



EXPLORER

The Official Atari Journal

Volume 7, Issue 6

November/December 1992



Atari Falcon030

Migraph PS-400
Wand Scanner



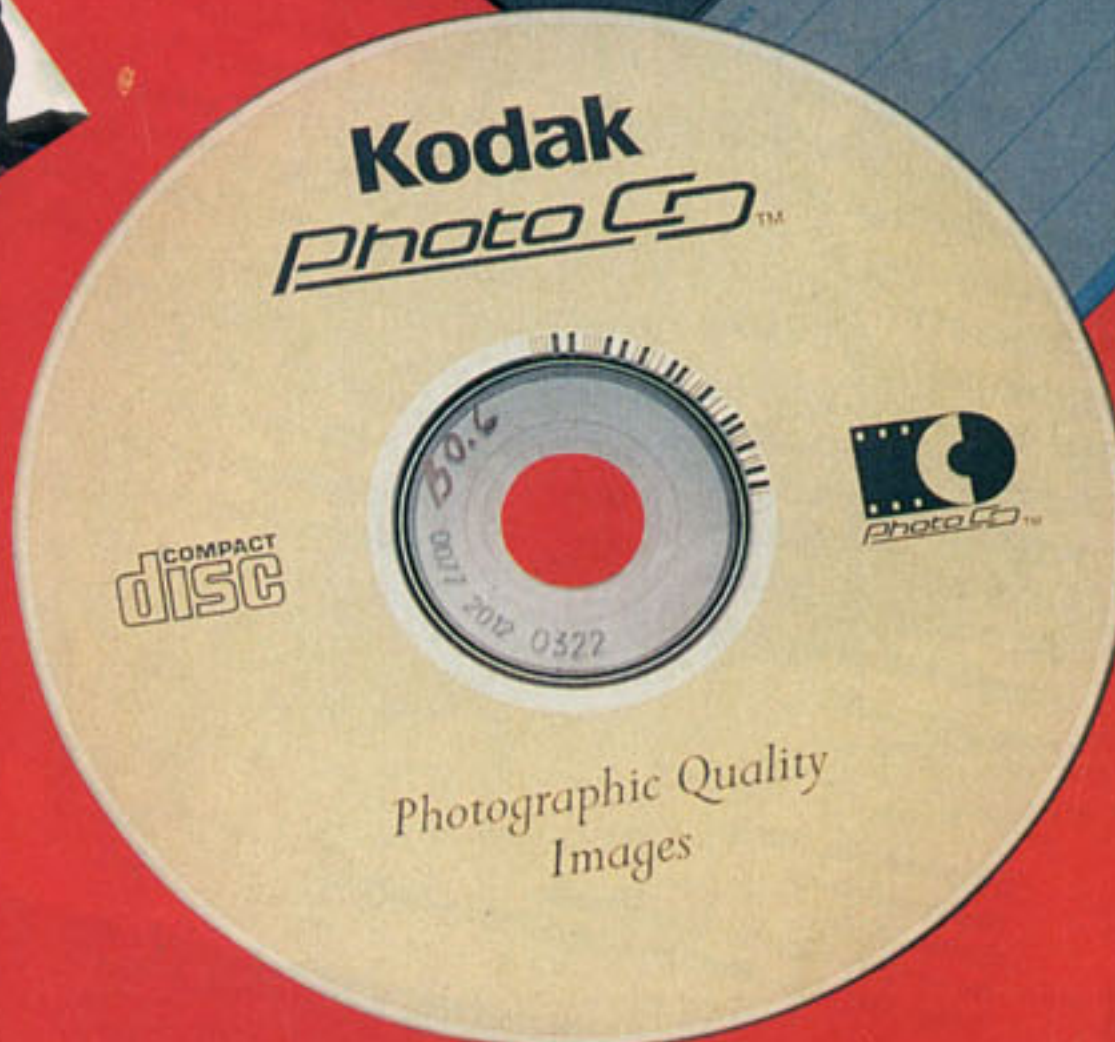
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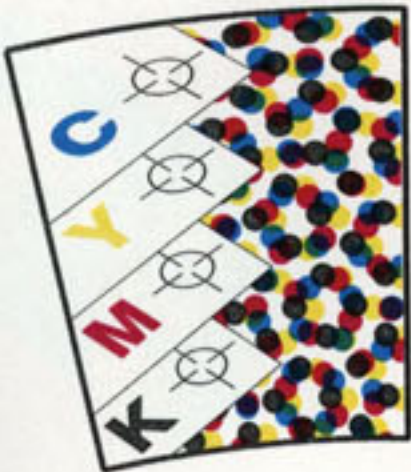
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On the Cover

The images on our cover came from a PhotoCD. Kodak has developed a system for digitizing photos taken with your camera and then storing them on a Compact Disc. Using a PhotoCD player from Kodak, you can view these images on your television.



You can also use a CD-ROM drive to read them into an Atari Falcon030 where they can then be viewed, cropped, or otherwise manipulated before saving them to a hard drive or floppy. Images may be loaded from the CD in several different resolutions, from fairly low monitor sizes on up to publishing quality—all in 24 bit color! As many as 100 images may be stored on each disk. Look for a complete article covering this and other technology made possible by the Atari Falcon030 in a future issue of Explorer.

Editor's Page

SEASON'S GREETINGS! Yes, it has been a bit too long since our last issue, what with the elves all busy this time of year, but we hope it was worth the wait. Now that this issue is in your hands, what can you expect to find inside?

Probably the best news for Atarians everywhere, and especially for not-yet-Atarians, would have to be the introduction of the Atari Falcon030 Computer. Not only is this machine incredibly powerful and easy to use, but it also offers features never before seen in a personal computer. The Atari Falcon030 loudly proclaims Atari's re-entry into the U.S. market, and it sends a message to the rest of the computing industry—Atari is far from dead! And with other new machines rumored to be in the works, it would seem a bit early to start singing a dirge. You can read all about the Atari Falcon030 starting on page 14.

You should also notice the number of new products that we have featured in our Atari World News section (beginning on the facing page), as well as those we have complete reviews of later on in the issue. The quality and quantity of Atari related hardware and software products increases every day, but we'll do our best to keep you up to date! Developer interest has risen a hundred fold with the announcement of the Atari Falcon030, and should continue to grow as the machine gains popularity.

Before you skip off to check out the rest of the issue, there is some Atari Explorer news as well. If you take a look at the mast-head, to the right, you'll notice some new names on our staff. As part of Atari's continued commitment to serving their customers, Atari Explorer production was moved from New York to Sunnyvale. This was done in an effort to both cut costs and, even more importantly, help Explorer provide more and better information to Atari owners. John Jainschigg, Peter Donoso, and Jesus Diaz were unable to move with the magazine, and so Mike Lindsay and I were brought on board to try and fill their very capable shoes. You will notice, however, that both John and Peter have written articles for this issue and should continue writing for Explorer in the future.

The move also adversely affected our production schedule, even more than we had anticipated. The long delay has caused many of our readers to unnecessarily worry about our future, and for that we are truly sorry. Had we known that production problems could cause such a delay, we would have done something to notify you earlier and allay some of your fears. For those of you concerned about the status of your subscriptions, we have made sure that you will receive the number of issues you paid for as well as an additional one, just to let you know that we care.

Quite a bit has happened since the last issue of Explorer, and we hope it has all been for the good. Whether it has or not will, in the end, be up to you, our readers. Please feel free to let us know what you like and dislike about the new magazine; we honestly appreciate the input.

Have a Safe and Happy Holiday Season!

— D. R. M.

