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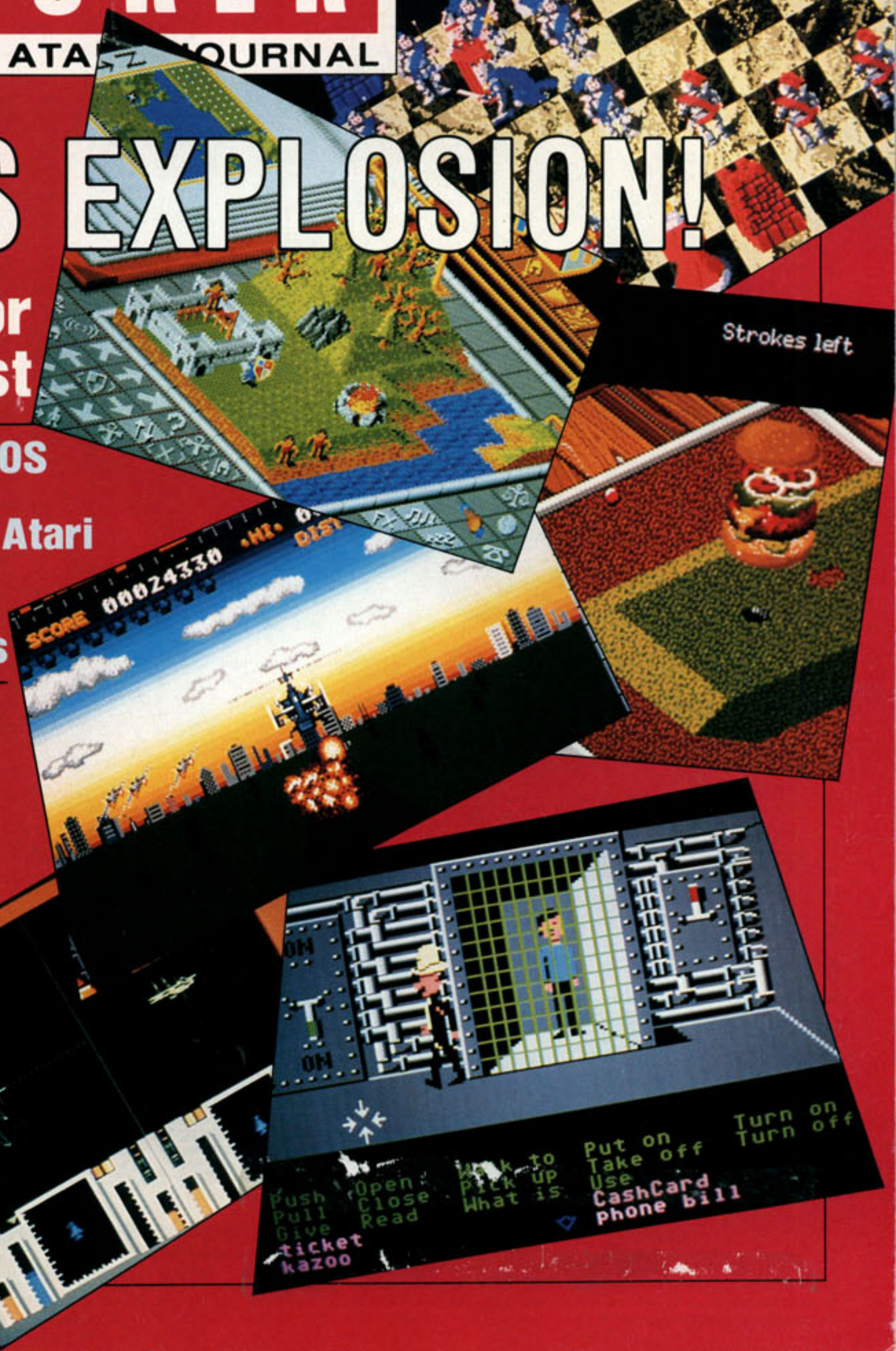

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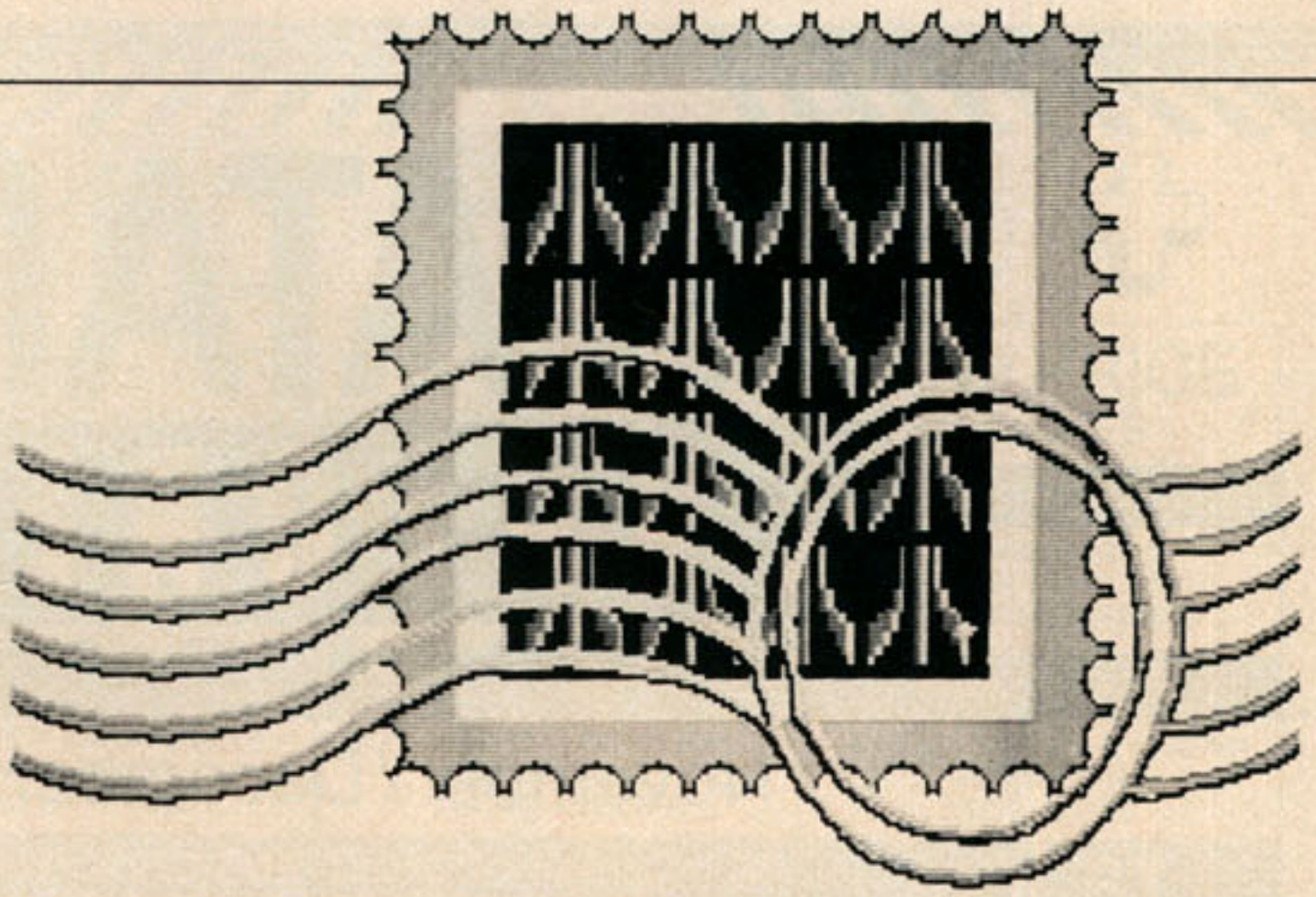

Letters To The Editor

A Touch-Up On Touch-Up

Dear Editor:

Thanks for the review of *Touch-Up* in the July/August issue of *Atari Explorer*. It was very informative. However, the information on color mapping was a bit misleading. Please let me clear up a few points.

Zoom Full lets you step back to get a view of your entire image. To do this, the program crunches the image down and discards many dots. If your image at Zoom Normal is made up of various dither patterns—as in color mapping—you can get some strange visual effects, such as checker-boarding, at Zoom Full. If you go back to Zoom Normal, you will notice that there is no such checker-boarding or stripes in the original image.

All screen dumps of color mapping in the review were done at Zoom Full, so Ms. Hahn's complaints about the various mapping options are invalid. She should have printed the images out to do a side-by-side comparison. In fact, screen dumps at Zoom Normal would have done just as well.

When the user chooses the type of mapping he wishes to use, he should consider carefully what he wants to do with the final image. Is it for screen display? For printout on a 300 dpi laser or a 9-pin dot matrix printer? Map to Black, Burkes, and Floyd/Steinberg mapping all produce one dot for each dot in the source image. This is good for screen displays and lower dpi printers. Map 2X2 and 4X4 produce clumps of 4 and 16 dots, respectively, for each source dot. This is often preferred for higher dpi printers.

I hope this has cleared up any questions your readers may have had concerning the color mapping in *Touch-Up*. Thanks for your time and for producing such an informative publication for Atari computers.

Paul Mazurek
Head Programmer
Migraph, Inc.
200 South 333rd St.
Federal Way, WA 98003

Help For Beginners

Dear Editor:

I picked up the July/August issue of *Explorer* today and was quite surprised at your response to the letter of Glen B. Cooper of Chula Vista, who was frustrated by the lack of information available to help him run *Publisher ST* with his Atari SLM804 laser printer. He suggested that some enterprising person or company prepare "scripts" that novices could follow to achieve specified results. Your response was that software publishers need to provide better documentation.

I suggest that neither is adequate in this particular case. Mr. Cooper should have been referred to his local user group, the San Diego Atari Computer Enthusiasts. There, he would not only find the answers to his questions, but maybe even find them taken further.

His letter suggests that he is unaware that he can save his desktop so that when he boots his system the desktop will automatically display PUBLISH.APP or WDWRITER.APP. A trip to the local user group meeting (perhaps with his hard drive in tow) would have told him all this and more.

Atari has long expressed a desire for user groups to provide this kind of support to end users. Please, in the future, keep user groups in mind. We are a great resource for this type of problem.

Robert G. Brodie
(ACE of Orange County)
1221 N. Bonnie Lane
La Habra, CA 90631

User groups are on our minds much of the time. Because, as we have mentioned before, our small staff is not able to answer technical questions, we refer most of the readers who call with such questions to their local user groups. We appreciate the willingness of user group members to share their knowledge and have long maintained that the user group network is one of Atari's most valuable assets. We do not, however, believe that the existence of this stable body of experienced users relieves software publishers of the responsibility to produce comprehensive and comprehensible documentation.

Try Your User Group

Dear Editor:

In your most recent listing of New & Improved, you include *Dac-Easy Accounting* for the ST.

For your information, Dac stopped making that program for the ST more than a year ago. I know, because I bought it, got sick, and was unable to use it until recently, when I found that the manual was useless. I called Dac and was told that they no longer make the program for the ST. I know why—it is impossible for a novice to follow the manual and make the program work.

I would appreciate it if anyone who has the Dac program and has figured out how to use it would write to me and give me his or her telephone number, so I could call for information.

Jack Bronski
290 Calef Hwy., Lot D1
Epping, NH 03042

The publisher confirms that the program is no longer on the market. A spokesperson insists, however, that Dac still supports Dac-Easy Accounting and that a call to the company's technical support line (214-458-0038 ext. 6) will yield assistance. Failing that, you could try your local user group . . .

What If There Isn't One?

Dear Editor:

A few months back, I wrote to you requesting information about user groups in Puerto Rico. In return, I received a very kind letter from Barbara Edwards, telling me that you didn't know of any group here. She also told met to let you know if my search was successful. It was!

I haven't found exactly a user group, but there are many 8-bitters here who share information, tips, and public domain software. We don't hold meetings, because we live far away from one another; we communicate by mail.

It was a bit difficult to find other Atarians here; I advise your readers to exercise patience and persistence. Communicating with other users is great. You can make friends, share your knowledge, and learn more.

If you can't find a user group or Atari dealer in your area, write to local newspapers. I did just that, and four days after seeing my letter published, Jorge Seda wrote to tell me about this small network of Puertorican Atarians connected by mail. As a last resort, you can write to Atari Corp. (P.O. Box 61657, Sunnyvale, CA 94088). They will send you a list of the user groups in your area, but sometimes their match is not very good.

Thank you for your magazine, your kindness, and your support. You really care about your readers.

Gabriel Pagan
Box 193
Lajas, PR 00667

Down The Rabbit Hole

Dear Editor:

I would like to commend on your review of the program *Calamus* in the September/October issue. It was a great review and an awful review, both at the same time. Indeed, it fit its *Alice in Wonderland* motif perfectly.

It was a great review because Mr. Kelley didn't make any glaring mistakes. It was an awful review because *Calamus* is much easier to use and has more features than Mr. Kelley is aware of. The responsibility for this falls on ISD for their incredible manual.

Calamus is, in my opinion, the best desktop publishing program for any personal computer. By itself it makes purchasing an ST worthwhile. Mr. Kelley's only major fault was to say that the manual describes every function in detail. It does—sort of. But there are hundreds and hundreds of features. Can any normal person tie this into a usable whole? I have spent six months working with the program on a daily basis, and I still discover new options on every one of those days. Two examples:

- Not only is it possible to customize the wording of the help option but every icon and option in *Calamus* can be assigned a keyboard equivalent of your own choice!
- The mouse can be used to zoom in and out of particular parts of the page with unbelievable accuracy without using the icons.

Both of these features are described

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Letters To The Editor

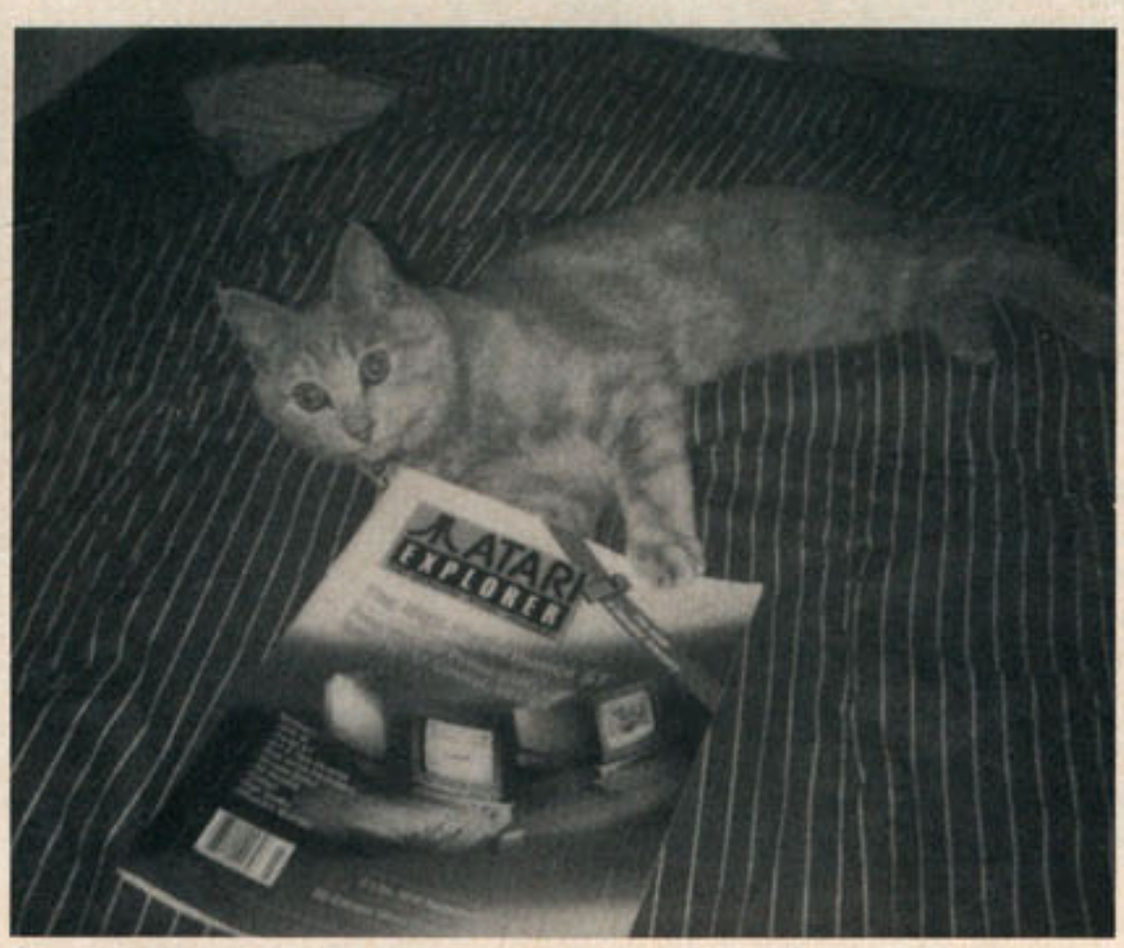
in the manual; I'm not sure I remember where, but they are there. Picture a book of 210 or so pages describing the features of the most complex program ever created for the ST. It boggles the mind.

ISD has informed me that they are working on a new manual that will make sense to the lay person. But even with the best manual *Calamus* requires commitment—not because it is clumsy, but because it is big.

Calamus is a truly professional program that allows you to do anything, do rapidly, do it with hairline accuracy, and print it out at the maximum speed of which your printer is capable. The program has some minor faults and bugs, as does any new program, but I must stay that ISD provides excellent telephone support, and none of the existing problems is significant.

All in all, I feel that you and other magazines would be doing everyone a favor if you ran a regular *Calamus* column. The program is that good.

David Barkin
Croton Park Colony
Peekskill, NY 10566

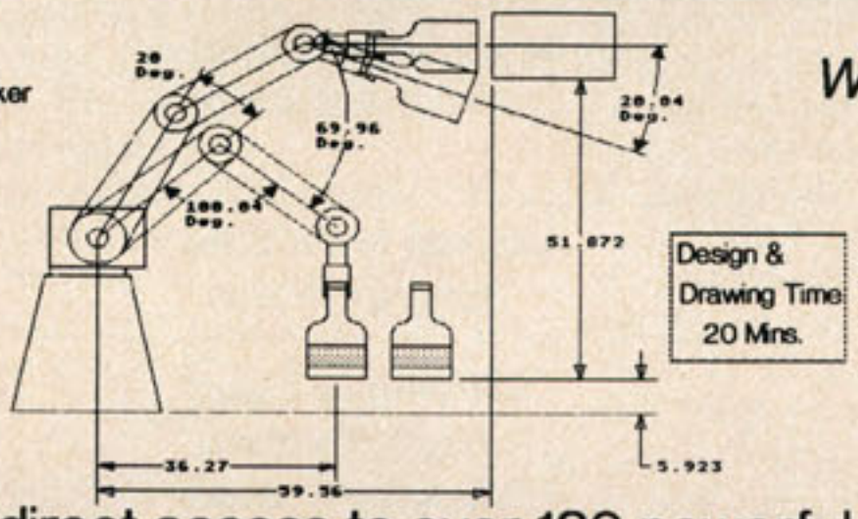


Gregg Hesling's computer-literate cat poses with a copy of his favorite magazine.

1st Word Plus Update

At the end of our review of the *1st Word Plus* v. 3.14, we inadvertently implied that owners of *1st Word* v. 1.06 could upgrade that program to *1st Word Plus* v. 3.14. In fact, only owners of early versions of *1st Word Plus* are eligible for the $25 upgrade.

Even at full price, however, v. 3.14 is an excellent choice for those who are accustomed to the original *1st Word*. For more information, call or write to Prospero Software, 100 Commercial St., Ste. 306, Portland, ME 04101, (207) 874-0382.



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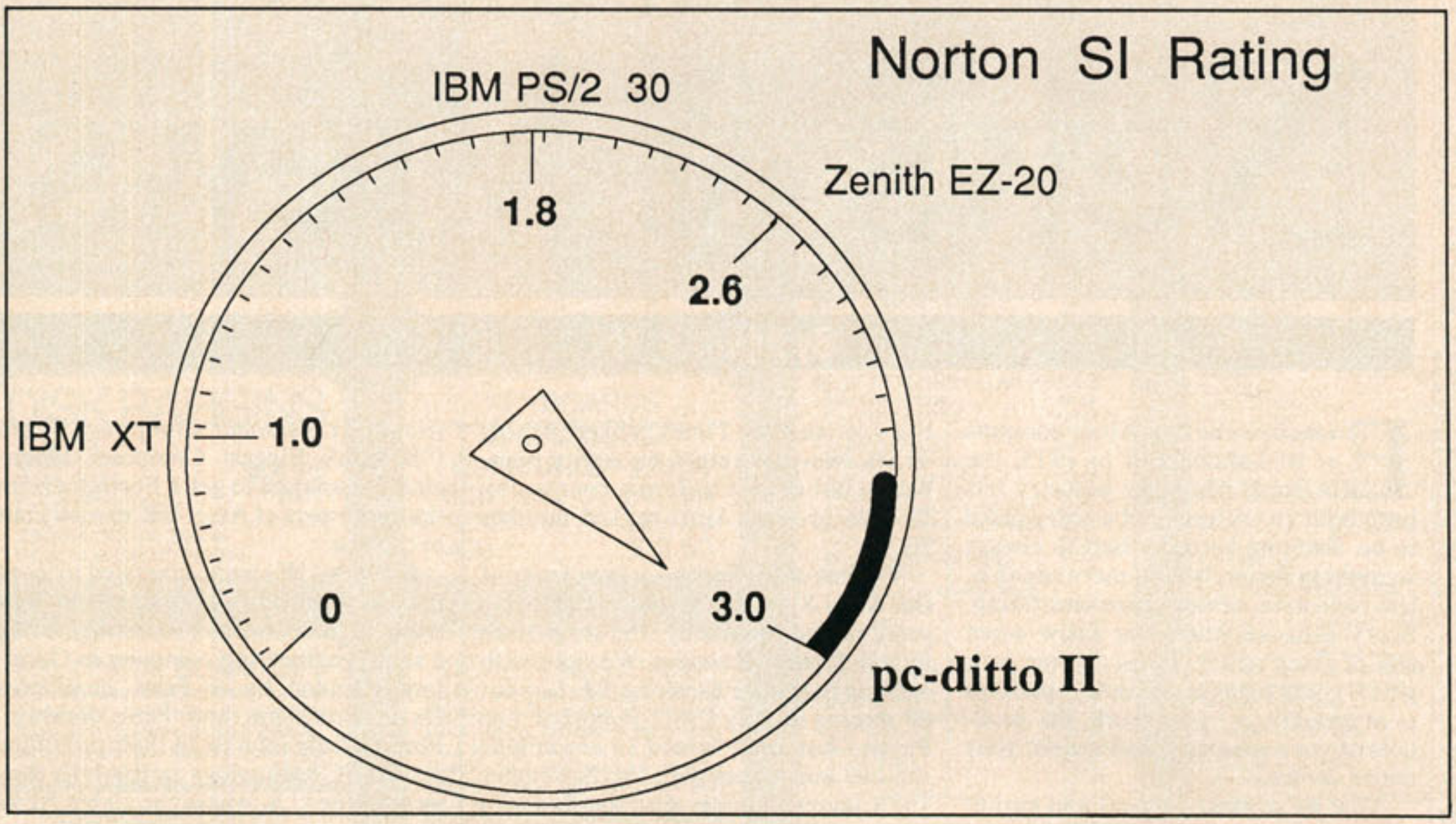

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The Atari market; Portfolio update; and PageStream vs. Calamus

News & Views

By DAVID H. AHL

Ever since the first Altair computer was announced in 1975, the personal computer industry has been both an exciting and a scary place to be. Exciting because there is always something faster, better, more capable, less expensive, newer, more interesting. Scary because you never know when one of these newer, faster, better gadgets is going to make obsolete—perhaps even annihilate—your work, the products of your company, and maybe your entire career.

Now we're pretty upbeat and enthusiastic about Atari. We think Stacy, the Portfolio, and the portable game system are pretty nifty products and are probably giving the executives of some other companies some sleepless nights. Investors in Atari seem to share our enthusiasm as the stock hits new 52-week highs week after week.

On the other hand, we can't help but notice the continuing consolidation that is taking place in the personal computing market around the IBM PC and Apple Macintosh formats with the resultant decrease in shelf space—and sales—of other incompatible machines.

Commodore is not doing well with either the C64 or Amiga. Apple II sales have practically dried up—except for the educational market which continues to keep the machine alive. Tandy is barely holding on with the Color Computer. And even in Britain where the populace seems to gravitate to odd and wacky machines, only the portable Cambridge Z88 seems to have found a small market niche.

Thus, it should come as no surprise that Atari sales and profits in the first half of 1989 were off somewhat from the excellent performance in 1988 when the *Los Angeles Times* ranked Atari's 31.9% two-year return on equity number 18 out of all California companies. In sales growth, Atari ranked number 70.

Victims of the decline in popularity of the Atari 8-bit line include third party vendors and, indirectly, the magazines in which they advertise. We note with sadness that after breaking *ST-Log* out of *Analog* in July 1986, Publisher Lee Pappas has been forced to recombine the two magazines with the November 1989 issues. This is due, in Pappas's words, to "the cold fact that advertisers for 8-bit products are nearly nonexistent, and there are precious few advertisers for ST products."

Antic, also, reflects this situation, dropping from 130 total pages with 73 advertising pages in late '86 to 44 pages with 4.5 ad pages just three years later.

Actually, here at *Explorer*, we've made out better than most, with the magazine staying at 80 pages since we started publishing it in 1986. Moreover, we've had a slight *increase* in advertising pages from around 13 in 1986 to 16 today. Nevertheless, although healthy by Atari standards, *Explorer* is no rival for *PC* or *MacWorld*. We'd like to think that with the exciting new Atari products coming down the chute we will be someday. But only time will tell.

Testing the Portfolio

Except for a few hours at the NAMM show, we haven't been able to get our mitts on a Portfolio yet. While our review in the September/October issue was comprehensive and thorough, there are some things you learn about a machine only by using it day after day.

So I was happy to learn that our friends at *Personal Computer World* ("Britain's Biggest Computer Magazine") managed to get a Portfolio from the developers at Atari UK to really put to the test.

Sidenote: We were interested to learn that the Portfolio was designed by Distributed Information Processing (DIP), a small engineering company in Guildford founded by ex-Psion employees David Frodsham and Peter Baldwin. Finding little interest in their prototype pocket PC technology in the UK, they went to the U.S. where the Cable News Network ran a segment that said, more or less, "Here's an opportunity for the U.S." Atari US negotiated a license to manufacture and market the machine, and Atari UK was made responsible for the liaison with DIP and the final physical design.

DIP is also selling the same machine direct to corporate customers, so don't be surprised if you see a Portfolio with the DIP logo on it.

Things that turn up in use department: the LCD display was not designed specifically for the Portfolio (or a PC clone) so it does not emulate any of the PC graphics standards. So for now, at least, Portfolio is a text only processor. Also, the screen can be set to a fixed 40×8 or to scroll around a virtual 80×25 PC screen. Very clever—except it doesn't work with some application programs. To be fair, Atari says that most DOS applications will have to be modified or rewritten for the Portfolio, but when *WordPerfect Executive* ran perfectly, we expected that other programs would too.

Those expensive memory cards that plug into the side of the Portfolio turn out to be reasonably standard Mitsubi-

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shi-format cards that come in three sizes—32K, 64K, and 128K. A 32K card is expected to sell for about $55. Each card contains a replaceable lithium battery with a five- to seven-year life. Unfortunately, these RAM cards will not be available for about six months.

For mass distribution of programs, mask ROM cards—about $10—will probably be used. For more timely distribution of data, PROM and EPROM cards are available, but are more costly. None of the three, by the way, can be written by the Portfolio itself.

PCW found that the address book and diary were the two applications that got the most use. Although the spreadsheet with its Lotus *1-2-3* compatibility is arguably the most powerful of the Portfolio applications, getting data in and out requires either much typing on a slightly-too-small keyboard or transferring data to/from a desktop machine.

Conclusions of the *PCW* reviewer? Almost identical to ours. The machine is great as an electronic personal organizer. Inclusion of a Lotus *1-2-3*-compatible spreadsheet heralds some truly serious use. RAMcards—now prohibitively expensive—are vital for serious DOS applications. When and how much the price for these cards falls and how available RAMcard software becomes will determine the ultimate success of the Portfolio.

PageStream vs. Calamus

We've noted with interest that the early reviewers of *PageStream* and *Calamus* in the various computer magazines have reached conclusions slightly different from those reached by reviewers (and users) in the publishing community.

There seems to be general agreement that *PageStream* and *Calamus* are the only serious contenders for big league desktop publishing on the ST. Although both of them boast many similar professional features, it is instructive to examine some of the differences.

Although *PageStream* uses outline fonts, eliminating the stepped edges associated with GDOS bit-image formats, it does not have outline *screen* fonts which, for the moment, remain the exclusive province of *Calamus*. This means that although the *PageStream* display is speedy, the user will probably be forced to make extra printouts to see what a page looks like. Score one for *Calamus*.

On the other hand, *PageStream* is the *only* outline font program on any computer (at present) to offer a complete selection of both painting (bit-mapped) and drawing (object-oriented) and editing tools. This allows it to import and manipulate both graphics and text from a wide variety of sources. *Calamus* does well on importing files but modifying them is more difficult. Score one for *PageStream*.

Professionals claim that under a magnifying glass the output of *Calamus* on the Atari laser printer is slightly better than that of *PageStream*. However, if you intend to take that final step to Linotronic at a print shop, *PageStream* is the *only* choice, because it alone produces PostScript output files. Why, one might ask, with the rest of the DTP world freely exchanging PostScript files, did the designers of *Calamus* shun the standard?

"Portfolio could be the ultimate in yuppie accoutrements"—PCW

While you ponder the answer to that one, you might also seek the logic behind the recent announcements by Apple and IBM of both companies' intentions to drop support of PostScript in favor of proprietary output formats.

The professionals' choice between *PageStream* and *Calamus*? If your output device is a dot matrix or laser printer, choose the features, documentation, or box color you prefer; they'll both do a good job. If, on the other hand, you want to input graphic files from other sources and output to a Linotronic or similar high-resolution device, go with *PageStream*.

Short Takes

July 22, 1989 was the 25th anniversary of the Basic programming language. Basic (Beginners All-purpose Symbolic Instruction Code) was first developed by John Kemeny and Tom Kurtz at Dartmouth College with the objective of enabling students to use computers with ease. The original Basic compiler had just 14 commands. Bill Gates and Paul Allen developed the first microcomputer version of Basic in 1975 for the MITS Altair 8800 computer. Microsoft estimates that more than 4 million Basic programmers are active today.

If you are into (not under) the weather, you will enjoy a terrific (and somewhat pricey) little device called Timestep from Signa Publishing in the UK. It consists of a dish antenna, receiver, and decoder for downloading into your ST weather maps and satellite images of the type TV stations and the military use for weather forecasting. It tunes in to the GOES, NOAA, and Meteosat satellites.

Computer Gaming World runs an ongoing reader ranking of computer games. According to their most recent ranking, the top ten Atari ST games are:

1. Dungeon Master
2. Hostage
3. Falcon
4. Zany Golf
5. Carrier Command
6. Silent Service
7. Arkanoid
8. Star Glider II
9. Battle Chess
10. Breach

If there is enough interest among readers, we'll publish our own top games listing for the ST and XE. Want to see it? Just send us your list of games and give each one an overall ranking from 0 (absolutely dismal) to 10 (totally awesome). Send it to Games Ranking, *Atari Explorer*, 7 Hilltop Rd., Mendham, NJ 07945.

While In The 8-bit World

Several new *cartridge* games have been announced and are under development for owners of 8-bit computers and the XE game system. We've seen some of these and they look very good. *Tower Toppler* and *Commando*, both recently released by Atari, have outstanding play action and superb graphics. *Deflektor* is a great game which requires speedy logic to arrange a series of mirrors and fiber optics to pass a laser beam from a transmitter to a receiver around obstacles on a series of courses of increasing difficulty.

The mega hit, *Xenophobe* is true to the arcade version in virtually every respect. Two other arcade hits, *Ikari Warriors* and *Mat Mania Challenge* are still in development but look terrific.

Telegames is developing an XE version of its best-selling 2600 game, *Quest for Quintana Roo*, a mystery-solving adventure game that has a different solution every time you play. ■

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NEW

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Macintosh Emulation

Data Pacific announces the Translator Off-Line, a product that gives Atari ST computers the ability to read, write, and transfer Apple Macintosh software and data from Macintosh disk format to ST and IBM PC formats.

Translator Off-Line supports Macintosh emulators using either 64K or 128K ROMs and single or double-sided disks. It comes with a cartridge, which plugs into the ST, and a cable, which connects the cartridge to the floppy drive port of the ST.

The device converts disks between Apple Macintosh format and Data Pacific's proprietary Magic disk format. Other utilities convert individual files between ST, IBM PC, and Magic disks.

Translator Off-Line carries a suggested retail price of $149.95.

Data Pacific has also announced a reduction in the price of its Magic Sac + to $59.95.

Data Pacific, 609 E. Speer Blvd., Denver, CO 80203, (303) 733-8158.

Printer With 14 Fonts

Star Micronics America announces the XB-2415 and XB-2410 Multi-Font dot matrix printers, both of which offer 14 resident fonts.

Both printers offer a super letter quality mode in addition to the standard letter quality mode. Print speed is 240 caps in draft elite mode and 80 cps in LQ mode. The 14 resident fonts are TMS Roman, TW-Light, Courier, Prestige, Script, Letter G, Orator, Helvet, Optimo, Cinema, Blippo, OCR A, OCR B, and Code 39. Users will be able to expand their font libraries with optional font cards. The printers offer graphics output at 360×360 dpi.

The XB-2415 15″ carriage model has a 41K buffer and incorporates Epson LQ-1050, IBM Proprinter XL24, and NEC graphics emulations. The XB-2410 has a 10″ carriage, a 27K buffer, and Epson LQ-850, IBM Proprinter X24, and NEC graphics emulation modes. A Centronics parallel interface is standard.

The XB-2415 sells for $999, and the XB-2410 for $749.

Star Micronics America, 200 Park Ave., Ste. 3510, New York, NY 10166, (212) 986-6770.

High Performance Hard Drive

Future Systems has announced the addition of the GT-Elite hard drive system to its family of floppy and hard drives for Atari ST computers.

The GT-Elite system is available with either a 30 or a 50Mb hard drive with a standard 1Mb floppy drive built in. It is a self-contained, external unit with its own power supply, controller/interface, floppy controller, realtime clock, and cooling fan. A second DMA channel for daisy-chaining additional peripherals is provided.

Each unit comes with an AC power cord, DMA interface cable, floppy interface cable, utility software, and user manual and is pre-formatted at the factory.

Suggested retail price for the GT-Elite 30 is $899; for the GT-Elite 50, $999.

Future Systems, 21634 Lassen St., Chatsworth, CA 91311, (818) 407-1647.

Keyboard Cable Extender

Maxwell C.P.U. is now shipping the MegaSTender, a keyboard cable extender for Mega ST computers.

Available in 6-, 8-, 12-, and 15-foot lengths, the extender allows the user to move the Mega keyboard to his lap or other remote location. Suggested uses are with MIDI equipment or large screen TV.

Price range for the MegaSTender is $16.96 to $24.95, depending on length.

Maxwell C.P.U. 507 W. Baseline, Lafayette, CO 80026, (303) 665-4849 or (303) 666-7754.

PRODUCTIVITY SOFTWARE

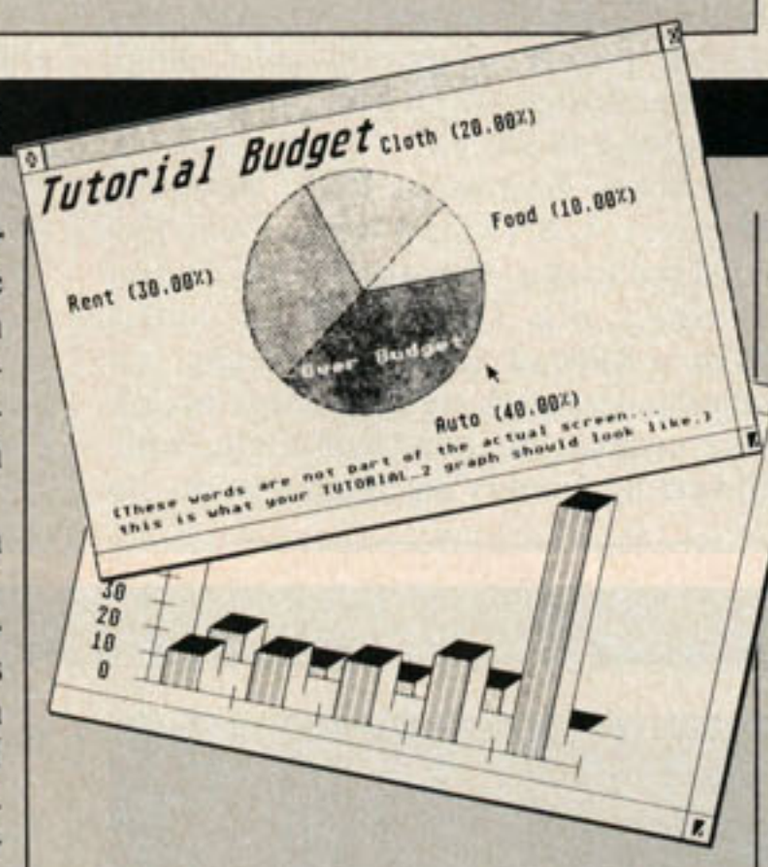
Antic Software announces *Cyber Print*, a color printing software package for the Atari ST. Designed to work with the Okimate 20 color printer, the program produces full color, detailed printouts of pictures created on the ST with various paint packages. $49.95.

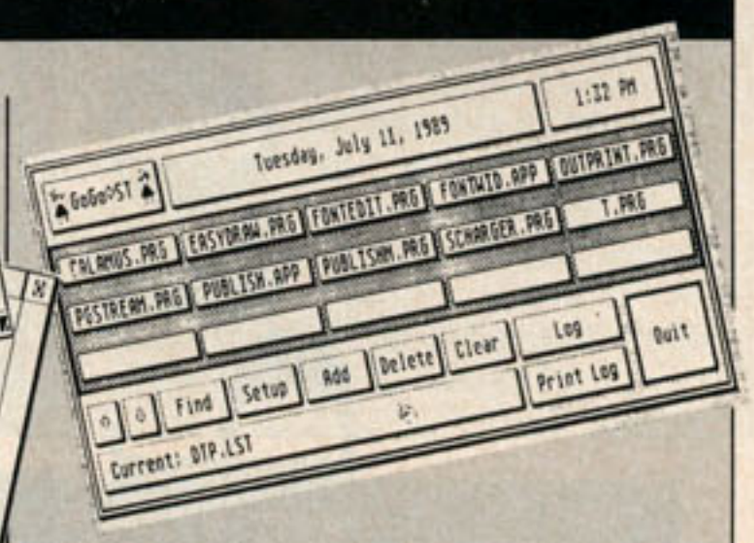
Antic Software, 544 Second St., San Francisco, CA 94107, (415) 957-0886.

Imagen Corporation has released *UltraScript ST-1*, a program that allows the 1040ST to print PostScript files on HP DeskJet, Epson LQ/FX/LX, IBM Proprinter, and IBM graphics printers. The software is based on the UltraScript PostScript language-compatible interpreter, which provides full control over the placement of text and graphics on the printed page. The $195 package includes the language interpreter and 16 typefaces. Also available are an add-on font package with 13 additional typefaces for $129.95 and a $295 package that includes the 35 Apple LaserWriter Plus typeface complement.

Imagen Corporation, 2650 San Tomas Expressway, Santa Clara, CA 95051, (408) 986-9400.

K-Graph3 from **MichTron** allows ST users to create ten different graph types, including vertical, area, horizontal,





line, stacked, 3D, overlaid, pie, x-y, and scatter. Input data-sets can come from .DIF files from spreadsheet programs or report files from spreadsheets, databases, and word processors, or they can be created from within *K-Graph*. $79.95.

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

Maxwell C.P.U. announces *GoGo ST*, is a utility that presents a list of your favorite programs, from which you can select with a single click of the mouse button. Also included are date and time functions and the ability to maintain a log of time spent using each program. $34.95.

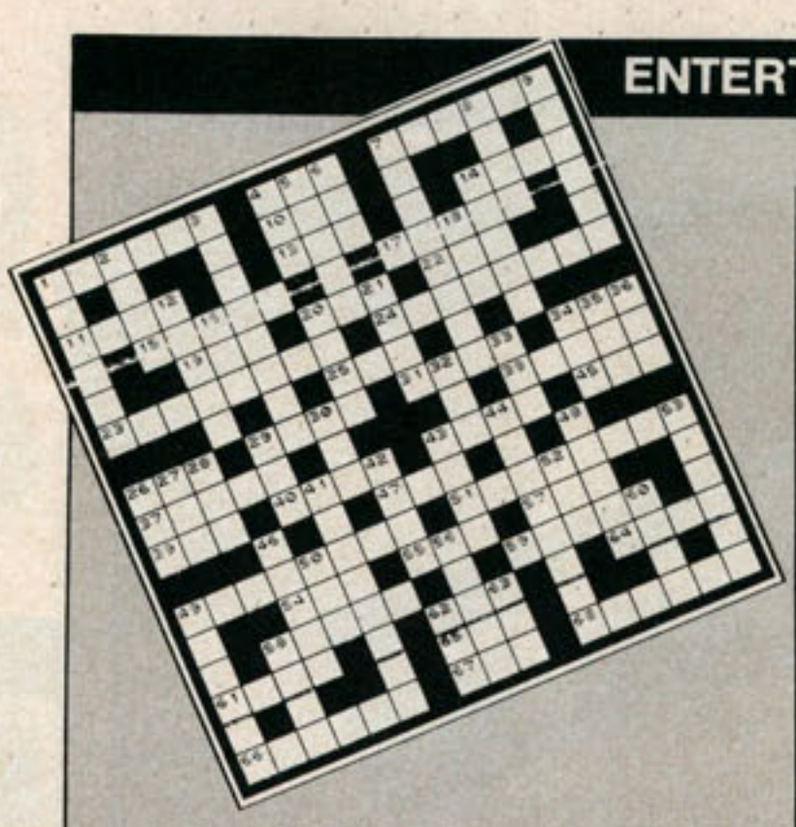
Maxwell C.P.U. 507 W. Baseline, Lafayette, CO 80026, (303) 665-4849 or (303) 666-7754.

Educational Management Systems has announced a line of products designed to establish the Atari ST as a workstation for schools. The main program, *School Scheduler* allows the creation of a master schedule and the entry of student data via mouse, keyboard, or Scantron scheduling sheets. The second program, *Grades—Interims—Student Teams*, provides flexibility in terms of number of students, number of grades, and number of grading categories.

Educational Management Systems, P.O. Box 153, Huntingtown, MD 20639, (301) 535-0062.

NEW Products

ENTERTAINMENT SOFTWARE



Artisan Software has released *Word Quest 2*, a GEM-based crossword puzzle generator for the Atari ST. The program takes a list of words and transforms them into a crossword puzzle grid. Output is to any dot matrix or laser printer or to *NeoChrome* or *Degas* file for use with desktop publishing programs. Features include auto-placement, five auto-sorts, formatted output, and instant access to specific details of each puzzle. $29.95.

Word Quest 2 is also available with *Word Quest*, Artisan's original word search puzzle generator, in a single package called the *Word Quest Power Pack* for $49.95.

Artisan Software, P.O. Box 849, Manteca, CA 95336,(209) 239-1552.

Mindscape announces *Fiendish Freddy's Big Top O' Fun*, a satiric, twisted look at six circus events, rendered in slapstick style for the Atari ST. The events you must complete, while thwarting Freddy's attempts to do you in, include the trapeze and high-wire, the knife throw, a juggling act with bombs that explode if you drop them, and a human cannonball shoot. $49.95

Mindscape, 3444 Dundee Rd., Northbrook, IL 60062, (312) 480-7667.

Capcom has released three futuristic adventures for the Atari ST. The first, *LED Storm*, is a road race in which you compete in a jet car competition that pits your skill against a course full of surprises.

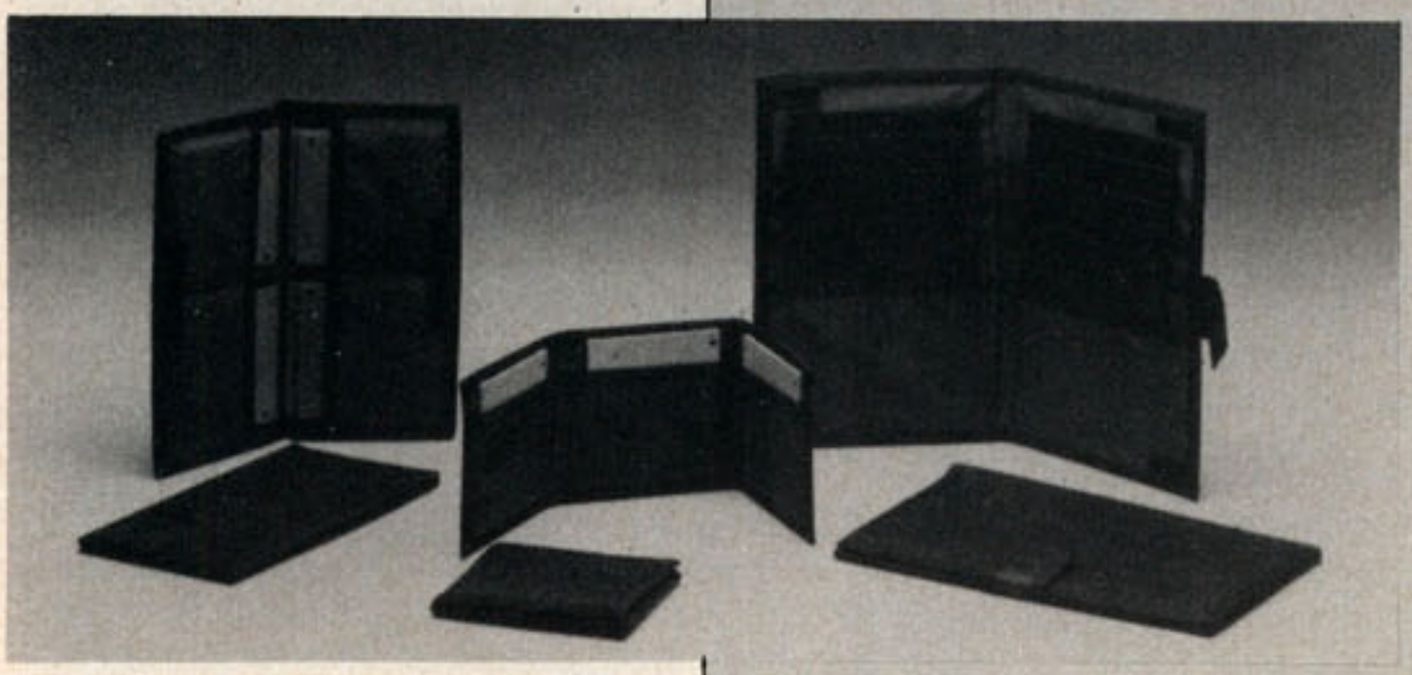
Last Duel is a one- or two-player game that challenges you to traverse hazardous alien landscapes in a ship that can be transformed from a land vehicle into a jet fighter.

In *Side Arms*, you are outfitted with an advanced space suit into which is built a deadly personal arsenal with which you must defend Earth from an invading horde.

Capcom U.S.A., 3303 Scott Blvd., Santa Clara, CA 95054.

Superman: The Man of Steel is an interactive comic book distributed by **Intracorp**. The game casts you as Superman in a race to save the planet from the clutches of his enemies, Darkseld and Lex Luthor. $39.95.

Intracorp, 14160 SW 129th Ct., Miami, FL 33186, (305) 252-9040, (800) 468-7226.



Disk Wallets

Computer Coverup introduces the Executive Series of disk wallets made of black, simulated snakeskin.

The Executive Series comes in two sizes for 3½″ disks—one that holds three disks and one that holds 10. The wallet for 5¼″ disks holds 10.

Computer Coverup, 2230 S. Calumet, Chicago, IL 60616, (312) 326-3000, (800) 282-2541.

Strategic Simulations introduces *Red Lightning*, a World War III game for the Atari ST. The new game is an operational-level land and air wargame that depicts a hypothetical conflict in central Europe between NATO and the Warsaw Pact nations. Modern air and land weapons systems are at your disposal. $59.95.

Strategic Simulations, 675 Almanor Ave., Sunnyvale, CA 94086, (408) 737-6800, (800) 245-4525.

Accolade has announced *Shoot 'em Up Construction Kit*, a program to help ST users who are certain that they can create a better shoot 'em up game than any the pros have released. Would-be game designers have a choice of modifying one of the three games included on the disk or starting from scratch to create something unique. $19.95

Accolade, 550 S. Winchester Blvd., Ste. 200, San Jose, CA 95128, (408) 985-1700.

