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START

#1 GUIDE TO THE ATARI ST

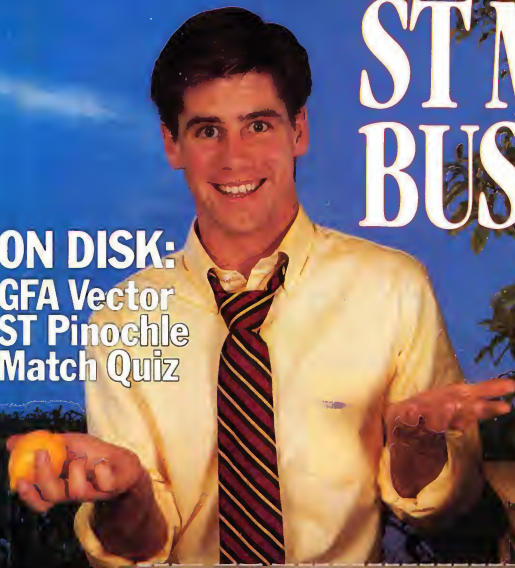
Volume 3, Number 11

June 1989

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ST MEANS BUSINESS!

ON DISK:
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ST Pinochle
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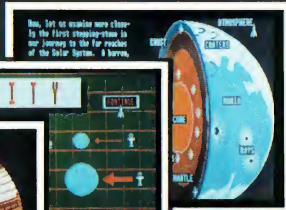
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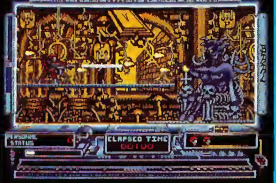
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Screen Shots from the Atari ST version
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Warning: this game is impossible to beat on your own.

Two joysticks required for two-player game.
Screen shots taken from the Atari ST version
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Two joysticks required for two-player game
Screen Shots are from the Amiga version
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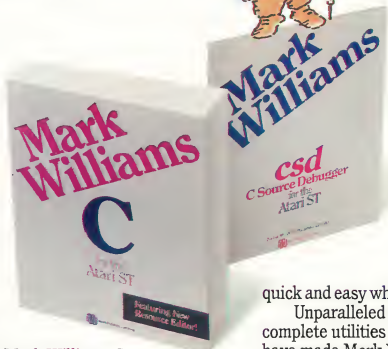
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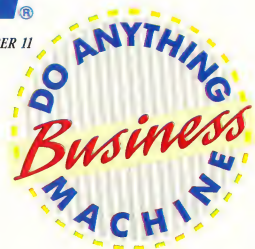
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#1 GUIDE TO THE ATARI ST START

JUNE 1989

VOLUME 3, NUMBER 11



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START[®]

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Editorial

A lot is happening in the Atari world these days! From Atari, we hear that the company is finally pursuing an aggressive marketing campaign to make the ST line well-known, widely available and affordable. And production is way up!

And if you or someone you know continues to be a doubting Thomas, take them to a shopping mall this spring. Atari will be showing their products in 150 malls across the country in a joint promotion with Mitsubishi. You or your friend might even win a free system! Other plans we hear are for an aggressive and competitive leasing plan for small (and large) businesses and a consumer credit plan for the rest of us. Yes, Atari!

Finally, Atari is doing its best to make being an Atari dealer attractive again. They still have to overcome the residual resentment over some of their past marketing practices, but quite a bit of interest has been shown recently by dealers who previously had disdained Atari.

Not only do we Atari users need equipment to run and dealers to sell and service it, we also need software. Unfortunately, once again piracy has caused software publishers to look very cautiously at the Atari market. A case in point is what happened with Spectrum Holobyte's Falcon: a month after its release, it was already up on pirate BBS's. Read Gilman Louie's Open Letter in the Atari Arts Forum on CompuServe for the sad story. Please, do your part—don't pirate software yourself and discourage your friends from doing it.

In our continuing efforts to insure that START meets your needs, we're adding two new columns this issue—Business Applications and Programming in Pascal. Business Applications opens with the first in a series on spreadsheets; next month we'll turn to desktop publishing. Programming in Pascal is one of a series of our "Programming in . . ." columns on different ST languages. We won't forget BASIC, however (our publication of three commercial GFA BASIC programming packages should confirm this), and we'll be adding C and Modula 2 to the list in the near future. Let us know your preferences.

We think this is a good issue for you. If you're interested in using your ST in business, you can check out a wide variety of interesting possibilities—and some of the software you might need. We have screenwriting macros and more on disk, as well as features, reviews and columns on everything from games to graphics. And as a special bonus for disk purchasers, we've included GFA Vector on this issue's START disk. We hope you enjoy it.

Andrew Reese
Editor

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Dialog Box

Letters From Our Readers

Software Renters Aren't All Bad

Your article on software rental (March 1989) contained many truths but was too one-sided. As a long-time software renter, I hope that no one immediately assumes me to be a pirate as asserted. I have found rental to be an invaluable means to evaluate first-hand the considerable software on the market, so that I can intelligently choose those that I ultimately purchase.

While it may seem to some that the only obvious purpose for renting is to pirate software, there are numerous other reasons that can in fact serve the ST community. Users can be prevented from becoming soured on the ST as the result of getting stuck with inferior software. And rentals can serve to create new purchases by hooking those who didn't expect to be a permanent user of a particular product.

I have no doubt that there are scabs that abuse the system—those leeches will always find some way to steal. However, the vast majority of software renters are legitimate potential customers and the software companies are wrong to assume that renters represent lost sales. Surely, most of us who are seriously committed to the long term use of a chosen software realize that if we don't eventually buy the product we're losing support through updated versions, replacements, technical help, etc.

Bob Wenham
Ft. Worth, Texas

We maintain that software rental does more harm to the industry and the user community than good, but we do realize there are two sides to every issue. We appreciate your bringing the other side to light, but we fear that software rental agencies are used much more by pirates than by legitimate users.—
START Editor.

One Dit Too Many

I have subscribed to your START from nearly the beginning, and I have been impressed with both the volume and quality of the information presented there. You do a great job in providing helpful information and programs to the ST community.

Alert Box

Dah Dit . . . Bleep!

Shortly after the February 1989 issue reached the newsstands, we started receiving bug reports on the Dah Ditter program about an annoying extra "blip" that sounds after each Morse Code character. It turns out that the bug only occurs in the compiled version of the program. If you have the GFA BASIC 2.0 Interpreter (from the January 1989 issue of START) you can fix the problem by simply running the program in the interpreter. Run GFA BASIC, click on Merge and then select DAHDIT.LST. This file is in ASCII format, so it will take a long time to load. (If you then click on Save and type in the filename DAHDIT.BAS, not only will it load into the interpreter much faster the next time, but you will be able to run this file in the GFA BASIC run-only program.)

If you have the GFA BASIC compiler, you can fix the bug and recom-

pile the code. Simply replace this Key_code procedure:

```
Procedure Key_code(Char%  
Element% #0  
Repeat  
  Dur% = A%(Char%,Element%)  
  Inc Element%  
  Sound 1,15,#125,Dur%*Rate  
  Sound 1,0,#125,Rate  
Until Dur%=0  
Sound 1,0,#125,Delay*2+Cust_flag%  
Return
```

with these lines:

```
Procedure Key_code(Char%  
Element%#0  
Do  
  Dur% = A%(Char%,Element%)  
  Exit If Dur%=0  
  Inc Element%  
  Sound 1,15,#125,Dur%*Rate  
  Sound 1,0,#125,Rate  
Loop  
Sound 1,0,#125,Delay*2+Cust_flag%  
Return
```

The corrected DAHDIT.PRG program (complete with data files, in case you don't have the February issue) is on CompuServe in Antic Online's May software shelf. Log onto CompuServe and type GO ANTIC to download the file. ■

I am writing to you about the Dah-Ditter program that was on the February 1989 disk. I am currently trying to learn Morse code to earn my Novice Class amateur radio license. When Dah-Ditter appeared in your magazine I was ecstatic. Learning code from tapes is boring and gives you a false sense of security since after a while you memorize the code that is being sent. Dah-Ditter lets you learn code and to improve your copying speed all the way through the Amateur Extra Class license requirements. Most of the boredom is removed because you can send any message you like.

The problem is that when I run Dah-Ditter on my 1040ST, I get an annoying little blip after every message is sounded out. The Farnsworth method requires you to learn code by the sound of the characters, not the dots and dashes that make them up. Consequently, the program is all but useless to me because the character sounds are all wrong. It acts as if the sound chip is not being properly turned off after each character. Without the source code I can do nothing. Do you have any suggestions? I want to make this otherwise excellent program useful.

John M. Larrabee
La Vista, Nebraska

Thank you for your praise of Dah-Ditter. We are aware of the "extra blip" bug; see the Alert Box in this issue for information on how to solve the problem.—START Editor

An Open Invitation

This is an open invitation for START readers to join GBUG, the international GFA BASIC Users Group, founded by RASCUM in July 1987. GBUG publishes a monthly newsletter also called GBUG which is loaded with GFA BASIC tips, tutorials, mini-program listings and much more.

START readers can join at the charter membership fee of \$15 per year (make checks payable to RASCUM. Our address is listed below). This price covers a full year's subscription of GBUG, a complete set of back issues and the associated mini-program listings on a supplied disk.

Our thanks to START magazine for making GFA BASIC readily available and for giving me the opportunity to spread the news about GBUG. Keep up the good work.

Robert Smith, President
RASCUM
22128 Newkirk Ave.
Carson, CA 90745 ■

Dialog Box
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544 Second Street
San Francisco, CA 94107

SUBMISSION INFORMATION

START Welcomes submissions. Please include both hard copy printouts of articles and program listings as well as disk files on ST compatible disks. Media will be returned if self-addressed, stamped mailer is supplied. START assumes no responsibility for unsolicited editorial materials.

Want The GFA VECTOR MANUAL?

When we offered the GFA BASIC 2.0 manual in our January 1989 issue, we were overwhelmed by your response—it's now completely sold out. Now, through a similar arrangement with Mich-Tron, Inc. we're able to offer you the original *GFA Vector Manual* to go with the program on the June 1989 START disk.

With GFA Vector you can now animate objects you have created with GFA Object (on our May 1989 START disk) and include them in programs written in GFA BASIC 2.0. To get the original MichTron manual, call (800) 234-7001 and ask for Product #TH0004. The manual is just \$9.95, plus \$3.50 for shipping and handling. (Only Visa and MasterCard orders can be accepted for phone orders.)

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UTILITIES:

Resource Construction Program, full-featured Make utility, linker, disassembler, archiver/librarian accept Laser C and DRI objects files.

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Source and assembly level debugger. Evaluate any C expression to print or set variables. Source and assembly mode allows interaction with compiler output. Disassemble or dump memory. Set breakpoints with the mouse on C lines or machine instructions. Watch C variables or machine registers. Multi-window user interface. Simple command structure.

	Laser C			Mark Williams C v3.0		
	Compile/Link	Run	Error	Compile/Link	Run	Error
Hello.c	2.43	—	—	15.98	—	—
Apskel.c	8.88	—	—	26.5	—	—
Sieve.c	4.59	2.45	—	23.9	2.77	—
AES	35.6	—	—	103	—	—
Savage	6.31	36.4	1.73 × 10 ⁻¹⁰	30.82	83.0	1.18 × 10 ⁻⁷

All times in seconds.
AES consists of nine source files totaling 1142 lines of code.
AES is built using Make.
Mark Williams C using RAM disk.

Megamax, Inc.

DEVELOPMENT SYSTEMS

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News, Notes & Quotes

What's Happening in the Atari World

by Stephen Mortimer
START Contributing Editor

UltraScript Released

Imagen's PostScript-compatible interpreter for the Atari SLM804 Laser Printer is now available. Released in late February, Imagen is selling UltraScript two ways: as a stand-alone package for \$22995 that includes 17 fonts, including Courier, standard symbols and several Lucida fonts. Atari is including UltraScript in their desktop-publishing packages and in a package with the SLM804 Laser (\$2,195). Several additional font packs are also available. A 13-face font pack that contains the original Apple LaserWriter fonts sells for \$12995. The 35 fonts found in the LaserWriter Plus sells for \$295. Users may upgrade from the 13-font pack to the 35-font pack for \$19595.

Approximately 10-12 popular font families are also available at a price of \$79.95 or \$99.95 per family. Families containing four or more fonts will retail for \$99.95 and families that contain one to three fonts will retail for \$79.95.

UltraScript currently works with all ST programs that support PostScript output to disk. Developers are also modifying their programs to take advantage of a pipeline in UltraScript that allows seamless printing from the application. One such program that takes advantage of this pipeline is Copyist DTP, DrT's music-scoring program. Imagen is planning to release UltraScript drivers for the Hewlett Packard LaserJet and compatibles, the HP Deskjet and the Epson LQ printers.

New Software from Atari

At press time, two new pieces of productivity software were in their final stages of development from Atari: Hyper Plan and Wordflair. Developed by third parties for Atari, both are high-power applications that will aid Atari in breaking into the business market.

Coming soon from Atari: HyperPlan and Wordflair!

Hyper Plan is a spreadsheet that features extensive graphing abilities, fast operation, Lotus compatibility and GDOS support. The program offers multiple windows for both worksheets and graphs, a database and an English-like macro language. The commands supported by Hyper Plan are a superset of those found in Lotus 1-2-3. Lotus 1-2-3 files may be imported or exported and 1-2-3 macros are compatible with Hyper Plan.

Graphing, one of Hyper Plan's strengths, includes a variety of styles including 3D pie and bar graphs, which can even be rotated on an axis to allow viewing from a different angle. Graphs automatically update when a value has been changed in the worksheet. Addi-

tionally, the worksheet can be modified by changing the values on the graph. All graphs can be exported as GEM metafiles for use in other programs.

Hyper Plan gets its name from the hyper-link functions that it supports. By establishing a hyper-link, the final result of a change in a worksheet can be reflected in every associated item. Hyper links can also be imbedded in cell notes. These links let Hyper Plan jump from one area of the worksheet to another, without scrolling.

Another feature of Hyper Plan is the ability to include buttons in the worksheet. These buttons can be integrated with macros to assist data entry, through the use of a data entry form. Data entry forms allow data to be entered into the worksheet more efficiently than the usual method. Hyper Plan will be available from Atari later this year at a price that had not been determined at press time.

Wordflair is touted as a document processor that incorporates the features of a word processor, spreadsheet, page layout, graphing and drawing program. These different forms of data are merged together by Wordflair into one integrated program. Calculation regions that contain formulas and data can be linked to areas of text so that if the text moves, the calculation region also moves. Dynamically linked pie, bar and line graphs can be created by Wordflair from data in calculation regions.

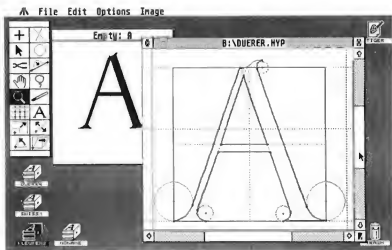
The page-layout program incorporated into Wordflair allows multiple page sizes and includes a grid that allows write, calculation, and graph objects to be auto-aligned, spaced horizontally or vertically, or snapped to the grid lines. A simple drawing capability allows creation of rules, bars and lines of varying thickness and type. GEM, IMG and META graphics files may be imported. Smart rulers can display measurements in inches, centimeters or picas.

Traditional word-processing features include cut-and-paste to a clipboard and search-and-replace using various parameters, and footnoting. GDOS fonts are used for a wide variety of text styles. A flat-file database allows for mail merging.

Wordflair is claimed to be an especially versatile program because of attention to the user interface. A full-page preview is one of those nice features, as is an automatically scrolling window for uninterrupted typing. Unlike ordinary word processors, write regions for text are objects and can be any size. Page margins and paragraph indentation are user-defined options. For high-quality output, Wordflair uses GDOS, and the entire document, part of the document, or the database records can be printed. Context-sensitive online help is available, and the help windows can share the screen with the current document. Finally, templates are included for business cards, letterheads, proposals and several other applications. Wordflair, like Hyper Plan, will be released later this year by Atari.

Fat Bits

- Atari Computer and Mitsubishi Automobiles are currently engaged in a joint promotion in over 150 shopping malls across the United States. The promotion began in April and will run through July. Atari's ST stations will focus on home use, MIDI, desktop publishing and more. Go to a mall nearby—you may win an ST system.
- Qualified new dealers can obtain a Mega 2, a Mega 4, a 520ST and 1040ST, a 30-megabyte hard drive, a laser printer, a complete desktop publishing package and one monochrome and one color monitor all on a 180-day consignment, if they purchase a specified equipment package. Call Atari at (408) 745-2906 for details.



- Calamus Outline will be a part of the Calamus desktop-publishing family from ISD Marketing. The program is comparable to Adobe Illustrator, a powerful drawing program for the Macintosh. Calamus Outline will work in conjunction with Calamus and allows

irregular text flow and sophisticated drawing capabilities.

- Double Click Software, creators of Shadow and many excellent shareware programs, has released DC PORT, a cartridge for the ST that adds two RS-232 serial ports. The MichTron BBS currently supports DC PORT to allow for three-line bulletin board systems. With an AUTO folder program, the user can switch between RS-232 ports with a key combination. A tentative price of \$200 had been set at press time.
- One of the problems with GDOS has been the limited number of point sizes available in some fonts. MichTron has solved that problem with their new font editor, HyperFont. HyperFont lets you create GDOS fonts in any point size from a font outline. ■

HyperFont from MichTron, Inc. is the latest Font Editor/Designer for the ST. With it, you can create GDOS fonts in any size and style. Watch for a comparison of HyperFont, Fontz and Calamus Outline in the August issue of START.

Stephen Mortimer is a contributing editor for *START* and lives in *Binghamton, New York*.

If you have a hot tip let us know at *News, Notes & Quotes, START Magazine, 544 Second Street, San Francisco, CA 94107*.

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-Ralph Mariano, ST Report



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What's New in the ST World

Compiled by Tom Byron
START Associate Editor

New Arcade Games for the ST

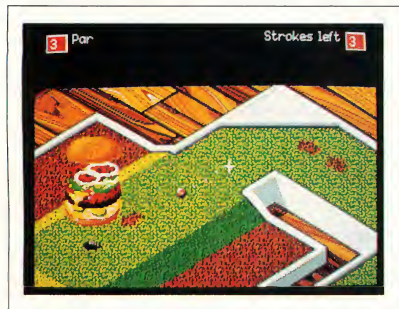
From Electronic Arts comes miniature golf with a twist. In **Zany Golf**, you maneuver your ball through nine of the wildest holes ever imagined. Get your ball past the flashing lights and crazy bumpers of the Pinball hole, or putt under a jumping burger at the Hamburger hole. At the Energy hole you

must dodge laser beams, particle rays and transporter pads where balls careen unexpectedly, or disappear in a burst of fireworks. Watch out for surprises. **Zany Golf**, \$39.95. **Electronic Arts**, 1820 Gateway Drive, San Mateo, CA 94404, (415) 571-7171.

Swifitar, from Accustar, is an arcade

shoot-em-up with 10 vertically scrolling and constantly changing landscapes. Stunning animation and detailed graphics provide non-stop action. **Swifitar**, \$39.95. **Accustar Software, Inc.**, Box 457, Rochester, MI 48308, (800) 777-1690.

Psyclapse has just released **Ballistix**, a thrilling new game that's going to blast all the other so-called soccer-type ball games right off the board. All you've got to do in **Ballistix** is score more goals than your opponent, whether it's another humanoid or the computer. Simple? Well, not quite . . . **Ballistix**, \$34.95. **Psyclapse** (a division of **Psygnosis**), distributed by **Computer Software Service**, 2150 Executive Drive, Addison, IL 60101, (312) 620-4444.



Miniature golf was never like this! In **Zany Golf**, the latest game from **Electronic Arts**, you must skillfully maneuver through windmills and past jumping hamburgers. Watch out for some surprises.

New Graphic Adventures for the ST

Zak McKracken and the Alien Mindbenders is the latest in **Lucasfilm's** line of comedy/thriller adventure games. As the title character, you're a journalist who writes for a supermarket tabloid, the **National Inquisitor**. You love to invent stories about possessed toasters, two-headed turtles, Martian minestrone recipes and vegetarian vampires. But when you discover that an **Inquisitor** story about space aliens who've taken over the phone company and plan to reduce our IQs to single digits is actu-

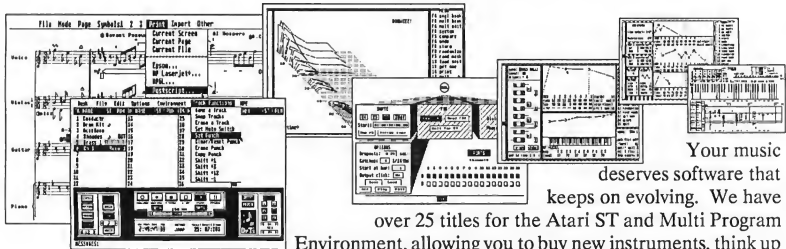
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*You Name It
and the ST Will Do It*



by Rob Weinstein, Dave Edwards,
Patricia L. Harrington and Marcus Badgeley

Atari ST and Mega computers have found their way into all types of businesses these days. We take a look at four diverse uses in this article—retail sales, small business management, stock sales and CADD consulting. If these experiences give you any ideas, then maybe you, too, could put your ST to work!

A Computer That Sells Computers

Several years ago an automobile manufacturer began advertising its product, which had been chosen for use by the California Highway Patrol, as the car "which chases other cars for a living." Now a similar claim can be made by Atari about the ST.

No. The ST does not chase cars for a living. This computer sells other computers for a living!

At least that's the case at Real Computers and Electronics in Petaluma, California. Here, in a store which also builds and repairs IBM-compatible PCs (clones), the computer of choice for their point-of-purchase and inventory control system is an Atari 520ST with a Supra 30-megabyte hard disk.

"When we started out," explains store manager Chris Watson, "we were looking for some programs—relatively inexpensive—which would take care of our point-of-purchase transactions and deduct those transactions from our inventory database."

"We began by setting up a system on one of our machines, an IBM clone. We liked the point-of-purchase part of the package, but after using it for a while, we discovered that it wasn't doing an adequate job on the inventory."

Watson, a graduate of University of California's computer department, a programmer and an avid computer enthusiast, was looking through some Atari magazines when an advertisement for Hi-Tech Advisers' Inventory Pro caught his attention. The advertisement promised enough features to pique Watson's interest and to warrant a telephone call.

To his delight, Real Computers wound up becoming a beta-test site for Sales Pro, then the latest offering from Hi-Tech. It not only included the features of Inventory Pro, but also incorporated the point-of-purchase features the



Real Computers in Petaluma, California uses an ST as a point-of-sale system, even though they assemble and sell PC clones. John Kenneally, shown at the station, is a salesman at the store.

store wanted. Since Real Computers also sold Atari hardware, they simply exchanged their counter IBM clone for a 520ST, loaded in the software and were in business.

Now, several years later, with the beta-testing completed, Real Computer is still using—and still impressed with—the 520ST. “The Atari is a much less expensive system to use, it’s as fast as we need and it does everything we ask. We have had excellent service from Atari and the technical support and upgrade policies of Hi-Tech are exceptional.

“I would recommend this system to

any small business without hesitation,” Watson says emphatically.

What does Watson mean when he says “small business?”

“With a 10-megabyte hard disk you should be able to handle a 2,000-item inventory, and about 2,000 to 3,000 customer records,” he explains, which means that a 520ST could last a small business quite some time.

Since most retail outlets have their product line in place either upon or shortly after opening, inventory tracking remains relatively constant. Customer records grow regularly, but a 3,000-

record capacity should hold most small retailers for the first several years, at least.

Eventually, Watson says, a retailer might grow to the point where more than one terminal would be necessary. “It’s not that you have too much information to handle,” he explains. “Usually it’s because you need more than one register to handle your flow of customers. And even at that point, the Atari serves as a perfect work station in a multi-user network.

One benefit of working with the Atari is that Watson and his fellow IBM enthusiasts have had a chance to explore and become familiar with the 520ST’s capabilities.

In fact, he explains, when they tested the Atari against two AT clones in calculating a spreadsheet, they found that it compared very favorably with the fastest AT. “When you take that speed and power and add the ST’s color capabilities, graphics capabilities and ease of expansion, it compares very favorably,” he says.

“The whole thing is easy, very fast, very flexible, and doesn’t cost an arm and a leg.”

And what more could a businessperson ask of a computer?

The ST Goes Consulting

by Dave Edwards

I run a consulting firm which is primarily involved in Computer Aided Design. I spend most of my time evaluating clients’ CAD needs and making software and hardware recommendations, but I also write articles about CAD and CAD-related products and do CAD training, usually for VersaCAD or Drafix users. Most of my work involves IBM PCs, but my Atari

1040ST has been an invaluable tool. It’s helped me pull off some unique projects.

One of my main uses for the ST is as a writing “sketch pad.” If I’m evaluating a PC product, it saves so much time to have the program running on the PC and just turn to the ST to make notes. Conversely, if I’m writing about an Atari product, I do it the other way around. I do most of my writing on the ST with

ST Writer, however, and then transfer it to the PC for final editing. Since my PC has a 3.5-inch drive, file transfer couldn’t be easier. I always format my disks on the PC clone, so that I can use the disks in whichever machine I want.

I have a copy of Aldus PageMaker version 3.0 on my PC, but I still find myself using Publishing Partner for most of my desktop publishing. (I also have a ▶



Dove Edwards runs a CAD consulting firm in Montgomery, Alabama. His ST is one of several computers in his office, but one for which he keeps finding new and innovative uses—like a 3D animation of a proposed mall.

copy of Soft-Logik's PageStream, but I haven't decided whether to learn it or PageMaker.) One reason I prefer Publishing Partner is for its text-wrap feature that PageMaker has only now implemented.

Needless to say, this impressed the client and the firm got the project.

I also work as a MIDI consultant, but that has tapered off in recent years because MIDI knowledge is becoming more widespread and the software quality keeps improving. I still often work with MGS Studios in Montgomery, Alabama. They purchased a 1040ST on my recommendation and have been very happy with it.

I'm also a big fan of Antic Software's CAD-3D and have used the program for some unique projects. Architectural firms now make a number of client pre-

sentations using video; I've done a few animated logos for them using the Cyber System, especially Cyber Control.

One of my architectural clients was building a strip shopping mall that had buildings along the road away from the main mall. He wanted to know how much of the mall would be blocked by these "outparcels" as motorists passed by. I decided to animate the buildings and show what they would look like in the computer. The project was already in CAD, so finding the distances was no problem. However, since CAD-3D does not allow coordinate input, I wrote a Cyber Control program that let me input coordinates and place boxes, walls and roofs exactly where I needed them. Then I placed the buildings and created the animation. Needless to say, this impressed the client and the firm got the project.

All in all, I find my ST to be a valuable member of my consulting firm. (Editor's Note: We'll have Dave's innovative Cyber Control program in an upcoming issue of START. If you'd like to contact him at his office, you can reach him at Dave Edwards Consulting, P.O. Box 210173, Montgomery, AL 36109, (205) 277-2048.)

I am a registered sales assistant to an extremely high-producing stock broker who often needs data that's unavailable from the company mainframe. Before I purchased my Atari 1040ST and a 20-megabyte hard disk, I had to compute these figures manually, then list them in a letter suitable for a client. This took me a great deal of time.