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ATARI WORLD NEWS

Oregon Research Expands

In addition to releasing *Diamond Edge*, their disk management tool system, **Oregon Research Associates** is making other news. Bob Luneski's company is now carrying *The Ultimate Virus Killer*—a utility designed to detect and protect your Atari from over 60 types of virus. *UVK* scans disks and RAM for any suspicious activity and is claimed to be able to detect unknown viruses, including "link" viruses. Regular updates to *UVK* are planned to ensure comprehensive protection.

ORA has also taken over North American distribution of HiSoft's line of application software and programming languages. Most notable, due to their recent updates, are *DevPac 3* and *HighSpeed Pascal 1.6*.

DevPac 3, an assembly language development system, has been enhanced to include multi-window editing of source files, 30% faster assembly, improved error flagging, 68881/68882 FPU and 68851 MMU support, and many, many new features.

HighSpeed Pascal 1.6 supports line debugging via Devpac 3's Mon, and also supports floating point coprocessors. It is also said to be more compatible with

Turbo Pascal 5.0.

Other HiSoft products distributed by Oregon Research Associates include: Knife ST, DevpacST 3, DevpacTT, HiSoft Basic 2, Lattice C 5.5, HiSoft C, High-Speed Pascal, FTL Modula-2, Developer, Tempus 2, WERCS, Harlekin 1, Harlekin 2, and ProFlight.

The company will also carry HiSoft's *True Paint*, a paint program designed to take full advantage of the Atari Falcon-030. *True Paint* will be shown at Comdex and is expected to be released in early December.

List Price: *Diamond Edge*, \$69.95. *Ultimate Virus Killer*, \$29.95. Oregon Research Associates, 16200 S.W. Pacific Hwy., Suite 162, Tigard, OR 97224; (503) 620-4919; FAX: (503) 639-6182.

The Storm Hits

Advantage Software, a division of *Atari Advantage Magazine*, has announced the December 7th arrival of the *Storm*—a totally new telecommunications software package from Alan Page, author of the original Flash. Advantage Software feels that *Storm* will provide users with powerful telecom capabilities including multiple capture buffers/windows; multitasking (download, edit, and run a script program at the same time); exact

VIDTEX and VT-100 emulation; X, Y, Z and B+ background file transfers; and a script language that's BASIC.

Yes, *Storm's* script language is BASIC—a full implementation of BASIC (line number-less) with extra commands to support terminal activities. The company says this will give many users the ability to write and modify scripts easily.

Storm has numerous features: macros, chainable function keys, background round-robin dialing with an unlimited sized dial directory, pop-up menus, and an editor with word wrap, mouse control, cut and paste (Atari Clipboard aware), and online type-ahead support.

Storm will work in any 80+ column resolution and under every version of TOS from Atari ST to Atari Falcon030.

List Price: *Storm*, \$59.95 + \$3 s&h until December 31—\$74.95 thereafter. Advantage Software, P.O. Box 610121, Houston, Texas 77208; (713) 526-6436.

E.Z. Software Intros Math Coarseware

E.Z. Arithmetic is a series of twelve drill programs from **E.Z. Software** that covers many aspects of arithmetic. Each program (module) focuses on a partic-

ular area of math, from whole numbers to fractions, decimals, percentages and integers.

A comprehensive outline covering the entire subject is provided, along with an easy to follow step-by-step procedure for each type of problem encountered. This method of presenting information is also employed to define all of the terms, concepts and methods in each module.

The software provides for unlimited random drilling in each topic, keeping track of correct and incorrect answers and "scoring" each session. The software works in 80 column modes.

Module topics include: 1. Whole Number Basics; 2. Whole Number Operations; 3. Whole Number Base Basics; 4. Whole Number Base Operations; 5. Fraction Basics; 6. Fraction Operations; 7. Decimal Basics; 8. Decimal Operations; 9. Measurements; 10. Percent Basics; 11. Percent Problems; 12. Integers.

NIBBLES & BITS

ViewTouch Corp has bought the rights to the Power series of products from PowerPoint Software. ViewTouch has released *PowerDOS*, the cornerstone of their PowerNet network package, as freeware. *PowerDOS* provides a multitasking GEMDOS-level kernal, permitting multiple background tasks to run concurrently. ViewTouch is currently working on a PowerDOS Developers Package. Send inquiries to: ViewTouch Corp., 344 NE Terry Lane, Grants Pass, OR 97526.

Nevin Shalit, of **Step Ahead Software** has announced a version of Tracker that runs under MicroSoft Windows. Said to be practically identical to Tracker ST V3.04, *Windows Tracker/ST* was developed to allow Tracker ST users to use Tracker files at work, or in any Windows environment. *Windows Tracker/ST* is now shipping at a list price of \$119.95. Registered Tracker/ST users will receive a discount coupon in the mail. Step Ahead Software, 496-A Hudson Street, New York, NY 10014; (212) 627-5830.

List Price: *E.Z. Arithmetic* (Volumes 1-12), \$49.95 each (volume discounts available) + \$5 s&h. E.Z. Software, P.O. Box 500, Midwood Station, Brooklyn, NY 11230; (718) 434-2304.

Extend-O-Save Engaged to Warp 9

As of the present moment, the current version of **CodeHead Technologies'** screen accelerator *Warp 9*, is 3.73. (you know those CodeHeads, give them a week, they'll add something new.) The newest feature of *Warp 9* is something the CodeHead's call *Extend-O-Save*. Have you noticed your PC and Mac buddies swooning over After Dark? *Extend-O-Save* is a modular screen saver, so if any programmer feels up to writing a module, flying toasters or Enterprises can now safely zip across Atari screens as well. Screen saver modules can be written in C and assembly (John Eidsvoog has posted programmer's information on GENie and elsewhere).

Other additions to *Warp 9* include having Pinhead built-in, automatic loading of fonts and desktop pictures for individual programs, and a revised *Warp 9* control panel.

List Price: *Warp 9*, \$44.95 (upgrades from earlier versions, and from Quick ST and Turbo ST available). CodeHead Technologies, P.O. Box 74090, Los Angeles, CA 90004; Phone: (213) 386-5735; Fax: (213) 386-5789; BBS: (213) 461-2095.

Mah-Jong Solitaire 3.0

Cali-Co Superior Software has released version 3 of their solitaire *Mah-Jong* game. This version includes many new tile sets, layouts and tablecloths on

which to play. Players may select and save their favorite default settings to customize their game. Play options include a "Show Tiles," a "Suggest Move," and an "Undo" option. Games in progress may be saved and played at a later date. *Mah-Jong Solitaire 3.0* is packaged using recycled materials.

List Price: *Mah-Jong Solitaire 3.0*, \$39.95 (upgrade from version 2.2: \$10, include master disk). **Requires:** Color resolution, double-sided drive. Cali-Co Superior Software, P.O. Box 9873, Madison, WI 53714; (608) 255-6523.



Mah-Jong Solitaire 3.0 is a game in which tiles are removed in pairs, the object being to remove all the tiles from the board.

Spar Updates PageAssistant

Spar Systems has released an update to *PageAssistant*, its Desk Accessory resource for PageStream, resulting in what Spar says should be the last update "for awhile to come." *PageAssistant 2.0* sports an updated interface with cleaner popup menus, lots of icons, hot keys, and a resizable GEM window with a pull-down menu bar. *PageAssistant* can remain on-screen, even while the user works in PageStream.

Much work has gone into revamping the "index" functions. A new point-and-select index with "Go To" buttons replaces the old index. Topics in the index are linked—select a general topic, and specific related topics will move into a special menu for viewing.