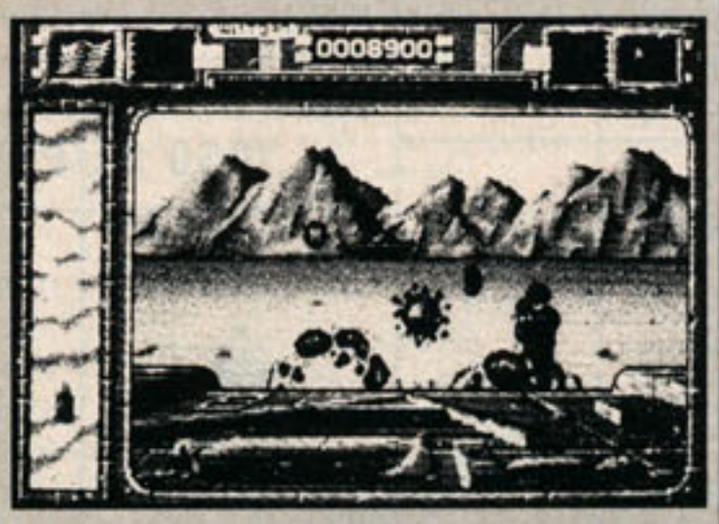
F40 Pursuit Simulator for the Atari ST from **Titus Software** puts you at the wheel of a Ferrari F40 in a race against time. You must plan your route using the onscreen map and avoid the road blocks set up by police who don't appreciate the speeds of which your car is capable. $44.95.

Titus Software, 20432 Corisco St., Chatsworth, CA 91311, (818) 709-3692.

Taito Software announces three new games for the Atari ST. *Arkanoid II, the Revenge of Doh* challenges one or two players to destroy an evil alien force by penetrating and eliminating 67 energy barriers.

In *Operation Wolf*, using commando-style tactics, you must rout the terrorists who are holding innocent civilians hostage in a steamy jungle hideout.

Rambo III is a role-playing adventure that follows the plot of the 1988 film. Using strategy and problem-solving skills, you must free Col. Trautman from a heavily guarded fortress near the border of Afghanistan where he is being held by Soviet commandos. $29.95 each.



Taito Software, 267 W. Esplanade, Ste. 206, N. Vancouver, BC V7M 1A5, (604) 984-3344.

Origin has announced two new games for the Atari ST. *Omega* casts you as a cybernetic engineer and challenges you to design the chassis, artificial intelligence, weapons, system, and electronics of a cybertank. $49.95.

Times of Lore is a "fantasy role-playing/action game" in which you play a hero-for-hire who must battle the forces of evil. Along the way you will meet 60 characters, all of whom follow individual daily schedules and engage in sophisticated conversations. $39.95.

Origin, 136 Harvey Rd., Bldg. B, Londonderry, NH 03053, (603) 644-3360.

MicroDeal announces three new games for the Atari ST. *Murders on the Orient Express* casts you as one of six detectives and gives you 80 hours in which to solve one of five murders that have occurred on the famous train.

Wumpo Deluxo is an updated version of a very old computer game, Hunt the Wumpus. The game, like computers themselves, has come a long way and now features many technological innovations, the likes of which the original Wumpus hunters could never have imagined.

Oddball challenges you to lead your team to victory in a game of Oddball, a sport that combines elements of ice hockey, tennis, golf, billiards, soccer, and water polo.

MicroDeal, 576 S. Telegraph, Pontiac, MI 48053, (313) 334-8729.

Quest For Clues II

Origin has released *Quest for Clues II*, a compendium of clues and solutions for 47 of the most popular computer text adventure and fantasy role-playing games. Edited by Shay Addams, editor of the "Questbusters" newsletter, *Quest for Clues II* also includes detailed maps.

Each entry begins with an overview of the scenario of the game under discussion, followed by objectives and general guidelines for play. Among the games for which clues are offered are *Ultima V*, *Leisure Suit Larry*, *Bard's Tale III*, and *Times of Lore*. The book sells for $24.99.

Origin, 136 Harvey Rd., Bldg. B, Londonderry, NH 03053, (603) 644-3360.

Mouse Holder

H&H Enterprises has announced the MouseCat mouse holder, a kitten-shaped device that grips the Atari mouse in its paws.

MouseCat comes in either light gray or white with green eyes, and pink ears, nose, and paws. It attaches to the monitor or other flat surface. The feline peripheral sells for $6.95.

H&H Enterprises, 4069 Renate Dr., Las Vegas, NV 89103, (702) 876-6292.

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Software packages are constantly being enhanced by their publishers to add features, fix bugs, and incorporate the latest technological advances. To derive the maximum benefit from your software investment, it is important to know what updates have been made to the packages you use. If you are not using the most current version of a package, contact the manufacturer to find out what enhancements have been made and what you must do to obtain the new version.

Working from information provided by the publishers themselves, we have compiled a list of the most current version numbers of many popular 8-bit and ST software packages and software/hardware products. Program version numbers are often found printed in the documentation, on the title screen, in a README text file on disk, or in an About . . . item in the left-most menu on the GEM desktop.

While every attempt has been made to make this list as comprehensive as possible, we realize that a few fine products may have been omitted. If you would like to see a specific program added to this list, please send your suggestion to New and Improved, *Atari Explorer*, 7 Hilltop Rd., Mendham, NJ 07945.

Note: we have not included entertainment and educational programs in this list because, as a general rule, these packages are not updated frequently.

•Bullets indicate a new listing or program update.

8-Bit Programs

Action, ICD/OSS	3.6	**MYDOS**, Supra	4.3
Bank Street Writer, Broderbund	1.0	**MagniPrint II+**, Alpha Systems	4.1
Blazing Paddles, Baudville	04422	**Parrot II**, Alpha Systems	2.8
Chipmunk, Microdaft	3.04	**Print Shop Companion**, Broderbund	1.0
ComputerEyes, Digital Vision	1.3	**Print Shop**, Broderbund	1.0
Desktop Performance Studio, Virtusonics	1.4	**Scanalyzer**, Alpha Systems	3.6
DOS XE, Atari Corp.		**SpartaDOS Construction Set**, ICD/OSS	3.2D
Draper Pascal, Draper	2.0	**Super Archiver**, Computer Software Services	3.03
Elite Personal Accountant, Clearstar Softechnologies	3.0	**Super Archiver II**, Computer Software Servs.	3.03EHN
Enhancements To Basic II, Hathaway Electronics	5.0	•**Top-DOS Plus**, Eclipse	1.5+
FlashBack, ICD/OSS	1.4	**Top-DOS Professional**, Eclipse	1c
Guitar Wizard, Baudville	11602	**Top-DOS**, Eclipse	1.5a
Kyan Pascal, Kyan	2.02	•**Turbofile** Micromiser	1.0
Lightspeed C, Clearstar Softechnologies	3.0	•**Turboword Plus**, Micromiser	2.0

ST Programs

1st Word Plus, Prospero	3.14	**dbMan**, Atari	4.0
1st Word, Atari	1.06	**DeskCart**, QMI	1.02
•**Accounting Series**, Hi-Tech Advisers	2.10	**DigiSound**, Alpha Systems	1.62
APL.68000, Spencer Organization	6.05C	**Disk Library**, Classic Image	1.2
Aegis Animator, Aegis Development	1.2	**Dollars & Sense**, Monogram	1.2
Alice Pascal, Looking Glass	1.5	•**DynaCADD**, ISD Marketing	1.5
Animatic Animation System, Kinetic Microsystems	1.0	**EZ Calc**, Royal	1.33
ASM 32, Memocom Development Tools	3.0	•**EasyDraw**, Migraph	3.0
•**Astronomy Lab**, Personal Microcosms	1.04	•**Edit-8000**, Savant Audio	1.3
•**Athena II**, Iliad	2.0	**Edit-DSS**, Savant Audio	1.0
Award Maker Plus, Baudville	23716	•**First CADD**, Generic	1.1
BB/ST, QMI	1.12	**Flash**, Antic	1.6
BBS Express ST, ICD/OSS	1.3	**FlashBack**, ICD/OSS	2.3
Backup, MichTron	1.94	**Fleet Street Publisher**, MichTron	2.0
•**Beta-CAD**, Beta-CAD	1.0	**Fontz**, Neocept	1.11
CAD 3D, Antic	2.03	•**Fortran for GEM**, Prospero	2.151
Calamus, ISD Marketing	1.09	**Fuel-Pro**, Hi-Tech Advisers	3.00
Church Manager, Hi-Tech Advisers	2.0	•**GFA Basic**, Antic	3.05
ComputerEyes Color, Digital Vision	1.32	**Hard Disk Accelerator**, Beckemeyer Development	1.13
ComputerEyes Mono, Digital Vision	1.0	**Hard Disk Toolkit**, Beckemeyer Development	2.00
Copy II ST, Central Point	2.5	•**Informer II**, Soft-Aware	1.0
Cyber Mate, Antic	1.1	**Interlink ST**, Intersect	1.85
Cyber Paint, Antic	2.0	**Inventory Manager**, La Foret	1.2
Dac-Easy Accounting, Dac	1.0	**Inventory Master**, Royal	1.5
Dac-Easy Payroll, Dac	1.0	**Inventory-Pro**, Hi-Tech Advisers	4.10
Data Manager ST, Timeworks	1.1	**LDW Basic Compiler**, Logical Design Works	2.0
DataTrieve, Abacus	E2.05	**LabelMaster Elite**, Migraph	1.0
Degas Elite, Electronic Arts	1.1	•**Laser C**, Megamax	2.10

Laser DB, Megamax	1.1
MT C-Shell, Beckemeyer Development	1.20
Magic Sac, Data Pacific	6.1
Mail Merge, Regent	1.3
•**Mail-Pro**, Hi-Tech Advisers	4.0
Mark Williams C, Mark Williams	3.0.9
•**Master Tracks Pro**, Passport Designs	3.4
MasterPlan, ISD Marketing	1.0
•**Micro C-Shell**, Beckemeyer Development	2.74
Micro RTX Developer Kit, Beckemeyer Dev.	1.13
Mighty Mail, MichTron	2.1
Modula 2, Jefferson	1.5
Multi-Manager Professional, New World	1.6
Multi-Manager, New World	1.0+
Navigator, Antic	2.0
NeoChrome, Atari	1.0
PC-Ditto, Avant-Garde Systems	3.01
Partner ST, Timeworks	1.0
•**Pascal for GEM**, Prospero	2.151
Payroll Master, Royal	2.151
•**Personal OS-9/ST**, Microware	2.3
Personal Pascal, ICD/OSS	2.05
Phasar, Antic	3.0
Power Print, Alpha Systems	2.1
•**Print Master Plus**, Unison World	1.61
Professional OS-9/ST, Microware	2.3
•**Prospero C**, Prospero	1.141
Pro Text, MichTron	4.0
Publishing Partner, SoftLogik	1.03
Real Basic, Computer Crossware Labs	1.3
Regent Base 2, Regent	12/18/88
Regent Word 2, Regent	9/14/88
Regent Word Student, Regent	9/14/88
Revolver, Intersect	1.1
ST Control, Trio Engineering	1.5
•**ST Hard Drive Utility Disk**, Supra	3.37
ST Sprite Factory, Future Software Systems	1.1
ST-Replay, MichTron	4.0
ST-Talk Professional, QMI	2.0C
STAccounts, ISD Marketing	2.0
Sales-Pro, Hi-Tech Advisers	4.10
Sales-Pro Plus, Hi-Tech Advisers	4.10
Solapak, Solar Powered Software	3.0
SQL Database, Regent	11/27/88
Super Directory, MichTron	2.0
SuperBase, Precision	1.049
SuperBase Professional, Precision	2.03
Super Sales-Pro, Hi-Tech Advisers	4.10
SwiftCalc ST, Timeworks	2.0
SwitchBack, Alpha Systems	2.0
The Chameleon, Future Software Systems	1.0
Thunder, Electronic Arts	1.32
•**Touch-Up**, Migraph	1.52
True Basic & Run-time, True Basic	2.0
TuneUp, MichTron	1.25
Turbojet, Neocept	1.20
Turbo ST, Softrek	1.4
•**Tweakit**, Savant Audio	1.4
Ultra-Speed Plus, Computer Software Services	1.5
Universal Item Selector, Application & Design	2.0
Utilities Plus,MichTron	1.1
VIP Professional, ISD Marketing	1.2
•**Video-Pro**, Hi-Tech Advisers	4.0
•**Word Writer ST**, Timeworks	2.01
•**WordPerfect 4.1**, WordPerfect	7/31/89
•**WordUp**, Neocept	2.0
Zoomracks II, Quickview Systems	1.0

NeoDesk 2.0

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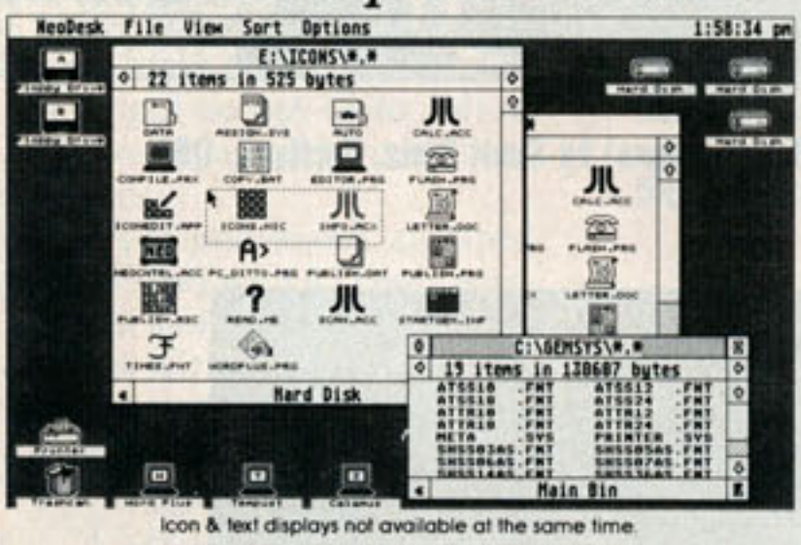

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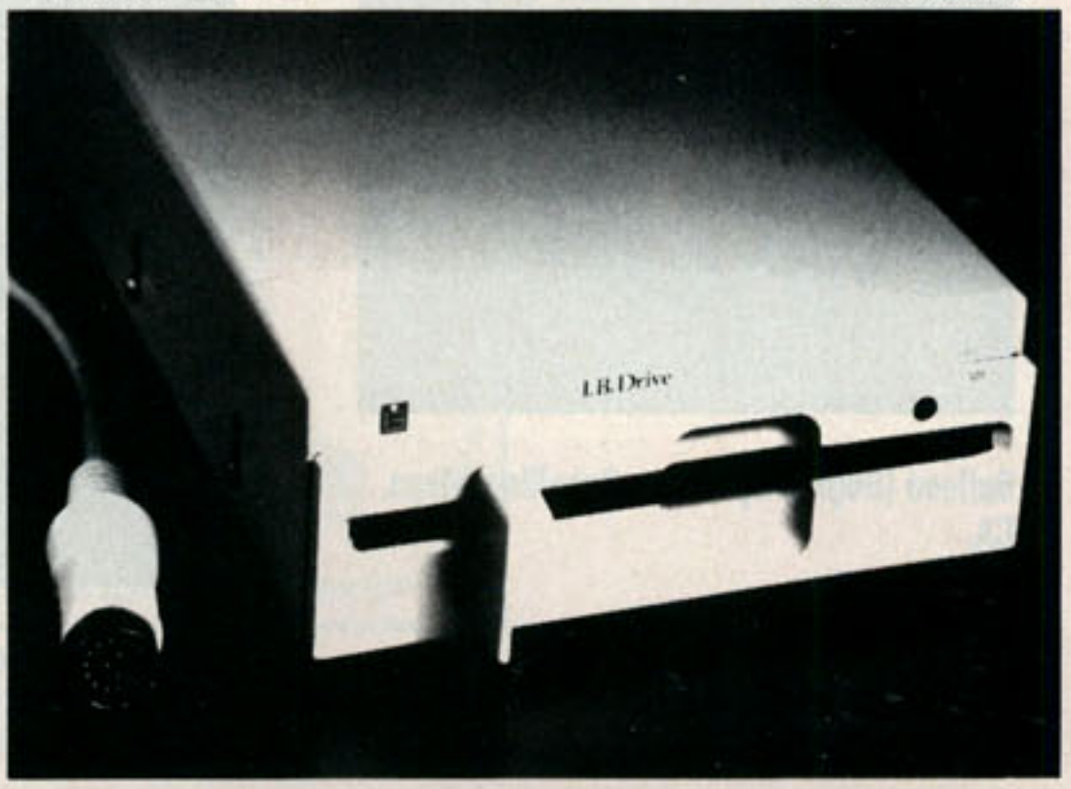

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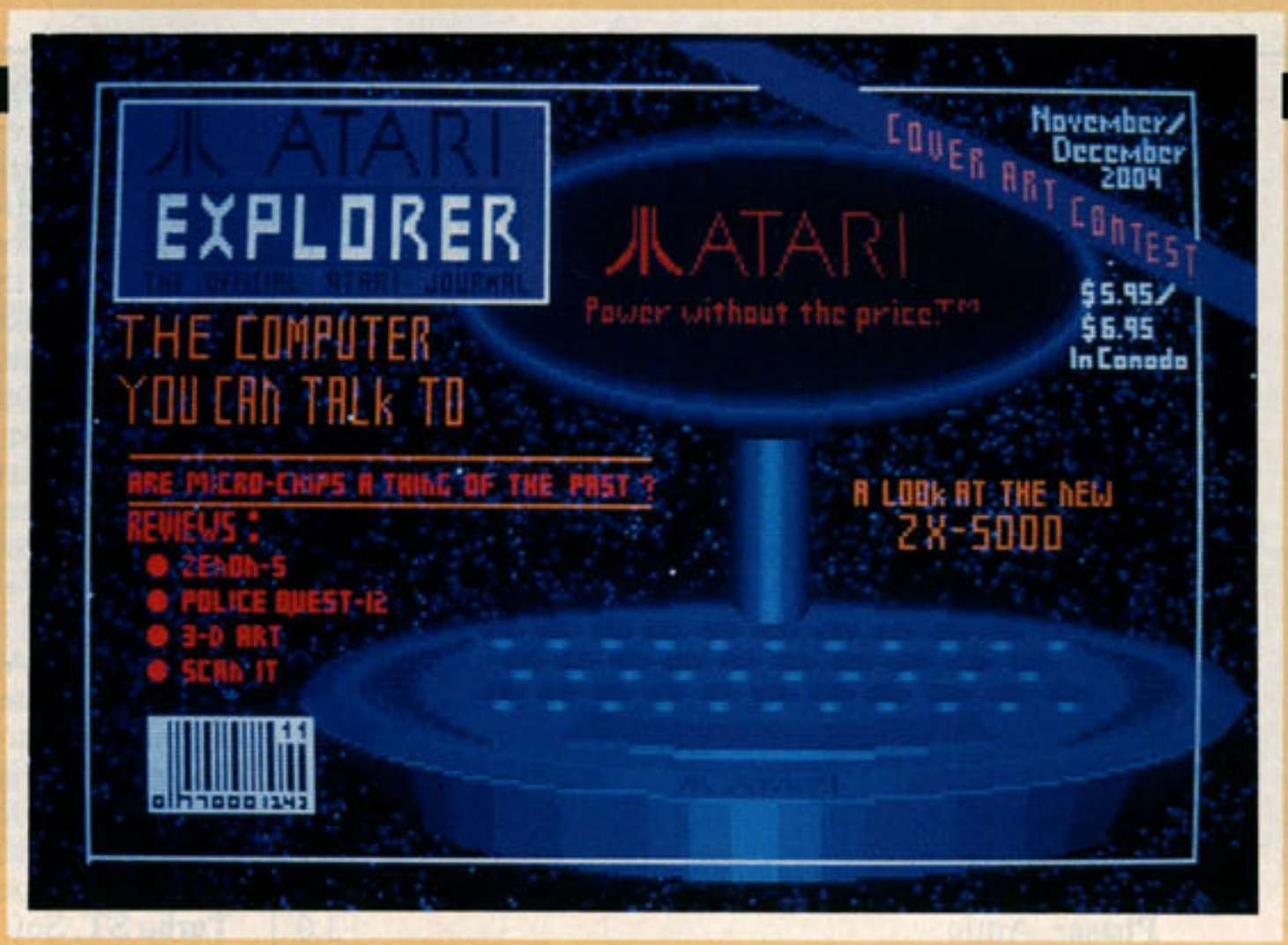
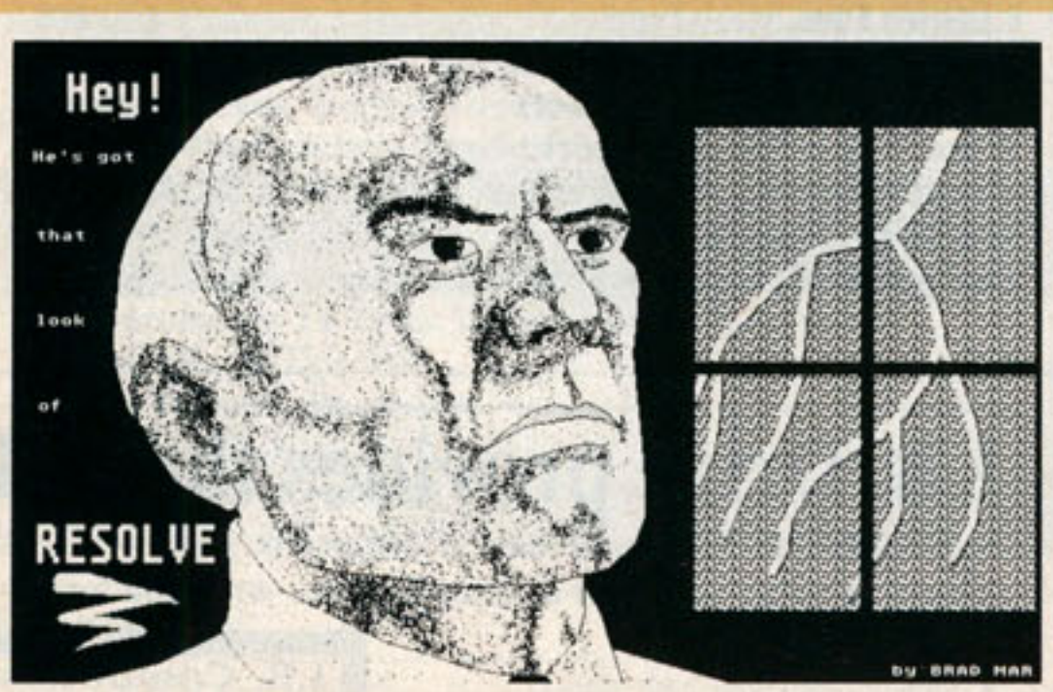
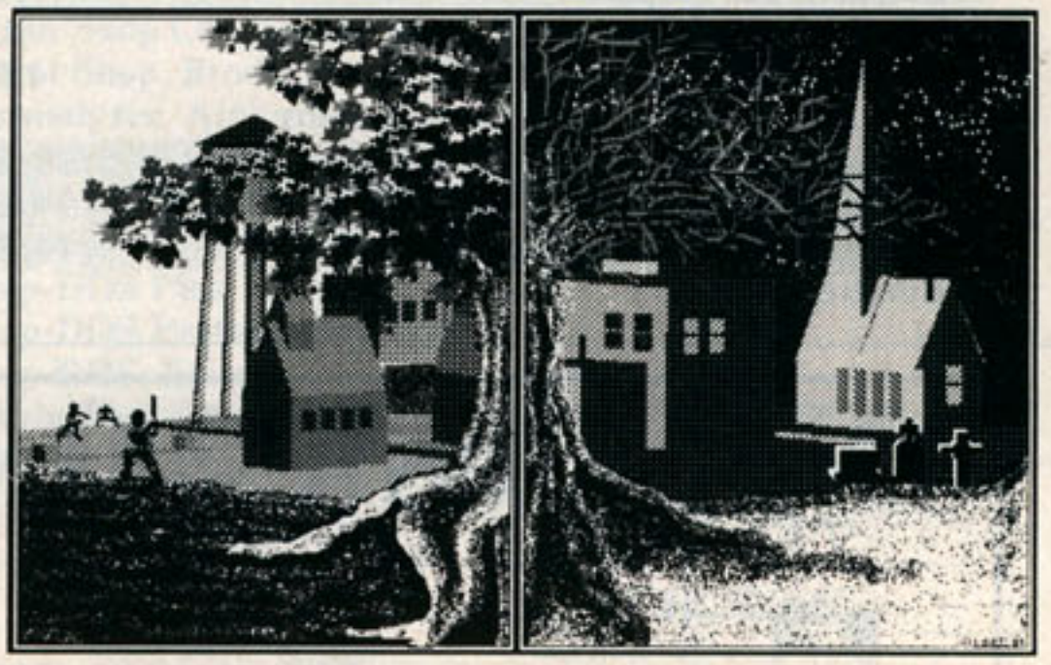
In India (Deags) by Juan Arteaga (age 9). Guayaquil, Ecuador (The image looks more like Morocco than India to us).



Things to Come (Neo) by Luisa Garcia, San Bruno, CA.



Resolve (Degas) by Brad Mar, West Hills, CA.



Our Town (Degas) by Scott Dietz, Portland, OR.

Balloon (Degas) by Arthur Schelling, Napa, CA.

Lighthouse (Neo) by Shu Bin Zhu, Brooklyn, NY.

Attack (Degas) by Dave LaTour, Duluth, MN.

Joker (Neo) by David Sparks, Ontario, CA.

Zinnias (Degas) by Ben Bellville, Galt, CA.

Graphics Gallery

Resuming Graphics Gallery after a one-issue hiatus, we have some spectacular images for your enjoyment. Thanks, readers, for your entries. With over 60 entries, the job of picking out the best ones was quite difficult.

Our grand prize winner was Michael Allen, a U.S. serviceman stationed in Kaiserslautern, West Germany. For his image of the castle at Neuschwanstein, Michael wins a 3-year extension to his *Explorer* subscription.

We invite your entry in our ongoing contest, but *please abide by the rules.*

- You may use any package you wish to create your image. However, entries must be submitted in *NeoChrome*, *Degas*, or *Tiny* format.
- Print your name and address on your disk containing *one* or *two* entries. We will no longer accept disks full of images; *you* should make the initial cut to your best ones.
- Include a self-addressed, stamped envelope (#10 size) with 45 cents postage for the return of your disk. We will return your disk with *ten new images.*
- Include on an 8½ × 11″ sheet of paper your name and address, the file name of your image, and the following statement: "I certify that the image submitted is my own personal work and that no portion was copied from any image belonging to another person or organization or from copyrighted printed or video material. I give *Atari Explorer* the right to print it, use it in promotional material, or distribute it via telecommunications service, BBS, or disk.
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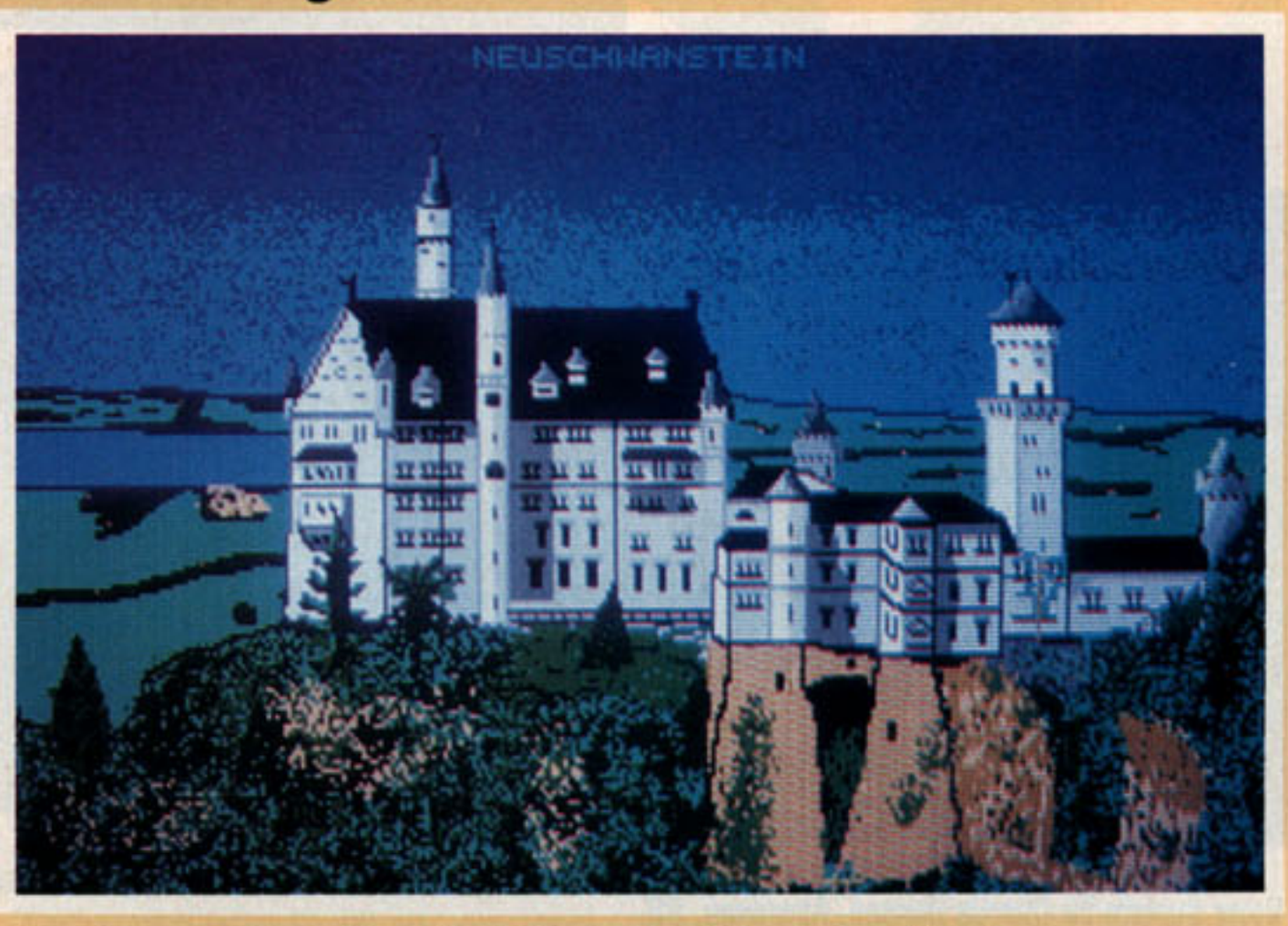
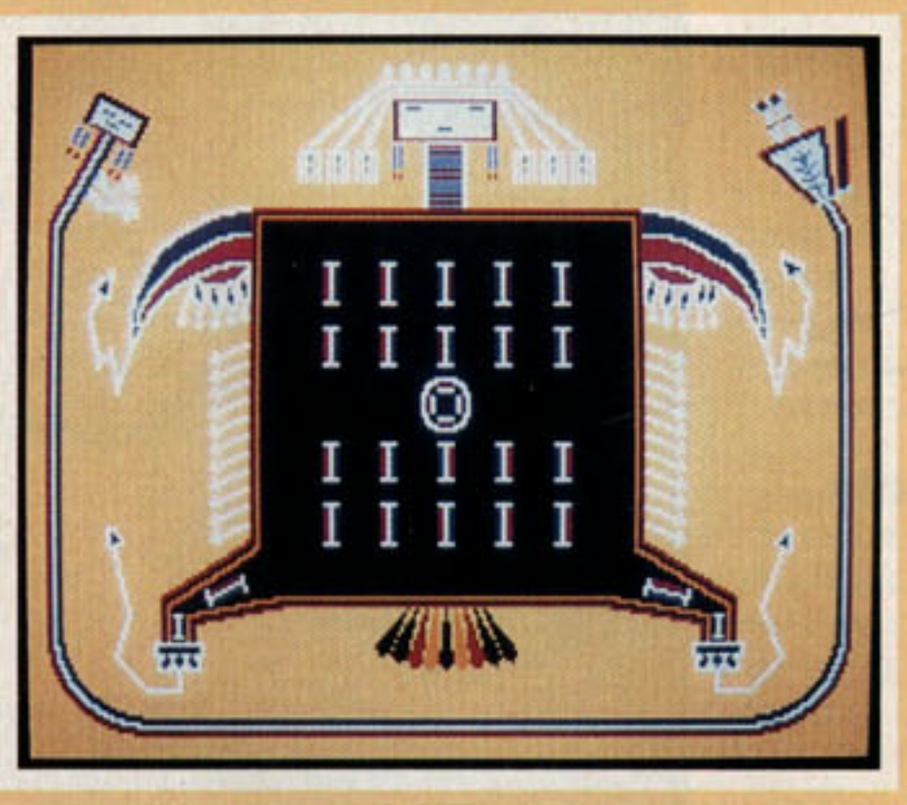
By DAVID H. AHL

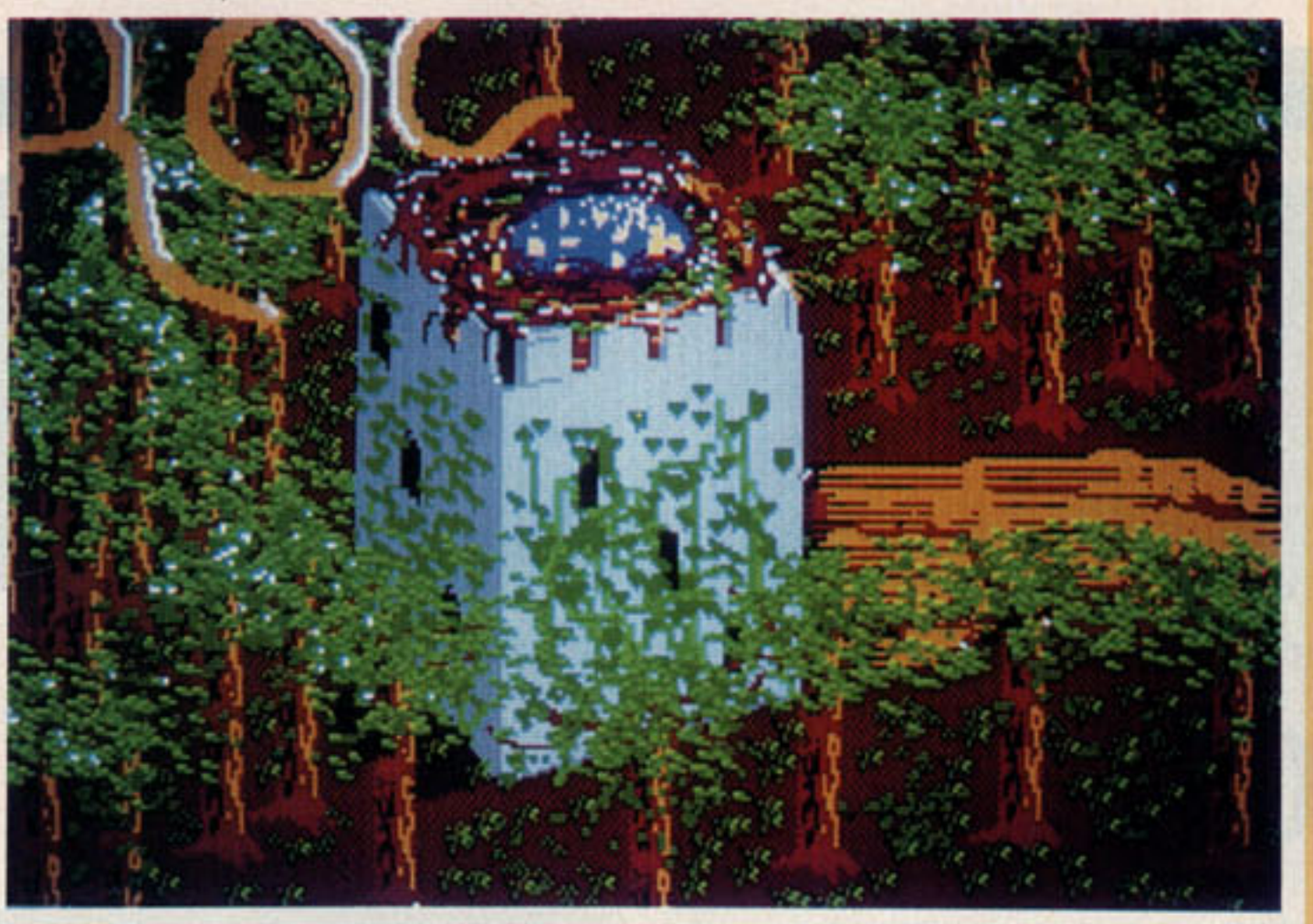


Neuschwanstein Castle (Degas) by Michael Allen, Kaiserslautern, West Germany.

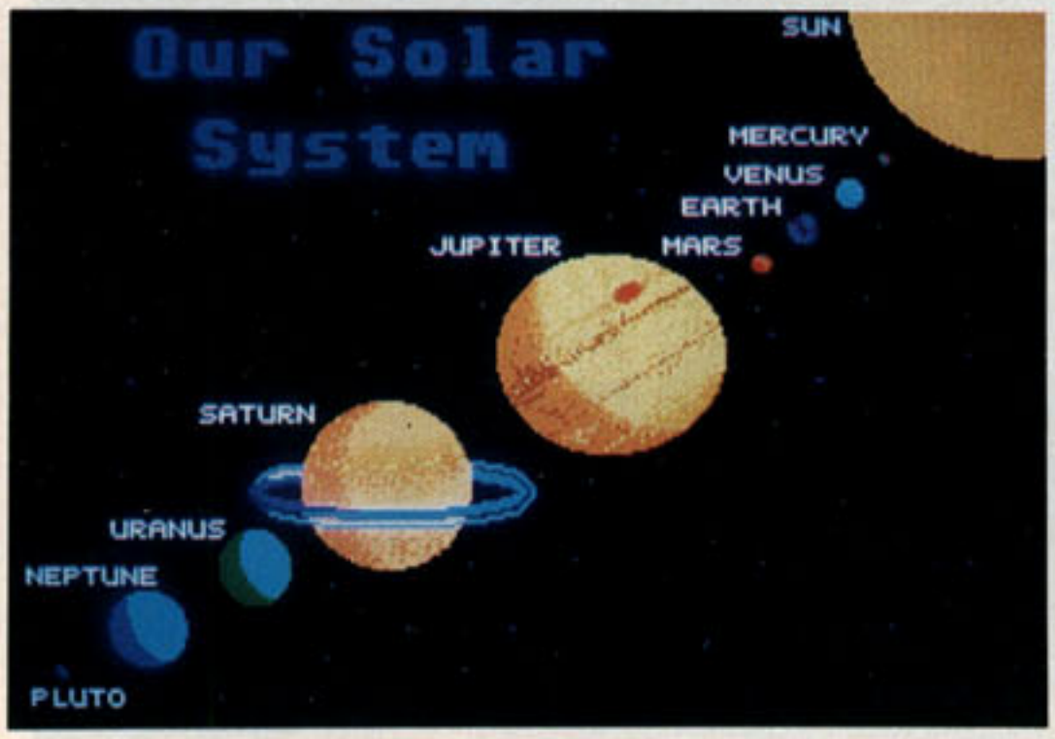


Ikne Etso, Navajo sand painting of the Thunderbird (Neo) by Robert Stinson, San Diego, CA.

Graphics Gallery

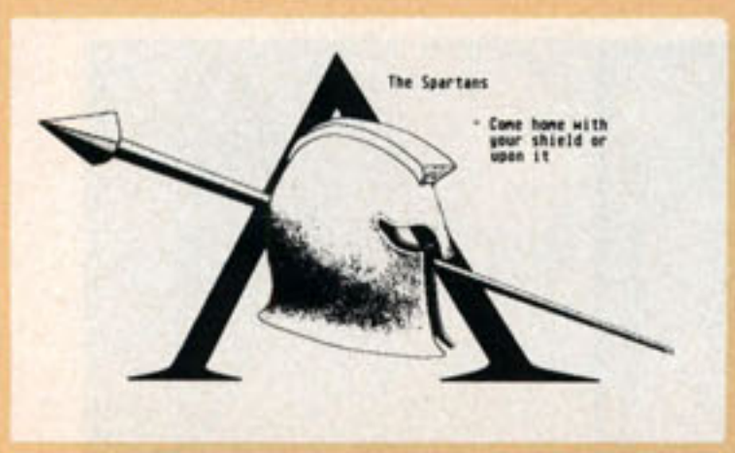


Roc (Degas) by Justin Bellville, Galt, CA



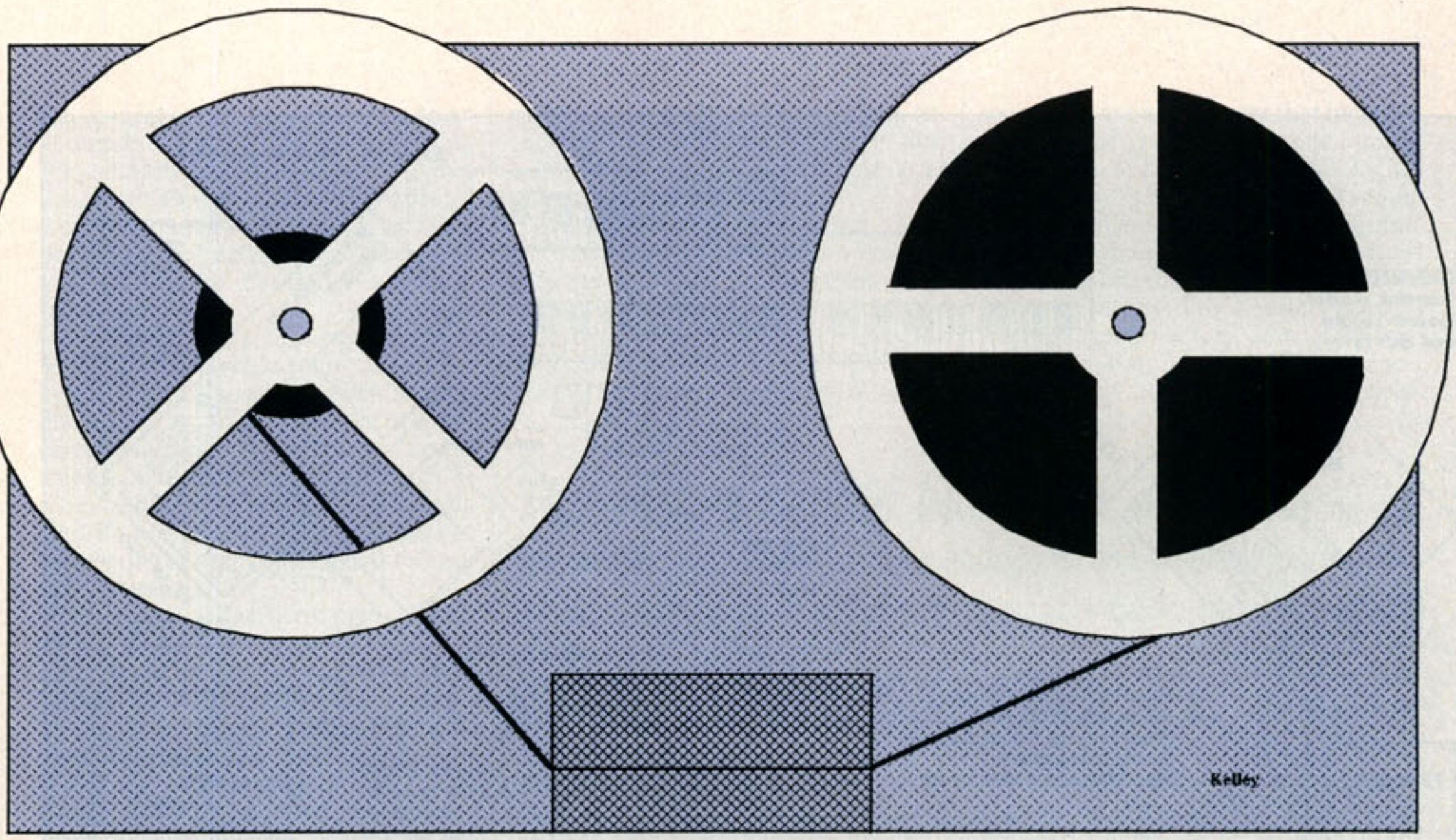
Solar System by Charlie Henson, Aberdeen, SD.

Grand Tetons (Neo) by Jim Grote, Cincinnati, OH.



Spartans (Degas) by Robert Hays, Dundee, MI.

California Raisins (Degas) by Joseph Reiss, Lore City. OH



Putting It All On Tape

Part 2: Home studio recording techniques

In the July/August issue of *Atari Explorer*, we described some of the equipment needed to record high-quality music at home. Now we'll examine some techniques that can be used to maximize the quality of recordings made on even very limited home studio setups.

As we mentioned last time, a key aspect of any good studio layout is easy access to both wiring and controls. It is difficult enough to act simultaneously as producer, engineer, and player without having to stretch across the room to accomplish basic tasks.

Figure 1 shows a set-up I have found to be particularly effective when faced with limited space. Everything is within arm's reach of the swiveling control chair. It is especially important to consider the placement of the MIDI master keyboard in relation to the computer screen, keyboard, and mouse.

The screen should be at eye level when sitting at the master keyboard and close enough for the smallest icons and numbers to be clearly visible without straining your back, eyes, or neck. This becomes crucial when working four to six hours at a stretch, as many of us home studio types do.

The furniture I ended up using in my own home studio cost next to nothing. A little ingenuity can go a long way when combined with garage sales and a few generous friends eager to part with old stuff; alternatively, you can build a custom set-up with minimal effort.

Another thing to consider is getting power to your equipment. Durable power strips with surge protection are highly recommended, because they both guard against the effects of brownouts and current spikes and permit you to power up related pieces of equipment from a single master switch. This is a great help in dealing with the many pieces of equipment that accumulate in the typical home studio.

Don't overdo collectivization, however. Instead, remember to modularize intelligently by plugging associated pieces of equipment into the same strip(s). That way, you can use components and subassemblies of your studio system separately, without having to power up the whole shebang. At a minimum, you'll want to devote one strip to your ST computer and its peripherals and another to your stereo amplifier and playback system, since you will often want to use these components for non-studio work.

Additional strips can be used to modularize subsets of your studio-only equipment (the synthesizer group, the effects and mixing console, and so on).

Another advantage of using master power strips is that they tend to limit the

By MIHAI MANOLIU

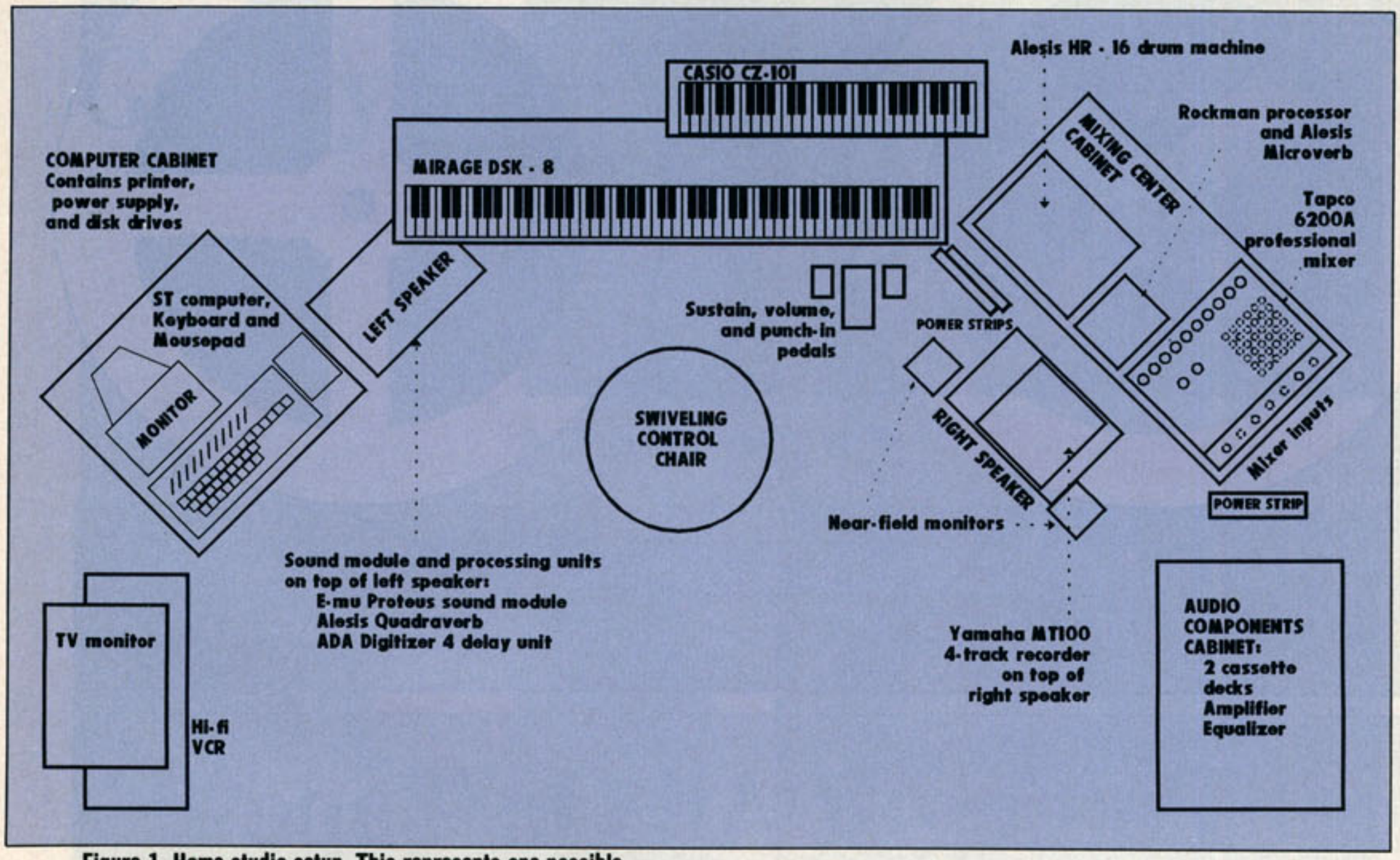


Figure 1. Home studio setup. This represents one possible configuration of studio components. Note easy access to mixer inputs and all other controls needed during sequencing and recording. If space allows, you should leave a path so that you can walk behind the whole setup.

number of times things get turned on, while ensuring that they don't get left on. Audio components (like computer equipment) survive longer if they are not turned on and off more than once a day, since applying power to a device exposes its circuits to a momentary surge.