Now I use A-Calc Prime to list the figures neatly, perform calculations and develop what-if alternatives. Then I merge the data from the spreadsheet into Timeworks Word Writer ST, where I can prepare professional letters. When we need form letters, I use files from a Base Two database to produce a mailing list. I can save time and at the same time produce a much more professional job.

My responsibilities also include processing forms for new accounts. With Base Two, I have created a file that lets me type in the necessary information just once and then use it in printing different forms. Base Two is a limited database program, yet it is these very limitations that make it so easy to use. Although more powerful database programs are available, Base Two suits my needs perfectly and I would not trade its ease of use for anything.

I call a great many clients and must keep a record of their responses. One client may not wish to be called about a particular product and another may have certain specifications. Previously, I found it particularly clumsy to refer to this list when making subsequent calls, but now I can list these comments in a Base Two notes file which I then sort by name, product, or whatever will help me the most, depending on the call.

I recently purchased Timeworks Partner ST, a desk accessory whose calculator and thesaurus I use every day. The built-in area code data record is

also helpful since I make long-distance calls frequently. I also make good use of Partner ST's note files and calendar functions.

My company has its own Broker's Edge software package for use with MS-DOS computers. I use pc-ditto whenever I need to run Broker's Edge and, although initial boot speed is slow, this

program performs very nicely with pc-ditto—and much faster than most IBM programs running under pc-ditto. Screen updates are virtually instantaneous and calculations never appear to slow the machine down.

I've used my 1040ST for about a year now and I'm very impressed. The GEM Desktop is easy to work with and, while

my husband says the disk processing is a little slow, I find it more than satisfactory. Although the screen display of the color monitor is good, I miss the crisp display of the monochrome monitor.

My goal is to incorporate my ST into my work even more by acquiring a modem to use with Partner ST and Flash! Since I contact clients every day with information about accounts, products or updates, this would be a real time-saver. A modem would also let me pull data directly from the mainframe.



Patricia Harrington was tired of having to integrate mainframe computer data into correspondence and reports by hand in a busy stock brokerage. Her solution was an Atari ST and her initially skeptical co-workers now respect her "toy."

**I've used my
1040ST for about a
year now and I'm
very impressed.**

Although it's really just a start, I am very happy with what I have done so far with the Atari. It's made many of my tasks easier and helped me save time.

Managing a Small Business

by Marcus Badgley

One of the most crucial elements in having a small business, or any business for that matter, is the need for organization. For the past year I have been operating in a very small office—we're talking 7 feet by 9 feet with a walk-in closet—and though my business is in the midst of a move, the need to conserve space has been foremost on my mind. With our Atari ST, we have been able to do many tasks at just one work station.

Within the space of one day, we'll run the gamut of computer-oriented functions from word processing to image scanning to playing a game (God forbid!). The day might start out by printing several invoices and letters using Timeworks Word Writer ST. We have created several forms such as an invoice, bid and contract which are designed to let us just open the documents and fill in the blanks. We also have pre-made forms for many of our repeat clients, making entry even quicker.

A little later in the day, we'll input a few names of recent acquaintances and business associates onto our mailing list with DataManager ST. Our main list is used when we send out an announcement or a promotional piece. Actually the mailing list, which also serves as a phone list, is printed out every week, as is our job list.

Both our job list and our financial spreadsheet are done on VIP Professional. Our job list is a record of what jobs we're doing, the job numbers and ▶



When you work in a 7-foot by 9-foot office, your computer had better be able to do almost everything you ask of it. Marcus Badgley puts his ST to work in a variety of ways to automate his small business.

the payment history. We're able to keep up to date in this way. I'm still searching for the perfect, yet general, small business package for the ST, as VIP is a bit overblown for our needs. At present we obtain hardcopy using an NEC P2200 24-pin dot matrix printer. Its quality is excellent and it's very affordable.

For publishing, we usually go the traditional route, mainly because until recently the ST programs have not offered the power and reliability we need. However, I've found that Timeworks Publisher ST lets me to do basic newsletter layout and design. I create mock-ups from the printouts and then give the typesetters instructions based on them.

Obviously we use the Atari for design and painting. We have pretty much every art/paint/animation program for the Atari that exists (except Doodle). When we're creating logos, we use our IMG Scanner quite a bit.

Our system is based around a 520ST with a 1-megabyte RAM upgrade and a single-sided and a double-sided drive. Since we also do some desktop publishing and high resolution work, we have both color and monochrome monitors.

Recently, we acquired a radiation screen that we place in front of whichever monitor we're using. It works great and I can spend more time using the computer without my eyes getting tired.

Lastly, because of the quantity of art files (which take up a lot of space), plus ever-increasing numbers of business documents, all of the relevant in-use files and programs are stored on an 80-megabyte hard drive. Finally, for diskette storage I found the Exponent Cassette, a wonderful, hot-looking disk storage unit from an Italian company called Siema.

In all, our system works well for us, saving us both time and space. Believe it or not, within our small space we had three work stations, one being the computer, one being a light table with parallel ruler for drafting and the third a fully equipped design and production area.

Strange but true, but thanks to the Atari ST we did it. ■

Dave Edwards and Marcus Badgley are frequent contributors to START. Rob Weinstein's first START article was "Thanks for All the Fish" in the February 1989 issue, while this is Patricia Harrington's first START article.

PRODUCTS MENTIONED

Cyber Studio, including CAD-3D 2.0, \$89.95;
Base Two, \$59.95;
A-Caic Prime, \$39.95;
Flash!, \$29.95. Antic Software, 544 Second Street, San Francisco, CA 94107, (800) 234-7001.

pc-ditto, \$89.95. Avant-Garde Systems, 381 Pablo Point Drive, Jacksonville, FL 32225, (904) 221-2904.

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Inventory Pro, \$39;
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CIRCLE 164 ON READER SERVICE CARD

VIP Professional, \$149.95. ISD Marketing, Inc., 2651 John Street, Unit 3, Markham, Ontario, Canada L3R 2W5, (416) 479-1880.

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Exponent Cassette disk storage unit, Siema, distributed by Intelligent Products Marketing, 2238 Camina Roman, San Ramon, CA 94583, (415) 866-8620.

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ON DISK!

GFA

VECTOR

PROGRAM BY GFA SYSTEMTECHNIK

ARTICLE BY ANDREW REESE, START EDITOR

GFA Vector lets you animate three-dimensional objects in your GFA BASIC programs! GFA Vector runs on either color or monochrome monitors and includes its own object-creation facility. You will need GFA BASIC 2.0 to create your own programs.

Add dazzling 3D animation to your GFA BASIC programs. File VECTOR.ARC on your START disk.

GFA BASIC 2.0 was written by GFA Systemtechnik as the definitive BASIC for the ST. Since its creation, GFA has ad-

ded a series of complementary modules to make programming in GFA BASIC even more powerful. Through arrangements with GFA and MichITron, we have been able to present GFA BASIC 2.0 and GFA Object in the pages of START in previous issues (and on the companion

START disks).

The GFA BASIC 2.0 Interpreter, presented in START in January 1989, is the main program you use to write and run programs. GFA Object, presented in May 1989, is a stand-alone three-dimensional object modeling program that lets you create 3D objects. You can use it to design complex spaceships, for example. GFA Vector, on this issue's START disk, lets you take your spaceships and animate them in real-time in your GFA BASIC programs.

GFA Vector runs on both color and monochrome monitors. You must be in medium resolution on color systems.

In order to make full use of GFA Vector, you will need a copy of GFA BASIC 2.0. If you do not have this interpreter, it is on the January 1989 START disk which you can order from our Disk Desk for only \$10.95, plus shipping and handling. You cannot create GFA Vector programs using GFA BASIC 3.0.

Finally, if you want a copy of the original manual for GFA Vector, complete with a tutorial and explanations of all of the machine language routines, we have a limited number available. See the end of this article for details.

Getting Started

GFA Vector is on your START disk in the archive file VECTOR.ARC, which contains the following files:

- GFABASRO.PRG, the GFA BASIC run-only program. This program lets you run your GFA BASIC programs, but not edit them. It may be distributed freely.
- EXAMPLE.BAS, a GFA BASIC 2.0 program that gives an example of GFA Vector's clipping routines. You may load it into the GFA BASIC interpreter to examine the code, but you can only run it by double-clicking on EXAMPLE.PRG.
- EXAMPLE.PRG is a customized

module file to run the example program.

- INITIAL.LST is the set of initializing and window clipping routines that must be merged into your GFA BASIC program so that it can handle your 3D objects. These routines are also listed in the sidebar accompanying this article.
- MODULE.PRG contains the routines required to draw 3D objects. It is also used to start completed 3D programs and call the GFA BASIC interpreter or run-only program and your BAS program.
- DEMO.DAT is an object file for use with the EXAMPLE.BAS demonstration. It contains 25 separate objects. (Object numbers 0-3 are cubes, 4-7 are pyramids, 8-11 are octohedrons, 12-15 are single-point objects, 16 is a space ship, 17-20 are polyhedrons, 21 is the space shuttle, 22 is the body of a bat, 23 and 24 are bat wings, 25-27 are houses and 28 is a goblet.)
- VECTOR.PRG, VECTOR0.OVL and VECTOR1.OVL are the three components of GFA Vector.

Copy VECTOR.ARC to a blank, formatted disk and un-ARC it, following the Disk Instructions elsewhere in this issue. When you are finished, we recommend that you create several copies of MODULE.PRG and name them MODULE1.PRG, MODULE2.PRG and MODULE3.PRG. (In order to run a 3D program, you will need to customize MODULE.PRG to call a specific .BAS file; if you have several copies of MODULE.PRG on hand, you will then be able to customize each one for a different program as you create your own GFA BASIC programs.)

You will also need a second blank, formatted disk as a work disk. GFA Vector was written to use pre-defined paths

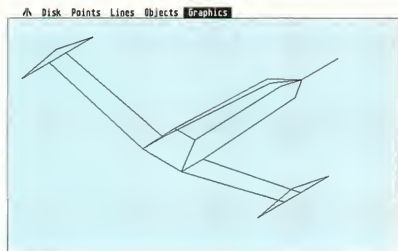


Figure 1. The GFA Vector Display screen with a space ship displayed. This is just one of 10 objects on your START disk. Others include the space shuttle—and an animated bat!

for its various components, so you will need to create the folders named EXAMPLE, MODULE, OBJECTS and VECTOR. Then copy EXAMPLE.PRG, EXAMPLE.BAS and GFABASRO.PRG into the EXAMPLE folder, MODULE1.PRG, MODULE2.PRG and MODULE3.PRG into the MODULE folder, DEMO.DAT into the OBJECTS folder and VECTOR.PRG, VECTOR0.OVL and VECTOR1.OVL into the VECTOR folder

How It All Fits

A complete GFA Vector program consists of the following:

1. A module, originally MODULE.PRG. You will use VECTOR.PRG to create a customized module. You can then rename MODULE.PRG to whatever you want; just remember to keep the .PRG filename extender.
2. GFA BASIC, either the GFA BASIC interpreter or the GFA BASIC run-only program.
3. A program written in GFA BASIC with the .BAS filename extender. It must include the routines in INITIAL.LST.
4. An object file with the filename extender .DAT.

The program is started by double-clicking on the customized module. After the 3D routines in the module load, the GFA BASIC Interpreter or Run-Only Program loads automatically. Then the .BAS program is loaded and it controls

loading of the object data (.DAT) file.

A Quick Demonstration

If you have set up your files and folders as described above, you are ready to run a demonstration of GFA Vector. Insert your work disk and double-click on the VECTOR.PRG icon to run the program. If you have a color monitor, you must be in medium resolution.

Now, go to the Disk menu and click on Demo program. You will see a complex demo that describes GFA Vector and then illustrates various features. Click the left mouse button to move to the next part of the demo and click the right button to end it. The space ship shown in Figure 1 is part of this demo.

Customizing a Module

To customize a module such as MODULE1.PRG to work with a program called TEST.BAS, you must first run GFA Vector. When the menu bar appears, select Create Module from the Disk menu. A dialog box will appear. If you are using the GFA BASIC interpreter, press the Delete key to delete GFABASRO.PRG and then type in GFABAS.CPRG and press Return. If you are using the run-only program, it is already entered as the default; simply press Return.

When you've pressed Return, the default name of the .BAS program will appear, MODUL.BAS. Press the Delete key to delete the default name and then type in your new program name. Then press Return again and the file selector ▶

box will appear. If you have set up GFA Vector with the folders described above, GFA Vector will first look in the MODULE folder for an uncategorized module program. Select MODULE1.PRG and then click on OK. GFA Vector will then customize MODULE1.PRG and re-write it back to the disk under the same name (you can later rename it to match the .BAS program, such as SPACE.PRG, so that you will know which modules you have customized).

Creating an Object Using Coordinates

If you have GFA Object (from the May 1989 START disk), you may create objects there, save them to disk and then convert them to GFA Vector .DAT format with the ANIMATOR.PRG included with GFA Object. GFA Vector also has an object creation facility, however.

When GFA Vector loads, you will see drop-down menus for Disk, Points, Lines, Objects and Graphics. GFA Vector lets you create objects two ways, either by entering numbers from the keyboard to define points and lines or by using the Graphics Editor to create them visually.

To have some data to work with, select Load file from the Disk menu and load DEMO.DAT from your work disk. Twenty-nine objects are included in this file, as detailed above.

The Point, Lines and Objects menus all have the same entries and their functions and uses are similar. On any of the three menus, *list* lets you list all or part

of the list of points, lines or objects to the screen, while *print* lets you create a printed copy of the same list. The *add* function lets you add new points, lines or objects to the end of your list and the *insert* function lets you insert new point, lines or objects within the list. You can *change* any points, lines or objects or *delete* them with these functions.

The *list*, *print* and *delete* functions all use a similar dialog box. You may select a range using the (-) and (+) buttons. Left-clicking on one of the buttons changes the value by one; right-clicking on one of the buttons lets you move quickly through the range. Once you have defined the range, click on the OK box (or press Return) to list, print or delete the range.

The *add* function does not bring up a dialog box. Instead, it presents you with a data entry screen, since it adds to the end of the list. In order to add a point, you must specify the X, Y and Z locations for the new point separated by commas, such as: 0,90,0 [Return]. The permissible range for point locations is plus and minus 1023 in any direction. When you have completed entering point coordinates, simply press Return.

To add a line, you must specify the starting and ending points for the line by listing them according to their point numbers. For example, you may have added two points as points 0 and 1. To add a line between them, all you have to do is type in 0,1 in *Lines/add*. Again press Return when you have finished.

To add an object, you merely need to specify that it consists of points *a* through *b* and lines *c* through *d*, such as *a,b,c,d*.

The *insert* and *change* functions bring up a dialog box that lets you specify the point in the list you want to work on. Use the (-) and (+) buttons to move through the list, then click on OK to either insert a new line, point or object or change an existing one. GFA Vector will keep track of your previously defined objects, so that if you add a point or line in the middle of the list, the program will still define the rest of your objects properly.

Creating an Object Visually

If you select Graphics Editor from the Graphics menu, you will first see a dialog box to select which object from your list you want to edit. Once you select one, you will see the editing screen shown in Figure 2. This is the screen in which you will create and edit your objects.

At the bottom of the editing screen are three windows showing the Front, Top and Left views of your object. The small window in the upper left shows the current location of the cursor, while the top right window lets you select the viewing scale (from 1:1 to 1:10) and lets you choose to edit points or lines. When you are finished editing an object, click on the OK box in this window. In the top center of the screen is an information window that tells you the range of points and lines used by this object.

To place a point, first make sure that there is an X in the points box, then simply move the cursor inside one of the view windows and left-click. A small cross will appear. To "lock" the cursor location in one window, so that you can set a point in all three dimensions, press and hold the *right* mouse button when you have the cursor where you want it in one window, then drag the cursor into another.

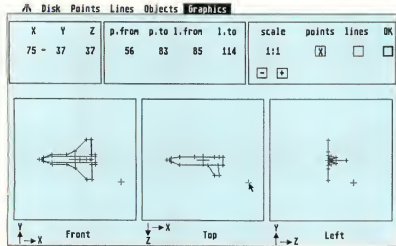


Figure 2. GFA Vector's Edit screen in which you create and modify your objects. All three views of an object are available on a single screen and all functions are mouse-controlled.

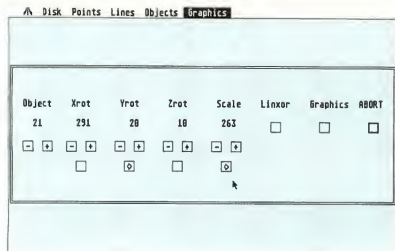


Figure 3. The Display screen lets you set up automatic animation to see how an object will look in motion. Or you can choose a particular angle and size to check a particular view.

You can only connect lines between points that have already been placed. First, click in the lines box in the upper right portion of the screen, then select a point. Make sure that you have located it in all three dimensions using the right-hold/drag technique. When you have properly located the cursor over a point, you will see that the cursor cross hairs are open in the center in all three windows. Then, without moving the cursor, hold down the Shift key and click the left mouse button. You will hear a tone signifying that you have located the beginning point of a line. Then locate the ending point, again in all three dimensions, and then left-click when the cursor is over it. A second tone will sound and a line will appear between the points.

That's all there is to creating or editing an object visually. Practice using the right-hold/drag technique; it's pretty easy once you get the hang of it.

Displaying a Graphics Object

The Graphics menu also has a Display object selection. If you click on this choice, you will be brought to the Display screen shown in Figure 3. From this screen, you may select the object to be displayed, the X-, Y- and Z-axis rotation of the object (Xrot, Yrot and Zrot), the magnification (scale from 1 to 511 with 64 being 1:1, or no magnification) and whether to show the object with XORed lines.

Under the rotation and scale choices

are four boxes. Click in any or all of these boxes to vary that parameter during the display of the object. When this function is active, you will see an arrow in the boxes.

To Display an object, click in the Graphics box to the right of the screen. To leave the Display object screen, click in the ABORT box.

File Handling

Under the Disk menu, you have several choices. We've already covered the Create module and Demo program options above. The others are Load, Write and Delete file and Quit. Load file loads a .DAT object file into GFA Vector. Write file saves the current .DAT object file to disk. Delete file lets you delete a .DAT object file from disk. Quit takes you out of GFA Object and back to the Desktop; there is no confirming dialog box, so be sure that you have saved your objects before quitting!

Machine Language Routines and Arrays

GFA Vector expands the functions available in GFA BASIC by adding a number of machine language routines, invoked by the Call function in GFA BASIC. In order to perform smooth animation, GFA Vector sets up a second screen page in memory, draws on the second and then flips it onto the visible screen. GFA Vector uses one- and two-dimensional arrays to hold the various parameters.

The machine routines are:

- **Init%**—Deletes the second screen page and copies the first onto it. The routines **Tfrm%** and **Linxor%** (see below) are then called automatically. Always call **Init%** before calling **Vector%**.
 - **Vector%**—Uses the parameters in the arrays to draw a new picture. The old picture is deleted unless **Ofrm%** is called first.
 - **Linxor%**—If called, any background detail is deleted by the object.
 - **Linxor%**—Causes the object to be drawn or redrawn so that the background is preserved.
 - **Ofrm%**—If called before **Vector%** the old picture is not deleted.
 - **Tfrm%**—When **Vector%** is called the old picture is deleted.
 - **Page1%**—Puts the first screen page onto the monitor. Always end your program with one or the other screen pages on the monitor so that GFA BASIC messages can be seen.
 - **Page2%**—Puts the second screen page on the monitor.
 - **Flip%**—switches the screen page from page 1 to page 2 or vice versa, but has no effect if the screen has been selected by the **Page1%** or **Page2%** calls. **Init%** resets the page selection.
- The arrays used by GFA Vector are:
- **Obj%(N)**, where N is the object number. Permissible values are 0 for inactive and 1 for active objects.
 - **Col%(N)**, where N is the object number. Assigns a color to each ob- ▶

Initialization And Window Clipping Routines

These are the routines for Initialization and Window Clipping that must be a part of your GFA BASIC program. They are on your START disk as INITIAL.LST in the file VECTOR.ARC.

Procedure Initialization

```

Env = Lpeek(Basepage + &H24) + 298
Tbbas = 0
For I = 0 To 7
  Tbbas = Tbbas + 2 * (4 * (7 - I))
  * (Peek(Env + I) - &H10)
Next I
Init% = Lpeek(Tbbas)
Vector% = Lpeek(Tbbas + &H4)
Linor% = Lpeek(Tbbas + &H8)
Linor% = Lpeek(Tbbas + &HC)
Flip% = Lpeek(Tbbas + &H10)
Page1% = Lpeek(Tbbas + &H14)
Page2% = Lpeek(Tbbas + &H18)
Ofrm% = Lpeek(Tbbas + &H1C)
Tfrm% = Lpeek(Tbbas + &H20)
Tbo% = Lpeek(Tbbas + &H24)
Arptr% = Lpeek(Tbbas + &H28)
Bxx1% = Lpeek(Tbbas + &H2C)
Dim Obj%(31), Xrot%(31), Yrot%(31)

```

```

Dim Zrot%(31), Scale%(31), Col%(31)
Dim Rot%(31, 2), Pos%(31, 1)
Dim Endpunkt%(31, 1)
Lpoke Arptr%, Lpeek(Arrptr(Obj%()))
A = Xbios(4)
If A = 0 Then
  X% = 2
  Y% = 2
Endif
If A = 1 Then
  X% = 1
  Y% = 2
Endif
If A = 2 Then
  X% = 1
  Y% = 1
Endif
Return
Procedure Clippingwindow(X1, Y1, X2, Y2)
Dpoke Bxx1%, X1 / X%
Dpoke Bxx1% + 2, Y1 / Y%
Dpoke Bxx1% + 4, X2 / X%
Dpoke Bxx1% + 6, Y2 / Y%
Return

```

ject, 0-15 for low resolution, 0-3 for medium resolution and 0-1 for high resolution.

- **Scale%(N)**, where N is the object number. Determines the size of the objects. Permissible values are 1-511 with 64 being the object's actual size (1:1). Doubling this number doubles the size of an object.
- **Pos%(N,0)** specifies the X-position of the origin of object N. Permissible

range is 0-639, for all resolutions.

- **Pos%(N,1)** specifies the Y-position of the origin of object N. Permissible range is 0-399 for all resolutions with 0 at the top edge of the picture.
- **Rot%(N,r)** sets the sequence of rotations for object N. The value of r is the sequence with permissible values of 0-2, 0 being the first rotation, 1 the second and 2 the third rotation. Permissible values of the expression

are 1-3: 1 is the X-axis, 2 is the Y-axis and 3 is the Z-axis. For example, the expression $\text{Rot}\%(0,1)=3$ means that the second rotation ($r=1$) of object 0 is about the Z-axis (3).

- **Xrot%(N)** contains the integer values of rotation in degrees from 0-359 about the X-axis for object N. When viewed from the positive axis toward the origin, this rotation is always counter-clockwise.
- **Yrot%(N)** contains the integer values of rotation in degrees from 0-359 about the Y-axis for object N. When viewed from the positive axis toward the origin, this rotation is always counter-clockwise.
- **Zrot%(N)** contains the integer values of rotation in degrees from 0-359 about the Z-axis for object N. When viewed from the positive axis toward the origin, this rotation is always counter-clockwise.
- **Endpunkt%(N,a)** contains the X-position ($a=0$) and the Y-position ($a=1$) of the last point of object N. Permissible ranges are 0-639 and 0-399, respectively. After each **Vector%** call, the coordinates of an object N can be obtained from the **Endpunkt%** array. Then these values can be used as the position of object N and the object moved with just this single definition.

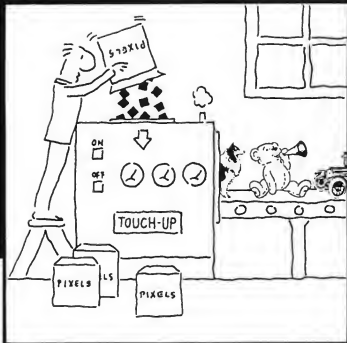
Getting the Manual

The original manual for GFA Vector is available by calling the Disk Desk at (800) 234-7001 or by writing to us at START. The price is \$1095, plus \$350 for shipping and handling. Ask for Item Number TH002. Remember, the number of manuals is limited, so act fast!

Send your check or money order in the amount of \$14.45 to: START GFA VECTOR Offer #TH002, 544 Second Street, San Francisco, CA 94107. ■

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5:00 p.m.:
Yay! Time for video games!



10:00 p.m.:
Okay, just *one* more game.

ARCADE ADDICTION

BY TOM BYRON, START ASSOCIATE EDITOR

Addiction. The very word conjures up images of gaunt, nervous figures hopelessly wandering the streets of a bleak, gritty metropolis in search of the substance that will make their lives briefly bearable again. But not all addictions are to substances. Take computer games for instance, particularly the arcade variety. At one time or another you've probably come across one that is so much fun to play that you find it hard to stop. The repetition and the slick, shoot-em-

up style compels you to keep at it. Personally, I'm almost glad I'm addicted to computer games. Whenever the day gets to be too much, I take a break, load up a game, sit back and play.

But, just what makes a game addictive? Is it merely stunning graphics and familiarity of gameplay? If it were, then every glossy scrolling game ever created would be a monster hit. No, a well-designed arcade game is much more: it begins at a just-conquerable level and

becomes more difficult at a pace even with the player's skill. It's not so difficult that it's out of reach, but never so easy that it quickly becomes boring.

Atari's *Missile Command* illustrates this point well. It has a seemingly endless number of waves that increase in difficulty as you progress. The first wave will fool you with how easy it is, but it makes you want to try the next one. Then you survive the second and third waves—by this time you may have lost



2:00 a.m.:

I can hit 300,000 if I can just get through this level—10 more minutes.



8:00 a.m.:

Why is my score going down? Why can't I stop?

EILEEN SASAKI

one or two cities, but you're still in good shape. You're now getting the hang of it and *know* you can stop any wave, but then you get to the fourth wave and the rain of missiles has now become a hurricane, coming down much faster than you ever expected. But you survive somehow. Even if you don't, there's always a next time. And you will win then, in fact you'll keep playing until you do. Sound familiar? Then, my friend, you are a computer games addict, too.

We Can Stop Anytime We Want

Three games have arrived in the START editorial offices within the last six months that should bear a Surgeon General's warning label: Addictive. Struggling through *Missile Command*, *Tower Toppler* or *Arkanoid* has become a favorite pastime around here. In fact, there have been times when people

Missile Command, Arkanoid and Tower Toppler can easily be called "addictive."

wondered if all we do is play games, but it really is research, you know. Because I'm apparently the only member of the editorial staff to be addicted to all three games, I get to do the reviews.

Of course, none of us is ready for the Betty Ford Clinic, but then again, none of us has made it to level 33 of *Arkanoid* yet, so there's still time. We're keeping a phone line open.

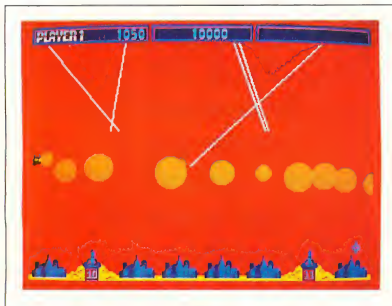
Missile Command from Atari

When I first played Atari's *Missile Command* over 10 years ago, I thought it was the greatest arcade game ever made, with graphics and gameplay no less than amazing. It was instant addiction and if I were the only person ever to play it, Atari would still have made a profit.

