1 illustrates the effect of various alignment options.

The function vst_alignment is used to set horizontal and vertical options for graphic text positioning:

```
vst_alignment(handle,hor_in,vert_in,
  &hor_out,&vert_out);
```

where "hor_in" and "vert_in" are integer values chosen from Figure 1, and "&hor_out" and "&vert_out" are pointers to integers in which the system will store the values it actually sets as a result of the call. If your application requests illegal values, left-alignment at the baseline will be implemented and hor_out and vert_out will both take the value of zero.

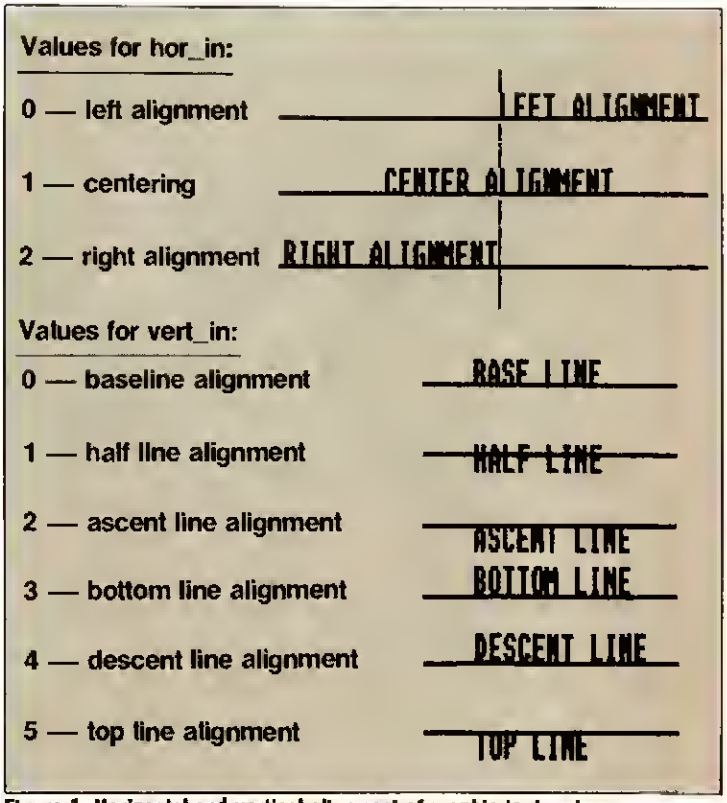


Figure 1. Horizontal and vertical alignment of graphic text; values used with vst_alignment( ).

Alpha Text Generator Listing 1.

ATARI KEY

- Any Atari ST Computer
- Mark Williams C-Language Development System

```
#include <osbind.h>

/* #include for isalnum(), isspace(), ispunct() */

#include <ctype.h>

/* Union for interpretation of two-byte keycodes
   returned by Bios console keyboard input */

typedef union{

/* Bconin() returns a long. */

        unsigned long keycodes;

/* The high word is the GSX code for the key. */

        struct{
                unsigned int GSX;

/* The low word is the key-code itself, 0 for
   special keys. */

                unsigned int key;
                } codes;
        } console_input;

/* External arrays for AES/VDI */

int     contrl[12],
        intin[128],
        ptsin[128],
        intout[128],
        ptsout[128],
        work_in[12],
        work_out[57],
        handle;

/* In main(), we initialize the application, open a
   VDI virtual workstation, execute the alpha_text
   function, implementing a not-terribly-bright
   screen editor, then close and exit. */

main()
{
        appl_init();
        open_vdi();
        alpha_text();
        v_clsvwk(handle);
        appl_exit();
}

/* A basic screen editor ...
        Press CTRL-C to exit;
        Press CTRL-R to toggle reverse video;
        Arrow keys move cursor;
        Destructive backspace implemented;
        CR/LF implemented on RETURN; */

alpha_text()
{
        console_input c;
        static char *string = " \0";
        int rflag = 0;

        v_enter_cur(handle);

        while(c.codes.key != 3){
           while(!Bconstat(2));
           c.keycodes = Bconin(2);

           if (isalnum(c.codes.key) ||
               ispunct(c.codes.key) ||
               isspace(c.codes.key) ||
               c.codes.key == 8){
                   *string = c.codes.key;
                   v_curtext(handle,string);

/* Implement destructive backspace */

                   if (c.codes.key == 8){
                       *string = 32;
                       v_curtext(handle,string);
                       *string = 8;
                       v_curtext(handle,string);
                       }

/* Implement CR/LF on RETURN */

                   if (c.codes.key == 13){
                       *string = 11;
                       v_curtext(handle,string);
                       }
                   }

/* Implement reverse video toggle on CTRL-R */

           else if (c.codes.key == 18){
                if (rflag) v_rvoff(handle);
                else v_rvon(handle);
                rflag = !rflag;
                }

/* Implement cursor control via arrow keys */

           else if (c.codes.key == 0){
                if (c.codes.GSX == 71)
                    v_curhome(handle);
                else if (c.codes.GSX == 72)
                    v_curup(handle);
                else if (c.codes.GSX == 75)
                    v_curleft(handle);
                else if (c.codes.GSX == 80)
                    v_curdown(handle);
                else if (c.codes.GSX == 77)
                    v_curright(handle);
                }
           }
        v_rvoff(handle);
        v_exit_cur(handle);
}

/* Open VDI virtual workstation, hide mouse */

open_vdi()
{
     int i,d;

     for(i = 0;i < 10;work_in[i++] = 1);
     work_in[10] = 2;
     handle = graf_handle(&d,&d,&d,&d);
     v_opnvwk(work_in,&handle,work_out);
     v_hide_c(handle);
}
```

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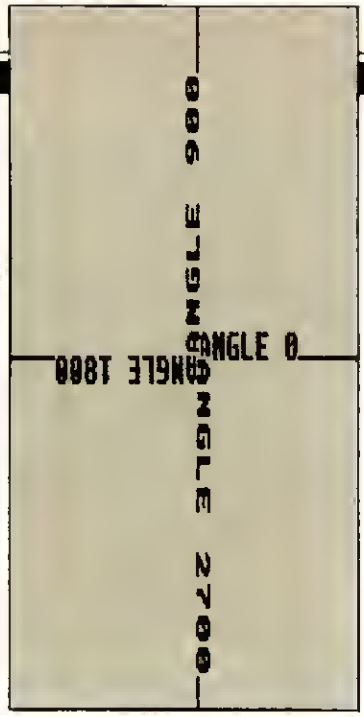


Figure 2. Graphic text rotation (values for use with vst_rotation( )).

Text Rotation

As Figure 2 shows, graphic text can be made to appear vertically or upside-down as well as right-side-up. To set the "character baseline rotation vector," use the function:

```
vst_rotation(handle,angle);
```

where "angle" is an integer with value 0 for right-side-up text (the default); 900 for text written vertically with the tops of characters pointing left; 1800 for text written upside-down; or 2700 for text written vertically with the tops of characters pointing right.

Horizontal text alignment functions in accordance with text rotation in determining where text will appear with respect to the point specified in v_gtext( ). If, for example, you have set right-alignment and a rotation angle of 900, subsequent graphic text will be printed vertically, the tops of characters pointing left, directly beneath the points you specify. Working with the program in Listing 2, Graphic Text Generator, will help clarify the relationship between horizontal text and rotation.

Character Size

The functions vst_height( ) and vst_point( ) are used to set the size of graphic text. The former is used when you wish to set text height to a particular number of pixels, as in

```
vst_height(handle,height,&char_width,
           &char_height,&cell_width,&cell_height);
```

where "height" is the number of pixels between the base and top lines of a given character. The latter is used when you want to set text height to a particular number of printer points (units of $1/72$") as in

```
vst_point(handle,point,&char_width,
          &char_height,&cell_width,&cell_height);
```

where "point" is the number of printer points between the bottom and top lines of a character cell—note the difference. In both cases, integer variables char_width, char_height, cell_width, and cell_height are used to return the width and height of characters and their cells as these are actually set by the call.

Theoretically, vst_height( ) and vst_point( ) can set text to any size you choose. Unfortunately, this depends on the text being drawn from a standard GEM font—something the ST is not currently equipped to handle.

The GDOS extension to ST GEM, expected in mid-1987, will let the ST access standard fonts and (among other things) permit vst_height( ) and vst_point( ) to work as advertised. Until then, however, the functions are capable of setting the size of the ST system font (which is mapped in a non-standard fashion because it has to serve multiple screen resolutions) to only a narrow (and non-linear) range of sizes, as shown in Figure 3.

Character Color

As noted above, graphic text can be produced in any color available in the current graphics mode. To set a color index for use in drawing graphic text, use:

```
vst_color(handle,color_index);
```

where "color_index" is a mode-dependent index for a color register.

Text Special Effects

The pièce de la résistance! Graphic text can be produced with a wide variety of special effects.

To set text special effects, use:

```
vst_effects(handle,effect);
```

where "effect" is a value made up by adding together numbers from the table in Figure 4, corresponding to the effects you want. For example, if you wanted to produce thickened text at light intensity, you would add 1 (for thickened text) and 2 (for light intensity text) to produce a value of 3 for the "effect" variable.

Experienced programmers will note that the effect numbers in Figure 4 correspond to bit values. Using Boolean functions and appropriate #defines, it is easy to write self-documenting code for setting text effects. For example:

```
#define THICKENED 1
#define LIGHT 2
#define SKEWED 4
#define UNDERLINED 8
#define OUTLINED 16

/* Set thickened text at light intensity */

vst_effects(handle,THICKENED | LIGHT);
```

Were GEM to store a bitmapped font for each combination of effects in each different character size, there would be no room in memory for anything else. Instead, GEM produces its special effects by using sophisticated routines to process the basic font bitmaps. While these routines do an excellent job in general, certain combinations of effects may render smaller text difficult to read.

The program in Listing 2, Graphic Text Generator, demonstrates most of the VDI graphic text functions discussed above. Instructions for compiling and running the program can be found at the end of this article.

Determining Graphic Text Attributes

The VDI supports a complex "inquire" function, vq_attributes( ), which lets you retrieve all graphic text attributes at once, storing them in elements of an integer array set up to receive them. To use vq_attributes( ), set up a ten-element integer array prior to calling the function as follows:

```
int attrib[10];

vq_attributes(handle,attrib);
```

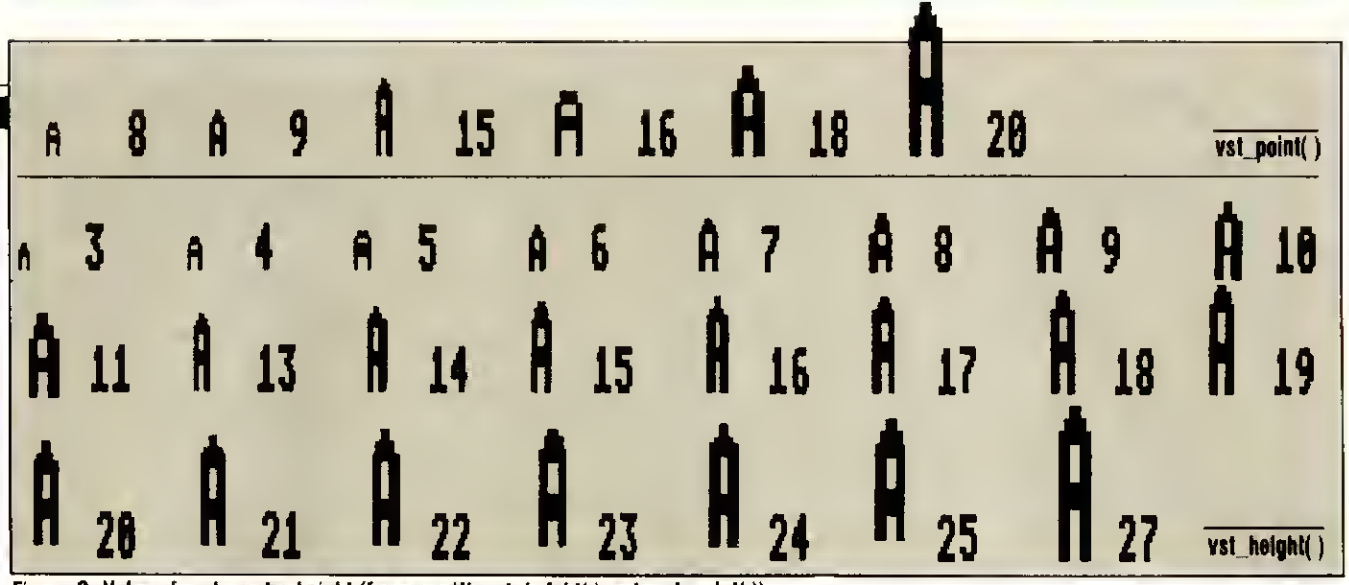


Figure 3. Values for character height (for use with vst_height( ) and vst_point( )).

After the call is made, values reflecting current attribute settings will be stored in the array as shown below:

```
attrib[0] = Graphic text face. Until the GDOS
            (Graphic Disk Operating System) is
            available, permitting fonts to be loaded
            from disk, this value will always be 1,
            corresponding to the "system font."
attrib[1] = Text color register.
attrib[2] = "Baseline rotation vector."
attrib[3] = Horizontal alignment.
attrib[4] = Vertical alignment.
attrib[5] = "Writing mode." (See below)
attrib[6] = Character width.
attrib[7] = Character height.
attrib[8] = Character cell width.
attrib[9] = Character cell height.
```

Additional "inquire" functions pertaining to text are also available, but understanding the significance of these will be easier once certain functions of the AES have been discussed in the next issue.

VDI Writing Modes

The most fundamental of the GEM graphic attributes is "writing mode"—the process by which the system places graphic data into screen memory. Four modes are available: Replace, Transparent, XOR (exclusive-OR), and Reverse Transparent.

Each writing mode performs a different set of Boolean operations among the "mapped" color indices of the pixels you are writing to the screen, the pixels already there, and the "mask" for the line or pattern you are drawing. By "mapped" color index we mean the numbers GEM uses to represent colors internally—not the same as the color indexes we have encountered so far. Figure 5 shows how GEM represents color indices in screen memory for each graphic mode.

By "mask" we mean a binary shadow image of the line, fill, or other pattern, containing all 0's where pixels of any color are turned on in the pattern, and 1's everywhere else. We discussed the logic of the masking process last issue, in the course of explaining how user-defined fill patterns and mouse forms are designed. With this information in hand, let's look at how each writing mode works.

Replace mode does just that—replaces whatever is on the screen with new data. When a figure containing both foreground and background colors (a patterned fill, for example) is written to the screen in Replace mode, it completely overwrites what is underneath it. The Boolean operation performed in Replace mode is:

```
RESULTING PIXEL = (NEW PIXEL AND MASK)
```

Transparent mode is more subtle. When a figure contain-

Value	Effect
1	THICKENED
2	LIGHT
4	SKEWED
8	UNDERLINED
16	OUTLINED

Figure 4. Graphic text special effects, applied individually, and corresponding attribute values, used with vst_effects( ). To apply special effects in combination, add up the individual values for the effects you want, and use the sum as input to vst_effects( ).

Color Index	Internal pixel value		
	Low-Res	Medium-Res	High-Res
0 (background)	0000 (0)	00 (0)	0 (0)
1 (normally black)	1111 (15)	11 (3)	1 (0)
2	0001 (1)	01 (1)	
3	0010 (2)	10 (2)	
4	0100 (4)		
5	0110 (6)		
6	0011 (3)		
7	0101 (5)		
8	0111 (7)		
9	1000 (8)		
10	1001 (9)		
11	1010 (10)		
12	1100 (12)		
13	1110 (14)		
14	1011 (11)		
15	1101 (13)		

Figure 5. Color-index to internal pixel value conversion.

Graphic Text Generator Listing 2.