Effects routing is another consideration. You can wire a processing unit on any of these three basic signal paths: the send/return from the mixer, the send/return on the 4-track, or between an instrument and the mixer or 4-track. Experimenting will lead you to the most useful combination for the types of processing you have.

Attaching effects to a mixer send/return has certain advantages, because it permits any signal coming into the mixer—whether from tape or "live"—to be routed out to the effects unit(s) under control of the console. This saves patching and repatching if the same effect is to be used many times or in a wide variety of ways (applied to incoming signal, during a track-to-track copy or "bounce," and so on). Unfortunately, a small mixing board or integral mixer-recorder typically has only one or two send/returns. It is thus necessary to decide which effect(s) to attach to the console and which to patch in and out of the signal path as needed.

An intelligent approach is to select your most versatile effect(s)—reverb, echo, delay, compression, etc.—for attachment directly to the console, where they can be used most conveniently. Suppose, for example, that your mixer has only a single send/return and that you own a multi-effects unit *and* an extra reverb unit. A good method for disposing of this equipment would be to hook the multi-effects box to the mixer (so that you could use it with any instrument being mixed) and put the extra reverb in line between the drum machine and its mixer input. (Having a dedicated reverb for drums can go a long way towards achieving that "studio" sound.) Whatever effects-routing scheme you hit on, remember that it is subject to change! Keep patch-bays accessible, and have patch-cords on hand.

Sequencing

Now that your studio is wired (see Part 1 for a basic wiring diagram) and ready to make music, let's take a look at some techniques you can use to create interesting music with a computer-based sequencer.

Let's assume, for the moment, that you have no musical ideas in mind; you are searching for inspiration. One approach I have found extremely helpful is to start building up a song from a rhythmic drum/percussion pattern. Since one aspect of what makes modern music great is its "groove," rhythm is not a bad place to begin. Moreover, it is easier and more natural to record melodic parts over a drum pattern than to rely on a mechanical metronome click.

If your drum machine produces MIDI data (and has touch pads), the easiest way to begin is simply to fire up

the sequencer, set its metronome to an acceptable tempo, and start banging (or, actually, touching) away. If not, you will need a way to trigger the drums from your master keyboard or other playable MIDI data source, interposing the sequencer so that data can be captured *en route*.

Normally, each instrument on a MIDI drum machine (tom-tom, hi-hat cymbal, etc.) is triggered when the machine receives a MIDI NOTE ON event corresponding to a particular note, so start by checking your drum machine manual for this note table. When you find it, it is a good idea to label the keyboard keys that correspond to each drum sound.

Then, hook the MIDI OUT port of your master keyboard to MIDI IN on the ST, and link the ST MIDI OUT/THRU port to MIDI IN on the drum machine. This will permit data to flow from the keyboard to the ST sequencer (where it can be recorded), thence from the ST to the drum machine. Alternatively, if the drum machine supports MIDI THRU, you can hook the MIDI OUT of the keyboard to MIDI IN on the drum machine and link the drum machine MIDI THRU to the ST MIDI IN, making the sequencer the last unit in the chain.

Finally, turn down the sound on the keyboard (or engage MIDI LOCAL OFF so that the master keyboard isn't producing sound—just sending MIDI data). Voila! Each time you press a keyboard key, the corresponding drum should sound, and the event should be recorded by the sequencer. If you can't get up to the tempo you want (hey, it's *hard* to play drums from a keyboard) you can turn down the sequencer metronome when recording, then speed it up to hear your patterns at full speed. Alternatively, try using the "step time" note-entry features of the sequencer to enter rhythmic patterns precisely.

When I don't have any ideas for patterns, I start experimenting with some of the factory presets on my drum machine or the large library of patterns I have assembled from various books and magazines. These include beats from popular songs and a variety of typical patterns in different styles, all painfully entered into my computer using step-entry.

My sequencer has 64 tracks, and I organize my library by recording a different pattern on each track and saving the whole sequence with all tracks muted. All I have to do is load a drum library sequence, and I can compare 64 patterns merely by turning tracks on. Having notes with each track is also helpful, both musically and for purposes of organization.

Working this way allows me to experiment using proven, professional patterns that I can quickly adapt to my own style. I can add a few tom fills or crash cymbals for a different accent, or even slow down a busy part and erase a few notes to create a totally different feel. A few modifications let me rapidly create a solid beat and free me to concentrate on other musical material. Also, the step-entry functions and mouse-based user interface of most ST sequencers make pattern development far easier than by direct drum machine programming.

The screen should be at eye level when sitting at the master keyboard and close enough for the smallest icons and numbers to be visible without straining your back, eyes, or neck.

To Quantize Or Not . . .

Now that you have a drum pattern in place, you can start on your first melodic track, a piano accompaniment. Rehearse the track a few times before recording. Then record it without quantization (automatic time-correction), getting down all the subtle syncopation and expressiveness inherent in your performance. Once you have a take (or several takes) down, use the editing features of the sequencer to correct any small errors. Or, combine sections from several takes into one, more or less perfect, final basic track.

Next, decide if you want to quantize the basic track or not. While quantized tracks are more metronomic, hence easier to play against, they tend to lack "human feel"—something that may or may not be important to you. If you want a more human feel, just make a copy of the basic track and save it before quantizing. Additional tracks can then be recorded against the quantized version of the base track. Later on, you can discard the quantized base track and substitute the original, provided it was played at metronome speed (i.e., without rubato).

Another way to avoid a mechanical sound is to use a sequencer that includes functions designed to put some human feel back into a quantized track by introducing very brief random delays and accelerations. These minute tempo shifts average out, producing a metronomically-correct track that still sounds as if it were played by a human being.

Beyond quantization, other global sequencer editing functions (search-and-replace, copy, time-shift, etc.) can help impose order on unruly aspects of music-making. For example, if your synthesizer responds to MIDI velocity information (data indicating how fast keys are being pressed down) a "too bright" track can be made less prominent by using global search-and-replace to lower all velocity values.

Another example: my MIDI guitar controller imposes a short, but audible delay between the time I pluck a string and the time MIDI data arrives at the sequencer. I can correct this by shifting the guitar track forward a few clocks.

Time-shifting, in combination with track-copy functions, can also be used to create subtle delay effects. For example, you can really enrich a thin-sounding part by copying it to a new sequencer track, shifting the copy a little bit so that it is slightly out of phase with the original, and playing both tracks back through separate synthesizer voices set to the same patch.

Copying and auto-transposition can be used to create tracks that harmonize with an original single line. When doubling or multiplying tracks, however, it is important to keep track of the number of sound sources you have at your disposal to *play* the additional "reinforcement" tracks that you create. Eight synthesizer voices can be used up very quickly this way.

Interesting effects can also be achieved by using the MIDI data produced by one instrument to trigger another. For example, you can add extra punch to a rhythm section by making a copy of the bass track, then using global

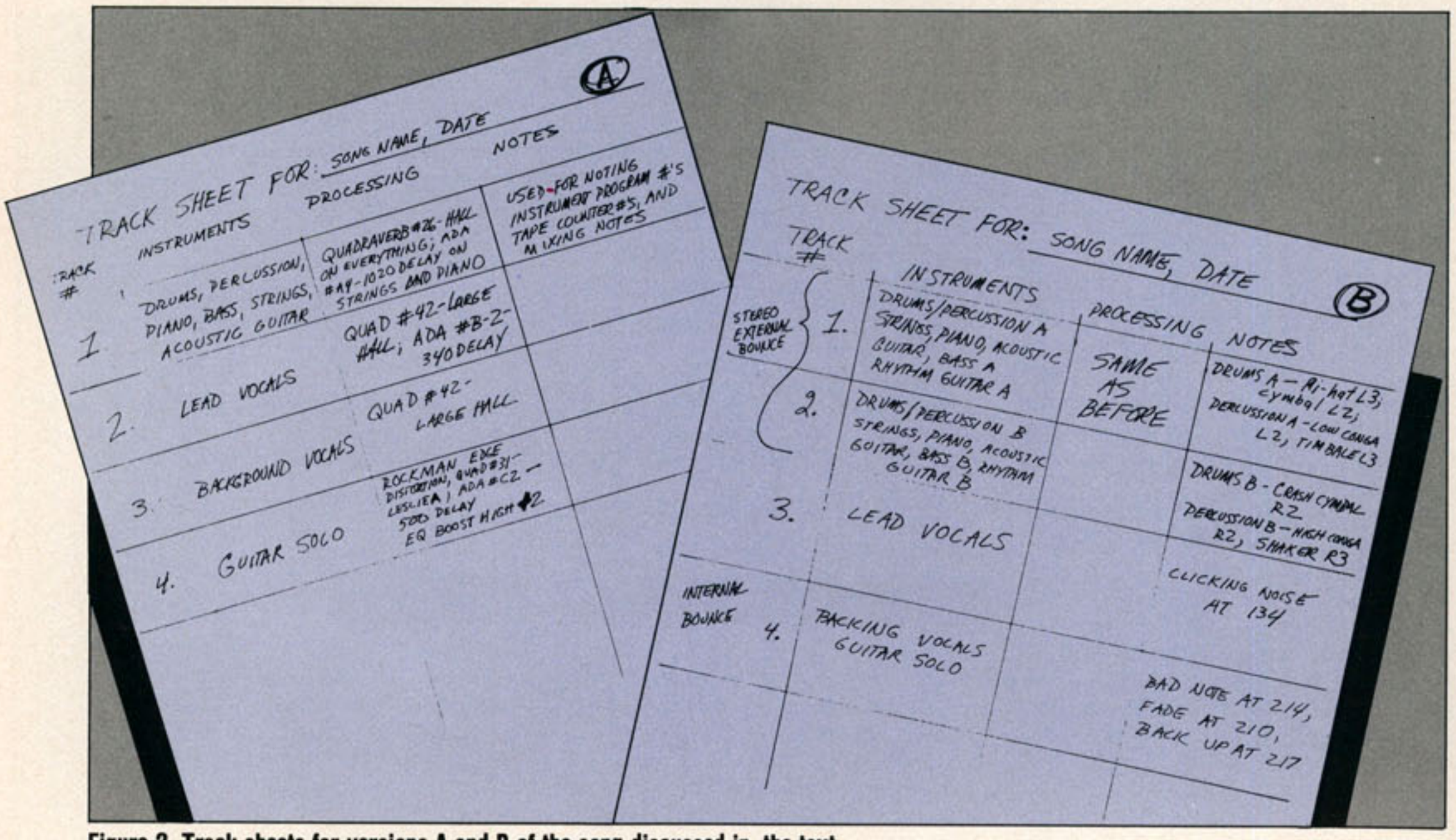


Figure 2. Track sheets for versions A and B of the song discussed in the text.

replace to set all NOTE ON and OFF events in the copy to the note value that triggers the kick drum. Combine this new data with your existing drum track to achieve a rock-steady lock between bass and drums that will reinforce each bass note played.

A few more useful techniques are worth mentioning. Many sequencers have a "strip note data" feature that allows you to take all the notes within a certain range and place them into another track. You might use this feature to take the bass line out of the piano accompaniment, put it on its own track, and have a string bass play it. Most sequencers also have some kind of punch-in ability, which lets you record into part of a track without re-recording the whole thing.

Yet another useful feature is automatic program change. Have one of the doubled piano tracks change to an organ sound after measure 4. Substitute a string patch after measure 8, and so on. Keeping performance data and patch-change data separate can help turn simple arrangements into interesting orchestrations. Program changes can also be used to change presets on your MIDI controllable effects processors.

Effects

Most good effects units these days have stereo capability. Using them in stereo can add a lot to your sound, especially when chorus and delay are the effects in question. No matter what kind of effects you have, the key to getting the most out of your gear is experimentation: avoid always using the same presets; try using effects developed for one instrument on a completely different instrument.

For example, I recently tried applying my Alesis Quadraverb's gated-reverb combination (normally used for drums) to a rhythm guitar part, and it sounded great! Putting an old fuzz box in-line with your synthesizer might be just what you need to make that lead part scream.

Equalization—the controlled muting and/or enhancement of different frequency ranges—is often used to change the character of a part or affect the way it combines with other parts. For example, acoustic guitar tracks often sound fine when played solo. In combination with other tracks, however, the acoustic guitar tends to get "boomy," overemphasizing the bass frequencies and muddying the low end of a mix. Equalization can be used to strip the bass frequencies out of a guitar part, while leaving the brighter high frequencies in place.

Because the recording process itself normally mutes certain frequency ranges, it is a good idea to put off using equalization until the final mix. In general, high frequencies tend to suffer, so set tone controls so that parts sound a little brighter than you will ultimately want to hear them. Then use EQ on playback to stop down the treble, as required.

Compression, which forces the different volume levels of a track into a specific dynamic range (making loud parts softer and soft parts louder), can make the difference between distorted and dense recordings and usable, transparent results. Use lower compression ratios (2:1, 3:1) for parts that need a wider dynamic range, such as lead vocals and solos. For rhythm guitars, bass, and background vocals, try 4:1 or 8:1 ratios to yield solid-sounding tracks without much dynamic variance.

Multi-effects processing, by which several effects can be hooked together to affect a single track, is an economical way to spice up musical material with-

out excessive re-recording. As you work with a multi-effects processor, you will begin to develop favorite combinations of effects appropriate for different instruments and musical settings.

One of my favorite lead guitar combinations, for example, combines medium chorus, clean distortion, 500ms. delay, and a medium hall reverb. Remove the distortion, and you have a very effective vocal patch (set the delay to a few barely audible repeats). A slight flanging coupled with long delay can give a great sound for sustained string section chords.

Whatever combinations you come up with, it is important to remember that multi-processing many tracks or instruments can lead to a big mess. Maintaining subtlety is critical, as you try to fit all your favorite sounds into the recording process.

Recording

The best way to start the recording process for a new song is to prepare a track sheet (see Figure 2). This planning stage is necessary if you are to get the most out of your 4-track recorder.

Suppose you want to record a song which needs an acoustic guitar, electric lead, bass guitar, piano, strings, percussion, and lead and background vocals, and you even want the drum machine to be in stereo. You have a big problem: how to record that many different tracks on the 4-track? Obviously, you can't record each instrument on its own track and then combine all tracks into a final mix.

One way to handle the problem is to pre-mix using the MIDI sequencer, putting as much music as you can under machine control, then recording groups of instruments together on single tracks. For the above example, you might begin by using MIDI and sequencing to polish the drum, percussion, bass, piano, and string lines into final form.

Then, you might employ the sequencer to play a synchronized "take" from all three instruments, running each through a different channel of the mixer. An acoustic guitar part—played "live" against the sequenced lines via microphone or pickup—might be added at this point, the mix carefully verified as being acoustically correct.

Finally, you would take only one output from the mixer and record this mix onto track 1 of the 4-track, making sure the recording level was set as high as possible without distorting, so that the greatest amount of signal is recorded. Remember, with each successive re-recording, fidelity is reduced, particularly in the high frequency range. Don't forget to use noise reduction and the highest possible recording speed.

Doing this kind of pre-mixdown will leave three tracks for lead vocals, background vocals, and the guitar solo. Adding these will give you a complete 4-track recording of your song, but no stereo image on the percussion.

***Because the recording process** itself normally mutes certain frequency ranges, it is a good idea to put off using equalization until the final mix.*

Having gotten this far, you may realize that the bass track—originally a synthesizer line played by the ST—should actually be played by a real bass. An electric guitar rhythm track might also enrich the sound. Hmmm . . . time to start recording version two.

Since you will clearly need more than four tracks, you have to change your approach to recording the new version. There are several methods for increasing the number of "tracks" available. These include "internal bouncing," which means recording two or three tracks then re-recording a mix of these (a live track can also be added in at this point) onto the fourth track, leaving the other three open for further recording, and "external bouncing," which uses the left and right channels of a second stereo recorder to record a stereo mix of the four original tracks of the 4-track. The left and right channels of the stereo recording are then sent back to two of the 4-track channels, freeing up two tracks. The advantage of external bouncing is that it permits a stereo recording to be built up incrementally.

Both methods require recording parts more than once, and quality is degraded with every pass. Internal bouncing is reliable for combining up to ten individual tracks into a single track, while external bouncing may be good for combining up to 12 or even 14 original tracks into two stereo tracks, depending on the quality of the second recorder.

Let's see how external and internal bouncing can be combined in practice to produce version two of the above example. For starters, record the drums, percussion, strings, piano, and acoustic guitar (your original group, minus the bass—most of which is produced under sequencer control) using a stereo reverb for processing and taking the left output from the mixer to track 1 and the right output to track 2 of the 4-track. The two tracks are identical, each containing a balanced recording of the basic ensemble.

Next, record a live bass part on track 3 and a rhythm guitar part on track 4 of the 4-track. Now that you have four tracks, you can proceed with your first external bounce. Connecting the left and right outputs of the 4-track to the appropriate inputs on the stereo recorder, record your four tracks onto the left and right channels of the second recorder. To create a proper stereo image, pan tracks 1 and 2 hard left and right, respectively, while giving the bass track a little pan toward the left and the rhythm guitar track an equivalent pan toward the right.

The left track of the stereo recorder now contains an image of your basic ensemble, plus a lot of bass and a little rhythm guitar. The right track contains the same image, but with a lot of guitar and only a little bass. So far, so good.

To complete your external bounce, reverse the process, re-recording the left track of the stereo recorder on track 1 of the 4-track, and the right track on track 2. Now, you can record backing vocals on track 3 and then use internal bouncing to copy track 3 to track 4 while adding the guitar solo.

Finally, you can record lead vocals on track 3. Your four tracks now contain 1) left and 2) right images of the basic ensemble (along with bass and rhythm guitar, panned left and right), 3) lead vocals, and 4) backing vocals along with the guitar solo. Recording the tracks in this way provides the cleanest possible lead vocal while retaining the stereo image in a way not possible using only internal bouncing.

Mixing

There are several things you should do to prepare for the final mix. Make notes on your track sheet, listing counter settings for such things as mistakes, fades, and quiet passages that need some emphasis. Buy metal tape for your master to ensure the best dynamic range and saturation. Finally, come to the mix with fresh ears; listener fatigue tends to produce unbalanced mixes.

Try several different monitoring arrangements to see what works best for you—headphones, regular home stereo speakers, or small near-field speakers.

This is the time to make final processing decisions for individual tracks, perhaps adding a new reverb setting for all tracks. You should probably take the four individual track outputs from the 4-track back into the mixer (adding individual effects on the way) then take the stereo outputs from the mixer into the second recorder or mastering deck.

Begin by getting the right sound on individual tracks, starting with the simplest—lead vocal, guitar solo, backing vocals, etc. EQ should start out flat; then correct settings should be found. Next, you can introduce signal processing (if any) and finally "pan" the track to produce the proper stereo image.

Once each track has been optimized, the whole mix must be fine-tuned, especially the EQ. Remember that EQ is interactive and that while one instrument may sound great on its own, when it is added to the whole mix it may get too muddled. Not everything belongs up front.

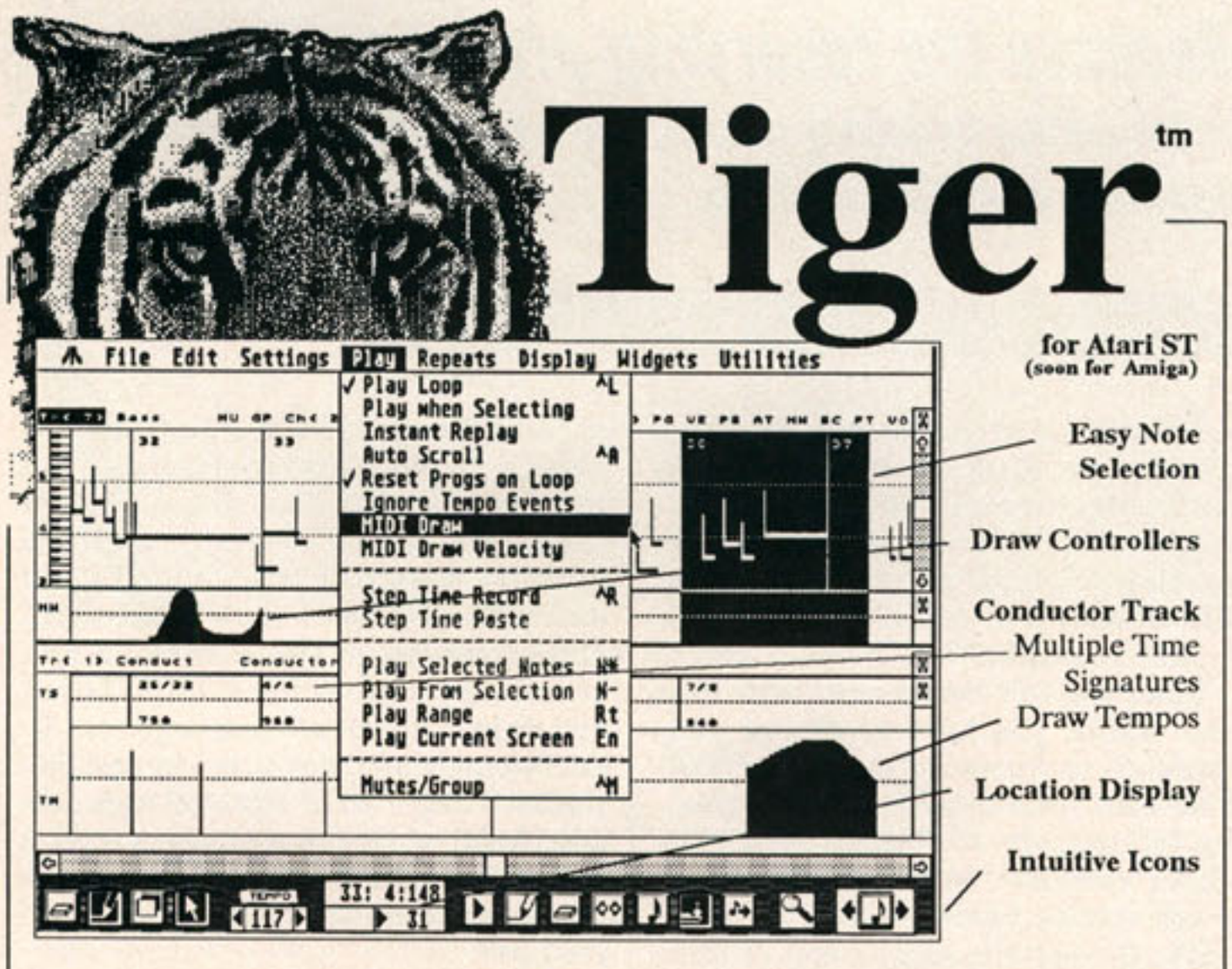
One of the most common problems with home recordings is a deep woof and rumble that can be avoided by rolling off the unnecessary low end on all tracks.

If the tracks were poorly recorded in the first place, no amount of EQ, processing, or begging can save the mix. Re-recording only the offending tracks is usually impossible at this point, since everything has been bounced around and combined. This points up one of the inherent weaknesses in the bouncing process, which should be kept in mind during initial recording: it is better to re-record a track at an early stage than be disappointed later on.

Because recording with a limited number of tracks means that you are submixing at every stage of the recording process, you must remain very critical of the sound, throughout. Assuming you like the balance among all the tracks you can proceed to record the mix, making sure to watch the track sheet for trouble spots. I usually record at least several takes, sometimes experimenting with different processing on solos and vocals.

Take a break, listen to the mix(es), and then decide whether to move on. It can be frustrating to find out later that you have to repeat the mixing process because you forgot to fade that annoying guitar noise at the end of your solo.

The home studio can be a source of fun and inspiration for musicians at all levels. I have often been surprised by the high quality of playing and recording that my home studio has fostered. As with other aspects of music, the more time you spend learning and practicing the art of recording, the greater your enjoyment and the more sophisticated the results. ■



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Understanding GDOS

The first step is getting acquainted with the ASSIGN.SYS file

If you have ever used Migraph's *Easy Draw* or Neocept's *WordUp*, you have already encountered GDOS. It is supplied with these and other, similar programs and must be available for the application to be able to go about doing all the nifty things it has been programmed to do.

So maybe you have used GDOS. Whether or not you actually understood exactly what it was doing or why it was there in the first place is probably a different story. And you are not alone, which is why I have attempted to eliminate some of the mystery surrounding GDOS in this article.

Probably the first step in understanding GDOS is knowing what those four initials stand for: GDOS is an acronym for Graphics Device Operating System. GDOS works in conjunction with the ST operating system (TOS); the GDOS.PRG (GDOS program) itself is run from an AUTO folder. Once it is loaded, it behaves much like a program "patch," latching onto GEM and performing as if it were actually a part of the operating system.

The ASSIGN.SYS File

Certain conditions must be met before GDOS can perform properly. The ASSIGN.SYS file is the first requirement. When GDOS is loaded, it looks in the root directory of the boot disk (or hard drive partition) for this batch file. (See sidebar for a sample ASSIGN.SYS file.) GDOS follows the roadmap-style set of instructions found in the ASSIGN.SYS file as it searches for the different software components—fonts, device drivers for different printers and plotters, etc.—necessary to its work.

The ASSIGN.SYS file itself is nothing more than an ASCII file, so you can modify and save it using almost any word processor. This ASCII file operates like an uncompiled piece of programming code. Anything written to the right of a semi-colon is simply a comment or a reminder and is, therefore, ignored by GDOS.

Every time you add a new output device to your system, or a new font to your font folder, you must modify your ASSIGN.SYS file so that GDOS knows about these new additions. So many commercial and public domain fonts and drivers are now available that all GDOS users would do well to learn a little about the structure of the ASSIGN.SYS file, making modifications easier.

The first order of business is defining a path to the folder in which you keep your fonts, drivers, and other GDOS ancillary files. The example shown in the sidebar is a modified version of the ASSIGN.SYS file that comes with Migraph's DeskJet printer driver. The PATH = instruction tells GDOS that I keep my font (.FNT) and driver (.SYS) files within an embedded GEMSYS folder on partition E of my hard drive.

The actual name of that folder is immaterial. In the more recent versions of GDOS, Atari has taken to naming that folder GDOS.SYS. GEMSYS was the name of the folder that held the fonts in an earlier version. I have simply chosen to continue to use that folder name.

Those font and driver files can be kept anywhere as long as their location is indicated in the PATH = line and that location is present when an application accesses any of the devices. For example, if you have only floppy disk drives, you probably won't have room on your application boot disk for the program files *and* all the font files, which can be quite large. The GEMSYS folder will probably then reside on the disk in drive B.

To avoid getting an irritating error message from an application when it looks for the GEMSYS folder and can't find it, it is good practice to leave the GEMSYS folder disk in place and use your other drive as your data drive—the drive that holds the disk on which you save your files.

The next set of instructions is a list of device drivers and their associated fonts. Device drivers are the programs that translate the information provided by an application into the format used by the output device. Certain device driver numbers are associated with specific device types. They are:

01-10 Screen drivers
11-20 Plotter drivers
21-30 Printer drivers
31-40 Metafile drivers
41-50 Camera drivers
51-60 Tablet drivers

Numbers 01 through 04 are the built-in device drivers of the ST. They are labeled accordingly in the sample ASSIGN.SYS file. The p following those initial four device numbers signifies that, because those drivers are built into ROM, they are a permanent part of the OS.

GDOS Fonts

If, by now, you have taken the time to study the sample ASSIGN.SYS, you have probably noticed that it lists font (.FNT) file names for screen fonts as well as printer fonts.

This is one of the reasons that GDOS fonts consume so much memory. GDOS requires screen font files specifically configured to correspond to the screen resolution. To take full advantage of each style printer, separate printer fonts are also required.

Laser, 24-pin, and 9-pin printers all print at different resolutions, so each has its own optimized printer fonts.

Also, unlike vector fonts, such as those used in *Calamus*, GDOS can generate different point sizes but doesn't

By PAMELA RICE HAHN

always do it too well. If your application shows a Swiss font in 24 point and 48 point, you can probably assume that the 48-point font is simply a doubled version of the smaller one. GDOS applications generally use a pixel-doubling algorithm, which explains why most larger GDOS fonts have what is often referred to as the "jaggies." Doubling the font size simply doesn't maintain the smooth, professional appearance of the original font.

GDOS doesn't load the fonts listed in the ASSIGN.SYS file on boot-up; it waits until an application calls for them. Once you exit the application, that memory is freed up and available for other things. GDOS waits unobtrusively in the background until it is called and doesn't (usually) interfere with other operations.

The only way you can tell that GDOS is in place, if you are not using an application that calls for it, is that GDOS sometimes causes a slight slowing down in the drawing of windows and other screen objects. This is most noticeable on older STs and seems to be caused by the way in which GDOS monitors the TRAP#2 vector, which lets applications call the GEM windowing routines.

The ST system and printer you are using determine the extent to which you will need to modify your ASSIGN.SYS file. When I added a DeskJet printer to my system, I found that I had to coordinate the number of fonts in my ASSIGN.SYS file with the application I was using. The DeskJet 300 dpi fonts are huge memory hogs.

Using the sample ASSIGN.SYS file with *WordUp* on a 1Mb ST was impossible; it didn't leave me enough room to create a page. Because of differences in the programs, I was, however, able to use *Easy Draw* with that ASSIGN.SYS file and still have room for two pages with a number of large .IMG or .GEM file graphics in memory simultaneously.

The Uniform Font Filename Format

With the first official release of GDOS in 1987, Atari adopted a standard way of naming font files. For example, take a look at the first of the DeskJet printer fonts in the sample file: ATSS07DJ.FNT. The first two letters identify the computer for which the font was created, in this case Atari.

(Doug Wheeler, in an explanation of GDOS included with Neocept's *Fontz*, reviewed elsewhere in this issue, argues that a more practical use of the first two letters would be to identify the creator of the font, i.e. MI for Migraph. He maintains that if you are using a GDOS font, you are working with an ST program and thus already know it was created for an Atari computer. Makes sense to me.)

Be that as it may . . . the second set of two letters indicates the type style—in this case, sans serif. The numerals indicate the point size—7-point—and the last two characters specify the device—DeskJet.

Metafiles

The last line of the sample ASSIGN.SYS file displays the META.SYS driver. This driver is used to create a

A Sample ASSIGN.SYS File

```
; HP DESKJET 21=150DPI, 23=300DPI
PATH = E:'EASYDRAW'GEMSYS'
; Change C: to drive w/GEMSYS folder
00p screen.sys ; default screen used when an application
               ; doesn't care about the screen resolution
; —START OF SCREEN FONTS—
01p screen.sys ; low resolution
02p screen.sys ; medium resolution
03p screen.sys ; high resolution
; SWISS
MIGLSS07.FNT
ATSS10CG.FNT
ATSS12CG.FNT
;MIGLSS14.FNT
ATSS18CG.FNT
ATSS24CG.FNT
;MIGLSS36.FNT
; DUTCH ATTR10CG.FNT
ATTR12CG.FNT
ATTR18CG.FNT
ATTR24CG.FNT
; TYPEWRITER
ATTP10CG.FNT
04p screen.sys
; SWISS
MIGHSS07.FNT
ATSS10.FNT
ATSS12.FNT
;MIGHSS14.FNT
ATSS18.FNT
ATSS24.FNT
;MIGHSS36.FNT
; DUTCH
ATTR10.FNT
ATTR12.FNT
ATTR18.FNT
ATTR24.FNT
; TYPEWRITER
ATTP10.FNT
; — START OF PRINTER FONTS —
21 DJET150.SYS ; 150 dpi DeskJet printer driver
ATSS07DJ.FNT
ATSS10DJ.FNT
ATSS12DJ.FNT
ATSS18DJ.FNT
ATSS24DJ.FNT
; DUTCH
ATTR10DJ.FNT
ATTR12DJ.FNT
ATTR18DJ.FNT
ATTR24DJ.FNT
; TYPEWRITER
ATTP10DJ.FNT
23 DJET300.SYS ; 300 dpi DeskJet printer driver
; SWISS
HPLHSS07.FNT
ATSS10LS.FNT
ATSS12LS.FNT
ATSS18LS.FNT
ATSS24LS.FNT
; DUTCH
ATTR10LS.FNT
ATTR12LS.FNT
ATTR18LS.FNT
ATTR24LS.FNT
; TYPEWRITER
ATTP10LS.FNT
31r META.SYS ; metafile driver
```

GDOS follows the roadmap-style set of instructions found in the ASSIGN.SYS file as it searches for the different software components necessary to do its work.

metafile—a kind of resolution-independent, ideal graphics file. These .GEM-extender metafiles save the instructions for recreating a document page at the highest possible resolution on any output device.

Because text is also represented graphically, this may ultimately do away with the hassle of maintaining GDOS printer fonts for each kind of printer. Unfortunately, the metafile standard is not yet consistently used. Migraph's *Easy Draw* version 2.3 is the best of the lot at deciphering the optional parameters used in other programs and accurately reading a .GEM file. Regardless of how an application handles the metafile standard, if you want to save your GDOS application creation, you must have this (META.SYS) driver in your ASSIGN.SYS file.

This seems as good a place as any to mention a fact about GDOS that has caused some confusion. When an image (.IMG) file is loaded into a document, GDOS does not actually maintain a copy of that image within the resultant .GEM file; rather, it stores the instructions that tell the program where to find that file. In other words, it records the path it took to find the .IMG file when it was loaded into the document.

If you, then, remove that disk from your drive or move the .IMG file to another partition on your hard drive prior to printing that page, GDOS will be unable to find the image and will leave that portion of the page blank.

Because Migraph's *Easy Draw* and A&D's *Universal Item Selector II* work so well together, I have solved this problem by creating a folder for each series of documents and moving or copying the .IMG file to that folder prior to loading it into *Easy Draw*. This way my .GEM file pages and the .IMG files I used to illustrate them are always within the same path.

This method keeps everything together, so that when I want to reprint a document at a later date, I don't have to remember exactly which .IMG files I used—which I probably wouldn't be able to do anyway.

Summing Up

The function of GDOS is to handle all the output functions of a program, making certain they are accomplished at the highest possible resolution. Because both text and graphics within a GDOS application are represented by a certain number of pixels arranged in a specified order, different device drivers are necessary to tell the computer how to arrange the display, whether it is on a monitor screen or at 300 dots per inch on a printed page.

GDOS has gone through several revisions. When it was initially introduced, the screen would display a GEMVDI Installed message as the program booted. This was followed by a GDOS Version 1.x message. The most recent versions display GDOS RELEASE 1.x.

As I have attempted to explain GDOS, it has occurred to me that it is much easier to use GDOS than to tell about it. This is true, because for the most part unless you want to modify an ASSIGN.SYS file to accommodate more, fewer, or different fonts, a GDOS program is pretty much ready-to-go out of the box.

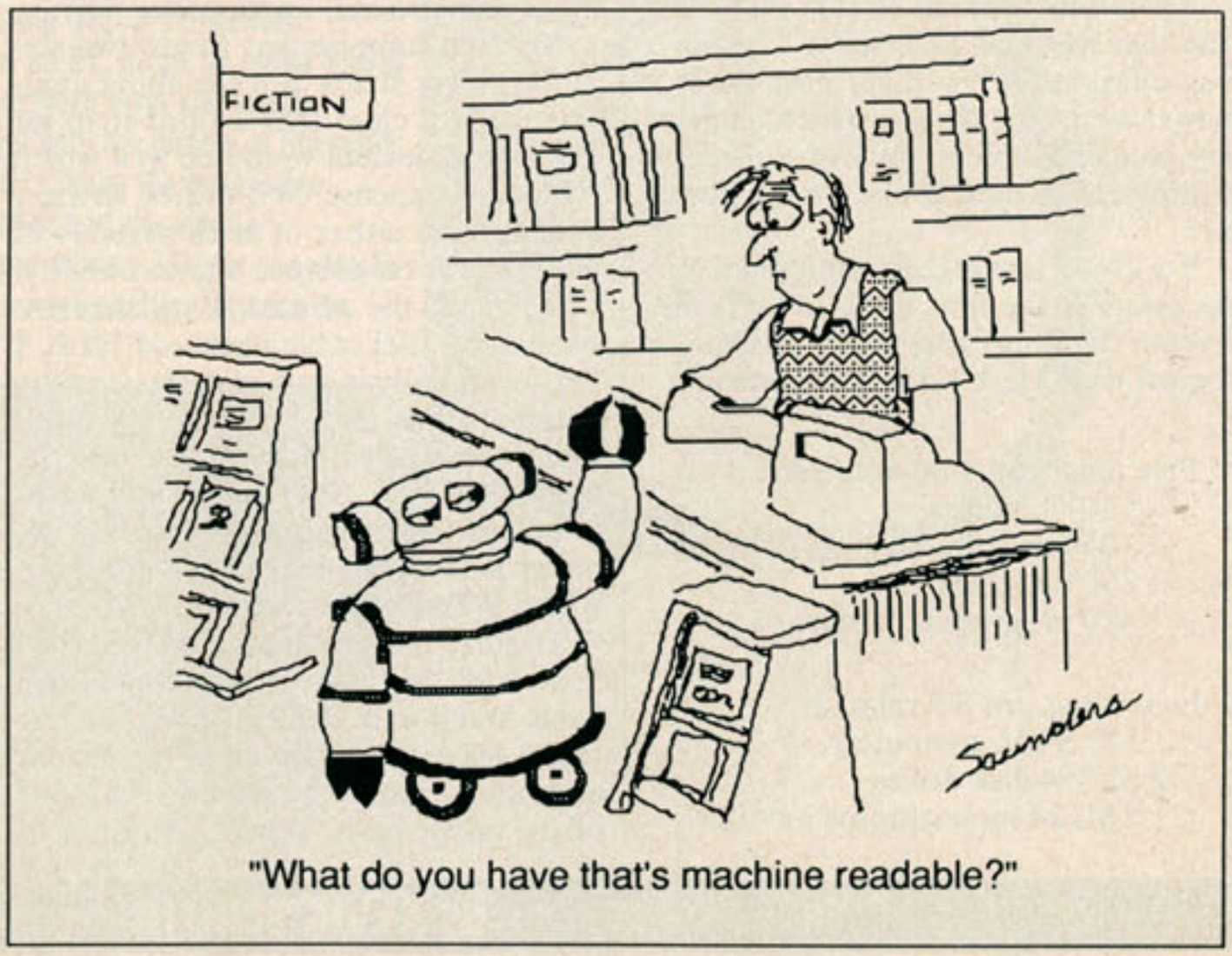
G+Plus, The GDOS Alternative

G+Plus is a handy new program from Codehead Software that makes coping with GDOS easier. The program itself is run from the boot disk AUTO folder and, working in conjunction with a *G+Plus* desk accessory, performs all the tasks ordinarily handled by GDOS. The manner in which it handles them is the bonus.

G+Plus will accept ASSIGN.SYS files by any name, as long as they have the .SYS extender. For example, I have the sample ASSIGN.SYS file shown in the sidebar saved as AASEZDDJ.SYS, my own personal code that tells me which fonts I have included—in this case, the ones supplied with the printer driver.

(As an aside, I have tried several 300 dpi printer driver packages and have found the fonts supplied with Migraph's DeskJet driver superior to all of the others I have used.)

G+Plus users can maintain any number of individually selectable files. Because the ASSIGN.SYS file isn't actually chosen until an application is run, font selection doesn't have to be made until you have decided which program you want to use and what you want to use it for. ■



"What do you have that's machine readable?"

Untangling The Rat's Nest

Achieving ac-cord between 8-bit and ST

It had to happen . . . I fought a delaying action by replacing my first computer—a trusty Atari 800—with a new 130XE. But finally, one of the local stores slipped through my defenses by offering a monochrome ST system with two single-sided drives for the price of one. So, all of a sudden, I find myself in the 16-bit world.

And a crowded world it is—four disk drives, two computers, two monitors, an 850 interface box, a modem, a printer, and even a 410 cassette recorder. And that's just what's on *top* of my desk.

What goes on *under* the desk is not to be believed—cables, wires, little gray and black power supplies . . . My long-suffering wife suggests a neater hobby: "How about ballroom dancing?" she asks plaintively.

But I just can't bring myself to retire a working computer, especially one for which I have three big boxes of software. "No," I say, "we shall bring order out of chaos."

There are 12 items in this electronic zoo that demand electricity. The obvious solution to this minor problem is a power strip—or three—which leads to my second problem: not every piece of equipment is used every time I power up.

To avoid turning on equipment unnecessarily, the first thing to do is distribute the plugs and power strips in a logical way. Here is the breakdown:

Five plugs are 8-bit-related:
- 1 130XE computer
- 2 1050 disk drives
- 1 850 interface
- 1 410 program recorder

Four plugs are ST-related:
- 1 520 STM computer
- 2 SF354 disk drives
- 1 SM124 monochrome monitor

Three plugs are for shared devices
- 1 Commodore 1754 color monitor
- 1 1200 bps modem
- 1 Star Gemini 10 printer

The color monitor is shared via a Practical Solutions Monitor Master, a device that permits an ST containing an RF modulator to drive a composite display. The display is not quite as clear as that of a dedicated Atari SC1224 RGB monitor, but the monitor does double duty, so I don't complain.

To make things even more practical, the monitor has separate audio/video inputs, front and back, with a small slide switch in the rear that selects which to use. The rear set includes separate inputs for luma and chroma (plus a third for audio). This arrangement can be exploited very effectively by the XE, outfitted with a special cable—so it is connected there. The Monitor Master feeds composite video from the ST into the front jacks, which are set up as a more conventional audio/video pair.

My first impulse was to use two six-outlet power strips. But the above analysis made it clear that a third strip for the shared devices would be well worth the added expense. With three strips, I can turn on either or both systems at will, and the cords run a bit more neatly.

To share the printer, I still have to swap a parallel cable back and forth. I may eventually install an A/B switch to eliminate this inconvenience, but until then I have to deal with the fact that the Gemini 10 (not 10X) has an awkwardly-placed Centronics port—right in the paper path at the rear of the printer—which makes cable swaps difficult.

To solve this problem, I made a short "extender" with about a foot of ribbon cable and a pair of Centronics connectors. I leave this attached to the printer and run it around the side to keep it out of the paper path. When I do get that A/B switch, installing it will simply be a matter of plugging in the three cables already in place. Until then, the extender is easier to reach than the printer port.

Sharing the modem is a little tricker. The ST is my main "terminal," so the modem cable runs from the ST to the modem. This is another ribbon cable and includes an extra male and female connector pair crimped on in the middle. These extra connectors let me plug in the 850 interface without reaching behind the modem or ST to unplug the cable. I can connect the 850 via a null modem plug, so I can pass files between the XE and ST (a null modem plug is just a short extender that swaps the lines running from pins 2 (transmit) and 3 (receive) on the RS-232 interface, making each computer think that it is talking to a modem), or I can attach it directly, so that the XE can use the modem. Having both male and female connectors on the main serial cable is also handy in that it lets me hook up a visiting portable computer without using an adapter or gender changer.

The only catch is that if the ST, the 850, and the modem are all powered up at once, they get confused and refuse to talk to the others. To prevent this, I simply turn off the device that isn't in use. For example, if I want to pass files between the two computers, I leave the modem off and plug in the XE via the null modem adapter.

So, you see, it is possible to to untangle the rat's nest on, under, and around your computer desk. If your system isn't exactly like mine, start by analyzing how and in what combinations you use your hardware. After that, it is just a matter of adding a power strip or two and, perhaps, buying or making a couple of cables.

Now, if I could just find a place for all those 5½" disks . . . ■

By KEVIN MARTIN

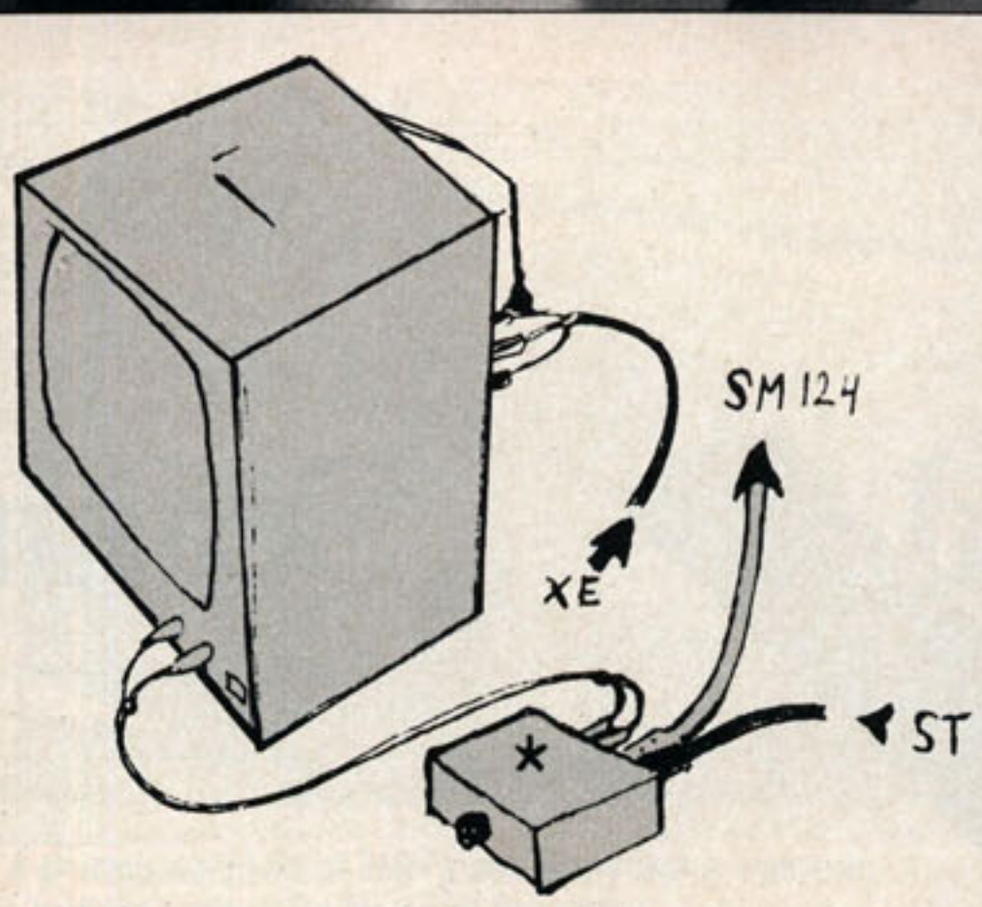


Figure 1. Sharing a Commodore 1754 color composite monitor between an XE and an ST (via the Practical Solutions Monitor Master). Note the use of a three-conductor "octopus" cable with the XE to take advantage of the separate rear-mounted luma and chroma jacks on the 1754. A conventional, two-conductor video cable is used to send the signals from the ST to the front-mounted audio/ video jacks.

Figure 2. Using a composite RS-232 cable to share a modem between an XE (with 850 interface) and an ST. Plugs on either end of the cable are male and female, while auxiliary male and female connectors, wired in series, are crimped onto the middle of the cable. A 9-pin to 25-pin adapter cable is used to make the connection between one of the 850 serial ports and one of the auxiliary connectors. A commercially-available null modem adapter can also be placed at this point, permitting direct communication between the two computers.

Migraph Hand Scanner

A clever new device makes it easy and convenient to add images to your documents

Creating, capturing, and modifying "computer artwork" is now much simpler thanks to a new device from Migraph. The Migraph Hand Scanner is, as the name implies, a small hand-held device that literally allows an image to be scanned into the memory of your ST. Bundled with *Touch-Up*, Migraph's image-editing software (reviewed in the July/August 1989 issue of *Explorer*), the Hand Scanner digitizes images in a choice of four resolutions—100, 200, 300, or 400 dots per inch.

The scanner system includes an ST cartridge interface, a power supply for the scanner, and the scanner itself. Installation is simple. (I'll repeat Migraph's warning: Installation of any cartridge interface should be done when the computer power is off. Failure to do so can damage both the computer and the interface!) In my case, it meant removing my clock card from the cartridge slot on the left side of the ST and inserting the scanner cartridge with the label facing up in its place. The power supply and the scanner plug into the cartridge. I then plugged the power supply into a surge-protected outlet, and when I powered-up my computer, the green indicator light on the scanner flashed once to show that it was connected.