I still think it's the greatest arcade game ever made. And now Atari has ported it to the ST, though they haven't advertised the fact. Since I have an ST in front of me for the majority of the day, I have plenty of time between my editorial chores to sate my addiction.

Commanding Gameplay

If you're one of the few people never to have played *Missile Command*, you'll find gameplay fairly intuitive. The prem-▶



The greatest arcade game ever? In Atari's *Missile Command* you must save your six cities from the ravages of interstellar missiles. The game runs in all three resolutions.

ise is simple: you have six cities to defend against a hostile onslaught of Interplanetary Ballistic Missiles (IPBMs), Multiple Independent Re-entry Vehicles (MIRVs), Smart Bombs, enemy satellites and bombers. With your two missile bases and both mouse buttons, blast the enemy forces as they rain from the sky. Easy, right? Well, at first. . . .

Commanding Manual and Features

The *Missile Command* game manual is well written and concise. It's as a manual ought to be—it tells you how to play the game and doesn't waste your time with a pointless scenario and an elaborate copy-protection scheme. You'll find no surprises in gameplay. In fact, the manual and the game does everything to help you get through *Missile Command* with the least pain.

A word about *Missile Command*'s copy-protection: there is none. Atari recommends that you make a backup of the game before you play it. If you have a hard disk to store it on, you're even better off.

Missile Command runs in all three resolutions and is accessed at the Desktop. Double-click on MSL.PRG and you're at the title screen. To get into gameplay right away click on Start under the Options menu.

On the other hand, you might want

to do a little exploring. Press Control-C to exit a game and return to the title screen. The various options in the drop-down menus let you make playing *Missile Command* easier or harder depending on the challenge you're looking for.

At the height of my own bout with "M.C. fever," I lost patience very quickly. It helped a lot to scrap the MIRVs and SBMs, set the bonus cities for every 5,000 points and skip the first two waves. By the time I made it to the sixth wave, which I consider the most difficult, I was in great shape (though to some of you M.C. vets a high score of 250,000 is nothing to be proud of).

Recommendation

The most fundamental thing I can say about *Missile Command* on the ST is that it's fun and easy to play. The graphics and sound haven't evolved beyond the arcade level, but even that's okay. You still get all the excitement of the greatest shoot-em-up of all time.

Tower Toppler from Epyx

The best way to understand *Tower Toppler* without seeing it first is to repeatedly bang your head on the nearest wall. Really, it's that frustrating, that irritating and that difficult to get through. It's the first game to ever make me so

angry that I threw the joystick at my ST in utter contempt. Yet I have to admit I love this game. It's compelling, I mean, once I start playing, I just can't walk away.

Tower Toppler from U.S. Gold (distributed by Epyx) is an exercise in futility—the beginner doesn't stand a chance. It's the "throw them in the water to teach them to swim" method of gameplay. This doesn't make *Tower Toppler* bad, just that much harder.

Impressive 3D graphics and entertaining sound effects make *Tower Toppler* aesthetically pleasing. Beyond that there's nothing "pleasing" about it. A word of warning: the game works best with one megabyte or more of RAM. Although it usually works fine on a 520ST, it does lock up once in a while.

Goal and Gameplay

Forget *Tower Toppler*'s vague and ambiguous scenario in which you are a seadog operative who works for Desstructo, Inc. (Makes you sound like a bad guy, doesn't it?) There are eight towers and two missions. Your goal is to get to the top of each tower and "topple" it. Oh, how I wish it were as simple as it sounds.

Tower Toppler boots automatically, and a joystick controls gameplay. At the title screen press the F8 function key to alternate between missions. Press the joystick trigger and you'll see the first tower.

Now, with impeccable timing and iron nerve, begin your journey up the tower. Negotiate past the various obstacles as quickly as you can. You'll need some fast and clever thinking to get all the way to the top because to add to the frustration, *Tower Toppler* has a time limit. I think it's superfluous, and would be better without it.

A Few Things to Note

Tower Toppler doesn't tolerate mistakes, so you have to be particularly careful where you step. Start out in the wrong

direction and you're one dead sea dog.

Once in a while something that resembles a model of a molecule will come flying across the screen. Avoid this at all costs! There is no way to stop or destroy it and if it hits you, you'll find yourself falling into the toxic waste below.

The pink balls you see bouncing around are balloons. They, too, can knock you over. You can get rid of them by standing the sea dog still and pressing the fire button. From your sea dog's legs will fly a small, dark ball that pops the balloon. Your weapon is also useful for destroying the flashing block barricades. I'm still not sure what this weapon is, but it works.

Getting to the End

It'll probably take several games—or more—before you make it to the top of even the first tower. I found that once you do get there, you understand the game well enough to make a good show in the next levels. (Editor's note: *Ha!*)

You might be a little disappointed when you finally reach the top of the first tower because nothing really happens. I guess I expected it to blow up or something spectacular like that, given the sophistication of the graphics. You'll see what I mean when (and if) you get there.

Between levels you get a chance to gain bonus points and time by shooting at fish from inside your minibus. Be aware that the faster the fish swims by, the bigger the bonus is when you shoot it. Also, a bonus sea dog is awarded for every 5,000 points.

Tower Toppler doesn't have a save-game feature, so every time you play you'd better get through the whole thing in that one sitting. This is an unfortunate lack of a much-needed option. It takes long enough to get through a level as it is, but to get through all eight would take more hours than you probably have time for in one sitting.

There is, however, a shortcut that will

at least let you go to the level of your choice. Don't look for it in the manual. I found this tip in the British magazine *ST Action*. At the title screen type `HellolamJMP`—no spaces—and press the trigger to begin the game. Now press any of the function keys (F1 to F8) to go to the tower you wish to play. I've tried it, and it works. Note: JMP are the initials of John Philips, Tower Toppler's creator.

Recommendation

What can I say? More than a month after Tower Toppler arrived in the office I was still playing it practically every day. And when I took it home over the

did one addiction end than a new one began. I should add that of all three games reviewed here, this is the only one to which the whole *START* editorial staff is addicted. (Editor's note: *I am not!*) (Reviewer's note: *Yes, he is.*)

If you've played Taito's *Arkanoid* at the arcade, you'll know how easy it is to get hooked. This game is a Tower Toppler addiction—one easily avoidable slip and it's over. But it's also a Missile Command addiction—constantly increasing demand on your physical ability. Part of its appeal has to be its familiarity—Breakout in its Sunday best. The premise is the same: a series of bricks at the



Tower Toppler may be the ultimate exercise in futility, but it's a lot of fun. With your sea dog operative you must reach the top of eight towers, in the time allotted. This screen shot only hints at the game's sophisticated graphics.

weekends I played it until my head and eyes ached. (Life? What life?) The problem is that after all that time I still made it only halfway up the third tower.

Well, the topplin' fires have finally died and I'm a free man once again, though every now and then I'll be standing in a line at the grocery store or some other public place and begin to scream uncontrollably about sea dog operatives and bouncing eyes. I hear the flashbacks end after a couple years.

Arkanoid from Taito

I may have been premature in saying I'm now a free man because no sooner

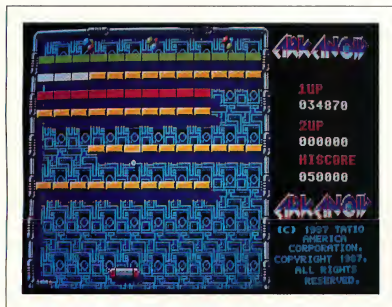
top and a paddle at the bottom. With the paddle you must hit a bouncing ball to destroy the bricks. Once the bricks are cleared from the screen, you move onto another screen and do the same thing. On the ST this process continues for 33 levels. *Arkanoid* is mouse-controlled and works only on color monitors.

But There is a Difference

Arkanoid's similarity to *Breakout* ends with the basic premise. In fact *Arkanoid* has features that make its ancestor look, well, ancient.

At the desktop, click on ARKA- ▶

NOID.PRG. After about a minute the title screen will appear, where you click the right mouse button to go to the scenario screen. Unfortunately, you *must* go through this screen to get to the game. Be prepared to suffer through inane music and an even more inane scenario. What a waste of memory!



According to the manual it is here that you choose two players by pressing 2 on your keyboard. The problem is that you have no way of knowing you're in two-player mode until you start the game. I've repeatedly pressed 2 only to find that I'm in the one-player mode when the game begins. Since Arkanoid doesn't have a restart game function, you have to die (or commit suicide) before you can reset the number of players.

Once you get to the game, you'll be impressed. The colors and graphics are good, though the sound effects tend to be obnoxious. In the office we usually play the game with the sound off.

The Bricks and Cannisters

The bricks on the Arkanoid game screens are different colors, and like Breakout, each color gives you a different score as you destroy it. Note that the silver bricks have to be hit a number of

times before they disintegrate, and the gold bricks can't be destroyed at all.

Every now and then a colored cannister with a letter on it falls from a brick that you hit. Grab these cannisters for extra powers. For instance, grab the green C to catch the ball and aim it at the point of your choice. Grab the silver

Arkanoid, the only game that everyone in the START editorial office is addicted to. The latest creation for the ST from Taito has 33 levels, and lots of special features to keep gameplay exciting.

trapped and you want to get rid of a lot of bricks in a hurry. However, keep in mind that once the D is in use, you lose access to all other cannisters. Always—always—take a B or a P.

The ball speeds to a blur apparently at random. It also speeds up when it's caught in a rut. Just when you think the ball is stuck in a pattern that seems like it will last all day, it suddenly speeds up and gets past you. An S cannister will slow it down, but not by much. I don't use the S cannister very often. Actually, no one here does.

Wrap-Up and Recommendations

In the ST version of Arkanoid there are 33 levels. Taito won't admit to any shortcuts or backdoors, and like Tower Toppler there is no save-game feature.

There is a surprise waiting for you at level 33, however. Apparently it involves a battle with an alien, but I'm still working on getting there. So far I'm the reigning Arkanoid champ here by making it to level 32 (I had just one brick left). Admittedly, I had a little help, but you'll have to wait for the August 1989 issue of START to find out how I did it.

Is Arkanoid addictive? START received the game almost three months ago and every day you can still hear the occasional call for a "Noid break." Now I wonder what game will free me from this one. ■

PRODUCTS MENTIONED

Missile Command, \$29.95. Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086, (408) 745-2000.

Tower Toppler, \$49.95. Epyx, Inc., 600 Galveston Drive, P.O. Box 8020, Redwood City, CA 94063, (415) 368-3200.

CIRCLE 167 ON READER SERVICE CARD

Arkanoid, \$34.95. Taito Software, 267 West Esplanade, North Vancouver, BC V7M 1A5, (604) 984-3344.

CIRCLE 168 ON READER SERVICE CARD

P to get extra paddles or the red L for laser fire. The pink B is the best—it lets you advance to the next level and awards you 10,000 points. By the way, the silver bricks yield no cannisters, so imagine a whole screen made up of only silver bricks—it happens at the eleventh level.

The screens themselves vary in difficulty of play, and there is a definite strategy to follow. Level three is tough to get through, but level four is pretty easy. It's in screens like level four that the laser comes in handy, because you can just mow down the bricks.

Don't be seduced by the 1,000 points each cannister gives you because some cannisters are more useful than others, and you want to hold onto the useful ones as long as possible. For example, you won't want to grab a pale blue D until you really need it. This is because the D turns your one ball into three balls, which is fine if your ball is

Juggler II, Switch/Back And Revolver

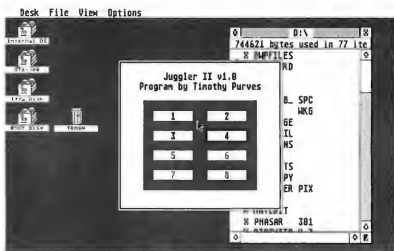
When You'd Rather Switch Than Fight

BY DAVID PLOTKIN
START CONTRIBUTING EDITOR

The Atari ST is a powerful computer, but it was never designed to run more than one program at a time. Of course, few people really *need* to run more than one program at a time (except for special uses like telecommunications). There are many times, however, when it would be nice to have two or more programs available in memory and switch between them, such as when writing a review of a program. You could load the program and your word processor in the computer at the same time and switch between them as needed. Or you could combine a spreadsheet and a word processor or database and share information using disk storage.

The ST is not really set up for this arrangement, either, but there is help. Three different programs make some form of this "task switching" possible. It's important to realize that each program has some quirks and will have problems switching between certain programs. It is best to learn which programs work best with which switching program—and keep back-ups just in case.

Another thing to keep in mind with



these programs is that to use them to their maximum capabilities, you need to have enough memory. For many purposes, dividing a 1040ST into two 520STs is enough. If you want to switch between CAD-3D 2.0 and Cyber Sculpt, however, you'll need at least two megabytes of memory, since each requires one megabyte itself. Keep your own needs in mind.

The Juggler and Juggler II

The first program to provide task-switching was MichTron's Juggler, which let you have multiple programs visible

in different windows on the screen.

Only the program in the active window was actually running; the others were suspended. You activated a window by clicking on it. Juggler was a good idea that didn't work very well because many programs either were not GEM-based (and thus wouldn't run in a window) or didn't follow the rules for programming under GEM. MichTron then followed up with Juggler II, which works somewhat differently. Both programs are provided by MichTron on one disk.

Juggler II partitions your ST's memory and treats each partition as a sepa- ▶

MichTron's Juggler II doesn't look like much, but it works perfectly and lets you switch between two programs of your choosing. For small businesses, graphics or writing, this kind of program is a godsend.

rate computer that can run any program you choose, but only one partition is active at a time. Partition sizes can range from 256K (hardly useful) to 2 megabytes in a 4-megabyte machine. Up to eight equal-sized partitions can be specified.

To set up Juggler II, you must rebuild your AUTO folder so that Juggler II runs last. Upon booting, Juggler II shows the amount of memory present and your choices for memory configuration. You can select a configuration, abort, or do nothing, in which case Juggler II will use the choice you made the last time you used it. After automatically rebooting to set the partitions, your first partition will be booted. To switch to other partitions, you press the Alternate and Shift keys together. As each partition is accessed for the first time, it boots.

Thereafter, switching to another partition activates it; whatever program you had been using in that partition starts up again from the exact point you left it.

Juggler II is quite flexible. The partitions can be in different resolutions (on a color monitor) and nearly all programs work properly with it. Moreover, the partitions can be customized. If you set up a folder called AUTO1 on your boot disk, the programs in that folder will be used to boot partition one, while the programs in folder AUTO2 will be used to boot partition 2 and so forth. You can even have DESKTOP.INF files in these AUTO folders so that the layout of the Desktop in each partition can be customized. Finally, you can autoboot to a GEM or TOS program when a partition is activated for the first time by including a simple ASCII file called JUGGLER2.GEM in that partition's AUTO folder.

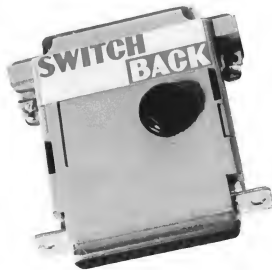
Juggler II comes with a desk accessory that lets you switch partitions without using the Shift and Alternate keys. This is especially handy with programs which won't permit the keypresses required by Juggler II.

In general, Juggler II works well with

programs that load from the Desktop. Games usually don't cooperate in this respect, but most utilities and even desktop publishing programs seem to behave well with Juggler II. Disk cache programs can cause disk damage for a variety of very good reasons and you are warned not to use them—this is true with all of the switcher programs looked at here.

Switch/Back

Switch/Back from Alpha Systems is a hardware/software combination that allows task switching much as Juggler II



This small box is part of Switch/Back from Alpha Systems. It plugs in between your printer and computer in the parallel port. If you have a Mega, this could mean trouble, since you must reach the black button to switch programs.

does—but works completely differently. The hardware is a small box that plugs into the printer port between the computer and any printer.

To use Switch/Back, you must place the partitioning program in your AUTO folder so that it loads last. Each time you start up, you then press the reset button on the Switch/Back box to reboot and engage Switch/Back. After that, your Desktop will appear just as it always has.

Switch/Back uses buffers to maintain

program states. When you first boot Switch/Back, you can stay at the Desktop or load a program. When you're ready to switch programs, you must press the button on the printer port box to freeze the current program. You can then capture the current program into a buffer, restore the buffer contents into the current program space (providing you have captured something into the buffer previously) or use the alternate option, which swaps the contents of the buffer and the current program space. You can also save the contents of a buffer to disk in a compressed format or load a previously saved buffer from disk—but you must use a special program included with Switch/Back.

By using the buffer, you can accomplish a lot with Switch/Back. You can load a program, save it to the buffer, then quit and load another program. From then on, you can alternate between the programs. Or you could load a program, then save it in its current state into the buffer. This provides an undo function, since you can always reload the program in its saved state from the buffer. Finally, since the buffer can be saved to or loaded from disk, you can now save games that don't otherwise have a "save game" feature.

Switch/Back can use multiple buffers (all must be the same size), but you must use a different boot-up program in the AUTO folder to use a different partition size. This is inconvenient. But even more inconvenient is the fact that both the printer port and the reset button are inaccessible on a Mega. This is not Alpha's fault, but it does make their product more difficult to use.

In its current revision (2.0), Switch/Back seems to work quite well. As with Juggler II, it can't really work with programs on self-booting disks such as games that don't allow the Switch/Back software to be installed. Alpha's advertising touts its ability to back up protected software to a disk file, but this only works if the software is not on a

boot disk and is all loaded into memory at once—many games load portions at each level.

Revolver

Easily the most full-featured of the programs reviewed here is Revolver from Intersect software. To use Revolver, you must install it so that it boots first in your AUTO folder. Although this normally means deleting and rebuilding your AUTO folder, Revolver has a utility that installs the program in the AUTO folder first.

Like Juggler II, Revolver divides your ST's memory into partitions and treats each one as a separate computer. Initially, Revolver sets up your ST with two equal partitions, but you can use up to eight partitions *and they don't have to be of equal size!* Blocks can be specified in increments of 256K.

Once Revolver is active, pressing the Shift and Alternate keys brings up a control panel with buttons both for configuring the program and accessing Revolver's many features. You can switch partitions from this panel or cycle through them by pressing the Control, Alternate and Shift keys.

The first time a new partition is accessed, it boots from disk. The boot disk must contain a copy of Revolver or you won't be able to switch out of that partition (because Revolver isn't active in that partition). Revolver is extremely successful in fooling the ST into thinking that only the active partition is present. Pressing the reset button only reboots the active partition (which is how you can reboot a partition to install Revolver). Further, even copy protected games will boot and run in a partition (although you can't access Revolver from them).

Besides the ability to load and use more than one program, Revolver provides functions for saving (Rollout) and loading (Rollin) a partition from a disk drive in a tremendously compressed format (when I tested Revolver, a one-

meg partition created a 383K disk file). This file is an exact picture of the memory contents, including the 68000 registers. By loading the rolled-out file back into a partition (which must be as large as the partition it was rolled out from) you return to the exact point at which you rolled the partition out—thus providing an undo or game-save feature. You may not roll out or roll in your current partition, but you can change to a



different one and then roll out (or in) that partition.

Revolver provides a host of features and utilities.

different one and then roll out (or in) that partition.

Another advantage to using Rollout/Rollin is speed. My word processor takes almost two minutes to load its dictionary and set it up in memory. However, once it has done so, rolling that partition out to the disk lets me load the "picture" of memory later—with my word processor and dictionary already set up. This saves over a minute in load time.

The Revolver main screen provides a whole host of other features. A reset-proof RAM disk, print spooler and disk

I/O buffer can all be specified and sized. (These will survive a warm boot.) A screen of disk file functions (copy, rename, move, delete, lock, hide, new folder, delete folder and floppy format) is available behind one of the buttons, as are such things as key click control, key repeat on/off, bell on/off, a way to send character strings to a port, set the mouse speed (handy!) and set the time and date. A VT-52 emulator is also included, along with a timed automatic reminder (which can be toggled on/off) to roll out a partition.

One unique function of Revolver is its ability to view another partition without switching to it. You can move the secondary partition on and off the screen under mouse control. This gives you a quick look at other partitions when you need it. Finally, you can even set up a fix for the famous 40-folder bug by specifying the number of folders for which you want to allocate space (100 folders takes about 17K of memory).

The manual that accompanies Revolver is very, very good—but using Revolver is so intuitive that you'll probably only glance at the manual once. Revolver does have two annoying quirks, however. First, it uses its own file selector box, which is not difficult to learn but is totally unlike anything else on the ST. A file selector like Universal Item Selector II would have been nicer. ▶



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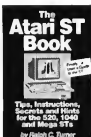
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CIRCLE 014 ON READER SERVICE CARD

I wish there were an advanced ST book for us non-programmers.



There is! The 159 page Atari ST Book, by Ralph C. Turner, begins where your owner's manual leaves off. "Hard copy of a year's worth of user group meetings run by a master teacher." (ST Informer.) "Very useful on every level, from rank beginner to the most advanced ST owner." (ST Business.) Covers RAMdisks, printer codes, modems, desktop tricks, control panel palette settings, and 12 other chapters. \$16.95, plus \$2.00 for shipping. Check, MO, Visa, MasterCard. Index Legalis, PO Bx 1822-31, Fairfield, IA 52556. (515) 472-2293.

CIRCLE 017 ON READER SERVICE CARD

Review Juggler II, SwitchBack and Revolver

Far more annoying is the fact that the dialog box which appears for switching or rolling in/out partitions always shows all eight available partitions and lets you select one of them even if they don't exist. Nothing happens if you choose a partition that isn't there and if you choose your current partition you are warned; would it have been so hard to "gray out" the invalid choices?

Summary

All three programs examined here perform quite well, although there is significant variation among them. Juggler II lets you custom-configure your partitions, but the partitions must all be the same size. It seems to be the most bullet-proof of these switcher programs. Switch/Back lets you save partitions in memory or to disk but requires pressing its awkward reset button every time you want to use it. Revolver won't save memory to another partition and won't let

you auto-configure your partitions—but it comes with extensive utilities and allows different-sized partitions.

Pick what you need, but once you've tried having multiple applications instantly available, you'll never want to go back. ■

David Plotkin is a chemical engineer for Chevron U.S.A. and a START Contributing Editor.

PRODUCTS MENTIONED

Juggler and Juggler II, \$49.95. Mitchron, Inc., 576 South Telegraph, Pontiac, MI 48056, (313) 334-5700. CIRCLE 160 ON READER SERVICE CARD

Switch/Back, \$69.95. Alpha Systems, 1012 Skyland Drive, Macedonia, OH 44056, (216) 467-5665. CIRCLE 161 ON READER SERVICE CARD

Revolver, \$49.95. Intersect Software, 2828 Clark Road, Suite 10, Sarasota, FL 34231, (800) 826-0130; in Florida, (813) 923-8774. CIRCLE 162 ON READER SERVICE CARD

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Switch/Back is a revolutionary new hardware and software package that lets you get more from your ST MUCH MORE. Switch/Back's gaming features lets you instantly save most games then continue playing. If you get in trouble you can switch back to where you were as many times as you like.

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SWAP—Switch back lets you load just about any two programs into your ST and switch instantly between them. It works with games, business programs, utilities, compilers, etc. Although only one program is running at a time, the other is available instantly, right where you left off.

The Switch/Back hardware plugs into your printer port for easy use (It has a pass through connector for your printer too.)

Switch/Back requires at least One Meg of memory (Or a Polydisk or Megadisk)

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The book includes topics such as Phreaking, Logic Bombs, Hardware data keys, the legal aspects of piracy and software protection, Custom disk format, Pirate Bulletin boards and much more.

In addition it contains reviews of the popular ST back-up programs and detailed explanations of ST disks and drives.

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Note: Those with only 512K of main memory can use Switch/Back with a Polydisk, just like those with one Meg.

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dBMAN V, in a package of three separate functions: Database Management, Report Printing, and Program Development, is the only database management program which has all the power, flexibility, and capacity that you'll ever need!

At the Database Management level, dBMAN V allows you to structure, enter, retrieve, and modify data. At home, **dBMAN V** can keep track of your recipes, address book, video tape library, and more. In the office, **dBMAN V** can be programmed to manage your entire business including inventory control, payroll, invoicing, and billing.

At the Report Printing level, dBMAN V has an integrated, high-powered, and fully relational report writer that allows you to create reports in a flash with absolutely no programming!

Report layouts are designed by placing fields at the desired locations on the screen.

This can easily be accomplished with the built-in cut, paste, and copy functions. The finished screen-layout reflects the printed output. From simple personal reports like recipe cards, mailing list, and video tape libraries, to

complex business reports such as inventory count sheets, packing lists, employee payroll reports and customer billing statements are easily created.

At the Program Development level, dBMAN V is the only database manager for the Atari ST that is compatible with the dBASE III Plus language. With this awesome programming power, you can develop and customize any programs to fill your home and business needs. For your home, create a check book program, with complete bank statement balancing to manage your

personal finances. For your office, customize a complete accounting system to fit your business needs.

Also available for **dBMAN V** is the high performance Greased Lightning compiler. This compiler fully supports macros, and executes dBASE programs up to 16 times faster than dBASE III Plus.

dBMAN is also available on Novell Netware, IBM PCNET, PC DOS, SCO Xenix, UNIX on NCR Tower, NEC ASTRA XL, Motorola 8000, Altos, Microport 286 and 386, Apple Macintosh, and Commodore Amiga.



dBMAN V's features:

- ✓ dBASE II and dBASE III Plus compatibility
- ✓ Easy-to-use, pull-down menu interface to create, add, edit, and report database information
- ✓ 320 programmable commands and functions
- ✓ Password protection and data security at field level
- ✓ Easily transport your dBASE III data files and programs between Atari ST and PC's
- ✓ Extensive data validation including range checking
- ✓ Single command menus: vertical, horizontal, scrollable and pull down menus
- ✓ User defined pop-up windows
- ✓ Create a GEM pull down menu, mouse menu and file selector
- ✓ Run GEM application from dBMAN
- ✓ Program debugger/editor.
- And more...

Report Writer features:

- ✓ 9 group levels
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- ✓ Page headers, page footers, group headers, group footers, titles, summaries, and body lines
- ✓ Print labels up to 99 across
- ✓ Conditional printing of any items
- ✓ Compute running sums, counts, averages, minimums and maximums
- ✓ Relate and report from up to 9 database files with lookup (one to one) and scan (one to many) relations. And more...

Specifications:

- ✓ Field types: Character, Numeric, Date, Logical, Memo
- ✓ Maximum characters per field: 254
- ✓ Maximum number of records per database: 2 billion
- ✓ Maximum number of index files: no limit
- ✓ Maximum record size: 4000 bytes
- ✓ Numeric precision: 17 digits

System Requirements:

- ✓ Atari 520, 1040, or MEGA ST with one floppy drive and 480K free RAM.



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ST Accounting For Home And Office

STAccounts, Pha\$ar

BY STEPHEN G. ROQUEMORE

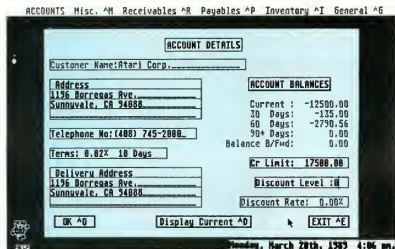
If you're looking for a good accounting package for a small business or to keep your home finances straight, STAccounts 2.0 and Pha\$ar 3.0 are two good choices. Let's look first at STAccounts 2.0.