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

/* External VDI/AES arrays, etc., and variables */

int  contrl[12],
     intin[128],
     ptsin[128],
     intout[128],
     ptsout[128],
     work_in[12],
     work_out[57],
     handle,
     hor_in = 0,
     vert_in = 0,
     effect = 0;

/* In main() we initialize the application, open a
   virtual workstation, call the demo function,
   close the workstation, and exit. */

main()
{
     appl_init();
     open_vdi();
     graphic_text();
     v_clsvwk(handle);
     appl_exit();
}

/* The demonstation function: a long loop
   that runs a menu, asks which attribute the user
   wishes to modify, calls an appropriate
   function to retrieve the necessary parameters
   and perform the modification, and displays
   the result. */

graphic_text()
{
     int x,y,choice,p[8];

     p[0] = p[2] = work_out[0] / 2;
     p[1] = 0;
     p[3] = work_out[1];
     p[5] = p[7] = work_out[1] / 2;
     p[4] = 0;
     p[6] = work_out[0];
     x = p[0];
     y = p[5];

     while(1){
        printf("\33HMain Menu\n\n");
        printf("1. Set text height (pixels)\n");
        printf("2. Set text height (points)\n");
        printf("3. Set text color\n");
        printf("4. Set horizontal alignment\n");
        printf("5. Set vertical alignment\n");
        printf("6. Set rotation\n");
        printf("7. Set special effects\n");
        printf("8. Quit\n\n");
        printf("Please choose an option:\n");
        choice = get_choice(8);

        if (choice == 1 || choice == 2)
             set_height(choice);
        else if (choice == 3) set_color();
        else if (choice == 4) set_halign();
        else if (choice == 5) set_valign();
        else if (choice == 6) set_rotation();
        else if (choice == 7) set_effects();
        else break;

        v_clrwk(handle);
        v_pline(handle,2,p); v_pline(handle,2,p+4);
        v_gtext(handle,x,y,"Sample text");
        while(!Bconstat(2)); Bconin(2);
        v_clrwk(handle);
        }
     v_clsvwk(handle);
     appl_exit();
}

set_height(choice) /* set text height */
int choice;
{
     int size,d;

     printf("\n\nEnter number for text height: ");
     scanf("%d",&size);
     if (choice == 1){
          vst_height(handle,size,&d,&d,&d,&d);
          }
     else vst_point(handle,size,&d,&d,&d,&d);
}

set_color() /* set text color */
{
     int color_index;

     printf("\n\nEnter a color index: ");
     scanf("%d",&color_index);
     vst_color(handle,color_index);
}

set_halign() /* set horizontal alignment */
{
     int d;

     printf("\n\nChoose horizontal alignment:\n");
     printf("1. left   2. center   3. right\n");
     hor_in = get_choice(3) - 1;
     vst_alignment(handle,hor_in,vert_in,&d,&d);
}

set_valign() /* set vertical alignment */
{
     int d;

     printf("\n\nChoose a vertical alignment:\n");
     printf("1. base   2. half    3. ascent\n");
     printf("4. bottom 5. descent 6. top\n");
     vert_in = get_choice(6) - 1;
     vst_alignment(handle,hor_in,vert_in,&d,&d);
}

set_rotation() /* set text rotation angle */
{
     int angle;

     printf("\n\nEnter angle for text rotation: ");
     scanf("%d",&angle);

     vst_rotation(handle,angle);
}

set_effects() /* toggle text special effects */
{
     int bit = 1,choice;

     printf("\n\nChoose to toggle effect:\n");
     printf("1. Thickened  2. Light  3. Skewed\n");
     printf("4. Underlined 5. Outlined\n");

     choice = get_choice(5);
     if (choice > 1) bit = bit << (choice - 1);
     effect = effect ^ bit;
     vst_effects(handle,effect);
}

get_choice(number) /* get keypress */
int number;
{
     int c = 0;

     while(Bconstat(2)) Bconin(2);
     while(c < 1 || c > number){
          while(!Bconstat(2));
          c = Bconin(2) - 48;
          }
     return(c);
}

open_vdi() /* "open workstation" function */
{
     int i,d;

     for(i = 0;i < 10;work_in[i++] = 1);
     work_in[10] = 2;
     handle = graf_handle(&d,&d,&d,&d);
     v_opnvwk(work_in,&handle,work_out);
     v_hide_c(handle);
     v_clrwk(handle);
}
```

ing both foreground and background colors is written to the screen in Transparent mode, anything already there is written over by the foreground-colored areas of the new figure, but shows through its background-colored areas. The Boolean formula for Transparent mode is:

```
RESULTING PIXEL = (NEW PIXEL AND MASK) OR (OLD
                  PIXEL AND NOT MASK)
```

XOR mode is based on the binary operation called exclusive-OR, the truth-table for which is shown below:

	1	0
0	1	0
1	0	1

Under XOR mode, only the mask is used in writing. Where it has all 0's (locations where pixels are set in the pattern you are writing to the screen), pixels are left alone. Elsewhere, pixels are reversed from their original states, assuming a value of 0 if their original value was 1, and vice-versa. The results vary, depending on what colors are already on the screen. The binary formula for XOR mode is:

```
RESULTING PIXEL = OLD PIXEL XOR MASK
```

Reverse Transparent mode is the opposite of Transparent mode. When a figure comprising foreground and background colors is written to the screen in Reverse Transparent mode, the background-colored areas are changed to foreground color, overwriting what is underneath them, while anything underneath the foreground-colored areas shows through. The formula for reverse transparent mode is:

```
RESULTING PIXEL = (OLD PIXEL AND MASK) OR (NEW
                  PIXEL AND NOT MASK)
```

Setting Writing Mode

To set VDI writing mode, the vswr_mode( ) function is used as follows:

```
vswr_mode(handle,mode);
```

where "mode" is 1 for Replace mode (the default), 2 for Transparent mode, 3 for XOR, or 4 for Reverse Transparent.

The program in Listing 3, Writing Mode Adjuster, demonstrates the effect of different writing modes on overlapping graphics and text.

The Programs

The three example programs included with this article are menu-driven and should be self-explanatory. They were written using the Mark Williams C-Language Development System, but should compile with few, if any changes, under Megamax, Alcyon, and other popular compilers. Using MicroEMACS or an equivalent editor, type each of the programs into a unique source file bearing the .c extender, then compile each from the Mark Williams "msh" shell $ prompt as shown:

```
$ cc filename.c -VGEM
```

The -VGEM expression causes the compiler to link in the required AES and VDI library functions automatically.

Compilation will produce files bearing .PRG extensions. These can be executed from within the "msh" shell by typing:

```
$ gem filename.prg
```

or by double-clicking on the program icons from the desktop. ■

Writing Mode Adjuster Listing 3.

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

/* External arrays and variables for VDI/AES */

int  contrl[12],
     intin[128],
     ptsin[128],
     intout[128],
     ptsout[128],
     work_in[12],
     work_out[57],
     handle;

/* In main() we initialize the application, open a
   virtual workstation, call the write-mode demo,
   close the workstation, and exit. */

main()
{
     appl_init();
     open_vdi();
     wrmode();
     v_clsvwk(handle);
     appl_exit();
}

/* The demonstration function. Asks the user
   which write-mode to use, then creates a
   display with graphics applied to text and
   text applied to graphics, using the mode
   chosen. */

wrmode()
{
     int mode,p[8] = {20,20,100,80,20,100,100,160};

     vsf_interior(handle,2); vsf_style(handle,10);
     while(1){
          v_clrwk(handle);
          printf("\33HWrite Mode Demo\n\n");
          printf("1. Replace\n");
          printf("2. Transparent\n");
          printf("3. XOR\n");
          printf("4. Reverse transparent\n");
          printf("5. Quit\n\n");
          printf("Select write mode, or quit: ");
          mode = 0;
          while(mode < 1 || mode > 5){
               scanf("%d",&mode);
               }
          if (mode == 5) break;
          v_clrwk(handle);
          v_gtext(handle,20,15,
             "Text on top of graphics");
          v_gtext(handle,20,95,
             "Graphics on top of text");

          v_bar(handle,p);
          vswr_mode(handle,mode);
          v_gtext(handle,50,50,
              "Here is some sample text");
          vswr_mode(handle,1);
          v_gtext(handle,50,130,
              "Here is some sample text");
          vswr_mode(handle,mode);
          v_bar(handle,p + 4);
          vswr_mode(handle,1);

          while(!Bconstat(2)); Bconin(2);
          }
}

open_vdi() /* "open workstation" function */
{
     int i,d;

     for(i = 0;i < 10;work_in[i++] = 1);
     work_in[10] = 2;
     handle = graf_handle(&d,&d,&d,&d);
     v_opnvwk(work_in,&handle,work_out);
     v_hide_c(handle);
}
```

Software Survey

These short reviews will keep you up to date on some of the latest, greatest, and not-so-great software available for Atari computers. (There's a joystick review here, too.)

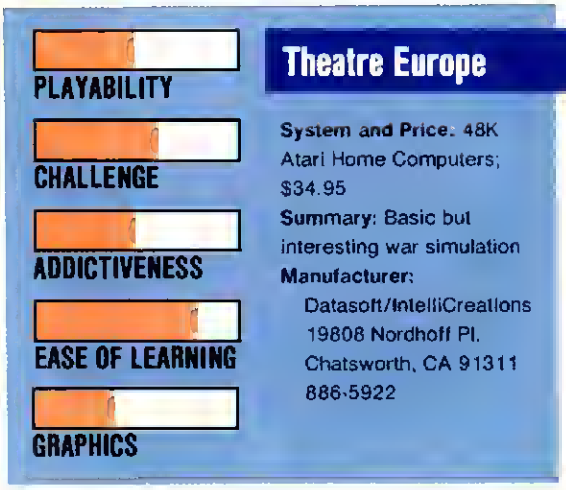
Over the years since the original Atari Video Computer System was introduced, the computer gaming market has supported more game controllers than you could shake . . . well . . . a joystick at. For the most part, new entries have incorporated only modest improvements on earlier models—a change in trigger placement or a modification of base or stick size.

Today, we find Epyx attempting to make game controller history by distributing the 500XJ Joystick. Originally marketed by a European company called Konix, it quickly became the best selling joystick on the far side of the Atlantic.

What makes the 500XJ so different from other joysticks? Your first glance will reveal part of the answer: it is molded to fit the hand. This unique shape, combined with the pebbled texture of the plastic, makes the 500XJ easier and more comfortable to hold than its predecessors.

The other obvious change is in the





Theatre Europe

System and Price: 48K Atari Home Computers; $34.95

Summary: Basic but interesting war simulation

Manufacturer:
Datasoft/IntelliCreations
19808 Nordhoff Pl.
Chatsworth, CA 91311
886-5922

Nuclear war is an unpleasant prospect that no one really wants to think about. That could explain why one dealer refused to carry *Theatre Europe* when it was first released in England; he felt it was "morally offensive."

Unlike many games of its genre, which re-enact historical battles, *Theatre Europe* projects what *could* occur during the first month of World War III. With NATO and Warsaw Pact forces plotted on maps of the European countryside, you command the group of your choice, and the computer takes the opposition.

From that point on, the game returns to the familiar war simulation format, including determination of troop strength, restocking of supplies and soldiers from reserve, and most important, movement of troops and battle. The parry-and-thrust of troop movements and battle segments is the heart of the game, but Datasoft has made it a bit more confusing than usual by adding what they call "action screens."

Action screens, it seems, are an attempt to add arcade action to wargame play by allowing you to influence the outcome of the battle by controlling the missiles used against the enemy. To its detriment, this feature is described only minimally in the manual. The whole concept is quite confusing, especially to the experienced wargamer, and I fail to see any advantage in it.

If you should find yourself in need of serious power assistance as the game progresses, you can call upon the chemical and nuclear weapons in your arsenal. One you use them, however, the most likely conclusion is an all-out nuclear confrontation, including upsetting messages from your underlings.

Theatre Europe appears to be geared to the fledgling computer general; games are of relatively short duration and can be saved to disk in mid-battle. It is disturbing to discover that the contest is slanted in favor of the Warsaw Pact forces, a fact that the programmers say is based on actual figures. Nevertheless, *Theatre Europe* should provide many hours of enjoyable armchair warfare.

— ***Andy Eddy***

placement of the fire button, which lies right beneath your index finger and contributes further to your game playing comfort.

Other features include a short-throw stick for quick response; a durable steel rod for support of the stick; audible microswitches, which enable you to hear as well as feel changes in stick position; indentations that cradle your fingers; and a five-year/ten million-shot warranty. It seems almost too good to be true.

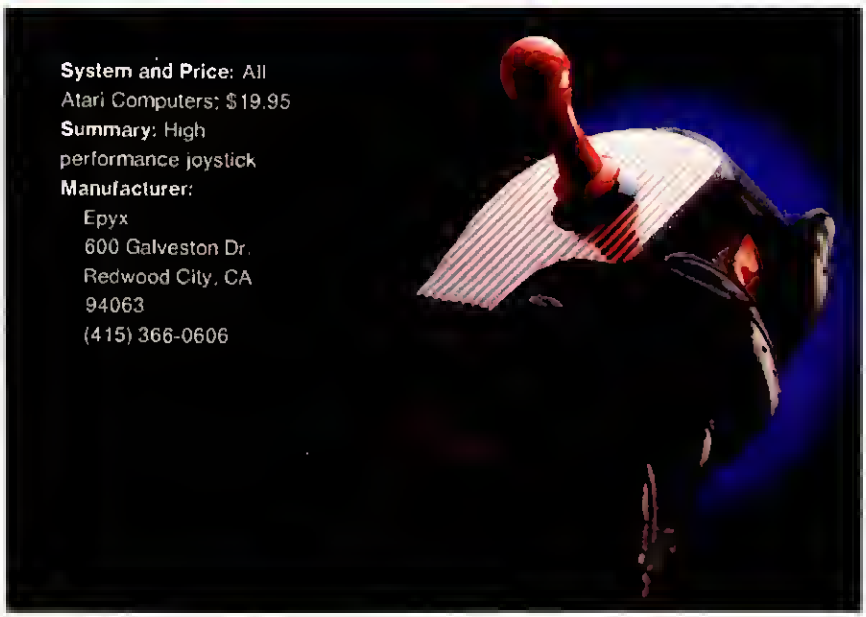
The only drawback is that the 500XJ can be used only by right-handed gamers, and Epyx has no plans to release one for lefties.

In use, the 500XJ really does offer more comfortable play than its competitors. Players will develop fewer blisters during long gaming sessions—the saving on Band-Aids alone could easily justify the cost of the 500XJ.

Epyx has put another winner in your hands.—*Andy Eddy*

500XJ Joystick

System and Price: All Atari Computers; $19.95
Summary: High performance joystick
Manufacturer:
Epyx
600 Galveston Dr.
Redwood City, CA
94063
(415) 366-0606



Electronic Arts has produced and distributed software of consistently high quality for as long as they have been in business. *Mail Order Monsters*, then must be viewed as the exception that proves the rule.

Mail Order Monsters combines a creature construction set with a variety of combat segments. The construction mode allows you to build a "morph" from a large collection of bodies, body parts, weapons, and accessories. Imagine, for example, a squid with hands, grenades, and a laser; mutation has never seemed so desirable.

The three stages of combat range from beginner (basic head-to-head battle) to intermediate (you choose one of three different contests) to the tournament game. In the latter you can win victory points and "psychons"—the currency of the game with which to build better, stronger morphs. Your creations can be saved on disk for use in later battles.

The concept behind the program is reasonable; it is in the execution that it falls short. The graphics leave a great deal to be desired, and the actual combat segments are quite anticlimactic. Strategy counts for little, so the winner in most cases is the faster of the two monsters.

I had hoped to find in *Mail Order Monsters* an extension and expansion of the arcade-like battle segments featured in *Archon*, but found, instead, clumsiness and frustration. The logjam of switching weapons and defenses, even pausing the battle, for example, takes so long that your opponent has plenty of time to beat much of the life out of your character.

The worst part of games like this is that the computer-controlled combatant fights so efficiently that it is almost impossible to gain any ground. About the only way to enjoy *Mail Order Monsters* is with another human player as an opponent, which is, of course, not always possible.

Even with a lower-than-average price of $14.95, this program is a serious disappointment. *Mail Order Monsters* belongs in the Dead Letter Office.

Andy Eddy

Mail Order Monsters

PLAYABILITY
CHALLENGE
ADDICTIVENESS
EASE OF LEARNING
GRAPHICS

System and Price: 48K Atari 8-bit Home Computer; $14.95
Format: Disk
Summary: Disappointing arcade battle arena
Manufacturer:
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
(415) 571-7171





Skyfox

PLAYABILITY

ADDICTIVENESS

CHALLENGE

EASE OF LEARNING

GRAPHICS

System and Price: Atari ST; $44.95

Summary: Exciting aerial combat game in a fighter of the future

Manufacturer:
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
(415) 571-7171

Are you looking for an exciting arcade-quality shoot 'em up? One that requires fast reflexes and few strategic decisions? One with so many scenarios (15) and skill levels (5) that you will never run out of new challenges? Look no further; Electronic Arts has released the Atari ST version of its best-selling *Skyfox* program.