PageAssistant now supports all of the new features of PageStream 2.2—where necessary, the help text and images have been updated. A new "Tips and Tricks" menu item includes how-to information on esoteric jobs—like creating postal bar codes.

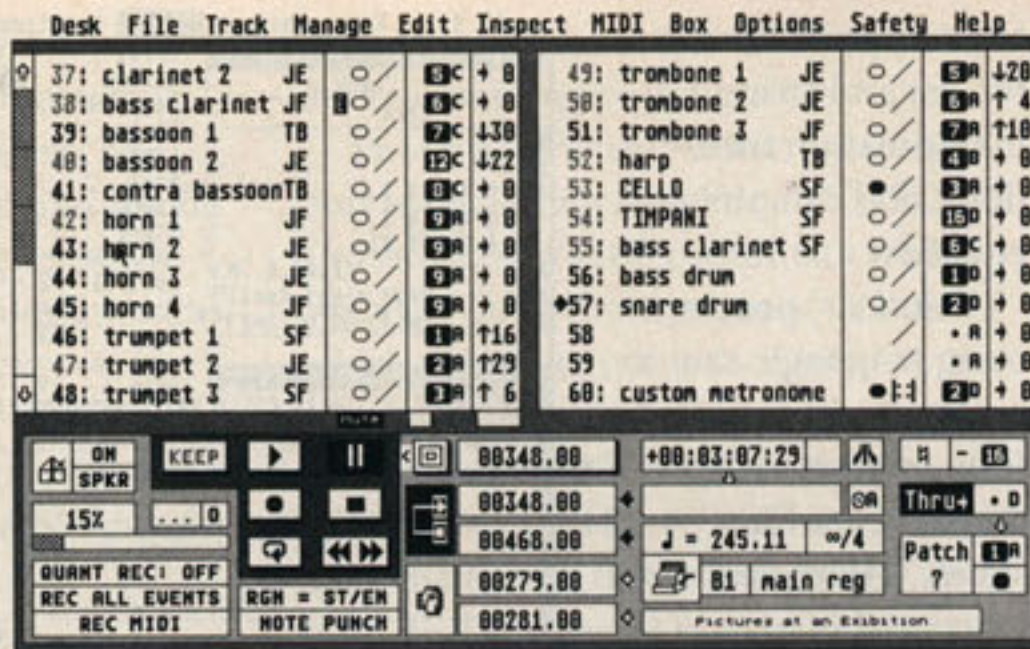
PageAssistant works in any 80+ column video mode.

List Price: *PageAssistant 2.0*, \$49.95 (upgrade from Version 1.22C: \$10 + \$3 s&h). Spar Systems, 381 Autumn Avenue, Brooklyn, NY 11208; (718) 235-3169.

Barefoot's Platinum MIDI Series

Barefoot Software, which has assumed all distribution and customer support for the former line of Hybrid Arts Software, has announced the release of *SMPTE Track Platinum*, a powerful 64 Track SMPTE-based MIDI sequencer bundled with a SMPTE time code generator; and *Edit Track Platinum*, their stand-alone sequencer version. Both programs have been re-designed to accommodate a new tile-based style of multiple windows.

This new interface will allow the user to reconfigure their screen display to contain a number of pre-determined window sizes which pertain to the program's various MIDI editing functions. According to the company, this non-overlapping window format assures the continued high degree of MIDI timing performance during recording and playback that SMPTE Track is famous for. Some of the main Tile windows cover the following: a Track tile allows for either 12 or 24 tracks to be displayed at once; a Joystick tile gives control of two MIDI parameters using a combination of vertical and horizontal axis positions; a Control tile features on-screen faders which can be assigned to multi-



SMPTE Track Platinum's new graphic layout uses Tile windows which remain a fixed size to maintain its rock solid timing.

ple channels; and a Chain Editor tile allows graphic editing of chain tracks.

Major new features include User-Definable Grooves, Tap In Tempos, and Real Time Velocity Shifting.

List Price: *SMPTE Track Platinum*, \$499 (includes a SMPTE time code generator). Upgrade from *SMPTE Track Gold*: \$119.00.

List Price: *Edit Track Platinum*, \$199.00. Barefoot Software, 19865 Covello Street, Canoga Park, CA 91306; (818) 727-7143; Fax: (818) 727-0632.

Join the CyberWars

CyberDrome: The Hoverjet Simulator, from **Fair Dinkum Technologies**, features a virtual universe based on an Artificial Life matrix which changes and evolves as you continue playing (ala' TRON). It combines the realism of a real-time 3-D flight simulator in a Virtual Reality environment with arcade action/-strategy type game features. Players can link up two computers with a serial cable or two modems to play in tandem as a team against the bad guys, with each player being able to view the actions and movements of their partner through their own cockpit viewport and communicate using both Direct and Quick-Com Message systems. There are six increasingly difficult mission levels plus a special training level for beginners, and additional missions will also be available on separate disks. *CyberDrome* is compatible with all Atari

ST/ST^E/TT030 computers with 1 MB of RAM minimum, a color monitor and a double-sided drive.

List Price: *CyberDrome*: \$39.95. Fair Dinkum Technologies, P.O. Box 2, Los Alamos, NM 87544; (505) 662-7236.

MacSEE 2.0 Transfers Mac & ST Files

If you do a fair amount of file transferring from Macintosh to ST format, **Reeve Soft's** *MacSEE* is a GEM based utility which can facilitate the fast conversion of any size file with or without resource files, to and from HFS format disks. Yes, *MacSEE* can read and write to

NIBBLES & BITS

DMC Publishing has announced the availability of over 1400 original, licensed typefaces from Linotype Corporation and the URW Font Foundry. (Samples available on GENie.) These fonts are licensed exclusively for use with DMC products (Calamus, etc.) and may not be converted into other formats. DMC also announced a limited time 40% discount on their entire library of over 1500 fonts. DMC Publishing, 2800 John Street, Suite 10, Markham, Ontario, Canada L3R 0E2; (416) 479-1880.

Pacific Software Supply, the largest Atari software distributor in North America, is looking for new *commercial quality* programs to market through its dealer network. If you are a programmer with commercial software, and are interested in having Pacific carry your product, call Mr. Curry or Mr. Whitten at Pacific; (805) 543-1037.

JMG Software has announced the free-ware release of the *HyperLink Runtime Package*—their database oriented "Application Generator." The runtime package will allow users to run any pre-built *HyperLink* application—while withholding the ability to edit the application. The full *HyperLink* package with Application Builder and Report Generator included lists for \$149 US. JMG also has a *HyperLink Developers Package* now available. JMG Software, 892 Upper James Street, Hamilton, ONT L9C 3A5 Canada; (416) 575-3201.

Hard Disks, SyQuest or 1.44 MB Mac formatted high density floppies! Unfortunately, standard 800K Atari and Mac formatted floppies are not presently supported, but the program does support Spectre formatted 800K floppies. PostScript files can also be converted but require a PostScript interpreter such as UltraScript or CompoScript to complete the conversion for transfer of Quark Xpress or Pagemaker files. .TIFF files can be converted for import into Calamus. Compatible with all Atari ST/-ST^E/TT030 computers, using either mono or color.

List Price: MacSEE, \$59.95. **Available Through:** CompuSeller West, 220 1/2 West Main St., Charles, IL 60174; (708) 513-5220.

Math Solutions Only a Mouse Click Away

Elan Software is introducing some very sophisticated algebraic computational problem solving software. Called *Solutions*, this GEM-based program can perform calculations based on real and complex numbers, unit conversion, matrices, vectors, statistics and more. A 750 function library may be updated with user defined functions. *Solutions*

also supports binary, bit, list and string manipulation functions, and can plot any equation.