STAccounts 2.0 from ISD Marketing is an excellent accounting package for any small business. It now supports GEM windows fully and is no longer copy-protected, making hard disk installation possible. It can also be used with one or two double-sided disk drives, although it's easier to set up with a hard drive. It *will not* support floppy disks formatted with Mega-Twister, however.

STAccounts will handle General Ledger, Accounts Receivable, Accounts Payable and complete Inventory processing. It does not support Payroll or Forecasting, however. You can generate purchase orders with the Report Generator feature as well as back-order reports based on information entered through the Invoicing section.

Manual Labor

The new spiral-bound manual is very well-written, professional and thorough.



ISD has done a good job implementing the GEM version of STAccounts. Not only is Version 2.0 easier to use, but it's improved in many ways over Version 1.0. Any small business should consider this accounting package.

It discusses loading the program, using the Report Generator (including a separate tutorial), Accounts Receivable, Accounts Payable, Inventory Control, General Ledger, and Period and Year/End processing. The manual, although a little more "generic" in its wording, is still geared toward the IBM PC and compatibles and all GEM screen dumps are from the PC version.

You must read the manual thoroughly before installing and using STAccounts. Curiously, it says nothing about making a backup copy of the master disk before using the program; this is something you absolutely *should*

do, then use the copy for your work and store the master in a safe place.

Be sure to return your warranty registration card, since no assistance of any kind will be given unless it's on file with ISD. A technical hotline phone number is given in the manual; be aware that it is *not* toll-free.

Setting It Up

Your first task (after making a backup) is to set up your data disk, system parameters, change the data file size and enter the company information. When this is complete, your formatted data disk is updated with this information. ▶

Account	Balance	Last Transact	Account	Balance	Last Transact
1 Checking	\$1888.87	May 26 DM/Tel	6 Visa	-457.92	May 25
2 Sears	-5157.14	May 26	7		
3 Deductions	58.88	Sep 14	8		
4 Savings	5284.02	Apr 30	9		
5 Bsns Check	5263.66	May 25	18 CASH		Sep 14

Recent transactions for: Savings					
Date	Payee	Category	ChkNum	Amount	
Feb 29	Payment (Checking)	Xfer Into		\$100.00	
Mar 11	Bsns Check	Xfer Out		\$2900.00	
Mar 21	Payment (Checking)	Xfer Into		\$188.00	
Mar 31	..Deposit..	Interest		\$66.66	
Mar 30	Payment (Checking)	Xfer Into		\$100.00	

Account	Amount	Cont
Savings		

Strike SPACE BAR to continue . . .

If you're using the General Ledger (G/L), you create these accounts next because they're used by all of the other modules. There are 12 pre-defined G/L accounts which you can keep or change as you wish—but you cannot change them once transactions have been entered. Next comes entering the tax and discount rates. Then you create the Accounts Payable (A/P) accounts, the Inventory Control data and finally the Accounts Receivable (A/R) accounts.

All transactions for customers and suppliers are entered through the A/R or A/P menus; there is also an Invoice/Credit option under the A/R Menu to process transactions that require paperwork; those which do not affect the inventory and don't require paperwork are entered through the Journal Posting Facility. This Facility is also used for all A/P transactions, including utility bills and inventory items. Everything is done through GEM screens, making it very user-friendly.

Reporting As Ordered

The reporting capabilities are outstanding. You can use the supplied reports as they are or modify them—or design your own—using the Report Generator. STAccounts provides printer drivers for the Epson FX-80 (the default), HP LaserJet and standard ASCII printers or you can create your own driver with the provided printer driver construction program.

The only drawback I could find is that when you request a List option from one of the Main Menus, you are first given the Output Control screen to select your printer, output port, destination and other characteristics; then, when you click on OK, you are presented with the requested report in a screen window, below which window are selection buttons for Exit, Next (page) and Print, which will then print the report to the previously selected destination. This gets to be tiresome; the Output Control screen should appear only *after* you have selected Print. (This also occurs in the Reports module).

All things considered, any small business would be happy with STAccounts. While it doesn't handle forecasting and Payroll, there's other software that does. It's easy to use and makes a boring task much easier to live with.

Pha\$ar 3.0

The best program available for home accounting on the ST has become even better. Pha\$ar (Professional Home Accounting System And Register) provides almost every feature you would want in a home accounting package. It will handle regular payments and deposits, cash transactions, transfers between accounts (but not income or expense categories), splitting amounts between categories, and limited reporting capabilities. It also provides a separate module to process

Pha\$ar 3.0 is a superb home accounting package. It includes almost all of the features you would want and odds some that you might not have thought of.

your taxes.

The manual is well-written and easy to understand, including an introductory chapter and a nine-chapter tutorial. It's written in a folksy style, which some may not be used to, but I feel it helps to see how you might use each feature. The next eight chapters are the reference section and correspond with the tutorial chapters. These provide more in-depth information about the topics covered.

Updates and Features

Version 3.0's changes from 2.0 include a common payee list, a most recent transactions list, the ability to cancel out of an account reconciliation, several choices of sorting categories and an upgraded calculator feature. It also allows check printing for window envelopes. The split transactions feature now shows a default amount for the Amount prompt, and fiscal year accounting is now supported. You can also save the register file without exiting the program, alter the system date and time directly and choose your own display colors instead of the (rather unpleasant) program defaults.

There are several other improvements detailed in the manual as well as extensive improvements to the tax program such as creating customized reports using the register file data. (The Tax Advantage, by Double Eagle Software, will now process Pha\$ar data files).

Essentially, Pha\$ar employs a modified single-entry system. When Transferring between accounts, it will create the second entry for you. Other programs use the double-entry system which requires you to enter two transactions to effect a transfer.

Setting Up Pha\$ar

To use Pha\$ar, you first set up your checking and savings account(s), assets and liabilities. (Assets include such things as your furniture, computers,

home, etc. and liabilities are your mortgage, credit cards, other debts.) These all receive an initial balance. Liabilities must carry a negative balance—that's how Pha\$ar knows they're liabilities.

Then you set up your income and expense categories according to how accurately you want to track your money. You can have 39 accounts, 29 income categories and 97 expense categories. Miscellaneous income and expense and a Cash Account are automatically defined for you.

You can enter up to 500 transactions per month; the register file has room for one year's worth of transactions. You can also pre-define 17 sets of up to 20

you then confirm by pressing Return. When you're finished, just press the Esc key to see a report of the balancing. You should also use this method to reconcile all transactions against your other accounts.

One Complaint and Lots of Praise

I have only found one thing to complain about in over 16 months of using this program: the split transaction feature lets you split transactions between expense categories only; it does not permit splitting between expenses and liabilities, nor can you split deposits between incomes and assets. For example, if I want to pay my mortgage, I may want to split the total between mortgage interest (a tax-deductible expense) and home loan (a liability); I must enter one transaction to pay the interest expense portion, then enter a transfer from checking to home loan to reflect the reduction in principal.

Otherwise, I have absolutely nothing but praise for this package. It does everything it says it does, it's easy to use, it's eminently suited to home accounting and it *does not fail!* With the proper setup, this program could also be used for a very small business; however, I wouldn't recommend it for that. But I highly recommend Pha\$ar if you want a complete home accounting package. ■

Stephen G. Roquemore is a professional programmer on IBM mainframes but is a longtime ST user. This is his first article for START.

PRODUCTS MENTIONED

STAccounts GEM Version 2.0, \$149.95, ISD Marketing, 2651 John Street, Unit 3, Markham, Ontario L3R 2W5, (416) 479-1880; Technical Support (416) 479-1991.

CIRCLE 165 ON READER SERVICE CARD

Pha\$ar Version 3.0, \$89.95, Antic Software, 544 Second Street, San Francisco, CA 94107, (800) 234-7001.

Pha\$ar provides almost every feature you'd want in a home accounting package.

transactions each and use them to speed data entry for common or recurring items.

Pha\$ar lets you define a net worth statement easily using the balances in the accounts on the register file. You can include any or all of your asset and liability accounts to customize the report—which you can modify at any time to reflect changes in your account structure. Pha\$ar also lets you keep a list of special occasions which the program can display automatically upon booting.

You can reconcile your checking account against your bank statement by entering the account number, the ending balance from the statement and the ending date. Pha\$ar will produce a list of all unconfirmed transactions which



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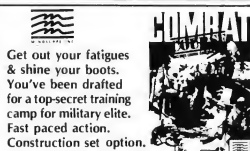
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Mac and PC On The ST

Hard Drive Help And Curator

BY DAVID PLOTKIN
START CONTRIBUTING EDITOR

As long-time owners of Magic Sac have learned, using a hard drive is pretty complicated. Data Pacific has devoted much time, effort and documentation to instruct users about it. To be fair, the fault is not Magic Sac's; it stems instead from the fact that the original 64K Apple ROMs (which are what the Magic Sac uses) really weren't set up properly to use a hard drive. The newer 128K Apple ROMs used in Gadgets by Small's Spectre 128 are designed to work with a hard drive, making hard drive installation quite a bit simpler.

If you want to use a hard drive with Spectre 128, you'll have several options. First of all, you can instruct Spectre 128 to reformat one partition of your hard disk. The partition must have been previously formatted for TOS and once Spectre 128 has reformatted it, it will no longer be available to your ST *except* when you are running Spectre 128. And, as usual, reformatting the partition erases everything on it. A word of caution: it's best to assign the last partition on your drive to Spectre 128—otherwise TOS may not be able to read any partitions beyond it.

You need to know a few things first. When you format a hard drive partition under Spectre 128, the default settings



Supra's FD-10 works quite well with Spectre 128—and you don't have to devote a hard disk partition to Mac programs and files. Use the Spectre 128 hard disk formatting function with SCSI device #4.

assume that you want to boot from the hard drive. Of course, you probably will want to do this eventually, but you must first install the System Folder (containing the System and Finder) on the hard drive. If you run Spectre with the hard drive autoboot set, but *without* the System and Finder on the hard drive partition, the result will be a complete system crash (trust me on this one—I tried it).

Further, until you set Spectre 128 up properly to autoboot from the hard drive, the hard drive icon will not automatically show up on the Desktop. To get it to appear, you must press a Func-

tion key (typically F3—for the first Spectre hard drive partition). If you do autoboot from the hard drive, however, then the hard drive icon does show up automatically.

The Floppy Alternative to a Hard Disk

If you own one of Supra's FD-10 "super floppies," which store 10 megabytes on a specially formatted 5¼-inch floppy, you will be delighted to know that this device works quite well with Spectre 128. It is an SCSI device and Supra sets its identification number to 4. To format an FD-10 floppy, you just use hard disk format under Spectre 128, setting the SCSI ID to 4. Since you can interchange the floppies, you aren't giving up one of your hard disk partitions permanently.

Mac Graphics and Curator

Once you are up and running on your Mac hard drive, you'll want to start putting programs on it. One nice thing about many Mac programs is that they can accept clip art from other programs through various methods, including (if all else fails) the clipboard. Thus, clip art has become very popular in the Mac world and there are many commercial and public domain clip art packages available. The handiest collections are ▶

Current Notes' Magic Sac PD Library. The clip art is already in Magic Sac format, and the price is right. The Current Notes library also includes many games and fonts as well, all tested to run under Magic Sac/Spectre.

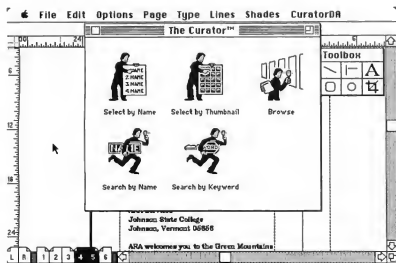
There are many graphics "standards" for Mac graphics and though most programs can read and save files in several of the formats, it's helpful to have a conversion program. Curator from Solutions International is such a program, but converting among the seven different graphics formats it supports is only

graphics you need. As your collection of graphics grows, it can become difficult to find the file containing the one piece of clip art you want to use. Curator can find graphics by filename, partial filename, keyword or thumbnail. These last two are very useful. Curator lets you associate special keywords with a graphics file. These keywords are then stored in a catalog so that by specifying one or more keywords, you can find files with any or all of those keywords. Any file that matches the specification has its thumbnail sketch displayed—a

thumbnail. If you were looking for the file by thumbnail, opening the file is as simple as double-clicking on the thumbnail sketch. The full-size contents of the file are shown in a window and you can cut any portion (or the whole graphic) to the Mac's clipboard. This is quite handy; for example, let's say you're using MacDraft, a drafting package which doesn't understand any of the seven file formats supported by Curator, but can accept graphics from the clipboard. Using the Curator Desk Accessory, you can locate the graphic you need, open it, cut out a piece to the clipboard, close up Curator and then paste the contents of the clipboard into MacDraft. Before Curator, you would have to quit MacDraft and use another application (such as MacPaint) to paste a graphic (if you could find the right one) to the clipboard, then restart MacDraft and paste the graphic into the document.

There is one problem in running Curator under Spectre 128 or Magic Sac. The Browse function, which lets you work with the keywords for all graphics at once (as opposed to the keywords of a single graphics file at a time) causes a system crash if you try to open a graphics file. Aside from this problem (which you can work around), Curator works well and fulfills a very real need. Now, if someone would just write such a program for the ST! ■

START Contributing Editor David Plotkin is a chemical engineer for Chevron U.S.A. and has published several articles in START and Antic.



Curator from Solutions International is a Macintosh program that not only converts among seven common Mac graphics formats, but also helps you to locate that particular piece of clip art for your masterpiece.

one of the program's many useful features. Curator is easy to use—it's all menu driven and uses intelligently designed dialog boxes.

Curator can be used either as an application or desk accessory so that its capabilities are available within other programs. Changing the format of a graphics file (including clip art) is quite simple—just open the file under Curator, then save it with a different name, specifying the save format. Common file formats, such as MacPaint, PICT (MacDraw), EPS (Encapsulated Postscript) and TIFF (scanned documents) are all supported, although not every format can be converted to every other format.

Finding That Elusive Clip Art

Another useful feature of Curator is that it can help you locate the particular

thumbnail sketch is a reduced representation of the graphics in the file—so you can get an idea of the contents of a graphics file without having to open it. When searching by thumbnail sketch, Curator even presents you with a window containing thumbnail sketches of all the catalogued graphics on your disk.

Once you have found the file you want to use, you can open it under Cu-

PRODUCTS MENTIONED

Public Domain Clip Art Disks, \$4.00. Current Notes, 122 N. Johnson Rd., Sterling, VA 22170.
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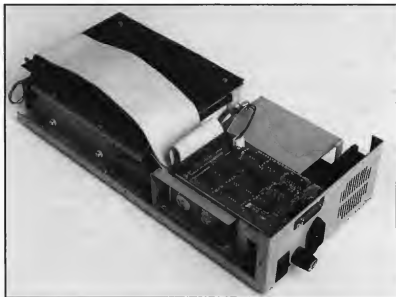
Of Cables And Controllers

BY DAVID SMALL
START CONTRIBUTING EDITOR
WITH DAN MOORE

So, what's in this box called a "hard disk" anyway?

Usually, when I ask questions like that, a phillips-head screwdriver isn't far away; I dig in and find out. If you feel comfortable with hardware and know about things like static electricity, I'd feel free. (Warning! This will violate your factory warranty!) One thing to be especially careful of are the heat sinks in the power supply board. They'll have a DANGER! tag on them, and for a darned good reason; they have 300 volts on them! Touching them will guarantee you at least a good jolt. I speak from experience; when my hard disk gave up on trying to kill me just with software errors, it tried to get me with hardware.

Because of the complexity of this subject, it will take two columns to complete this discussion of hard drive hardware. This month, I'll focus on cabling, converters and disk controllers. Along the way, in these columns, I'll take a few short detours to help orientate you further. For example, I'll mention the SCSI bus as part of the hard disk, but also point out that it's the same SCSI that Apple uses on the Mac.



A hard disk for an Atari consists of an ACSI-SCSI converter, a disk controller, the hard disk mechanism itself, a power supply and interconnecting cables. There's a lot to know about each component—and they can all fail in unspeakable ways!

This way, you'll be familiar with the jargon. I've found that once someone has the overview—the orientation—then the usually narrow techie documents make more sense.

You Start With the Cable. . .

First, let's look at the cable from the ST to the hard disk. It has male DB-19 connectors on either end and 19 conductors inside.

Helpful Note: I have had two hard disk

cables go bad so far. They usually go "intermittent" first, a maddening state where your hard disk works, but gives errors that are impossible to track down. If you're getting these errors, then it may be a warning to you that your cable is deteriorating.

If your hard disk is giving flaky, unreliable performance, try switching cables. (This usually means a trip to the dealer or borrowing a cable from a friend. And for heaven's sakes, if you find a bad cable, mark it "BAD!" before ▶

you throw it in your junk box. A year from now, you might not remember it was bad. (This is good practice for all bad cables, disks, PC boards, etc.)

This is made triply worse by the 18-inch cable lengths that Atari supplies. This short length practically guarantees some sharp bends in the cables; a few bends later, the internal conductors break. Again, I've seen this twice.

When I opened up one Atari cable to fix it, I found numerous cold solder joints, a sure sign of bad construction. I have also seen cables get so twisted up that the connectors inside the plug pull towards one another and short out; again, not good. Therefore, investing in a spare hard disk cable wouldn't be a bad idea at all. ICD has a particularly nice long cable I use and happily recommend.

Electrically, this cable is on what is known as the ACSI bus. This is Atari's own custom interface used by no one else in the industry. It does bear a passing relationship, however, to SCSI, (often pronounced "scuzzy") which is an industry standard.

Let's follow the cable into your drive. It plugs into a 19-pin female connector on the case.

A few manufacturers (ICD for one) now supply a 19-pin daisy-chain twin female connector on their ACSI plug-in board. You can then plug another cable from the first hard disk to a second hard disk, much like daisy-chaining floppy disk drives. This is both good and bad. The good is that it lets you add another hard disk; the bad is that unless you know what you're doing, the second drive won't work at all. The second drive must be internally configured (wired) to respond to a different SCSI device number; otherwise, the two drives will both respond to any command, confusing things terribly.

Also, the ACSI design is very sensitive overall and may keep a second unit from working at all, depending on

when your machine was built, cable impedance, length, distance from a local radio station (I kid you not), and so on. Atari laser printers may aggravate this situation as well.

ACSI to SCSI

From the 19-pin female connector on the case, the signals enter the ACSI to SCSI interface board. This board simply converts the ACSI signals into the

The Adaptec ACB-4000 controller is cheap and reliable—nothing too fancy.

industry-standard SCSI signals. Generally, the SCSI signals emerge on a 50-pin ribbon cable from this board.

SCSI is the industry standard for general communication between CPU's, hard disks, and other high-speed devices. It's really pretty neat and very quick on its feet. The Apple SCSI connector on the back of the Mac is a DB-25 with only 25 pins, just like a modem cable; how (you might ask) can Apple use 25 pins when the SCSI standard is 50 pins? Well, of the 50 pins, 24 are ground, and a few others aren't too important! With a little work, you can convert an adapter cable from the Apple 25-pin SCSI to a standard 50-pin SCSI. The innards of an Atari drive can then be made to work with a Mac—that's how compatible SCSI is across machines!

The 25-pin spare connector on a Supra drive is an Apple SCSI connector for daisy-chaining drives. **WARNING: This is NOT a place to plug in a**

modem or printer. Just because the plug fits (DB-25) doesn't mean that you should; it will almost certainly destroy the Supra if you do.

The Disk Controller

Back to the SCSI ribbon cable coming from the ACSI-SCSI board.

The 50-pin ribbon cable carrying the converted commands and data plugs into the disk controller. This is a stand-alone computer with plenty of smarts. The one I have, for instance, uses an 8085 microprocessor; that's one of the many processors supplied in CP/M machines.

The disk controller is a dedicated computer which processes disk commands sent to it over the SCSI wires (bus). Most commonly, it reads or writes 512-byte sectors to the hard disk and passes the data from or to the ST. Sometimes it's also asked to do things like format the hard disks, or park the disk heads.

The board Atari usually uses is the very popular Adaptec ACB-4000 controller. This is a pretty good controller; cheap, reliable, nothing too fancy.

NOTE: The newest Atari designs have merged the ACSI and hard disk controller onto one PC board, eliminating the separate 50-pin cable. This doesn't change this discussion, really; just consider the two merged on the Megajfile drives.

From the controller there are two cables to control the hard disk, one 34-pin and the other 20-pin.

ST 506—Or, On to the Disk

A hard disk known as the ST-506 (a Seagate 5-megabyte unit) long ago defined the signals in the 34-pin and 20-pin cables, so they're called an ST-506 compatible interface. If you look in an IBM add-ons book, you'll see that most of the hard disks are ST-506 compatible; that means you could plug most of them into this controller, given the correct software. Electrically, they should work okay and since both Supra

and LCD supply software that let you specify your controller and hard disk specs, you can then format almost any ST-506 disk and make it go. I recommend LCD and Supra because I have personal experience with them; other people have said good things about other manufacturers whose products I haven't tried.

Many, many people are swapping out their 20-megabyte hard disk mechanism and replacing it with a 40-megabyte half-height mechanism. In this way, your Atari (or other) hard disk suddenly becomes a 40-megabyte drive.

Another very interesting alternative is to add a second hard disk to the ACB-4000 controller Atari uses. The controller can run two drives by using just a second set of ST-506 cables. I have two 40-meg drives running from a single controller. The setup is very reliable and it provides enough storage for most of my purposes. The second drive's partitions then become more

If your hard disk is flaky, try switching cables.

drive letters to add (the first drive is C,D,E,F and the second is G,H,I,J). With the street price of 40-meg mechanisms at about \$399, this is a very attractive and cost-effective way of adding storage. See my article in the Winter 1987 issue of START, "Megabytes not Megabucks," for a more detailed description of how to do this.

Note: Seagate's ST-4096, full-height, 80-megabyte, 28 millisecond (fast!) drive is now down to about \$515. This is an incredible steal; 40-megabyte drives usually cost about \$400. Check out the ads in *Computer Shopper* Maga-

zine, but remember, full-height mechanisms won't fit in many chassis.

The best 40-megabyte mechanism I know of for the price that would fit directly into your ST chassis (e.g., half-height) is the Seagate ST-251-1; the difference between the ST-251-1 and the plain ST-251 is a little more cost, but a lot faster average access time. The performance makes an astounding difference; I recommend it.

Coming Attractions

Next column, I'll take a closer look at the disk drive mechanism itself and the power supply. I'll also give you a few more tips on trouble-shooting and even more suggestions for making the most of your hard drive. See you next time! ■

David Small is a START Contributing Editor and the creator of Magic Sac and Spectre 128. Dan Moore is best known in the Atari world as the creator of Paper Clip for the 8-bit machines.

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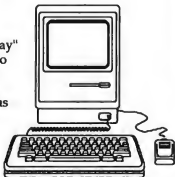
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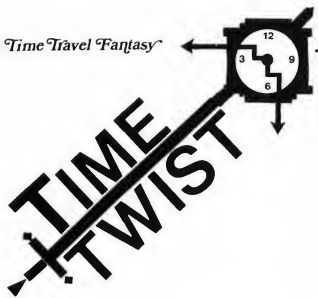
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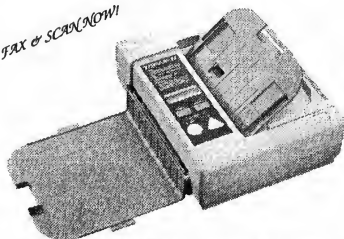
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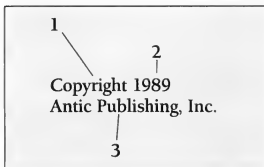
Copyright Basics For Beginning Programmers— And Everyone Else

BY ANDREW REESE
START EDITOR

If you write computer programs—or just have thought about it—you need to understand copyright. In this and following columns, I'll try to explain the basics of copyright for the computer programmer; it's not an easy subject and, like the computer industry itself, it's constantly evolving.

As an editor and author, I deal with the nuts and bolts of copyrights every day. I don't claim to be an expert in copyright; if you have a specific copyright question, the best single piece of advice I can give you is to consult an attorney who specializes in it. As a former lawyer who studied copyright and handled copyright matters, I hope to teach you the concepts, so that you can decide when or if you need to talk to a lawyer and then be a more perceptive consumer of legal services.

Also, we'll focus here on copyright under the federal law. There are state laws that still apply to create a so-called common law copyright, but federal law is more important for computer programs than state laws are.



A copyright notice consists of three things: 1. The word "Copyright"; its abbreviation or symbol; 2. The date of first publication of the work; and 3. The name of the owner of the copyright.

What Is a Copyright?

Most simply and narrowly stated, copyright is the right to keep anyone from copying or using your intellectual work without your permission. A copyright in a work—the bundle of rights you have regarding that work—must be distinguished from the work itself, say, actual computer program code. This may sound odd to you, but the idea really isn't so foreign. For example, your house and the land it sits on is a thing, but without the legally-defined bundle of rights that we call real

property, "your house" might not even be yours. When you buy it, you not only want its sunny dining room, but you want even more the right to keep everyone else out of it!

Copyright applies to movies, sculpture, computer programs and almost every other tangible form of communication. The federal copyright laws, contained in Title 17 of the U.S. Code, protects ". . . original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced or otherwise communicated, either directly or with the aid of a machine or device."

That's a mouthful, but think of it this way: it protects a *tangible expression* of an *original work*. Let's take the first of these phrases—*tangible expression*. If you have an idea for a totally new killer game floating around in your head, you *can't* copyright it; it's not tangible and it's only an idea. But the second you turn that idea into code and type it into your ST, it's covered by federal copyright law. ▶

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Getting Started

This brings up an important distinction, one you must understand: copyright does not cover *ideas*, it covers the *expression* of those ideas. Perhaps a simple and very real example would help here. According to movie industry lore, the go-ahead for the movie *Alien* was based on a simple concept: "Jaws in outer space." That idea (an implacable, non-human, virtually invincible killer hunting and slaughtering humans in a spaceship) could not have been copyrighted, but the movie based on it could be and, of course, was.

Closer to home, the bare idea of using a graphic interface to manage a computer's operating system is not subject to copyright. The *expression* of it is. (This has been a touchy subject for some years and will continue to be one. Although the original concept for the Mac interface came from a Xerox think tank, Apple is very protective about its version. At various times, Apple has ac-

cused Digital Research, Hewlett-Packard, Microsoft and others of treading on Apple's copyrighted toes. At least one major lawsuit is still in the courts.) Finally, consider the difference between the *idea* of a maze game with pursuing monsters and the *expression* of that idea in Pac Man.

The second phrase above, *original work*, means that your program must be the product of your own mind. We at START couldn't change the name of LDW Power to, for example, "START Power" and then claim a copyright; it's not original with us. (Note again that the concept of a computer spreadsheet is not subject to copyright; the expression—the program—is.)

A copyright, then, is simply a legal means of protecting creations of the mind. Just as there are laws that let you keep trespassers from taking over your house, copyright laws let you keep trespassers from taking over your program.

How Do I Obtain a Copyright?