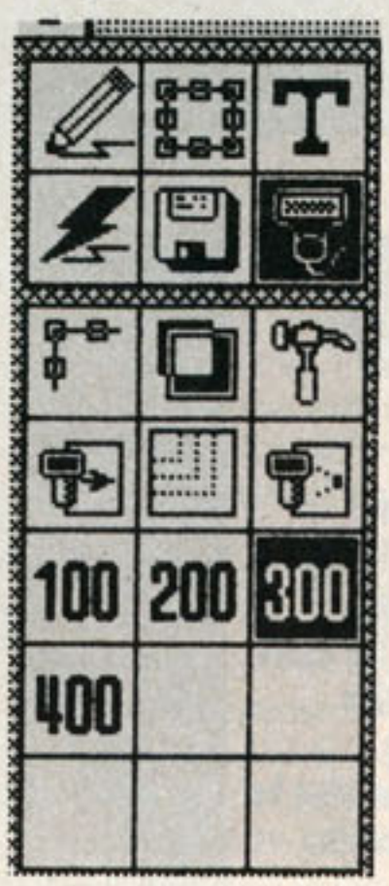


Figure 1. The Touch-Up icon menu has been modified to include the new Migraph Hand Scanner scan mode. Once the scan icon is selected, the icons below it change to correspond to the options available in that mode.

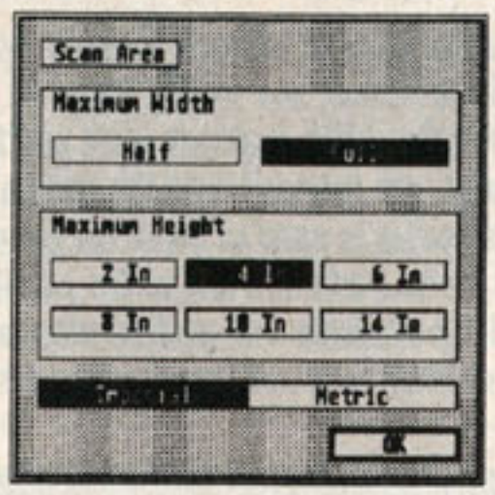


Figure 2. The Scan Area dialog box reveals information about the height and width of the scan.

The *Touch-Up* icon menu has been modified to include a new Hand Scanner scan mode. (See Figure 1.) Once you select the scan icon, the icons below it change to correspond to the options available in that mode. You then set the *Touch-Up* capture resolution to match the scan resolution of the scanner, which is, in turn, set by positioning a switch on the right side of the scanner.

The last bit of setup involves choosing the scan area icon and using the dialog box (shown in Figure 2) to modify the scan height and width if necessary. The Hand Scanner can scan an area up to 4″ wide and up to 14″ long.

A panel on the left side of the scanner provides the setting choices for line drawings or halftones (photographs). Halftones can be scanned at any of three dot-size settings—small, medium, or large. A light/dark contrast control wheel is next to the scanning choice selector.

By PAMELA RICE HAHN

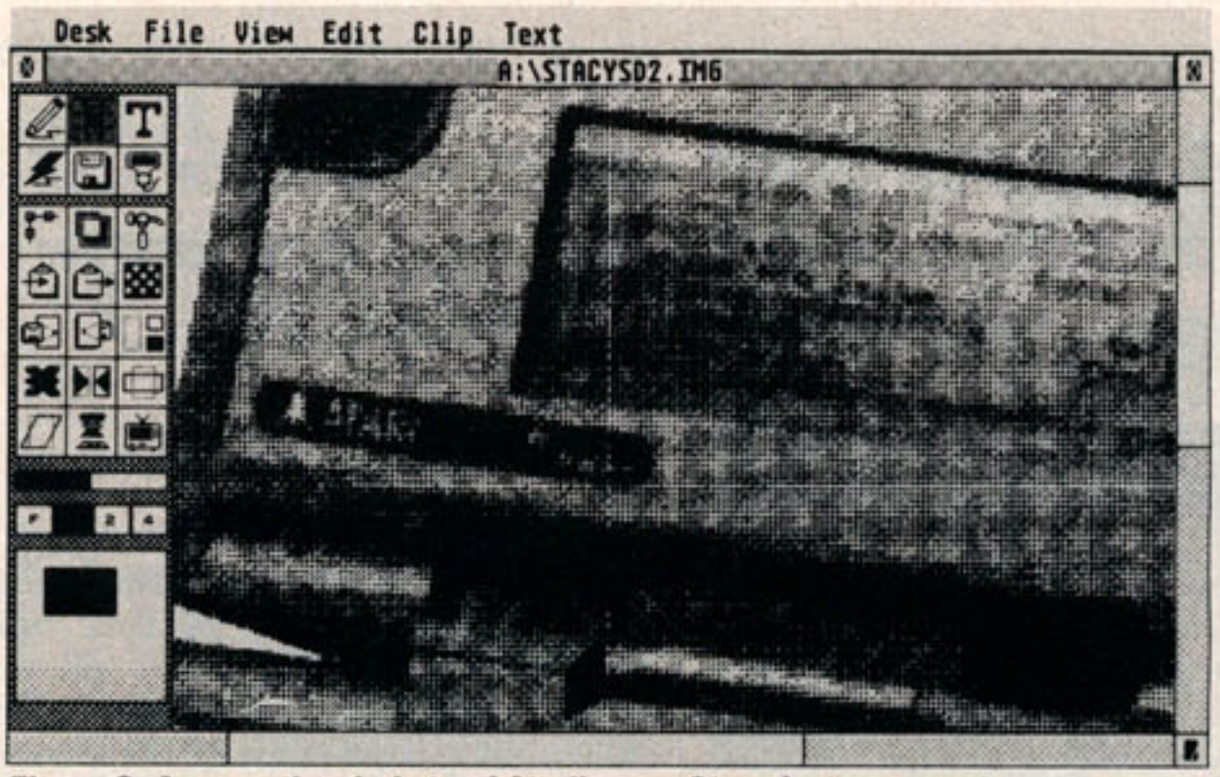


Figure 3. A promotional photo of Atari's new Stacy laptop computer scanned in halftone mode using the Small Dot setting.

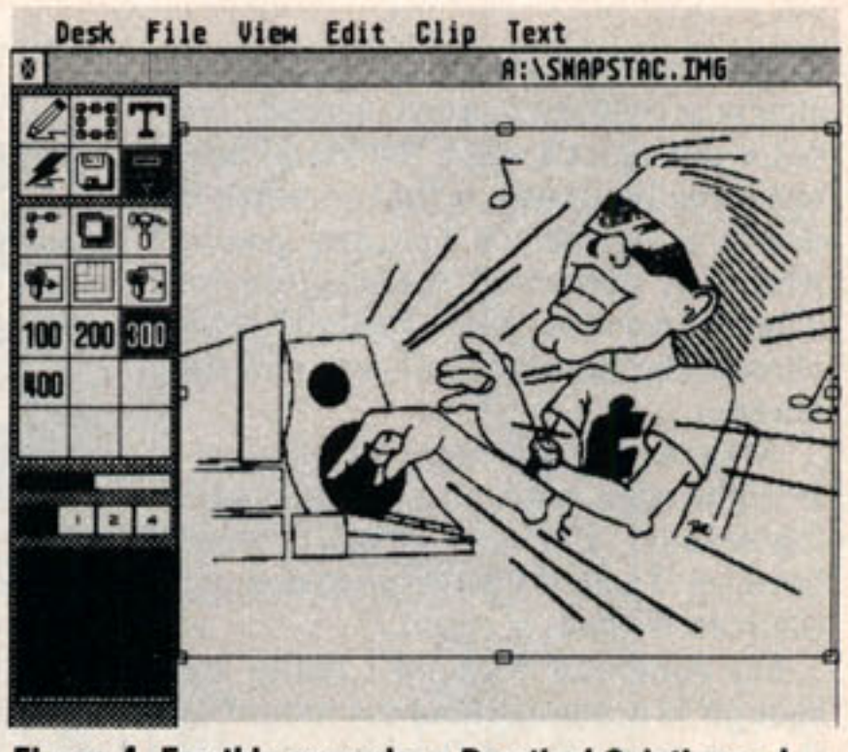


Figure 4. For this example, a Practical Solutions ad was scanned using the Line Drawing setting.

Most line drawings can be optimally scanned by simply leaving the contrast set at the mid-point; halftones require some experimentation with both dot-size and contrast level. I found that halftone images print out much darker on my Hewlett-Packard DeskJet printer than they appear on the screen. Therefore, I now set the contrast as low as I possibly can to capture the halftone image and then capture and save it in all three dot-size resolutions. Once I have printed all three sample images, I choose the best one and then do any necessary cropping or modification of the image in *Touch-Up*. Figure 3 illustrates a halftone scan; Figure 4 shows a line drawing scan.

When a scan is saved in the Clip mode, the name displayed on the image window bar doesn't change to reflect the change. Clip mode is a convenient way to crop out unnecessary portions of a picture, but once I have done a save, I feel more secure knowing the exact name of the image I am modifying. So, after I had saved the image shown in Figure 3, I loaded it back into *Touch-Up*. Then I did a screen snapshot of the screen displaying STACYSD2.IMG—a scan of Atari's Stacy laptop done in Small Dot mode—to illustrate this review.

I now edit the MVACE News, the newsletter for the Miami Valley Atari Computer Enthusiasts, an Ohio Atari user group. I scanned a drawing from a Practical Solutions ad for their Tweety Board stereo sound enhancement device, knowing I would want to use it to illustrate a review of the product in the newsletter. Figure 4 shows that drawing. It also still displays the image name, SNAPSTAC.IMG—the name I gave the *Degas* snapshot after I converted it into an .IMG file in *Touch-Up*. Using the scanner clears the previous image from the screen display, replacing it with the newly-scanned image, but doesn't clear the filename of the previous image.

Capturing the image is accomplished

Migraph Hand Scanner

System: Atari ST

Required equipment: 1Mb RAM

Summary: A convenient, easy-to-use device for capturing and converting artwork

Price: $499; $299 with Touch-Up upgrade

Manufacturer:
Migraph
200 S. 333rd St. (220)
Federal Way, WA 98003
(216) 838-4677
(800) 223-3729

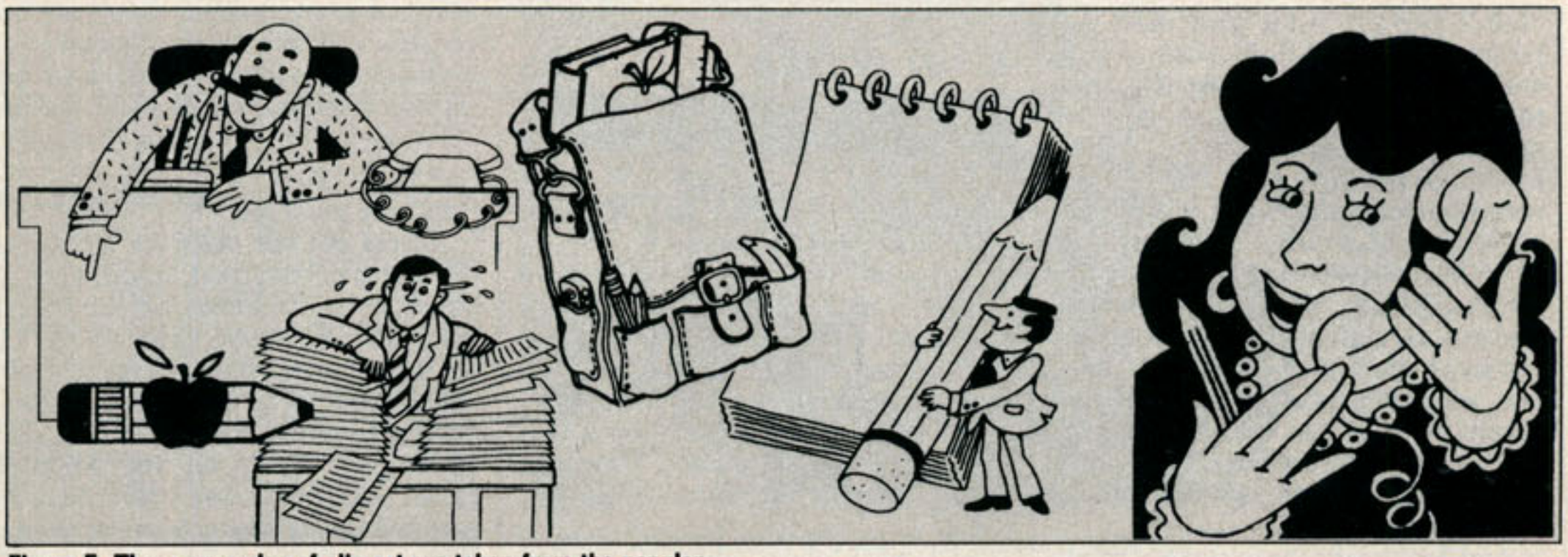


Figure 5. These examples of clip art are taken from the popular Dover series of black-and-white illustrations.

in the time it takes to roll the scanner slowly across the picture. A green indicator dot signals when the Hand Scanner is ready to scan; it flickers when the device is moved too fast and goes off when any portion of the image is lost. The higher the scan resolution you choose, the slower you should move the scanner.

Migraph recommends using a straight edge, such as a book, to guide the scanner. For most smaller images, however, I found I was able to complete the scan without a guide.

My computer desk isn't really wide enough to accommodate my mouse and the scanner. So, I purchased a lap desk—one of those beanbag-style bottom and hard surface top contraptions. I place the beanbag on my lap and secure the page I want to scan with peelable labels—the kind you can remove with less-than-industrial-strength solvents. That way I can leave the mouse in its normal place on my desk.

The Hand Scanner is real boon for ST desktop publishers. Those who can draw will find it easier to scan a pen and ink drawing than to render the same image on the computer screen using a paint program or graphics tablet. Those who are less artistically inclined can scan public domain clip art illustrations for their documents.

***Those who can draw** will find it easier to scan a pen and ink drawing than to render the same image on the computer screen using a paint program or graphics tablet.*

Most libraries have volumes of public domain illustrations, and for very little money, you can start a clip art library of your own. Figure 5 shows some examples of clip art from the popular Dover series of black-and-white illustrations. Available from Dover Publications, Inc., 31 East 2nd St., Mineola, NY 11501, these 64-page books sell for $3.95. A complete Dover pictorial archive catalog is available from the company upon request.

Whether you are a regular desktop publishing program user or need a way to move your artwork from paper to computer-compatible format for modification within an art or animation program, you need Migraph's Hand Scanner. I know this newsletter editor does! ■

Keeping Out Of Court

Artwork, like books, magazines, and computer software often carries a copyright, which means that whoever owns the copyright on the image owns the right to use, or say who uses, that picture. The rules are the same as those that apply to text and program code, but because pictures are often small or cute or, in the case of trademarks, ubiquitous, desktop publishers and others sometimes fail to seek the required permission before reprinting them.

Some uses of artwork are said to be "fair." The use of an illustration in a review of a product, for example, is in an entirely different realm, legally, from the use of that same image to add pizzazz to your company brochure, which is why the pages of *Atari Explorer* are not peppered with ® and ™ symbols, while many of the ads you read here are.

We are entitled to use the word *Atari*, for example, as often as necessary to convey information about the company and its products to our readers. If, however, we were to take advantage of your familiarity with that name to try to sell you one of our own products, we would have to acknowledge ownership of the trademark.

And don't make the mistake of thinking that just because you found a picture of Snoopy or Superman on some "public domain" disk in your local user group's libary you won't be hearing from the lawyers who represent United Features Syndicate or DC Comics (some of whom get paid handsomely to do nothing but scan publications for infringements) two days after your publication hits the streets.

Cartoons are another form of artwork that suffers frequent abuse. How many Far Side cartoons have you seen in user group newsletters? How many of those editors do you think received permission (probably for a fee) from the copyright holder, Universal Press Syndicate, to reprint those cartoons?

And what about *Atari Explorer*? Have you ever seen one of our cartoons reprinted in a newsletter? We have. If those editors had asked us for permission to use those cartoons, we would have referred them to the cartoonists from whom we purchased only *one-time* rights. The cartoonists would then have agreed to let the editors use the cartoon for a very small fee.

***Don't let the Migraph Hand Scanner** or any other piece of hardware or software turn you into a picture pirate.*

This is not the place for a detailed discussion of copyright, trademarks, licenses, or related topics. Let it suffice to say, "when in doubt, check it out." If you can't pin down the source of a cartoon, article, or program and get permission to use it, don't print it in your publication. Don't let the Migraph Hand Scanner or any other piece of hardware or software turn you into a picture pirate. ■

Touch-Up Update

Coupled with the introduction of the Migraph Hand Scanner is the release of an upgraded version of *Touch-Up*, which boasts new and enhanced features that make it even better than the original.

As you may recall, *Touch-Up* is a GEM-based virtual-page image creation and editing program. In other words, the program provides the means for creating images that are not limited to the screen display area. This flexibility makes it possible to optimize the number of pixels per image to correspond to the maximum output of your printer.

Touch-Up can also display (load) and save images in a wide variety of formats, even those commonly used on other computer systems such as the IBM .PCX and Apple *MacPaint* formats. For my example I chose to load the commercial .PCX format image from Stephens & Associates shown in Figure 6. Using *Touch-Up*, I was able to resize the image and convert it to a format that was both compatible with the DTP program I was using and able to take advantage of the 300 dpi capabilities of my printer.

The format versatility offered by *Touch-Up* opens up an entire new arena of clip art selections for the ST user. In addition to the popular ST-format files, most bulletin boards and user group libraries contain countless public domain clip art images in formats used by other computer systems.

Hard Drive Caching

When I did my original review of *Touch-Up*, I was working with a 1Mb 520 ST. Since that time, I have purchased an EasyRam II upgrade, which gives me 2.5Mb of memory.

My newsletter duties include using and evaluating desktop publishing (DTP) programs, which are notorious memory hogs. But I don't need the addi-

By PAMELA RICE HAHN

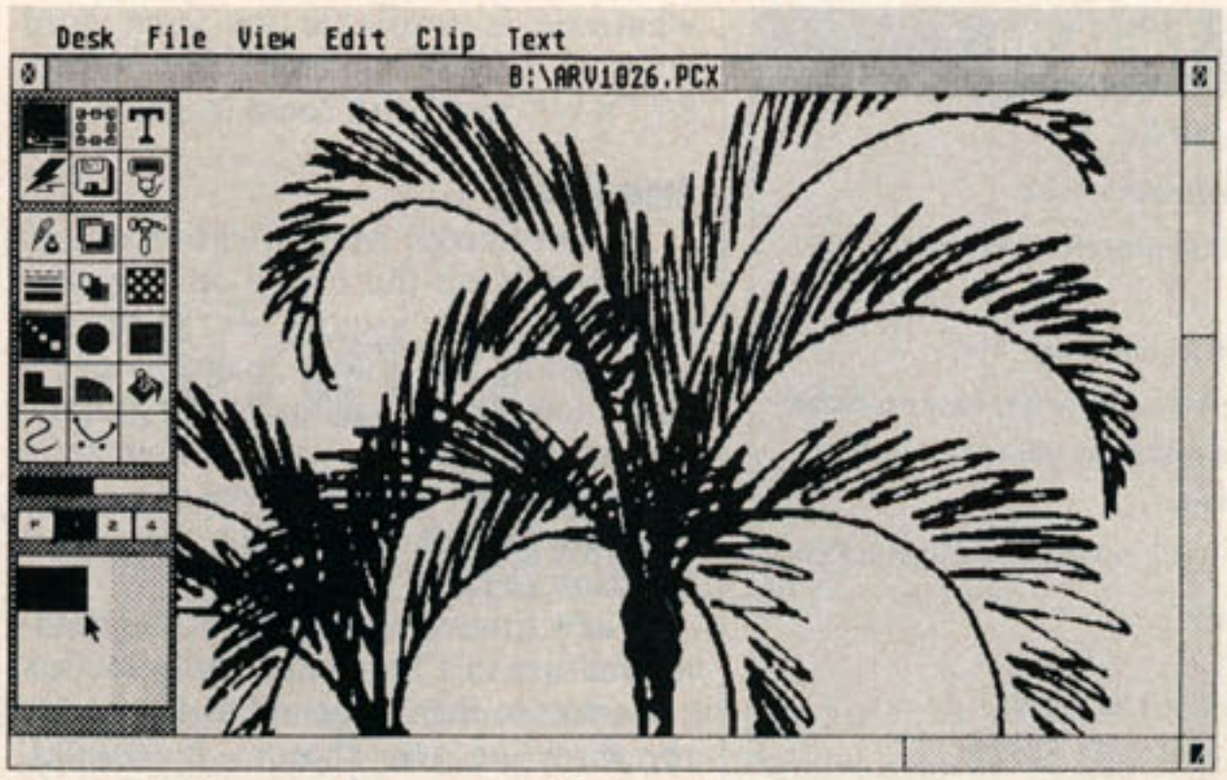


Figure 6. IBM's .PCX format is one of the many computer graphics formats that can be saved and modified within Touch-Up.

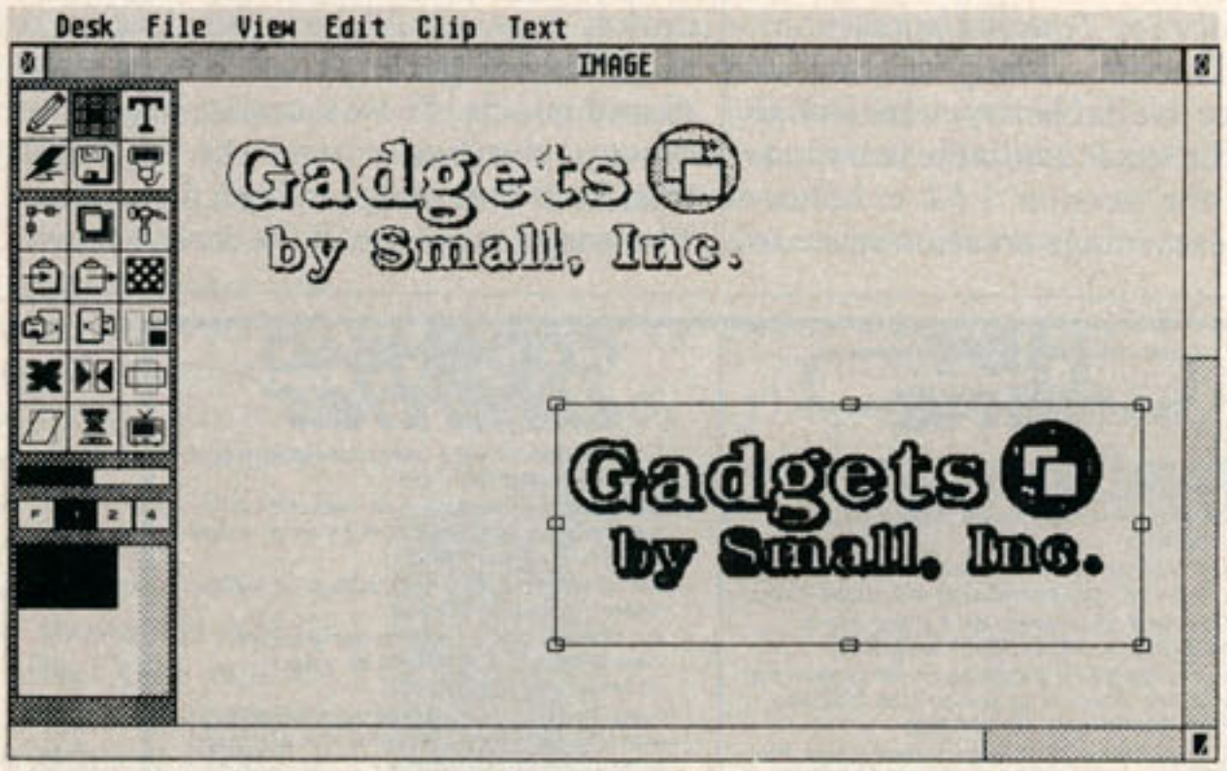


Figure 7. The Bolding feature in Clip mode adds dots to the image in the clip box in the direction you choose—horizontal, vertical, or both.

Figure 8. Lightning mode now has an On-Screen Locator for repositioning an image.

Touch-Up

System: Atari ST

Version reviewed: 1.52

Required equipment: 1Mb RAM; 720K drive

Copy protection: None

Summary: This powerful, feature-laden bug-free graphics utility has gotten even better

Price: $179.95; upgrade, $20 plus PSK

Manufacturer:
Migraph
200 S. 333rd St. (220)
Federal Way, WA 98003
(216) 838-4677
(800) 223-3729

tional memory for *Touch-Up* anymore. The original version of the program limited the space available to you for image creation to the space available in memory. One of the version 1.52 enhancements increases image creation space to whatever is available on your hard drive. A 1040 ST can now hold a 300 dpi 8½″×11″ page with room to spare.

Other Goodies

An On-Screen Magnification option now speeds up the image editing process. Because it usually isn't necessary to magnify the entire image to get a closer look at the portion of the graphic you are working on, you can now get a 2X magnification of the area surrounding your cursor simply by pressing a function key.

A new time-saving option is the Bolding feature in Clip mode. This selection adds dots to the image in the clip box in the direction you choose—horizontal, vertical, or both. The company logo in Figure 7 was scanned from a photocopy of a Gadgets by Small ad. Setting the scanner light/dark contrast selector to a darker scan would have resulted in a muddier image with too many misplaced pixels. It was easier simply to draw a clip box around the logo and then Bold that image in both directions. The image at the top of the screen shows

The format versatility offered by Touch-Up opens up an entire new arena of clip art selections for the ST user.

the logo as scanned; below it you can see the same logo after Bolding. This process completed filling out the letters much quicker than I could have done by going to Lightning mode and manually adding dot-by-tiny-dot.

Not that Lightning mode is without its merits. I use it often, preferring to erase unwanted areas or experiment with changes in that setting, secure in the knowledge that I can Undo any alterations I don't like. In the initial *Touch-Up* release, Lightning mode could be used only on the portion of the image displayed on the screen at the time the mode was entered. This meant that you had to exit Lightning mode, reposition the image, and then re-enter Lightning mode to move from one part of your image to another. An On-Screen Locator, shown in Figure 8, now allows you to do this repositioning from within Lightning mode—a real time-saver and a much-used option.

Another Clip mode feature is the Rotation by Degree option, an enhancement that permits an image within a Clip box to be rotated by degree increments, selectable up to 1/10 of a degree.

Dong, Dong, Dongle Goodbye

That's right. Migraph has completely done away with copy protection on *Touch-Up*. The initial release required a Program Security Key (PSK), or "dongle," and purchasers of the earlier version can now receive a $15 credit when they return the PSK after upgrading to the new program version.

onclusions

I ended my initial review of this program by asserting that all ST desktop publishers need *Touch-Up*. I can't think of a stronger recommendation for ending this update: If you use your ST for desktop publishing, you *NEED Touch-Up*. ■

HOTWIRE
- **Run any ST program simply by pressing a "hot" key...from the ST desktop!**
- No more wading through folders to run programs.
- Up to 54 programs, documents, or configuration files may be installed in a single menu.
- Load and Save complete menus, with a keypress or with the GEM file selector
- Run a program by clicking on its name in the HotWire menu, or by pressing its "hot" key from the Menu or the desktop!
- Call up the HotWire Menu instantly from the GEM desktop with the keyboard or the mouse!
- Unique "work file" features make HotWire an excellent shell for developers.
- HotWire will change the way you use your ST!

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- **CodeCopy:** a fast disk copying program, designed for making multiple copies.
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- Tested with **hundreds** of standard ST desk accessories!
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G+plus
- **The powerful and complete replacement for Atari GDOS!**
- Join the ranks of users who are free of GDOS slowdown.
- Change fonts and device drivers for GDOS programs...**without rebooting!**
- Automatically load the correct ASSIGN files for each program you use.
- Special "solid" line mode actually speeds up all line drawing by about 25%!

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CodeHead Software
P.O. Box 74090
Los Angeles, CA 90004

Fontz

Create your own GDOS fonts

Fontz

System: Atari ST

Copy protection: None

Summary: A versatile GDOS font editor

Price: $34.95

Manufacturer:
Neocept
547 Constitution #A
Camarillo, CA 93010
(805) 482-4446
(805) 482-0313

Font editors—8-bitters call them character set editors—have always been popular with Atari users. Now, however, with the advent of desktop publishing, these creativity tools can offer a level of sophistication and utility previously available only on very high-end typography systems.

Fontz is a font editor designed for use with GDOS and GEM.

Using the Program

With a font file loaded, *Fontz* displays the font in a horizontally scrollable window at the top of the screen. A larger horizontally and vertically scrollable window below the font display shows the character to be edited on a grid called the *character cell*.

At the top of the edit window is a status display, which shows the ASCII character number, offset (the equivalent of the kerning adjustment of the character), and the width and height of the character cell in pixels.

All of these options and commands can be accessed via either mouse or keyboard.

The basic functions available in *Fontz* are creating, converting, scaling, and editing fonts. The easiest way to create a font is to start with either a font similar to the one you want to create or the sample font provided for this purpose.

After the base font is loaded, the parameters, including name, line placement, point size, and ASCII character range, for the new font are set. New characters are created either by drawing them in the character cell or by copying them from another font file. If you want to modify or add only a few characters in the font, you need not copy the entire font.

Conversely, if the new font file contains more characters than you need, you can enter a narrower range of characters in the Change Hi/Lo Characters dialog box, and the superfluous characters will be eliminated.

Along with the ability to copy entire characters, *Fontz* offers several block editing commands, which allow you to paste or merge sections of other characters into the character cell.

If you decide to create a new character from scratch, you will appreciate the commands found in the Draw menu, which allow you to draw lines, boxes, filled boxes, two-point circles, three-point circles, three-point arcs, two-point disks, three-point disks, and three-point pie slices.

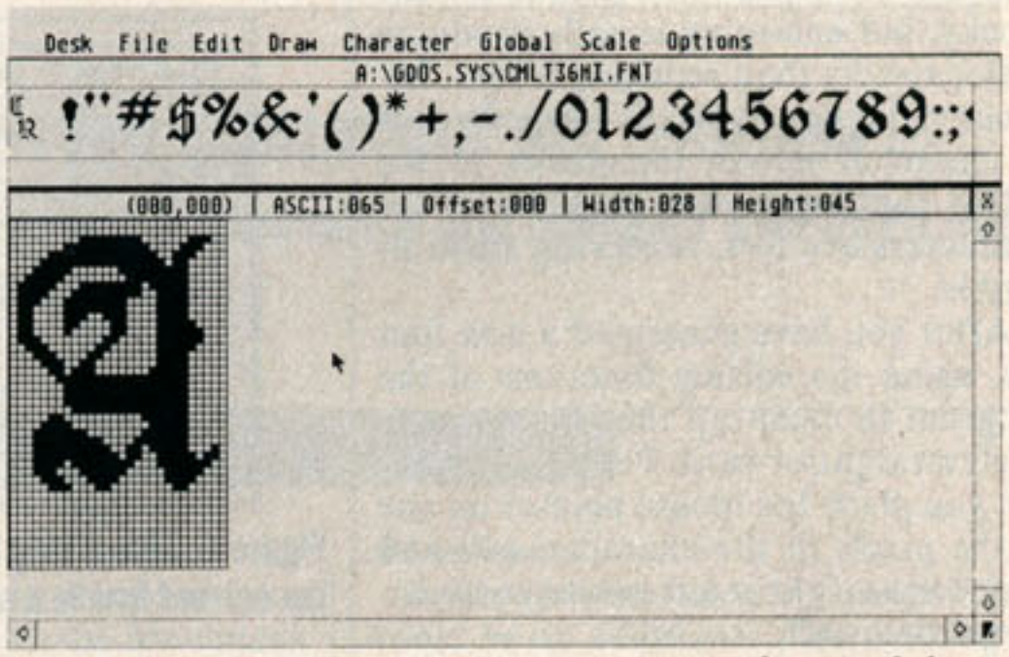


Figure 1. A typical screen display. A font has just been loaded.

As an alternative to creating a new font from scratch, *Fontz* can generate new GEM fonts by converting Hippo, *Degas*, Amiga, and Macintosh fonts to the GEM format.

Font conversion is almost automatic. All you have to do is check the information in the Font Name/ID/Pointsize di-

By GARRY JONES

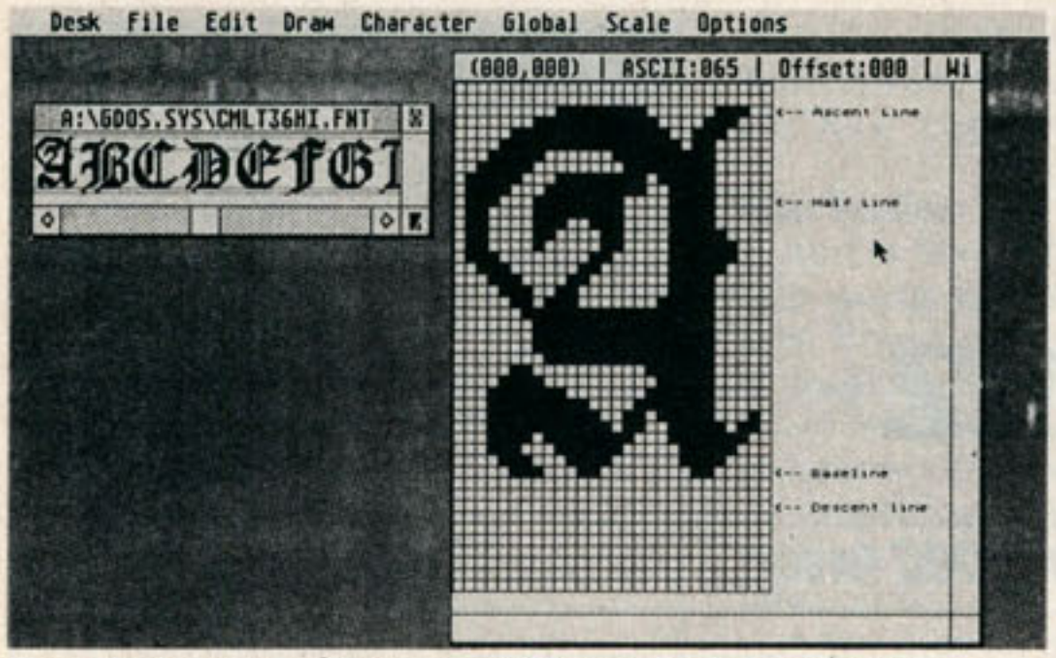


Figure 2. A typical editing screen. The small window displays as much of the entire font as possible, and the large window is used for editing.

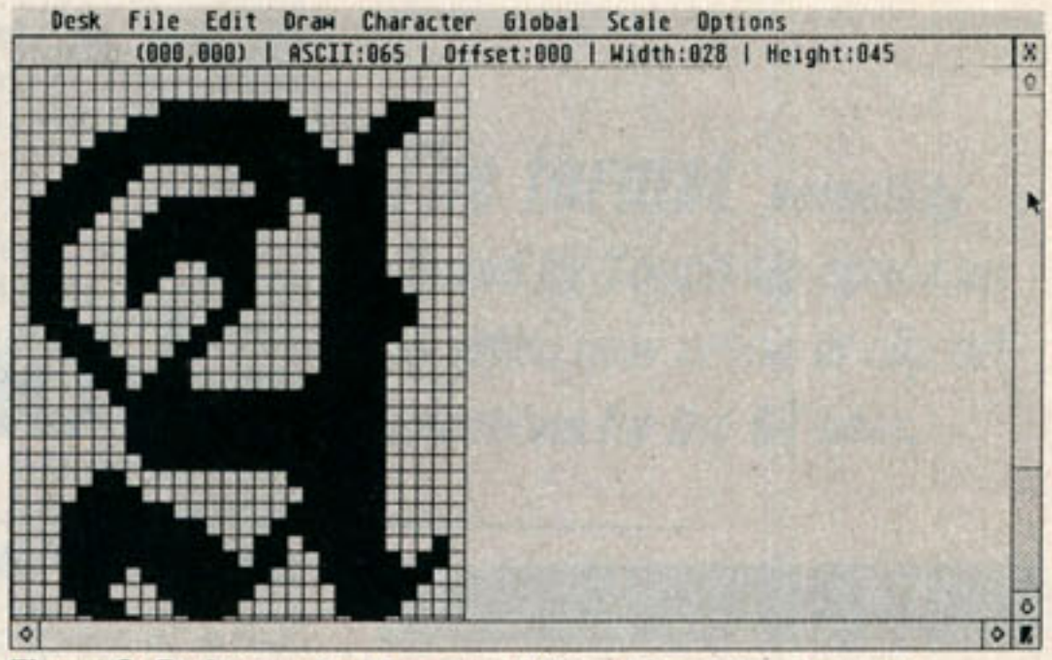


Figure 3. By increasing the size of the grid and the size of the window, you can zoom in on the character and make small changes.

alog box and alter anything that needs to be changed, then set the conversion parameters in the Font Conversion Options dialog box. Saving the file finishes the conversion.

Fontz also makes it relatively easy to scale a font to a different point size or for a different output device (high-, medium-, or low-resolution display or printer). Enlarged fonts tend to appear blocky, but enlarging usually produces better results than reducing a font, because reduction typically causes a loss of character detail, sometimes to the extent that significant portions of the characters are lost, rendering them illegible.

After you have generated a new font file, using the editing functions of the program to clean up the characters is fairly straightforward. To edit a character, you place the mouse pointer on one of the pixels in the character cell and click on the right or left mouse button to turn it on or off.

The Character menu offers commands to clear, fill, or reverse the colors in the character cell. The character can also be flipped horizontally or vertically; shifted up, down, left or right; and rotated clockwise or counterclockwise in 90° increments.

Even though this wealth of commands makes it relatively easy to edit fonts, do not assume that the work can be done quickly. Creating attractive, professional-looking fonts takes a great deal of time and effort, and there is probably no way to speed the process; pixel-by-pixel editing is still very much hand work.

Bug Hunt

After editing a few fonts with *Fontz*, I tested them in both *WordUp* and Microsoft Write. I ran into a couple of problems, one caused by a bug in the program; the other by what I'll call a "programmer's oversight."

The bug allows you to place the descent line of a character—the line that determines how far below the baseline the descenders of characters can fall—below the character cell. For example, a

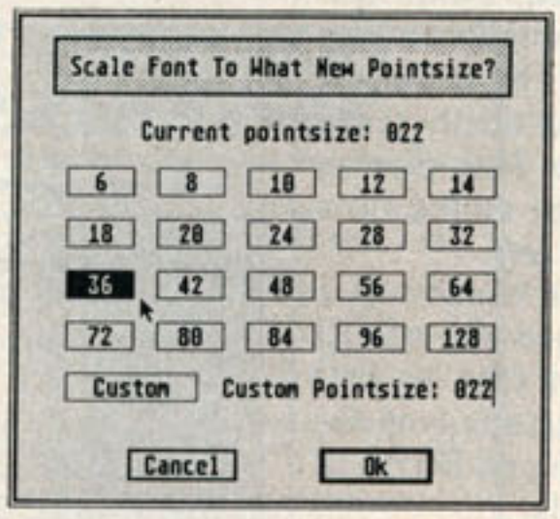


Figure 4. This dialog box allows you to scale the current font to a new size.

12-point high-resolution font will typically be displayed in a character cell 15 pixels high. When the font lines are placed, the descent line should be no lower than the bottom line of pixels in the cell. But *Fontz* will allow you place the descent line a line below the character cell, where no pixel can or should go.

This bug is significant, because GDOS has the ability to double the size of a font as a means of providing multiple character sizes without having to consume memory with extra font files. When a font with a misplaced descent line is loaded into a program, such as *Write*, which supports this GDOS function, the dangling descent line tricks GDOS into recognizing the font as twice its actual size (a 10-point font becomes a 20-point font, for example).

In a program such as *WordUp*, which doesn't support the GDOS font size doubling capability, characters in a font with a dangling descent line are displayed in their correct size but appear to be double spaced. As a result, printouts of *WordUp* and *Write* end up a mess.

To appreciate the "programmer's oversight," you must understand that the GEM font specification includes a table for character offset or *kerning* information. This table, according to the manual, "contains an entry for each character in the font which specifies how many pixel spaces to add to the character position before actually printing the character." A flag stored in each GEM font indicates whether or not the offset table is to be used in calculating the printing position for each character. *Fontz* includes a command to set this flag.

The "programmer's oversight" in *Fontz* allows you to save a font with the offset table enabled even though all character offsets have a zero value. While this has no effect on Microsoft *Write*, which apparently ignores the offset table, it causes *WordUp* to overlap all the characters when printing out a document, creating a hideous mess.

The manual contains no warning about this possibility. I think the program should check for fonts being saved with all character offsets equal to zero and the offset table enabled and should display a warning message.

Documentation

The *Fontz* package includes an 86-page perfect-bound manual, complete with table of contents and index. It is divided into three chapters with a preface and an appendix. The only really important information in the preface is

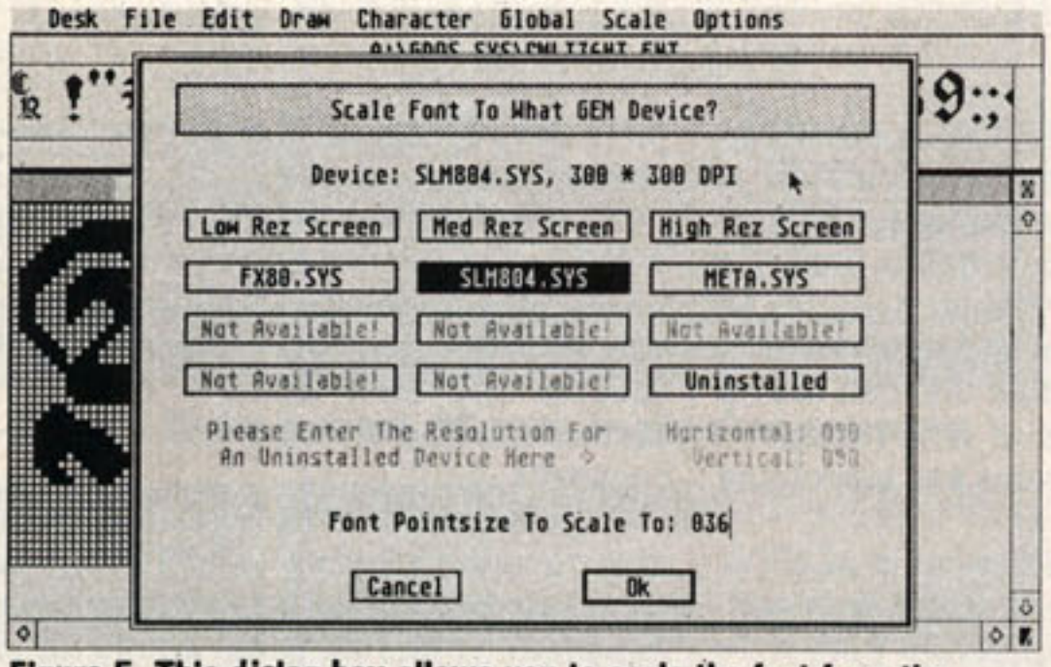


Figure 5. This dialog box allows you to scale the font from the resolution used by one device to the resolution used by another.

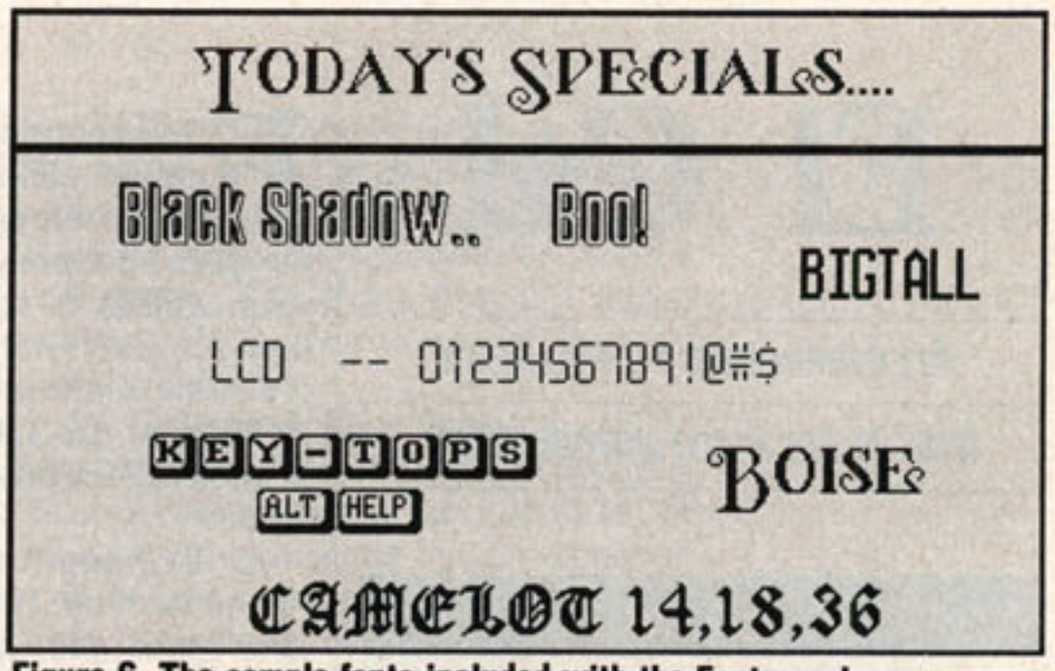


Figure 6. The sample fonts included with the Fontz package.

that after 60 days, technical support is available by phone during limited hours for $25 a year.

Chapter One provides an overview of the program and an explanation of key typographic terms. It also offers an introduction to GEM and GDOS and instructions for installing *Fontz* on a hard disk.

Chapter Two presents the program in more detail, with a menu-by-menu description of every command, operation, dialog box, alert box, and error message. This section is quite thorough, making it easy to understand the workings of *Fontz*, particularly if you experiment with the sample font, while following along in the manual.

Chapter Three discusses applications for *Fontz*, such as converting fonts, creating new fonts, and creating logos.

Finally, the appendix contains information on using fonts, creating ASSIGN.SYS files, and the GEM font definition. Unfortunately, there is no discussion of the GEMSYS folder, which contains the GEM fonts themselves.

Negative Notes

While *Fontz* is a powerful and well thought out tool for converting, editing, and creating GEM fonts, it does have a few limitations, which should be addressed in future revisions.

The first problems which should be corrected are the descent line bug and the "programmer's oversight."

Following that, the author should consider several limitations that affect the usefulness of *Fontz* in converting Macintosh fonts to GEM fonts. While the *Fontz* conversion routines work flawlessly, Macintosh fonts must be stored in individual files before they can be loaded into *Fontz*.

This is contrary to standard Macintosh practice, which allows several point sizes of the same type style to be stored together. Nor does *Fontz* provide any way to separate these Macintosh font groups into individual files for conversion. As a result, if you want to convert Macintosh fonts for use on the ST, you must either have access to a Macintosh computer or a Macintosh emulator for the ST, so you can split the Mac fonts into individual files with the Macintosh font mover utility.

Fontz has a rich command set accessible via both mouse and keyboard commands and operates with more than acceptable speed.

In addition, most *Fontz* users would probably appreciate the inclusion of utilities to uncompress Macintosh .PIT and .SIT files (the Macintosh equivalent of .ARC files) and separate bundled Macintosh fonts into single files. This would make it much easier for *Fontz* owners to take advantage of the numerous Macintosh fonts available in the public domain.

While the *Fontz* command set allows you to enter values for Boldface Factor, Underline Size, Light Text Mask (for lightened text), and Skewed Text Mask (for italicized text), all values must be entered in hexadecimal notation, and there is no preview mode for these effects. *Fontz* automatically enters a set of default values, but if the program supported decimal entry of these values and provided a preview display, it would be much easier to tailor these effects to match a particular type style.

The manual could also be improved with the addition of a discussion of the range of acceptable values for these text effects and the inclusion of illustrations to show the corresponding appearance of the font.

Printout functions for printer fonts would be an additional plus, making it possible for you to examine special effects and character kerning. With the inclusion of filenames, font names, point sizes, I.D. numbers, printer types, and resolutions, font data sheets and sample books could be easily created.

In conclusion, *Fontz* is a well-done, nearly bug-free program. It has a rich command set accessible via both mouse and keyboard commands and operates with more than acceptable speed. The font conversion functions provided with the program are a real plus and work perfectly, the only limitation being a lack of utilities to ease the importation of Macintosh fonts.

Overall, *Fontz* is an excellent value. For anyone who uses software that supports GDOS and multiple fonts, *Fontz* is very nearly essential. ■

El_Cal

An elementary calculator that is far from elementary

El_Cal

System: Atari ST

Version reviewed: 1.10

Copy protection: None

Summary: Elementary calculator with lots of sophisticated extras

Price: $44

Manufacturer:
Debonair Software
P.O. Box 521156
Salt Lake City, UT 84152

Even though *El_Cal* is described as an elementary calculator, it bears no resemblance to the simple desk accessory calculators that are so prevalent in the public domain. In fact, *El_Cal* is not an accessory at all; it is a stand-alone module that can use up to 330K of the 350K of RAM reserved in a 520ST for programs and associated data.

El_Cal requires a minimum of 270K just to start up. It then checks for available space and intelligently puts it to good use. It may decide to disable certain options, such as the on-line help function or screen buffering—used to speed up the drawing of the main panel by storing its image in memory—which by itself occupies 28K of RAM.

Once the program is up and running, memory allocation is entirely user-configurable. You can give up the help function in favor of screen buffering. Or you might decide to give up both to allow room for large data sets. You can increase or decrease the size of the buffers.

To validate the original files on the *El_Cal* disk, Debonair Software has provided a diagnostic program, which determines whether *El_Cal* or its associated data files have become corrupted.

The only phone support for the program is provided by the author, via CompuServe: 70611,2552 or Genie: J.Wrotniak. The cost of one update, within nine months of purchase, is included in the price of *El_Cal*. Additional updates cost $5.

Documentation consists of extensive on-line help and a 60-page user manual.