Solutions' programming language, said to be easy to learn, is fully interactive. Furthermore, as Elan states, "[With *Solutions*] it is possible to instantly compute the derivative of any equation. The answer can be computed directly or one step at a time so the user sees all the intermediate results."

Any data created may be saved to disk in a format that may be imported into spreadsheet and graphing programs. Likewise, any user defined library, as well as work in progress, may be saved to disk.

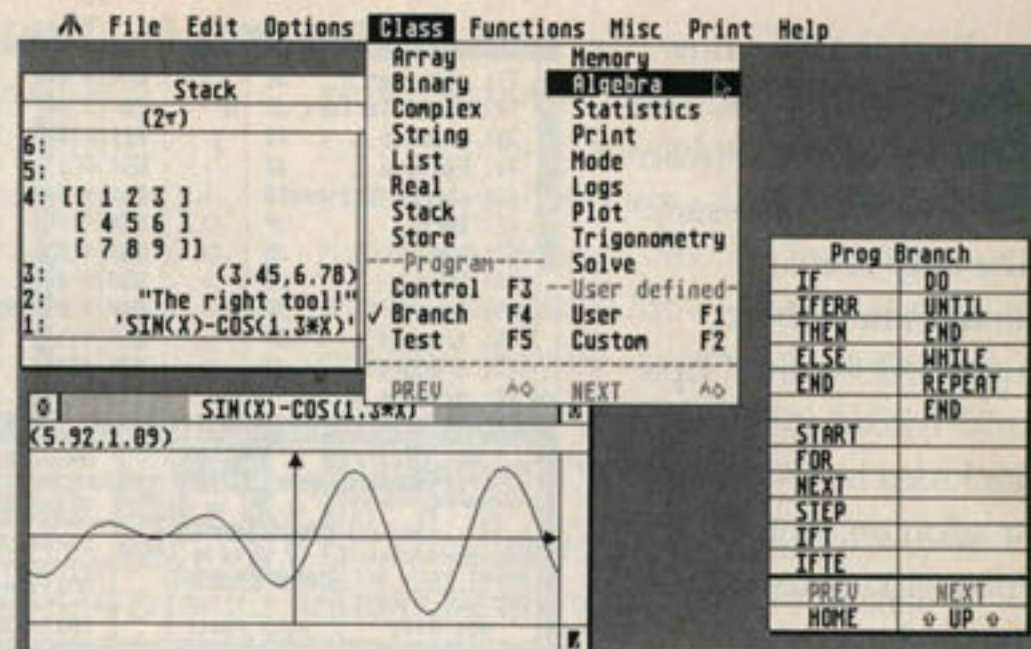
Solutions comes on a double-sided floppy disk accompanied by a 200 page indexed manual with complete glossary. Versions for MS-DOS and Windows are due in December.

List Price: *Solutions*: \$99.95.

Requirements: One megabyte of RAM minimum. Elan Software, 550 Charest Est, P.O. Box 30232, Québec, QC, Canada G1K 8N5; (418) 692-0565 (call collect); FAX: (418) 683-9189.

Mail List Manager from Fouch

Fouch Software's *Mailing Manager* is a GEM-based mailing list program that's very fast (a sample sort of 5,000 names was performed in a little under 8 seconds!), easy to use, and features label and form letter mail-merging capabilities. *Mailing Manager* has a number of advanced sorting features that can configure your data by pre-set fields, or by any word you choose, and is capable of holding up to 320,000 records per file—with an unlimited number of files. There are a number of options for viewing and editing your records, and there are up to



Solutions is designed to save anyone who works with math valuable time by taking care of all the complex computations.

ten CPI masks that are supported for different size character-per-inch printer configurations. Works on Atari ST/-ST^E/TT030, in color and mono, and with all dot matrix and laser printers.

List Price: *Mailing Manager*, \$49.95. Fouch Software, 1283 West 8th Street, Erie, PA 16505; (814) 455-1294.

Gribnif releases CardFile 4

Gribnif Software has released *CardFile 4*, a new version of their Rolodex-style Personal Information Manager. *CardFile* has been redesigned, with a new interface and new features—many ideas coming from user suggestions. Able to run as both a Desk Accessory and as a program, *CardFile* keeps track of addresses on "Cards" in an Address Book, and stores information concerning appointments in a daily agenda. Extended notes can be added to any Address Card or included in an agenda.

CardFile does more than simply store information; it can use the information in a variety of ways. Up to four phone numbers may be included in each Address Card, and *CardFile* can (through a modem) dial them. A monthly calendar can be set to remind users of appointments. *CardFile* can exchange data with other popular TOS address book programs, and for totally foreign formats, the "Data Conversion" utility is said to be able to massage any kind of

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data file for use with *CardFile*.

CardFile also includes options that allow printing of mailing labels, real Rolodex cards, address lists, and phone lists. *CardFile* supports the Atari Clipboard, so Address Card information can be "sent" to other applications—even directly to a Portfolio.

CardFile comes on a single-sided disk with a re-written, illustrated 65+ page manual.

List Price: *CardFile 4*, \$39.95 (upgrades available at discounts). Gribnif Software, P.O. Box 779, Northampton, MA 01061; (413) 247-5620; Fax: (413) 247-5622.

Expansion is the Key at Wizztronics

Wizztronics has announced four new products for the TOS series of com-

puters; each product allowing users flexibility in adding peripherals.

First up is *Printer Perfect*, a parallel port switcher interface for all ST, ST^E, TT and Atari Falcon030 computers which connects up to three printers. Choosing which printer to use is facilitated by the use of a desk accessory, and the unit itself is powered by an AC adaptor. Users of HP and DeskJet printers can have their laser, dot matrix printer and even their plotter all hooked up at the same time, easily switching between them without having to constantly unplug and re-connect wires. List price is expected to be under \$100, and will be ready for shipping by mid-December.

Cartmaster is a multi-cartridge control system that plugs into the cartridge port, giving users access to any one of up to four cartridges without having to turn off the computer to disconnect and

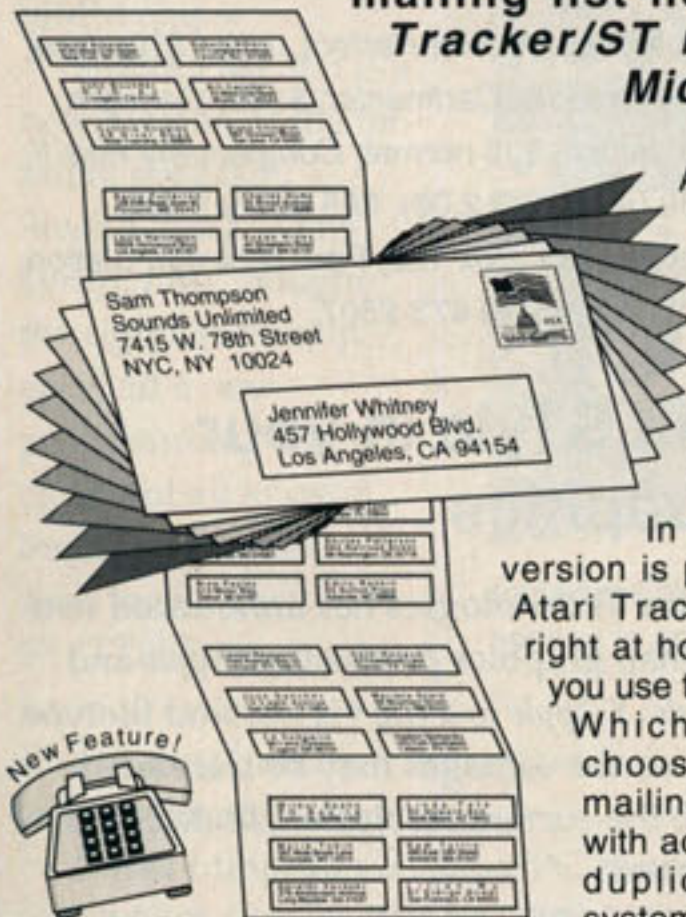
reconnect cartridges.