At its core, this is easy to answer: The moment you type your new game into your ST, you have a copyright in it. Really, that's it. And that copyright extends fifty years beyond your death, as specified in Title 17.

But if you do create a superior new game, you'll undoubtedly want to share it with someone, your buddy or even a software company. If you just give a copy to either one without doing anything more, you've *published* your creation; if you didn't put a *copyright notice* on it, you've probably lost any copyright you had. Your dynamic game goes into the *public domain* and anyone can copy it or use your code. (There are a number of other ways to prevent this under certain limited circumstances, but the easiest protection is simply to add a Copyright Notice.)

continues on page 54

Getting Started

continued from page 52

An example of how serious this can be was the recent lawsuit between chip-makers Intel and NEC. Intel created the 8086 microprocessor and licensed it for manufacture by others. NEC created its own version and Intel sued for copyright infringement, among other things. The courts have held (so far) that microcode "hard-wired" into the circuits of a microprocessor can be copyrighted, but since Intel hadn't done enough to protect its copyright by making sure that its licensees put a copyright notice on the chip case, Intel had lost its copyright in the 8086 chip. We haven't heard the last word on this, but you can see how seriously the courts treat copyright notices.

If you do put a copyright notice in your code, what does that accomplish? Essentially, it puts the world on notice that you claim a copyright in your game and that no one is free to copy it.

What's Necessary In a Copyright Notice?

To be valid, a copyright must contain three things: first, the word "Copyright," "Copr" (its abbreviation) or the circled ©. Second, it must contain the date of first publication and, third, it must include the name of the owner of the copyright. This last could be the name of the creator or someone else depending upon the circumstances of its creation, etc.

This notice should be located wherever it will be seen by others. If the game is published as a printed listing, the notice should be a part of it. If the game is published only as a runnable program and users are unlikely to look into the object code on the disk, then you should make sure that your copyright notice appears somewhere on the display. The goal here is to make sure that any potential infringer can easily see the notice and know thereby that a copyright is claimed.

What's Next—And a Tip

In the next column, we'll look at registration of a copyright, its whys and wherefores, the differences between a copyright and a trademark and some of the ins-and-outs of copyright.

If you'd like to know more about copyright, pick up a copy of *The Copyright Book* by attorney William S. Strong at your local bookstore. It's not a substitute for the advice of a knowledgeable attorney, but it is an excellent readable sourcebook that can answer some of the more esoteric questions we can't reach in this column. ■

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Special Effects Part IV: How To Use Traveling Mattes

BY JON A. BELL

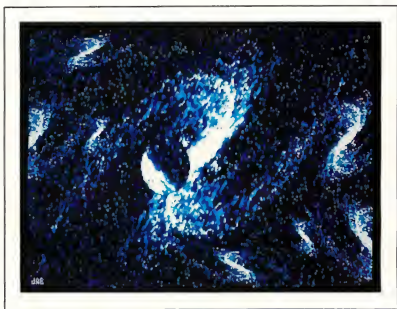
Cyber Paint goes to the mat to produce a space bubble. File CYBRCRNR.ARC on your START disk!

One of the most fascinating things you can do with Cyber Paint is use it to alter existing imagery—either a still DEGAS image or an animation sequence—and then composite it back with the original imagery.

This is what we're going to do in this installment of the Cyber Corner: we're going to use Cyber Paint to selectively alter portions of a complex image with *traveling mattes*—a striking and very useful visual technique.

What's a Matte?

Quite simply, a matte is a mask. In Cyber Paint, you can use mattes much as Hollywood special effects people use them to add spaceships, giant monsters or futuristic buildings to scenes. A matte can be used to cover or reveal selected portions of an image. When it's used to cover a portion of an image, then it's probably a "hold-out" matte—one which "knocks out" part of the background image and also serves as an opaque silhouette to hold another image within it, which may be added later.



With traveling mattes, you can assemble several layers of images for unique visual effects. If you'd like to experiment with them—and duplicate this unique animation at the same time—all you'll need is Cyber Paint and the file CYBRCRNR.ARC on your START disk.

When it's used to reveal part of an image, it may serve as a "hole" or window onto that specific image.

The latter use is what we're going to experiment with in this issue. We're going to create an interesting deep space sequence using a complex galaxy background, a ball matte and a sprinkling of ADO/APM effects.

A Galaxy on Your Disk

On your START disk you'll find a file called CYBRCRNR.ARC. Un-ARC this file, following the Disk Instructions elsewhere in this issue. In the un-ARCD

file are three additional files: GAL-AXY.P11, SPHERE.P11 and ZOOM.ADO. You'll need all three files to create the Space Sphere sequence. Once you've un-ARCD the files and transferred them to disk, make sure you have a second disk available—preferably double-sided—to save your finished animation sequence. If not, format a fresh disk and set it aside.

At this point, load Cyber Paint (either version 1.0 or 2.0) into your ST, then go up to Menu and select Load/Save. When the Load/Save menu appears, click on .ADO (or .APM) to ▶

load ZOOM.ADO file from your un-ARCDed files disk. This will set the .ADO/.APM menu with the matte movement parameters we want.

Soap Bubbles in Space

The effect we're going to create is that of a refractive sphere flying through space. As it zooms from offscreen, far left, to the bottom right of your screen, it will look like a crystal ball distorting its background. My inspiration for this effect came from the Joe Dante film *Explorers*, in which a group of young boys (assisted by some goofy extraterrestrials) create a forcefield bubble that enables them to travel into space. The bubble is a blue sphere which encases the boys' tiny spaceship. As presented in the film, the bubble optical effect (courtesy of George Lucas's Industrial Light and Magic) distorted whatever background it moved across, just as a real glass bubble would if you held it up to your eye and looked at your surroundings.

To create the effect in the film, ILM first filled background plates of whatever scenery the bubble was to pass in front of, then they matted in the bubble imagery, which consisted of airbrushed artwork, reflective lighting highlights and a slightly smaller version of whatever background was behind it on any particular frame. The result was a three-dimensional-looking moving sphere. The .ADO/.APM parameters will make our bubble move in our Cyberspace.

Now, go back to the Load/Save menu and load SPHERE.P11. This is the matte ball we'll use to create our sphere. Place the ball in the Clip buffer by pressing the Tab key, then erase the ball on frame 1 by pressing the Ctr/Home key. Next, press Return six times to create 61 blank frames.

Go back to the .ADO/.APM menu, set Frame Mode to All, and then select Preview. You'll see the clip buffer box come in from the left side of your screen and disappear off into the dis-

tance on the right. This is how your crystal sphere is going to fly through the scene. Now, click on Render. Cyber Paint will then render the blue ball across all 61 frames. (When it's finished rendering, you can leave the .ADO/.APM menu and play the animation once or twice to get an idea how the final effect is going to look.) When you've finished playing the animation, save it to your freshly formatted disk under the title MATTEBALL.SEQ. (You'll want to save all your work files to disk so you can use them in the future, if you desire.)

Next, go to the *first frame* of the sequence you've just saved, make sure Frame Mode is set to To All, then go up to the Load/Save menu. Select .P11, then select Under (or Underlay). Load the picture GALAXY.P11 underneath the flying ball sequence. A menu box will appear, asking if you want to do this under all frames, starting with this frame; click on Yes. Cyber Paint will then load this DEGAS Elite picture underneath your flying ball animation. Now when you play the sequence, the flat blue ball will fly over this deep-space galaxy background.

Go up to the Color menu and select color 1 (the background color, or black)—the first color on the left, top-most row of the color palette. Next, make sure that you're still in To All, then go to the Frame menu and select Separate. Then, on any frame of your animation, left-click anywhere *inside* the ball image. A menu box will appear, asking if you want to separate across all frames. Click on Yes. Cyber Paint will then fill the blue color of the sphere with black. (It will also fill other occurrences of this dark blue where they appear on the galaxy picture, but don't worry about this.) When Cyber Paint has finished Separating the sphere image, save this sequence to your fresh disk, calling it BACKGRND.SEQ. The "black hole" flying across the Galaxy picture will serve as the "holdout matte"

for your replacement imagery.

Now, Kill this sequence from your memory, and load MATTEBALL.SEQ back into Cyber Paint. Go up to the Color menu, and select color 2 from the palette—it's a dark blue, almost black. Then select Separate from the Frame menu and left-click anywhere *outside* the ball image, making sure you're still in To All mode. Cyber Paint will Separate out the black background and render it as the dark blue (to make it opaque). Go back to the Color menu, select color 1 (black), and Separate the ball across every frame just as you did before. When it's done, go to the first frame of your animation, then go to the Load/Save menu. Select .P11 and Underlay, then load the GALAXY.P11 picture underneath all the frames of your sequence.

As you can see when you play the sequence, the black ball acts as a moving "window," revealing the untouched Galaxy picture. Now, go back up to the Frame menu, select Separate once more, and select color one (black) from the Color menu. Separate everything outside the moving window imagery. You now have a moving window on the galaxy—and nothing else. Save this animation sequence to your workdisk as GALSPPHERE.SEQ.

Now you're ready to create your traveling matte.

Space/Time Distortions and Other Fun Things

Now the going gets somewhat tricky—and forgive me, but to produce the effect we want, the going also gets a little tedious. Don't worry—the results should be worth it.

First, set your Frame Mode to To Frame, then go to the first frame of your sequence where the background imagery appears. Now, in *this exact order, do the following across the next 60 frames:*

1. Press Tab. This will Clip the image and save it to the Clip buffer.

2. Press Clr/Home. This will clear the current image from the frame.
3. Press I. This will invert the image in your Clip buffer.
4. Left-click your mouse button to invert the image. (Note: Before you do this, make sure your mouse cursor is below the galaxy image.)
5. Right-click your mouse button to set the inverted image on the frame.
6. Press the right arrow key on your keyboard to advance to the next frame.
7. Repeat the above procedure on the frame, and continue until you've finished the entire sequence.

(If you're groaning in pain at the thought of all this repetitive work, don't—it's actually quite easy to get a rhythm going if you're using the keyboard to enter your commands. Tab, Clear, I, left-click, right-click, right arrow, repeat. Pretty soon you'll be doing it like an automaton, but don't get going too fast—you want to make sure you get every frame.)

Now, when you've finished inverting all of the circular Galaxy images, save this to disk as GALSPINV.SEQ. Set the Frame Modes to To All, go to the first frame of your inverted galaxy animation, then go to the Load/Save menu. Select Underlay, then load BACKGRND.SEQ—the holdout matte sequence—into your inverted imagery. When it's done, play the animation.

Fascinating, isn't it? You see the sphere effect mainly by how it distorts and alters the background—one of my favorite Cyber Paint techniques.

Wrapping Up

There are ways to simplify these procedures, of course, and the results will look different. You can Defocus, Crystalize or Antialias a copy of the Galaxy picture, save the altered image to disk, load that as an Underlay into your MATTEBAL.SEQ, then load your original BACKGRND.SEQ under that. Experiment with the features in Cyber Paint

2.0's Pixel f/x menu and see what you can come up with. Try adding more frames (when I originally did this sequence, it ran 100 frames long), random sparkling highlights or flashes of light on the sphere every dozen frames or so. And don't forget to try out these techniques with other Cyber animations (including CAD-3D 2.0 objects).

That's it for this issue. In the future, we'll talk about miscellaneous lighting effects such as sparkles, and how to use the classic START program Pixel-Pro with Cyber Paint. ■

Jon A. Bell is the former Associate Editor of START, and is now Managing Editor of ORACLE, The SQL Database Journal.

PRODUCTS MENTIONED

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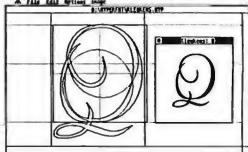
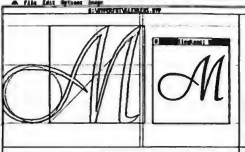
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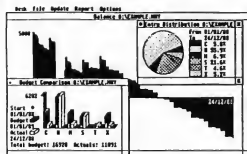
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Great New Graphics Tools From Migraph

Easy Tools, Touch-Up, Draw Art and Scan Art

BY DAN FRUCHEY

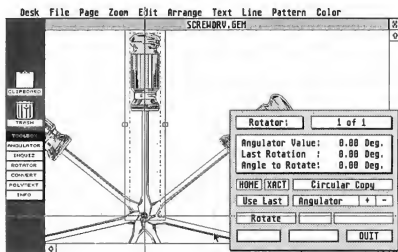
Migraph entered the ST market three years ago with Easy Draw, a superb object-oriented graphics program that puts even MacDraw and GEM Draw to shame. While Easy Draw remains the flagship of the Migraph line, Liz and Kevin Mitchell have now published Easy Tools, Scan Art, Draw Art, and Touch-Up to complement Easy Draw.

While these four products are intended to be used with Easy Draw they can, with the exception of Easy Tools, also be used to enhance other graphics and desktop publishing programs. You will, however, need at least one megabyte of memory and a double-sided drive to run Touch-Up or Easy Draw with Easy Tools. A double-sided drive will also be necessary to read either of the clip art collections.

Easy Tools

Easy Tools is a collection of graphic tools that expand the capabilities of Easy Draw. The toolbox is packaged as a desk accessory that remains dormant until Easy Draw is loaded into memory. Then an icon appears on the screen that allows access to Easy Tools' additional functions.

Easy Tools precisely manipulates object-oriented graphics and text. It will



You can look at objects from all angles with Easy Tools. One of its most powerful tools is the Rotator, which, as you can guess, rotates objects on any axis and at any angle—and lets you duplicate and resize them during rotation.

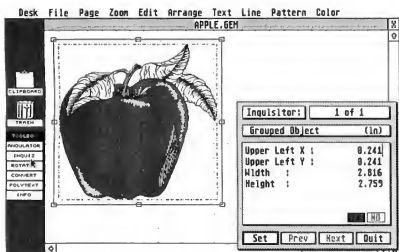
measure, create, duplicate, resize and rotate graphics and graphic text with little effort. It speeds up many of the mundane steps required to produce object-oriented graphics. Easy Tools will create grids of any size, precisely size and place graphics with up to 1/1,000-inch accuracy and copy graphics in any size from 1 to 999 percent of the original.

One of the most powerful tools available is the Rotator, used (as the name says) to rotate graphics. Objects can be rotated on any axis and at any angle. During rotation, objects can be duplicated and resized to create designs and patterns quickly.

GEM programs that follow the standards established by Digital Research

can't rotate text, because they use GDOS fonts. This limitation is especially frustrating if you want to create rotated text banners and sidebars. Easy Tools includes a polytext function that lets you create text that can be rotated and manipulated. The rotated text can then be used in Easy Draw or exported to other programs that also succumb to this GEM limitation.

Easy Tools is an essential addition to Easy Draw for professionals who use graphics. Carpenters, architects and engineers will find this powerful tool indispensable when creating scale models or plans. Artists, designers and desktop publishers will find that Easy Tools saves time and helps avoid costly page ▶



The Inquisitor feature in Easy Tools lets you enter the coordinates and dimensions for a figure in numerical form rather than using the mouse to stretch, shrink and position the figure.

pleted pictures or portions of pictures.

Four zoom levels are available at all times. You can zoom in for detail work or zoom out to the full page mode to obtain an overall view of pictures in progress. Most editing functions must be performed in one of the zoom modes, but overall changes like masking and use of fill patterns can be performed in the full page mode.

Touch-Up includes all of the options normally found in a paint program. You can create boxes, lines, polylines, arcs, wedges and ellipses almost automatically. Line style and thickness, shadow style and direction, brushes and fill patterns are all adjustable. Pictures can be copied, rotated, flipped, mirrored, slanted, stretched or sized using the clipboard and working area.

There are many versatile extra touches that save time and add a great deal of power to Touch-Up. These include creation of B-spline and bezier curves, masking and automatic outlining of graphics.

One extra I found especially useful is the Clean Up mode. Scanned pictures normally contain stray pixels where the hardware picked up ghost images, smudges, or dirt. Normally a great deal of time is required to erase these individual dots so that pictures will look sharp. The Clean Up mode automatically erases stray dots on the page. If you do have scanned clip art, this mode is a real time and sanity saver.

layout mistakes. If you use Easy Draw, Easy Tools will prove to be an enjoyable addition to your system.

Touch-Up

For the last two years, I have been using a scanner to copy monochrome images. I have hundreds of scanned-in pictures and I use them quite frequently. Previously, I couldn't edit my pictures once I had scanned them. Programs like DEGAS Elite allow users only to load and edit a single screen of picture data. The pictures I had scanned in at 300 dots per inch were sometimes *five times* the size of a single screen.

Migraph's Supercharger addition to Easy Draw allowed some very primitive dot-by-dot editing of image files and it could clip out specific portions of a picture for use. Unfortunately, Supercharger went no further—it's an advanced picture conversion utility, not a paint program.

Enter Touch-Up, Migraph's advanced paint program and picture conversion utility rolled into one. Touch-Up can create and edit bit-mapped graphics using virtually any picture format that is currently accepted by ST and Mega computers. In addition, Touch-Up will import pictures from many non-ST formats to give you the graphics versatility of other systems.

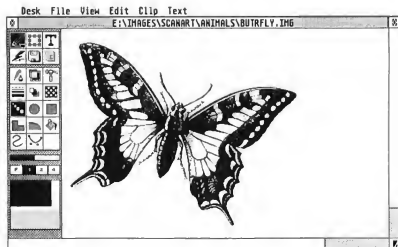
Touch-Up works on both color and monochrome monitors. However, while you can load color images, you can only

edit them as monochrome images. During the loading process, you must choose a method of converting the colors to black and white. All output is monochrome.

Touch-Up uses the standard mouse, windows and drop-down menus every ST user has come to expect. To the left side of the working area there is also a series of icon-oriented option menus used to access the various modes.

Features, Features, Features

One of the chief attractions of this program is a freely adjustable working area. From postage stamp-sized images to graphics five times the size of a single screen, Touch-Up loads them all without a hitch. If you need more room to merge additional graphics, you can readjust the size of the working area at any time. A resizable clipboard is also available for storing and editing com-



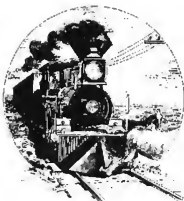
From images the size of a postage stamp to graphics that are five times the size of a single screen, Touch-Up loads them all without a hitch—and you can readjust the size of the working area at any time.

Touch-Up uses 12 resizable vector fonts. Publishing Partner and Page Stream fans may recognize the designs as they are based on the same fonts. Any text created with Touch-Up is treated as a bit image graphic, not as editable text. This has many advantages. Text can be manipulated in many ways normally inaccessible within Easy Draw and other programs that follow GEM standards. Styles available to modify the included fonts include bold, light, italics, backslant, outline, underlined, filled and fat. Text created with Touch-Up consumes less memory than GDOS text and allows much more versatility. They do, however, cease to be resolution-independent when created this way.

Pictures can be loaded and saved in many ST formats including Printmaster, DEGAS/DEGAS Elite, Image and NEOchrome. You can also load and save MacPaint, PCX and TIFF graphics normally used by Apple and IBM computers. When you're finished creating your art work it can also be saved in GIF or Amiga IFF formats.

On top of these capabilities, Touch-Up also includes a slide show utility, direct output to printers via GDOS, the ability to lock modes in place, tear-away menus, editable file paths, sample graphics and a utility that speeds up mouse movements.

Touch-Up is a powerful design tool that is a suitable companion for any



Scan Art monochrome bit-mapped images, edited extensively to provide crisp, clean output. Scan Art has over 100 graphics with themes such as animals, food, holidays, the office, performing arts, school, sports and transportation.

graphics or publishing software you own. What Easy Draw is to object-mapped graphics, Touch-Up is to bit-mapped graphics. The program can be compared favorably to MacPaint, PC Paint and other high resolution paint programs on those other systems. For the casual user, Touch-Up might be a bit option-heavy, but for the professional user Touch-Up has all the power you need.

Migraph is helping to broaden acceptance of the ST by supporting importation and exportation of non-ST standard graphics formats. Many collections of graphics already exist on other systems and now it is possible to retain the power of an ST and still have the graphics selection other computer owners boast about.

I am extremely impressed with

Touch-Up; it is a quality product that will definitely save time on desktop publishing and graphics projects.

Away With the PSK?

A controversy has arisen over Migraph's use of a Program Security Key (PSK) with Touch-Up. The PSK, sometimes referred to as a "dongle" (don't ask me why), must be plugged into the *parallel port* first or Touch-Up won't run. It does not interfere with your printer or any other programs.

The PSK should limit piracy of Touch-Up, while still letting you load the program onto a hard disk. I have mixed feelings about it. While I don't believe application programs should be copy-protected, I'll take the bad with the good and Touch-Up is very good.

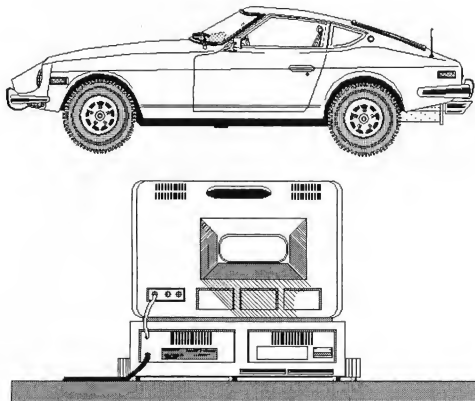
Scan Art

Scan Art is a collection of monochrome bit-mapped images (clip art) obtained from popular design resources. The scanned pictures have been edited extensively to provide crisp, clean output. The collection comes on two double-sided disks and has over one hundred graphics with themes such as animals, food, holidays, the office, performing arts, school, sports and transportation.

The images are saved in GEM Image format (.IMG) and can be used with most publishing and graphics programs ▶



With Touch-Up, you can create and edit bit-mapped graphics using whatever picture format your ST can handle—and even some non-ST formats.



Draw Art images are object-oriented clip art. They're not as crisp as the Scan Art images, but they're far more flexible.

and in those word processors that import graphics. The pictures can be used with programs that run in any screen resolution without resorting to conversion utilities.

Scan Art has saved me many hours of searching for appropriate graphics. I frequently use Scan Art in the newsletters and brochures I create for clients and friends. Creating commercial publications? Don't worry. Scan Art can be used in your projects without copyright infringement (a potential problem with public domain pictures).

A catalog included with Scan Art shows each graphic. There's also an index that lists their dimensions. This well-documented product will make an excellent addition to any clip art collection.

Remember, however, that Scan Art is sold only on double-sided disks. If you have only a single-sided drive, you will have to ask a friend or cooperative dealer to copy them to single-sided disks.

Draw Art

While Scan Art is composed of *bit-mapped* images, Draw Art is a collection of *object-oriented* clip art drawn by graphic artist Tom Ethen. The collection of over one hundred images comes on two double-sided disks, thus raising the same potential problems as Scan Art. Its themes include animals, arrows, borders, buildings, computers, maps, office equipment, sports equipment and tools.

Because Draw Art is object-oriented, its graphics can be "disassembled" and used in many different ways. As an example, the front wall of a house can be removed to reveal an interior presented in three-dimensional realism. You can remove the lens from a 35mm camera image to show the shutter planes; the possibilities are endless. This ability is unique to object-oriented graphics and has tremendous potential.

Graphics for almost every conceivable application are included in the collection. From baseball bats for little league flyers to detailed houses for real estate ads, Draw Art is an exceptional

collection of high-quality artwork.

A catalog of the pictures is included, along with hints and ideas on using and displaying Draw Art.

Object-oriented graphics (also called vector graphics) have another distinct advantage over bit-mapped graphics. Bit-mapped graphics can only be enlarged to a certain point before their lines and curves display jagged stair-step patterns that make them look blocky and unattractive. Vector graphics are saved as shape and pattern definitions rather than pixel-by-pixel bit-mapped images and thus can be resized endlessly without a loss in resolution or detail. When changes are made in an object-oriented graphic the computer recalculates the relationships between objects and optimizes each component so that the pictures will look their best no matter what screen resolution or output device is used.

I have yet to find a project where I have not used some form of object-oriented graphic. Draw Art is an invaluable addition to my graphics library. It speeds up projects and allows me many variations in design. Creating object-oriented art is a time-consuming task; using Draw Art is quick and painless.

And In Conclusion. . .

Even Siskel and Ebert would offer "Two Thumbs Up" for these four outstanding efforts by Migraph. They're that good. ■

Dan Fruchey, formally the desktop publishing columnist for ST Applications, works as a paramedic in Santa Rosa, California and runs a small clip-art business on the side.

PRODUCTS MENTIONED

Draw Art, \$69.95; **Easy Tools**, \$49.95; **Scan Art**, \$49.95; and **Touch-Up**, \$179.95. Migraph, Inc., 200 S. 333 Suite #220, Federal Way, WA 98003, (206) 838-4677 for information or (800) 223-3729 for orders.

CIRCLE 159 ON READER SERVICE CARD

Clipboard

by Heidi Brumbaugh,
START Programs Editor

In celebration of this issue's *Arcade Addiction* article by Tom Byron, here are three game tips compiled after intensive research by the START staff:

Defensive Groundwork

When Missile Command starts to get hectic, around the fourth level, spread a thin line of lasers from both missile silos at the very beginning of the round to pick off the first line of attack. Use both silos evenly so you don't exhaust your missile supply from either one of them early on.

Keep your Balance

The trickiest jumps in Tower Toppler are when you are jumping over a bouncing eye—timing in this devious situation is critical. Give yourself a head start by getting into position as close to the edge of the ledge as possible. Beware—hang over too much and the eye might knock you off as it bounces by, but getting as close as possible to the edge without falling off will give you the time you need to get clear when you make your jump.

Steady the Pace

Arkanoid is a fast-paced game and watch out—the longer you live in a single turn the faster it gets. We've noticed that the ball speeds up if you hold the paddle in the same position for too long. If the ball is thrashing around on a part of the screen where you don't need to hit it very often, keep the paddle moving back and forth.

Install Application: Setting it Up

One feature of the ST Desktop's powerful Install Application option is that it

lets you bypass the standard "Open Application" dialog box you see when you double-click on a program with the extension .TTP.

In most cases .TTP programs work on files that all have the same file extender. For example, ARCX.TTP always works on files with the extender .ARC. Install Applications lets you set up your system so that ARCX.TTP will automatically un-ARC any file you double-click on that has the extender .ARC.

To use Install Application, single click on the application you want to install, for example ARCX.TTP. When the program icon is highlighted, click on "Install Application. . ." under the Options menu. The button "TOS-takes parameters" should be highlighted; if it isn't, single-click on it. Now type in the file extension ARC next to Document Type.

Click on OK (do not press Return). You must save your Desktop to your boot disk so that the next time you turn on your computer you will still be able to double-click on ARC files to un-ARC them.

Install Application: Solving the Problem

Install Application works great, so what's the problem? Say you have ARCX.TTP in the folder UTILS in drive D, but the file you want to un-ARC is in your SCRATCH directory on drive C. If you double-click on your archive file the system will first look for ARCX.TTP in the SCRATCH directory. If it doesn't find it, it will look for it on drive A. If ARCX.TTP isn't there you will get an error message telling you that the system can't find the file you just tried to access.

You can solve this problem by editing your Desktop Information file (DESKTOP.INF) and explicitly giving the path name for ARCX.TTP. Load DESKTOP.INF into your word processor and replace ARCX.TTP* with D:\UTILS\ARCX.TTP* in the line:

```
#P 03 04 ARCX.TTP* *.ARC*
```

Save the file in ASCII format and reboot the system.