El_Cal offers not only the functions you would expect to find on an electronic calculator, but the following sophisticated capabilities: hyperbolic and Euler functions; statistical distribution functions; numerical integration, differentiation, and equation solving; real roots of linear, square, and cubic equations; minimization and maximization of functions of up to nine arguments; one- or two-dimensional buffers for statistical data; polynomial regression to the 6th degree. It will also perform statistical processing of the buffered data, computing mean and standard deviation, linear regression and correlation coefficients with histogram, scatter-plot, and regression line graphic capabilities.

In addition, you can fit a histogram with any user-defined distribution; fit a series of x-y points with almost any user-defined function; and use least squares and least absolute deviation methods to find up to nine function parameters.

El_Cal has the same built-in elementary function plotting capabilities you would expect to find on an elementary calculator. The Plot panel allows rapid access to all 20 expression lines, any and all of which can be plotted together in a single frame.

Plotting to a printer is not directly supported, but can be accomplished by pressing the Alternate-Help key combination. Plots are usually drawn in a small window in the main screen, but a full-screen plotting mode is also provided, and the screen image can be saved to a disk file for a touch-up with a paint program.

El_Cal also boasts an arithmetic expression parser, which performs a computation only after an entire expression has been entered. Expressions are entered on a long, LCD-like display line either by clicking on the digit and operator buttons or directly from the keyboard. A Variables panel provides room for displaying ten variables, and three Function panels—Standard, Statistical, and Defined—are stacked at the far left side of the Main panel. The Defined Function panel allows you to define, modify, delete, and insert user-defined functions into expressions.

A July update of the program includes linear algebra, operations on vectors and square matrices, and the ability to solve systems of up to 10 linear equations.

Of course, some functions are not supported, including calculations on complex numbers; symbolic algebra; plotting of 2-, 3-, and n-dimensional surfaces; loops and conditional branching; teaching calculus or numerical analysis; and solving sets of non-linear equations. Nor can *El_Cal* manage your home security system or brew your morning coffee . . . disgraceful!

One of the advantages of *El_Cal* over traditional calculators is that *El_Cal* continues to display the expression after the result is computed, so it can be mod-

By FRANK EVA

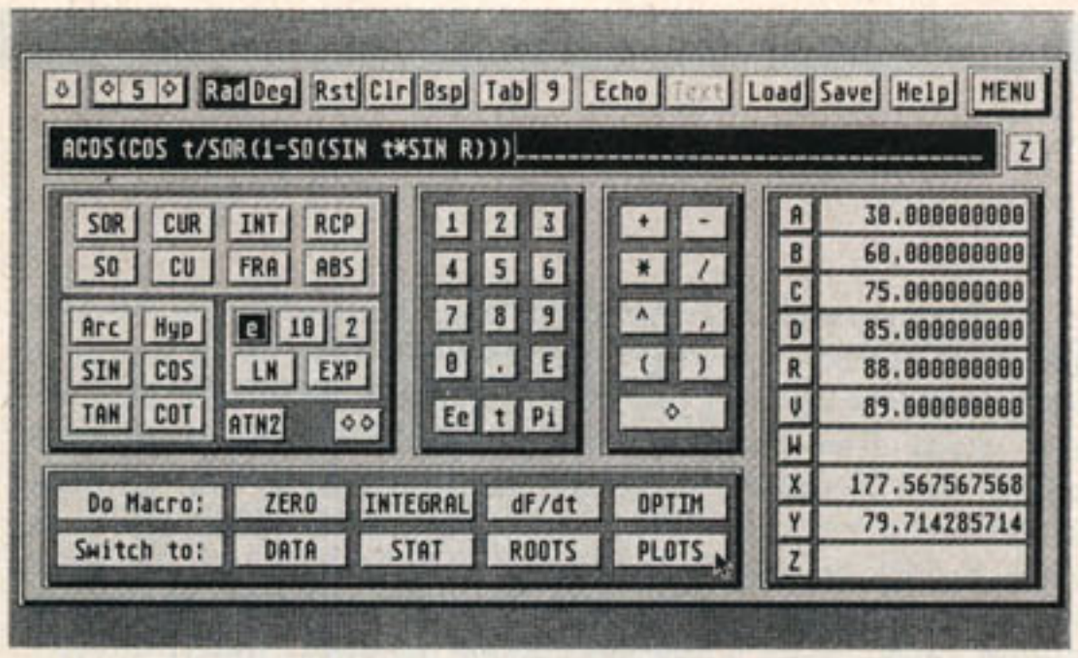


Figure 1. The main screen. Advanced functions remain inactive.

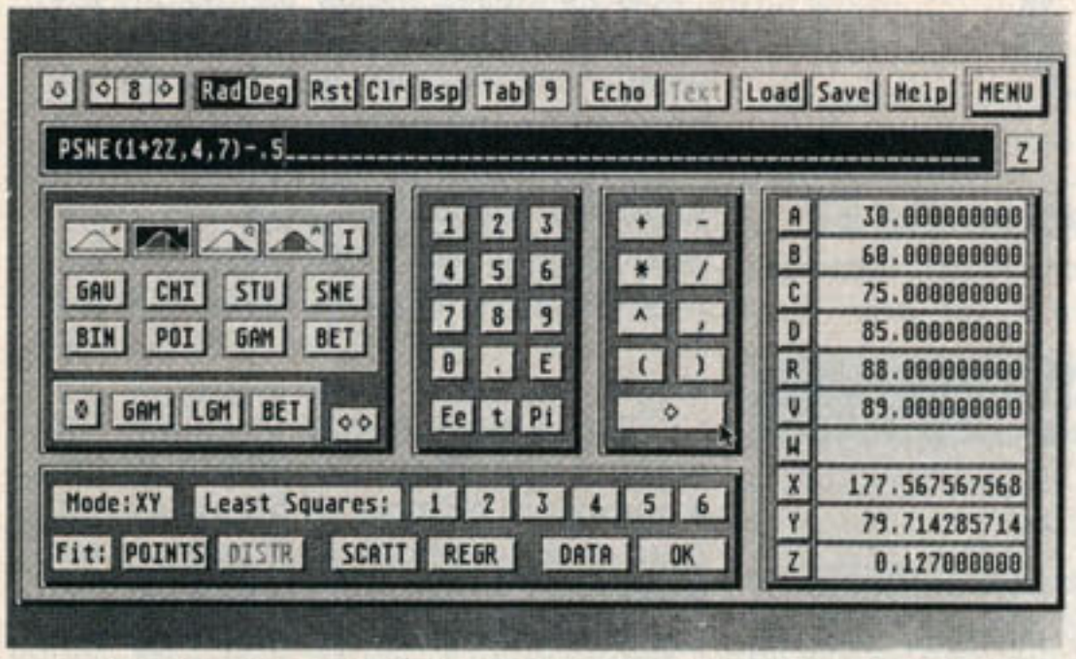


Figure 2. Statistical distribution functions are accessible at the left, and the panel grouping statistical operations appears at the bottom of the screen.

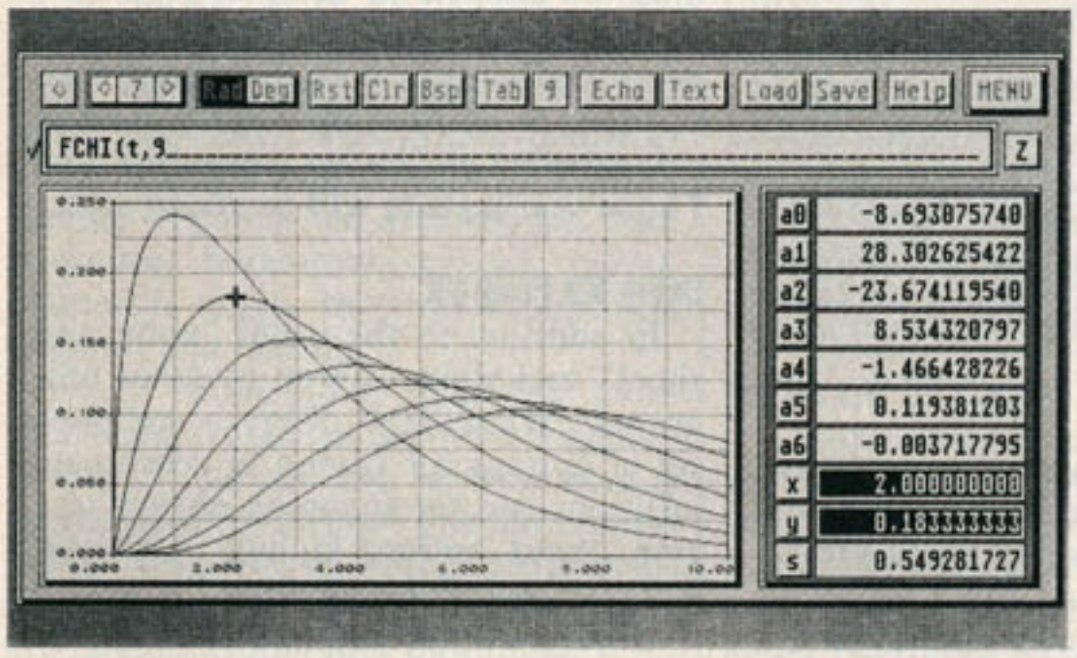


Figure 3. An example of the "quick and dirty" plotting option available in El_Cal.

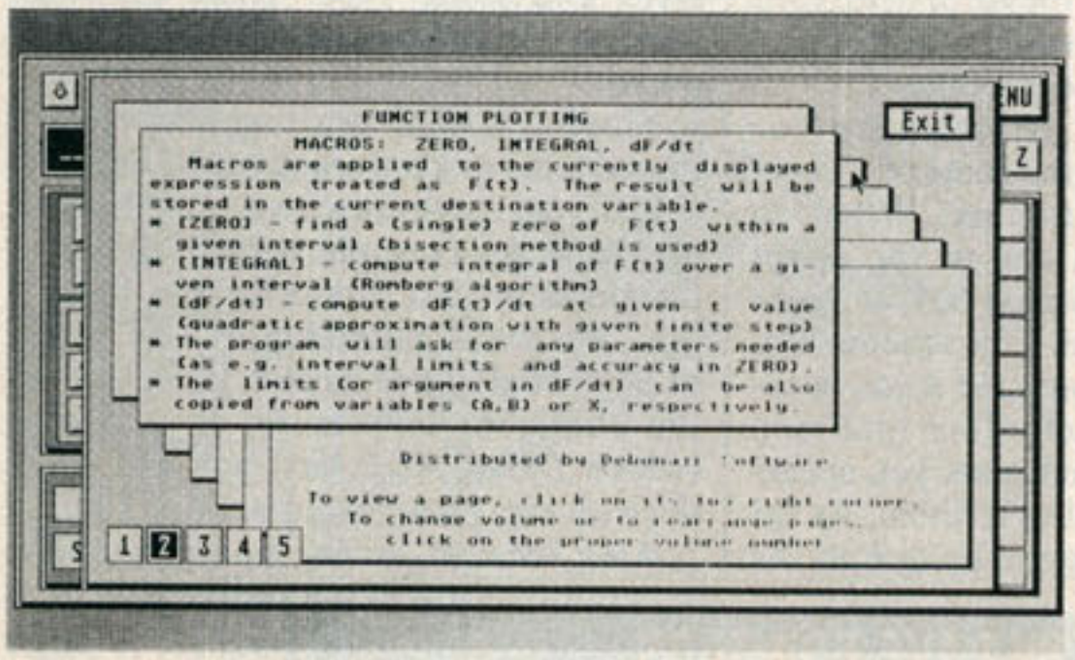


Figure 5. A page from the on-line manual.

ified after the fact. Text is inserted at the cursor, using the Backspace, Delete, and arrow keys. Variable values are always stored in full precision or 16 decimal digits. The Print function allows echoing of all operations and their results to a printer.

El_Cal makes good use of the GEM user interface. The Main panel occupies an entire screen and offers access to 200 objects, either directly or via submenus.

You can store up to 20 expression lines, switching from one to another with the click of the mouse button. All expression lines can be stored to or read from a disk file. If the auto-scroll function is enabled, computing an expression automatically causes stepping to the next expression line, a feature that can be used to chain expression lines into mini-programs for fast, repetitive execution.

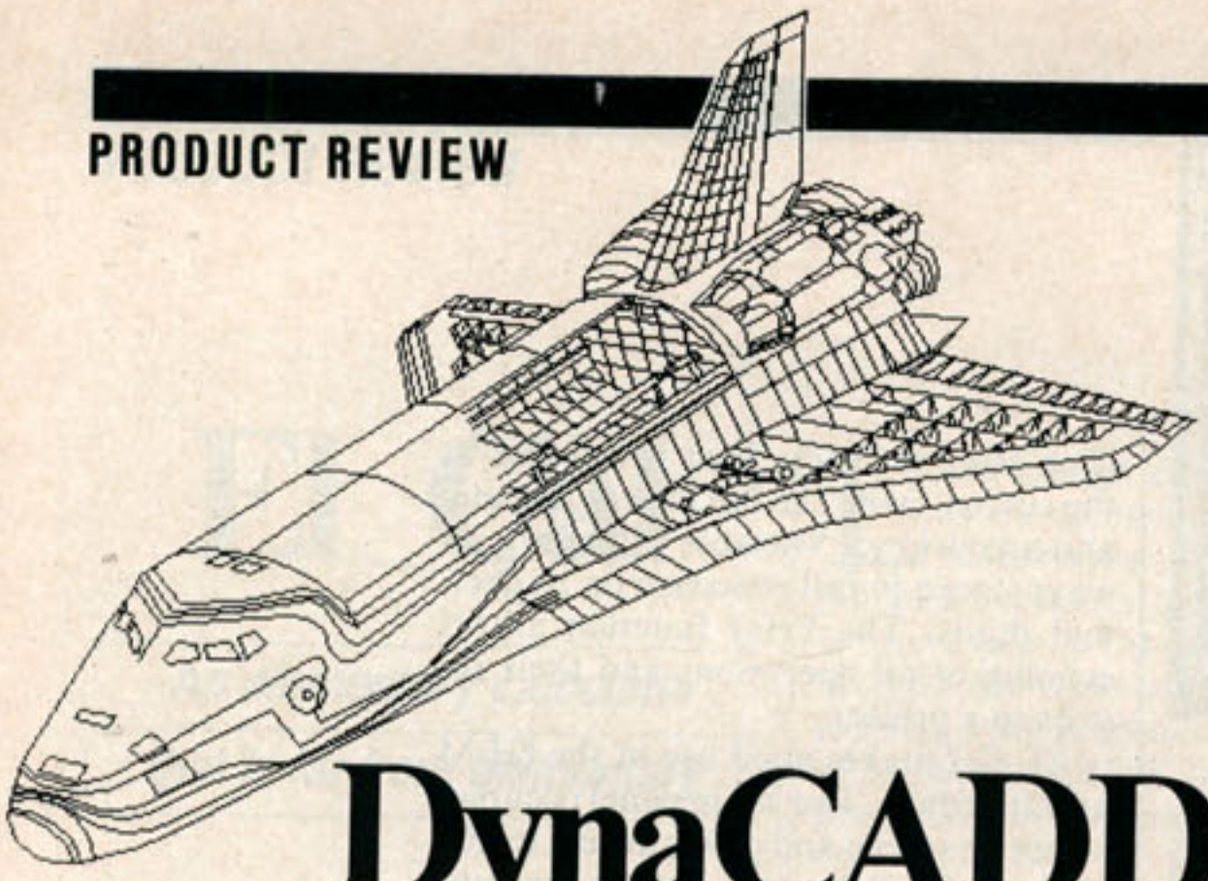
The choice of statistical distribution functions offered by *El_Cal* is purported to be larger than than that offered by any other software package currently available. A total of 44 functions is accessible from the Statistical Function

Figure 4. The panel used to perform linear algebra operations.

panel. Factorial, combinations, and Euler functions, useful in applications dealing with probability, are also supported.

In addition to the pre-defined functions, *El_Cal* allows up to 12 user-defined functions to be declared, edited, and modified. Mini-libraries of useful formulas can easily be created, saved, and loaded from disk.

In conclusion, *El_Cal* is an excellently programmed GEM application—a fully functional calculator that will please the vast majority of power users just as it is. If, however, you need a function that the program lacks, don't hesitate to leave a message for author J.Andrzej Wrotniak on Genie or Compuserve. He says that he answers all mail he receives, and since he has already released two updates to the original version of *El_Cal*, he may already have included the feature you seek. ■



DynaCADD

A truly professional computer-aided design program for the ST

DynaCADD

System: Atari ST

Version reviewed: 1.45

Required equipment: 1Mb RAM; hard disk and math coprocessor recommended

Copy protection: Cartridge key

Summary: Full-featured professional computer-aided design program

Price: $695

Manufacturer:
ISD Marketing
2651 John St.
Markham, ON L3R 2W5
(416) 479-1990

DynaCADD is a new computer-aided design program that sets new standards of professionalism for the Atari line of computers. As with many of the other offerings of ISD Marketing, innovation is the key word in this product.

DynaCADD has several features not found in any other CADD program, including those for IBM PCs. With its unique user interface and seamless use of 2D/3D and the largest set of commands available on any Atari CADD program, *DynaCADD* is the most powerful and flexible CADD program I have seen for the Atari ST to date.

The program comes on three floppies with a manual in a loose-leaf binder. Copy-protection is effected with a cartridge port lock (dongle). I would rather it not have any copy protection, but with the current state of software piracy, it is certainly warranted. However I would prefer a printer port lock like the one Migraph originally distributed with *Touch-Up*.

The program uses a system of *parts* and *drawings* for its database. As you might have surmised, a part is a kind of "sub-drawing" used to complete the whole. You can assign a sheet size and scale to a drawing when you start it, or you can start drawing right away and worry about size and scale later. A dialog box prompts you for these values in any common English or metric size.

Layers of Menus

CADD programs are notorious for being difficult to program, because the complexity of most packages requires an enormous number of commands. Therefore, the designers of any CADD program worth its salt must find a way to make commands available quickly and easily.

Icon-driven programs offer speed and easy access, but create another problem in the process—so many icons are required that displaying them all leaves no room on the screen for your drawing. The designers of *DynaCADD* have addressed this problem and created a workable solution in the form of an icon menu system that really sets the program apart from its competitors.

On the left side of the screen are four icon pads that form the roots of a complex hierarchical structure. When an icon is chosen from one of the upper pads, a new subordinate set of icons appears on the screen. This scheme limits the amount of space the icons occupy, keeping them nicely off on their own side of the screen, and gives you access to an unlimited number of them. As far as I know, this design is unique in the CADD world, and it deserves all the praise that can be awarded.

Other parts of the screen include the View commands across the top and the command line interpreter below. Every time you select an icon, the program is actually keying in a command. You can eliminate the interpreter by keying in the commands yourself, but the icons are much easier to use.

Options also exist for turning parts of the screen off. If, for example, you don't want to see the command lines, you can press a key and turn them off.

DynaCADD uses standard GEM pulldown menus for program switch settings and other operations such as load and save. Because speed is important, this is the perfect use of these menus.

There is also a pop-up calculator that appears whenever the program asks for a number to be input. It has many standard trig functions and even several memories. However, one big shortcoming of *DynaCADD* becomes apparent when you look closely at the calculator—there is no way to key in feet and inches, which means that all values must be entered in decimal format. I don't know too many architects or engineers who want to work in decimal feet. In the U.S. market, the ability to enter values in feet *and* inches is essential, and I hope that feature will be added soon.

Using the Program

In addition to the usual "point and shoot" technique offered by other programs, *DynaCADD* offers a complete set of options for keying in coordinate locations and for snapping objects to a grid. Input options include Absolute, Relative, and Polar modes.

Objects to be manipulated can be chosen in a variety of ways—individual selection, window, layer, pen number, style, and object type. These controls become very important as your drawing grows.

Modern CADD drafting uses layering systems to keep track of the objects in different categories. In a set of building plans, for example, each of the major systems that comprise the building—electrical, plumbing, HVAC, and so on—would have its own level. Given the ability to turn levels on and off (which *DynaCADD* has) you can produce several plots from the same file.

Also, because you can manipulate ob-

By DAVE EDWARDS

jects as a group, you can take advantage of advanced editing features. Say, for example, you needed to change all the columns in your building. Instead of selecting and changing them one at a time, you could delete and replace them all at once, if they were on the same layer.

With *DynaCADD* all these operations and more, for a total number of options that you would expect to find only in the most professional of programs, are possible.

Each object in your drawing can have its own layer number, pen number, and screen color. Pen numbers are very important in professional applications because they allow the use of multiple-pen plotters.

The different object types are as follows: Points; Lines—ortho, vertical, horizontal, perpendicular, parallel, tangent, and at angle; Circles—two points, center-radius, diameter, and three points; Arcs—center-two points, three points, and semi-circle; Fillets-radius, diameter, and corner by radius; Ellipses—three points and major/minor axis; Elliptical Arcs—five points and major/minor axis; Rectangles; Polygons—sides, rotation, radius, and diameter; Text—height, width, rotation, slant, and left/center/right justification; Polyfigures/subfigures; Dimensioning—open/filled arrowheads, auto tolerance, horizontal/vertical, radial, diametric, chain, baseline, centerlines, angular, and leaders.

Every option—and there are more than enough to make the mind boggle—is easy to find and use, because each is represented by an icon. The dimensioning options alone are absolutely incredible, offering many built-in options that are missing from other programs.

Once you place an object in a drawing, *DynaCADD* supplies a great many *transformation* options with which you can edit them. These include Trim, Move, Copy, Delete, Rotate, Mirror, Array Copy, and Divide into Equal Divisions. Other editing options include Change Radius, Endpoints, Line Style, Layer, Pen Number, Text Width/Height/Rotation/Slant/Font, Stretch, and Scale.

The real joy of using CADD is that "you never have to draw anything twice." Using the complete set of editing features offered by *DynaCADD*, you can easily take parts of existing drawings and incorporate them into new ones. And, as most draftsmen know, changes are inevitable, and CADD makes it possible to make major changes that would require hours of erasing and redrawing if done manually.

I lack space in this article to describe all the options of *DynaCADD* in detail, so I will simply reiterate that there are a great many of them and remind you that with a program of this type the more ways you have to perform any given operation, the better. If your application requires a certain feature or function, a quick call to ISD marketing should reveal whether *DynaCADD* can meet your needs. In general, I am very impressed with the completeness of the command set; the programmers have done their homework, and it shows.

Output and 3D Options

Output can be to a pen plotter, dot matrix printer, or laser printer. To use a laser printer, however, your system must have at least 2Mb of RAM. Using a pen plotter with several different pen sizes produces professional looking plots as good as any I have seen from a CADD package.

You can set such output parameters as port, pen speed, and orientation, and save them for use in future drawings. Most other Atari ST CADD packages assume dot matrix output, the *DynaCADD* approach to output, however, is much more in keeping with that of professional packages. Having a pen number assigned to each element makes drawings look less stiff and results in greater readability.

DynaCADD also features 3D options, which are done in a "solids modeling" fashion as opposed the standard "surface modeling" used by other systems. With solids, there are true curved objects rather than just a series of flat sides that appear to be curved.

Three-dimensional objects are created in much the same way as 2D objects by using a set of viewing commands. When you look at a 2D CADD drawing, you normally look down on a plan that has a Z value of 0. With *DynaCADD*, if you want to place 3D objects in space, you simply define a new *viewing plane* in three-space and give your object a value for depth.

These viewing planes, once defined, can be saved and recalled for later use. This system is widely used and has proved to be one of the easiest ways to learn and understand the complexities of 3D drawing. In fact, the system used in *DynaCADD* is very similar to that used in *AutoCAD* Release 10.

DynaCADD is the first Atari CADD program I have seen that succeeds in integrating 2D and 3D in an easy-to-use and -understand package. I believe the future of CADD is in 3D, and I am glad to see it on the Atari ST.

The current version of *DynaCADD*

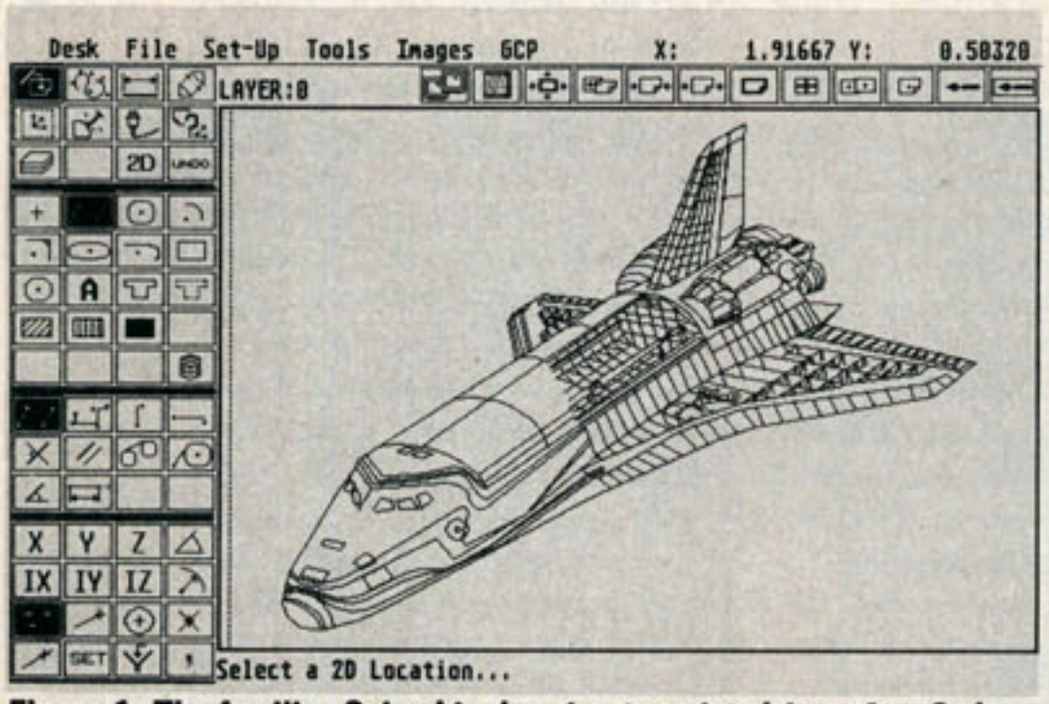


Figure 1. The familiar Columbia drawing translated from AutoCad. Note the basic DynaCADD menu system at the left.

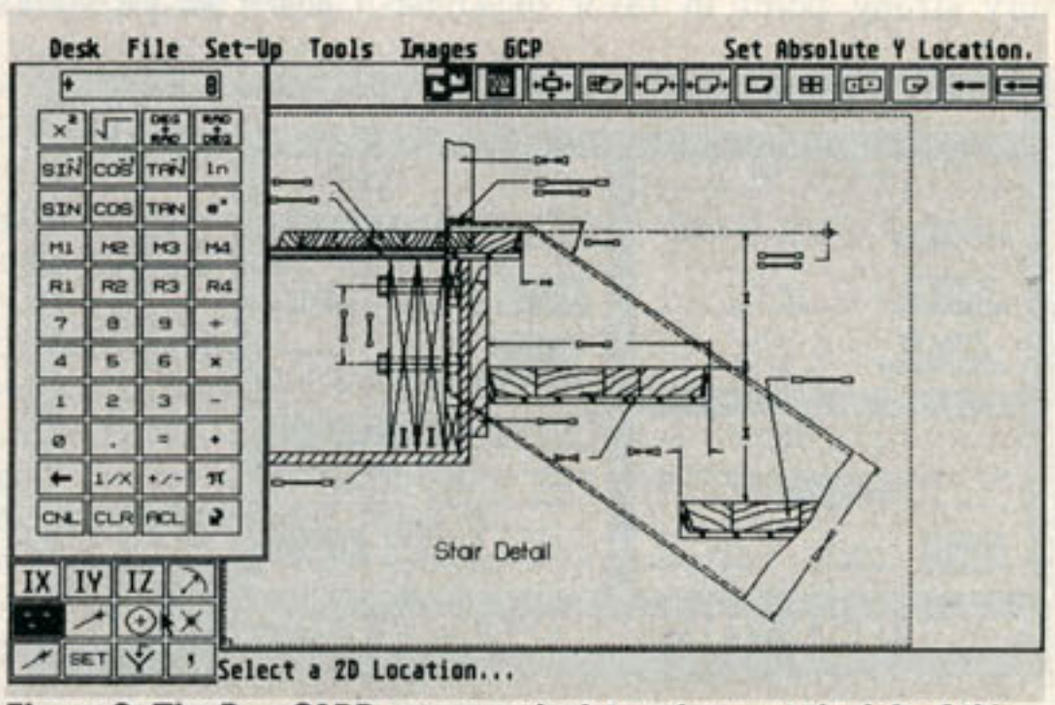


Figure 2. The DynaCADD pop-up calculator shown at the left of this screen is used when numeric input is reqired.

does not have shading, but hidden lines can be removed. The resulting image can be sent to a 2D drawing for further editing or plotting. For most CADD users, shading is not nearly so important as being able to plot a hidden line file.

In the normal 3D viewing mode, (wireframe) objects are transparent, so you can see through to the back of the object you have drawn. To give the object a more realistic appearance, you can have the program remove the hidden lines, which causes it to appear solid (or opaque). I particularly enjoyed using the 3D functions of *DynaCADD*, so I hope ISD continues to improve them.

Sharing Files

DynaCADD comes with several utilities that add even more value and professionalism to the package. The most important is one that is offered by most of the popular PC CADD programs. The DXF, Drawing Exchange Format, translator is an ASCII form of the *AutoCAD* database that allows you to transfer drawings from one CADD program to another.

I tried the *DynaCADD* translator on several DXF files, and most ported over very nicely. I also took some *DynaCADD* files and transferred them to *AutoCAD* with equally good results.

This ability to read and write DXF files is important for current CADD users. Let's say, for example, that an architect who uses *AutoCAD* wants a mechanical engineer to design a heating system for a building. The engineer, however, being an intelligent fellow, has an ST on which he runs *DynaCADD*. No problem . . . the architect has only to output his file in DXF format, and the *DynaCADD*-using engineer will be able to work with it on his system. This is a very strong point in favor of *DynaCADD* and one that will solve many of the compatibility problems that are bound to arise in the future as more people realize the value of CADD.

DynaCADD also has its own ASCII format, called DEF. Using this format, you can produce programs to write files that contain drawing information that can be read by *DynaCADD*, or you can easily extract information from these files.

Another nice feature saves macros, recording a series of commands for later or frequent use. And you can use the font editor to create your own text styles—which may not be necessary if ISD makes good on its promise to include *Calamus* fonts in future versions of *DynaCADD*.

The manual is well done and very logical in its presentation of the myriad commands the program offers. I would, however, like to see an expanded tutorial section or, even better, a separate workbook to help users become familiar with the program.

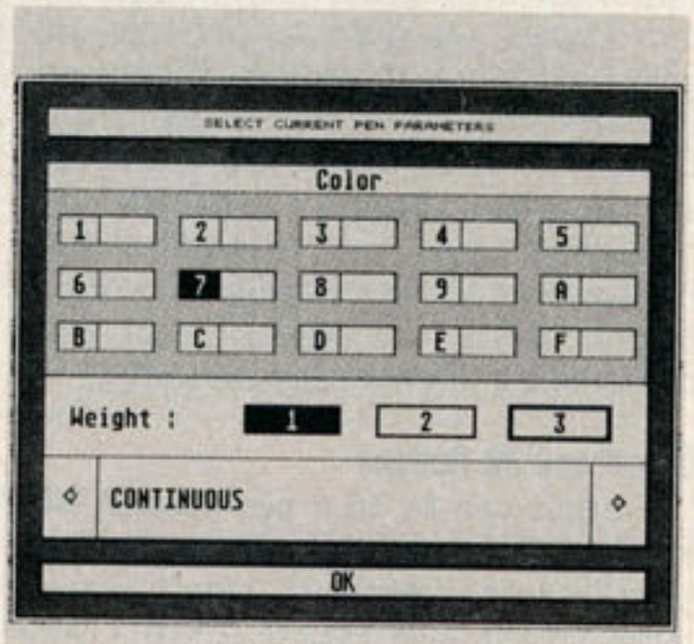


Figure 4. Dialog box used for selection of plotter pen parameters.

Summary

I certainly hope that you can tell by now that I think this program is *great*! It is about time that a package of this calabre was released for the ST. The only limitations of the package are imposed by the ST itself. The only thing that could improve it would be a 16MHz machine with 256 colors at 640×480 pixels. But in the mean time *DynaCADD* supports the Moniterm large monitors and the newly added math coprocessors, All CADD programs need a math coprocessor to run at full speed, so I would like to see ISD change their copy-protection scheme to allow 1040 users to use a coprocessor in the cartridge slot.

Much has been made of the price of *DynaCADD*, but for a program of this complexity and capability, it is definitely not out of line.

Be looking for a major new release of *DynaCADD* soon. The pre-release information shows some impressive new features, which should send *DynaCADD* to the top of the CADD system charts. Promised additions include cross hatching, a detail window, entity tagging, element statistics, and up to 256 colors.

That the new release will feature a programmer's shell is one of the most exciting pieces of CADD news to come along in a while. This shell will allow you to use compiled macros, change the user interface, and even create your own icons—terrific for creating custom CADD applications. The new release should be available by the time you read this.

In summary, then, if you are in the market for a serious, high-end CADD program and are willing to pay for the luxury of real professionalism, get *DynaCADD*. ■

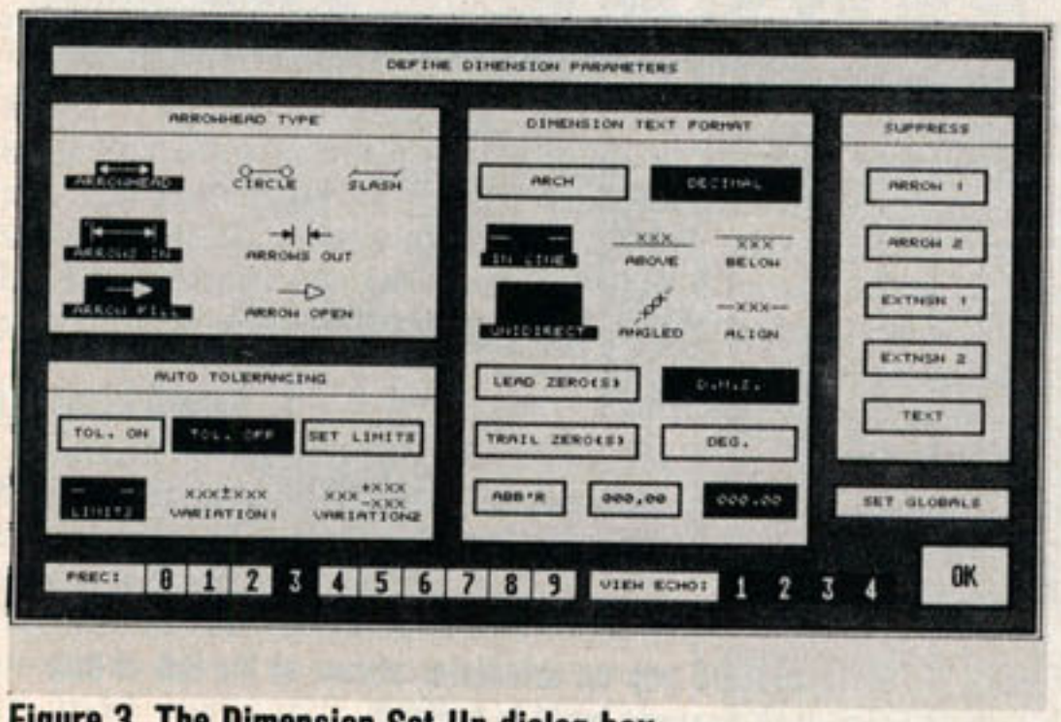


Figure 3. The Dimension Set-Up dialog box.

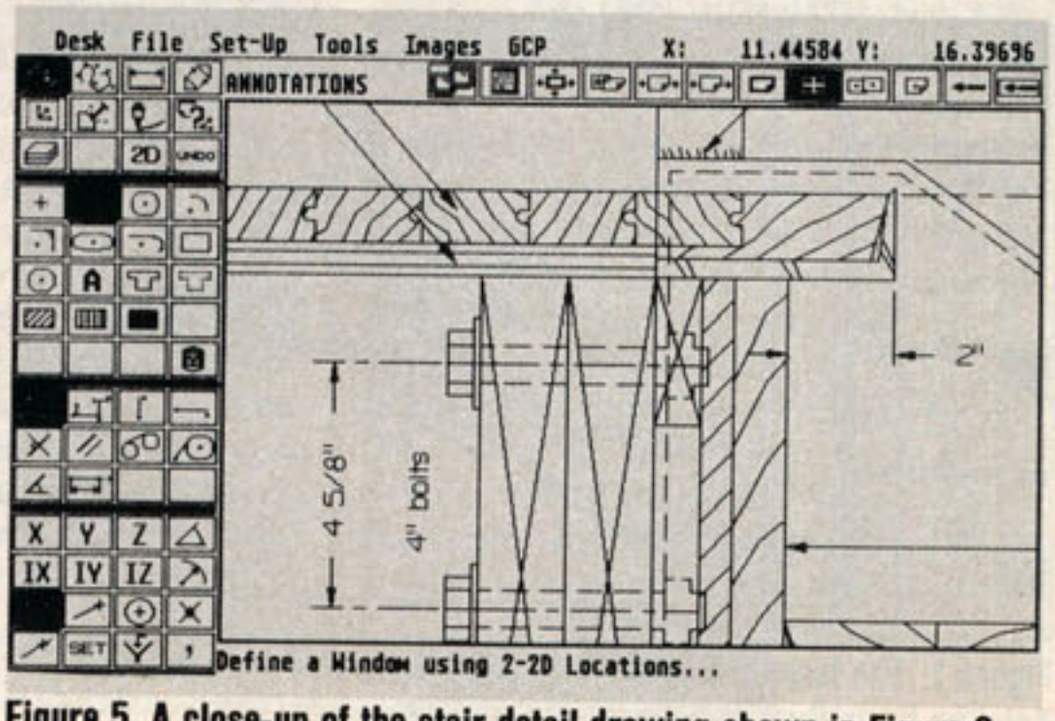


Figure 5. A close-up of the stair detail drawing shown in Figure 2.

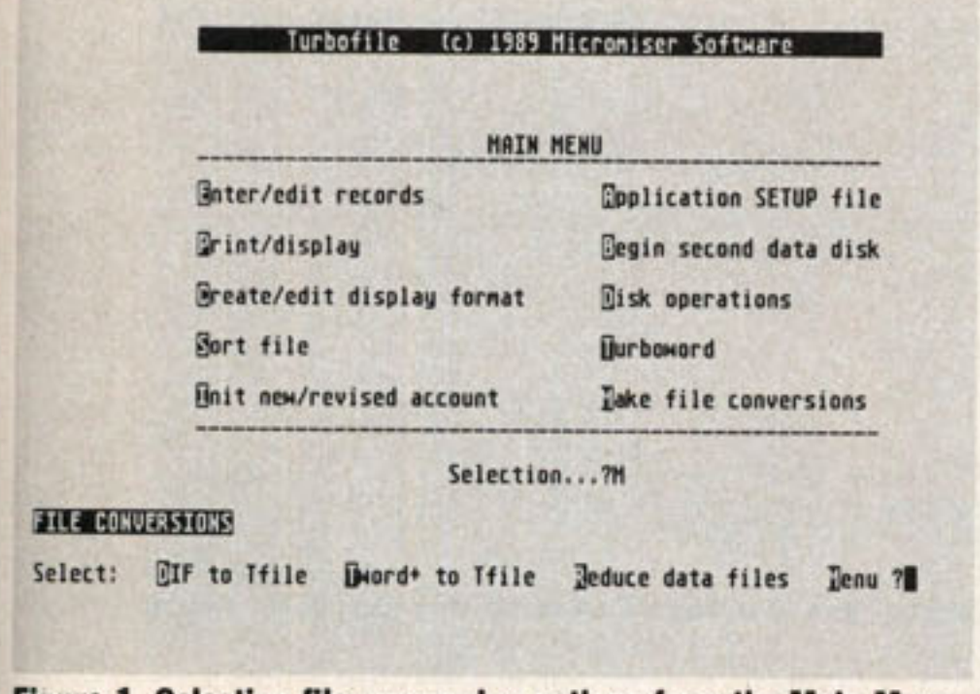


Figure 1. Selecting file conversion options from the Main Menu.

Until now, I have used my Atari XEP-80 80-column board exclusively with a public domain terminal program and an earlier MicroMiser release, *Turboword+*, an 80-column word processor, which I reviewed in the March/April 1989 issue of *Explorer*.

Turboword+ alone justified, for me, the purchase of the XEP-80, so I was quite eager to test drive MicroMiser's latest release for the 8-bit Atari computers, *Turbofile*, a file manager designed specifically to take advantage of the XEP-80.

Turbofile comes on two disks. The distribution disk contains all the necessary program files on two disk sides; the tutorial disk fills two sides with tutorials. The spiral-bound 122-page manual includes both a table of contents and an index—if only all software manufacturers were as generous.

My normal inclination when faced with a new program is to set aside the documentation and just boot the disk. Tutorial disks receive the same short shrift. So, I was about to place the distribution disk in my drive when the words "not a boot disk" flashed before my eyes . . . well, Noyes, I guess you'll have to peek at the docs.

And it was good thing that I did. There is absolutely no way that *Turbofile* can be used without the documentation. You do not have to digest the entire 122 pages, but you must familiarize yourself with the manual. Taking advantage of the Quick Course tutorial isn't a bad idea either.

Another prerequisite is the XEP-80. I also recommend a monochrome monitor, but that is not a necessity.

Turbofile can be run under almost any DOS you are likely to have—Sparta DOS, Sparta DOS-X, DOS XL, DOS 2.5, or MYDOS—in single-, enhanced-, or double-density, which means that it will run on almost any disk drive you are likely to have, including a hard drive or RAMdisk. DOS operations can be performed from within the program.

Features

Now that you know the ground rules, let's look at what the program has to offer.

The question most serious users of database managers ask first is, "How much data can the program handle?" The answer in this case is: a great deal. Maximum practical data storage for a single account (database) on a floppy disk system is about 2.5Mb (MicroMiser says that this is equivalent to about 7Mb in a fixed field-length environment). This capacity more than doubles if you use the Sparta DOS-X cartridge and triples if you have a hard disk.

Another important consideration is that *Turbofile* allows you to import .DIF files from spreadsheet and other database programs. This means, among other things, that if you already have a sizeable database set up under another program, you need not re-type the data.

In addition, files created with *Turbofile* can be used with *Turboword+* files to create form letters. *Turboword+* can also be used as the screen editor for *Turbofile*.

Basically, *Turbofile* is a full-featured file management system (in 80 columns), that can store, retrieve, and sort large amounts of data. Let's look at it in operation.

Getting Started

As mentioned above, although the *Turbofile* distribution disk contains all the necessary programs and files, it is not a boot disk. Before you can run the program, you must configure your system, a process that involves transferring specified files from the distribution disk to a DOS disk.

Although this procedure may seem inconvenient, it is actually beneficial, because it allows you to customize the program to your system.

My system, for example, includes a 256K XL, a 1Mb MIO, two 1050 drives (one Happy, the other a U.S. Doubler), an XEP-80, a monochrome monitor, and a Star-Micronics NX-1000 printer. I chose to use the public domain MYDOS 4.5 in conjuction with the appro-

PRODUCT REVIEW

Turbofile

A versatile 80-column file manager for Atari 8-bit computers

Turbofile

System: Atari 8-bit computer

Required equipment: XEP-80; monochrome monitor recommended

Copy protection: None

Summary: A versatile, flexible 80-column file manager

Price: $49

Manufacturer:
MicroMiser Software
31413 Westward Ho
Sorrento, FL 32776
(904) 383-0745

By DAVID NOYES

```
                    Anycorp, Inc. Invoice
                                                initials:
ACCT#?AA101      DATE?8/7/89     INV#?30201  SALESPERSON?LT   PO#?0104sR

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ADR2?Able Mfg, Inc.
ADR3?2701 Oakdale Pl, #3
ADR4?Council Bluffs, IA 50407-2012
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                                                SUBTOTAL?98.00
                          (Tax computed if STS=T)       TAX?5.88
                          ($2.75 will be added if COD)  SHIPPING?1.56
FOLLOWUP?OCT2                                          TOTAL?105.44
                             ("Paid in full" entered, printed if not COD)
COMMENT?Has XL/256K/Doubled 1050                       MSG?Paid in full

 Keep  Edit  Restore  Print  New  Find  Step  Delete  Close
```

Figure 2. The Input Screen. The user selects and locates fields, titles, and comments.

```
FORMAT files on drive #2:                  PRINT/DISPLAY*****************Turbofile

1. INVOICE
2. INVO132
3. ADDRESS
4. ADDR160
5. LABELS1
6. LABELS2
7. DISKFILE
8. TAPELIBR




hit <return> for menu
ENTER NUMBER ONLY OF FORMAT OR RETURN?3

 RET screen  Printer  File  Enter date  Use ramdisk  Sort  Quit again  Menu ?
```

Figure 3. Choosing among user-created formats for printout.

priate *Turbofile* files to create my double-density *Turbofile* boot disk.

I used about three-quarters of the 24 files on the distribution disk. You could get by with fewer, as some are infrequently used, but with double density, there is plenty of room. If you have a RAMdisk, you can have all program files load automatically into the RAMdisk, which makes switching from one operation to another quite a bit faster.

Once the boot disk has been created, you must create a Setup file, which tells the computer how many drives you have, where the programs will reside, where the data will reside, whether a RAMdisk will be used for data, and which printer port will be used.

That done, you can finally get to the business of managing data by establishing an account. Right away, I realized that this program was different from the other file managers I have used—there were no fancy pulldown menus, no pop-up entry screens, and no fill-in-the-blank fields or pre-defining of field lengths.

Nope, to set up an account, you go to *Turboword+*, if you have it, or the special version of *Turboword+* editor that comes with *Turbofile*. There you specify field names and any other text you want on the entry screen.

Design-Your-Own Entry Screen

Yes, you design your own entry screen. Sounded like work to me, but it turned out to be easy—after I stopped trying to second guess the documentation and followed the instructions. I originally thought that this extra work was a drawback, but I now see that customizing your data entry screen allows you to arrange things for maximum efficiency.

I also found that not having to define field length was a big plus. For my trial of *Turbofile*, I set up a database of program names, disk numbers, and disk sides. I never know how many characters to allow for program names, and with *Turbofile*, I didn't have to make an arbitrary decision. Furthermore, if your fields are not pre-defined, you save space, because you have no allocated-but-unused bytes lying around. *Turbofile* can also use calculated fields, but I have never had occasion to use them.

Once configuration, setup, and entry screen design are history, data entry can become a reality. The input screen appears just as you have designed it, along with any explanatory text you have included and a menu across the bottom of the screen. Selecting N, for new, begins the data entry process. As you fill in one field, the cursor automatically advances to the next, and when the form is completed, pressing K, for keep, stores the record on disk.

Additional entry screen functions include the handy Restore command, which, when used during editing, recalls the unedited version of the record you are working on. Delete, deletes a record, and Print does just that to the currently displayed record. Find, the standard search command, is augmented by Step, which allows you to step through the records brought up by Find.

Sorting and Reporting

After the data have been entered and before you generate your first report, you will probably want to do some sorting. To do this, the manual says, you must create a sort file . . . I felt an annoying chore coming on. But it was easy.

I selected a major field (it could have been a minor one), a word, a number of characters, a type of data (there are other parameters specific to addresses, numbers, etc), and a sort disk. Before I knew it the program had sorted my data and produced a sort file that I could print or display.

I decided to print and again found that a preliminary step was required; I had to create a format for a columnar or label type report. Again, the task was trivial; the format, which tells the printer what to print where, was quite easy to create.

Finally, I was ready to test the ability of the program to carry out my wishes and my own ability to follow directions. I turned my printer on and instructed *Turbofile* to print my sorted data in the format I had previously specified.

My patience was rewarded; the printout was just what I wanted. *Turbofile* had done everything I wanted it to do.

Conclusion

Beyond the fact that *Turbofile* had performed as advertised, doing my bidding at every turn, what had I learned about it? For openers, it is unforgiving of failure to read its documentation. It is different and, as such, takes some getting used to. It is powerful and a bit complex, but by no means too complex.

It requires steps that are not required by other file managers. Again, however, these steps are not difficult or time-consuming, and I suspect that they are at the heart of the unusual power and flexibility the program boasts.

Were there any glitches? Not really, I discovered a minor bug that prevented the uppermost left-hand character on

```
                    TRIP LOG
DESTINATION?                                    TRIP#?     DATE?

MILES?     GALLONS?        MILEAGE?          CAR?          PRICE_GAL?

  GAS?       TOLLS?        TOT.COST?        (This is a screen message)
================================================================================
DRIVES 1,2 |Data disks in drives 1 and 2 (this is a comment in the setup)
(DESTINATION)=GET D1:CITYLIST.TXT |Will find city from list on disk
(TRIP#)=COUNTER 3 |Use one of three incremented counters
(MILEAGE)=(MILES)/(GALLONS)
(CAR)="Buick"
IF (MILES)/(GALLONS)>=18 (CAR)="Toyota"
IF (CAR)="Toyota" (PRICE_GAL)=ENTER 98.9
IF (CAR)="Buick" (PRICE_GAL)=SELECT 103.9
(GAS)=SELECT $(GALLONS)*(PRICE_GAL)
(TOT.COST)=ENTER $(GAS)+(TOLLS)
LINES 10 |These are format instructions for immediate printout
FONT 27,120,1 AT 1,1 |Epson compatible print in NLQ mode
WRITE "TRIP LOG" AT 36,1 |Title of printout at printer col 36, line 1
WRITE "DESTINATION" AT 2,3 |Label for data at 2,4
(DESINATION) AT 2,4 |Print city at col 2, line 4
(TRIP#) AT 60,4
(DATE) AT 70,4 |One entry for each field to be printed
(MILES) AT 2,6 |etc., etc.
```

Figure 4. Setting up the Input Screen, calculated fields, and immediate print format using the special Turboword+ editor. The Input Screen appears above the dotted line; entry instructions are listed below.