In *Skyfox*, you become a pilot of the future, flying the Skyfox Mach 4 Federation fighter plane against The Enemy, whose hovering motherships continually launch air fighters and ground tanks against Federation asteroid bases.

The Skyfox fighter has an awesome weapon system which includes laser cannons, heat seeking missiles, and guided missiles. You can use either a joystick or the mouse to control the fighter. I prefer the joystick, but a friend swears that the mouse gives him finer control. If you have a joystick with the fire button in the top of the control stick, you will find play somewhat easier, because occasionally you must use your left hand for pressing keys to arm and disarm missiles, engage the automatic pilot, or turn the computer map off and on.

The computer screen represents the interior of your Skyfox fighter. The radar screen is at dead center; you can toggle between overhead and far forward radar views. Important messages also pop up on your radar screen. To the right of the screen is a shield indicator; when the red bar is gone, so are your shields. You should get back to your home base and recharge them before this happens. To the left is a fuel indicator. Fuel consumption increases with speed— thrust boosts and steep climbs are especially expensive. You can refuel at home base.

Other cockpit indicators include your current X-Y coordinates, compass heading, altitude, enemy plane launch detector, elapsed time, and missile counts. Of course, the most important part of your cockpit is the forward window from which you can see the pretty landscape (enjoy it while you can), tanks (mean and ugly), and fighter planes (fast and lethal).

You'll want to start with some tank training missions to get the hang of flying the Skyfox. When you build up some confidence, you can try the fighter training missions. I found it relatively easy to shoot a plane down when I was on his tail, but darn near impossible when I was nose to nose with him.

"Oh well," said I, "so what. I want the taste of a real invasion mission." Big mistake— I died in about four seconds. After getting nowhere in many, many tries, I reluctantly went back into training. First, some more fighter training, followed by high/low training, and finally combo training.

Then I was finally ready to take on an invading Enemy Mothership with its deadly armada of tanks and fighters. Swoop down, take out some tanks. Radar shows a wave of planes approaching, hit the thrust boost and climb over them, 180-turn, and put some laser cannon fire up their tails. Hit the auto pilot to get to the next tank group, zap 'em, and prepare for the next fighter wave. Use some heat seekers to dispatch them, and try for a run on the Mothership. Too soon; still too much other activity. Uh, oh, fuel is getting low; better return to base for more fuel and to charge up the shields. And so it goes as you master a small invasion.

I leave it to you to imagine a full invasion (three Motherships), massive invasion (six Motherships), and five other types of invasion, each with its own special shape and pressure (Halo, Alamo, Advancing Wall, Chess, and Cornered). Hit it!—***David H. Ahl***

There are many good game ideas; there are far fewer good games. This gap between concept and execution is what turns potentially outstanding programs into mundane, uninspiring exercises. *Wanderer* is one the latter.

The primary selling point of the game is its 3-D graphics. Its worst features are the far-out premise upon which the game is based and scanty documentation that offers virtually no help to the novice player.

Briefly, the story line is as follows: Cats have become the hottest commodity on Earth in the year 2986 (Unfortunately, I don't think Garfield will be around long enough to see it). Your landlady's cat has been stolen, and since she won't fix anything around your apartment while her darling Moggie is missing, it falls to you to get the little imposer back.

The catnappers are fond of a card game that will remind you of contemporary Earth's poker, and you decide to win the cat back by beating them at their own game. You set off into space, and at each planet you encounter foes who must be defeated before you can exchange the cards you have for the ones they have, thereby building your

World Games

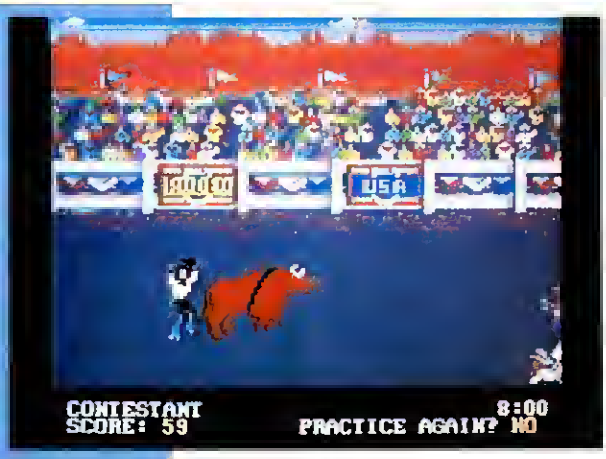
PLAYABILITY

CHALLENGE

ADDICTIVENESS

EASE OF LEARNING

GRAPHICS



System and Price: Atari ST; $34.95
Summary: Arcade-style simulation of rather obscure athletic competitions.
Manufacturer:
Epyx
600 Galveston Dr.
Redwood City, CA 94063
(415) 366-0606

It all started with *Summer Games*, an Olympics simulation that was an instant hit because of its ease of use, graphic superiority, and realism. *Summer Games II* and *Winter Games* followed, each trying hard to be as good as, but in general falling short of the original.

Unfortunately, *World Games* has some of the same shortcomings. It seems that the series is running out of events. Most sports fans were familiar with the events depicted in the first three games of the series—a situation that made realism a high priority. A quick rundown of the events included in *World Games*, however, reveals the weakness of obscurity. Included are: Weightlifting, Barrel Jumping, Cliff Diving, Slalom Skiing, Log Rolling, Bull Riding, Caber Toss, and Sumo Wrestling. How long has it been since your attention has been grabbed by any of *those* events—either in person or on TV?

But *World Games* does avoid some of the shortcomings of its predecessors; there are only two poor events. One is Sumo Wrestling, which requires too much memorization for its pace, which is also too quick considering the size of the on-screen combatants. The second is Slalom Skiing, which is so difficult as to be nearly unplayable; it is far too difficult to get the skier slowed properly and turned sharply enough to make the gates.

Aside from those two clinkers, the events are rich in graphics, strong in competition, and graced with the extra little touches that reveal the tender loving care lavished by the game's creators.

In Weightlifting, the athlete does deep-breathing exercises while waiting to lift the bar and turns red in the face if you hold him in a strenuous position too long. In Cliff Diving, the diver will give a smile and a wave if you get him into the water and back to the surface safely. He isn't as happy if you smash him into the cliff or onto the rocks below. An attentive pelican watches every move.

Most of the features that have characterized the *Games* series are present here. It is possible, for example, to compete in one or all events and practice any or all events, but World Records can be set only in competition. *World Games* adds a travelogue feature that tells a bit about the country in which each sport is taking place.

When you compete in all events, an awards ceremony concludes the festivities with the overall champ finally getting his due.

Eight different players can select a country and compete head-to-head, and it is in this multiple-player mode that the game really shines. How many games do you know that offer fun and challenge to that many people?

It would be nice if all four programs could be linked for one marathon competition with the computer keeping track of the overall standings. But even without that feature, *World Games* is a worthy addition to your library, especially if *Summer Games I* and *II* and *Winter Games* already occupy space on your shelves.—***Rick Teverbaugh***

Wanderer

PLAYABILITY

CHALLENGE

ADDICTIVENESS

EASE OF LEARNING

GRAPHICS

System and Price: Atari ST; $39.95
Summary: Space trading, conquest, exploration, rescue mission with 3-D graphics
Distributor:
Eidersoft USA
12416 N. 28th Dr.
Suite 18-252
Phoenix, AZ
85029
(602) 978-0284

hand into something that will earn you a trip to a Black Hole, which is where you find the jokers. Once you have accumulated enough points, you go to the Ark, battle with the Sphynx, rescue Moggie, and achieve victory. Got all that?

Your energy and shields are limited, so use them wisely, and don't forget to replenish as often as possible.

As I said, the graphics provide the only real charm in the game. Two pairs of 3-D glasses come with the game, but take good care of them; they have the usual cardboard frames with one blue lens and one red lens each. Future versions of the game will be compatible with Antic Software's new liquid crystal shutter glasses, which should improve the already sensational 3-D effects.

Objects sail above and below you as well as to each side. There are two radar views at the bottom of the game screen; one to tell if the foe is in front of, behind, to the left, or to the right of your craft, while the other covers the views above and below.

The game is billed as a complete space adventure game, but the instructions occupy only 14 pages, including one and a half pages describing how the 3-D effect works. That means quite a bit is left to the imagination and trial-and-error.

With a better premise and a well-written rulebook, the graphics of *Wanderer* could have carried the game toward the top of the list of good space adventures. As it is, flaws in execution make it a game that is fun to look at for a while, play for a bit, and then forget.—***Rick Teverbaugh***

Super Cycle

PLAYABILITY

ADDICTIVENESS

CHALLENGE

EASE OF LEARNING

GRAPHICS

System and Price: Atari ST; $29.95
Summary: Simulation of high speed, cross-country motorcycle racing
Manufacturer:
Epyx
600 Galveston Dr.
Redwood City, CA
94063
(415) 366-0606



Super Cycle is an exciting simulation of motorcycle racing, but it is exciting only to the extent that cross-country motorcycle racing is exciting. For my money, the real challenge is found in the moto-cross circuit with its treacherous, testing track, complete with nerve-racking leaps and life-threatening landings.

Having, perhaps, recognized this, the folks at Epyx have included special challenges throughout the program. These make each game a greater test than just finishing each course in the allotted time.

The game is adorned with just about all the options you could want, although many don't really affect play at all. For instance, the first few choices you are asked to make cover the color of your cycle, helmet, and clothes. The truly

War, mostly, by the end of the 20th century, a quick notion of who drops the most bombs the quickest, has gotten more interesting, at least strategically, in the 21st century. It seems that long-range nuclear missiles have nearly ceased to exist with the advent of jamming techniques and laser defense technology.

So what's left? The re-emergence of tank and infantry battles of course. That is very loosely the premise upon which *Ogre* is built. Ogres are cybertanks—faster, more dependable, more powerful than conventional tanks—with one more harrowing difference: they are completely computer controlled.

In this grid-style-map strategic battle, an Ogre has been sent to destroy the enemy's command post and, if possible, return home again. In the two-player version, either player can control the Ogre. In the computer opponent version, the only human choice is to defend the command center. That is probably the game's only weakness: given that it is possible to take command of the Ogre in two-player games, it would be nice to be able to practice strategy in the one-

Ogre

PLAYABILITY

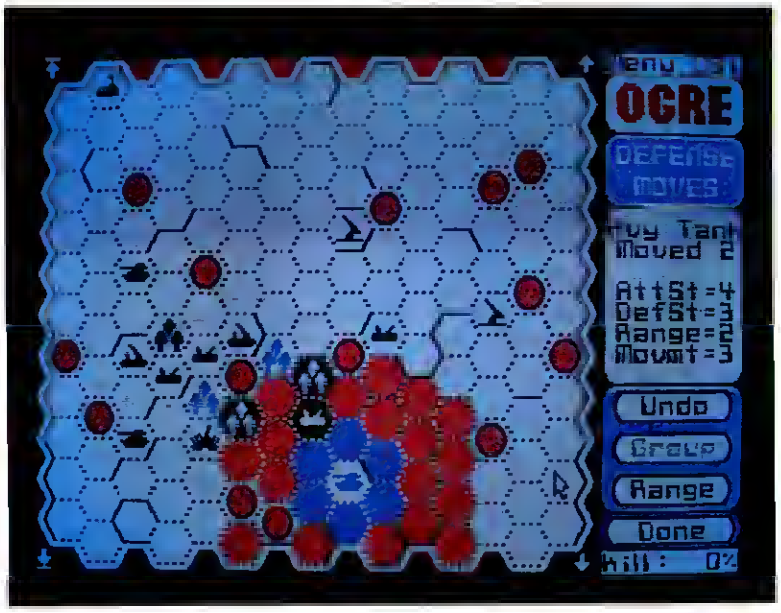
ADDICTIVENESS

CHALLENGE

EASE OF LEARNING

GRAPHICS

System and Price: Atari 8-bit Home Computers and Atari ST; $40
Summary: Futuristic war/strategy game
Manufacturer:
Origin Systems
340 Harvey Rd.
Manchester, NH 03103
(603) 644-3360



fashion conscious, can even choose from several different designs of leather jacket. Yet none of these selections has even the slightest bearing on the outcome of the challenge ahead.

Four different difficulty levels determine the skill and tenacity of the drivers you compete against and the amount of time given to complete each course.

When a course is completed within the allotted time, you earn bonus points, and each second you have to spare is added to the time allotted for the next course.

The other riders are obstacles around which you must steer on the course, but they don't present any real competition. You race against the best previous point total, which is saved to disk. As the difficulty level increases, so does the point value of each course. It is possible, therefore, to skip some of the courses at level two and still earn a higher score than a player who has completed all the courses of level one. But beginners will find it best to start with level one.

Your cycle is joystick controlled. Pushing forward on the stick causes the bike to go faster, pulling backward slows it down. To steer, you move the stick left and right, and the fire button shifts the bike through its three gears.

The courses offer a variety of backgrounds, but not many different layouts. Some courses have city motifs, others are run through the desert, but they are all flat with similar twists and turns. The biggest obstacle to winning the race against the clock is crashing—into either off-road obstacles or on-road riders. It takes time to get back onto the bike, get started, and regain your speed.

Some courses are bonus rounds. Flags appear on the road, and riders score points by hitting them. Try to resist the temptation to flatten the ones near the edge of the course; you may run off the road and lose valuable time.

Graphically the game is above average more for the smoothness of the ride than for the special effects of the crashes or the scenery. *Super Cycle* will give your reflexes and joystick a good workout. You won't exactly feel the wind in your face, but you will find hours of fun as you strive to score "just a few more points."—***Rick Teverbaugh***

player mode.

The map is a field of hexagons, 15 × 22, representing an area 14 miles × 20.5 miles. On the map there is nowhere to hide: the only texture is created by craters and rubble. Craters cannot be crossed, and rubble can be crossed only by the Ogre and the infantry of the defenders.

Weapons at the disposal of the defenders include heavy tanks, missile tanks, howitzers, and ground effect vehicles.

The first chore when putting the game in motion is to select a pre-drawn field or create one. The defender must then deploy his troops and place his command center in a strategic location—usually along the back row of hexagons at the end opposite the point at which the Ogre enters the grid. The deployment of troops—what units make up the defense and where they are placed—also goes a long way toward determining the strategy to be used in the game. You can use either 12 or 20 armor units, depending on whether a Mark III or a Mark V Ogre is used in the attack.

Infantry can be 20 or 30 squads, again depending on the Ogre. My advice is to use at least two howitzers: The Mark III Ogre has only two missiles; if it uses both to take out your howitzers, it will have to get quite close to destroy the command center. You should also learn to make good use of the ground effects vehicles. They are speedy and move twice per round. They can move into firing position and then move out of range after firing, especially if the Ogre has been slowed by damage to its treads.

The playfield takes up about the left-hand 80% of the screen. What remains is devoted to the many pull-down menu options available both before and during the game. You can save the game at any point and resume at a later time. With simply a click of the mouse you can tell where a piece may move on that turn and what the firing range would be with any of those moves. Color is used to highlight legal moves.

Dialogue boxes prompt you through the movement phase and appear when a unit is capable of firing at the Ogre, so you get all your best shots in—and you'll need every one of them.

Ogre is as good an overall war/strategy game as you will find on the market today. Graphically, the game isn't overwhelming, but more flashy graphics would probably detract from the focus of the battle. I could find no significant flaws in the execution, ease of play, variety, or depth of challenge of *Ogre*.

— ***Rick Teverbaugh***

Puzzles & Problems

By DAVID H. AHL

Answers are on page 74



Out for a Jog

Al and Brad live across the street from one another, and both go jogging every morning around the same rectangular route formed by four streets. The distance of the route, as measured in the center of the streets is exactly two miles. However, Al jogs on his side of the street (the inside of the rectangle), and Brad stays on the other side. If all the streets are 20 feet wide and Al and Brad jog 200 days per year, how much farther will Brad have jogged in a year?