Assembly Language Challenge

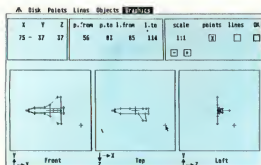
The assembly language code listing in this issue's Programming in Pascal column calculates the position of a pixel on the screen and performs an exclusive or (eor) on that pixel. This routine is fast, but it could be faster. To see how fast that routine could work the Clipboard is issuing a challenge:

Submit your version of the FLIPPXMS routine to the Clipboard (544 Second Street, San Francisco, CA 94107) in hard copy and disk format. Comment each line of code, and include in the comment line the number of clock cycles each instruction takes. Enclose with your entry a cover letter with your name, address, daytime phone number and the total number of clock cycles your routine takes.

The monochrome version of Small Flight (SFLTASMI.PAS) must work with this routine without any modifications. The fastest routine will be published in the Clipboard in a future issue of START, and the winner will receive \$25.

All material becomes the property of Antic Publishing and may not be returned. In case of a tie, the entry with the earliest postmark will win. Entries must be received by June 30, 1989. ■

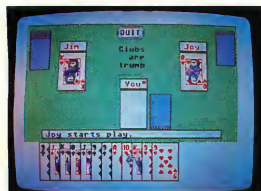
Disk Contents



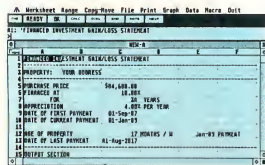
GFA Vector. . . Page 24



Match Quiz ST. . . Page 79



Pinocle. . . Page 94



Business Applications. . . Page 92

Send Your ST Soaring!

This issue we continue to provide you with top commercial-quality programs from GFA Systemtechnik with **GFA Vector**. Use this program with **GFA Object** (from the May 1989 issue) and the **GFA BASIC 2.0** interpreter (from the January 1989 issue) to create great 3D animated sequences for your programs. File **VECTOR.ARC**; runs in medium or high resolution.

Computerized Concentration games aren't new, but Jon Rick's **Match Quiz ST** will really knock your socks off. This game combines color-cycled animation with musical medleys for a dazzling display. Use **Match Quiz ST** to teach your children arithmetic or musical notes, or create your own trivia files to match wits with players of all levels. File **MATCH.ARC**; runs in low resolution.

For a diversion this month, try Charles Baily's **St Pinocle**. Play this classic card game against two computer opponents. You can customize many of the rules in this challenging game. File **PINOCHE.ARC**; runs in low resolution.

Also on your **START** disk are some great tools for serious **ST** users. If you're writing a screenplay, Mike Perry's **WordPerfect Macros** will make formatting your work a snap—so you can get right to the creative aspects of writing. File **WPMACROS.ARC**; requires **WordPerfect**.

New to spreadsheets? Then dive into Christopher Herd's **Financed Investment Gain/Loss Statement** template to get started. This template complements **START**'s new **Business Applications** column. File **GAINLOSS.ARC**; requires a spreadsheet that can read **WKS** format files.

Another new **START** column this issue is **Programming in Pascal**. Bruce Wiebe introduces you to assembly language programming—and shows you how to use it to get your Pascal programs really moving. See his **Small Flight** demo on disk, and read the **Clipboard** in this issue for **START**'s assembly language challenge. File **SMALLFLT.ARC**; runs in medium or high resolution.

Finally, the **CyberPaint** files on your **START** disk let you follow along with Jon Bell's **Cyber Corner** this issue as Jon describes how to use traveling mattes for stunning optical effects. File **CYBERCNR.ARC**; requires a color monitor and **CyberPaint**.

**NO START
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Disk Instructions

How to Get Our Programs Up and Running

Each article in this issue with a disk icon next to its title on the Table of Contents or "On Disk" on its first page has an accompanying file on your START disk. These files are *archive* files—they've been *compressed* with the Archive Utilities Set, or ARC, a public domain program available for many personal computers. We use the ARC utility to squeeze the many files that may go with a particular article into *one* compressed file, which may be only 40 percent the total size of the original files.

In addition to the archive files, you'll find the program ARCXTTP, which stands for ARChive eXtract, on your START disk. You'll use this program to *decompress*, or extract, the disk files we've shrunk down with ARC.

All programs on your START disk are copyrighted. They are for your own private use, and are not public domain.

Getting Started

To use the files and programs on your START disk, please follow these simple instructions. You'll need two blank, formatted single- or double-sided disks to properly extract the files.

Your START disk is not copy-protected and you should make a copy of it *immediately* to the first blank disk. Make sure the write-protect window is *open* on the START disk at all times to insure that you don't accidentally erase the disk.

Note: If you are unsure how to format a disk, copy a disk or copy individual files, please refer to your original Atari ST or Mega manual and study these procedures carefully before going on.

After you've copied your original START disk, store it in a safe place and label the copy disk "START Backup."

Now, put your START Backup disk in Drive A of your computer and double-click on the Drive A icon to see the disk's contents.

Un-ARcing the Files

To use START's compressed disk files, please follow these steps:

1. Copy the ARced file you wish to use and the program ARCXTTP from

your START Backup disk onto your second blank formatted disk. When you're finished, label it *Un-ARC* disk.

2. Now you'll extract the compressed files from the ARC file you just copied. Insert your Un-ARC disk into Drive A. If the Drive A window is already open on the Desktop, you can press the Escape key to see the new disk directory. Otherwise, double-click on the Drive A icon to see the directory. Double-click on ARCXTTP. The following dialog box will appear:



3. Type in the name of the ARC file you just copied over to your Un-ARC disk and press Return. You do *not* have to type in the extender .ARC. You can type in the name in upper or lower case.



(Note: If ARCXTTP can't find a file, it may be because you have misspelled

the name of the ARC file. You must type the filename *exactly* as it appears in the directory.)

4. As the program runs, it will display the names of the individual files as it extracts them, similar to the example below.

```
Archive: SAMPLE.ARC
Extracting file:EXAMPLE.PRG
Extracting file:FILE.TXT
Extracting file:SAMPLE.PIC
Extracting file:README
```

When ARC has successfully extracted all the files, it will return to the Desktop and you will see the original files within the directory window, along with the archive file and the ARCXTTP program. You may now use any of the START files as you wish; just follow the instructions in the appropriate article in this issue.

To use any other archive files on your START disk, simply repeat the above procedures. Be sure you begin each time with a blank, formatted disk.

In addition to the runnable programs, some ARC files may also contain source code listings or an ASCII text file (called BREAKDOWN.TXT, for example) which describes the program's structure. You can examine such a file from the ST Desktop by double-clicking on its icon and then clicking on Show (to see it on the monitor) or Print (to print it out). ■

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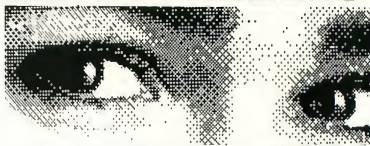
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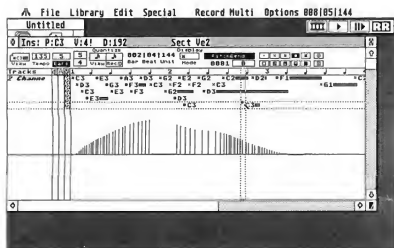
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The ST/MIDI Connection

Atari At The NAMM Show

BY JIM PIERSON - PERRY
START CONTRIBUTING EDITOR
WITH JAN PAUL MOORHEAD



The main work area for RealTime, the multi-tasking sequencer. The display shows the MIDI note data and some graphically edited pitchbend data. The pointer is being used to add additional notes in step time.

Patching Things Up

Generic patch editor programs are a hot new MIDI application. Previously, dedicated patch editor programs were required for each synthesizer to deal with instrument-specific sound parameters (sysex data). The new approach is to use a single program with numerous screen controls (e.g., sliders) that can be assigned to any desired type of sysex data. The first entries in this field are Tweak It! from Savant Audio, X-Or (formerly Orchestrator) from Dr. T's Music Software and GenEdit from Hybrid Arts.

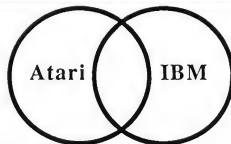
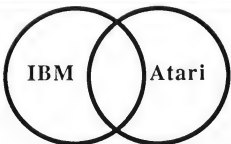
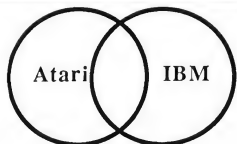
NAMM is also a prime time for major upgrades to sequencer programs. Hybrid Arts has released new versions of their MIDI Track sequencers along with a new member of the family, EditTrack. All are mutually compatible, the differences being in hardware synchronization capabilities. This upgrade also includes support for MIDI files (format 0 and 1).

Dr. T has finally broken the GEM barrier. His KCS version 1.7 features a standard menu bar, scroll bars and access to desk accessories, and it can work with up to eight program modules under the multi-program environment (MPE). Two new modules were released: ▶

Every January, the music community holds its breath waiting for the new wave of instruments, electronic wonders and software to be released at the Winter NAMM (National Association of Music Merchandisers) show. This year was no exception and Atari was right in the mainstream, showing its commitment to the music/MIDI market. The large number of exhibitors showing products for the ST really reinforces its role as the "musician's computer."

The major software news is availability of multi-tasking environments for music and other applications on the ST. This is real multi-tasking, not just program switching a la Multifinder on the

Mac. First honors for implementing this ability go to Intelligent Music's new sequencer program RealTime. In fact, while writing this report with ST Writer I am running songs through RealTime in the background. Coming close on its heels is M-ROS, the Music Real Time Operating System, from Steinberg/Jones, which is envisioned to provide multi-tasking across ST, Mac and IBM AT computers. This system was demonstrated by simultaneously running Cubit (an advanced new sequencer), Synthworks M1 (new patch editor for the Korg M1) and the Mimix desktop automated mixing system.



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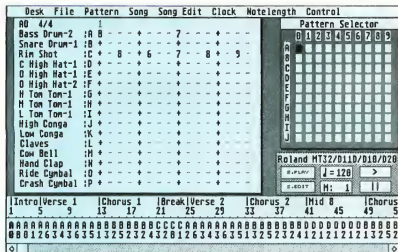
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KEEPING THE BEAT WITH MIDI DRUMMER

The First ST Drum Machine Sequencer

BY JIM PIERSON-PERRY



The MIDI Drummer workscreen. The current pattern is displayed in the grid while a full song (pattern list) is shown at the bottom of the screen in the display window. The pattern selector box is at the upper right corner.

is played at that time. Typically, a pattern is developed by overdubbing one drum sound after another while listening as the pattern loops. An example would be to start with a kick drum, adjust its timing, then add snare drums, cymbals, tom toms, etc.

As You Like It

MIDI Drummer runs on all STs and Megs with either color or monochrome monitors. Key disk copy protection is used, permitting you to install the program on a hard drive and make backup copies. A backup master disk can be purchased from MusicSoft by registered owners at the (somewhat exorbitant) cost of \$25. The manual covers all program operations tersely and has several minor inaccuracies between it and the current program operation. It could stand a rewrite, including an index and additional screen shots. Standard GEM implementation is followed with full access to desk accessories. Several apparent menu commands are actually just messages and should be relocated to a help screen.

Program operations are carried out from a main workscreen divided into four areas: pattern grid, pattern selector box, song display and playback con-

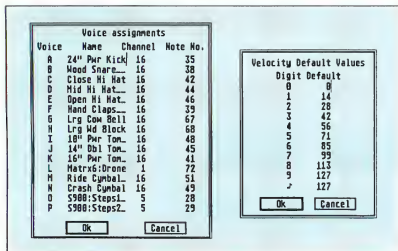
Sometimes the timing works out just right. In a recent START MIDI column, I listed a drum machine sequencer under my MIDI software wish list. Not 12 nights after submitting the column a notice arrived from MusicSoft announcing MIDI Drummer, the first drum machine sequencer for the ST. Well-designed, simple to use and with more features than you could shake a spear at, this program turns drum machine programming from tedium into fun.

MIDI Drummer works with any drum machine that responds to MIDI note triggering, including virtually all of the popular models, and goes well beyond just drum machines to control synths and samplers as well.

Measure for Measure

Drum machine sequencing is oriented toward creating small blocks of measures called patterns. Once started, a pattern plays through to completion, then loops back and starts over again. Songs are built up by stringing different patterns together, adjusting the number of loops played per pattern. This is conceptually different from typical linear sequencers that are based on a tape recorder model, building a song one entire track at a time.

Patterns are usually viewed on a grid with time (beats per measure) on the X-axis and available drum sounds listed down the Y-axis. A mark (hit) on the grid means the particular drum sound



The two setup dialog boxes are shown here for voices and preset velocity scale. Of the 16 voices used, 13 are from a drum machine (Alesis HR-16), two are from a sampler (Akai S900) and one is from a synthesizer (Oberheim Matrix 6).

gram receives tempo information from an external source (such as a hardware sequencer) and responds to MIDI clock and song position pointer messages.

Taming of the Grid

Anyone who has ever programmed a drum machine will feel right at home with MIDI Drummer. Patterns are entered on the screen grid by clicking with the left mouse button to mark hit points. Clicking on a hit a second time erases it. Keyboard equivalents for each voice can be used (tap write) to enter or erase hits to a sixteenth-note resolution; you must use the mouse for higher resolution. You can completely define a pattern before hearing it or create and edit it while it is playing.

Simple hits are denoted with an asterisk on the grid and all get the same default velocity value. Entering a hit by typing a number from 0 to 9 gives it the corresponding preset velocity value from the setup assignment table. These values can be edited like any other hit to change or erase them. In addition, holding the shift button down and clicking on the left mouse button increases the value. (Shift-right button decreases the value.) For more detail, clicking on a hit with the right mouse button calls up a dialog box where you can enter the exact velocity value from 0 to 127. Use of velocity dynamics significantly adds to the realism of your drum parts.

Hit durations are defined initially as a very fast trigger pulse. Alternative settings are to last for one MIDI clock beat, duration of a one-thirty-second note beat or sustain until the next hit for the voice. Hit duration is a global parameter, affecting all voices over all patterns. The trigger setting seems to work fine with drum machines but was not picked up by my synths. All other duration settings were fine. An All Notes Off command described in the manual is not implemented in the current program version.

trols. Patterns are created and edited in the grid, which occupies the center of the screen. Grid resolution supports timing down to a one-thirty-second note. Up to 100 different patterns can be created and kept in memory, each with an index name (A0 to J9) in reference to the pattern selector box. Patterns are defined for a single measure but each can have its own time signature.

Songs are constructed in the song display window by choosing patterns from the selector box in the order they are to be played. Up to eight separate songs can be kept in memory at once, each identified by a 24-character name. A song select menu command lets you decide which one to edit or play. Playback start and stop are controlled by screen buttons or their keyboard equivalents, along with a tempo setting that can be varied while MIDI Drummer plays.

Before starting to create patterns, you need to define the voices (sounds) that will be played by your specific MIDI setup. These can range from separate sounds in a single drum machine to combinations of instruments played on different MIDI channels. A dialog box guides you through assigning a MIDI note, channel and name (12 characters) for up to 16 voices. (It's not necessary to use them all.) An optional velocity scale can be created to assign 10 preset note-on velocity (loudness) values to add dy-

namics when entering hits. All 100 patterns and eight songs, along with voice and velocity tables, can be saved as a setup file. As drum machines and other instruments do not follow any standard for relating drum sound to MIDI note, you can have separate setup files for each MIDI instrument configuration used. You can design a default setup file to load automatically when the program starts. The program comes with a sample setup file for the Roland D-10.

Anyone who has ever programmed a drum machine will feel right at home with MIDI Drummer.

MIDI Drummer can act as either the master or slave with respect to the MIDI clock for your system. Operating under an internal clock (master mode), MIDI Drummer will play with respect to its given tempo setting and send MIDI clock, start/stop/continue and song position pointer messages. If set to use an external clock (slave mode), the pro-

Each pattern starts with a default time signature of 4/4. This can be changed to any signature of the form "1 to N over N" (where N=1, 2, 4, 8...32). Time signatures such as 5/4 or 11/8 are not supported directly but can be broken into consecutive patterns (eg 5/4 equals 3/4 followed by 2/4). The only exception is 12/8 for patterns with a triplet feel.

Playback is started and stopped by clicking on the respective screen transport buttons or their keyboard equivalents. The tempo can be set explicitly or computed after hitting the 0 numeric key button four times at the desired rate (nice touch!). All patterns are played with respect to the current tempo. The allowable range is 30 to 255 beats per minute and can be changed with the mouse during playback, but tempo changes cannot be programmed as part of a song. A metronome can be turned on that plays through the monitor internal speaker (not MIDI) to help set and follow the tempo. During playback, a beat counter at the top of the grid helps you track the program through the grid. Individual voices can be muted or unmuted during playback by clicking on the voice name in the grid.

Several editing features are provided to simplify creating patterns. An individual voice line, across the entire grid, can be copied to any voice line in any pattern. Extending this, an entire pattern can be copied to any other pattern. When copying a pattern, its time signature goes over with it. If you make a mistake, you can clear hits individually (via mouse or keyboard), across an entire voice at once or the entire grid can be cleared.

A MIDI Drummer's Night Song

After defining all the patterns you need, the next step is to assemble them in the desired order to build the overall song. MIDI Drummer makes this operation very straightforward with the song display window and pattern selector box.

Holding down the shift button and clicking on an index in the selector box adds the corresponding pattern into the song.

Song playback is controlled by the start/stop transport buttons; a screen toggle button selects between song and individual pattern play. While playing a song, the current pattern is highlighted in the song display box and shown on the pattern grid. A measure counter increments to track playback through

As intuitive as this program is, MusicSoft's customer support people will probably get lonely waiting by the telephone.

the song. Patterns can be edited even while a song is playing. Conversely, songs can be created and edited even while a pattern is playing. Songs normally play through once and then stop, but this can be changed to repeat the song a set number of times or to the entire song continuously.

While editing, the song display can be set to either insert or overwrite mode, similar to a word processor. Under insert mode, existing patterns in the song display are pushed to the right to make room for new entries. The alternative, overwrite mode, simply puts new patterns in place of previous ones.

Standard cut, copy and paste menu operations are provided along with function key equivalents. These work over a block of patterns selected with

the mouse. The paste function can be extended to paste multiple fills at once. In cases of total frustration, a song clear operation will erase the entire song buffer. Text labels can be entered in the song display window to identify song fragments or provide notes for whatever reason. Simply click within the song display window at the desired location and enter your text in the resulting dialog box. Using this feature to mark pattern blocks associated with verses, chorus, intros, etc. can be a real time-saver during editing.

Much Ado About a Few Things

I ran into two small problems while using MIDI Drummer that apparently are due to the new Mega ROMs. First, the dialog box for entering explicit hit velocities didn't work. This was not too much of a problem, as the 10-level preset velocity scale gave adequate dynamics for drum parts. A second strange bug was that opening the Control Panel desk accessory (and only that one) while running the program prevented further playback. Editing or file operations were not affected, but it simply would not play. I tested a host of other desk accessories and no other one caused this problem. Neither of these minor blemishes showed up when I tested the program with a standard 520ST or 1040ST; MusicSoft is currently checking into them.

Of course, no review would be complete without a list of desired additional features. First, I'd like to divorce the voice assignment setups from the patterns and songs when stored to disk. That way, pattern files could be shared between users without editing, regardless of their drum machine choice or MIDI setup. Second, include a menu command for disk formatting. This is a fairly trivial addition that should be a standard feature for all programs where you run the risk of losing your work. Just a little touch to add to the already good user interface. On editing, I'd like ▶

to see the copy line and pattern edit commands enhanced to write to a destination range rather than the present single destination. When editing 10 patterns that are variations of a single theme, I'd rather do the initial copy command just once. Finally, how about making tempo a pattern-specific value like time signature? It would be nice, and more reproducible, to be able to build tempo changes into the song rather than manipulating the tempo window during playback.

All's Well That Ends Well

I saved one of the best features for last. A companion program is supplied with MIDI Drummer that converts songs into standard MIDI file format. This lets you write drum parts quickly and efficiently with MIDI Drummer, then import them as tracks into any sequencer that recognizes MIDI files. I tested this by import-

Patterns can be edited even while a song is playing.

ing songs into Dr. T's Keyboard Controlled Sequencer and it worked great! In addition, The Copyist (Dr. T's scoring program) also recognizes MIDI files, so I was able to generate transcriptions of my drum parts. MIDI file support is fast becoming a standard feature that users are looking for and it's good to see that MusicSoft wasted no time in supporting it. And that's not all: two additional programs are included that exercise your MIDI system and analyze the MIDI data flow going in or out of your ST.

All in all, I recommend MIDI Drummer highly. It takes the drudgery out of drum machine programming and makes it easy to try new ideas quickly. I should also mention that I had no trouble getting technical support from MusicSoft on several occasions during this review. There was always someone online with the answers. That's a pity: as intuitive as this program is, they'll probably get lonely waiting by the telephone. ■

START Contributing Editor Jim Pierson-Perry is a semi-professional musician and research chemist who lives in Elkton, MD.

PRODUCTS MENTIONED

MIDI Drummer version 1.6a, \$99.95, MusicSoft, 1560 Meadowbrook, Altadena, CA 91001, (818) 794-4098.
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Programming In Pascal

Supercharging Pascal With Assembly Language

BY BRUCE WIEBE

Supercharged stars move fast with SMALLFLT.ARC on your START disk.

In this first installment of START's newest programming column, I'll show you how to use assembly language routines in your Pascal programs to dramatically improve performance. On your START disk, there are three versions of the demonstration program Small Flight, each faster than the one before it. Un-ARC the file SMALLFLT.ARC, following the Disk Instructions elsewhere in this issue.

Double-click on SFLTVDI.PRG from either medium or high resolution. The pixels coming toward you simulate the stars you would see if you were blasting through the universe in your X-Wing fighter.

Take a Trip

I got the idea for Small Flight from the March 1986 issue of MacTutor: It was originally written by Mike Morton and I wrote the ST conversion in OSS Personal Pascal.

Small Flight simulates three-dimensional movement on a two-dimensional plane with all calculations performed in 3D then converted to 2D display coordinates. To store information about a star you need to keep track

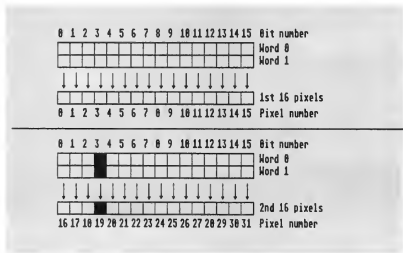


Figure 1. In medium resolution the first 16 pixels on the screen correspond to the first two words in screen memory, the next 16 pixels correspond to the next two words, etc. To change pixel number (19,0), you would have to change bit 3 in word 2 and also bit 3 in word 3.

of three values: x, y and z. Random values are generated for x and y. The variable z is 200, which represents the distance the star is from you. By decreasing the value of z, the star will get closer and closer to you. In my example I am using 75 stars at once. When a star disappears off the screen, another one is generated.

The formulas to convert the point (x,y,z) to a 2D display are:

$$h = x * k / z$$

$$v = y * k / z$$

The variable k is a constant that determines how wide the view is. Vary this number and see the effects.

In my program the procedure Cycle examines each star and moves it toward

the viewer by decreasing z and recalculating (h,v). The previous position of the star is erased and a new position is created. Turning pixels on and off is done with the Flippix routine.

The program itself is very simple. The challenge, of course, was to get the program running as fast as possible.

Getting Up to Speed

Most programs can benefit a great deal by improving a small segment of code that is used frequently. Since Flippix is the most-used routine in Small Flight, we'll be able to increase the program's speed dramatically by optimizing its use.

My first attempt at Small Flight uses ▶

the built-in Personal Pascal function Plot(). The program SFLTVDI.PRG shows my result. By executing the Personal Pascal function Set_ Drawmode(3), a call to Plot() will turn a pixel off and on. This is the slowest method I used for Flippix.

My second attempt was to use A-Line routines. The 68000 chip has some unimplemented instructions that computer manufacturers can use however they wish. Atari chose to implement these as fast graphics primitives (basic graphics commands). Among these primitives are a_getpixel (which returns the color of a pixel) and a_putpixel (which changes the current color of a pixel). You need to use both of these functions since you must know the current color of a pixel before you can change it.

A-Line routines can only be called from assembly language. The Tackle Box ST from SRM enterprises has a pre-written assembler module that you can link with your Pascal program and access the A-Line routines. Tackle Box's object files are copyrighted, but by examining SFLTLINA.PAS you can see how these calls are used.

SFLTLINA.PRG is certainly faster than SFLTVDI, but we can do better.

For my third attempt, I did what every computer manufacturer warns never to do and almost every game programmer does anyway: I wrote directly to screen memory. Run the program SFLTASM1.PRG if you have a monochrome monitor or SFLTASM2.PRG for medium resolution color and see for yourself. The speed is amazing! This version was the most challenging to write. Being the first assembler program I have written, the final Flippix routine was very satisfying to complete.

Finding the Screen

The screen memory on the ST is just like the rest of the ST's memory—it can be anywhere. In fact, the default screen memory varies among the different ST

models. Screen memory is a 32,000-byte contiguous block of RAM that must begin on a boundary evenly divisible by 256.

Finding the starting address of screen memory is easy enough. The function XBIOS(2) (get_physbase) gives you this number. The following Pascal

program segment shows how the procedure should be set up:

```
FUNCTION GetPhysBase : Long_
Integer;XBIOS(2);
```

Never assume that the screen memory is at a particular address. Always

```

1          COMMENT PASCAL
2          XDEF      FLIPPPIX
3          SECTION  TEXT
4          FLIPPPIX
5          move.l    (sp)+,d5      *pop off return address
6          move.l    (sp)+,d0      *pop y off stack
7          move.l    (sp)+,d1      *pop x off stack
8          move.l    (sp)+,a0      *get screen address
9          lsl.l     #7,d0         *multiply by 128
10         move.l    d0,d4         *save the result
11         add.l     d4,d0         *the result
12         add.l     d4,d0         *of all this is to
13         add.l     d4,d0         *multiply by 640
14         add.l     d4,d0         *without using mul
15
16         add.l     d1,d0         *add x to get pixelnumber
17         divs.w    #16,d0        *get byte offset
18         swap      d0           *exchange high and low byte
19         move.b    d0,bitnumber  *save the remainder
20         swap      d0           *flip bytes back
21
22         and.l     #$0000FFFF,d0 *clear high byte
23         lsl.l     #1,d0         *multiply by 2 the fast way
24         add.l     d0,a0         *find address of screen byte
25         move.w    #15,d3       *get bitnumber to AND with
26         sub.b    bitnumber,d3  *d3 is number of bits to shift
27         move.w    #1,d4        *put a 1 in d4
28         lsl.w    d3,d4         *shift bit to correct position
29         move.w    (a0),d1      *load word of screen to d1
30         eor.w    d4,d1         *toggle bit
31         move.w    d1,(a0)      *write directly to screen
32         move.l    d5,-(sp)     *push return address on stack
33         rts
34
35         bitnumber even
36         dc.b     0

```

Figure 2. This code segment is from the file FLIPPPIX.M on your START disk in the archive file SMALLFLT.ARC. This is the monochrome version of this routine; the medium-resolution version is the file FLIPPPIX.S. The line numbers are for reference only.

use the XBIOS(2) call to find the address.