The unit has room for inserting three cartridges vertically and there is an additional port located on the side of the unit for a fourth cartridge, which has been specially designed to also accommodate a Spectre GCR Macintosh emulator cartridge from Gadgets By Small. The accompanying software includes both a desk accessory and a program version, which lets the user decide which cartridge is presently activated. The *Cartmaster* unit draws its power from the computer's power supply via the cartridge port interface, eliminating the need for an external power supply.

The unit is also compatible with Steinberg Avalon 16Bit and ADAP I/II converters, as well as Steinberg's Midex Plus and C-Lab's Unitor series of cartridges. *Cartmaster* uses a top-quality gold-plated edge card connector, works

Tracker/ST & NEW Windows Tracker/ST

From a musk ox farm in Alaska to a world-famous band from New Orleans, thousands of Atari owners use Tracker/ST for all of their mailing list needs. And now, *Tracker/ST* is available for Microsoft Windows as well!



Answering requests from many of our registered users, we have created a fully compatible Windows Tracker/ST. Users can import and export files between Atari and Windows Tracker/ST.

In addition, the Windows version is practically identical to Atari Tracker/ST, so you'll feel right at home from the first time you use the program.

Whichever platform you choose, Tracker/ST is the mailing list program to use, with advanced features like a duplicate name warning system, unlimited filtering (for

super-targeted mailings) and much more. See your local dealer, or contact Step Ahead Software for more information about Tracker/ST and Windows Tracker/ST.

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4. After you get your account, visit DELPHI's Atari Advantage, by typing GO COMPUTING ATARI.

DELPHI

with all versions of TOS and all ST/-ST^E/TT030/Atari Falcon030 computers, and retails for \$199.

The *Cartright* cartridge port extender has a 10" multi-ribbon cable with a male gold-plated edge card connector on one end and a female cartridge pin connector on the other. It can be used by itself, giving the user easier access to their computer's cartridge port, or in conjunction with *Cartmaster*.

Those who may have their Mega ST or ST^E sitting on top of an exterior hard drive or switcher box may find this unit an especially handy solution for relieving the strain put on by over-sized cartridges that may otherwise hang unsupported from the elevated cartridge port. The unit is available in one of two configurations.



Cartmaster gives access to any one of up to four cartridges without manually switching them.

NIBBLES & BITS

Keith Gerdes, formerly with Double Click Software, has formed a new company, **Trace Technologies**. TraceTech is now the distributor and support point for *Data-Diet*—with version 2 set to ship in December as an upgrade to all current owners. TraceTech is also announcing the November release of *Data Rescue*, a "data recovery" package. Trace Technologies, PO Box 711403, Houston, TX 77271-1403; (713) 771-8332.

Castle Publishing has taken over publication of *Atari Advantage Magazine*. They have already published their first two issues of the new *Atari Advantage*, October and November 92, and are on-track with a monthly schedule. Neal Symms, the new editor-in-chief, says of *Advantage*, "We're striving to make *Atari Advantage* the voice of the worldwide Atari community. We'll be promoting the greater involvement of well known developers, user groups and sellers from across the globe." *Atari Advantage* can be reached at: Atari Advantage, P.O. Box 610121, Houston TX 77208; (713) 526-6436.

DragonWare Software has a new telephone support number and new hours of operation. They can be reached at (406) 265-7300 between 10am and 4pm Monday thru Friday and Saturday from 11am to 4pm Pacific.

The basic assembled package, which retails for \$35, comes pre-assembled, lacking only the enclosure case for the female multi-pin connector end. If you can't stand the sight of an un-housed pin connector you can purchase a inexpensive plastic box at any Radio Shack or electronics store and easily make one cut to accommodate the multi-pin receptacle. A pre-assembled, fully-enclosed deluxe model is available for \$65.

Compatibility Plus II, the successor to Wizztronics original *Compatibility Plus*, is a TOS 2.06 upgrade board with dual TOS capability. This allows users to switch between 2.06 and any other version of TOS. A lot of the classic games released for the original ST only run with TOS 1.0, and with *Compatibility Plus II*, users can upgrade to Atari's great NewDesk desktop and still be able to play all their favorite shoot-em-ups.

The board replaces the 68000 processor presently installed in the ST, and although it can be socketed in, Wizztronics highly recommends having it soldered in for best results. (Removal of the original board does void any warranty from Atari that may still be in effect.) Piggy-backing an Ad-Speed 16MHz or Turbo 30 accelerator board is said to be very easy to do, and as long as they're compatible with each other,

users can even have both an accelerator and a PC/ATSpeed or AT-Once PC emulator.

The unit retails for \$139 with TOS 2.06 ROMs or \$85 without. The original *Compatibility Plus*, which switches between any two sets of TOS chips is also still available for \$69, and requires only the addition of a user-supplied double throw single pole switch and three wires.

List Prices: *Printer Perfect*, under \$100 (due in December); *Cartmaster*, \$199; *Cartright*, \$65 deluxe, \$35 normal; *Compatibility Plus II*, \$139 (with TOS 2.06), \$85 (alone). Wizztronics, P.O. Box 122, Port Jefferson Station, NY 11776; (516) 473-2507.

Put STyle in your Graphics

Zocra Technologies has announced two bitmap graphics products, *STipple* and *STyle*. *STipple* is a file viewer and filetype convertor—images may be translated into the current resolution, scaled, and clipped.

STyle, *STipple*'s "big brother" adds the ability to manipulate files—dithering, rotating, scaling, sharpening, smoothing, clipping, and rendering to any resolution or any number of colors.

STyle and *STipple* support many ST and Mac file formats as well as several computer-independent formats. Both programs are fully GEM based and can run in all ST/TT resolutions. (Exception: *STipple* cannot currently run in TT Low.)

List Price: *STyle*, \$35.95 US. *STipple*, \$29.95 US (discounts and bundle pricing available). Zocra Technologies, 4-319 MacKay St., Ottawa, Ont., K1M 2B7 Canada.

PMC is Rich in Ideas, Products

Purple Mountain Computers (PMC—formerly known as PDC, Inc.) is a hotbed of Atari activity up in Bellevue, Washington that has been busy for the past few months flooding the market with their offerings.

First up is *ST News*, a newsletter/-newspaper with interviews, "look-sees" at new products, and announcements of PMC specials. *ST News* is free for the asking.

PMC also has their own growing line of hardware and software items. The *Xtra-RAM* SIMM upgrade board can be wired into any ST, and allows users to plug in 1, 2.5 or 4 MB worth of SIMM chips.

Stealth PMC 1.3 is a new version of the terminal program, *Stealth* (a.k.a., Hag-Term). PMC bought the rights to *Stealth*, and had a new programming team clean out all known bugs. *Stealth PMC* runs in all Atari ST/TT030 resolutions, has a rewritten on-disk manual, and is a free upgrade to existing *Stealth* owners.