If, instead of jogging on the streets, Al and Brad jog on an access road around a circular reservoir—also two miles in length—and Al stays to the inside and Brad to the outside, what will be the difference in distance at the end of the year?

GFA Basic

The first Basic to make a case for programming in Basic on the ST

System: Atari ST
Price: $79.95
Summary: Brings Basic to the ST in a manner truly worthy of the machine.
Manufacturer:
Michtron
576 S. Telegraph
Pontiac, MI 48053
(313) 334-5700

I'm one of those people who think that Basic has gotten a bum rap. It is, of course, the programming language I learned first and, arguably, best (simply through exposure), and I am by no means an assembly whiz or C prodigy. For my kind of dabbling, Basic has long been a comfortable place to be.

Unfortunately, it has never offered the kinds of capabilities offered by other programming languages. It has been slow, weak, unable to hook into the strongest facets of any machine. Programs written in Basic have a tendency to reveal themselves in the worst ways. Know what I mean? "This is so bad, it must be written in Basic," you may occasionally find yourself saying.

Even worse, and largely responsible for the reputation (or lack thereof) acquired by the Basic language, are the nearly barbaric programming conventions it seems to encourage. Certainly, sloppy programming and damnable coding habits are ultimately the responsibility of the programmer himself. But Basic undeniably tempts the holiest of the holy—with its line numbers, its untaggable variables, and its lowly desperado of a command, GOTO. In a showdown, GOTO will plug you first every time.

I call myself a Basic fan, yet I'll freely admit that if called upon to decipher a page of code, I would take Pascal or Logo hands down. Maybe even Lisp, if I'm feeling frisky.

Why is this? Because languages like Pascal are "structured," that is, designed to encapsulate code routines in separate modules, callable by some logical name, and much easier to comprehend quickly. There are no line numbers (at least none that the programmer need concern himself with) and no GOTOs. Rather, there are procedures and procedure calls. When reading someone else's code, you can see paths quickly. When writing your own code, you don't need to leave a trail of breadcrumbs to help you remember your logic. Neat.

It should be noted that there has been a bit of a backlash against Pascal in recent months, and I do understand it. Pascal forces you to declare yourself in its own terms, to put all your cards on the table right at the beginning, as it were, and to think the way Niklaus Wirth thinks, if you intend to get anything substantive done.

In its desire to keep you clean and coding on the right track, Pascal confines you, and this may inhibit inspiration. David Small, veteran Atarian whose latest venture is the Magic Sac Macintosh emulator, has called Pascal "a Fascist language"—a tad overstated, perhaps, but I can certainly see where he is coming from.

In its own way Pascal is almost as bad as Cobol with respect to the requirements of even the simplest of jobs. Sometimes you need to cross a ravine and all you really want is a strong plank—you don't need a suspension bridge every time.

But let me remind you, I am not a programmer, I am a writer who programs as a hobby. And I am one of those people who think that Basic has gotten a bum rap.

Introduction to GFA Basic

Billing itself as "the full access" Basic programming language for the Atari ST series, GFA Basic, from GFA Systemtechnik in Germany, fulfills that promise better than any other ST Basic I have seen to date. It has hooks into most of the powerful features of the ST and is quite fast (more a reflection of the 68000 processor in the ST than anything else). It is possible to write a program in GFA Basic that in no way reveals the fact that it is not written in C, or Forth, or assembly. Huzzah. It lists for $79.95. Double huzzah.

What's more, GFA Basic is a structured Basic. It sports no line numbers, and though it does feature a GOTO statement, you can hold it in abeyance, rather like the hyperspace button on an arcade game. If your back is to the wall and there is no other way out, your old

By JOHN J. ANDERSON

buddy GOTO will blast you out of there in no time. But he leaves your code a messy place. Better bring a mop.

In addition to the fact that GFA Basic supports procedures, it allows exactly and only one command per line. This may seem like a throwback, and I can tell you that it does take some getting used to. But if memory is not a problem (and on the ST it is not, or at least should not be, a problem), the approach results in code that is much easier to follow.

Sure, your listings are a lot longer than they would be with multiple command lines. But at the same time, they are much less dense. It is less likely that you will miss something important as your eye scans a chunk of code. And what might have seemed like a constraint at first quickly evolves into a programmer's aid, once you ease into it.

The editor within GFA Basic has its nuances, but on the whole is a pleasure to use. It is what I call a "real-time" editor: that is to say, you can change the code on a line, click RUN, and watch the modified code execute. There is no pressing of RETURN to enter a line, no Byzantine windowed entry system as found in Microsoft Basic for the Mac. Simply make your alterations and go.

Insert, delete, block move and copy, search and replace, all work exhilaratingly well. True, marking blocks and manipulating them is a two-step process, and can seem a bit awkward. Paging does not work window-style, either, but with mouse clicks on the menu bar, which is a little distracting at first. But the editor is smooth, robust, and powerful. It includes a large set of cursor movement commands. It allows you to flip between the editor and display screens to see the results of your code upon it. It allows you to toggle between insert- and overwrite-style input. It even features a pseudo-direct mode, which allows commands to be entered command-interpreter style. TRON and TROFF commands aid in debugging code.

Error messages in GFA Basic are presented in full text and point you directly to the problem. The interpreter is quite "smart," and can often accept a line that has been entered incorrectly, fixing the mistake as it goes (as long as the mistake is a minor one).

As an example, a line you enter as ?at (2,2)"Test" will click in as Print At (2,2);"Test" and execute correctly. I was especially impressed by the insertion of the semicolon. Even when your code results in a crash, Basic will tell you how many bombs your ST has returned and what they might be trying to tell you.

The function keys on the ST are fully enabled by GFA Basic and can shortcut point and click commands to load, save, save in ASCII format, merge, list files to a printer, flip between screens, go to direct mode, test program loops, run a program, or quit.

If your back is to the wall *and there is no other way out, your old buddy* **GOTO** *will blast you out of there in no time.*

The Command Set

The GFA Basic command set is extremely complete, and we don't have room here to list it in its entirety. Suffice to say that you won't find it lacking any command you want to use. In fact, you will discover that it is replete with commands you didn't know you needed but will happily learn to use. Among these are commands for graphics, sound, menus, windows, mouse, machine code calls, drive control, time and date, directories, file manipulation, various input formats, a wide range of loop formats, string handling (à la Microsoft), error trapping, I/O channels, PEEKs and POKEs, screen manipulation, READ-DATA manipulation, pointers, and traces.

Among the special functions are VDI and AES calls, including window control through GEM, the capability to pass on variables and arrays indirectly, a raster copier command, fast movement of memory blocks, monitor calls, and true and false conditions.

The EXEC command allows you to load and execute a non-Basic ST application and run it from within a GFA Basic program. The C: command calls and runs a routine written and compiled in C.

Variables can be in the form of single letters or words, and the full word is always used by GFA Basic to distinguish between variables. If a value is assigned with the LET command (optional, of course), then even command names are allowed as variable names—you can say LET LET=17, and it will happen. Real, integer, Boolean, and string variables are supported. Significantly too, local variables are also supported.

Included on the disk with GFA Basic is a program that strips line numbers from ST-Basic programs for conversion to GFA Basic. The program helps show you where you need to do some custom tailoring. Also on the program disk is a run-only version of GFA Basic, which is a quasi-compiler. It allows you to run GFA Basic programs as stand-alone applications, and GFA Systemtechnik invites you to copy the run-only module at your pleasure. My informal tests showed no appreciable speed difference between the actual program and the run-time compiler—but this was only because both were so fast.

So it becomes clear that GFA Basic is an excellent program and an excellent programming language. It brings Basic to the ST in a manner truly worthy of the machine. In fact, it could be said that GFA Basic is the only Basic programming language yet released that presents a good, strong argument for programming an ST in Basic in the first place.

Documentation

That is not to say that GFA Basic is entirely without disappointments. The documentation was originally written in German and suffers badly from "translationitis," wherein quotes are called "inverted commas" and the like. In places it is verbose about a simple point, in other places terse about a complex one. It confuses bars and slashes, ohs and zeros, the words TEST and TEXT. And then there are the simple typos in program code.

I fear that the documentation accompanying GFA Basic will hinder its deserved acceptance as the de facto Basic language for the Atari ST, as it camou-

flages the elegance and ease of use of the package.

Then there are the problems of hooking into GEM. These can not fairly be placed at the feet of the people at GFA Systemtechnik, but in their efforts to bring the power of the ST to the commonfolk, they get caught in the middle. Simply opening and updating a movable window on the ST is an exercise in the complexities of GEM (see example in accompanying program). But perhaps I am revealing with this comment my own deficiencies rather than those of the systems I describe.

GFA Basic Demo Program

Listing 1 is a program I worked up to demonstrate the capabilities of what I think are the most interesting commands of GFA Basic. The goal is to show off some of those capabilities and to provide a tutorial for new users. This listing is available online through Compuserve and Delphi along with the run-time package. By downloading the files you can have a look at GFA Basic in the comfort of your own home and perhaps get a better idea of whether or not it is something you would like to purchase. I have annotated the program here (note that you won't be able to list the program with the run-time package).

What the program does is throw a menu bar on the screen, offering selections for Intro, Windows, Mouse, and Graphics. You can choose from these selections and run through demonstrations of various commands. The following is a description of the program itself:

The first module of the program defines the menu bar and displays it on the screen. It initializes a text string (Bar$), which will contain all the elements of the menu, and uses READ and DATA statements to construct the string.

A demonstration program on the GFA Basic disk uses a totally different method to create a menu bar, and although it reads menu selections more efficiently, I prefer the method shown here. My method uses less brute force and is easier to track and easier to modify. The menu bar is constructed so that desk accessories can be present on the boot disk. You can disable them easily if you want to.

The next module is the main program loop, which, as you will see, is a mere four lines long. It simply scans the menu bar and waits for a point and click. When it gets one, it moves on to Procedure Menu.

The Procedures

Now we reach our first defined procedure, Menu. You could handle the same task in a more efficient manner, but not a clearer manner. Here we identify each point and click by its actual name and refer it to a specific procedure named in a similar manner. Each is sandwiched into an IF-END-IF loop.

Why do it this way? Well the best reason is that it makes adding and subtracting elements from your menu bar as straightforward as possible. Let's say you decide to eliminate one selection under Graphics, but you want to add a whole new header between Mouse and Graphics with six new selections in it. If you read the menu numerically, you would have to go in and re-engineer the whole Menu procedure. By doing it this way, all you need to do is revise the DATA statements, enter your new selections to Procedure Menu, and then make sure you add procedures for each new selection.

In a way, this program can actually serve as a "template" for menu creation, which is the real reason that I wrote it. Note also that the escape hatch is located here. A click on "Quit" returns you to the GEM desktop.

Next we see the menu components themselves. The first procedure displays the "About this program" box on the Desk accessories menu. As you can see, constructing an alert box is really easy using the GFA Basic command ALERT.

The procedure Intro simply provides a text block with an explanation of what GFA Basic is and what this program attempts to do.

Procedure Default displays the four default windows available to GFA Basic. They are opened, updated, and closed with clicks of the mouse, demonstrating the commands TITLEW, INFOW, OPENW, CLEARW, and CLOSEW. I should note that the documentation clearly states that the CLOSEW command must be used when a window display is completed, and that quick-clicking between four open windows can occasionally result in a crash. I tried coding it in about six different ways, but could not bulletproof the code. In actual practice, your programs will probably not call on four windows to open, update, and close in such quick succession.

Procedure Alert simply shows how alert boxes can be nested and branched with minimal effort.

Procedure Gem demonstrates what is involved in creating an honest to goodness, movable, sizable window. It is difficult, to say the least, and probably beyond the scope of the beginner. But it can be done.

Procedure Cursor shows how the cursor can be cycled through eight ROM defaults. The command DEFMOUSE also supports user-defined mouse shapes, though this is not demonstrated here.

Procedure Position uses the command MOUSE to read the position of the mouse and print its coordinates.

Procedure Buttons reads the mouse buttons and prints their condition, using the command MOUSE.

Procedure Fonts demonstrates the command DEFTEXT and shows the fonts, styles, and combinations available with it.

Procedure Graphmode shows how easily graphics can be handled with the GRAPHMODE command. It puts on the screen a small circle controlled by the mouse. When you hold the left button down, you can draw with the circle shape.

Procedure Sprite demonstrates the SPRITE command, bouncing an animated block on the seeen.

And that's all I wrote.

I had initially written this program on a monochrome ST system and found upon running it in color that it required modification—some fields were suddenly way out of range, text was printing in the wrong size, and the like. But the modifications were simple. The version of the program that appears here will run on all ST systems, mono or color.

One advantage of the monochrome system while running GFA Basic, by the way, is a 48-line text mode, wherein a nice big chunk of the program can be seen all at once. You can easily toggle between this mode and regular (23-line) mode.

If you own an Atari ST and you think Basic has gotten a bum rap, you owe it to yourself to have a look at GFA Basic. It just might be good enough to clear Basic's name, at least as far as the Atari ST is concerned. But remember, this will happen only if you try hard not to use GOTO —unless absolutely, positively necessary. ■

If you own an ST

and you think Basic has gotten a bum rap, you owe it to yourself to have a look at GFA Basic.

GFA Basic Demo

ATARI KEY

- Any Atari ST Computer

This program and the GFA Basic run-time module can be downloaded from any of the following information services:

- CompuServe (Data Library 3)
- Delphi (ST Programs)
- Genie (MichTron Roundtable)

```
'
' ------------------------------------------------------------------
'
'
'  GFA BASIC DEMONSTRATION -- V 1.0
'
'  by John J. Anderson, Atari Explorer Magazine
'  CompuServe 76703,654
'  Delphi      JOHNANDERSON
'  Genie       J.J.ANDERSON
'
' Absolutely no rights reserved. Feel free to improve, distribute, ignore.
'
'
' ------------------------------------------------------ create menu strip
'
Dim Bar$(90)   !  dimension string to hold menu text
For I=0 To 90   !  set up a loop
  Read Bar$(I)   !  read data from data field
  Exit If Bar$(I)="*****"   !until the marker is reached
Next I
Bar$(I)=""   !  tail blanks into string
Bar$(I+1)=""   !  ditto                    --actual menu text follows
Data  Desk , About this program
Data ----------
Data 1,2,3,4,5,6,""
Data  Intro , Introduction ,----------, quit ,""
Data  Windows , Default Windows , Alert Boxes , GEM Windows ,""
Data  Mouse , Cursor Definition , Mouse Position , Mouse Buttons ,""
Data  Graphics , Fonts , Graphmode , Sprites ,""
Data
Data ***
Menu Bar$()   !  activate menu
'
' ------------------------------------------------------ main program loop
'
Do
  On Menu
  Gosub Menu   !  All the loop does is say "look at the menu and branch"
Loop
'
' ------------------------------------------------------ reading menu
'
Procedure Menu   !  This procedure parses the menu selections
  If Bar$(Menu(0))=" About this program"   !  If this is the selection,
    Gosub About                            !  go to the corresponding procedure
  Endif
  If Bar$(Menu(0))=" Introduction "        !  ditto
    Gosub Intro
  Endif
  If Bar$(Menu(0))=" quit "
    System                                 !  the escape hatch
  Endif
  If Bar$(Menu(0))=" Default Windows "
    Gosub Default
  Endif
  If Bar$(Menu(0))=" Alert Boxes "
    Gosub Alert
  Endif
  If Bar$(Menu(0))=" GEM Windows "
    Gosub Gem
  Endif
  If Bar$(Menu(0))=" Cursor Definition "
    Gosub Cursor
  Endif
  If Bar$(Menu(0))=" Mouse Position "
    Gosub Position
  Endif
  If Bar$(Menu(0))=" Mouse Buttons "
    Gosub Buttons
  Endif
  If Bar$(Menu(0))=" Fonts "
    Gosub Fonts
  Endif
  If Bar$(Menu(0))=" Graphmode "
    Gosub Graphmode
  Endif
  If Bar$(Menu(0))=" Sprites "
    Gosub Sprite
  Endif                                    !  sure it's long, but it's easy, too
Return
'
' ------------------------------------------------------ menu components
'
Procedure About   !  information box for the program
  Menu Off        !  turn off menu inverse shading
  M$="MGA Basic Tutorial|Version 1.0|John J. Anderson|Atari Explorer"
  Alert 1,M$,1,"OKAY",B
Return
'
' ------------------------------------------------------ introduction
'
Procedure Intro   !  a "pseudo-window", made out of a filled rectangle
  Menu Off
  Cls             !  clear the screen
  Deffill 1,0,0   ! define the fill
  Pbox 20,20,550,170   !  draw the box
  Deftext 1,4,0,6      !  define the text font          --text follows
  Text 30,30,"  GFA Basic is a structured Basic that brings the full power of"
  Text 30,40,"the Atari ST to the Basic programmer. It is easy to learn, fast,"
  Text 30,50,"features a powerful 'real-time' editor, and is packed with a"
  Text 30,60,"very complete command set for programming applications."
  Text 30,70,"  ---------- ---------- ---------- ---------- ---------- ---------- "
  Text 30,80,"  It comes with a run-only module that allows you to create "
  Text 30,90,"pseudo-stand-alone applications to share with other Atarians."
  Text 30,100,"Michtron and GFA Systemtechnik promise to release a true com-"
  Text 30,110,"piler soon which will allow for true stand-alone applications"
  Text 30,120,"and even greater speed. The package lists for $79.95."
  Text 30,130,"  ---------- ---------- ---------- ---------- ---------- ---------- "
  Text 30,140,"  This demo program shows just some of the power of GFA Basic."
  Text 30,150,"While using the program, you need never touch the keyboard."
  Text 30,160,"Just point and click, and have fun. - JJA"
  Menu Bar$()   !  reactivate menu bar
Return
'
' ------------------------------------------------------ default windows
'
Procedure Default   !  shows the four default windows
  Graphmode 1   !  make sure you've got the right graphics mode
  Menu Off
  Cls
  Titlew 1,"Window 1"   !  title for the window
  Infow 1," First default window"   !  subtitle for the window
  Titlew 2,"Window 2"
  Infow 2," Second default window"
  Titlew 3,"Window 3"
  Infow 3," Third default window"
  Titlew 4,"Window 4"
  Infow 4," Fourth default window"
  Openw 1
  O=1   !  initialize variable that tracks active windows
  Hidem   !  do not display mouse
  Repeat   !  start a loop
    K=Mousek   !  read the mouse buttons
```