Now comes the more difficult part, knowing which bits and bytes to manipulate. The basic plan of attack is as follows:

1. Convert the xy coordinate to a pixel number using the formula:

$$\text{pixel number} = 640y + x$$

2. Divide your number by 16 to find out which word this pixel occupies.

3. Move the word into a register.

4. Find out which bit to flip.

5. Flip the bits by using the eor (exclusive or) instruction.

6. Replace the manipulated word(s) in screen memory.

Monochrome (high resolution) is the simplest to understand. Each pixel on the screen can be either on or off (black or white). Thus, each pixel can be represented by one bit in memory. The first 16 pixels on the screen are mapped to the first 16 bits in screen memory (one word). If the bit is 1, the pixel will be on (black), if the bit is 0, it will be off (white).

The first 640 pixels (the top line on the screen) are mapped to the first 640 bits, the next 640 pixels to the next 640 bits, and so on until the end (639,399) is reached.

Medium resolution is more complicated. Since there can be a choice of four colors for each pixel, two bits are needed to represent each pixel. The ST does this by using interleaved bit planes. The first 16 pixels are represented by the first 32 bits (two words) in screen memory. To change pixel number (19,0), you would have to change the third bit in the second word plus the third bit in the third word. See Figure 1.

Low resolution uses the same idea, but with four bit planes instead of two. Since each pixel can be any one of 16 colors, it takes four bits to represent each pixel.

The Assembly Language Routine

Let's go through the assembly language routine in Figure 2 one step at a time. The statement numbers are for reference only. This is file FLIPPX.M5 on your un-ARCD Small Flight disk. Note that the label FLIPPX starts in column 1. I'll use the high-resolution example and stop to describe the differences for medium resolution when necessary. I used MichIron's DevpacST to develop the assembler routines.

The line 1, COMMENT PASCAL tells the assembler to generate code that is compatible with OSS Personal Pascal. Line 2, XDEF FLIPPX, tells the assembler that the symbol FLIPPX is to be global. Some assemblers (like Assempro) use the pseudo command globl to accomplish this.

Lines 5-8 pop values off the stack. Personal Pascal pushes the parameters on the stack before it makes the call to the assembly language subroutine. Recall what the Personal Pascal function looks like:

```
PROCEDURE Flippix(screenaddress,hy
: Long_Integer); EXTERNAL;
```

In assembly language, register a7 always points to the top of the stack. Sometimes sp (stack pointer) is used to denote register a7. The order that the parameters are pushed on the stack is important. Parameters are pushed in the same order that they are declared, from left to right. This means that the assembler routine will be popping them off in the reverse order. Since the three parameters are all declared as Long_Integers (32 bit values), the assembler routine must execute move.l instructions instead of movew instructions.

The screen address is in register a0,

the y coordinate is in register d0, and the x coordinate is in d1. Lines 10-14 multiply register d0 by 640. We need to multiply by 640 because each row contains 640 pixels. If we were working in low resolution this number would be 320. Line 9 (lsl.l #7,d0) shifts the contents of d0 seven bits to the left. This is equivalent to multiplying by 2 to the power 7.

The result is stored in register d4 (line 10) and added to register d0 4 times (lines 11-14), which is the equivalent to multiplying by 640.

Why not just execute a multiply instruction? Even one multiply instruction would take longer to use than the method above. You can find this out by consulting a book on the 68000. I used the quick reference guide that came with DevpacST. Here is a comparison of the two methods:

A multiply instruction takes 70 clock cycles.

My method uses:

lsl.l	22 cycles
move.l (register to register)	4
add.l 8 cycles (times 4)	+32
	58 total

I can save 12 clock cycles by avoiding the multiply instruction.

The add.l d1,d0 instruction puts the pixel number in d0. Next I divide the result by 16.

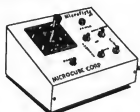
By adding x to the result (line 16) we get the pixel number. This is the number of pixels relative to the upper left corner. Using this number we need to find out which word in screen memory contains the pixel and which bit in that word is the pixel.

By dividing the pixel number by 16, (line 17) you get both values. The quotient is the word that contains the pixel, and the remainder is the bit number in the word. Note that the bit number is from left to right. ▶

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Programming in Pascal

Since there are two bytes in a word, multiply the above quotient by two. I used the lsl.l trick again (line 23). Here is where a difference occurs in the medium resolution version; the above quotient would have to be multiplied by four instead of by two.

After a divide instruction, the quotient is in the low word and the remainder is in the high word. By executing the swap instruction to exchange the high and low word, the remainder can be stored (lines 18-20).

Line 22 clears the high byte of register d0. Line 24 adds the newly calculated byte address to the starting screen address to register a0.

Lines 25-28 perform the bit shifting to get a one in the appropriate position to eor (exclusive or) with the word in screen memory.

Lines 29-31 copy the word from screen memory to register d1, exclusive or's it with register d4, and places it back in screen memory.

This sequence must be modified slightly for the medium resolution version. Since each pixel needs two bits (stored in two different words), two words would have to be eor'd. The code would look as follows:

```
movew (a0),d1
movew 2(a0),d2*2 bytes past
eorw d4,d1
eorw d4,d2
movew d1,(a0)
movew d2,(a0)
```

PRODUCTS MENTIONED

Personal Pascal, \$99.95, OSS/ICD, 1220 Rock Street, Rockford, IL 61101. (815) 968-2228.

CIRCLE 174 ON READER SERVICE CARD

Tacklebox Tools is no longer available commercially.

Hisoft DevpacST Version 2, \$99.95, distributed by Michtron, 576 South Telegraph Road, Pontiac, MI 48053, (313) 334-5700.

CIRCLE 160 ON READER SERVICE CARD

Recommended References:

COMPUTE's Atari ST Machine Language Programming Guide, \$18.95, Chilton Book Co., Attn: Cash Sales (include \$3.50 Shipping & Handling), Radnor, PA 19089, (800) 345-1214.

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Programming the 68000, by Steve Williams, \$24.95, Sybex Computer Books, 2021 Challenger Drive, Bldg. 100, Alameda, CA 94501.

CIRCLE 176 ON READER SERVICE CARD

Atari ST Machine Language, by B. Grohmann, P. Seidler & Slibar, \$19.95. Abacus Books, 5370 52nd St. S.E., Grand Rapids, MI, 49508, (616) 698-0330

CIRCLE 177 ON READER SERVICE CARD

This completes the function of the assembler program. The last two statements (lines 32-33) place the return address back on the stack and execute the rts (return from subroutine) instruction.

The last parameter Personal Pascal pushes on the stack is the return address. The assembler routine must be able to pass control of the program back to the original calling program.

If you're using DevpacST, you must have the COMMENT PASCAL line at the top of your program, then assemble it to DRI format. The resulting file is linked via the additional link files in Personal Pascal. The XDEF or globl commands are used to make symbols accessible from the high level language.

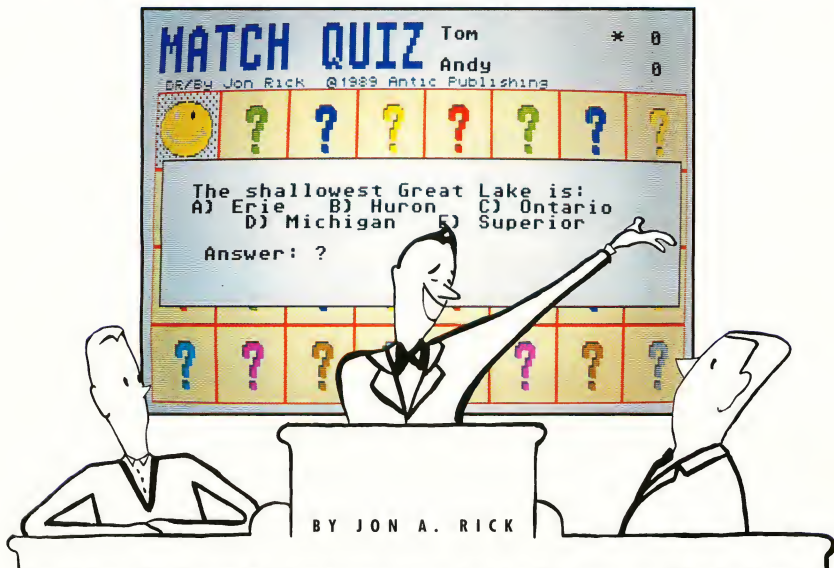
Wrap Up

I have always been intimidated by assembler language. If you feel the same way, now's the time to get over that phobia! There are a lot of advantages to knowing assembler. I think the best approach is to code in a high level language and use assembler for small routines, like I did in this program. A big advantage of having a library of assembler routines is that they're as fast as possible and should not be hard to link with almost any high-level language. ■

Bruce Wiebe lives in Winnipeg, Manitoba, Canada and is a systems analyst with Manitoba Hydro. This is his first article in START.

Match Quiz ST

ON DISK!



Let's face it: learning can sometimes be, well, boring. The tedium a child endures through hours of seemingly useless math and spelling drills doesn't make the educational experience any better. In Match Quiz ST, START presents a way for your son or daughter to learn easily and painlessly. In fact, Match Quiz is so much fun you might want to give it a try yourself. A color monitor is required.

Hey, buddy, gotta match? File MATCH.ARC on your START disk.

When my daughter entered the first grade she had to practice her addition

and subtraction tables and her new piano lessons constantly, none of which exactly drew raves from her. She would much rather play Matchboxes, a com-

puter game based on Concentration, the old game show in which images on a grid had to be matched by answering questions correctly. I thought that if ▶

there were only a way to combine the fun of Matchbox with the educational benefits of math and piano drills, I could make my daughter's learning experience more enjoyable. The result was Match Quiz ST.

To run Match Quiz ST, copy the files MATCH.ARC and ARCX.TTP onto a blank, formatted disk and un-ARC MATCH.ARC following the Disk Instructions elsewhere in this issue. The files CLIP.DAT, CLEF.DAT, LBJ.SND, MATCH.MUS and PLAYSCRN.PII must be in the same directory. The game was written in GFA BASIC and runs in low resolution only.

Getting Started

At the Match Quiz game screen, an alert box will ask you to type in the name of the first player. Type in the name and press Return. A second alert box will appear that will ask you for the name of the second player. Type in that name and press Return.

After the game knows the names of both players, an alert box asks you to choose the type of game you wish to play. You have three choices: Math Quiz, Word Quiz and Music Quiz.

If you choose the Math Quiz, you're then asked for the maximum and minimum value of your problems, that is, the highest and lowest numbers you wish to be quizzed on. For example, if you choose 10 as your highest number then no problem you're given will have a number higher than 10 as the answer.

If you choose the Word Quiz from the game choices, a file-select box will appear that gives you a choice of sample quizzes. Word Quizzes can be true/false, fill-in-the-blank, multiple choice or question-and-answer. I've included three sample quizzes for you to try out: STWRD, TRIVIA.WRD and DEIDRE.WRD.

Your third choice is the Music Quiz where you're required to correctly identify notes on the Grand Staff.

After you choose the type of quiz

you wish to run, an alert box will ask each player the difficulty level at which they wish to play. Your choices here are Easy, Normal and Hard. Not only does your choice determine the difficulty of the questions, it also determines the

Match Quiz ST is based on Concentration, the old game show.

amount of time each player will be given to answer a question. The easier the level, the longer the time. After both players enter their choices the game begins.

Playing Match Quiz ST

The players' names are shown in the upper right-hand corner of the game screen. An asterisk indicates whose turn it is. The game is played like Matchboxes, which in turn is played like the old TV show Concentration. There are 32 boxes on the screen with 16 different pictures behind them, two of each. The object of the game is to find the most matching pairs.

To select a box, point and click on it with the left mouse button. This calls up an alert box with a question. Match Quiz ST checks your answer as you type it, so you cannot use the Backspace key to correct a mistake and you don't need to press Return to enter your answer. You'll type your answer over the question marks; the number of question marks tells you the number of characters in the correct response. Match Quiz ST is not case-sensitive.

If you enter the correct answer within the allotted time, the picture in that box is shown and the you may select another box. If you answer correctly

again and both pictures match, you win a point and can pick additional boxes until you either answer a question incorrectly or don't match two images. There are two wildcard images in the game that will match with any other picture. To stop the game in the middle and start over or return to the Desktop, click the right mouse button.

During gameplay, press the Help key to get a hint for an especially tough question. Keep in mind, however, that every time you press the Help key, it leaves less time to answer the question.

Create Your Own Quizzes

At the Desktop, click on QUIZ-MAKE.PRG to create your own word quizzes. (You must be in medium or high resolution.) A word quiz has three parts: the correct answer, the displayed question and an optional hint. A quiz file can hold up to 50 questions.

The quiz-creator program is an adaptation of the Generalized Input Routines by Michael Hepner in the December 1988 issue of START. The program has many alternatives in the use of drop-down menus, function keys and mouse "point-and-click," so you should find it easy to use. Many keys (such as Escape, Insert, Delete, Clr Home, Tab, Up Arrow and Down Arrow) are functional. You can refer to that article or the comments in the listing for a further description of how the program works. Experimenting will not harm any of the files because you can always Quit or Reload File to wipe out any errors. I suggest you practice first by editing the sample quiz files.

Program Details

Match Quiz ST was written in GFA BASIC. To look at the source code, double-click on MATCH.LST and click on Show or Print. To load the file into GFA BASIC, run GFA and click on Merge, then select MATCH.LST.

The pictures were all drawn with DEGAS Elite. A GFA BASIC program

was used to "clip" the smaller pictures and combine them into a single file on disk. The original pictures are in the file ALL.P11. The main display is an untouched DEGAS picture. The music file was designed just for this program. Each byte of a song contains both a note value for the Sound command and a duration. The ST timer is used to monitor when the note ends. The Get_key and Playsong routines work together to keep the music going while checking for keyboard input from the player. The title song, "Little Brown Jug," is played by the XBIOS(32) routine as described in *The GFA BASIC Book*. The song was created using the Elsie program from that book.

The three sample quizzes are called from a common routine called Quiz. If you want to add your own, it only has to interface with the game at this point. Your routine can also call Get_key to wait for input. To play a song, Wnote (Which note) must be set to a specific note and Wsong (Which song) to a value from one to 20 to choose which song is played. I play songs numbered 17-20 while waiting for keyboard entries. They're written to gain tempo rapidly as time runs out in order to pressure players into answering a question quickly.

Matching Up

I have found Match Quiz ST to be a useful aid in my daughter's educational development. The more she plays, the more she learns and if she has fun while she's learning, then all the better. ■

Jon Rick is an Atari enthusiast currently living in the Far East. This is his first program for START.

PRODUCTS MENTIONED

The GFA BASIC Book by Frank Ostrowski, \$19.95. Antic Software, 544 Second Street, San Francisco, CA 94107, (800) 234-7001.

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ON DISK!

SCREEN WRITING

with Word Perfect on the ST

BY MICHAEL PERRY

The road to writing riches these days seems to lead to Hollywood. If you're good enough to write that next blockbuster screenplay and lucky enough to get it read by the right people, you just might take home a tidy six-figure bundle by the time it's on the screen. But first you have to write it—and write it right. With WordPerfect and the macros on the START disk that accompany this article, you'll have a leg up. The rest is up to you.



Why create those WordPerfect screenwriting macros yourself? We'll do it for you. File WPMACROS.ARC on your START disk.

Before every great movie, there was a great screenplay. You'd never know it from the way that directors and actors like to put their names above the title, but in the beginning, there was the word. And more recently, the word processor.

The rewards for selling a screenplay can be substantial; some first-time writers reap \$300,000 or more their first time out. Although production companies are always on the lookout for next year's hit, they often are deluged with thousands of submissions. It costs



from \$40 to \$400 to have a script read by a professional story analyst, so companies look for ways to eliminate obvious "losers" that can be sent back unread.

When a screenwriter doesn't have an agent or an uncle in the business, he or she has to make sure the script looks thoroughly professional if he or she wants it to be read. A gripping story and likeable characters are the most important elements, but the fact remains that an improperly typed screenplay gets the same reaction as architectural drawings done in purple crayon: It's simply not taken seriously.

There are a hundred little rules that need to be obeyed in the typing of a screenplay; they describe what is capi-

talized, how to break pages, how to introduce new characters, etc. To list them all is beyond the scope of this article, but the aspiring screenwriter should consult the excellent reference work entitled *Complete Guide to Standard Screenplay Formats, Part I: The Screenplay*.

Doing It on the ST

For screenwriting on the ST, one of the best word processors available is WordPerfect. There are constant margin changes throughout a screenplay, as well as specific formats for the "fly page" and first page of a script. WordPerfect is up to the task, because of its "macro" feature. Macros allow the writer to consolidate a series of keystrokes and mouse movements that are frequently used

into one single keystroke. WordPerfect files can also be moved onto an IBM or Macintosh computer without being reformatted.

On the START disk this month in the file MACROS.ARC are WordPerfect macros for use in screenwriting that will set tabs, margins, and page lengths, plus some handy macros for frequently used terms. There is also a sample layout of a fly page, set up so the writer can be sure his fly page looks proper.

To use the macros, un-ARC MACROS.ARC following the Disk Instructions elsewhere in this issue. Then place them in your WordPerfect default directory. The following instructions will get you through the creation of your hit screenplay. ▶

Screenplay Rules and Tips

Fly Page: The fly page is the first thing seen in a screenplay when you open the cover. Simply load the document FLYPAGEWP into Word Perfect, and replace the information such as title, name, production company name (if there is one) and so on, with the information for your screenplay.

Page One: At the top of your first file, load the macro PAGEONE.MAC by pressing Alt-F10, and then type in PAGEONE.MAC. This will set the margins, tabs, etc. and correctly locate the title and "FADE IN" on the page. The first page of a screenplay does not have a page number. (This isn't a single stroke macro because you only need to

use it once per screenplay.)

Page Two and Beyond: At the bottom of page one of the screenplay, put a hard page break by pressing Control-Return. At the very top of page two, load the macro PAGE2UP.MAC by pressing Alt-F10 again, and this time entering PAGE2UP.MAC. Margins, tabs, etc. are set again and the running header which contains the page number is added.

Breaking Up Files: It's not a good idea to put all 120 or so pages of a screenplay in a single file while writing it. Most screenwriters break up a screenplay into blocks of approximately 20 pages. When you start a new file midway through your screenplay, put the PAGE2UP.MAC at the head of the file, then insert the new page number by pressing Alt-F8, choosing "New Page Number" on the menu, and entering the next page number. If your last file ended on page 56, start the new file on page 57.

Setting Action, Dialogue, and Personal Direction Margins: As you go through your screenplay, you will have to change the margins several times per page. These macros are used more than any others, so they are single-stroke macros. They're called by holding down Alternate and then pressing the indicated key.

To set dialogue margins, press Alt-D.

To set action margins, press Alt-A.

To set personal direction margins, press Alt-P. Personal direction is the parenthetical comment following a character name but before his dialogue begins.

Tabs: Tabs have been set for personal direction, character names, and opticals (CUT TO: or DISSOLVE TO:).

Some additional features are !Alt-U for "CUT TO:," !Alt-I for "INT." (Interior) and !Alt-E for "EXT." (Exterior).

Personalizing Your Macros

Suppose you have a character named Fitzsimmons, who appears throughout your script. In order to spell his name

A Day In The Life Of An ST At A Film Production Company

At C U Productions, we have used the Atari ST for nearly three years and it's proven to be an excellent choice for a film and video production company, in large part because of its ability to interface with other brands of computers.

C U currently uses a Mega ST2 with a monochrome monitor, a self-built 5¼-inch drive and 45-meg hard disk, Avatex 1200 modem and a Spectre 128 cartridge. We've used WordPerfect since beta-testing days, and pc-ditto for about a year, as well as a variety of other business software, both ST and Macintosh. Our laser printer is actually hooked up to an IBM clone that we have access to as a part of our co-op office rental agreement.

A recent example of the strength of the ST came when we were producing a promotional film for a Japanese car company. The client's writer had generated his script on a Macintosh and lived 45 miles away. We had to do a production breakdown on the script and if we had any other computer, we might have had to re-key from page one.

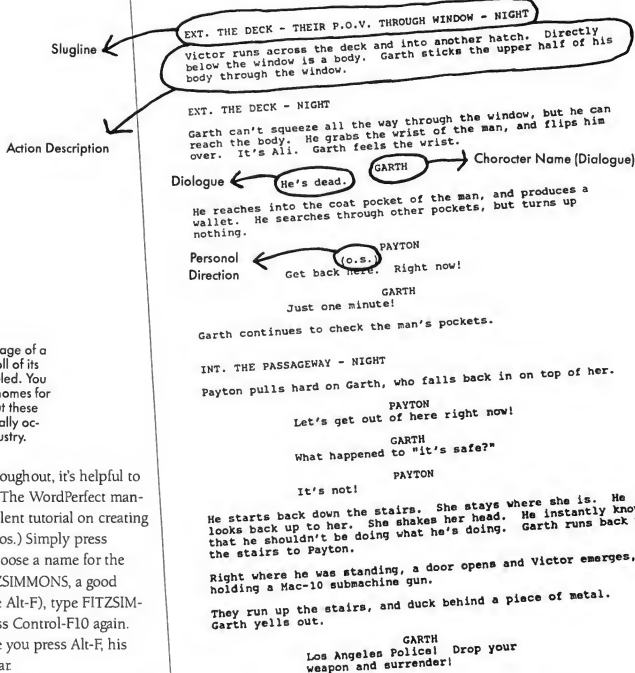
Instead, the writer sent us his draft of the script via modem, which we captured in the Macintosh partition of the hard drive using Spectre

128 and a public domain Mac terminal program. We then moved his file to the Atari ST partition using the Transverter, and then loaded it into Atari WordPerfect to add our changes and comments.

We saved the file onto a 5¼-inch disk and walked down the hall, loaded it up into IBM Word Perfect on the office co-op computer and printed it out on the laser printer.

In the time that it might have taken to drive to the writer's house and back, we had our completed shooting script ready and printed out and met with the client that afternoon. The ST also saved us the time it might have taken to re-key the document.

This example is not an exception; it's part of doing business. When working for clients, a production company can save a lot of time, money and anguish by being flexible enough to communicate with a variety of computer systems. We've received working documents, scripts and budgets in Mac, IBM and Atari formats and digested all of them. The ST's capacity to emulate other computers has saved us the expense of having two more computers in the office. ■



This is a typical page of a screenplay with all of its components labeled. You may hear other names for some of them, but these names are generally accepted in the industry.

consistently throughout, it's helpful to write a macro. (The WordPerfect manual has an excellent tutorial on creating and using macros.) Simply press Control-F10, choose a name for the macro (for FITZSIMMONS, a good choice might be Alt-F), type FITZSIMMONS and press Control-F10 again. Now, every time you press Alt-F, his name will appear.

The macro described above will only be good for names in dialogue calls—character names within dialog or scene descriptions are only capitalized the first time they appear in a script. It's a good idea to make a second macro for character names mentioned in the description portions of your screenplay. (Dialogue references and the character's first appearance should be "FITZSIMMONS"; all subsequent references in the action portion should be "Fitzsimmons".)

Finishing Your Screenplay

When completing a draft of a screenplay, most screenwriters assemble all of the components into one huge file to correct the pagination. Simply load in

the first file, go to the bottom of the file by pressing the Clr/Home key twice and then the Down Arrow, load in the next file, and repeat till you have the whole script in one huge file (usually about 175K for a typical screenplay).

Then, remove all the hard page breaks except between page one and two, using search and replace. Next, go manually from page to page using Control and Down Arrow, and put the breaks where you would like them, consulting your script style manual, of course.

When breaking a scene in the middle, place the cursor where you'd like to put the break, and use the macro IAlt-B. It will automatically place the correct (CONTINUED) at the bottom of the first page, put in a hard page break, and put CONTINUED: at the top of the next page.

Also, remove the "new page numbers" from the middle of the script, that were inserted during your early drafts. If you don't, you may end up with skipped or repeated page numbers. The macro REMVPGN.MAC will do this. ▶

General Rules

The margins, tabs, page lengths and running headers are set correctly in the macros. One thing that is not included, but is important, is the print pitch, because of the variety of printers in use.

SCREENWRITING MACROS: A SUMMARY

- PAGEONE.MAC—Sets up first page. Used only once, at top of first page.
- PAGE2UP.MAC—Sets up margins for pages 2 and up. Should be used once at the top of each file.
- REMVPGN.MAC—Used once, after entire file has been assembled. Removes "new page numbers" control codes.
- [ALT] A—Action margins.
- [ALT] B—For breaking page mid-scene. Adds (CONTINUED) at the bottom of the first page, followed by a hard page break and CONTINUED: at the top of the next page.
- [ALT] D—Dialogue margins.
- [ALT] E—EXT. (Exterior)
- [ALT] I—INT. (Interior)
- [ALT] P—Personal direction margins.
- [ALT] U—CUT TO:
- FLYPAGE.WP—Not a macro, but a file correctly laid out as the first page of a screenplay. ■

Screenplays should be printed 10 characters to the inch (pica), non-proportional and ragged right with no italics or underlining. Use of unusual fonts or fanciful Desktop Publishing layouts are frowned upon. Dot matrix is just barely acceptable. Letter quality or laser printing is best.

Print your screenplay on plain white paper and do not include pictures, budgets, letters, or anything else other than the screenplay. Bind it in heavy cardboard with brads. This is what million-dollar screenplays look like. Fancier bindings are considered amateur and are a "red flag" that gets screenplays returned unread.

Practical notes: While it is tempting to use "block protects" to keep character names attached to dialogue, my experience in trying this is that hundreds of block protects in a single file tend to make WordPerfect choke and crash. Therefore, set your page breaks manually. Since page breaks are only put in once, just before your final printout, it is not too taxing to do by hand. Anyway, it presents a good opportunity for final proofing.

There are a few mysteries yet unsolved in WordPerfect and my experience in composing a 120-page screenplay is that I have a "bombs across the screen" crash about once a week or so. As Murphy's Law would indicate, these seem to occur most frequently when I haven't backed up my file recently.

A Word of Warning—And Some Tips

These WordPerfect macros will help get you through the first draft of a feature film. Certain elements that you may have seen on professional screenplays that have been omitted include scene numbers and lists of characters after the title page. These things are never put in by the screenwriter—they are added once a script has gone into production.

"Published" screenplays, which are bound like novels and sold in book-

stores, are often formatted like stage plays. Do not trust or imitate that layout—it is only for the consumption of the general public and a screenplay submitted in that style indicates an inexperienced writer.

Making these macros available is a little dangerous; the temptation of the first time screenwriter is to believe the rules are flexible and that it "doesn't really matter." But if you want your screenplay to be read, here are a few more tips:

1. Just tell the story. Try to avoid stepping on the director's toes. Calling camera moves or angles, such as "ZOOM IN" or "HIGH ANGLE" is a sure way to exile a script to the bottom of the stack. Putting personal directions such as (*intensely*) or (*wistfully*) after every bit of dialogue is also considered hackneyed, and directors resent it.

2. Make sure that character names are consistent throughout. If a character is called James in the first 20 pages and Jim in the next 100, it's confusing and amateurish.

3. Double- and triple-check the spelling. If you have WordPerfect, there is absolutely no excuse for spelling errors, which are as annoying to producers as missing teeth on a star.