FILE DISPLAY

Pg 1

ProgramName	DiskNumber	DiskSide
850 Express 3.0	003	B
Amodem 7.52	002	A
Cribbage	053	B
DOS 2.5	121	A
DTerm	003	A
MYDOS 4.5	121	B
PD Utilities	035	A
PD Utilities	035	B
Solitaire	053	A
Smart DOS	002	B
Turboword +	133	A
Turboword + Dictionary	133	B

Figure 5. Sample printout of the author's database, sorted alphabetically.

the entry screen editor from showing in the field name on the entry screen, but MicroMiser has already fixed that.

I also discovered that if an application setup file is on two disk drives, the program goes crazy and refuses to recognize either. The documentation now warns against that situation. There are no real negatives.

All things considered, I highly recommend *Turbofile* to any XEP-80 owner. It is definitely the most versatile and powerful file manager I have seen for the 8-bit Atari line. And MicroMiser's track record of updates and response to users' questions, problems, and requirements, leaves no room for qualms about on-going support for the product. If you need a serious file manager for your 8-bit Atari system, get *Turbofile*. ■

ATHENA II

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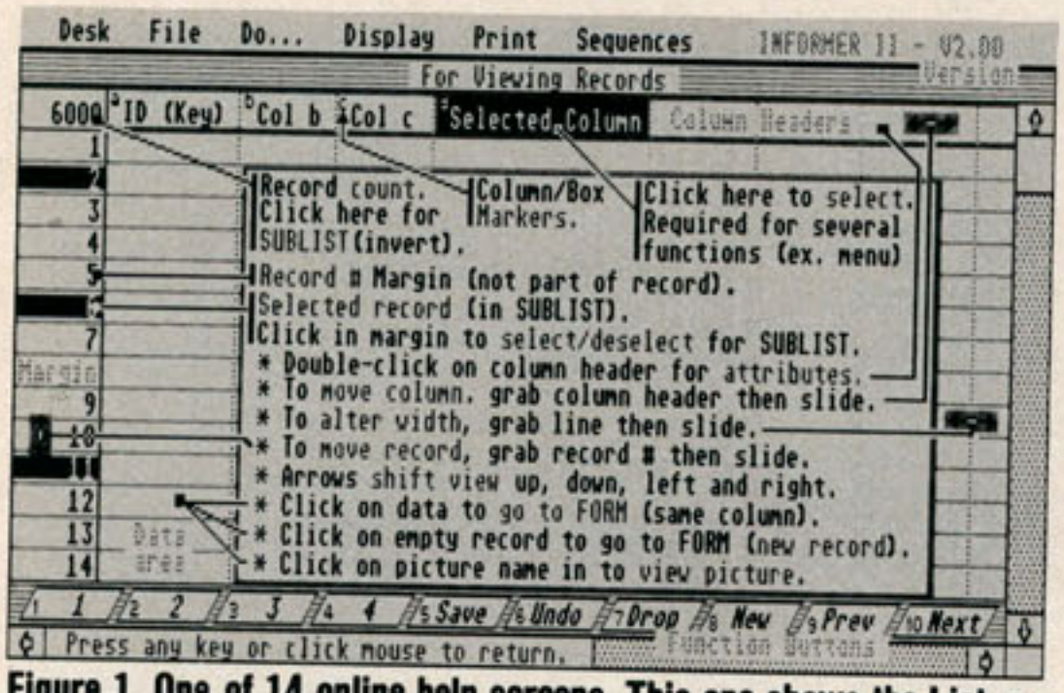


Figure 1. One of 14 online help screens. This one shows the List, a spreadsheet-style record-viewing and processing screen.

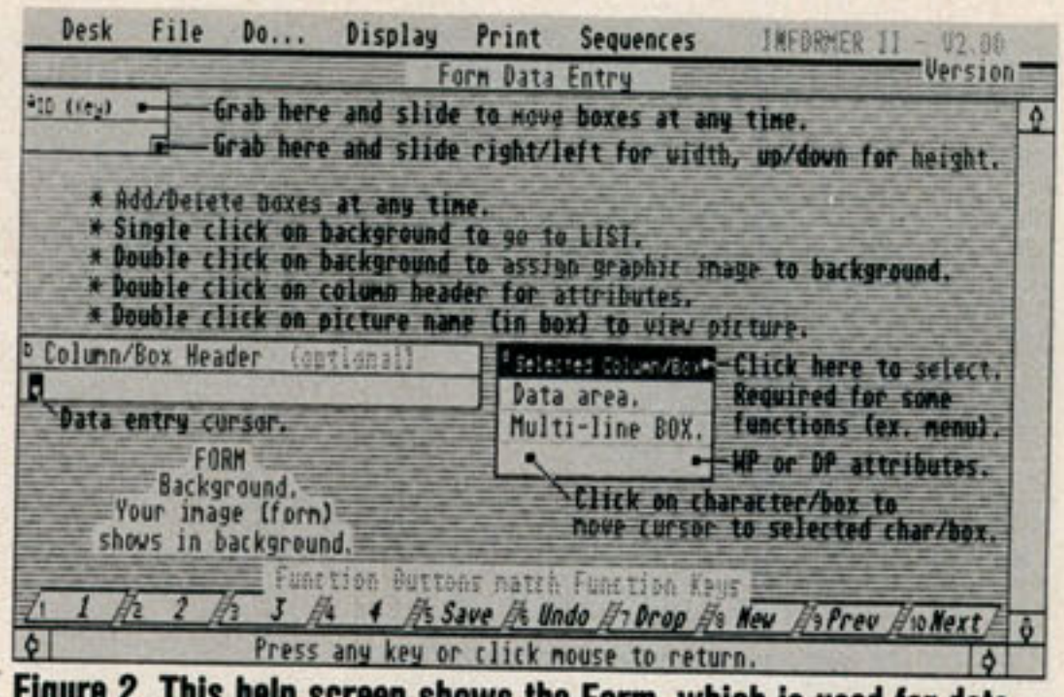


Figure 2. This help screen shows the Form, which is used for data entry. By assigning an image to the background and adjusting the input boxes, the onscreen Form can be made to look like hardcopy.

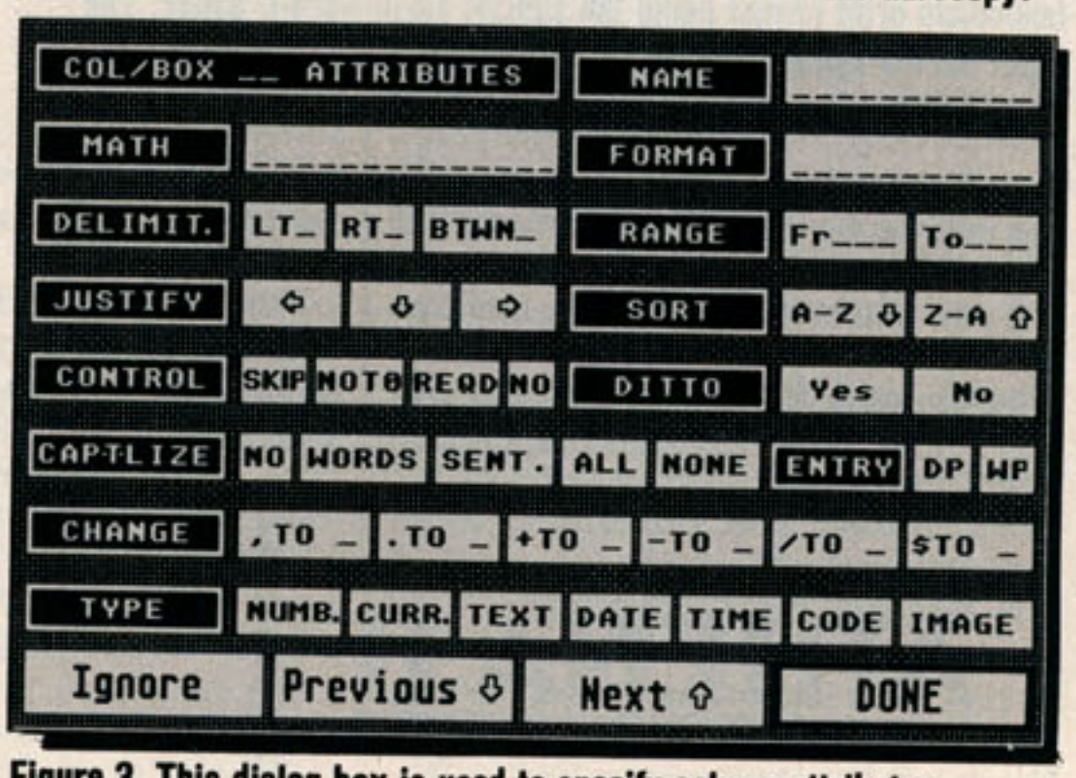


Figure 3. This dialog box is used to specify column attributes. Columns can be added, changed, or deleted at any time.

Informer II

An exceptionally competent database manager at an exceptionally reasonable price

By EDMUND D. MANN

In the May/June 1988 edition of *Atari Explorer*, Publisher Dave Ahl evaluated *The Informer* a database manager from Regent Software. He concluded that the program was "a serious product; in fact, one of the most versatile and—dare I say it?—powerful databases available for the Atari ST." He criticized the program for its inability to print labels and the manual for its style and organization.

Well, *The Informer* is back in a new improved version called *Informer II*, which prints labels and boasts a completely re-written manual. The updated version is marketed by Soft-Aware, a California-based company headed by the program's author, Dick Skraly.

The Informer is an excellent data base manager; *Informer II* is even better, offering many features that are not available in competitive software. And when it comes to features that overlap those offered by other database managers, *Informer II* outperforms its competitors.

Whether you need to crunch num-

Informer II

System: Atari ST

Version reviewed: 1.0

Copy protection: None; Fareware

Summary: A full-featured database manager worth ten times the price

Price: $50

Manufacturer:
Soft-Aware
334 "B" N. Euclid
Upland, CA 91786
(714) 982-8409

Figure 4. The keystroke help screen provides a comprehensive overview of the keystrokes needed for data entry.

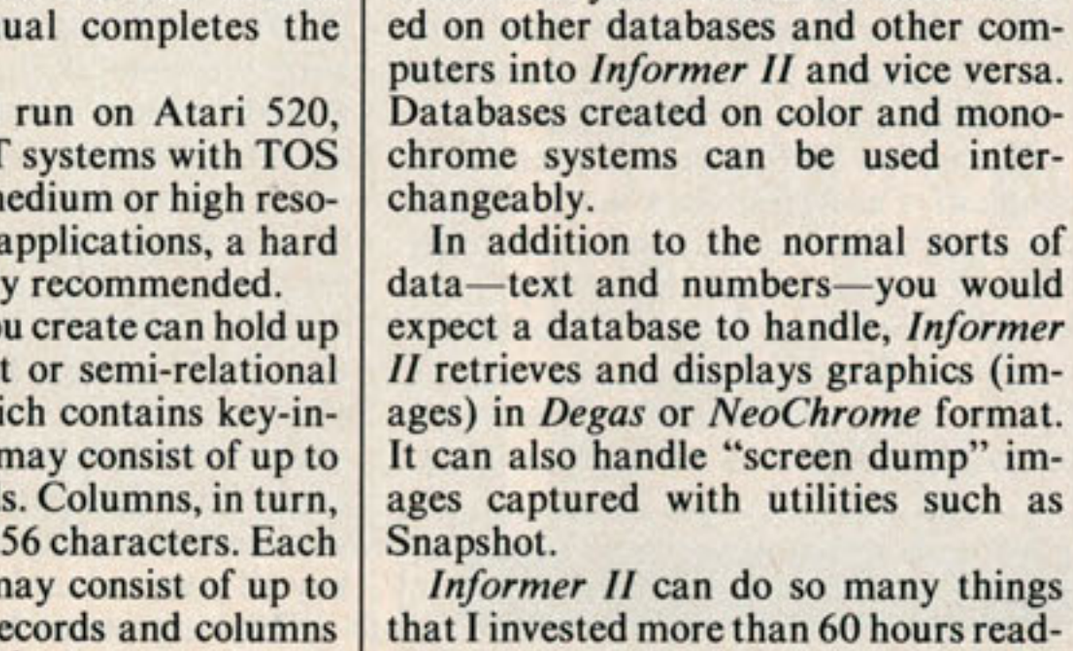


Figure 5. The Set Print Options dialog box is used to customize forms, reports, and screen printouts.

bers, store and retrieve records, or merge a mailing list with computer-generated letters, *Informer II* is better than any other database program currently available for the Atari ST.

The package comes with three single-sided disks—a program disk, a tutorial disk, and a help disk—so you can run the program from an SF314, SF354, or third-party disk drive. The well-written tutorial-style manual completes the package.

Informer II will run on Atari 520, 1040, and Mega ST systems with TOS in ROM in either medium or high resolution. For serious applications, a hard disk drive is strongly recommended.

Each database you create can hold up to four independent or semi-relational Tables, each of which contains key-indexed records that may consist of up to 36 Columns or fields. Columns, in turn, may contain up to 256 characters. Each record, therefore, may consist of up to 9216 characters. Records and columns are variable in length.

Because *Informer II* is memory-based, the size of your database is limited by the amount of RAM available in your computer. When the program is run on a two-drive Atari 520ST without accessories, for example, approximately 150,000 characters remain available for data storage.

Each record occupies only the space required by actual characters entered plus 1 extra character for each Column and 16 characters for the record index. An average record size of 74 characters and ten Columns would, thus, occupy 100 characters (74+10+16). A 520ST, then, can handle 1500 records of that size, a 1040 or Mega ST can handle 6500, and the largest Mega can handle 36,500.

Delimited ASCII text files can be read and written by *Informer II*, which means that you can transfer data created on other databases and other computers into *Informer II* and vice versa. Databases created on color and monochrome systems can be used interchangeably.

In addition to the normal sorts of data—text and numbers—you would expect a database to handle, *Informer II* retrieves and displays graphics (images) in *Degas* or *NeoChrome* format. It can also handle "screen dump" images captured with utilities such as Snapshot.

Informer II can do so many things that I invested more than 60 hours reading and re-reading the manual and another 30 hours learning to input, correct, manipulate, and print the data using my color-monitor-equipped 520ST and 1040ST.

The manual suggests that it will take you about three hours to master Practice Session 1, an hour and a half for Practice Session 2, and an hour for Practice Session 3, but I found those times inadequate for real mastery. With 90 hours invested in learning to use the program, I still have a long way to go until I can consider myself proficient, i.e. until I can use the program without referring to the manual.

The manual, rather than printing instructions and leaving you to figure out what the author meant to say, is keyed to eight practice Tables stored on the tutorial disk. The manual and tutorial disk literally take you by the hand, leading you through each step and explaining what you must do to accomplish each task.

The various tasks associated with building and using your database are accomplished via commands that can be invoked using either the mouse or keyboard commands—or a convenient combination of the two. I found the GEM menus easy to use and the learning process quite intuitive.

Background

In the course of preparing this review, I spoke with the program author and learned that he has many years of experience with mainframe and personal computers and has written other database programs for the Atari ST, most notably, *The Informer*. His objective was to make *Informer II* perform the way massive databases perform on mainframes.

When I asked him about his relationship with Regent Software, which markets *The Informer*, Dick told me that because Regent was already selling two database programs, *Regent Base* and *The Informer*, he did not think the company could give the marketing emphasis to *Informer II* that he wanted to see. Therefore, he decided to market *Informer II* directly to Atari dealers and by mail order to end users. The consequences of that decision now allow retailers to sell *Informer II* for $50, which I believe is much less than it is actually worth.

About Fareware

The marketing method Dick has devised is unique. As an author and publisher of business programs, he knows how difficult it is for a programmer to find a publisher who is both willing and able to invest the money required to bring a high-quality program to market. He also knows that retailers are limited in terms of both available funds and space in which to store and merchandise the software packages they buy.

Recognizing that retail shelf space is expensive and that manuals take up most of the space devoted to software

packages, Dick developed the marketing concept he has named "Fareware." *Explorer* does not usually devote much space in its reviews to the marketing schemes of individual companies, but Fareware is so unusual that it merits a closer look.

Most software authors work in their homes. The lucky ones find publishers who like their efforts enough to pay them for the right to market their software. Among the responsibilities that the publisher assumes under this arrangement is the publication of a manual and the design and production of appropriate packaging—both of which can be very costly.

Once the manuals and packages are produced, the publisher must store them until they are sold. And sales are dependent on marketing—either to dealers through a sales force or to dealers and end users through advertising.

The author receives a royalty on each package sold, and the rest of the proceeds from the sale go to the publisher, who has assumed all the financial risk.

Some software authors give their products away as "freeware" or public domain software; others market their software as "shareware," requesting a donation from those who try and like the programs. With Fareware the author gets his royalty, and the retailer and the user share the profit.

Here's how it works. Instead of spending money on advertising and on fancy boxes, to which the retailer must allot expensive shelf space, Soft-Aware ships to the dealer only a disk in a space-saving package. The dealer has only one copy of the manual, which is, of course, available for the prospective buyer to inspect.

When a user purchases the disk, he mails in the registration card that is included in the package. When the folks at Soft-Aware receive the registration card, they do two things: They mail a manual to the purchaser and they send a commission check to the retailer.

To obviate the desire to pirate software, Soft-Aware rewards the user for not making illegal copies. The company encourages its customers to let their friends try the software. Those who like it can send a registration card to Soft-Aware along with payment for the manual. Soft-Aware then sends a commission check to the original purchaser.

Fareware allows the software author to be paid for his work and the user to be paid for his role in marketing a product that he uses, thus eliminating piracy.

In theory, the concept is great. The problem Fareware does not address, however, is the low cost and availability of photocopies. I think the concept must be taken one step further to include a technique to prevent users from copying the manuals as well as the disks, since business software is virtually without value unless the manual is available.

One successful anti-piracy scheme is being used by Logical Design Works, the publisher of *Vegas Gambler*. The "key card," which lists the key you must enter to be allowed access to the game is printed in maroon ink on black paper, so it cannot be photocopied. The card is difficult to read, but the scheme certainly deters would-be pirates.

I suggest that piracy exists only because publishers expect unrealistic—even usurous—profits. They have managed to convince millions of otherwise intelligent people that paying $250 for software that is nationally advertised at $495 is a good deal. Buyers never seem to ask, "How much is it really *worth*?"

Dick Skraly has chosen to charge a fair price for his software. He would rather sell 100,000 copies of *Informer II* to Atari ST users at $50 each than try to sell 1000 copies at $500 each, even though the software is, in my opinion, worth at least $500.

Because Dick is willing to take a risk and try an innovative marketing concept, you can buy *Informer II* for $50 from your favorite Atari retailer or directly from Soft-Aware. If you have the original version of *The Informer* from Regent Software, you can get the updated version from Soft-Aware for the same modest $50.

I predict that you will have the same experience with Informer II that my wife had with our microwave oven.

Conclusion

After spending more than 90 hours with *Informer II*, I suggest that if you already own a database program and are happy with it, there is no need to buy and learn to use *Informer II*. If, however, you do not already own a database program or want more than the program you are now using can deliver, I you urge to invest in *Informer II*. Remember, you can port whatever files you already have on disk, provided they are in ASCII format, to *Informer II*, so you need not worry about having to re-key all your valuable data.

Thinking about buying and using a new database program reminds me of what my wife said when I bought our first microwave oven for her. She said, "I could live a lifetime without it." Today she could not live a day without it.

I predict that if you are an ST user with a need for a full-featured database management program, you will have the same experience with *Informer II* that my wife had with our microwave oven—once you learn to use it, you will wonder how you ever got along without it. ■

ST HELP KEY

Copy Without Warning

If you are annoyed by the prompts that appear every time you try to copy something from the GEM desktop, you can tell GEM not to post these warnings. Just choose Set Preferences from the Options menu and change Confirm Copies from Yes to No. Doing the same thing for Confirm Deletes is not advised, however, because a mistaken delete can be disastrous; a mistaken copy is more likely to be harmless.

From *The Atari ST Book of Tips, Instructions, Secrets and Hints*, © 1988 by Ralph C. Turner, Index Legalis Publishing Co., P.O. Box 1822-20, Fairfield, IA 52556, (515) 472-2293.

Software Survey

A wide range of entertaining and useful programs for holiday giving and getting

Battle Chess

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST

Required equipment: Color monitor

Copy protection: Keyword

Summary: 3D animated chess game; challenging and entertaining for beginners and experts alike

Price: $49.95

Manufacturer:
Interplay
1575 Corporate Dr.
Costa Mesa, CA 92626
(714) 549-2411
(800) 227-6900

One of my favorite scenes in the movie "Star Wars" is the one in which Chewbacca and the robot C3PO play a three-dimensional holographic game. When I first saw it I thought, "Wow, wouldn't it be great if that were really possible!" Well, *Battle Chess* comes as close to satisfying that desire as any game I have seen to date.

In *Battle Chess* the chess pieces are represented by animated three-dimensional characters. When you move the knight at the start of a game, for example, the armored soldier representing it shoulders his way out from the back of the board and walks to his new square. His movement is accompanied by the digitized sound of footsteps and clanking armor. This is definitely a new and interesting approach to a very old and venerable game.

If you know how to play chess, you know how to play *Battle Chess*. The normal rules apply; castling is permitted, as is capturing a pawn *en passant*. If, on the other hand, you have never played chess, that's OK, too; Interplay includes a well-illustrated manual that will help you learn.

The computer plays a good game of chess, as far as I can tell. I know all the moves and a little strategy, and it beat me consistently on the second level. I did considerably better on the novice level.

More advanced players can adjust the competition to a level they find satisfying; *Battle Chess* has a library of 30,000 opening moves and ten levels of ability. The higher the level, of course, the longer it thinks. You can force the

Continued on next page

Battle Chess

computer to make a move—to take the best move it has found up to that point—if you get tired of waiting, but that seems like cheating.

When you load *Battle Chess* you see the chess board in front of you with the pieces arranged on it. The game starts up in three-dimensional mode, but there is a two-dimensional board if you want to play it that way. You move a piece by clicking on it and the square to which you want to move it. You cannot make illegal moves.

Among the special features available from the menu bar are options to take back a move, restore a move you have taken back, and have the computer suggest a move for you. In addition, you can play long distance chess, if both you and your opponent have Hayes-compatible modems.

The real attraction of *Battle Chess* is the 3D animation. When you take a knight with a knight, for example, the attacking piece approaches the other with his sword drawn. They fight it out for a moment with swords clanging. The rest of the scene then becomes like something from "Monty Python and the Holy Grail." The attacking knight cuts the enemy down, a limb at a time, and assumes control of the square.

I was so fascinated with the animation in *Battle Chess* that I used the setup option to try every combination of attacking and defending pieces I could think of, just to see what would happen. Two of the best confrontations were the rook (castle) taking the queen and the pawn taking the king.

When moved, the rook changes from a brick tower into a stone behemoth that looks very much like The Thing from Fantastic Four comics. He steps slowly over to the queen, his heavy steps reverberating, picks her up, and stuffs her into his mouth. The bishops and the queens often use magic when taking an enemy piece, while the King has lots of tricks up his sleeve.

Battle Chess is a good chess game in its own right, even without its fantastic graphics. You can play alone or challenge a friend. You can have the computer take over either side at any point, or have it play itself. I also like the idea of playing over the modem.

Battle Chess is a joy for both chess players and computer graphics aficionados, and those are the two groups to whom I recommend this game most heartily.

—John S. Manor

Tomahawk

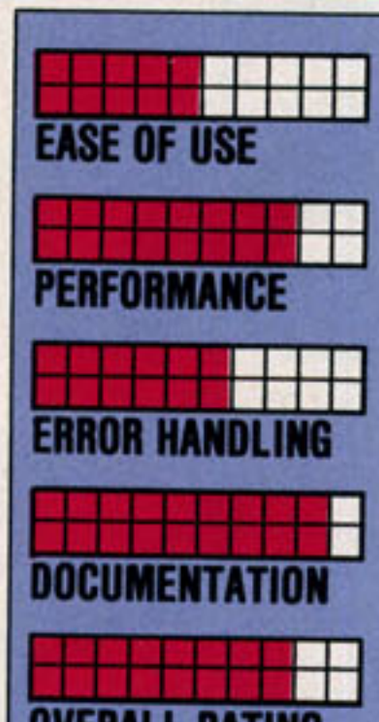
Tomahawk is a helicopter simulation that combines the realism of a flight simulator with the action of a shoot-em-up. It is not a new release, but one that is still available and definitely merits consideration by 8-bit gamers.

While the program lacks the complexity of SubLogic's popular *Flight Simulator*, the graphics are very similar. The horizon is represented by a line across the middle of the screen. Objects such as trees, mountains, buildings, and assorted targets appear as three-dimensional line drawings. This graphics technique works well in creating a 3D world in which to set the simulation, but the overall effect is unimpressive to those who have become accustomed to the superior graphics usually offered by Atari computers.

Tomahawk offers four different missions, the first of which is strictly for training; there are no enemy forces with which to contend. In this mode, you have time to learn to control your AH-64A Apache Advanced Attack Helicopter.

Modeled on the real thing, your craft is equipped with three separate weapons systems, including three-mile guided missiles and rockets with a range of 4000 feet. The instrument panel, which provides all the information you need to complete your missions, occupies the lower half of the screen.

Tomahawk allows you to adjust weather conditions and level of difficulty for each mission. Once the mission



System: 64K Atari 8-bit
Copy protection: Yes
Summary: A challenging flight simulator and air combat combination
Price: $29.95
Manufacturer:
Software Toolworks
19808 Nordhoff Pl.
Chatsworth, CA 91311
(818) 885-9000

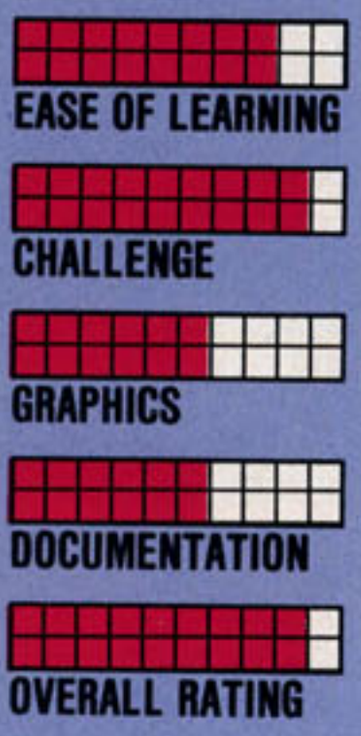
Swiftar

The evil Cyborgs have taken over the planet Akaron, and it is up to you, as Captain of a Warp Fighter, to dispose of these pesky aliens. As you penetrate wave after wave of Cyborgs, you begin to notice crystals floating by. Grab ten of these—one from each wave—and you will restore the planetary force field that once protected Akaron.

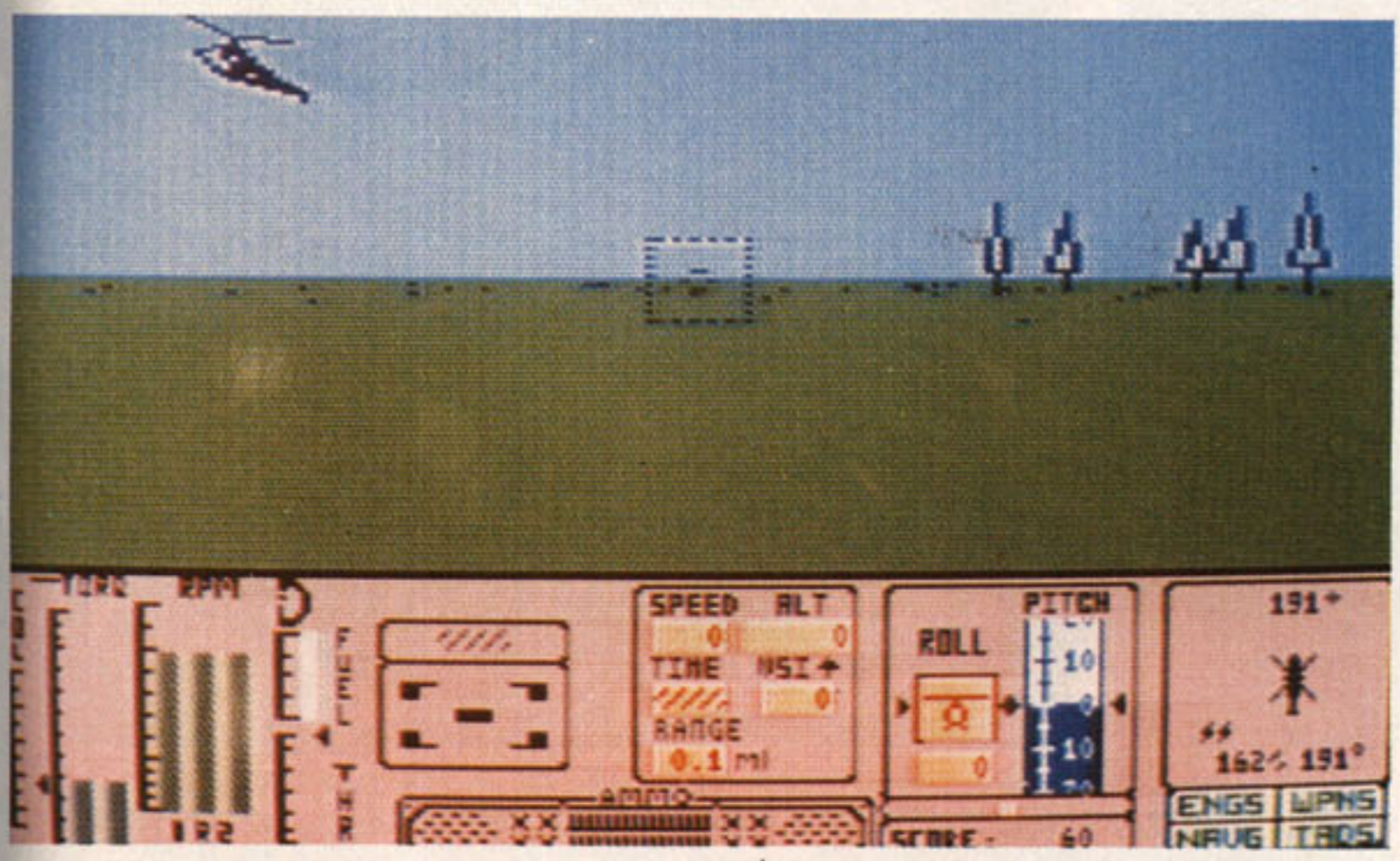
For each wave, the Cyborgs use different weapons. By far the most potent alien weapons are the mines, spiked grey balls, which when hit explode, sending forth a cloud of mini-mines that home in on your ship.

The first wave of aliens is the easiest to defeat. Cannons shoot at you, rotating balls roll down the screen, and some of those dangerous mines show up. The next wave is reminiscent of the old Atari game *Caverns of Mars*. You ascend through a cave, dodging the fire of wall-mounted cannons and lasers. It is tough to get through the cave, and there is a surpise waiting for you at the top.

In the third wave, things really start to get interesting. Tanks firing guided missiles at you appear. Squadrons of jets also swoop at you as you try to avoid the numerous rotating cannons. This game is no walk in the park.



System: Atari ST
Required equipment: Color monitor; joystick
Copy protection: Modified keyword
Summary: Blast the Cyborgs and save the planet; lots of action
Price: $39.95
Manufacturer:
Accustar
P.O. Box 457
Rochester, MI 48308
(313) 731-1690



begins, you control the chopper with your joystick.

In the combat missions, you must avoid attacks from both helicopters and ground-based enemy installations. If your craft sustains more than three hits or four equipment failures, it will crash. You can, however, have damage repaired if you can find and land at one of the four friendly bases located in each sector.

In addition to dodging enemy fire, you must attempt to destroy the sources of the attacks. Although you can use one of eight on-board laser-guided missiles to hit distant targets, you get more points if you use rockets or a chain gun at closer range. It is quite gratifying to watch your targets explode, particularly if you can avoid being hit yourself.

Landing the chopper is perhaps the most difficult part of the game. You must constantly adjust the torque of the engines by pressing the Q and A keys to achieve the proper rate of descent.

The pilot's handbook that comes with the program is quite comprehensive and very detailed. A quick reference guide is included to help you learn the keyboard commands.

The single tragic flaw of *Tomahawk* is the inability to save a game in progress. Missions three and four require significant amounts of playing time to complete, and there is no provision to pick up where you left off, except by pausing the game and leaving the computer on.

By my reckoning, it would require about 24 hours of continuous play to complete mission three, which requires you to clear 128 sectors, each of which contains eight targets, for a total of 1024 targets. This is simply too much time to devote to any game in one sitting.

My only other complaint about the game is that the drudgery of clearing sector after sector of enemy targets can become monotonous.

Overall, however, *Tomahawk* is an intriguing game and one that deserves a spot in most 8-bit gamers' libraries. As a flight simulator alone, the program is a worthwhile buy. ***—George Hulseman***

The remaining seven waves assault you with even more impressive military hardware. There are bombers, helicopters, laser satellites, battleships, fast attack boats, and even a mother ship.

Some of the waves present special tactical problems, such as narrow valleys and tall buildings in the cities. The fourth wave is my favorite. There you face the battleships, firing volley after volley of shells at your ship. If you touch an icon as it floats down the screen, you acquire guided missiles to fire at the ships.

Occasionally, messages appear in a window at the side of the screen during battle. These messages offer important tips, such as reminding you to grab a crystal.

This is important, because, if you miss a crystal, you are doomed to repeat that wave when you reach the force field at the end of the game. You need all ten jewels to reactivate the force field.

Swiftar can be played at any of three difficulty levels—easy, medium or hard. In this game, easy is hard, medium is harder, and hard is as fast and as difficult as any stand-up arcade game I have ever played.

To get practice on difficult waves, hold the Control key down and type ACS at the screen on which you are asked to choose a difficulty level. A new screen lets you choose the wave on which you want to start playing. To finish the game you still have to play all the waves and gather all ten crystals.

Swiftar is a high quality shoot-em-up arcade game with sharp graphics and lots of interesting surprises and challenges. The game is very playable, as each wave is a satisfying game in itself. ***—John S. Manor***

Zynaps

System: Atari ST

Required equipment: Color monitor; joystick

Copy protection: Yes

Summary: A Scramble-like, action-filled shoot-em-up

Price: $14.95

Distributor:
Scorpion Software
19 Harbor Dr.
Lake Hopatcong NJ 07849
(201) 663-0202

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

Those poor aliens . . . everyone picks on them. But they asked for it: they have invaded every fictional planet in the universe and beyond, and they never seem to learn that theirs is a lost cause—particularly with an ace fighter pilot like you in the cast.

In *Zynaps*, you get to show a bunch of the toughest green-blooded antennae wigglers you've ever come up against just what you are made of.

Zynaps is another in the long tradition of Scramble-type games. You fly your fighter through horizontally scrolling caverns as waves of alien

Renegade

System: Atari ST

Required equipment: Color monitor; joystick

Copy protection: Keydisk

Summary: Unfortunately faithful conversion of an obsolete coin-op hit

Price: $29.95

Manufacturer:
Taito Software
267 W. Esplanade
N. Vancouver, BC V7M 1A5
(604) 984-3344

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

Street fighting games are currently enjoying enormous popularity among both arcade and computer game enthusiasts. The genre is not new, however; as long ago as 1986 (three years is a long time in this industry), Renegade was a hit in the arcades. Now Sega has released a home version of this trendsetter.

As the ST version of the game begins, you find yourself surrounded first by a gang of vicious subway thugs. Then, by a gang of bikers on the waterfront. Next, by a group of female marauders wielding whips and clubs on a sleezy downtown street.

You then move on to Mean Street, where the thugs are equipped with razors. And finally, a confrontation with Mr. Big and his henchmen rounds out the action. Each level is timed, and a life is lost if the leader of each succeeding gang is not disabled in the allotted time.

Joystick control is easy to master, because the number of possible moves is limited. By holding the fire button down and pressing the stick to the left or right, you can, for example, throw a punch at your adversary. Moves cannot be made in rapid succession; one must be completed before another can be selected. Consequently, the joystick often seems unresponsive.

From the very beginning, your renegade character is assaulted from all sides, and the odds seem almost insurmountable. On the first level, for example, four weaponless toughs are accompanied by two masked marauders wielding whips, all of whom must be decked twice before they vanish. In the background skulks a seemingly indestructible karate expert, the leader of the pack, who must be decked at least four times before he gives up the ghost.

It is best to go after the weapon-equipped gang members first. In the case of those wielding whips, it is disap-

spacecraft do their best to collide with you, hit you with mines, or force your ship into a wall.

You start out firing lasers at the aliens, but you have several other weapons to call upon, including plasma bomb throwers, homing missiles, and seeker missiles. You select weapons by collecting the energy "stars" left behind by zapped aliens; your Weapon Activation Indicator changes every time you hit a star, cycling through your list of weapons. When you see the weapon you want, you hold the joystick button down and scoop up one more star, activating the weapon. This system is about as easy to use as it is to describe; sometimes I select missiles and get bombs or vice versa—it is difficult to predict.

You are supposed to be able to increase the power of your weapons and the speed of your ship, but in hours of play, I have yet to see this happen. I blame all this on the manual, which is blatently inaccurate in its description of several commands. Nevertheless, *Zynaps* is quite playable.

Fighting your way through to the alien base is a difficult task; you could spend days practicing just to get through to the next area. The alien ships look like rubbery balls and flying birds, which fly erratically toward your fighter, making it difficult to hit them with your lasers. Missiles make things a little easier, because you get to fire both lasers and missiles at the same time.

Bombs are meant more for ground installations, but they also help in the air. There isn't too much resistance from the ground, but the guided missiles the aliens occasionally launch at you are tough to avoid. First they hover until you get close; then they move toward you slowly, either hitting you or forcing you against a cavern wall. And they are not affected by laser fire; you must either avoid them or wait until they explode on their own.

Zynaps appears to be divided into distinct sections. When you get shot down, you return to the beginning of the section you were working on—if you still have one of your three lives left. The caverns disappear after a while, and if you are really good at the game, you find yourself flying through space to an encounter with an alien Command Ship or, even worse, a Mother Ship.

Doing well in *Zynaps* requires the reflexes of an F-14 fighter pilot and the eye of an eagle. If you somehow manage to get to the end of the game, you must use your lasers, missiles, and bombs to blast the alien base to smithereens.

Zynaps is a simple, straightforward shoot-em-up arcade game that is very difficult to beat. The aliens fight you for every foot of ground you gain in the caverns, and the game provides all that a good arcade game should—satisfying graphics, plenty of action, and a real challenge. If you are looking for some serious arcade action, *Zynaps* is a game to consider.

—John S. Manor

pointing to see how quickly they recover from your assault. You will find it very difficult to inflict a second knockout on these opponents, because they recover instantly—this in contrast to the weaponless thugs, who recover much more naturally. This is such an obvious fault, that it can only be attributed to an error in programming.

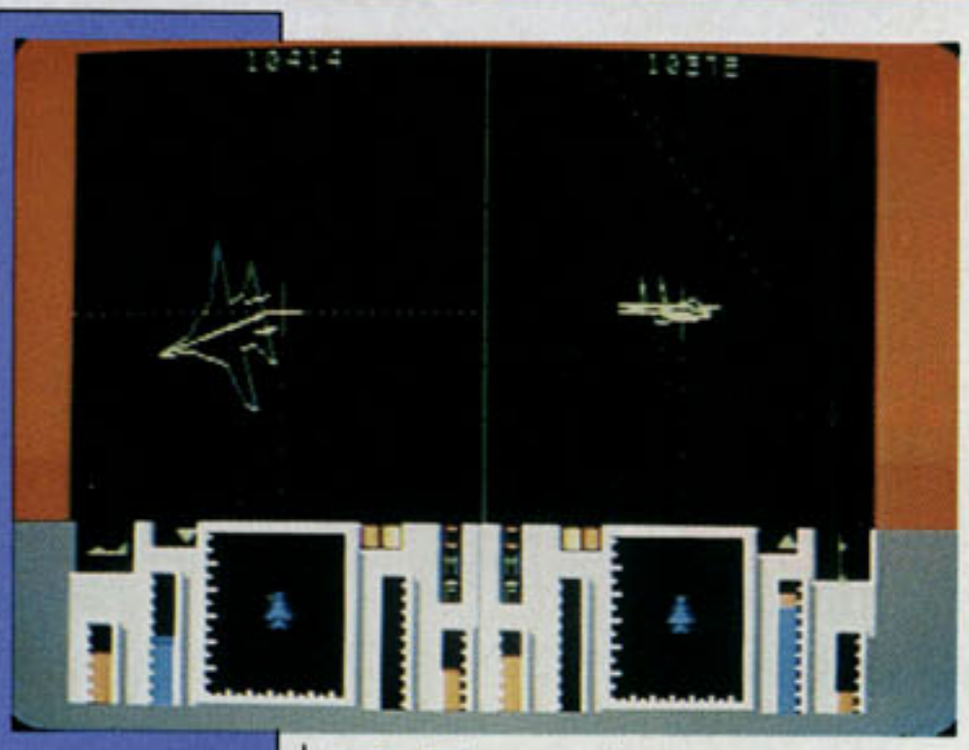
The inconsistent recovery pattern is just one of several examples of careless programming that detract from the game and make it something less than fun to play. The opponents are too good at what they do; the level of difficulty is too great for all but the most experienced players; and the frustration factor is all but intolerable.

And if play value alone were not enough to consign *Renegade* to the ranks of the second rate, there would still be the matter of graphics: *Renegade* is over the technological hill in the graphics department. Taito used the original graphic files for the ST release, but remember, those files are more than three years old. The characters are poorly drawn, with dots for eyes and dashes for mouths—less realistic than we have come to expect from even 8-bit software.

I congratulate Taito for entering the ST market with home versions of its most popular coin-ops, but *Renegade* is no great shakes for ST owners—better quality products have been around for a long time.

—Frank Eva

Topgun



EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST

Required equipment: Color monitor; joystick(s)

Copy protection: Yes

Summary: A bargain-priced combat simulation

Price: $14.95

Manufacturer:
Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
(312) 480-7667

You are flying your combat jet over enemy territory when suddenly a blip appears on your radar. It's an enemy aircraft, coming right at you, and he's not there to play games. You accelerate to your top speed, arm your missiles, and hope to get off the first shot. In a duel to the death, you roll and dive through the skies as you play *Top Gun.*

Top Gun can be played against a computer opponent or another human pilot. The display is a spit-screen that shows the instruments and cockpit view of both aircraft. Both pilots have an altimeter, air speed indicator, weapons indicator, enemy above/below indicator, and game-related instruments that

Continued on next page

Topgun

indicate damage, cannon temperature, and thrust level. An artificial horizon and climb/dive indicator guide you in flight, and radar shows the position of the enemy. When you get close enough to fire a missile, a Missile Lock-on indicator counts down three seconds from the time you get the enemy jet in your sights to the time you can fire.

You can use any of three weapons in a dogfight—a cannon, missiles, or flares. You must hit the enemy jet with 25 shots before it will succumb, but a single hit with a missile will obliterate him. When one of his missiles comes at you, you can avoid it by shooting off a flare at just the right moment. If, however, your timing is off, your military career is over.

Each pilot starts the game with three lives. Your goal is to advance through as many combat missions as possible before losing all your lives. You must shoot down your opponent three times in a given mission before he does the same to you. If you are playing against the computer, you then advance to the next mission and receive three new lives.

The computer opponent starts getting really tough to beat around the third mission, so you need not fear that the game will lose its challenge.

The animation and graphics in *Top Gun* are limited to the wild blue yonder; there is no scenery. The planes appear as wire-frame objects that are nonetheless well animated. When a plane is shot down, the explosion is a simple expanding star-like figure. You also see the view from his cockpit as your opponent twists and turns on his way to earth. The opening graphics are nice, with a cool *Top Gun* logo and a launch sequence from two carriers, neither of which has anything to do with the game.

The only complaint I have about *Top Gun* is the documentation. The manual describes the game adequately, but lists the wrong commands for the ST version. It took me only about five minutes of experimentation to figure this out, but I expect more consideration from the publishers of any game—even one from budget line.

Documentation notwithstanding, *Top Gun* is a pretty good game at the budget price of $14.95. You can buy similar games, with more aircraft functions and better missions, but they cost two or three times as much. *Top Gun* will give you a taste of air combat and a good deal more than $14.95 worth of playability.

—John S. Manor

Arkanoid

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST

Required equipment: Color monitor

Copy protection: Keydisk

Summary: Excellent execution of a simple, yet addictive, concept

Price: $19.95

Manufacturer:
Taito Software
267 W. Esplanade
N. Vancouver, BC V7M 1A5
(604) 984-3344

The first video game I ever played was Atari's Breakout. It was colorful, easy to play, and lots of fun. Now, quite a few years down the technological road, Taito has taken brick-breaking a few steps further in *Arkanoid*.

The silly sci-fi scenario that accompanies *Arkanoid* claims that you are controlling some kind of escape pod, but in reality you are in control of nothing more than a good old-fashioned paddle. Using your paddle, you must make your way through 33 brickstrewn screens, each of which sports a different and more challenging pattern of bricks.

Some of the bricks must be hit twice to be eliminated, while others can't be destroyed at all. And then there are the strange creatures that pop out of the top of the screen and interfere with your shots.

To help even the odds, the game designers have included bonus capsules in some of the bricks. When a brick that contains one is struck, the capsule falls out; to claim the special ability it bestows, you must grab the capsule before it gets to the bottom of the screen.

The bonuses bestow the following abilities: advance to the next level, catch the ball and release it in another position, divide the ball into three balls, double the size of the paddle, add laser guns to the paddle, add an extra life, and slow down the ball.

Your paddle is controlled by the mouse, a system that works very well.

The graphics in the ST version of *Arkanoid* are not spectacular, but they are true to the coin-op version. Sound effects are limited to the usual boops and beeps, you expect to hear in this type of game and, perhaps because of their familiarity, complement gameplay effectively.

Arkanoid offers the kind of addictive fun that will have you saying, "Just one more time" . . . for the next five hours.

—Clinton Smith

I have played many computer games and assumed many roles over the years, but I think I am safe in saying that *Populous* is the first game that has ever cast me as a divine being.

As the divine being, your goal is to ensure that your followers survive and flourish, while those of the other (obviously false) god disappear from the face of the Earth.

The screen is split into several sections. The Book of Worlds, lying open in the upper left-hand corner of the screen, displays a map of the world in which you currently find yourself. The Closeup Map, which occupies most of the screen, is a 3D closeup of that world, showing your people and the landscape in detail. You can move around and see other parts of the world by clicking on either the direction arrows or a spot on the Book of Worlds map.

The Command Icons, located in the bottom left-hand corner of the screen, let you choose which of your divine powers to use. The Manna Bar keeps track of your magical powers. As the number of your followers grows, so does your Manna, and an arrow on the bar shows you which powers are currently available to you. The Shield Summary reveals the strength of your followers and that of the enemy.

You do not have direct control over the actions of your followers; they go about their business unaware that you are looking on. When they find a flat parcel of land, they build a house, and after a while, the house yields more followers, who build more houses, and so on. The more houses there are, the more followers you have, and the greater your power becomes.

The power you use most in *Populous* is the one that allows you to change the contours of the land to provide your followers with nice flat places on which to build. The size of the flat space determines the size of the house your followers can build; bigger houses produce greater numbers of followers and increase your Manna proportionately.

Your people are also affected by the kind of world in which they live. Grass-

lands provide a nice climate with plenty to eat. Deserts spell a quick demise for those who wander through them for extended periods. And ice and snow severely impede population expansion.

While you are busy creating flatlands, the followers of the other god are also busy building and proliferating. As your Manna increases, however, you acquire the ability to slow their progress by inflicting on them disasters of various sorts.

An earthquake causes a section of land to shake violently, destroying most of the houses that have been built there. Using a less direct method, you can create a swamp, which will swallow up anyone who walks on it.

Choosing the Knight command turns your people's leader into a destructive knight who heads for enemy land, where he kills any followers of the enemy he meets and sets fire to their houses. Invoking a volcano causes the land to rise violently, destroying any houses in the vicinity.

A flood covers all low land with sea water, washing away buildings and drowning the inhabitants. Floods can also affect your people, so be sure to build on high land if you plan to rely on the flood to keep the enemy's followers under control.

Your ultimate weapon is Armageddon, a command that compels both populations to head toward the center of the world and engage in a final battle. If your population outnumbers your opponent's, you will probably win control of the world.