(continued)

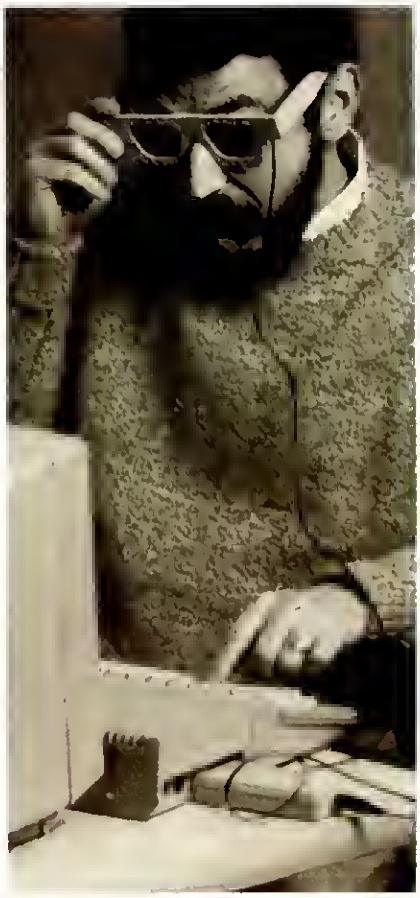
GFA Basic Demo (continued)

```
  Print At(2,2);"Left mouse button opens windows,"
  Print At(2,3);"right button closes them."
  Print At(2,4);"Press both buttons together"
  Print At(2,5);"to return to menu..."
  If K=1    !   see if left mouse button is being pressed
    Clearw Q    !   clear the contents of current window
    Inc Q    !   increment Q by 1, a neat GFA Basic command
    If Q>4    !   clip the counter within range
      Q=1
    Endif
    Openw Q    !   open new window q
  Endif
  If K=2    !   see if right mouse button is being pressed
    Inc Q
    If Q>4
      Q=1
    Endif
    Closew Q    !   close current window
  Endif
Until K=3
For I=1 To 4
  Closew I    !   close all windows
Next I
Closew 0    !   return to normal screen
Menu Bar$()    !   reactivate menu bar
Showm    !   reactivate mouse
Return
'
'------------------------------------------------ alert boxes
'
Procedure Alert    !   Somewhat whimsical look at branching windows
  Menu Off
  B=0    !   initialize counters
  C=0
  Alert 2,"Are you impressed|with GFA Basic|so far?",1,"yes|no",B
  If B=2
    Alert 2,"Come on. You must|have seen something|you liked.",1,"yes|no",C
  Endif
  If B=1 Or C=1
    Alert 1,"Glad to hear it.",0,"okay",B    !   person is enthusiastic
  Endif                                      !   or at least non-hostile
  If C=2
    Alert 3,"Trash disk",0,"yes",B    !   person deserves a scare
    System                            !   don't worry, we're not
  Endif                               !   really going to trash anything
Return
'
'------------------------------------------------ GEM windows
'
Procedure Gem    !   Shows you a sizable, movable window
  Menu Off    !   and the effort it requires
  Cls
  Attr=Windtab+2    !   set attributes for window
  Xpos=Windtab+4
  Ypos=Windtab+6
  Width=Windtab+8
  Height=Windtab+10
  Dpoke Attr,&HFFF    !   poke it in there
  Dpoke Xpos,20
  Dpoke Ypos,20
  Dpoke Width,350
  Dpoke Height,120
  Titlew 1,"GEM WINDOW"    !   name it
  Infow 1,""    !   no info box this time
  On Menu Message Gosub Message    !   read actions on window
  Openw 1    !   open it
  Clearw 1    !   clear it
  Repeat    !   fill it with randomly plotting lines
    Color Rnd*0.5
    Line Rnd*640,Rnd*400,Rnd*640,Rnd*400
    On Menu
  Until M=22    !   until user clicks on the close button
Return
Procedure Message    !   handles sizing, placement, and closure
  M=Menu(1)
  If M=22    !   closure
    Closew 1
    Closew 0
    Menu Bar$()
  Endif
  If M=23    !   full-size button has been pressed
    @Setxybh(0,10,630,180)
  Endif
  If M=27 Or M=28    !   user is custom-sizing window
    @Setxybh(Menu(5),Menu(6),Menu(7),Menu(8))
  Endif
Return
Procedure Setxybh(X,Y,B,H)    !   nasty little chunk of code
  Dpoke Gintin,Dpeek(Windtab)    !   to handle window size
  Dpoke Gintin+2,4    !   and placement
  Gemsys 104
  Xa=Dpeek(Gintout+2)
  Ya=Dpeek(Gintout+4)
  Ba=Dpeek(Gintout+6)
  Ha=Dpeek(Gintout+8)
  Get Xa,Ya,Min(Ba,B),Min(Ha,H),Temp$
  Closew 1
  Dpoke Xpos,X
  Dpoke Ypos,Y
  Dpoke Width,B
  Dpoke Height,H
  Openw 1
  Clearw 1
  Dpoke Gintin,Dpeek(Windtab)
  Dpoke Gintin+2,4
  Gemsys 104
  Put Dpeek(Gintout+2),Dpeek(Gintout+4),Temp$
  Clearw 1
  Closew 0
  Openw 1
Return    !   wish it were easier than this, folks...
'
'------------------------------------------------ changing cursor
'
Procedure Cursor    !   lets you click through ROM cursor shapes
  Menu Off
  Cls
  Deftext 1,0,0,6
  Text 10,160,"Defmouse { }"
  Text 10,170,"Left mouse button changes cursor,"
  Text 10,180,"right mouse button for menu..."
  Repeat    !   set up a loop
    Pause 10    !   put a brake in to damp selection, as DEFMOUSE works
    Mouse X,Y,K    !   so fast a single click often jumps selections
    If K=1    !   read mouse, see if left button is pressed
      Inc Q    !   if it is, increment counter by 1
      If Q>7    !   clip counter into range
        Q=0
      Endif
      Text 90,160,Q    !   print out the value
      Defmouse Q    !   define the mouse as that value
    Endif
  Until K=2    !   until the right mouse button is finally pressed
  Menu Bar$()
Return
'
'------------------------------------------------ reading mouse
'
Procedure Position    !   a real simple one, reading out mouse X and Y
  Menu Off    !   coordinates
  Cls
  Deftext 1,0,0,6
  Text 10,170,"Mouse {  ,  ,0}"
  Text 10,180,"Right mouse button for menu..."
  Repeat
    Mouse X,Y,K
    Text 67,170,X    !   print out the actual value
```

```
  Text 99,170,Y    !  ditto
 Until K=2         !  these are sometimes flaky and I don't know why
 Menu Bar$()
Return
'
'------------------------------------------ reading buttons
'
Procedure Buttons   !  another simple one to show mouse botton presses
 Menu Off
 Cls
 Hidem   !  hide the mouse
 Deftext 1,0,0,6
 Text 10,170,"You are pressing mouse button ( )"
 Text 10,180,"Press both buttons together to return to menu..."
 Repeat
  Mouse X,Y,K      !  read the mouse buttons
  Text 263,170,K   !  print out the actual value
 Until K=3         !  until both buttons are pressed
 Showm             !  reactivate the mouse
 Menu Bar$()       !  reactivate the menu bar
Return
'
'------------------------------------------ changing fonts
'
Procedure Fonts   !  lets the user click through available fonts
 Menu Off
 Cls
 Deftext 1,0,0,6
 Text 10,160,"Left mouse button clicks through styles,"
 Text 10,170,"right mouse button clicks through sizes."
 Text 10,180,"Press both buttons together for menu."
 S=0   !  initialize counters
 G=4
 Hidem   !  hide the mouse once again, or it flickers
 Repeat   !  set up a loop
  Pause 10   !  once again, a brake to damp the action
  Mouse X,Y,K
  Text 10,70,T$
  If K=1
   Inc S   !  increment counter on clicks of left mouse button
   Deffill 0,1,1   !  set up a filled rectangle to erase
   Pbox 8,30,350,80   !  previous entries
  Endif
  If S=0   !  this section works same way as menu parser
   T$="normal text"   !  hopefully self-explanatory
  Endif
  If S=1
   T$="boldface"
 Endif
 If S=2
  T$="light"
 Endif
 If S=3   !  clip the counter to next meaningful value
  S=4
  T$="italic"
 Endif
 If S=5
  T$="boldface italic"
 Endif
 If S=6   !  clip the counter
  S=8
  T$="uoderlined"
 Endif
 If S=9   !  clip the counter once again
  S=16
  T$="bordered"
 Endif
 If S=17
  T$="boldface bordered"
 Endif
 If S=18   !  clip
  S=20
  T$="bordered italic"   !  looks weird, bot what the heck
 Endif
 If S=21   !  clip back to the beginning
  S=0
  T$="normal text"
 Endif
 If K=2
  Inc G
  Deffill 0,1,1   !  set up blanking rectangle once again
  Pbox 8,30,350,80
 Endif
 If G=5   !  now we're doing the same thing again, but this
  G=6   !  time we're looking at the right mouse button
 Endif   !  and incrementing a different counter
 If G=7
  G=13   !  calls for a lot of clipping, doesn't it?
 Endif
 If G=14   !  we're changing font sizes here
  G=32
 Endif
 If G=33
  G=4
 Endif
 Deftext 1,S,0,G   !  this is the line that actually does it
Until K=3
Menu Bar$()
Return
'
'------------------------------------------ graphmode demo
'
Procedure Graphmode   !  draws and "undraws" a circle with the mouse
 Menu Off
 Cls
 Deftext 1,0,0,6
 Text 10,160,"Graphmode {mode}"
 Text 10,170,"1=replace 2=transparent 3=xor 4=reverse transparent"
 Text 10,180,"Left mouse button to draw, right mouse button for menu..."
 Repeat   !  set up a loop
  Mouse X,Y,K
  If K=1   !  if the left button is pressed, circle "draws"
   Graphmode 2
  Else
   Graphmode 3   !  otherwise it just sits there, undrawing itself
  Endif
  Circle X,Y,50   !  this line actually plots it
  Circle X,Y,50   !  unplots it unless button is pressed
 Until K=2
 Graphmode 1   !  reset graphics mode
 Menu Bar$()
Return
'
'------------------------------------------ sprite demo
'
Procedure Sprite   '  demonstrates a bouncing sprite
 Menu Off
 Cls
 Deftext 1,0,0,6
 Text 10,190,"Hold right mouse button down for menu..."
 A$=Mki$(1)+Mki$(1)+Mki$(0)   !  packs string with sprite data
 A$=A$+Mki$(0)+Mki$(1)
 For I=1 To 16
  A$=A$+Mki$(0)+Mki$(65535)   !  65535 is a solid line
 Next I                       !  read it in 16 times
 Hidem                        !  and it becomes a block
 Repeat
  Mouse X,Y,K
  For I=0 To 190   !  throw it down
   Sprite A$,190,I
  Next I
  For I=190 To 0 Step -1   !  bounce it up
   Sprite A$,190,I
  Next I
 Until K=2   !  until the right mouse button is pressed
 Menu Bar$()
 Showm
Return
'
'
'------------------------------------------ END
```

The latest hardware and software announcements for Atari 8-bit and ST computers

New Products



3-D Glasses

Antic Software announces Stereo Tek electronic liquid crystal shutter glasses that plug into the cartridge port of the the Atari ST.

Two optical shutters in eyeglass frames are connected electronically to an ST running special 3-D software. Every time the ST screen refreshes, one shutter closes and the other opens. The monitor displays alternating right and left eye views synchronized with the shutter. This creates alternating views faster than the eye can see, and the brain translates the normally flat monitor image into a three-dimensional one.

One megabyte of graphics can be viewed every second at a frame rate of up to 60 frames per second, which is two and a half times faster than the speed of a movie.

Antic Software's *CAD 3-D* program (reviewed in the November/December issue of *Atari Explorer*) has been coupled with animation/editing software and repackaged as *Cyber Studio*. The new package allows the user to animate 3-D images and use them with the 3-D glasses.

The glasses and *Cyber Studio* software sell for $199.95.

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

SYSTEMS SOFTWARE

MichTron has announced *R.A.I.D.*, a debugging system for the ST which includes a mini-assembler/disassembler, full screen editing, and symbolic definitions display. Other features are Tracer options; Copy, Fill, and Move Block commands; resettable Breakpoints, and two screen displays to keep program and debugging activity separate. $39.95.

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

Beckmeyer Development Tools has released *Hard Disk Accelerator* for the ST, a program designed to improve hard disk performance by combining RAM access with hard disk access. The program is automatic, can be used with a small amount of memory, works with copy-protected software, and can be used with large programs. $39.95.

Also available from Beckmeyer is *AnsiTerm*, an ANSI terminal emulator that allows the Atari ST to perform the functions of that terminal using the ANSI X3.64 protocol and adds the additional capabilities of automatic file transfer and printing. $24.95.

Beckmeyer Development Tools, 478 Santa Clara Ave., Oakland, CA 94610. (415) 452-1129.

Logical Design Works announces Revision 1.1 of the LDW Basic Compiler. Features that have been added to this revision include faster arithmetic functions, faster screen output, enhanced GEM environment, hooks to BIOS, multi-line statements, and improved run-time error handling.

Revision 1.1 also compiles up to 70% faster than 1.0 and includes batch compilation capability and binary code output. $69.95; $25.00 for registered owners of 1.0.

Logical Design Works, Inc., 780 Montague Expy., Ste. 205, San Jose, CA 95131. (408) 435-1445.

PRODUCTIVITY SOFTWARE

MichTron has announced *TrimBase*, a data management system that allows the user to generate custom reports, as both tables and free text. It features pull-down menus and mouse control, and will run with color and monochrome monitors.

TrimBase also provides relational functions for cross-file interactions, including condense, break up, merge, subtract, and join files. $99.95

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

Double Eagle Software announces that *The Tax Advantage* for the tax year 1986 is now available for all Atari computers.

The program supports IRS Forms 1040, 2106, 2441, 4562, and 6251, and Schedules A, B, C, D, E, G, SE, and W, which include income averaging, depreciation, and the alternative minimum tax. Form 1040 can be printed directly on the IRS form or in draft format. All other forms and schedules are printed in formats that can be submitted directly to the IRS. The ST version takes advantage of the pull-down menus and other features of the GEM interface.