Darek Mihocka's ST-on-a-PC-board, *GEMulator*, is marketed by PMC (see preview on page 28). Look to PMC for *GEMulator* board support.

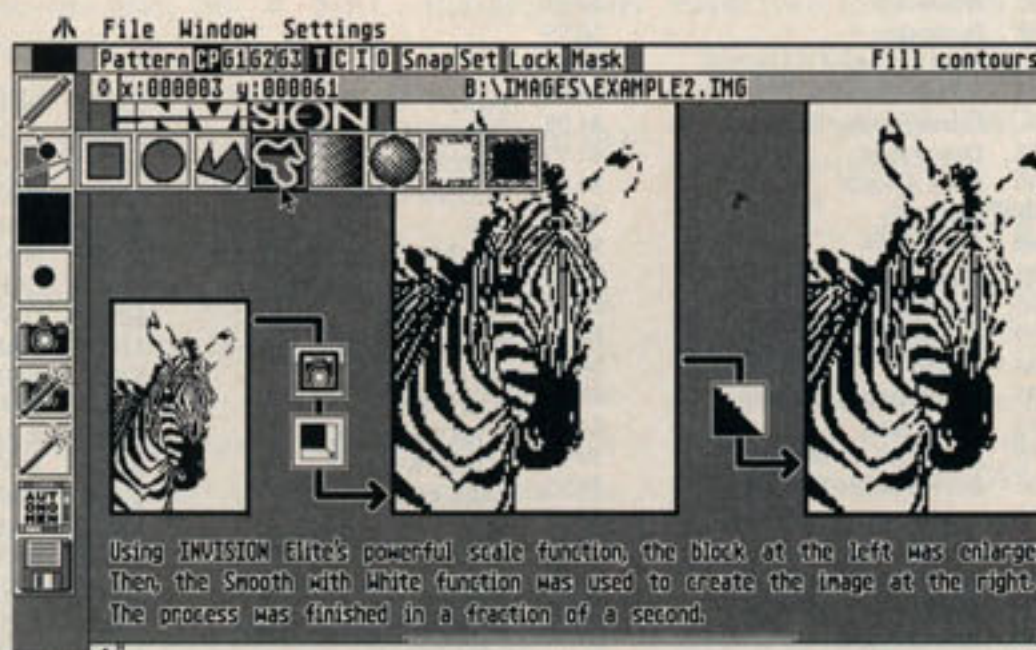
Finally, PMC is offering the *Freedom Floptical Drive*—a 21 MB (yes, twenty-

one megabyte) floptical 3.5 inch SCSI disk drive. The *FFD* includes ICD's Link host adaptor, the latest version of ICD's hard drive software, a single floptical disk, case, and power supply. The *FFD* can read floptical disks and "regular" ST double-sided and high-density floppies—2 to 3 times faster than a floppy drive.

List Price: *Xtra-RAM*, \$74.95. *Stealth PMC*, \$29.95. *GEMulator*, \$299.95. *Freedom Floptical Drive*, \$499. **Requires:** *Gemulator*, 286+ MS-DOS system. Purple Mountain Computers, Inc., 15600 N.E. 8th St., Ste. A3-412, Bellevue, WA 98008; Voice/Fax: (206) 747-1519.

DMC Markets INVISION Elite

DMC Publishing, a recently-formed division of ISD Marketing devoted to Desktop Publishing and to better serve the Calamus family of software products, has announced the release of *INVISION Elite*, a powerful GEM-based monochrome raster drawing package for creating or editing both graphics and



Invision Elite has a Smooth With White feature which can be applied to an enlarged image to smoothen out resulting jaggies.

text. The program features the capacity to load up to 25 simultaneous images which can be manipulated using a variety of special effects and drawing tools. *INVISION Elite* supports export to the Atari Clipboard for all block, cut and paste functions.

This combination icon-based and

menu-driven program boasts Instant Access Panning, which facilitates quick relocation to any section of a graphic that is larger than screen size, and claims it is able to handle virtually unlimited image sizes. The initial release will import .IMG, Degas PI? and PC? in all resolutions, .MAC, .GIF and Raw Image (.RO1) files, as well as Calamus .CVG graphics, which are automatically converted to a raster format. Color images are converted automatically to a pre-set assignment of greyscale values which can be manually re-assigned to suit the user's needs.

List Price: *INVISION Elite*, \$129.95.

Requires: High resolution (ST, STE, TT030, Atari Falcon030). DMC, 28800 John Street Unit #1, Markham, Ontario Canada L3R OE2; (416) 479-1880; Fax: (416) 479-1882.

Spelling Sentry Stands Guard

The latest product from **Wintertree's** Phil Comeau (author of *Gram Slam* and *Grammar Expert*), is *Spelling Sentry*. This spelling checker can be run as a desk accessory or program and has an option that allows the user to check their spelling as they type, from within any program—word processor, text editor, DTP or telecom programs—a sure-fire way of learning how to properly spell that word that you always seem to be misspelling no matter how many times your word processor's spell checker corrects it! *Spelling Sentry's* dictionary contains over 100,000 words, has a supplementary dictionary for words to add as it checks for errors, suggests intelligent alternatives for misspelled words, and can automatically expand abbreviations into full words. *Spelling Sentry* supports the Atari clipboard and is memory configurable to suit the user's individual requirements.

List Price: *Spelling Sentry*, \$59.95.

Wintertree Software, Inc., 43 Rueter St., Nepean, Ontario Canada K2J 3Z9; (613) 825-6271.



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This is where I, Marcus E. Dalldorf, owner of San Jose Computer, comes in. I don't believe in "business is war" or war of any kind of war for that matter. I believe we are all partitions of the same hard drive. What hurts one Dealer, hurts all Atarians. What helps one dealer, helps all Atarians. Everybody wins, or everybody loses. Anything else is just an illusion. We need a "win win" team approach. I'm located near Atari headquarters, and know the Atari ropes. I'm already dealing with Atari politics and policies. If I share my inventory and information with other dealers, they too can survive. S.J.C. can act as an "Atari interface". Why should we duplicate our efforts to do the same thing? We should play "zones" instead of one-on-one. So, if S.J.C. handles Atari distribution, Warranty repair, RA, COOP, MDF claims, and training, then the local dealer can do what he does best. He can concentrate on selling systems to his clients. With that extra S.J.C. support buffer, He can be confident that He won't leave his customers stranded.

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This is where you, the customer, comes in. If you want to buy something from San Jose Computer, but you aren't within range. Simply select a local retailer that you would like to carry Atari products. Pick the dealer that is the most honest, likable, and connected to your type of applications. Don't worry if that dealer swears that they will never carry Atari products "no matter what." I'll make them an offer they can't refuse, free stuff. Send your order to S.J.C. along with the name, contact person, phone number, and any other info you may deem appropriate, of the local dealer you want on board. I'll contact that dealer to make the arrangements for your order, and a suitable bribe, to be sent directly to your local dealer. I'll put your name c/o local dealer, right on the label so they can notify you when it arrives. They won't have to do anything but call a local customer to let them know that they can come in and give them lots of money. I don't think any local dealer would object to that. If they do, I'll send your order directly to you, and some free games to the dealer. If you then go to that dealer and buy those games, voila! They're carrying Atari. I'll push. You pull. We, as a team, will get them on board.