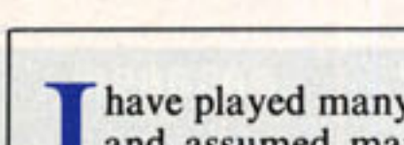
In addition to the single-player game, which requires you to take on the computer, you have the option of playing another person via modem.

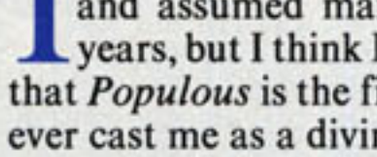
The great graphics are enhanced by a lot of neat digitized sound effects—the voice of the evil entity when you win a game, for example. If you use a double-sided drive, you get to hear the digitized theme song, but it isn't so great that you have to worry about running right out to buy a new drive if yours isn't double-sided.

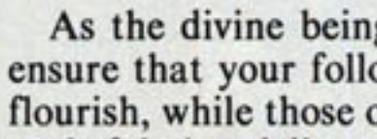
Populous should appeal to Atarians who don't often find much of interest in the Software Survey section of *Explorer*, Atarians who want to do more than move back and forth and shoot or rescue the sacred orb from the powers of evil, Atarians who appreciate an intellectual challenge. If you are looking for something completely different that will, nonetheless, keep you entertained for hours on end, try *Populous*.

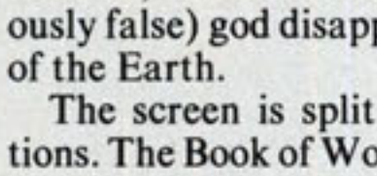
—Clinton Smith

Populous









System: Atari ST

Required equipment: Color monitor

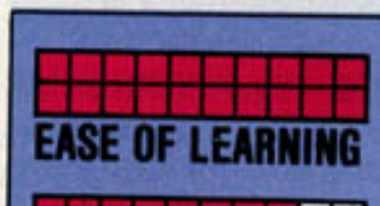
Copy protection: Yes

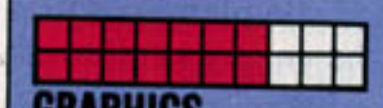
Summary: An entertainly different intellectual challenge

Price: $49.95

Manufacturer:
Electronic Arts
P.O. Box 7530
San Mateo, CA 94403
(800) 245-4525
(800) 562-1112 in CA

Alcon





System: Atari ST

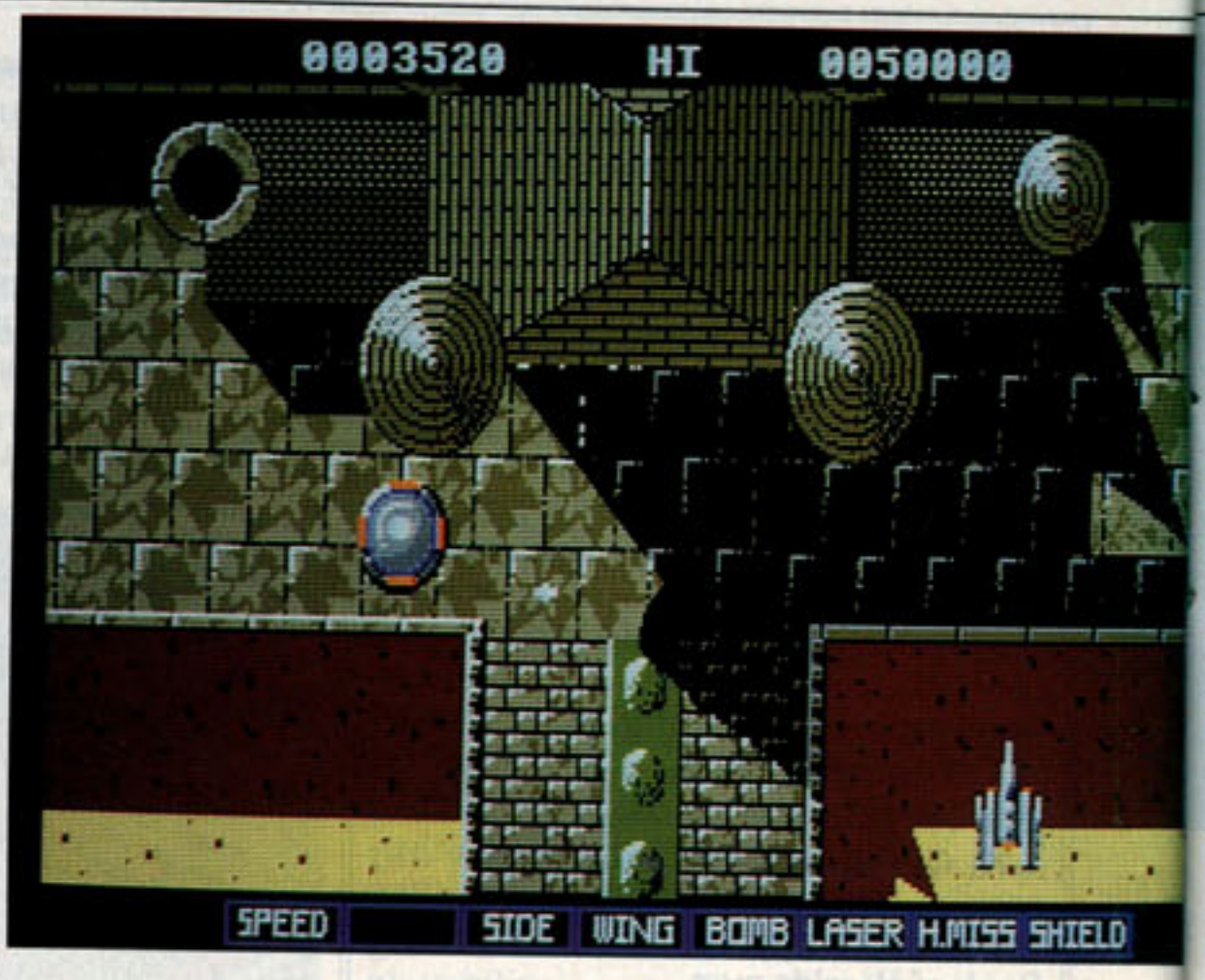
Required equipment: Color monitor, joystick

Copy protection: Keydisk

Summary: A good action arcade game that pits you against the aliens of Orac with a variety of weapons

Price: $19.95

Manufacturer:
Taito Software
267 W. Esplanade
N. Vancouver, BC V7M 1A5
(604) 984-3344



In *Alcon* you pilot a sophisticated SW475 fighter over the planet Orac. You are humanity's last best hope to defeat the alien race that has taken over the planet. The aliens are waiting for you though, with their most sophisticated weapons at the ready.

Fortunately, your fighter is equipped to deal with this perilous situation. You start out with a simple gun that shoots bullets. By gathering gold stars left behind by the aliens you destroy, however, you can earn the energy necessary to make use of some of the advanced systems your fighter has to offer. These systems include bombs, lasers, shields, homing missiles, sideways firing, and the ability to increase the size and range of the craft.

Also after touching a star, you have the option of speeding your ship up considerably, which is almost a necessity if you are to survive for any length of time. You can do this five times. If you need a

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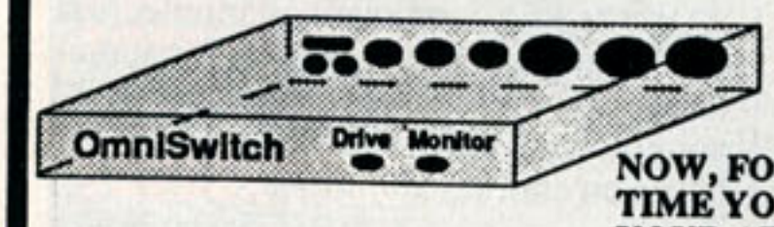

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rest, you can pause the game with the Esc key.

Alien ships always target your current position, so it is important to keep moving. If you have earned enough extra speed, you should be able to dodge most of their shots. The homing missiles are your best weapon at the beginning of the game. It takes time to earn them, but they are well worth the effort. You can fire missiles in eight directions at once, and they will hit their targets without fail.

Some of your other weapons are useful in special situations; the shield helps in areas of heavy alien fire, while the bombs are come in handy against strong fortifications. The aliens always come at you from the same places, so you can study the game and devise effective patterns of attack and defense.

You start out with five fighters, and an extra is awarded after 50,000 points.

What I like most about *Alcon* is the flexibility if offers in the ways you can use your weapons. You can switch to any weapon at any time, as long as you have earned sufficient energy stars for it. There is supposed to be a way, undocumented in the manual, to hyperwarp to any area on the planet by saving your energy and applying it to the engines of the fighter instead of the weapons. I haven't figured out how this happens yet, but I'm still working on it.

I also like the variety of terrain and weapons the aliens send against you. At the beginning of the game, you encounter two main types of ships, but ground installations and dreadnaughts show up as you cover more of the planet surface.

One thing I don't like about *Alcon* is the way you fire your weapons; you have to press the fire button for every shot. I like to be able to hold the button down for automatic fire.

My only other minor criticism is that you cannot store your high scores to disk. After playing a long game, I like to have something to show for my effort. These are minor criticisms, however, and won't detract significantly from your enjoyment of the game.

The graphics in *Alcon* are sharp, colorful, and appealing, though the animation seems to slow down when many ships are on the screen. At the start of the game you can choose to hear sound effects or music while playing. The sound effects are good, with realistic zaps and explosions. The music is excellent, adding excitement to the game without becoming annoying.

Alcon comes with an instruction booklet. A cartoon inside the disk folder describes humanity's struggle against the aliens. The program uses a keydisk copy protection scheme, so it can be played from a hard disk.

Alcon is a well-designed arcade game with plenty of playability. The variety of weapons and aliens to shoot them at, along with the ever-changing terrain of Orac, promise to deliver many hours of shoot-em-up fun. ***—John S. Manor***

Bubble Bobble

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST

Required equipment: Color monitor; joystick(s)

Copy protection: Keydisk

Summary: Cute, non-violent coin-op conversion

Price: $29.95

Manufacturer:
Taito Software
267 W. Esplanade
N. Vancouver, BC V7M 1A5
(604) 984-3344

Travel with Bub and Bob, miniature Brontosauri, as they try to rescue their friends from the evil Baron von Blubba. That's the scenario of Taito's hit arcade game, which has just been converted to ST format.

The arcade version of *Bubble Bobble* was voted one of the top money-makers of 1987-88 by U.S. arcade operators. And even though I can not comment on the accuracy of the conversion, I believe *Bubble Bobble* is good enough to rate a high score as a computer game, regardless of its roots.

Bubble Bobble combines the play mechanics of several groundbreaking arcade games to arrive at an enjoyable and refreshingly non-violent game. Your job is to make Bub and/or Bob blow bubbles to encase villains. You then attempt to burst these bubbles, which causes the encapsulated beasties to be magically transformed into special rewards, which can be collected for bonus points.

The simultaneous two-player mode is especially enjoyable for parents to play with young children. A single-player mode is also available. The joystick is used to move Bub or Bob left, right, and up with rewarding precision.

Your little dinosaur can leap to a platform above him and suffers no ill effects if he falls off. Consequently, the frustration factor is negligible.

Pressing the fire button causes a bubble to be blown. If the bubble is close enough to a baddie, it will surround him and start to float him away. Bursting a water bubble acts as a sort of smart bomb, knocking out many beasties at one time.

There are 100 levels of progressive difficulty and numerous rewards to be collected. Although a game can be restarted with the joystick, no provision is made for restarting at the level on which your last life was lost. There is a high score screen, but this, like other Taito conversions, lacks the ability to save scores to disk.

The graphics are very cute, and each on-screen hero and villain is uniquely animated. All in all, *Bubble Bobble* is a wonderful romp. ***—Frank Eva***

Zak McKracken and the Alien Mindbenders

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST

Required equipment: Color monitor

Copy protection: Keyword

Summary: A challenging, but satisfying graphic adventure

Price: $44.95

Manufacturer:
Lucasfilm Games
P.O. Box 1037
San Rafael, CA 94912
(415) 662-1902

It is the year 1997, and aliens from outerspace have constructed a stupidity machine designed to reduce the IQ of Earth's population and enable the bad guys to conquer the planet without a fight. Your mission is to guide hero Zak McKracken in a solar system-wide quest for a way to end this wanton waste of brainpower.

Zak is a freelance reporter for *The National Inquisitor*, a hint-packed copy of which is included with the software. You start your quest in the bedroom of Zak's apartment in San Francisco. Surrounding you are a bed, a dresser, a fish named Susi, a telephone, an answering machine, a desk, a lamp, a plant, a cat clock, a window shade, a rug, a tear in

In *Galactic Conqueror* you and your specially equipped ship, the Thunder Cloud II, are pitted against a group of rebels out to take over the local star group. Your mission is two-fold—you must protect the Stellar League's base and stop the rebel advance. You fly your ship around the galaxy, attacking the rebels wherever they show themselves. If they reach the base, all is lost and the era of peace enjoyed by the Galaxy will end, along with the game.

The Thunder Cloud II is a neat-looking needle-nosed fighter armed with powerful lasers. You can blast away dozens of enemy ships before even one of them can get through to fire at you. To protect you against enemy fire, you have a shield, the condition of which is displayed in glowing blue in the upper left corner of the screen. When the shield is gone, the next enemy hit on your ship destroys it. Don't worry though, because you will just be teleported back to your mother ship where you can launch another fighter. You never run out of fighters. The shield is re-energized when you return to your mother ship before each new stage of the game.

Galactic Conqueror is played in three stages. You start the game after your mother ship deposits you on the surface of a planet. You must blow away rebel missile silos, mines, robots, and even meteorites with your powerful lasers. The second stage is an aerial dogfight with the rebel Space Army, composed of one of four kinds of fighters intermixed with mines, missiles, and meteorites.

The third stage is set in space. You meet the rest of the rebel army in a duel to the death. In this stage you have to watch out for the Imperial Enemy Ship, which delivers rebel troops to the planets. Blast it, and you get bonus points.

After you clear all three stages on the planet, you return to the mother ship, where you see a strategic map of the galaxy with the Stellar League base in

Galactic Conqueror

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST

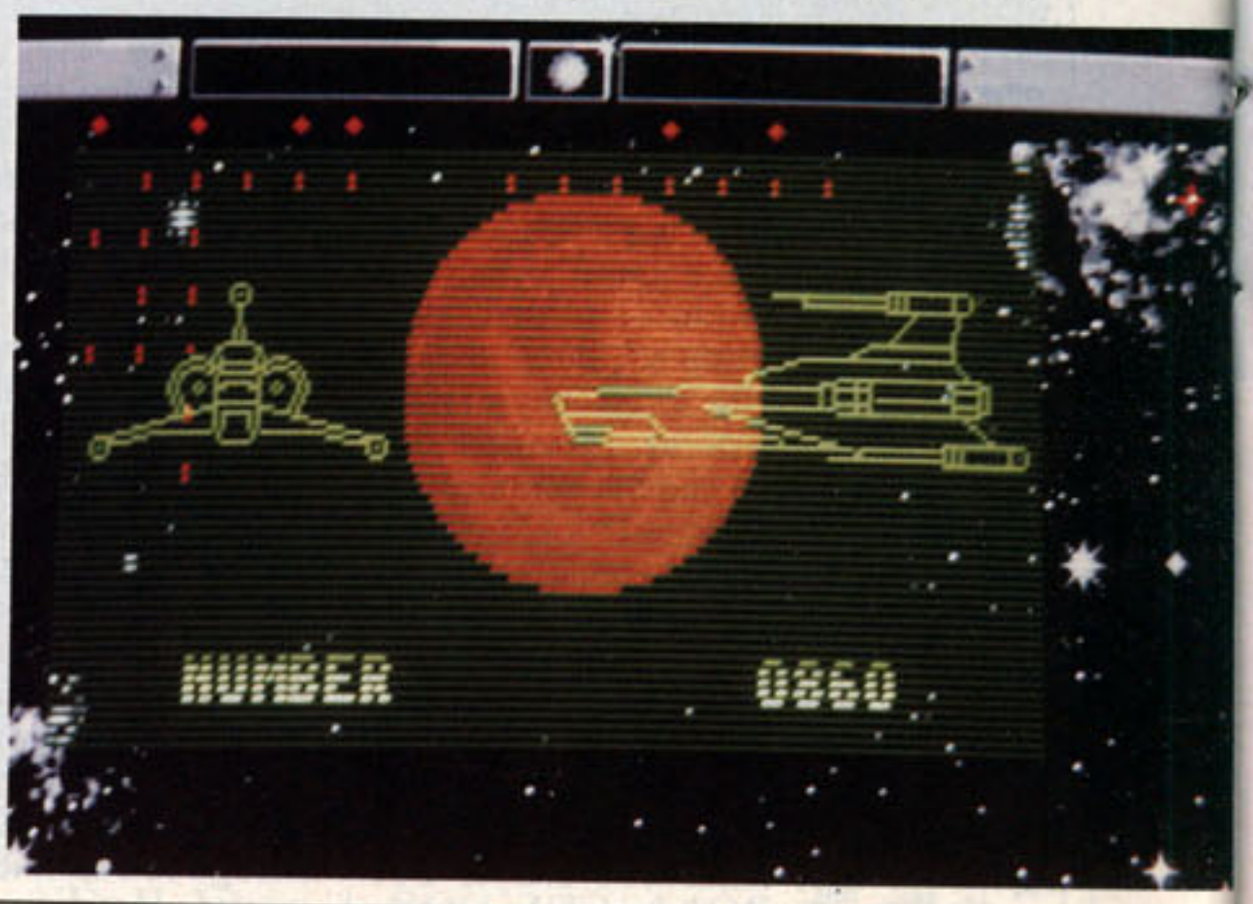
Required equipment: Color monitor

Copy protection: Yes

Summary: A space-based arcade game with lots of action—if not variety

Price: $44.95

Manufacturer:
Titus Software
20432 Corisco St.
Chatsworth CA 91311
(818) 709-3693



the wallpaper, and a door.

A hint to get you started: Under the rug are some loose boards, which can be removed with a monkey wrench. Squeezing into the resulting hole in the floor is a good way to start the game. The usual adventure game conventions, such as the need for a source of illumination in a dark place, are in effect throughout the game.

You control Zak entirely with the mouse, issuing commands by clicking on any of 20 verbs displayed at the bottom of the screen in combination with any object on the screen or in your unlimited inventory. The inventory, too, is displayed at the bottom of the screen.

When a character speaks to you, his lips move convincingly, while his words appear in a two-line message box at the top of the screen.

During the early stages of the game, Zak is invulnerable; no amount of stupidity on your part can kill him. As things progress, this changes. The program does, however, warn you of impending danger, telling you, for example, that Zak has only two minutes worth of air left in his space suit.

In *Zak McKracken*, the key to success is the solution of clever puzzles, rather than the avoidance of capricious fatality, and if you get stuck on one, you are free to try another. Often solving one puzzle either provides or leads to the solution of another. In general, I think many players will find this rational, logical approach to gameplay much more satisfying and less frustrating than the *deus ex machina* approach.

The detailed graphics are excellent and often helpful in solving the puzzles. In addition, I found that my interest in the graphic scenes motivated me to investigate. There are 15 cities to which you can travel, and each city has between one and thirty screens for you to explore. Animated sequences are frequently used to complete a character's action and to show what the aliens are up to. Pressing the Esc key halts an animated sequence.

There is no copy protection on the three disks that are included in the package, so you can make backup copies or run the game from your hard drive. You can save 16 games—or more, if you copy the saved game files to another disk or directory. A hint book is available directly from Lucasfilm Games for $7.95.

At first $44.95 seemed like a lot of money to pay for a game, but so far I have spent 40 hours playing *Zak McKracken and the Alien Mindbenders*, and I expect to spend another 20 hours before I finish it. Sixty hours of entertainment comes out to 75 cents per hour, which doesn't strike me as a bad value at all—especially given the high quality of the gameplay.

If you like clever, puzzle-oriented adventure games, don't miss Lucasfilms' *Zak McKracken and the Alien Mindbenders*.

—Darryl May

the center of the screen. Red dots represent the advancing enemy, blue dots are friendly worlds, and four moons at the corners of the screen give you early warning of rebel attacks. You must protect them as well as the main base.

You can examine a planet by moving a cursor over it and hitting the joystick button or the spacebar, which causes a digitized picture of the planet to appear along with a drawing of the kind of rebel fighter you will find there. Some of the fighters are more destructive than others, so this information can be important.

The rebels continue to advance while you are studying the map, so don't waste too much time planning your next move; select the most strategic rebel-occupied planet and warp your ship on over to it.

I like some of the special functions built into *Galactic Conqueror*. Using the ST function keys, you can save or load a map, stop a game and go to the map, pause, or quit the game and see high scores. Another function key provides a close-up digitized view of your fighter during the battle, and yet another allows you to speed up the already furious action by accelerating your ship.

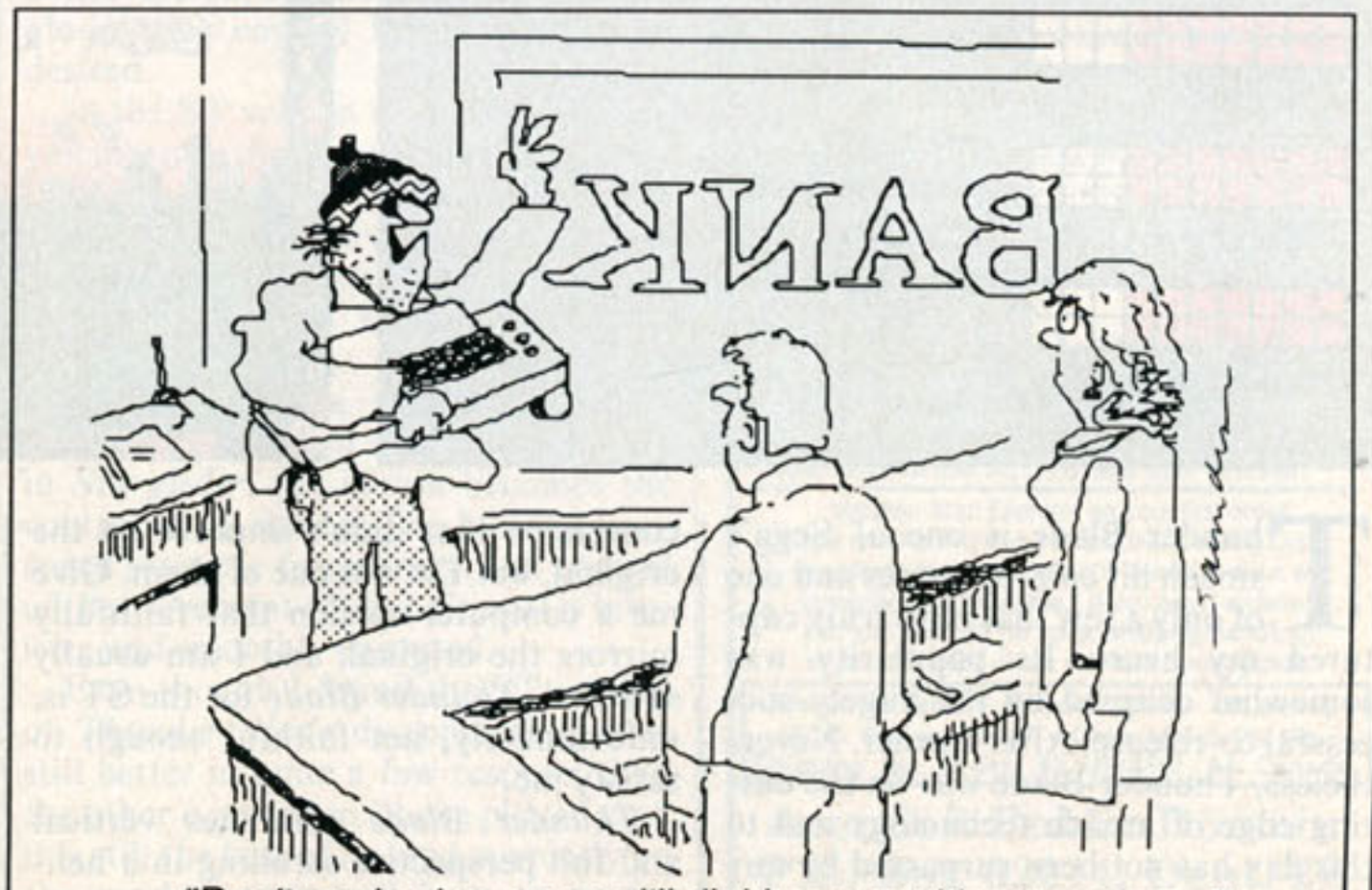
The graphics, animation, and sound in *Galactic Conqueror* are good. Your ship spins through space while dogfighting, and rebel ships make kamikaze dives at you. My only complaint is that everything comes at you from the center of the screen, making it hard to see the detailed graphics and judge who to blast first. The action is so fast I just held down the fire button and moved the ship to spread my laser fire and blast (almost) everything in my path. The sounds of the lasers and the explosions, which seem to have been digitized, add to the enjoyment of the arcade action.

Galactic Conqueror comes with the disk and a manual. The manual was adequate, though I noticed some errors. The F6 and F7 keys don't perform as advertised; use Help and Undo instead. And F9 moves your score and shield indicator to the bottom or top of the screen—something the manual doesn't mention.

Galactic Conqueror is quite addictive, even though the action doesn't change much from planet to planet. This sameness detracts from the overall play value of the program and keeps *Galactic Conqueror* from being one of the all-time greats.

Nevertheless, I recommend the game for shoot-em-up lovers, because it held my attention long after I had seen all it had to offer.

—John S. Manor



"Don't anybody move or I'll digitize you with my scanner!"

If you like golf, you have probably played on or more of the good golf simulations currently available for the ST. But have you ever had the urge to apply your golfing skills to something a little more whimsical? Something that would take full advantage of the color and graphics potential of your powerful Atari ST?

Well, now you can with *Zany Golf*, a game that lets up to four players compete on a whacky ten-hole miniature golf course.

In addition to its own rules and obstacles, each hole has its own par—the number of strokes you have in which to complete it. If you run out of strokes the game is over. When all players have run out of strokes, a score screen shows how many holes each player has completed, the number of strokes each used on each hole, and the total number of strokes racked up by each.

The game gives you some general advice and an overall picture of the hole before you start playing it. You use the mouse to set your ball on one of three

Zany Golf

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST

Required equipment: Color monitor

Copy protection: Yes

Summary: An amusing, imaginative miniature golf game

Price: $39.95

Manufacturer:
Electronic Arts
Box 7577
San Mateo, CA 94403
(800) 245-4525
(800) 562-1112 in CA

Thunderblade

EASE OF LEARNING

CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST

Required equipment: Color monitor; joystick optional

Copy protection: Yes

Summary: Mediocre conversion of an arcade favorite

Price: $49.95

Distributor:
Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
(312) 480-7667

Thunder Blade is one of Sega's smash hit coin-op games and one of only a few that have truly captured my heart. Its popularity was somewhat eclipsed by the hugely successful co-release, After Burner. Nevertheless, Thunder Blade was on the cutting edge of arcade technology and to this day has not been surpassed by any similar product.

Some reviewers would pan a coin-op conversion that didn't improve on the original, but I'm not one of them. Give me a computer version that faithfully mirrors the original, and I am usually satisfied. *Thunder Blade* for the ST is, unfortunately, not faithful enough to satisfy me.

Thunder Blade combines vertical and full perspective scrolling in a helicopter attack scenario that features realistic 3D effects. In the first scene, for example, the chopper moves toward and away from the screen as you change altitude; the cityscape below is continually redrawn to give you the feeling of plunging in and out of open areas between huge skyscrapers.

The graphic rendition of *Thunder Blade* for the ST has some definite plusses. While much of the detail in the original game had to be sacrificed to allow blitterless STs to keep pace,

starting spots on the green. Then you hold down the left button, leaving behind a line that extends from the ball away from the hole; the longer the line, the harder the putt. Let go of the mouse button to putt.

I have never seen a real putt-putt golf course without a windmill, and sure enough, *Zany Golf* has one on the very first hole. If you hit the ball through the door of the windmill, you earn an extra stroke. If you miss, the ball rolls down a ramp and reappears at the bottom of the hill. When you get close to the hole, you see a flag marking your target. The flag disappears into the hole when the ball gets close.

The second hole, the Hamburger hole, has to be my favorite. The green is U-shaped green, and you have to bounce your ball off a squirting catsup bottle and roll it under a bouncing hamburger, complete with tomatoes, pickles and onions. Clicking the mouse button makes the burger bounce higher. The animation throughout *Zany Golf* is amusing and takes good advantage of the graphic capabilities of the ST.

Some of the courses in *Zany Golf* have ingenious ways of getting the ball where you want it to go. On one hole, you have to blow the ball around with electric fans; on another you can control the ball with the mouse when it rolls onto colored tiles. One of my favorites is the pinball hole, which is set up like a pinball machine with bumpers, targets, and flashing lights. You must keep your ball in play with flippers at the bottom of the screen until it bounces into the hole at the top left of the machine.

I found *Zany Golf* refereshingly playable. You have no manual nor system of controls to memorize; it's just you and the golf course. The learning curve is about 30 seconds long.

Even though *Zany Golf* is a simple game, it should provide enough challenge and relaxation to keep any gamer happy for a long time. You will find yourself clicking for just one more game, because there are always new tricks to master. And you can always improve your score and try to break par—just as in regular golf.

Zany Golf is a good entertainment value. It combines the fun of a real miniature golf course with the imaginative bells and whistles a good programmer can conjure up. ***—John S. Manor***

enough remains to save the conversion from also-ran status. In fact, I know of no other game for any home computer that simulates the feel of a helicopter ride as well as this one does.

Simulation aside, there are some flaws that detracted greatly from my enjoyment of the game—among them, the wasteful title bar, which occupies the top quarter of the screen, obscuring much of playfield. The practical effect of this is that the shots of enemy helicopters and tanks are frequently seen before the vehicles themselves appear on the screen.

Also, enemy bullets look the same onscreen as your own, making it difficult to know which ones to avoid. The only way to tell which is which is somehow to determine which get larger (as they approach your chopper) and which diminish in size (as they move away).

A feature of questionable value that has been added to the ST version is the ability to reverse the vertical scroll, making it possible for the helicopter to reverse directions without turning. In the scenario in which a naval vessel must be attacked, this ability actually becomes a hindrance, for no matter how you try to maintain your airspeed, the chopper seems to just crawl forward. That may be more realistic, if the ship is under full forward power, but it is certainly not the way the coin-op played.

The arcade game placed you in the cockpit of the aircraft with a helicopter-style joystick in your hands. A lever at your left controlled your speed, and separate trigger buttons controlled missiles and machine guns. Obviously, no one expects to find this elaborate system in a home version, but the translation to single-joystick control leaves a lot to be desired.

In the ST version of *Thunder Blade* you increase the speed of the chopper by holding down the fire button while pushing the stick forward. But because the trigger button also fires your weapons, the potential for confusion and frustration is great.

Thank goodness the programmers decided to include a mouse routine! As in *Starglider*, the mouse becomes the controller of choice. The buttons keep speed separate from firing, and control of the movement of your aircraft is intuitive and smoothly executed.

Even though I found the ST version of *Thunder Blade* disappointing, it is still better in quite a few respects than the other conversion I have played, and it is still the best of its kind currently on the market, so it will have to do for now. ***—Frank Eva***

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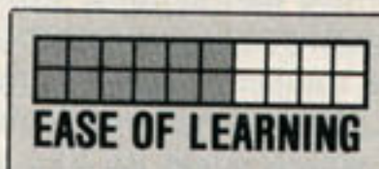
S.T.A.C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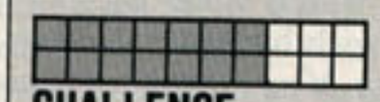
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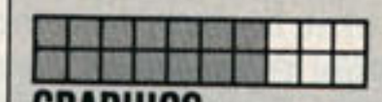
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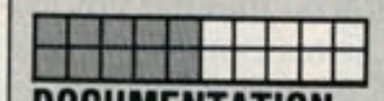
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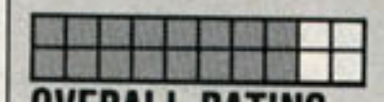
OVERALL RATING

System: Atari ST

Required equipment:

Copy protection: None

Summary: A powerful, versatile program for creating adventure games

Price: $69.95

Distributor:
Terrific Software
544 Second St.
San Francisco, CA 94117
(415) 957-0886

It is hard to imagine an Atari computer owner who has not, at some time or other, played an adventure game. And most of us who have set off on an adventure more than once have at least wondered how they are made.

Now owners of Atari ST computers can now only find out how they are made, but make up their own adventures—simple or complex, graphic or text-only—with the *ST Adventure Creator* by Sean Ellis, author of the similar *Graphic Adventure Creator* for 8-bit systems.

The first thing an adventure author must do is create a setting in which the game can take place, so *S.T.A.C.* provides a powerful set of commands and utilities with which you can create your own fantasy world governed by your own rules.

I have done some Basic programming, and when I saw the number and complexity of the commands offered by *S.T.A.C.*, my first thought was that I might as well attempt to program my game in Basic. But as I became more familiar with the package, my opinion changed.

S.T.A.C. is menu-driven, and the menus are basically similar, so they are easy to understand and use. Your adventure begins to take shape as you map out the rooms (or locations) in which your adventure is to be set. Then you list the objects that will be found in the rooms. All this is done by entering information on forms accessed via menus.

The next step is more complex: you enter commands, many of which have to do with "conditions," in sentence form. A condition tells the program what to do when a player enters a room or picks up an object. A typical condition might have a form like this: "If you are in room 6 and have a gold coin and give it to the ogre, then the ogre leaves you alone." An alternative condition, which might be the next sentence, would be: "If you are in room 6, but you don't have the gold coin, the ogre attacks you. You die. The game is over." Conditions govern the action of the game.

All commands and conditions are entered using the S.T.A.C. language. A simple condition entered in S.T.A.C. might look like this: if verb "give" and noun "coin" and carried 3 then message 8 20 +count. In other words, having enocuntered the ogre, you should enter GIVE COIN. The program checks to see that you have object number 3 (a gold coin) on the list of objects, which you have entered from one of the menus. If you do, message 8, which you have also entered from a menu, is printed. The message might say, "The ogre thanks you and moves aside to let you pass." You then get 20 points for being smart enough to bribe the ogre.

This looks complicated, and it can be, if you try to write a complicated adventure. However, *S.T.A.C.* comes with a set of standard adventure commands and conditions, called the QSTART file, already created for you. You can load this file from the disk into the program and build on it. You can also change it or start from scratch.

The QSTART file offers pre-programmed ways to handle such things as what happens when a player dies, listing an inventory of what you are carrying, and basic functions like turning graphics on and off.

Unfortunately, the user manual just doesn't stack up to the rest of the program. I found it vague in some important areas—the way rooms are connected, for example.

The thing that saves the manual from virtual uselessness is the step-by-step description of the creation of a simple adventure. This careful walkthrough, along with the easy-to-use menus and forms, does a good job of negating the other shortcomings of the manual.

S.T.A.C. includes a small collection of utilities that make the process of creating your own adventure even more enjoyable than it might otherwise be. You can paint your rooms and draw your objects with the built-in paint program and add sound effects (bells, whistles, beeps) and original music with the sound utility. There is also a font editor that lets you customize the text that appears on the screen.

To close with a cliche, what you get out of *S.T.A.C.* will depend on what you put into it. *S.T.A.C.* makes designing an adventure easy and a lot of fun. Your imagination can run wild as you paint rooms, choose objects, write messages, and design traps and puzzles.

If you are a novice programmer, it may take some time for you to feel comfortable with such programming concepts as conditions, but if you know Basic, or any other computer language, you should have no trouble getting started.

S.T.A.C. impressed me with its versatility. It is a very powerful program, and you can even sell the adventures you create, as long as you give credit to creators of *S.T.A.C.*. If you love adventuring and have the persistence to work your way through the manual, you will find *S.T.A.C.* an exciting new approach to a time-honored form of computer recreation.

—John S. Manor

Back To A:*.*

ST HELP KEY

To change the directory line of the GEM file selector to A:*.*, regardless of what is already there:

1. Click on the directory line.
2. Press the Esc key.
3. Click on the Move bar in the directory window.

A:*.* will appear on the directory line.

From *The Atari ST Book of Tips, Instructions, Secrets and Hints*, © 1988 by Ralph C. Turner, Index Legalis Publishing Co., P.O. Box 1822-20, Fairfield, IA 52556, (515) 472-2293. ■

RealTime

A high-end MIDI sequencer packed with features

A whole new generation of MIDI sequencers for the Atari is now making its way into the hands of musicians eager to be on the leading edge of computer-controlled music. Among them is *RealTime*, a program that combines the features of a solid sequencer with a mult-tasking environment to create one of the best all-around MIDI recording packages on the market.

Part of the charm of *RealTime* is that it was designed to be conducive to experimentation and creativity; part that it offers many levels of complexity. The price you pay for all this charm is that, whether you are new to MIDI or a veteran user, you will have to budget some time to learn *RealTime*. Don't expect to assimilate it all within a few days; it might be months before you are pushing the limits.

Organizing Music

Unlike most sequencers, which organize musical information more or less rigidly according to a multi-track tape recorder model, *RealTime* offers a more musicianly approach, which is well-suited to those who compose their music through improvisation and experimentation.

Under *RealTime*, music data are recorded (or entered via note-painting or other editing features) on tracks pertaining to different *sections* of a composition—verse, chorus, bridge, etc. Once music data have been entered in a section, the section is automatically placed in the *RealTime* workspace library, from which it can be accessed to form part of a more complex structure, called a *song*.

Once a song is assembled (a click-and-drag process that involves moving sections from the Library window into the Song window and specifying repeats as necessary), it too becomes part of the workspace library, where it remains available to produce other, more complex songs (see Figure 1). A section can contain up to 256 tracks; a song, an effectively unlimited number of sections and repeats—up to 999 bars of music in all.

The process of recording and arranging—of moving from track to composition and back again—is vertically integrated and completely interactive. New tracks can be added to a section at any time, and a variety of *views* (see below) make it easy to examine and edit different aspects of a track or section without losing touch with how a composition as a whole is evolving. Songs and sections can be saved separate from other workspace data.

Devices

RealTime also offers a useful abstraction called the *Device*, which helps you organize the mechanical aspects of your studio setup and automate certain parts of the music-making process. Devices come in two types, drum and synth.

Drum Devices store the names of the sounds made by your drum machines or samplers and the pitches associated with them, providing a way of vectoring rhythm track information through one or another drum sound as if each drum were an independent mechanism (see Figure 2).

Synth Devices are more complex. They are essentially automata used to store collections of notes, chords, and other musical figures for triggering from within a composition. Sophisticated algorithms can be brought in-line to activate synth devices in a wide variety of ways—in specific orders, at random, or according to a range of probabilities.

Devices can be loaded and saved separately or combined in files called *Device Lists*. A particular Device List can be set to load automatically when you

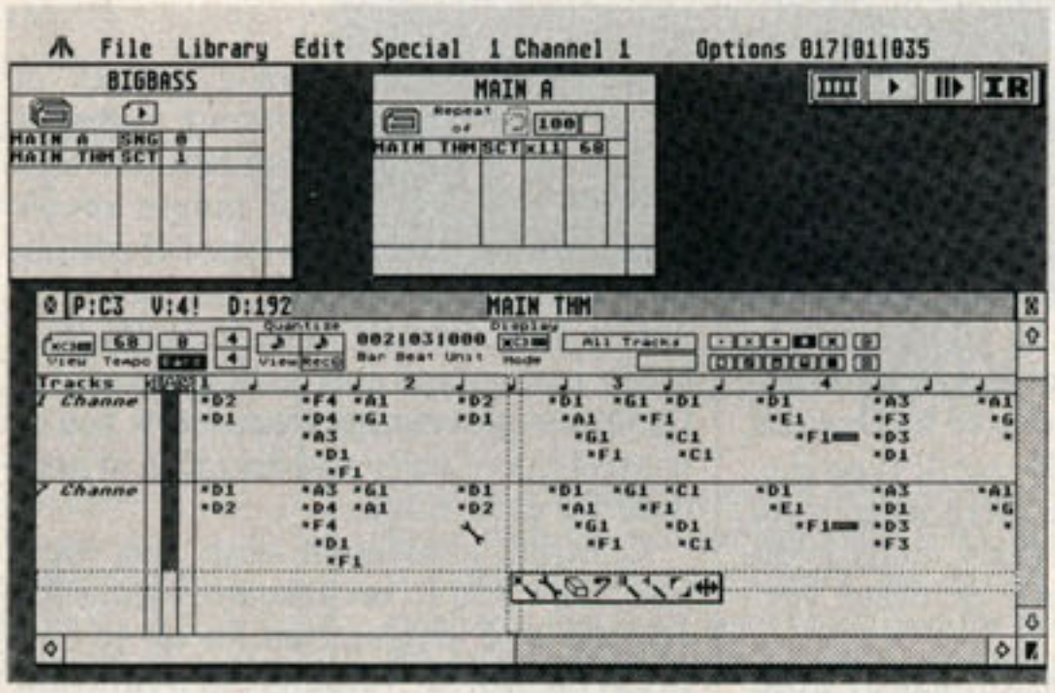

Figure 1. The RealTime main screen. The workspace/file is called BigBass, a name is reflected in the Library window in the upper left corner. To its right is the Song window, Main A, and below is the Main View window, opened to show the Section Main Thm. The Event Area contains the notes for the two tracks. The toolbox window appears at the bottom of the Event Area.

By MIHAI MANOLIU

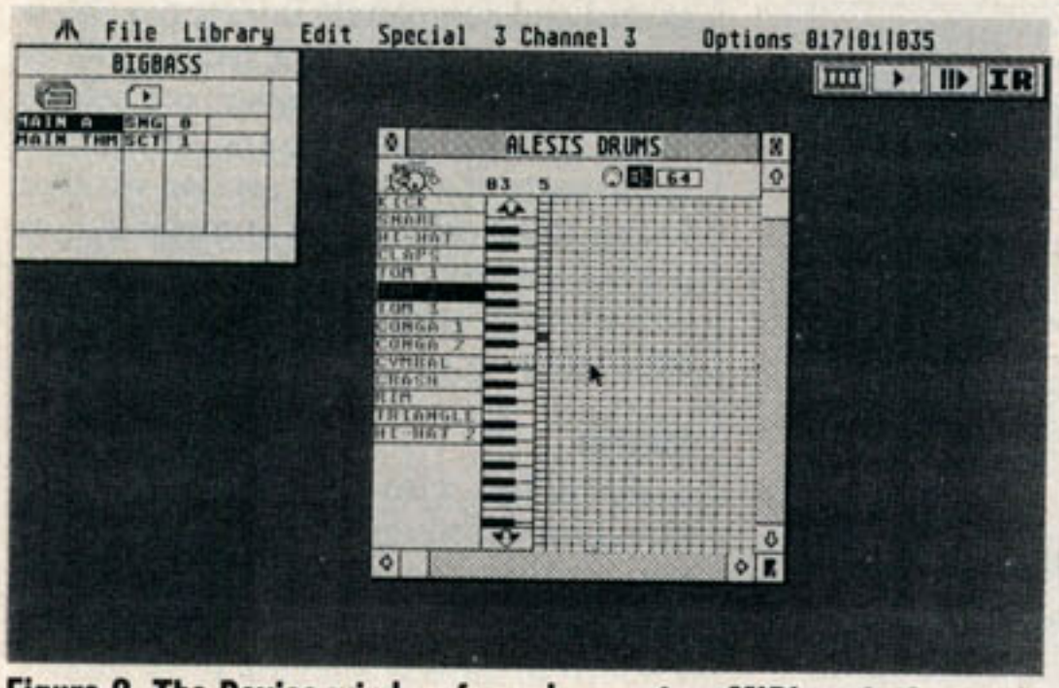

Figure 2. The Device window for a drum setup. MIDI equivalent notes are being assigned for Tom 2.

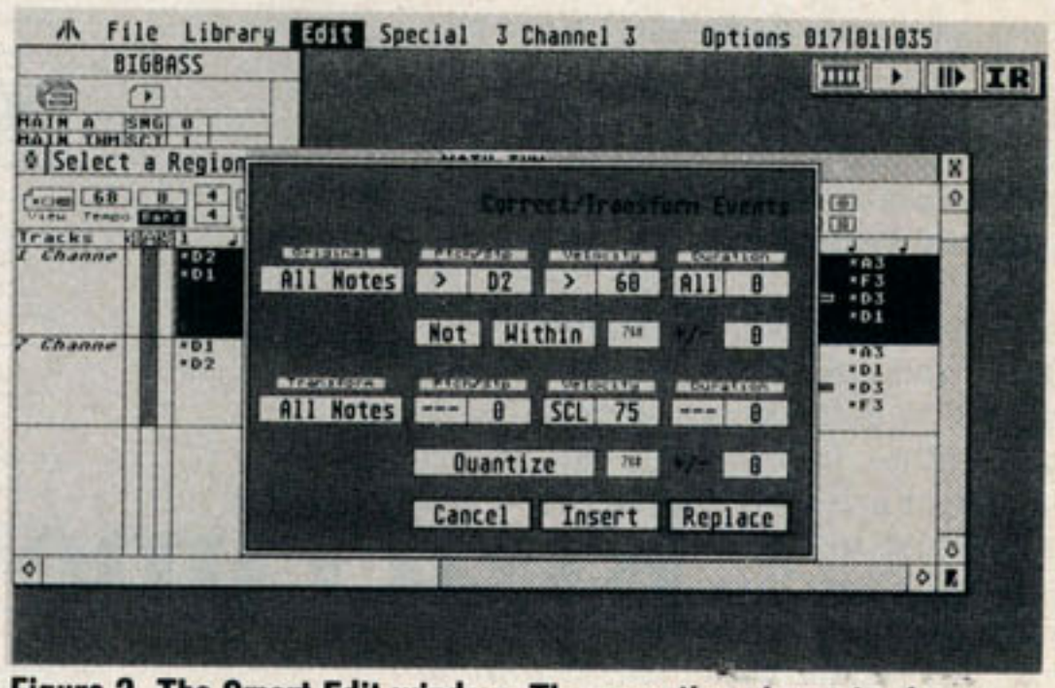

Figure 3. The Smart Edit window. The operation shown is about to scale all notes with pitch higher than D2 and velocity greater than 60 to 75% of their original values. The selected edit area is shown darkened in the background.

boot *RealTime*, simplifying the process of setting up devices for an established studio arrangement.

Event Editing Tools

RealTime offers a variety of iconic tools for editing different kinds of MIDI data. You open the Toolbox by moving the cursor into the Event Area and clicking with the right mouse button. A small window containing eight icons appears (see Figure 1). Among these, the most powerful is probably the Monkey-wrench, which, in combination with the Shift key, allows you to change the pitch, velocity, and/or duration of individual notes.

Other powerful tools include the Eraser, used to excise notes individually or in small groups, and the Selector, used to define regions of notes for further algorithmic editing or modification.

To create global changes in a particular type of MIDI data, various "smart editing" features can be employed (see Figure 3). Events to be altered can be selected according to source (i.e., recorded data, data generated by Devices, data entered manually, etc.); type (i.e., MIDI controller data, pitch wheel data, etc.); pitch range, velocity, and/or duration (for note data); or other variables.

Values can be transformed by absolute or relative amounts, scaled by percentage, quantized into a range of multiples, etc. If you know the MIDI protocol well, these features can be used to do a wide variety of useful tinkering on raw data—from quantization and transposition to note and controller thinning.

RealTime

System: Atari ST

Version reviewed: 1.11

Copy protection: Yes

Summary: One of the most versatile new sequencing programs on the market

Price: $350

Manufacturer:
Intelligent Music
116 North Lake Ave.
Albany, NY 12206
(518) 434-4110

Views

RealTime also offers a variety of more abstract *views* on your recorded data that let you establish relationships between tracks, control ranges of effects, and perform other types of editing and arrangement without handling MIDI data directly. The Velocity/Velocity percentage and Articulation/Articulation percentage views allow you to control the velocity and duration of note data for each track.

Controls associated with this view also allow you to set absolute values for velocity and articulation for up to five predetermined velocity/articulation Strike symbols, plus probabilistic limits used to restrain the behavior of the random Strike symbol. (Strike symbols are used in note-painting.)

Other controls allow you to set permissible deviations in velocity and articulation, which is useful for re-establishing a human feel in pre-quantized MIDI track data.

The Track Bondage view slaves (so to speak) one track to another and creates variations of the master track, which is useful for orchestration, rhythmic emphasis, unusual doubling effects, and algorithmic variations. A variety of controls determine which aspects of the master and slave tracks are preserved.

The Pitch View gives you control over transposition and lets you specify what percentage of the notes on a track are played (note density). It also offers a way to control the Note Order feature, which is used in conjunction with synth Devices. The Time View is used for both shifting the time location of a track and blurring the timing slightly through time deviation control.

The Fills View provides access to a whole range of controls used to generate extra notes between already existing notes. For example, the Fill With option can generate fills using sound from another track. Divisions define the spacing between events, and Density selects a percentage of fill occurrences. Fill filters limit the placement of events between certain boundaries.

Note Painting

RealTime permits the entry and editing of note data by hand through a sophisticated graphic interface. Notes can be painted into a track for later replay or added while the track is playing—a very useful feature that aids in experimentation.

The Striker is icon used for note-painting moves in quantized steps, facilitating the accurate rendition of various durations. However, the process of note-painting can become cumbersome

when a wide variety of velocity and articulation values must be represented, because only five Striker velocity/articulation values can be preset at one time.