Double Eagle Software, 2210 Wilshire Blvd., Ste. 875, Santa Monica, CA 90403. (213) 459-9748.

Kuma Computers announces *K-Spread 2*, an enhanced spreadsheet package for the Atari ST that offers a capacity of 256 columns by 8126 rows and displays up to five windows simultaneously.

Other features include macros, an alpha-numeric sort function, color coding, full use of GEM, selective formula amendment, sideways printing on 100% Epson-compatible printers, debugging facilities, keyboard alternatives to pull-



Basic Buffer

The Black Box Basic Buffer receives data through either a parallel or a serial interface at a user-selectable baud rate, then transmits the data directly to either an RS-232 serial or Centronics parallel printer.

The device will accommodate four transmission modes and has serial or parallel input and output ports. It has a 256K storage capacity that enables the user to print up to 256 copies of its contents.

Black Box Corporation, P.O. Box 12800, Pittsburgh, PA 15241. (412) 746-5500.

down menus, and more than 60 functions (trig, math, conditionals, etc.). £79.95.

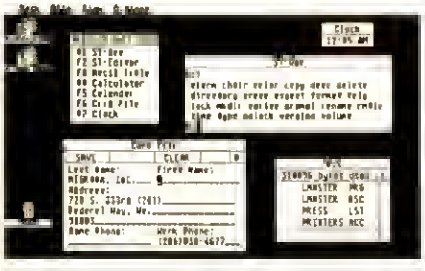
Kuma Computers Ltd., 12 Horseshoe Park, Pangbourne, Berks RG8 7JW, England.

Quickview Systems has announced *Business Starter Kit*, which contains 35 *Zoomracks* templates and output forms. Included are templates for invoicing, payables, prospecting, area codes, daily calendar, names and addresses, checkbook, and phone logs. $19.95.

Also available is the *Home Starter Kit*, which contains templates for the home user, including names and addresses, checkbook balancing, phone log, gift lists, recipes, and cookbook indexes. $19.95.

Quickview Systems, 146 Main St., Ste 404, Los Altos, CA 94022. (415) 965-0327.

Migraph announces *Fast*, a desk accessory that operates in all three resolu-



tions. The program includes ST DOS, which allows the user to execute the most common DOS commands without returning to the desktop; ST Editor; Card File, a database set up as a user-configurable address book; a calculator; a calendar; an ASCII table; and a clock. $49.95.

Migraph, 720 South 333rd St., Ste. 201, Federal Way, WA 98003. (203) 838-4677.



Chest-Top Publishing

Underware Ribbons from Diversions, Inc., allow you to transfer any design that can be made on a printer to a t-shirt or other piece of fabric.

Ribbons for single-color printers are available in black, red, blue, green, yellow, brown, and purple. Multi-color ribbons can be purchased for use with color printers, and colored pens can be purchased with the ribbons or separately. Ribbons and pen sets retail for between $14.95 and $34.95.

Diversions, Inc., 505 W. Olive Ave. #520, Sunnyvale, CA 94086. (408) 245-7575.

ST Travel Case

The Workstation IV from Port-A-Byte is a travel case for Atari ST computers that accommodates a monitor, two disk drives, a cpu, all transformers, a mouse, and a disk storage box. While in the case, all components are shielded, fan-cooled, and cushioned by a shock absorbing system.

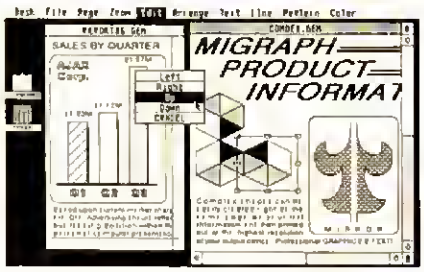
Features of the Workstation IV include a retractable cord, covered power inlet, master switch, surge protector, and power indicator light. The complete system sells for $268.

Port-A-Byte, 1901 Wilson Ave., SW, Grand Rapids, MI 49504. (616) 791-9816.

GRAPHICS SOFTWARE

Migraph announces version 2.0 of *Easy-Draw*, a professional drawing program for the Atari ST.

New features include the ability to Flip or Mirror any object; a single GEM file format; Edit polyline; metric and inch measurements, a new Change Arc command, which displays beginning and end angles and percentages; automatic copy of objects from one window to another; and a new Arrange command, which allows the user to space



and center objects evenly. $79.95; $15.00 for registered owners of earlier versions.

Migraph, 720 South 333rd St., Ste. 201, Federal Way, WA 98003. (203) 838-4677.

Video Title Shop from **IntelliCreations** is a program designed for use in conjunction with a VCR or video camera. It allows the user of an Atari 8-bit home computer to attach computer to



VCR and record title screens directly to video tape.

Video Title Shop offers a variety of type styles and sizes, decorative borders, and fade in/fade out features. Datasoft's *Micro Painter Plus* program is included with the package, so users can create and import graphics. $29.95.

Datasoft/IntelliCreations, 19808 Nordhoff Pl., Chatsworth, CA 91311. (818) 886-5922.

Braiders of the compressed .ARC; CP/M for the ST; news from Delphi; and an in-depth look at Genie



Teletalk

By JOHN J. ANDERSON

Greetings, telecommunicators. I trust your modems are in good, working order and your ready lights are on. Because if you have an open phone line, the sky's the limit.

First things first. There's something new in the air, and it's called the arc compression format. It started out on CP/M and soon moved to those blue boredom machines, but because it was actually a good idea, it has been imported to the realm of the Atari ST. ARC stands for "archival," and it refers to an encryption format. The result: more data can reside in less space and be transmitted in less time. Another benefit of ARC is that it is capable of bundling multiple programs. As you go snooping around online services and local bulletin boards, you will soon see more and more files in .ARC format.

Yes, archived files involve a translation step, something ST owners have been blissfully spared up until this point. But the benefits far outweigh the disadvantages, and preparation of .ARC files is relatively simple and painless. The real benefit of this step is that it makes available a whole new class of programs that could not be practically uploaded or downloaded until the advent of ST .ARC files.

There is, for example, the program known colloquially as Shiny Bubbles—simply the most impressive graphics demo ever constructed for the Atari ST series. By the wizards of Xanth, Shiny Bubbles depicts a group of crystal balls sailing over a field of scrolling Atari logos in three-quarter view. The balls twirl and move closer, their undersides reflecting the changes scrolling below all the while. Worthy of a dedicated graphics terminal costing $20,000 or more. Rock solid and silky smooth. And available for download from either CompuServe (SB.ARC, in data library 0), or Delphi (SHINY BUBBLES, in the ST Programs Database). Be prepared to pay some connect time—downloading the file from CompuServe took me over half an hour at 1200 baud. You must also have at least 1 meg of RAM to run this baby.

CP/M for the ST

Then there is CP/M for the ST, made available directly through Atari Corp. In a move of unparalleled generosity, the folks at Atari have put a complete CP/M emulator system online, making it available for only the cost of the connect time. There is a question in my mind of the ultimate utility of CP/M on the Atari ST, but it is undeniable that hundreds of public domain programs are available in CP/M, many on the online services themselves, and here is a quick and effective way of making these programs available to ST owners.

Without ARC, downloading CP/M for the ST would be a daunting task. It still takes time, but it may be worth it to you. On CompuServe, look for CPMAIN.ARC, CPMDOC.ARC, CPMISC.ARC, CPMARC.DIR, and CPMCOM.ARC, all located in data library 3. ST CP/M is also available from Delphi, once again in the ST database.

Remember, you will need to decompress these programs before you run them by downloading the ARC translator itself, which of course is available in uncompressed format. ARC.TTP resides in CompuServe's AtariSIG data library 3, along with ARC.DOC, which is a documentation file. On Delphi, head once again to the AtariSIG ST Programs database.

The documentation file must be decompressed in order to show on the screen or print out. To do this, first make sure you have saved both files to a disk with about 200K free. Double click on the ARC.TTP program. It will respond with an "open application" box. Type X ARC [RETURN] and the compressed files will unfold themselves on your disk.

Right now ARC.TTP is command-line based and as such is somewhat unfriendly. Efforts are underway now (and a couple of beta efforts are now online) to make a GEM shell for ARC that will be intuitive. We'll keep you posted.

Delphi

A few more words on Delphi are in order at this point. While I have for a long time considered Delphi to be among the weaker players in the online game, it has come a long way since the last time I stopped by for a look around. Among other things, the AtariSIG there has grown big and healthy, and is very well-run.

A number of noted luminaries are regulars on the message board of the Delphi AtariSIG, including Russ Wetmore, Tom Hudson, and selected Atari brass, and there is a huge cache of quality 8- and 16-bit programs and text files available from the databases. They include the following categories: Games and Entertainment, Telecommunications, Sound and Graphics, Music, Edu-

cation, Electronics and Science, Reviews and News, ST Programs, Koala Pictures, and Degas Pictures. Because the SIG is administered by *Analog* magazine, most of the programs published in that magazine are available for download as well.

Owners of 8-bit machines will find the Delphi Atari SIG supports them as actively as ever; it features dozens of programs online that squeeze every ounce of power from those machines. In the 16-bit database ST owners will find their own treasures, including the following: improved disk formatter programs, allowing drives to run much faster; a software speech synthesizer; the latest version of the STWriter word processor; a program that changes the disk icons on the desktop to more appropriate (and cooler) looking icons; and numerous games, graphics demos, and tutorials.

I can think of no better endorsement than to note that I have now become a regular on Delphi. Give it a try. You may even find, as many of us have, that a slower traffic rate makes for a cozier place to meet. The message board doesn't reset every other day on Delphi, and that's kind of nice.

Genie: New Kid on the Telecom Block

Things used to be easy: your employer paid for an online account, and you used the Source, or you had to pay connect charges yourself, so you used CompuServe. But I date myself. Those days are long gone. The Source has gotten cheaper, and CompuServe has gotten more expensive. Both have had to tailor themselves to better suit power users and hobbyists. Meanwhile, Delphi has come on fast. And other newcomers vie for a piece of the telecommunications pie.

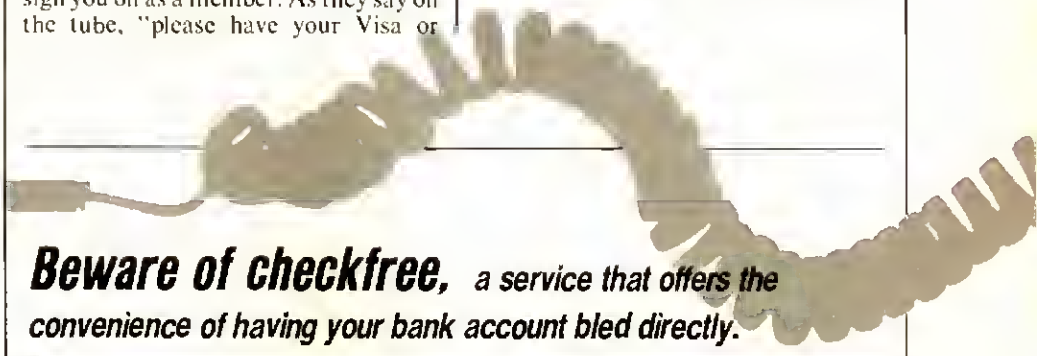
Genie, which stands for General Electric Network for Information Exchange, is one of the more promising new arrivals on the network service scene. GE sees a future in the arena, and has gone to quite some lengths to make itself a desirable place to be. First and most important, it is inexpensive—$5.00 an hour at 1200 baud during non-prime time. That is a real bargain in a world where information services have been slowly upping the ante, and in some cases, sucking it directly from your checking account when you're not looking.

Also, Genie sports next-generation software. Obviously GE has taken a close look at the other popular services with a mind to lifting the good ideas while avoiding the pitfalls of the competition. Hey folks, all's fair in love and telecommunications.

And that's what America is all about, isn't it?

Anyhow. You have to have a little patience to join the Genie network, as well as some front money, but it is worth it, and there is no basic monthly charge after that. You can get the ball rolling online with a data call to (800) 638-8369. When you connect, type HHH and press RETURN. At the U# = prompt, type XJM11957,GENIE RETURN.

At that point, GE claims you can take a look around Genie, but don't get your hopes up—you can't see much. The real reason they have set up this number is to sign you on as a member. As they say on the tube, "please have your Visa or Mastercard ready." They will want to get some information from you, including your mother's maiden name, as they are readying to charge you $18 for the privilege of joining Genie.



Beware of checkfree, *a service that offers the convenience of having your bank account bled directly.*

And that's what America means to me. But it's worth it, really. And heck, it prequalifies you, as well as keeping out the riffraff, right?

The folks at Genie claim they will contact you the next business day. Once again, I advise you not to hold your breath. Then again, perhaps I was a special case. Once I did receive a call, however, it was from an extremely cheerful young woman who sweetly chatted about the weather, then rather abruptly shifted the conversation to my mother's maiden name. I was able to supply it, and so won an $18 deduction from my Visa card, a user number, a password, a mailbox name, and local access phone numbers. And so I became a member of Genie. So can you.

The first thing to remember is not to call after 8:00 a.m. or before 6:00 p.m. on a weekday, unless you are willing to pay $35 an hour for connect time. The next thing to remember is to configure your terminal to half duplex. For reasons currently beyond my comprehension, Genie works best if you are willing to echo to yourself. If you are not willing or able to do so, you can request host echo mode by inserting a CONTROL-R in front of your user ID when you log on. But I am advised that this request gums up Genie's response, so if you are able, do set to local echo.

For the record, Genie's preferences are as follows: an 8-bit word, one stop bit, and no parity. The system is rather forgiving, however, and you can log on successfully from other configurations. If these sorts of specs get you down and you are having problems, you may need to speak to an actual human being at Genie. You can give it a try at (800) 638-9636, extension 21.

So. Dial your local access number. At the U# = prompt, you should enter your user ID number followed by a comma, followed by your password, followed by a RETURN. And so, with some ado, you are finally fully connected with Genie. And what do you see? A menu much like the header on other services—offering news, shopping, travel services, games, electronic mail, a CB simulator, user groups and clubs known as "roundtables," and real-time national conferences.

What's Available

A What's New header leads to a menu where you can get information about new commands, added products and services, and system changes. There is also a schedule of events. It is probably a good idea to check in here periodically.

The GE Mail and Genie Editor's Desk header leads you to the areas where you can send and receive mail

(both electronic and paper). You can also send feedback to the Genie "editor" to comment on the service, ask questions, request changes, and so on.

The News and References menu offers electronic news and information about computers, software, and other topics, including book and movie reviews. This is also where you will find Grolier's electronic encyclopedia.

The Genie LiveWire CB simulator is where you can chat in real time with friends you meet through Genie.

National Real Time Conferences are similar to the LiveWire CB simulator, except they are structured more for a meeting environment. A meeting leader is chosen to lead discussions. Guest speakers may be scheduled and question and answer periods arranged.

New clubs and user groups are forming weekly in the Roundtables section. The groups offer games, software, technical advice, discussions, and interaction with groups of people who share your specific interests. Check out this area, and find a club with interests that you share.

The Shop and Swap shopping service is the place to buy and sell items electronically. The area offers classified ads, Genie product ordering, and other shopping opportunities. More electronic shopping areas will be coming soon, we are promised.

The Genie Game Room offers a mix of old classics like Original Adventure and new games like the multiplayer Stellar Warrior to test your mind and skills. And you can discuss the latest strategies or get advice in the Games Roundtable.

The Travel Services section lets you get travel information and make your plans and reservations while sitting in front of your computer. Information about flights, hotels, car rentals, and weather is all at your fingertips.

The final header, User Settings and Information, allows you to view and change information relating to your terminal and billing. You can change your password, locate updated access phone numbers, and read an online user's manual.

***The Genie** Game Room offers a mix of old classics and new games.*

Evaluation

And how does Genie score on the most important resource of any telecommunications service—its user base? Well, it offers nowhere near the number of subscribers of a giant like CompuServe, but it is growing quickly, due to its ease of use and reasonable pricing. It seems that Atari users in particular have been discovering Genie lately, judging by the activity on the Atari Roundtable.

Atari Corp. has just announced that it will co-manage an onging developer's conference on Genie, which is good news indeed. A few weeks ago, in fact, a certain Mr. S. Tramiel was named as a conference speaker, and more than 80 users crowded into a single "room," as Genie calls it, to hear what he had to say.