TT RAM EXPLAINED

The unique architecture of the TT 030, both hardware and operating system, is the key to its tremendous speed advantage over other, more expensive, platforms. Basically there are two kinds of RAM in a TT, system RAM, and NIB RAM. The system RAM is special because it has two buses hardwired to it, a special 64 bit internal bus, and the 32 Bit system bus. The special 64 bit bus is dedicated to drive the video "TTVIDEO" chip. This bus, together with the on chip buffering of the TTVIDEO chip yields real high performance video access. Plus, it takes the video traffic off the system bus. The system bus is free to move big chunks of data around, or for the CPU to access data to process. Note, the CPU doesn't get involved with updating the video or moving data around. It delegates the job to the TTVIDEO and memory controllers. So, even at 32 MHz, the CPU is bored unless it's fed lots of things to compute! The other kind of RAM is called NIB RAM (nibble mode as opposed to PAG mode RAM). NIB RAM is especially useful for DMA block transfers to, and from the hard drive or VME, because it can increment its address from one word (2 bytes=1 word) to the next, to the next, etc. So, whole blocks of contiguous data can be accessed with one command. Basically, the memory controller acts like a 3 ring circus ringmaster, commanding what acts occur in what ring, and making sure the trapeze acrobat doesn't fly into the elephant act as all three rings perform at once (this is called autovector processing). The memory controller delegates the "move the elephants over there," command to the DMA (direct memory access) chip which in turn tells the NIB RAM, hard drive, etc. where to start, which way to go, how far, and "go for it." The hard drive and NIB RAM have the bus to themselves as they write/read double words (two 16 bit words or four 8 bit bytes =32 bit wide system bus) on each clock cycle. Conventional PAG type RAM requires the bus to provide the addressing data (RAS & CAS) for each access. This requires 4 clock cycles per access. Anyway, NIB mode RAM can be addressed like PAG mode, and PAG mode can hold contiguous block data. But, to optimize performance, certain configurations make more sense than others for a given application.

APPLICATION OF TT POWER

Didot Pro. CD combines images, line art, Type, Color, Postscript Type 1 fonts, Calamus fonts, Vector graphics, CVG, DVG, RVP, TIFF, TIC, TIH TIM, EPS, GEM, GMA, IMG, QFAX, ISH, ISS, BUT NO LSD (unless the VME MATRIX card is defective), into your comprehensive layout. Full featured page layout including built in autotracer. Fonts can be edited on the fly like any other vector object. Final screen separation, and rasterization at 2400 DPI can be done on the design platform. This enables preview of final screen on the monitor or proof printer (like an electronic loop, 300 DPI proof of a portion of the 2400 screen to maintain dot ratio), all in minutes instead of hours. Special hand optimized screens pioneered by Lynotype-Hell, that are free from the usual abortions inherent in postscript screening technology, are included in Didot! If you bring me a ISS file (final screen file) on your Syquest or optical cartridge, I can shoot it to film on My Lynotype imagesetter and process the film on My new Pako processor, all in minutes. One trip, one stop, final film in your hands, ready for the pressman. If you are too far away to come in, you could upload a DIP file, or output postscript for a conventional service bureau. When you grow tired of paying lots of money for 24 Hr. "rush" charges to a postscript service bureau, add an imagesetter to your system for complete in-house capabilities. Then you could charge others lots of money for a few minutes of computer time. The features go on and on, and more modules are added all the time. I knew all these years (13 so far) of "hanging in there" with Atari would pay off someday!

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Atari Falcon030 is Here!

New Computer from Atari Defines "Personal Integrated Media"

By John B. Jainschigg

ON SEPTEMBER 23RD, FOLLOWING a lavish press reception at the Copley Plaza, Atari demonstrated its new Atari Falcon030 computer—flagship of an exciting new line of low-cost, high-performance computers incorporating a state-of-the-art digital signal-processor (DSP) on the motherboard—to a special meeting of the Boston Computer Society. Following on the heels of the massive European premiere, staged a month earlier at the Düsseldorf AtariMesse, the BCS event completes the process of introducing Atari Falcon030 to the world public.

In both venues, audience response was predictably enthusiastic. Numerous outbursts of spontaneous applause gave indication that Atari Falcon030's debut will be remembered as a watershed event in the history of consumer electronics.

With its announcement of the \$799 Atari Falcon030, Atari has boldly reasserted its claim as personal computing's price /performance leader. Perhaps even more important, Atari had thrown down the glove to competitors by proposing a powerful, new standard for marketing Atari Falcon030's innovative multimedia technology to consumers: Personal Integrated Media.

Personal Integrated Media

Though the computer industry's cur-

rent rage for multimedia computing has made inroads in a few narrow professional markets, consumers have largely ignored the phenomenon. To explain this reluctance, most computer makers cite the prohibitive cost and complexity of present multimedia hardware and software solutions. But this, said Atari President/CEO Sam Tramiel, in his opening remarks, is just one part of the problem.

Contrary to industry speculation, Tramiel said, consumers are very quick to understand the advantages of multimedia for entertainment, education, and at-home productivity. But their expectations for multimedia computing are much higher than most computer manufacturers realize, and for a very simple reason.

"A majority of families now own at least one color TV, and many own VCRs, video cameras, and CD players," Tramiel noted. "This technology is very advanced: large screens, picture-in-picture display, remote controls, and programmability are common features. So as far as consumers are concerned, any computer that purports to handle multimedia must offer the same or better media quality—across the board—as these 'ordinary' products. That means TV-quality or better video, and CD-quality or better audio.

"Nor do consumers think that these

features should be expensive," Tramiel continued. "People say, 'if I can get a CD player or VCR for \$199, and a color TV for \$300, why shouldn't I get the same quality audio and video in a computer that costs less than \$1,000?' " Atari's research further demonstrated that consumers would expect multimedia systems to offer "instant gratification." Crucial features must be built-in, software must be engineered for ease of use, and applications must directly address people's personal goals. Atari developed the Personal Integrated Media model, and designed the Atari Falcon030, in response to these conditions.