In sum, though the note-painting feature is awkward when employed for step-entry, it works fine for editing—particularly when it is used to add or remove material from pre-recorded tracks.

Other Features

RealTime will produce standard MIDI files, but in a somewhat peculiar fashion, requiring that you start by making a copy (Movie) of the Song or Section you want saved in MIDI file format by playing it when the Movie icon is highlighted.

Importing MIDI files is easier, and *RealTime* automatically assigns different channels to different tracks in the process of translating MIDI files to its own internal format.

The internal timing of *RealTime* resolves to an adequate 192 pulses per quarter note, and quantization can be applied either during recording or afterwards. *RealTime* can synchronize to MIDI Time Code, MIDI Song Position Pointer, and even SMPTE (using Phantom hardware, available from Dr. T's Music Software).

Further useful features revolve around *RealTime* support of multitasking, both internally and externally. You can edit and save files, and even load and operate certain external applications—all while your music is playing.

Conclusion

RealTime is a great program for the creative musician. It may take you a while to get used to its unique approach, but it will be time well spent. The manual is adequate (though it does leave some important questions unanswered), and the tutorial is particularly good. Extras such as the detailed index and profuse illustrations definitely help to make this dense program much more accessible.

However, *RealTime* is still limited in certain ways worth mentioning. For one example, it provides no way to record or edit MIDI system exclusive data, though this feature is expected in the next revision. For another, the program offers no "note-taking" feature that would help document the tracks and sections it is used to produce.

Nor is *RealTime* compatible with existing hardware enhancements used to expand the number of MIDI channels that can be addressed by the ST.

Large files seem to load and save fairly slowly. And the program uses memory in such a way that owners of older STs may need to remove accessories in order to get it to boot. Moreover, *RealTime* is copy-protected, and cannot immediately be installed on a hard disk—instead, registration of your purchase entitles you to a free backup copy and a hard disk installation utility, both of which are supposed to be sent by return mail.

Finally, although the $350 price tag may be reasonable for such a powerful program, not many musicians are likely to be able to afford *RealTime* if they have already invested heavily in earlier sequencers. A simpler version at a much reduced price could be a major seller.■

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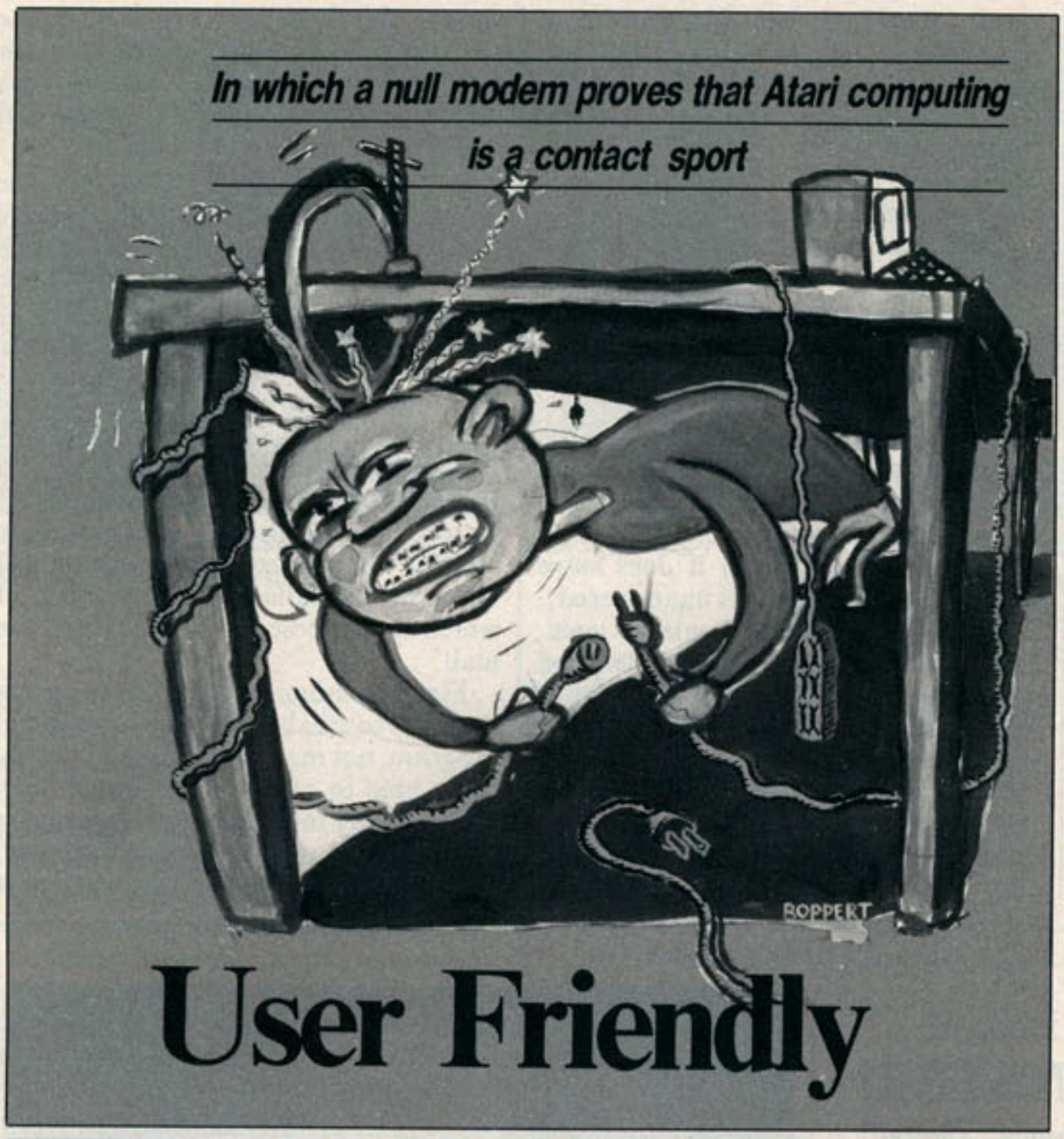

User Friendly

By DAVID NOYES

For a brief change of pace, my column for this issue centers not on newsletters, but on two of my most recent Atari computing experiences.

Being a true Atari 24-bitter (owner and operator of both 8- and 16-bit machines), I am always on the lookout for ways to integrate both into my computing. I was, therefore, quite pleased to discover a public domain *Print Shop*-to-*Printmaster* conversion program in my local user group's 16-bit PD library. The utility, which came from the Cryptic Wizard, Wizard's Corner, CHQ BBS (216-758-0284), is actually two programs. The first is an 8-bit graphics compilation program; the second converts the compiled files from *Print Shop* to *Printmaster* format.

I have an extensive collection of *Print Shop* icons, so I was eager to test the program.

As I read the documentation, however, I began to realize that testing the program was going to take some doing. The instructions told me to port the 8-bit Basic compilation program over to the 8-bit machine, compile the icons on it, and then port the compiled file(s) over to the ST, at which time the 16-bit conversion program could be run. The medium for accomplishing all this porting was a *null modem*, an item I didn't happen to have handy.

I had some instructions kicking around the house on how to make a null modem cable, but no instructions on how to use one. Instructions in hand, I went to my local Radio Shack to buy cable and connectors and, in my browsing, discovered that all that I really needed (in addition to my modem and the cable currently in use) was Radio Shack part number 26-1496, Null Modem Adapter, male DB25 to female DB25, which sells for $7.95.

I rushed home, attached the connector to the modem connection at the rear of my ST, and then attached the cable coming from the modem (RS-232) output on my MIO board—after disconnecting it from my modem, of course—to the adapter. I then had a cable running from my 800XL to my 1040ST passing through my MIO board to the adapter along the way. I had not, to that point, applied power to any portion of either system, because I was still feeling rather tentative about the entire experiment.

Keeping my fingers crossed, I turned on both machines, loaded shareware terminal programs (Vanterm on the ST and Bobterm on the XL), put both machines in half duplex, so I could see what I was typing on one (in terminal mode) on the other. Because both Vanterm and Bobterm can function at 19,200 baud, I set my parameters to reflect that transmission rate.

Using telecommunications as a model, I transferred the 8-bit program, which was currently resident on a disk in the floppy drive of my ST, to the formatted disk waiting in the 1050 attached to the XL. My logic? That I operate one machine—the ST—as if I were uploading to a BBS and the other—the XL—as if I were downloading from a BBS.

In an instant, both screens indicated a successful transmission, but it all happened very quickly, and at first I thought I had been unsuccessful—until I checked the directory of the disk in the 1050 and the filename and sector size. The speed of completion was simply a function of the 19,200 baud rate. What a treat for someone weaned on a 300 baud modem!

I ran the 8-bit program and transferred the compiled files back to the ST just as I had done before in reverse; I uploaded from the XL and downloaded to the ST. No problem . . . and no need to hurry; the ST waits for the file to be sent, just as the XL waits when the ST is sending. The whole process is just like accessing a BBS via a modem, except that no modem is involved, and the baud rate is considerably higher.

Atari Computing: A Contact Sport

Living as I do on the top of a small mountain in New Jersey, I have always been concerned with providing not only surge protection for my computer equipment, but protection from lightning strikes as well.

I know that surge protection is not lightning protection, so my standard procedure is to unplug everything, including the phone line to the modem,

ILLUSTRATION BY JOHN BOPPERT

Being a true Atari 24-bitter (owner and operator of both 8- and 16-bit machines), I am always on the lookout for ways to integrate both into my computing.

[redacted]

when I am not actually using my system. Bear this in mind as I set the stage.

My computer desk is shaped like a letter L that has fallen to the left; the keyboard of the 1040 is about 3″ inches lower than the rest of the desk to the right of it. This, of course, places the keys at a comfortable height. And of course, the higher portion to the right of the keyboard is an ideal location for the mouse, right?

Wrong. Right for right-handers, impossible for a klutz like me who has no coordination in his right hand and only a minimum in the left.

Using a little ingenuity, I placed the ST a 12″×1″×3′ plank. This gave me about a foot on the left—ideal for a mouse pad and a mouse—and provided better access to the built-in floppy drive. Fantastic!

Well, not exactly. The mouse cable was then draped across the keyboard. The solution: four small rubber feet on the plank that allow the mouse cable to pass under the ST and come out on the left side. Great!

Well, not exactly, what if I bumped into the corner of the plank and knocked the ST onto the floor? I had a fix for that. I bought a $3 C-clamp (didn't want to damage the desk by drilling holes in it) and clamped the plank at the front right corner.

Finally, I was set to compute. My custom setup kept the mouse perched comfortably to the left of the computer, and all I had to do was be careful not to whack my right knee on the handle of the clam under the desk. What a genius!

Now, remember absolute lightning and surge protection—everything unplugged, right? Remember, too, my eagerness to experiment with my new null modem.

Well, I got home from work the other day, ran upstairs, dove under the computer desk to plug in my two main power cords, and almost instantly saw stars (no, I didn't have an astronomy program loaded). At the same time I felt intense pain in my head and instinctively put my hand to the area that was hurting. It felt wet (please pardon the gore); my hand was covered with blood.

I had hit the C-clamp with my head, and I now have eight stitches in my scalp to prove it. Don't let anyone tell you that Atari computing is not a contact sport! ■

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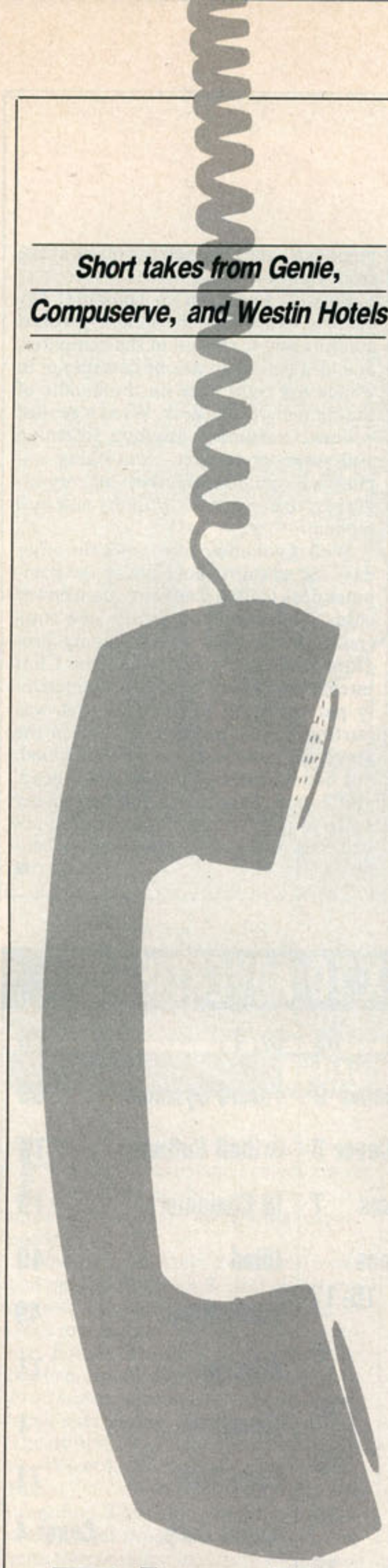
Short takes from Genie, Compuserve, and Westin Hotels



Teletalk

By BETSY STAPLES

```
GEnie          NEWSBYTES          Page 316
          Newsbytes News Service

  1. About Newsbytes
  2. Newsbytes Instructions
  3. This Week's Index
  4. Retrieve News by Bureau
  5. Retrieve News by Subject
  6. Retrieve News by Story Type
  7. Download A Week's Newsbytes

  8. The Mailbag (Reader Mail)
  9. Send FEEDBACK to Newsbytes

Enter #, <P>revious, or <H>elp?3
```

Figure 1. Newsbytes main menu.

```
        Newsbytes News Service
        Subject Selections

1. Apple
2. IBM
3. UNIX
4. Trends
5. Business
6. Telecom
7. General
8. Government
```

Figure 3. Newsbytes subject menu.

```
NEWSBYTES INDEX/WEEK OF AUGUST 15, 1989/Issue #320
SAN FRANCISCO, CALIFORNIA, U.S.A., 1989 AUG 15 (NB) -- In this week's
edition:

============
GENERAL NEWS
============

HACKERS PARTY HELD IN AMSTERDAM
AMSTERDAM, THE NETHERLANDS, 1989 AUG 11 (NB) -- For three days,
Amsterdam's Club Paradiso was a paradise on earth for hackers.
From the second until the 4th of August, it was the venue of the
eloquently named Galactic Hacker Party & ICATA '89, organised by
the Dutch hackers magazine Hack-Tic ('the magazine for
techno-anarchists')

PIRATE SOFTWARE THRIVES IN HONGKONG
HONG KONG, ASIA, 1989 AUG 12 (NB) -- Industry professionals have
long complained that the local distributors of PC software packages
are providing very poor service and support. A change may be on
the way.

DOWN UNDER CD-ROM YELLOW PAGES
SYDNEY, AUSTRALIA, 1989 AUG 10 (NB) -- Sydney-based Read Only
Memory has released its latest database-on-CD product. "Australia
On Disc 2" contains all names, addresses and phone numbers contained
in the telephone books of all Australian capital cities.

TOOLKIT FOR LAPTOP TRAVELLERS
HUNTINGTON BEACH, CALIFORNIA, 1989 AUG 11 (NB) -- Computer Products
Plus (CP+) has recently released the Road Warrior and Delux Road
Warrior Toolkits for travellers who run into problems hooking up
their laptops to phone systems when they travel.

========
BUSINESS
========

COMMODORE LOSES $8.9 MILLION
WEST CHESTER, PENNSYLVANIA, U.S.A., 1989 AUG 8 (NB) -- Commodore
International has announced a loss of $8.9 million for the fourth
quarter on sales of $180.3 million.
```

Figure 2. Sample entries in Newsbytes index of the week.

Atarians who travel with their computers can now find entertainment and companionship even in unfamiliar cities when they stay at Westin hotels. The chain now offers modular phone jacks in guest rooms of all Westin hotels and resorts.

Five Westin hotels—those in Indianapolis, San Francisco, Vail, Calgary, and Edmonton—offer double phone jacks so that guests can use the telephone while sending information over the modem.

This new service should be of special interest for Stacy owners. But no matter which machine you use, be sure to check out the cost *before* logging on; hotel phone charges can be usurous!

New From Genie

Just last week, Senior Technical Editor Jainschigg and I were wondering, "Whatever became of Neil Harris?" We hadn't heard a word from the former voice of Atari since he left Sunnyvale for suburban Washington, DC.

Then came two press releases from Genie loaded with pithy quotes from the

```
        Newsbytes News Service
          Type Selections

1. News
2. Exclusives
3. Bulletins
4. Corrections
5. Advances
6. Reviews
7. Editorials
8. Indexes
```

Figure 4. Newsbytes type selections menu.

thing, we're here to help him."

As for Newsbytes, Product Marketing Manager Harris describes it as "one of the premier computer and consumer technology news services in the world."

Newsbytes transmits an average of 200 stories per week and stores two weeks' worth of stories and six months' worth of reviews and editorials for access by Genie subscribers. You can display a menu containing headlines by subject, type of story, or geographic location of the originating bureau—Los Angeles, San Francisco, Atlanta, Washington, London, Brussels, Toronto, Tokyo, Singapore, Kuala Lumpur, Hong Kong or Sydney—and then select just the stories you want to read.

Alternatively, says Neil, you can "download all the current week's stories in one large file to be read offline."

Genieus offers a bulletin board, on which they can post messages by categories, and realtime conference capability for online discussions.

one-time publisher of *Explorer*. According to Neil, Genie's two newest services are Genieus, a roundtable that offers subscribers detailed information about available online services, and Newbytes News Service, a weekly international computer industry news service.

Genieus offers new and experienced users a bulletin board, on which they can post messages by categories, and realtime conference capability for online discussions. It also offers timely information about Genie news and events.

In the bulletin board area users will find the following categories: How to use Genie's bulletin boards, Using Genie's roundtable conference system, Using Genie's software libraries, Using GE Mail on Genie, Lost and found on Genie, What's new on Genie, and Genie's wishing well.

Also available are tips on system navigation, an online user manual, a phone access list, and information on client services, copyright notices, policies and guidelines, hours of operation, holiday schedules, and rates.

Says Genieus RT Sysop Mark D. Hiatt, "If there is something you like about the Genie service and you want someone to know about it, this is the place to do it. Likewise, if you don't like something and want to blow off some steam, we're here to listen to that, too . . . If a Genie service user needs any-

The Source Dries Up

By the time you read this, The Source, one of the original online information services will have been absorbed by the other pioneer in the now well-established industry, Compuserve.

If you were a subscriber to The Source, you should have received a Compuserve user ID number and password, which, when used, will qualify you for a $20 usage credit. For more information, Source members can call a special toll-free customer service number: (800) 635-6225 or (614) 457-8650.

Compuserve spokesman Maurice Cox reports that a customized welcome menu has been posted on Compuserve to help Source members learn Compuserve navigation commands, become familiar with databases, and locate online support services. Former employees of The Source have been "encouraged to interview for open positions within Compuserve's national organization."

And on that note, the first decade of telecommunications service draws to a close. ■

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#393/394/533 - PrintMaster Graphics
#400 - Seven Disk Labeling Programs (w/100 Pin Feed Disk Labels $6.95)
#470 - Two Virus Killer Utilities, Database and more
#475 - Werty's House of Horror (Adult Game, Color)
#500/600 - Publishing Partner Fonts
#511 - Dungeon Master Maps for Levels 1-7
#512 - Dungeon Master Hints/Character
#514 - Monochrome Emulator V3.0 and more
#551 - Kid Shapes Ages 2-8 (Color Only)
#555 - The Assistant Chef - Electronic Cookbook
#557 - Children's Programs (Color Only)
#567/728 - Desk Accessories
#575 - Sheet V2.0 - Shareware Spreadsheet
#588 - Pac Man, Hangman and more (Color Only)
#590 - Dungeon Master Utilities
#599 - PageStream Fonts, Font Converter
#655 - ST Writer V3.0 w/Spell V2.8
#667 - Benjamin's ABC's for Kids (DBL)
#689 - Pictionary Type Game & Poker (Color Only)
#693 - Statistically Accurate Baseball V5.0
#696 - Hard Disk Utilities
#699 - Children's Programs: Kid Color, Kid Adder Kid Story, Kid Sketch (Color)
#700 - ST Xformer V2.4 - 8 Bit Emulator
#721 - Drawing Programs
#723 - Lottery Programs
#741 - Copystar V1.0, Address Book Base
#749 - Barnimals - Listening/Guessing Game (Color)
#758/759 - Calamus Fonts
#768 - NeoDesk Icons
#769 - Super Breakout (Mono Only)
#790 - Pentimo Strategy Game (Mono Only)
#791 - 3 Tetris Games (DBL/Color Only)
#792 - D&D Programs
#794 - *Bloodwych* Playable Demo (Color)
#795 - B/Stat - Statistics and Graphics
#798 - The Pilot Flight Game (Color Only)
#799 - PrintMaster/Plus Utilities
#801 - Mail/Envelope Labeling Programs
#803 - Desk Manager V2.5, Quick Menu
#807 - Quick ST V1.4, Turbo ST V1.6d Demo
#810 - Sheet V2.5P Shareware Spreadsheet
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Hacking The 8-Bit Atari

A basic tutorial to fill in some of the gaps

Hacking the 8-bit Atari computer is fun. What makes it so is the wide range of things you can do with it. Besides all of the things you expect from a computer, such as competent number-crunching, the 8-bit offers plenty of graphics features, four sound channels, and numerous I/O and user-interface options. Moreover, the 8-bit is essentially a simple machine—no more than an hour's work can get you started with Atari operating system and assembly language programming.

In the next few issues of *Explorer*, we will explain how to work with 8-bit graphics and sound. We will provide the information that will enable you to write your own fast-action games and colorful applications. And we will include memory maps and other useful documentation for you to keep and add to your programming library.

System Overview

Becoming proficient at programming the Atari system is largely a matter of learning to use the Central Processing Unit (the 6502 CPU) and its four support chips: ANTIC, GTIA, POKEY, and PIA. The interrelationships among the CPU, these support chips, system peripherals, and memory are shown in Figure 1.

As indicated by its central location in the figure, the CPU is

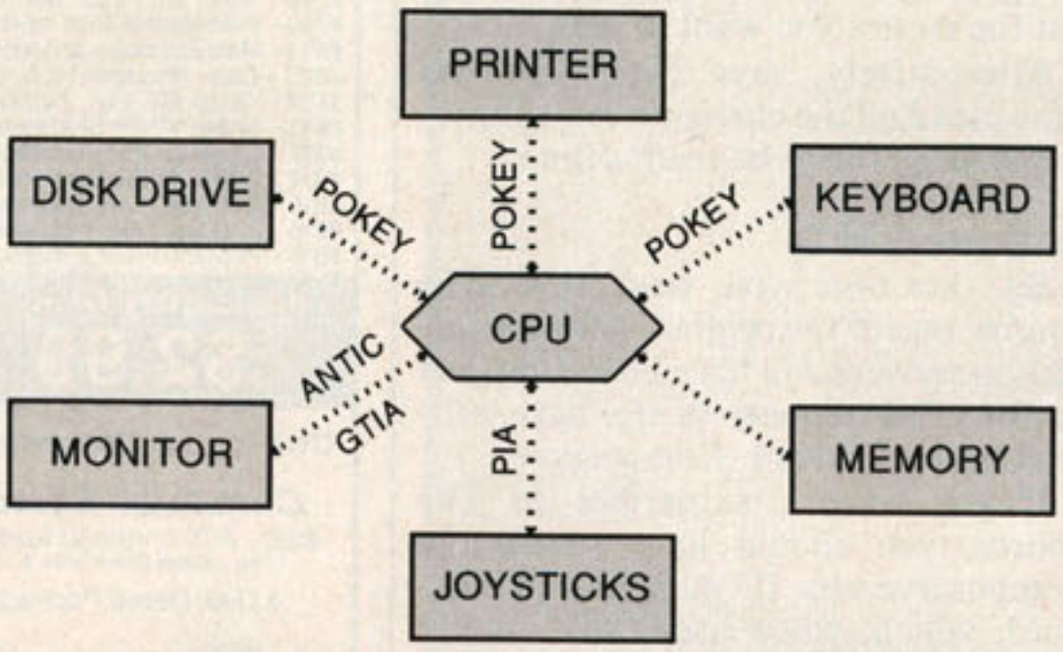

Figure 1. The overall architecture of the Atari 8-bit computer, showing the relationship between the 6502 CPU and the support chips that drive its various peripherals.

the workhorse of the computer system. It is responsible for all arithmetic and logical operations as well as data transfers from one part of memory to another. The support chips serve to control various peripheral devices, as follows.

ANTIC: The primary responsibility of ANTIC, a microprocessor in its own right, is to fetch video data from memory and display it on the TV screen.

GTIA: The main job of GTIA, a television interface adapter chip that works along with Antic, involves the control of color and bitplane graphics (player-missile graphics).

By ALLAN MOOSE and MARIAN LORENZ

Recent enhancements to the Atari 8-bit computer line, including the XEGS computer-convertible video game system with light gun; the XF551 double-density disk drive; and the XEP80 80-column card—not to mention advances in operating system software both from Atari and from third-party manufacturers—are helping to create renewed interest in 6502-based Atari machines.

Unfortunately, much of the superb literature and technical documentation written about the Atari 8-bit line during its heyday is now out of print or difficult to find. The current generation of budding Atari hackers cannot easily turn, as past generations of programmers have, to such classic reference works as Chris Crawford's "De Re Atari," the legendary "Tricky Tutorials," and Dave Small's famous "Outpost: Atari" columns in Creative Computing in hopes of discovering the often-undocumented arcana employed by wizards of yore.

So, starting with this issue, Atari Explorer is proud to present a new series on 8-bit programming—something with enough meat to satisfy the increasing number of Atari owners who know how to use basic applications, have worked their way through Basic, have a fair understanding of computers in general, and are ready for something more.

Our authors, Allan Moose and Marian Lorenz, are long-time Atari enthusiasts and experienced 6502 techs, as well as accomplished writers and educators. We think you'll find their articles easy to follow, while being both challenging and rich in information.

While a basic curriculum for the series has been established to cover the major points of Atari system design and Atari 6502 programming, the authors and editors are interested in making the series as responsive as possible to our readers' needs. We would appreciate your feedback—in the form of both suggestions for further topics, and your own articles and programs inspired by the topics discussed.—Ed.

Location	Use
55,296 to 65,535	Operating system and arithmetic routines
53,248 to 55,295	Hardware registers ANTIC 54,272 - 54,783 PIA 54,016 - 54,271 POKEY 53,760 - 54,015 GTIA 53,248 - 53,503
40,960 to 53,247	4K unused memory; Basic or left cartridge
32,768 to 40,959	Used for screen memory and display lists. Amount used depends on graphics mode.
? to 32,767	User program RAM. Location of the bottom depends on presence or absence of DOS and other factors.
1,536 to 1,791	Page six. Unused by OS or Basic. May be used to store machine language routines.
1,152 to 1,535	RAM used by Basic and arithmetic routines
512 to 1,151	OS RAM. Contains shadow registers used to update hardware registers during the vertical blank.
256 to 511	Page one. Hardware stack.
128 to 255	Basic page zero.
0 to 127	OS page zero.

Figure 2. Memory allocation Overview.

Mode Number		Columns/Rows		Scan Lines	Screen RAM	Total Screen	
Basic	ANTIC	with Text Window	W/O Text Window	Bytes per Mode Line	Bytes per Mode Line	Memory (minimum)	Number of Colors
0	2	-	40X24	8	40	960	1
-	3	-	40X19	10	40	760	1
12	4	40X20	40X24	8	40	960	5
13	5	40X10	40X12	16	40	480	5
1	6	20X20	20X24	8	20	480	5
2	7	20X10	20X12	16	20	240	5
3	8	40X20	40X24	8	10	240	4
4	9	80X40	80X48	4	10	480	4
5	10	80X40	80X48	4	20	960	4
6	11	160X80	160X96	2	20	1920	4
14	12	160X160	160X192	1	20	4296	2
7	13	160X80	160X192	2	40	3840	4
8	15	320X160	320X192	1	40	7680	1
*9	-	-	80X192	1	40	8138	1
*10	-	-	80X192	1	40	8138	9
*11	-	-	80X192	1	40	8138	1
15	14	160X160	160X192	1	40	8138	4

*GTIA modes are not set by the ANTIC display list but by setting bits D6 and D7 in the GTIA hardware register prior at address 53,275 decimal.

Figure 3. Atari Graphics Modes.

POKEY: A digital input/output (I/O) chip that controls transmission of data from the keyboard and serial communications port, POKEY is responsible for sound generation, hardware timers, reading paddle and other continuous controllers, and a number of other tasks.

PIA: The Peripheral Interface Adapter, PIA, is connected to the joystick ports and is a resource for hardware interfacing and alternative forms of I/O. Among other things, PIA supports a full parallel interface for joystick and other device interfacing.

Memory Mapping

Besides the CPU and support chips, the other important component of a computer system is memory—a place where programs and data are stored for rapid access by the CPU and other components of the system. The memory of your Atari computer is contained in a group of chips.

Some of these chips—called ROM, or Read-Only Memory, chips—contain permanent information: namely, an operating system program that gets the computer up and running each time it is turned on. Other memory chips—called RAM, or Random-Access Memory, chips—are used to store programs and data while the computer is running.

The Atari 6502 microprocessor sees its memory—both ROM and RAM—as a consecutive series of boxes, each of which can store one 8-bit binary value (see sidebar). Each box is referred to by a number called an *address*, which indicates its position in the series. The *program counter*, or address register, of the 6502 is 16 bits (two bytes) wide, meaning that the microprocessor in the computer can address memory locations from 0 to 65,535—65,536 locations (64K) in all. (N.B.: The other registers of the 6502—used for arithmetic, logic, and other purposes—are only eight bits wide; for this reason, the 6502 is referred to as an "8-bit" microprocessor.)

The Atari architecture allocates the address space of the 6502 according to the plan shown in Figure 2. As you can see, the highest addresses are occupied by ROM chips, which contain the operating system and floating-point mathematics package. Most of the remaining addresses are in RAM and are used for program and data storage, storage of video display information, etc.

A small group of addresses—between 53,248 and 55,295—are not real memory locations at all. Rather, these addresses act as windows onto the control, status, and data registers of the support chips—ANTIC, POKEY, GTIA, and PIA. To monitor these chips or make one of them perform a specific function, the 6502 can simply read or write a value from or to one of these *memory locations*. In such a setup, the control registers of the support chips are said to be *mapped* into the 6502 address space, and the 6502 is thus said to employ a *memory mapped* architecture.

The TV

The Atari 8-bit computer was designed to be compatible with an ordinary television. To understand how graphics work on the Atari, it is therefore helpful to have some idea of how a TV set works. At the rear of a TV picture tube is an electron gun that sends out a narrow beam of electrons (several

The Binary Number System

Computers use binary numbers to perform arithmetic operations, encode program instructions, and store data. Binary numbers represent the natural numbers 1, 2, 3, 4, . . . as sums of the powers of 2. The first 16 powers of 2 are shown in Table 1.

For example, the number 167 can be represented as the sum of:

$2^7 + 2^5 + 2^2 + 2^1 + 2^0$

or

$128 + 32 + 4 + 2 + 1$.

This is translated to binary by marking the represented powers of 2 by 1's and the unrepresented powers of 2 by 0's, as shown below in Table 2.

So, 167 in binary is 10100111. For notation purposes, binary digits (*bits*) are grouped in units of eight called *bytes*, which correspond to the values that can be stored at a single memory address. The largest number that can be represented by one byte is 11111111 or 255. The largest number that can be represented by two bytes is 11111111 11111111 which is 65,535 (add up all the decimal values of the 16 powers of 2 as shown in Table 1.

It is customary to label the bits in a byte from left to right as D7 to D0. D7 is called the Most Significant Bit, D0 the Least Significant. As you become more involved with programming you will have occasion to refer to bits by number. Very often, changing the value of a particular bit in a memory location is a signal to the computer to perform a specific function.

Binary Conversions

There are many *algorithms*, or procedures, that can be used to convert decimal numbers to binary. One of the simplest is to divide the number by 2, repeatedly, dropping any decimal remainder at each step and noting if the result is even or odd. Mark odd results with a 1 and even results with a 0. The binary equivalent of the converted number can be read off the list of marks, from bottom to top, as shown in Table 3.

Binary numbers are often represented in what is called *hexadecimal* notation, a shorthand that encodes each group of four bits (called a *nybble*) as a single digit or letter representing a number from 0 to 15 (four binary digits can represent a range of values from 0 (binary 0000) to 15 (binary 1111)), as shown in Table 4.

For example, the value 167 decimal, which is 10100111 in binary, is represented as A7 in hexadecimal. The top four bits (1010) have the value 10, or A hex, while the bottom four bits (0111) have the value 7, or 7 hex.

Another system of notation, called *page/offset* or *high byte/low byte* is often used to represent memory addresses and other two-byte binary values. In this system of notation, the more significant byte of a two-byte value is considered to represent the number of a particular 256-byte-long memory *page*, while the less significant byte represents an offset (from 0 to 255) into that page—the combination of page and offset reference a specific memory address. Normally, page/offset notation is in decimal, the two values separated by a comma.

For example, the address of memory location 1536 decimal is represented as 00000110 00000000 in binary. The high byte, or *page byte*, has the value 6 (6×256=1536), while the low byte, or *offset byte* has the value 0. Thus the notation 6 , 0 serves to reference location 1536 in page/offset notation. Subsequent locations, with decimal addresses 1537, 1538, . . . , are represented as 6 , 1; 6 , 2; and so on. The highest address in page six is 6 , 255 (binary 00000110 11111111) or 1791 decimal.

Converting from decimal to page/offset notation is very easy. Just divide the decimal value by 256—the length of a memory page. The quotient is the value for the high byte; the remainder is the value for the low byte. For example, address 33,104 can be converted to 129 , 80 as follows:

```
          129  -- HIGH BYTE
256) 33104
     25600
      7504
      5120
      2384
      2304
        80  -- LOW BYTE
```

Converting in the opposite direction is also easy. To determine the decimal equivalent of a page/offset reference, just multiply the high byte value by 256 and add the low byte value: 129 × 256 + 80 = 33,104. ■

POWER	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7	2^8	2^9	2^{10}	2^{11}	2^{12}	2^{13}	2^{14}	2^{15}
VALUE	1	2	4	8	16	32	64	128	256	512	1024	2048	4096	8192	16384	32768

Table 1.

POWER	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
VALUE	128	64	32	16	8	4	2	1	
	128	+ 0	+ 32	+ 0	+ 0	+ 4	+ 2	+ 1	= 167
BINARY	1	0	1	0	0	1	1	1	

Table 2.

167		ODD: 1
167/2	= 83	ODD: 1
83/2	= 41	ODD: 1
41/2	= 20	EVEN: 0
20/2	= 10	EVEN: 0
10/2	= 5	ODD: 1
5/2	= 2	EVEN: 0
2/2	= 1	EVEN: 1

Table 3.

DECIMAL	HEXADECIMAL
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	A
11	B
12	C
13	D
14	E
15	F

Table 4.

beams in a color TV). These electrons interact with phosphors on the screen to create the glowing dots of color that make up a TV picture. This glow fades rapidly, meaning that the image on a TV screen must be *refreshed* at frequent intervals. According to the American NTSC (National Television Standards Committee) standard, the screen should be redrawn every 1/60 of a second, a rate tied to the 60Hz cycle rate of AC house current.

At the beginning of each refresh, the electron beam is directed to the upper left-hand corner of the screen and begins to scan toward the right. When it reaches the right-hand side, the beam is briefly shut off (horizontal blank) and the electron gun is re-aimed at the left-hand side of the screen, slightly lower down.

This horizontal scanning process is repeated, building up a picture line by line, until the bottom of the screen is reached. When it reaches the last scan line, the beam is shut off for a slightly longer interval (vertical blank) before the process starts over.

A normal broadcast TV picture is actually made up of two separate scans, each of which refreshes every other line of a 525-line-deep scanning array. This process, known as *interlacing*, causes the entire screen to be refreshed every 1/30 of a second.

The Atari computer, which does not employ interlaced video, generates a display only 262 video scan lines deep. Part of the display generated by the Atari falls outside the visible borders of the screen. This so-called *video overscan* prevents unsightly borders from appearing on the display and must be taken into account by the programmer when planning custom displays, as we shall shortly see.

Instruction code	Purpose
0 16 32 48 64 80 96 112	Output from 1 to 8 blank video scan lines.
1	Jump and wait for vertical blank (JVB). Jump destination must be stored in page/offset format, in the following two display list bytes.
65	Jump immediate (JMP). Jump destination stored as above.
2 - 15	Display mode instructions. Display a line in the indicated hardware graphics mode (see Figure 3). Options for implementing Load Memory Scan, Display List Interrupt, and fine vertical and horizontal scrolling may be added to display mode instructions as shown below.

Special Options for Display Mode Instructions

Bit:	D7	D6	D5	D4	D3	D2	D1	D0
Value:	128	64	32	16	8	4	2	1
	DLI	LMS	VS	HS	Display Mode			

DLI: Display List Interrupt. Setting this bit will cause the 6502 to execute a short machine-code interrupt routine before ANTIC processes the current display instruction.

LMS: Load Memory Scan. Setting this bit will cause ANTIC to draw display data for this and subsequent mode lines from the address specified in the next two display list bytes.

VS: Vertical scroll. Implements fine vertical scrolling.

HS: Horizontal scroll. Implements fine horizontal scrolling.

Figure 4. The ANTIC Instruction Set.

ANTIC and the Display List

At the heart of the Atari graphics system is ANTIC, the video coprocessor. Like the 6502, ANTIC is a microprocessor, complete with its own, somewhat limited, instruction set. ANTIC manages the Atari screen display by executing a simple program, called a *display list*. The display list defines which of the Atari graphics mode(s) is to be employed in constructing the screen, and where to find the data that is to displayed there.

The display list describes the Atari screen from top to bottom in terms of *mode lines*. Some 17 distinct graphics modes are supported by the Atari hardware, 14 of which are controlled entirely by ANTIC, and three of which depend on the assistance of GTIA (see Figure 3). Each hardware graphics mode is characterized by a particular way of interpreting display data and converting it to an image.

A complete screen display is made up of a series of mode lines—sometimes all the same, sometimes mixed. For example, the Basic default GRAPHICS 0 screen is made up of 24 lines of ANTIC mode 2, each of which displays 40 bytes of screen data, interpreted as characters.

By contrast, the Basic GRAPHICS 1 screen is actually a mixed-mode display, consisting of 20 lines of ANTIC mode 6 (each displaying 20 bytes of screen data interpreted as large characters), followed by a text window made up of four lines of ANTIC mode 2.

Instruction	
112	Print 8 blank lines
112	Print 8 blank lines
112	Print 8 blank lines
	These three instructions print a total of 24 blank lines at the top of the display, compensating for video overscan.
71	Display one line of ANTIC mode 7 and start drawing display data from the address shown in the next two bytes. The value 71 is the sum of 7 (the ANTIC mode) and 64 (the Load Memory Scan option bit value).
112	Address of screen memory in page/offset format
158	158×256+112=40,560.
7 7 7 7 7 7 7 7 7 7 7 7	Additional mode 7 instructions, one for each of the remaining 11 lines of a 12-line-deep, full screen display.
65	JVB instruction, telling ANTIC to wait for the vertical blank, then jump back to the head of the display list to repeat display processing. Location of the start of the display list is referenced in next two bytes.
92	158×256+92=40,796.
158	

Figure 5. A typical display list, set up to create a full screen of large characters in ANTIC mode 7. This is equivalent to a Basic mode 2 display without a text window, such as would be produced by the statement GRAPHICS 2 + 16.

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In order to offer an acceptable variety of graphics modes, Atari Basic is obliged to construct a variety of display lists. The graphics modes offered by Basic, however, do not begin to exploit the infinite variety of hardware graphics mode combinations made possible by custom display list programming.

ANTIC Instructions

Display list instructions are one byte long, coded as shown in Figure 4. There are three basic classes of display list instruction:

- Blank line instructions, which cause ANTIC to display a certain number of blank video scan lines in the current background color.
- Jump instructions, which tell ANTIC to continue executing display list instructions at a new location, with or without waiting for the vertical blanking interval.
- Display mode instructions, which cause ANTIC to display a line in a particular hardware graphics mode.

A display list is normally quite easy to set up. Every display list starts off with blank line instructions to compensate for vertical overscan. Next, the first mode line is specified by a display mode instruction that incorporates the Load Memory Scan option, telling ANTIC the location of screen memory. Subsequent mode lines are then specified. At the end of the display list, a JVB (Jump and wait for Vertical Blank) instruction is used to redirect ANTIC back to the beginning of the display list, so that it can control the next screen refresh.

Figure 5 shows a custom display list designed to create a full screen of large characters equivalent to that produced by a Basic GRAPHICS 2+16 statement. The display list is stored in a consecutive series of memory locations in RAM. Its start address is always stored in page/offset form at addresses 560 (low byte) and 561 (high byte).

Once you have found the start address of the display list, the list itself can be drawn out of memory using the Basic PEEK statement, which returns the value stored in a memory location. Listing 1 is a utility that will dump out the Atari Basic display lists, which will be handy references when you write mixed mode display lists of your own from scratch.

Listing 2 shows what can be done by modifying the display list for one of the Basic default graphics modes to create a mixed-mode display.

In the next issue, we'll be exploring display lists in more detail and learning various tricks for modifying the Basic DL more effectively and for creating our own custom displays from Basic. ■

DISPLAY LIST DUMP

Listing 1. Utility to dump Basic display lists to printer.

ATARI KEY

- Any Atari 8-bit computer
- Atari Basic

```
30 REM OPEN CHANNEL TO PRINTER
40 OPEN #1,8,0,"P:"
50 GRAPHICS 0:CLR
60 DIM INSTRUCTION(204),LOCATION(204)
70 POSITION 4,10:TRAP 50
80 PRINT "Enter Graphics Mode number";
90 INPUT MODE
100 GRAPHICS MODE:COUNT=0
105 REM LOCATE STARTING ADDRESS OF DISPLAY LIST
110 DL=PEEK(560)+PEEK(561)*256
115 REM CALCULATE ADDRESS AND DL BYTES
120 FOR X=0 TO 204
130 LOCATION(X)=DL+X
140 Z=PEEK(DL+X)
150 IF Z=65 AND COUNT=0 THEN COUNT=X+2
160 INSTRUCTION(X)=Z
170 NEXT X
180 PRINT #1;"GRAPHICS    ";MODE
190 PRINT #1;"    "
200 PRINT #1;"ADDRESS","BYTE","VALUE"
210 PRINT #1;" "
220 FOR I=0 TO COUNT
230 PRINT #1;LOCATION(I),I+1,INSTRUCTION(I)
240 NEXT I
250 CLOSE #1
```

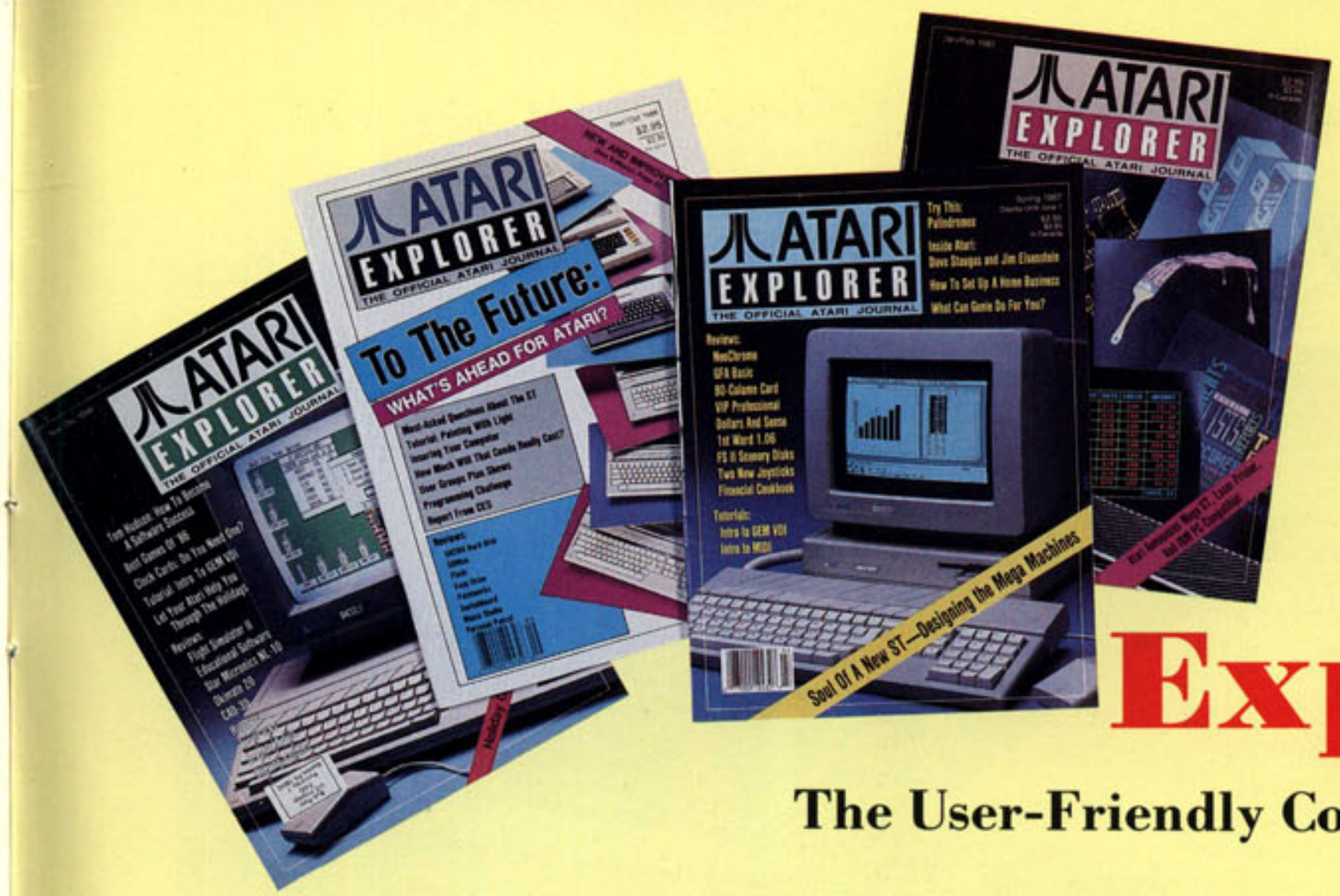
CUSTOM DISPLAY

Listing 2. Demonstration of how to modify a Basic display list to produce a custom display.

ATARI KEY

- Any 32K Atari 8-bit computer
- Atari Basic

```
10 REM CALL GRAPHICS MODE YOU ARE MODIFYING
20 GRAPHICS 8+16
30 REM ESTABLISH VARIABLE TO KEEP TRACK OF STARTING
   ADDRESS OF DISPLAY LIST
40 DL=PEEK(560)+PEEK(561)*256
50 REM MODIFY THE ORIGINAL LMS INSTRUCTION IN
   DISPLAY LIST
60 REM 1ST LINE OF DISPLAY LIST IS MODE 2
70 POKE DL+3,71
80 REM PUT IN 1 MORE MODE 2 LINES
90 POKE DL+6,7
100 REM COUNT DOWN 128 GRAPHICS 8 LINES
110 REM TAKING INTO ACCOUNT 2ND LMS INSTRUCTION
115 REM PUT IN 4 MODE 1 LINES
120 POKE DL+137,6
130 POKE DL+138,6
140 POKE DL+139,6
150 POKE DL+140,6
160 REM POKE IN JVB
170 POKE DL+141,65
180 REM LO-BYTE/HI-BYTE OF RETURN ADDRESS
190 POKE DL+142,PEEK(560)
200 POKE DL+143,PEEK(561)
210 REM TELL OS WHAT MODE TO USE
220 POKE 87,2
230 POSITION 0,0
240 PRINT #6;"ATARI DISPLAY LIST"
250 REM TELL OS NEW MODE
260 POKE 87,8
270 REM LOCATE CURRENT TOP OF SCREEN
280 TOPSCN=PEEK(88)+PEEK(89)*256
290 REM OFFSET TOPSCN BY # OF MEMORY BYTES FOR MODE
    2 LINES +1
300 TOPSCN=TOPSCN+41
310 REM POKE THIS LOCATION BACK INTO 88,89
320 POKE 88,TOPSCN-(INT(TOPSCN/256))*256
330 POKE 89,INT(TOPSCN/256)
340 COLOR 1
350 FOR I=0 TO 720 STEP 3
360 ANGLE=I/57.26
370 R=5*ANGLE
380 X=INT(R*COS(ANGLE))
390 Y=INT(R*SIN(ANGLE))
400 IF I=0 THEN PLOT 160+X,64-Y
410 DRAWTO 160+X,64-Y
420 NEXT I
430 REM TELL OS NEW MODE
440 POKE 87,1
450 REM LOCATE CURRENT TOP OF SCREEN
460 TOPSCN=TOPSCN+5160:REM MODE 2 BYTES + MODE 8 BYTES
470 POKE 88,TOPSCN-(INT(TOPSCN/256))*256
480 POKE 89,INT(TOPSCN/256)
490 POSITION 0,2
500 PRINT #6;"MIXED MODES DISPLAY"
530 GOTO 530
```



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