As Atari well knows, its users have grown comfortable with the notion of "power without the price." Perhaps the popularity of Genie as a gathering place of Atarians is due to their extension of this credo to the online domain.

A few days after your official entry to Genie, a looseleaf user's manual will arrive in your mailbox. It is not the slickest thing you have ever seen, but it does a credible job of documenting the Genie system. Fortunately, the system is so friendly and easy to get around that the documentation presents a surmountable challenge. CompuServe may be bigger and offer more Atari material, but after a look at their documentation you may feel like having a short lie-down.

One personal caveat—beware of checkfree. This is the service that offers you the convenience of having your bank account bled directly. Genie offers it too. My friend, if you have a charge card, my advice is to use it. Then, at least, you can have the pleasure of feeling like you are paying for Genie, rather than having your salary garnished. Also, if a billing error occurs, you will have a chance to withhold payment rather than demanding a refund, which always leaves you at a distinct disadvantage. ■

Puzzles & Problems Answers

Questions on page 21

Hitchin' a Ride

Obviously, hitching a ride took more time than walking, because at the halfway point when John got a ride, he had already spent as much time walking backwards as it would have taken him to go all the way walking frontwards. Since we know that John walks at 4 mph, the additional time is the driving distance (4 miles) divided by the driving speed (60 mph), or two minutes.

Muriel's Grandfather

Age	Worth
50	$ 52,485
60	115,890
70	255,890
80	565,016
90	1,064,800

Add and Square

2025, 3025, and 9801.

Margie's Mother

Martha must put $3543 in the bank in January 1987.

Spruce Tree

15 feet.

Rainy Vacation

18 days.

Appalachian Trail

Without more information, you cannot calculate an exact answer. If the ups and downs are in the form of sharp cliffs, they will add 400 feet per mile. If, however, the Trail climbs gradually for half a mile and falls back gradually over the second half, the trail distance can be calculated by the formula for the hypotenuse of a right triangle with one-half mile as one leg and 200 feet as the other. Double the answer, subtract 5280, and you will find that the the additional distance is 15.13 feet. (In case you are wondering, the ups and downs on the actual Trail add about 100 extra feet per mile.)

Amicable Numbers Question on page 36

The next pair is 1184 and 1210.

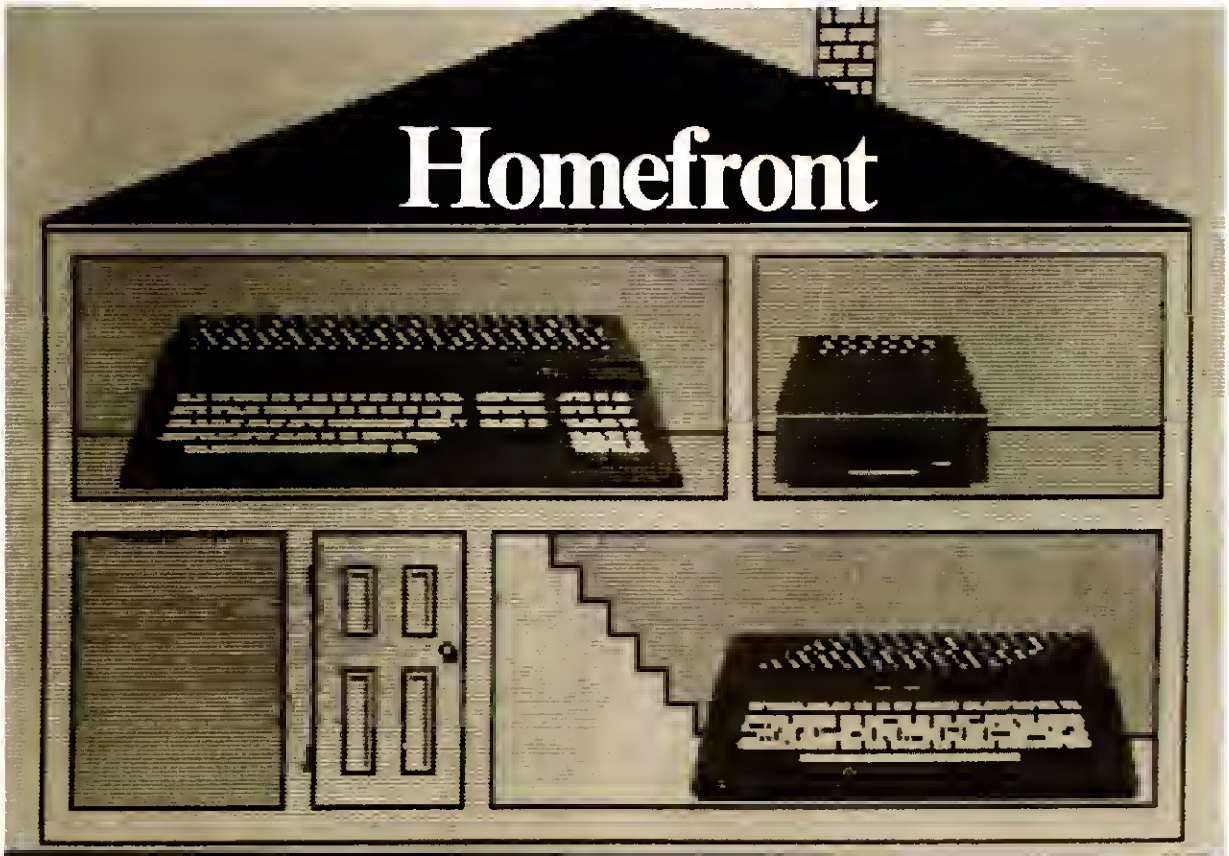
Out for a Jog Question on page 63

On each of the four sides of the rectangle, Brad will cover 20 feet more than Al; 80 feet per day times 200 days equals 16,000 feet or just over three miles.

The circumference of a circle is equal to π times the diameter. Since the diameter of Brad's circle is 40 feet wider than the diameter of Al's, Brad will cover 40 feet more per day, or 8000 feet per year—exactly half the extra distance he covers on the rectangular course.

Setting up a home business with your Atari

Homefront



By ROXANE FARMANFARMAIAN

Illustration by Nicholas Jainschigg and Peter Kelley

Define the American Dream. Making a buck in the privacy of your own home, using your Atari computer.

Define how. The possibilities boggle the mind. Everything from doing mailing lists to tracking investments; from word processing resumes to calculating mortgage payments—all for other people, of course; and, of course, all for a fee.

Define how to change from hacker (or cyberphobe) of leisure to homefront entrepreneur. Simple. First, figure out what money-making jobs are out there. Then match those that sound most appealing with those that fit your lifestyle and skills. Finally, take the leap and open for business. Easier said than done? Yes, but not difficult.

Surveying the Field

Whether you're hoping to do some moonlighting, looking to become a full-time work-at-homer, or just casting about for something to do in your spare time, your first task is to find the service that you and your Atari are most suited to provide.

Computer-based services fall into two categories: activities based around or requiring a computer (such as contract programming) and activities that are facilitated or streamlined by computer use (such as writing, telemarketing, and bookkeeping). Each of these categories can be further divided into activities that require a high degree of computer knowledge and ones that a neophyte computer user can offer.

In some cases, the local community will create a ready market for a service you can provide. If you live near a university, for example, consider offering word processing or online research services. A bookkeeping service might be just the thing if your community is thick with little shops and hotels; mailing list management if your neighborhood is full of country clubs, philanthropic organizations, or schools.

If, at first glance, it seems as if all available market niches have been filled, consider how the computer itself might enable you to compete on the basis of speed, cost, efficiency, or even simple novelty, with existing services operating in a conventional manner. A word processing service offering special typefaces, for example, or computer-generated graphics mixed with text, might easily find business, even in a community rife with conventional typing outfits.

Sometimes, the computer makes it possible to extend a service that has never existed before. For example, you might be able to sell local real estate agents on letting you and your Atari generate customized mortgage projections for their clients. Such services can be marketed directly or subcontracted to others.

If these pointers don't help you determine where your market and skills overlap, the following two books are chockablock full of ideas for home-work—ideas ranging from the plausible ("Why didn't I think of that?") to the fantastic ("How did anyone think of that?") The books are: *Computing for Profits, 101 of the Best Money-Making Applications for a Personal Computer*, by Allan H. Schmidt and Ira Alterman, and *The Work-at-Home Sourcebook, How to Find "At-Home" Work That's Right for you*, by Lynie Arden.

Computing for Profits breaks down the possibilities according to skill level, in doing so, drawing a distinction be-

tween computing skills and other kinds of abilities. In the "low technical/low business" category, Schmidt and Alterman list such things as medical record keeping and billing services.

Under "low technical/high business" skills are listed such specialties as investment planning and tax preparation. Reviewing specialty software is suggested for those whose technical acumen is slightly higher ("medium technical") but whose business skills are not as sharp ("medium business"). Many other skill categories and combinations are covered, and the book includes case studies and lists of necessary equipment and supplies for many of the business ideas it offers.

The *Work-at-Home Sourcebook*, on the other hand, is more than just an idea book. It is a compendium of companies that regularly hire people for work at home, and a number of the jobs they offer require or recommend computer use. If you are looking for work as a contract programmer, for example, you might page through the book and find the following entry:

Tom Snyder Productions, Inc., 123 Auburn Street, Cambridge, MA 02138. (617) 876-4433.

Contact: Richard Abrams.

Positions: Contract programmers and software engineers. Company produces educational games for Apple, Atari, Commodore, and IBM. Most of the available work is conversion from machine to machine.

Provisions: Pays by the job or hourly rate of $10 to $40 an hour.

Other computer-related entries in the book involve technical writing, translation of material written in foreign languages, and market research, to name a few.

Serious perusal of these two volumes should give you at least an inkling of what is possible, what other people have found to work, and what services really do sell. Have you decided what you want to do? On to the next step.

Planning Your At-Home Business

Working from home changes your lifestyle. Redesigning your front door by hanging the proverbial shingle alongside it is the least of the changes. Unless you set up a separate, self-contained office, your private and professional lives will start to overlap. Depending on the work you plan to do, part of your domestic living and storage space will be taken up by work; your phone will henceforth need to be answered in a professional voice (even if the call turns out to be for one of your kids); your business will start grabbing the lion's share of your mailbox; and tax filing will get even hairier than it already is. That's for starters.

What about the risk of missing out on social life because of deadlines, or having clients traipse through your living room at odd evening hours because that's when you're "open for business," or even getting into scheduling conflicts because you need the computer for your work and the kids need it for school?

Setting up a separate office space in your home, fully outfitted with its own equipment, such as a second computer, phone, and answering machine, can solve a lot of these problems before they occur. It can also be costly, though if you use a distinct part of your home exclusively for business, the IRS will let you deduct much of the added expense.

If you remain unperturbed by the anticipation of these upheavals or, at least, remain stoically committed regardless of the potential consequences, it means you are well-suited to doing business from home. Now to answer some of the really tough questions.

Whether you plan to freelance on a per-project basis, work on contract, or start your own company, you will need to ask yourself some or all of the following questions:

Equipment

What equipment will I need to get started, and how much will it cost? If you need to turn out letter quality material, for example, for word processing, forms design, or mass mailings, you will need a printer that delivers same. If your business will involve databases, spreadsheets, or other memory-intensive applications, you may need to invest in upgrades to your existing software. The database you use to keep your Christmas card list in order will be overwhelmed by the demands of a mail order business; the spreadsheet you use to balance your checkbook will probably not be powerful enough to handle bookkeeping for even a small department store.

When planning, strive to anticipate the demands you will be making on your equipment and software for the foreseeable future. In equipping a business at this scale, it is usually worthwhile to pay for extra capacity at the beginning and use the relatively slow startup period to become familiar with your tools. The alternative will involve planning and implementing significant upgrades later on, while under pressure from your growing business.

Supplies

What supplies will I need to stock up on? First of all, you will need some kind of letterhead stationery and a business card, so that prospective clients will know you are a professional. Then, depending on the nature of the work you have chosen, you will probably need a healthy supply of pin-feed paper, perhaps even the more expensive "disaperf" for high quality documents. Pin-feed labels and Rolodex cards may also be on the list if you are doing any kind of office management or mailing list maintenance.

If public relations is your bag, colored printer ribbons may be what you need to spend your money on, or you may just need to buy some extra regular ribbons if you're doing much writing or editing. Get enough disks to last you at least three months, and make sure to stock up on colored disk labels and other organizational aids. All of the above, and many other computer and business-related products can be purchased in bulk at prices far lower than those charged for small quantities of the same. The money you spend at the outset will, provided you have planned correctly, save you money in the long run.

By far the least expensive source for consumable supplies such as printer paper and diskettes are mail order houses such as Lyben Computer Systems

Consider how the computer itself might enable you to compete on the basis of speed, cost, efficiency, or even simple novelty, with existing services operating in a conventional manner.

(1050 E. Maple Rd., Troy, MI 48083 (313) 589-3440) and Quill Corporation (100 S. Sehelter Rd., P.O. Box 4700, Lincolnshire, IL 60197 (312) 634-4800), both companies which specialize in bulk orders and whose "own brand" or "generic" product lines are often considerably cheaper than famous name brands of approximately equal quality.

However, although buying things like paper and ribbons by mail order makes good sense, it makes equally good sense to concentrate your purchases of business software and capital equipment—new computers and peripherals—closer to home. Buying these big ticket items from a local dealer may cost a little more, but the investment is repaid manyfold in terms of the added help, service, and support such dealers provide.

Not much can go wrong with a box of printer paper, but computers—even Atari computers—tend to be a bit more fragile. If your business depends on your equipment, it's good to know there is someone close by standing behind it.

Records

What kind of financial record keeping do I need to establish? If you're setting up your own company, the IRS requires you to keep your personal and business affairs separate. If, on the other hand, you are just adding to the household income through freelance work, the rules are less stringent, though the need for good records is just as great.

Things can get particularly confusing when, for example, your Atari is used part time for business and part time for entertainment—strict logs and supporting materials must be kept so that your hoped-for tax deductions don't go down the drain. Be sure to get a log book for tax purposes and an accordion file (or other filing tool) for keeping your accounts, financial records, receipts, and other documentation in order.

Before you start to do much business, set up a system– preferably with the help of a professional accountant—to keep track of expenses and income. Make it a habit from the outset to note in writing what you contract to deliver and what you are owed upon delivery. Many home businesses fail, not so much because they are not turning out a saleable product, but because their owners consider them too small to warrant a businesslike approach to accounting and recordkeeping practices.

Legalities

What legal issues that affect my work at home should I be aware of? Conducting business in your home may require taking out extra insurance or filing for a permit if your neighborhood isn't zoned for business. A talk with your lawyer or county (or municipal) permits office should clarify the situation. In most cases, work that doesn't involve client parking and bustle doesn't pose a problem; you can do on-line database searches for a fee from now till eternity without anyone caring, because it creates no disruption of the residential environment in your community.

Scheduling

What type of schedule can I maintain? You will need to figure out, probably through trial and error, where your thresholds are. On the one hand, you will need to dedicate sufficient time to your at-home work so that you can do a professional job, deliver on schedule, and keep the work coming in. The time should be relatively pressure-free—in other words, not stolen from a timetable already dedicated to other activities, because that will fracture your thinking processes and eventually affect the quality of your work. By the same token, your at-home work schedule should accommodate the family and job requirements of your daily life; otherwise your schedule will become an unhappy compromise on all fronts.

Goals

What goals do I have for this business endeavor? One of the virtues of working at home is the flexibility it offers—not only in terms of scheduling, but in terms of options. You can conduct one or three or six different types of business from the same desk; doing telephone recruitment (and keeping your records in a database) for one company in the morning, while doing word processing for another company in the afternoon, for example. You can work a heavy schedule or a light one. You can work in total isolation or conduct a business that involves a lot of on-line interaction, telephone work, or client contact. Whatever your goals, set them before you start, and track your progress periodically as your business develops.