4. Print it, mail it out, and sell it for hundreds of thousands of dollars. ■

Michael Perry is the head of C U Productions in Hollywood. He has produced over 100 music and industrial videos.

PRODUCTS MENTIONED

WordPerfect for the ST, \$329. WordPerfect Corp., 155 North Technology Way, Orem, UT 84057, (801) 222-4010.
CIRCLE 158 ON READER SERVICE CARD

Complete Guide to Standard Screenplay Formats, Part I: The Screenplay, \$16.95. By Hill Cole and Judy Hoag (1988, CMC Publishing).

Horizontal Scrolling & Looking For Love

In this issue START's venerable editor takes a look at the long-awaited sequel to one of the all-time great graphic adventures from Sierra On-Line. Also, veteran game reviewer David Plotkin examines the similarities and differences of three arcade shoot-em-ups that do something not often seen in the computer gaming world: they scroll horizontally.

LEISURE SUIT LARRY GOES LOOKING FOR LOVE (IN SEVERAL WRONG PLACES)

Reviewed by Andrew Reese

The delightfully demented Al Lowe is back. Who's Al Lowe? He's the designer and author of 1987's hit graphics adventure, *Leisure Suit Larry in the Land of the Lounge Lizards*. And the hero of that twisted tale, "Leisure Suit" Larry Laffer is also back in a new adventure that takes up where the first left off: *Leisure Suit Larry Goes Looking for Love (In Several Wrong Places)*.

Al has a wild sense of humor that permeates his computer creations. If you haven't played a *Leisure Suit Larry* game, then you're in for a treat. But be sure that you have a high tolerance for lewd, crude and hilarious humor—*Larry II* is full of it.



Larry II is a 3D-graphics adventure in which you move your animated alter ego around the screen and occasionally type in commands to make him take specific actions, such as "Put the airsick bag in the hair rejuvenator bottle." This makes for a varied and interesting game, especially since the built-in responses are seldom what you expect, but always good for a chuckle.

Music, Hardware and Manuals

Sierra has added a sophisticated musical score to this game. They've been working with Roland to implement an

MT-32 music board for the IBM PC and their efforts have carried over to the ST. You can either enjoy the sound track through the monitor speaker or, if you have an MT-32 or a Casio CZ-101 synthesizer, the game music can be played through it. I tried the synth option with my son's Yamaha PSS-480 and the results, although much better than through the monitor, were not quite what I'd hoped. I think the Yamaha's channel assignments for the various instruments must be different from the Casio.

This game is big, and it makes some ▶

In this concluding scene from *Leisure Suit Larry Goes Looking for Love (In Several Wrong Places)*, Larry and his new bride, Kalalau, are huddled together (for warmth, I'm sure) on the beach of Notoany Island. The evil Dr. Nonockee has been vanquished!

special demands on your system. You must have at least one double-sided disk drive, as it's shipped on three DS disks. There is no physical disk copy-protection, so you can make backups easily or install it on a hard disk (the best solution). Some of the animated sequences (particularly the last few) take more than a minute to load, even from a hard disk. But it's worth it.

Larry II uses a manual form of copy-protection, in which you must match an image of one of your "girlfriends" to a picture in the game manual. There are variations in hair and dress color, hair style, jewelry and dress style, so you have to look closely. Once you type in the last four digits of her "phone number," you can proceed with the game.

In Larry I, you had to answer five questions about the 1950s to prove you were old enough to play the game. Larry II has no such restriction and includes a control to adjust the "filth level" of the game. At the filthiest level (where I set it), the game uses some fairly foul language, but nothing worse than is heard around the START offices at deadline time.

And Now, On to Our Story . . .

The story? Well, it begins with Larry being dumped by the love of his life from the first game. But if you succeed through the first part of the game, Larry wins a sea cruise on the Love Tub with the beautiful Barbara Bimbo and a million-dollar-per-year lottery prize. But that's just the "bare" beginning.

Later episodes involve onklunks, KGB agents, maitre d's, barber shops, witch doctors, piranhas, cross-dressing, bombs, bimbos and bikinis. If you manage to make it all the way through the game, Larry will wind up broke but happy on a tropical beach on Notoony Island with his new (and lovely) island bride. I finally defeated the evil Dr. Nonookee and finished the game, but only after some help from the Sierra On-Line Hint Line and their BBS. It's

good to know that they're there to help, but the game is well set up to bring out a laugh when you take a wrong turn. Making mistakes is sometimes more fun than doing it right.

Larry II uses Sierra's new Creative Interpreter, which provides a fairly sophisticated parser and excellent gameplay. Almost every screen has some clever animation in it and Larry himself has never been better drawn (complete with shading and bald spot), nor more easily controlled. You can use

Leisure Suit Larry II includes a control to adjust the "filth level" of the game.

the mouse, arrow keys, joystick or keypad to move Larry and generally I found that the keypad was the best. I usually kept Larry moving at the highest speed available, because the animation tends to slow his movement down. In some sequences, however (such as crossing the quicksand), I slowed him way, way down for precise control.

The graphics are easily the best yet from Sierra On-Line. Larry II runs in low resolution with just a 16-color palette, but you'd swear that there's more. (It will also run on a monochrome system, but you lose a lot.) Kudos to the artists and designers.

Quibbles and Bits

I suppose there are always quibbles in every game. Twice, it crashed on me with a message to call Sierra On-Line's Customer Service, but since I was never able to repeat the crashes, I didn't. Also, this is a very linear game; you must add

every conceivable item to your inventory when you can, because it may become vital much, much later in the game. And if you don't have the item (or didn't do the right thing with it at the right time), all you can do is restore or restart the game and try again.

A good example of the problem with linear games is the bikini top. It's on the cruise ship (I won't tell you where), but you can spend an hour playing the game after leaving the ship before it becomes a necessity. When I was stuck without it, I had to restore a position on the cruise ship and then find the top. Then, to continue, I had to go all the way through that portion of the game I'd just completed. And since there's a very slow piece of animation that repeats five times in between, I became quite irritated.

At least it's easy to save and restore game positions. But there's been a change in the save/restore routines from the first game, and I don't think it's entirely positive. Previously, you could choose which game save file to overwrite and thus keep their number down to a manageable level. Now, you can only overwrite a file if your disk is full or if you don't mind saving a game with the exact same title as another. I ended up with 20 save-game positions on my hard disk, over 800K of files! I finally had to move another folder onto a different partition to make more room—a quirk in the save-game function wouldn't let me overwrite an existing file, because it had been saved at a much earlier position and was several K smaller.

Overall, however, I loved the game. My wife loved the game. My kids loved to watch the game. The START staff loved the game. It's a kick. If you want to spend a few days laughing and don't mind a little locker room humor, then Larry II is definitely for you. Oh, and Al Lowe says to remind you that everyone should take a little reading material with them on a long flight.

HORIZONTALLY SCROLLING GAMES: ZYNAPS, MENACE AND HYPERDOME

Reviewed by David Plotkin

Games that scroll the screen horizontally have never been as plentiful as those that scroll the screen vertically. Recently, however, three horizontally scrolling games for the ST have appeared on the market: Zynaps from Hewson, Hyperdome from Exocet and Menace from Psygnosis.

Zynaps from Hewson

In Zynaps you man a large, not especially maneuverable fighter as it flies through a cavern with some very tight spaces. The landscape is very nicely done, with shading to give a highly realistic effect.

Besides the hazards of running into the walls of the caverns, there are the enemies. They come in a variety of bobbing, weaving airborne vehicles, that not only try to collide with you, but also launch missiles. These aren't too hard to avoid, unless three or four are released at once. Then, watch out!

Other hazards include ground bases that can launch tracking missiles, command ships (heavily armed and vicious), and mother ships (a command ship, only more so). The command ships tend to show up on levels of their own, and are almost impossible to destroy.

When you begin your journey, your ship is slow, and mounts some pretty feeble lasers, capable of only two shots at a time. It'll take some pretty fancy flying to stay alive in this part of the game, because if you miss with your lasers, you have to wait until the beams leave the screen before you can fire again.

To increase your weaponry, you must destroy whole waves of enemies. If you do, they leave behind pellets, which you can grab by flying over them with the fire button held down. Each time you grab a pellet, the icon on your control panel, representing extra weapons for the ship, changes. When it shows the

weapon you wish to use, you must fly over a pellet to engage that weapon.

Some of the extras available include more maneuverability (four levels), more powerful lasers, plasma bombs, homing missiles and seeker missiles. The plasma bombs and the two types of missiles replace each other—you can only have one of these three active at any time.



Hewson's Zynaps. The game has you man a large, not especially maneuverable fighter as it flies through a cavern with some very tight spaces. Nice graphics and effective scrolling make this an excellent arcade-type shoot-em-up.

The lasers have four power settings; each time you enhance them they can fire faster and you can get more blasts on the screen at once. The plasma bombs are great for ships that are close or for ground targets—they just bounce around until they hit something.

The homing missiles bring up a cursor on the screen which doesn't appear to be under your control. At any rate, these missiles home in on enemy targets and destroy them. You can have one or two of these missiles on the screen at a time if you select the homing missile icon twice. The seeker missiles are more efficient at finding targets than homing missiles, and can destroy multiple enemies before being destroyed themselves. You can also have a maximum of two of these at a time.

Some Conclusions

The graphics, sound and animation of

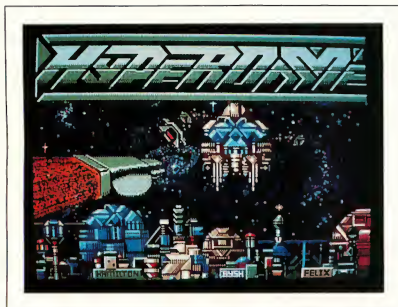
Zynaps are quite good, with an excellent musical soundtrack, which, mercifully, does not play during the game. The game lets you enter the high score, but does not store it to disk.

I also encountered a few bugs. Periodically, my copy of the game crashes with a row of bombs reaching clear across the screen. Also on my copy, the pause and quit functions don't work, so

there's no way to stop when the phone rings.

Finally, the programmer simply wasn't up to the task required by this game. There is a considerable change in speed when more objects appear on the screen. As the joystick response gets more and more sluggish, you tend to overcompensate, and then run into a wall or enemy when the action suddenly speeds up. This effect is not fatal to the game, but it does tend to shorten it.

Overall, I like Zynaps. It has a considerable learning curve, and is quite frustrating at first, due in part to somewhat inadequate documentation (though better than many European imports). But once you figure out how it works, it's fun and the element of strategy is a welcome change—if you can find the time to glance at the control panel while fighting off all those enemies!



Hyperdrome from Exocet

Hyperdrome is another game where half the "fun" is figuring out how everything works. In the box is the disk and a single sheet of paper that purports to show what various areas of the screen are used for. That's it—no instruction manual, not even a warranty card.

In Hyperdrome you pilot a small spacecraft across a horizontally scrolling screen, strewn with various obstacles. Much the same as in Zynaps, your ship is slow and feeble when you start out. Facing it are enemy craft (singly and in waves) and various gun emplacements. Interestingly, the first level is the hardest, because the gun emplacements look just like the walls of the cavern, and you must watch to see what shoots at you. You must also figure out where holes can be made with your guns in the seemingly-solid wall approaching head-on. The graphics in other levels change, and moving obstacles, such as elevators (called lifts) are also added.

To increase your ship's capabilities, you must blast gun emplacements and then run over the glowing marker left behind (anything here sound familiar?). As each marker is accumulated, an indicator moves down eight boxes on the right side of the screen. These boxes are each labeled with an icon and represent the increased weaponry available:

Hyperdrome from Exocet (distributed in the U.S. by Scorpion), has you pilot a small spacecraft across a horizontally scrolling screen, strewn with various obstacles and inhabited with hostile aliens.

speedup, more powerful guns, double firing rate, missiles, homing missiles, spread, droid (follows your ship and shoots when you do) and shields.

When the box that indicates the weapon you want is active, you must let go of the joystick and press the Spacebar. This gives your ship the extra capability, resets the indicator, and often means you run into something because you had to let go of the joystick. Running into anything except a glowing marker costs you a life and gives you back your slow, feeble ship—a distinct problem if you're facing one of the large "mother ships" in the intermediate levels!

There are two difficulty levels in Psygnosis's Menace. In Novice Level, running into the cavern walls won't deplete your ship's shields. In Expert Level, scores are doubled, but you must avoid all obstacles.

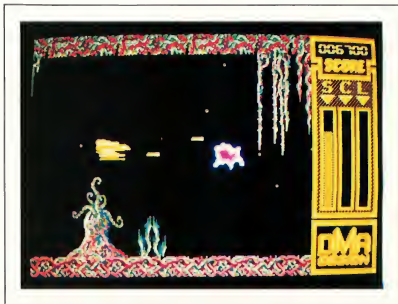
There are some problems with Hyperdrome. First of all, not all the weapons seem to work. "Spread" did not work consistently, and the homing missiles didn't seem to work at all. There is also no way to abort or pause a game. Finally, the game had to reload each time, even if I had not gotten off the first level. Unlike Zynaps, however, the scrolling was smooth and there were no speed variations.

Menace from Psygnosis

The object of Menace is to destroy the planet Draconia, which consists of six levels. Each level is populated by grotesque alien lifeforms, which you must blast with your lasers.

The large, detailed graphics and smooth controls of Menace make it easy to play. There are two difficulty levels—in Novice Level, running into the cavern walls doesn't deplete your ship's shields, while in Expert Level, scores are doubled, but you must avoid all obstacles.

As with the other games, Menace gives you a way to enhance the initially inadequate weaponry of your ship. If you manage to obliterate a complete wave of alien attackers, a block comes floating toward you. Running over the block adds 1,000 points to your score, but each time you shoot the block five times, it changes to a different enhanced



weapon. When the block attains the icon representing the weapon you wish to add, you then run over it to add that capability to your ship. However, it's not as easy as it sounds. First of all, some of the aliens are very tough to kill, so knocking out the whole wave is quite a chore. Then, you must shoot the block and run over it before it scrolls off the screen. Often, you take whatever weapon you can get because there isn't time to shoot the block enough times to achieve the weapon you want.

The extra capabilities you can add to your ship include added maneuverability (speedup), cannons, lasers, outriders and shields. Speedups add up to seven

The large, detailed graphics and smooth controls of Menace make it easy to play.

times the ship's original maneuvering speed. When you add either cannons (short range) or lasers (long range) to your ship, you must run over another icon to full arm them. The cannons and lasers do not last indefinitely. They're depleted as they're used; energy bars on the screen show the current status of the cannons and lasers.

You can add up to two outriders to your ship. These are small, short-range weapons that fire in a direction that you control by the motion of the ship (in-

ter-controlled). It takes a little time to get the hang of it, but these outriders can be very handy against enemies who approach from the rear. Shields make your ship immune to damage for a short period of time.

Wrap-Up

Menace is an extremely difficult game. It doesn't feature smoothly increasing levels of difficulty, instead, it starts out fairly easy, then suddenly gets nearly impossible, then gets easy again.

At the end of each level is the Guardian. This creature is huge, and shoots large numbers of indestructible projectiles at you. There isn't a clue in the manual on how to kill one of these beasts, even going up against it with cannons, lasers, and a full energy charge doesn't seem to work. What this means, unfortunately, is that many gamers will never see beyond level one! You only get one life—when your shields are depleted, the game is over.

In the Final Analysis

The games here—Zynaps, Hyperdome and Menace—have obvious similarities. At the end of each level is a Mother Ship, Guardian, etc. Each also has a way to increase ship weaponry, and each is a pretty good game in its own right. They're not really different enough to buy more than one—and with all its bugs and slowdown/speedup problems, Zynaps is still the most playable of all three games. ■

Andrew Reese is Editor of START. David Plotkin is a chemical engineer for Chevron U.S.A. and a contributing editor for START.

PRODUCTS MENTIONED

Leisure Suit Larry Goes Looking For Love (In Several Wrong Places), \$49.95. Sierra On-Line, Inc., P.O. Box 485, Coorsgold, CA 93614. For orders only, call (800) 344-7448.

CIRCLE 170 ON READER SERVICE CARD

Hyperdome (Excelsi Software), \$34.95; **Zynaps** (Hewson Consultants), \$34.95; Both games are distributed in the U.S. by Scorpio Software, 19 Harbor Drive, Lake Hopatcong, NJ 07849, (201) 663-0202.

CIRCLE 172 ON READER SERVICE CARD

Menace, \$29.95. Psygnosis, Ltd., distributed in the U.S. by Computer Software Service, 2150 Executive Drive, Addison, IL, 60101, (800) 669-4912.

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Business Applications

Doing Spreadsheets On The ST

BY CHRISTOPHER L. HERD

Get started in the world of spreadsheets with FIGLS.ARC on your START disk.

Spreadsheets are marvelous tools with uses limited by your imagination alone. In this column and the ones that follow, I'm going to take you on a guided tour through the fascinating world of spreadsheets. What I cover will hopefully give you some insight into the "black magic" of spreadsheet template writing. And when I'm finished you'll have an entire spreadsheet ready for use and modification.

I used LDW Power to write the templates, but they'll be generic enough to transfer to your favorite spreadsheet program. If you're serious about learning spreadsheets, however, I recommend that you buy one of the Lotus 1-2-3 clones, LDW Power or VIP Professional.

You'll find this month's spreadsheet template on your START disk in the file FIGLS.ARC. Copy this file to a blank, formatted disk and then un-ARC it following the Disk Instructions elsewhere in this issue. You'll need either LDW Power or VIP Professional to load this template. Follow the program's directions for loading a template file and load in FIGLS.WKS—it's in Lotus 1-2-3 version 1.0 format.

All Misconceptions Aside

Let's first clear the air of some of the basic misconceptions about spreadsheets. The first misconception is that spreadsheets are monstrous things maintained by huge accounting departments. Not so—several of the templates I'll be presenting here will be small enough to fit onto one screen, and they'll be plenty useful for your personal finances or small business.

The second misconception is that you must use a spreadsheet to balance your checkbook. This normally causes uninitiated skeptics to respond with something like "I balance my checkbook a lot faster with my pocket calculator, thank you." Yes, you can balance your checkbook with a spreadsheet template, but you can also do a whole lot more. And that takes us to the subject of this column.

The Gain/Loss Statement

Before you can run, you should first learn to walk. So, before we delve into business spreadsheets, we'll start with a basic template that you can use at home. I call this one-page template my "Financed Investment Gain/Loss Statement." As you work with it, it will give you some insight into the functions and flexibility of spreadsheets.

Here's the situation: Have you ever wondered how much you could realize if you sold your house? The template, as set up, is applicable to any financed investment that either appreciates or depreciates.

The Details

Now, let's discuss some of the more important details of our template. The numbers you must input are the purchase price, financing interest rate, financing term, appreciation, the date of first payment and the date of the most recent payment. From these last two dates and the entry in the monthly payment schedule, the present age of the property will be calculated. If your program doesn't have the date functions necessary to perform this calculation (both VIP Professional and LDW Power do), you may omit lines nine and 10 and input the age of the property in months into the current cell C12.

Similarly, the entry in cell E12 is just a reminder of the mortgage's age-in-months; it can be input manually as a label if you don't have the proper date function.

Another product of this spreadsheet is the exact amount of the payment in the top right corner of the output section. Like the rest of these numbers, it's

calculated by the worksheet. Note the combined use of the IF function and the very handy payment (PMT) and present value (PV) functions. This helps to preclude spurious results.

Analyzing the Results

Assume that you bought the house for \$84,600, financed it at 10 percent for 30 years, expect the property to appreciate at four percent per year and you've just made the January 1989 payment.

Your property is now worth \$89,524.00, according to your appreciation rate. You still owe \$83,919.53 on the \$84,600 loan. The difference, presumably, is what you'd net (without considering closing costs or commissions) if you sold the house now for the market value and paid off the loan. This is your "Cash-Back Value."

Of course, that amount isn't straight profit. Over the last 17 months, you've been paying a horrendous amount of

interest and not much toward equity. In fact, the interest payments alone amounted to \$11,940.76, the "Accum Interest Value" as noted on the spreadsheet. So, to gain a cash-back value of \$5,604.47, you spent \$11,940.76 in interest payments, which means that your net gain is (\$6,336.30), the spreadsheet's way of telling you minus \$6,336.30!

Now, look at the last line. Your \$6,336.30 loss, distributed over the 17 months you've been making payments, comes to only \$372.72 per month (compare this to \$400-per-month rent payment) for a two-bedroom apartment. Without even factoring in the income tax savings for this mortgage interest deduction, you still came out ahead under these assumptions.

Try a Little Experimenting

As an experiment, see what happens if the house appreciates at only two percent per year or how fast you can build

up equity by getting an 8.5 percent mortgage for 15 years with 30 percent down (just multiply the purchase price by 0.7).

The template I've prepared is even more flexible than that. Maybe you don't own a house. Just plug in the purchase price of your new (or old) car, the finance rate and its age in the payment schedule. For appreciation, try -20 percent or -25 percent. ■

Christopher L. Herd lives and works in Colorado Springs, Colorado. This is his first article in START.

PRODUCTS MENTIONED

LDW Power, \$149.95.
Logical Design Works, Inc.,
780 Montague Expressway,
Suite 403, San Jose, CA
95131, (408) 435-1445.
CIRCLE 178 ON READER SERVICE CARD

VIP Professional,
\$149.95. ISD Marketing,
2651 John Street, Unit 3,
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2W5, (416) 479-1880.
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CIRCLE 049 ON READER SERVICE CARD

ON DISK!

BY CHARLES L. BAILY

PINOCHLE



Pinochle is one of the most popular card games ever played, yet it has been all but ignored by the computer industry. In a market overflowing with poker, bridge and blackjack simulations, Charles Baily's Pinochle for the ST is a breath of fresh air. A color monitor is required.

It's your bid! File PINOCHLE.ARC on your START disk.

Check any catalog of entertainment software and you'll find all the card games you ever wanted, right? Wrong. I've perused both commercial and public domain lists and found enough poker, blackjack, cribbage, rummy, solitaire and bridge games to keep me happy well into the next century. But one card game is conspicuously lacking from all those lists: pinochle. Since this is the game I want to play the most, I decided to write one on my own.

To see the results, copy PINOCHLE.ARC and ARCX.TTP onto a blank, formatted disk and un-ARC PINOCHLE.ARC following the Disk Instructions elsewhere in this issue.

Double-click on PINOCHLE.PRG. ST Pinochle was written in GFA BASIC 2.0 and runs in low resolution only.

Pasteboard Pinochle

Within the card-playing world, pinochle stands out. It uses its own special deck, can be played with one or two decks and in teams or singly (cut-throat). The pinochle deck has four suits, like a standard deck, but has two each of the cards from nine to ace and no card lower than a nine. (Double-deck pinochle uses two decks and no nines; that still means four of each card in the game.)

As the game begins, each player is dealt between 12 and 16 cards (depending on the type of game). Each player then counts up the possible points he or she can make in a combi-

nation of *meld* and *play*. Based on these points, the players then bid in an auction for the privilege to name the trump suit and, thereby, maximize his or her meld and play points. If you bid higher than you're able to make from your meld and play points, you "go down" and your bid is subtracted from your score. If you make your bid, all of your meld and play points are scored.

ST Pinochle is played to a set maximum number of points; in the computer version, you can choose the maximum—see below.

Once the bidding is completed, the successful bidder names the trump suit and all players lay down their meld. Once the meld is scored, the players pick up the cards and the play begins. The successful bidder leads the first card (which *must* be a trump). The play continues until all cards have been played.

Some special rules for pinochle: You must follow suit, and if you have a card in your hand that can beat the highest card already played in that trick, you must play it. Also, if you are out of a suit, you must play a trump if you have one.

In pinochle, as in most games, the highest trump or the highest card of the led suit wins the trick. The cards rank a bit differently in pinochle than you may be used to: the top card is the ace, followed by the ten, king, queen, jack and nine.

Play points are scored by taking tricks with point cards in them. The point cards are the aces, tens and kings. Also, one point is scored for taking the last trick.

ST Pinochle

In ST Pinochle, the computer plays two hands, counts meld (if you want it to), bids for the two computer players and keeps score. The bidding is "one bid and did," instead of by auction. The program will also count your meld and suggest a trump, if you want it to.

Then there is the play of hands. The computer plays two hands, making the move of each. All this is being done while it checks each card to be sure that there are no deviations from house rules.

ST Pinochle has its own house rules, but they can be modified if you wish. At the title screen click on the right mouse button to call up the Menu Bar. Under Options you can click on any of the rules you wish change. Here you can determine the dealer's bid, the minimum bid, whether double pinochle is worth eight or thirty and the maximum score to win. You can also change the speed of the game and choose whether to count your own meld or have the computer do it for you. The names of the player(s) with the high score(s) are highlighted as is their bid.

Gameplay

At Pinochle's title screen, click on the left mouse button to begin the game. This will take you to the bid screen where you can either make your bid or pass. Your cards have already been dealt and are at the bottom of the screen for your scrutiny. To bid, you can either click on a number from the grid or click on Other and type in your own bid. Click on Pass if you don't wish to make a bid at all.

After the highest bidder chooses trump, click the left mouse button to get a meld count from each player. Click again to go to the final screen before gameplay. This screen gives you the statistics of the game you're about to play. It lists the lead player's bid, what that player's meld count is, what the trump is and what the lead player needs to score in order to make his or her bid. (See the sidebar for a breakdown of how melds are scored.)

Now click on Continue and the game begins. To choose a card, click on its number or letter. Play until all your cards are used. To exit the game, click on Quit. When your game is played out, you'll be given a rundown of the game's results. Click the left mouse button to continue play.

Wrap Up

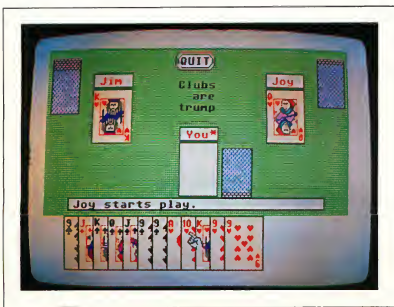
I hope you find the ST version of pinochle as relaxing and enjoyable as I

have. And, if you play the game as much as I do, you'll be amazed at the money you'll save not having to buy a new deck of cards every couple of months. ■

Card-game enthusiast Charles L. Bailly is professional programmer who lives in Easton, Pennsylvania. This is his first program for START.

These are the meld values of Pinochle hands:

- Aces around -10
- An ace in every suit.
- Double aces around -100
- Two aces in every suit.
- Kings around -8
- A king in every suit.
- Double kings around - 80
- Two kings in every suit.
- Queens around -6
- A queen in every suit.
- Double queens around -60
- Two queens in every suit.
- Jacks around - 4
- A jack in every suit.
- Double jacks around -40
- Two jacks in every suit.
- Run -15
- Ace, ten, king, queen and jack of trump.
- Double run -150
- Two aces, tens, kings, queens and jacks of trump.
- Nine of trump -1
- Nine of trump.
- Pinochle - 4
- Queen of spades and the jack of diamonds.
- Double pinochle -30
- Two queens of spades and two jacks of diamonds.
- Marriage - 2
- A king and queen in the same suit.
- Royal marriage -4
- A king and queen in trump (you don't get additional points for this if you have a run). ■



ST Pinochle's game screen. As you see this is three-handed pinochle; the computer determines your two opponents. At your turn, choose a card by clicking on either its number or letter.

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