Working from home can be rewarding, and fun, but it's serious business. Start off right, and you have every chance of building a great partnership with your Atari and turning it into a real success. ■



INDEX TO ADVERTISERS

Abacus	Cover 4
Astra	53
Atari Bonanza	32-33,43
Atari Corp.	1, 22-23
Atari Explorer	Cover 3
Computer Crossware Labs	7
Computer Games Plus	Cover 2
Navarone Industries	17
Proco Products	17
Superior Micro Systems	77



Part 2: A nuts and bolts guide to MIDI

Sound Chip

By PAUL SWANSON and JOHN JAINSCHIGG

In this installment of our series on the Musical Instrument Digital Interface, we will dig deeper into what makes MIDI work. Specifically, we'll be examining the bytes and bits that make up the MIDI protocol, learning about the different kinds of MIDI messages, and connecting each to a musical instrument function.

Basics of the MIDI Data Stream

The MIDI data stream is composed of command bytes, which have values greater than 127, and data bytes, which have values of 128 or less.

In general, a MIDI message consists of one command byte followed by one or two data bytes. Exceptions to this rule include certain single-byte messages that do not require data (like MIDI clock) and special "exclusive" messages that pertain only to particular brands of equipment.

The command byte is divided into three *fields* and thus contains three pieces of information. The first field is the high order bit, which being set to 1, identifies the byte as a command byte. The second field, comprising bits 6, 5, and 4, identifies the type of command being sent. Taken together, these three bits can assume only eight different values, so there are only eight basic MIDI commands.

The lowest four bits (3, 2, 1, and 0) identify the MIDI channel to which the command pertains. Together, these bits can represent values from 0 to 15 ($0 to $F), identifying MIDI channels from 1 through 16. Figure 1 shows how a MIDI command byte is composed and gives names to the different types of commands available.

The short ST Basic program in Listing 1 is designed to break out and identify MIDI command bytes from an incoming MIDI data stream. Enter and run it, making sure your synthesizer is connected to the MIDI ports properly and is turned on. MIDI IN on the ST must be connected to MIDI OUT on the keyboard, and MIDI OUT on the ST should be connected to MIDI IN on the synthesizer.

Lines 10-30 set up a string array containing the various command byte identifiers (stored in DATA statements starting at line 1000) and clear and expand the Basic output window. The statement in line 40 uses the INP(-3) expression to test if MIDI data is waiting at port number 3. If so, the statement N=INP(3) AND 255 retrieves the two-byte data value and discards the upper (garbage) byte.

The data byte is then tested by ANDing it with 128 (line 50); if this test succeeds, the high bit of the data is set, meaning this is a command byte. If it is a command byte, bits 6, 5, and 4, forming the *command type* field, are then broken out by ANDing the data value with 112 (binary 01110000) and dividing the result by 16 to shift it right by four bits, leaving a number from 0 to 7 (binary 000 to 111) that can be used as an offset into the string array, M$, to retrieve the command type.

The four lowest bits, forming the channel field, are isolated by ANDing the data byte with 15 (binary 1111), and the result is simply printed.

While the program is running, actions taken at the synthesizer (like pressing a key or moving the pitch wheel) will cause appropriate identifiers to appear on the computer screen, provided the amount and rate of data output by the synthesizer doesn't exceed the ability of Basic to receive it. Moving the pitch bend wheel, in particular, will cause the synthesizer to send a lot of data very fast, so move it slowly, or you may lose some bytes.

You may notice that when actions of the same type are performed repeatedly (two or more program change buttons pressed one after the other, for example), only the first will register. This is due to an economy measure called *running status*, employed by most MIDI systems to minimize the number of bytes that need be sent in certain situations.

Simply put, if a MIDI transmitter wants to send a series of commands of the same type, the command byte is usually sent only once; just data bytes are sent thereafter. Incoming MIDI data must thus be interpreted according the command byte most recently received (the running status), if it is to be applied correctly. Our little Basic program fails to keep a record of the running status, so cannot distinguish implicit commands sent in this manner.

A Closer Look

Now, let's look a little deeper into the composition of the MIDI data stream. As noted above, almost all MIDI messages consist of a command byte (except where running status is involved) and several data bytes. For example, when you press a key on your synthesizer, three bytes are sent. The first is the command byte, with its high bit set, the next three bits set to 000 (indicating NOTE ON), and the low four bits set to indicate what MIDI channel the command pertains to (usually 0000 for MIDI channel 1, unless you have set your synthesizer to transmit on a different channel).

The second byte (with its high bit off), contains the *key number*, a value from 0 to 127, indicating which key you have pressed. The third byte contains a value between 0 and 127, representing how fast you have pressed the key—its *velocity*. On inexpensive synthesizers like the Casio CZ-101, which do not have velocity-sensitive keyboards, a median value of 64 is generally sent in this position.

The short ST Basic program shown in Listing 2 recognizes NOTE ON and NOTE OFF commands and interprets the data bytes associated with them. All other commands and unrelated data are ignored.

A unit of data is input from the MIDI port at line 3, its high byte stripped off by ANDing with 255. Line 40 tests the high bit to determine if a command byte has been received. If so, it sets variable

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Bit 7 (Command)	Bits 6,5,4 (Type field)	Bits 3,2,1,0 (Channel field)
1 (always)	000 = Note Off	0000 to 1111 (0 to 15)
	001 = Note On	
	010 = Polyphonic Key Pressure	
	011 = Control Change	
	100 = Program Change	
	101 = Channel Pressure	
	110 = Pitch Wheel Change	
	111 = System Command	

Figure 1. Parts of a MIDI command byte.

```
9 REM --MIDI COMMAND BYTE INTERPRETER--
10    dim m$(7)
20    for i=0 to 7:read m$(i):next i
30    fuilw 2:clsarw 2
40    if not inp(-3) then 40 else n=inp(3) and 255
50    if n and 128 then print m$((n and 112)/16);" on channel";n and 15
60    goto 40
1000  DATA NOTE OFF,NOTE ON,POLYPHONIC KEY PRESSURE
1010  DATA CONTROL CHANGE,PROGRAM CHANGE,CHANNEL MODE
1020  DATA PITCH WHEEL CHANGE,SYSTEM
```

Listing 1.

```
9 REM --MIDI NOTE ON/OFF INTERPRETER--
10    fuilw 2:clsarw 2:rs = 0
20    if not inp(-3) then 20
30    n=inp(3) and 255
40    if n and 128 then rs = n:fl=0:goto 20
50    if (rs and 112)/16<>0 and (rs and 112)/16<>1 then 20
60    if fl=1 then print "with a velocity of";n:fl=0:goto 20
70    print "Note";n;
80    if rs = 144 then print "on, ";
90    if rs = 160 then print "off, ";
100    fl = 1:goto 20
```

Listing 2.

```
9 REM --ENHANCED MIDI NOTE ON/OFF INTERPRETER--
10    dim k$(11)
20    for i=0 to 11:read k$(i):next i
30    fuilw 2:clsarw 2:rs=0
40    if not inp(-3) then 40
50    n=inp(3) and 255
60    if n and 128 then rs=n:fl=0:goto 40
70    if (rs and 112)/16<>0 and (rs and 112)/16<>1 then 40
80    if fl=1 then print "with a velocity of";n:fl=0:goto 40
90    print "Note ";k$(n mod 12);" of octave";int(n/12);
100   if rs=144 then print          "on, ";
110   if rs=160 then print "off, ";
120   fl=1:goto 40
1000  data C,C#,D,D#,E,F,F#,G,G#,A,A#,B
```

Listing 3.

```
9 REM --AUTOMATIC HARMONIZER--
10    rs=0:fl=0
20    if not inp(-3) then 20
30    n=inp(3) and 255
40    if n and 128 then rs=n:fl=0
50    if (rs and 112)/16<>0 and (rs and 112)/16<>1 then 20
60    out 3,n-48*(fl=1):fl=(fl+1) mod 2:goto 20
```

Listing 4.

rs (for running status) equal to this value. It then sets a flag, indicating that a command byte has been received and that we are now expecting data bytes, and goes back to await further input.

When data bytes (high bit=0) are received, line 50 tests the current running status to determine if this data is related to a NOTE ON or NOTE OFF command. If so, the expected data bytes (key number and velocity) are accepted and interpreted. The flag, fl, keeps track of which data byte (the first or the second) is being examined.

Type in and run the program with your synthesizer properly hooked up, as before. Pressing any key on the synthesizer will generate a NOTE ON message on the computer screen, denoting the key number of the key pressed and the velocity value. Releasing the note will either generate a NOTE OFF message for that key (with its own velocity value) or, depending on the brand of synthesizer you own, a NOTE ON message with a velocity of zero, which stops the note from sounding. Non-velocity-sensitive synthesizers like the CZ-101 generally use the latter method for turning off notes.

An enhanced version of the same program (Listing 3) gives a more musically meaningful reading for each synthesizer keypress. As noted above, the first data byte in a NOTE ON message contains a key number from 0 to 127, denoting one of 128 possible keys (over ten octaves) ranging from C five octaves below middle C to G# five octaves above. (Most synthesizer keyboards don't stretch quite this far at either end; the CZ-101, for example, offers just four octaves in total. However, many synthesizers can both produce and correctly reproduce MIDI notes outside their normal keyboard range.)

When applied to a key number, n, the expression "n mod 12" returns a value from 0 to 11, used as an index into the string array, k$, which contains alphabetic names for the different keys in an octave. To obtain the octave itself (0-9), the expression "int(n/12)" is used.

Talking Back

You can control your synthesizer remotely by sending it the same kind of MIDI information it generates when played manually. The ST Basic program in Listing 4 tracks NOTE ON and NOTE OFF messages generated by the synthesizer and sends them back in slightly altered form, creating automatic harmony when you press a single syn-

thesizer key. The harmony is produced by adding 4 (a major third) to every key number byte received as part of a NOTE ON or NOTE OFF message.

Now that we have some background in MIDI analysis, we are prepared to examine the rest of the MIDI commands and their associated data values in greater depth. Next issue, we will be discussing the remainder of the protocol in detail and will present a full-scale MIDI analyzer that takes almost every MIDI command into account. Stay tuned! ■

Error Box

Several errors found their evil way into last issue's Sound Chip column (Part 1: A nuts and bolts guide to MIDI). Herewith, corrections for these errors, along with sincere apologies for any inconvenience or misunderstandings they may have caused.

•The ST does support MIDI THRU, though not in the conventional manner, via a separate port. Messages appearing at the ST MIDI IN are copied directly to MIDI OUT, implementing the equivalent of a MIDI THRU function when the ST is idle. If the ST is receiving messages at the same time as it is writing them, the data streams will be combined at MIDI OUT and must be sorted out by the receiving devices.

•The address of the International MIDI Association is 12543 Hortense St., Studio City, CA.

•The C-language function midiws( ) writes a null-terminated string of bytes to the MIDI OUT port, minus the trailing \0 (null). The null expression was erroneously represented as *0, due to a typographical error.

•Listing 2, the C-language version of the MIDI terminal program, ends when the user presses Control-C, unlike its brother in Listing 1, which terminates when the user presses Esc. To correct the disparity, change the line in Listing 2 that reads:

```
if ((c = Bconin(2)) == 3) break;
```

to:

```
if ((c = Bconin(2)) == 27) break;
```

•At the right-hand side of Figure 3, the simplified block diagram of a Casio CZ-101, reference is made to MIDI THRU. This function is not implemented on the CZ-101.

Again, my apologies.—*JBJ*

ASDR Generator

Are you intrigued by the possibilities of computerized sound synthesis? Here's an interrupt-driven machine-language program that can turn your 8-bit Atari into a fairly sophisticated polyphonic synthesizer! Define a volume envelope by creating a list of numbers, from 0 (lowest volume) through 15 (highest volume) in DATA statements, as shown in line 2000 of the Basic loader program below. Terminate the list with a marker value of 255. RUN the program to set up the synthesizer and envelope in memory. Then, play notes and chords by POKEing pitch values (from 0-255) into addresses 203 (voice 0), 204 (voice 1), 205 (voice 2), and 206 (voice 3).

ATARI KEY

- Any Atari 8-Bit Home Computer
- Atari Basic

```
9 REM --READ IN MACHINE LANGUAGE--
10 FOR I=1536 TO 1620:READ A:POKE I,A:NEXT I
19 REM --READ IN ASDR DATA--
20 PTR=1629
30 READ AMPLITUDE:POKE PTR,AMPLITUDE
40 IF AMPLITUDE<255 THEN PTR=PTR+1:GOTO 30
49 REM --ACTIVATE INTERRUPT ROUTINE--
50 A=USR(1536)
59 REM --PLAY SOME SAMPLE CHORDS--
60 FOR I=1 TO 4:READ N1,N2,N3,N4
70 POKE 203,N1:POKE 204,N2:POKE 205,N3:POKE 206,N4
80 FOR DELAY=1 TO 300:NEXT DELAY
90 NEXT I
999 REM --MACHINE LANGUAGE DATA--
1000 DATA 104,169,0,141,8,210,169,3,141,15,210,162
1010 DATA 6,160,21,169,6,32,92,228,96,162,3,160
1020 DATA 6,181,203,208,7,189,85,6,208,15,240,41
1030 DATA 153,0,210,169,0,157,89,6,149,203,254,85
1040 DATA 6,132,207,189,89,6,168,185,93,6,164,207
1050 DATA 201,0,48,10,9,224,153,1,210,254,89,6
1060 DATA 208,3,222,85,6,202,136,136,16,199,76,95,228
1999 REM --SAMPLE ASDR ENVELOPE DATA--
2000 DATA 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15,0,255
2999 REM --FREQUENCY DATA FOR CHORDS--
3000 DATA 121,96,81,60
3010 DATA 91,35,60,45
3020 DATA 81,64,53,40
3030 DATA 60,47,40,29
```

Here are some more envelopes you can try for starters. To use one, just enter it in place of line 2000 in the listing.

Bell:

```
2000 DATA 15,15,13,13,11,11,9,9,7,7,5,5,3,3,1,1,0,255
```

Horn:

```
2000 DATA 1,1,1,1,3,3,3,3,5,5,5,5,7,7,7,7,9,9,9,9,1
1,11,11,11,13,13,13,13,15,15,15,15,0,255
```

Vibrato:

```
2000 DATA 15,15,11,11,15,15,11,11,15,15,11,11,15,15
,11,11,15,15,11,11,0,255
```

Slapback Echo:

```
2000 DATA 15,15,15,15,15,15,0,0,0,0,0,0,0,0,0,0,15,15
,15,15,15,15,0,255
```

By JOHN JAINSCHIGG

What Next?

After the new wears off, many personal computers wind up gathering dust in a closet. Don't let your Atari be one of them.

Why did you originally buy an Atari computer? To do word processing? To compose music? To manage your business? To play games? Chances are, whatever your initial reason for buying an Atari, you've discovered that it has many additional capabilities and potential applications.

The flip side of the coin is that you've probably experienced some frustration as well. Maybe your word processing package won't do subscripts or underlining. Perhaps your database won't sort on as many fields as you need. Or, it could be that when you write a program, your whole system acts user-hostile.

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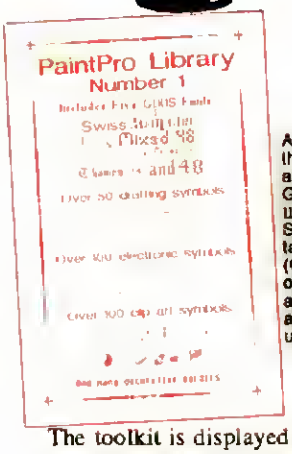
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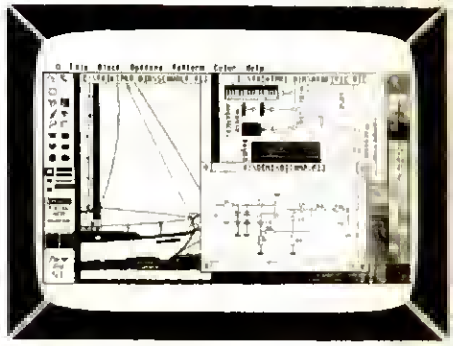
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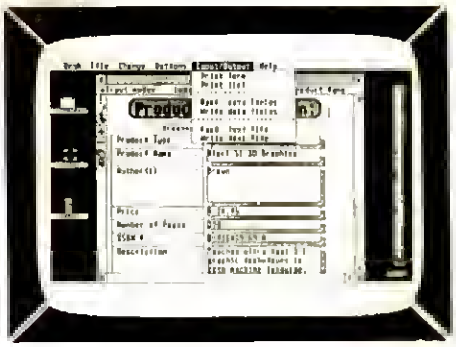
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