Designed for Personal Integrated Media

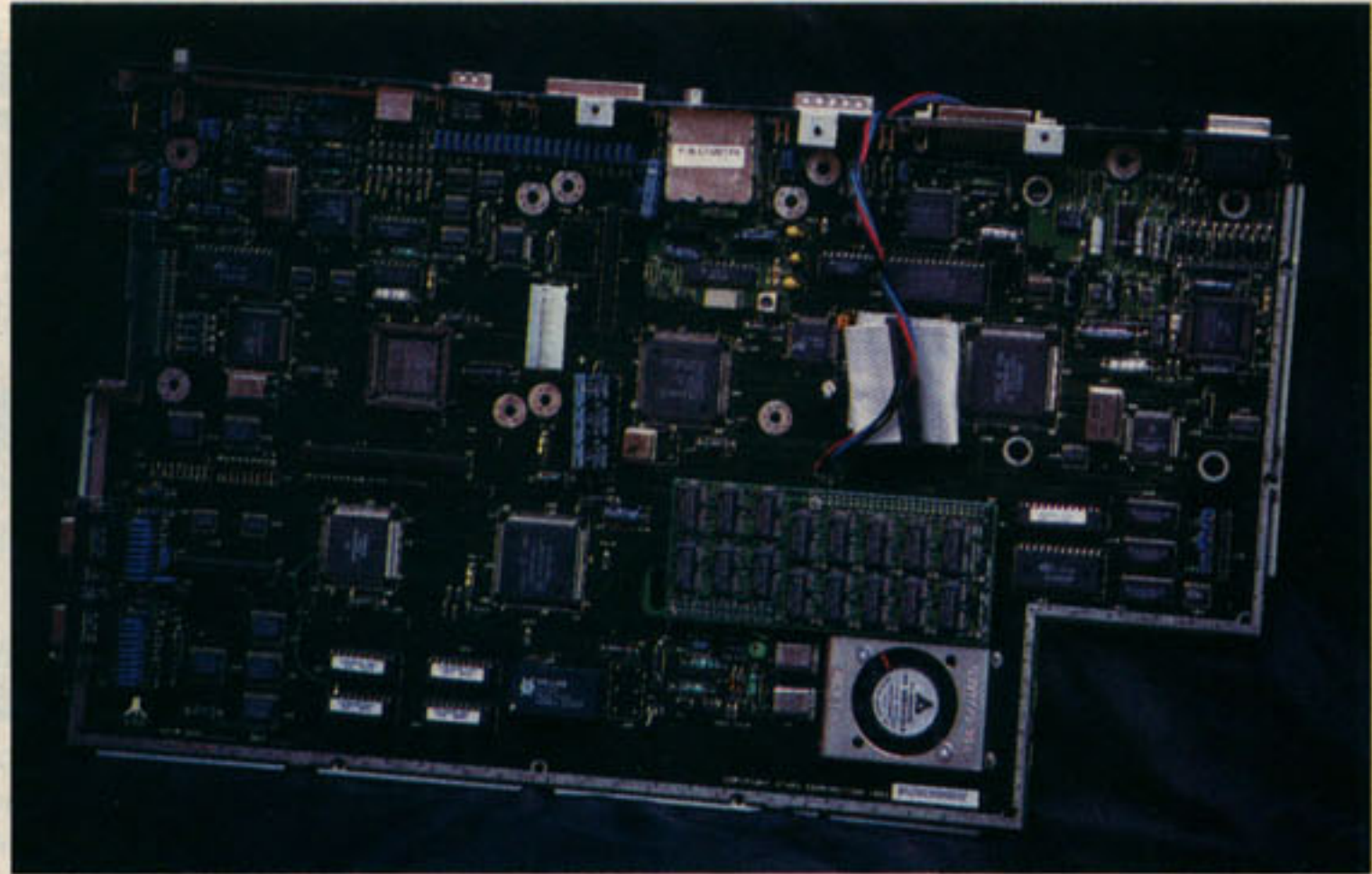
Following his introduction, Tramiel ceded the floor to Atari Falcon030 design chief, Richard Miller, who proceeded to explain some of the new computer's innovative features. Only at the most superficial level, Miller said, could the Atari Falcon030 be described as a "souped up ST or TT."

He said that while retaining 100% compatibility with existing hardware was a high priority of the almost three-year design effort, incorporating the features required by Personal Integrated Media meant that the basic ST/TT hardware had to be completely redesigned. Atari Falcon030's architecture is based

around four independent, functionally-integrated processors: the 16 MHz 68030 CPU and 33 MHz 56001 DSP processor, both produced by Motorola, and custom DMA and BLITTER chips, developed by Atari, which share access to RAM and other system resources, simultaneously. The Atari Falcon030 chipset contains approximately five times the number of transistors as the original ST. Overall, Atari Falcon030's bus bandwidth exceeds the ST's by a factor of ten, processing power by an order of magnitude.

Part of the Atari Falcon030's increased performance is attributable to use of the 68030, a true 32-bit processor that offers on-chip demand-paged memory management, features separate instruction and data caches serving a pipelined architecture, and communicates with the system via separate address and data buses, maximizing throughput. The Atari Falcon030 will also accept an optional math coprocessor, and full MS-DOS/Windows compatibility can be obtained by plugging a third-party 80286 or 80386 processor card (now being produced in Europe and due in North America by January 1st) into an internal slot.

Atari's custom direct-memory-access



(DMA) chip provides high-speed transfer of data between memory and peripherals, independent of the CPU. A high-performance SCSI II peripheral interface is supported, allowing "plug and play" attachment of industry-standard hard drives, DAT units, and other hardware. Atari Falcon030 can accept a high-speed IDE internal hard drive as well. The combination of DMA coprocessor, SCSI II, and IDE gives the Atari Falcon030 the ability to move large amounts of data to and from mass storage, very quickly—

essential for the transparent recording and playback of high-fidelity audio and video data.

Atari's redesigned BLITTER manages video memory at over 60 million pixels per second. Its bit-block-transfer functions permit smooth animation, screen redraws, and other special effects while running in parallel with the 68030. Atari Falcon030 video is Super VGA compatible, offering 256 colors in 640 x 480 resolution, as well as a 16-bit "truecolor" mode (with optional overscan for video) in which each pixel is imaged by 16 bits of RAM (5 bits red, 6 bits green, 5 bits blue). An Atari Falcon030 screen can thus contain up to 65,536 ($2^5 \times 2^6 \times 2^5$) colors, simultaneously, drawn from an overall field of 262,144 (64^3) RGB combinations. A broad spectrum of simultaneously-available colors is crucial for the accurate representation of video which, though essentially a low-resolution medium, gains enormous quality by subtle color variation. True-color is also vital for WYSIWYG 4-color desktop publishing and high-quality computer graphics. In the latter case, it is likely that Atari Falcon030's full color bandwidth will be exploited transparently by Personal Integrated Media software for fine-shading, antialiasing, "liquid media," and other effects.

Atari Falcon030's video system can

Personal Integrated Media

Personal Integrated Media is the logical evolution of multimedia. Just as the printing press made written material generally available, personal integrated media will make today's information widely available. Not only will individuals be able to freely—and interactively—manipulate traditional computer data such as text and graphics, they'll also be able to manipulate information dependent on synchronization: time-base data such as video, audio, animation and telecommunications. And those capabilities will all be integrated into a single, ready-to-use unit. We'll be able to create our own home videos integrated with text and music. We'll be able to record ourselves singing the lead vocals to our favorite rock 'n roll classic with the original musicians playing along—or we'll add a timpani solo to our favorite opera. We'll be able to create performance art in our living rooms, narrate and score the family photo album, create a visual family tree, keep a video journal of the places we've visited, play an adventure game set in the house in which we grew up. The opportunities for personal expression, entertainment and education are unlimited.

drive both monochrome and multisync monitors, and output directly to NTSC video monitor, VCR, TV, or existing Atari monochrome and color monitors such as the SC1224 and SM124. Frame output timing can be locked to an externally-produced sync signal for high-quality genlocking. Screen output can thus be recorded directly to video tape, either in realtime, or frame-by-frame, for animation, rendering, titling, and video-editing applications. An inexpensive enhancement will permit the Atari Falcon030 to accept, display, modify, and store input directly from a video camera or VCR.

DSP Magic

Atari Falcon030's most unique component, said Miller, is its Motorola 56001 digital signal processor. The 56001 DSP is a single-chip engine, capable of performing 96 million operations per second. Its job, in summary, is to analyze and transform analog problems into digital answers.

What this may mean depends on the requirements of a particular Atari Falcon030 application. At the simplest level, the DSP's enormous bandwidth gives Atari Falcon030 the ability to record and play back up to eight channels of 16-bit digitized sound at rates up to 50 kHz. Atari Falcon030's sound system thus exceeds the oversampling margin and quantize specs of most commercial CD equipment.

The DSP's programmable effects subsystem can be used to apply equalization, delay and reverb, distortion, phasing and flanging, compression, surround sound, and other effects to incoming or outgoing audio data. Atari Falcon030 will be shipped with an application called Audio Fun Machine, demonstrated at BCS by Bill Rehbock, which lets you plug in a microphone or other audio source and apply a range of digital effects to the signal. Professional audio applications may employ the DSP to enhance audio tracks with "aural excitement," "harmonizing," "Mega Bass," and other high-end special effects,

previously requiring expensive, dedicated hardware.

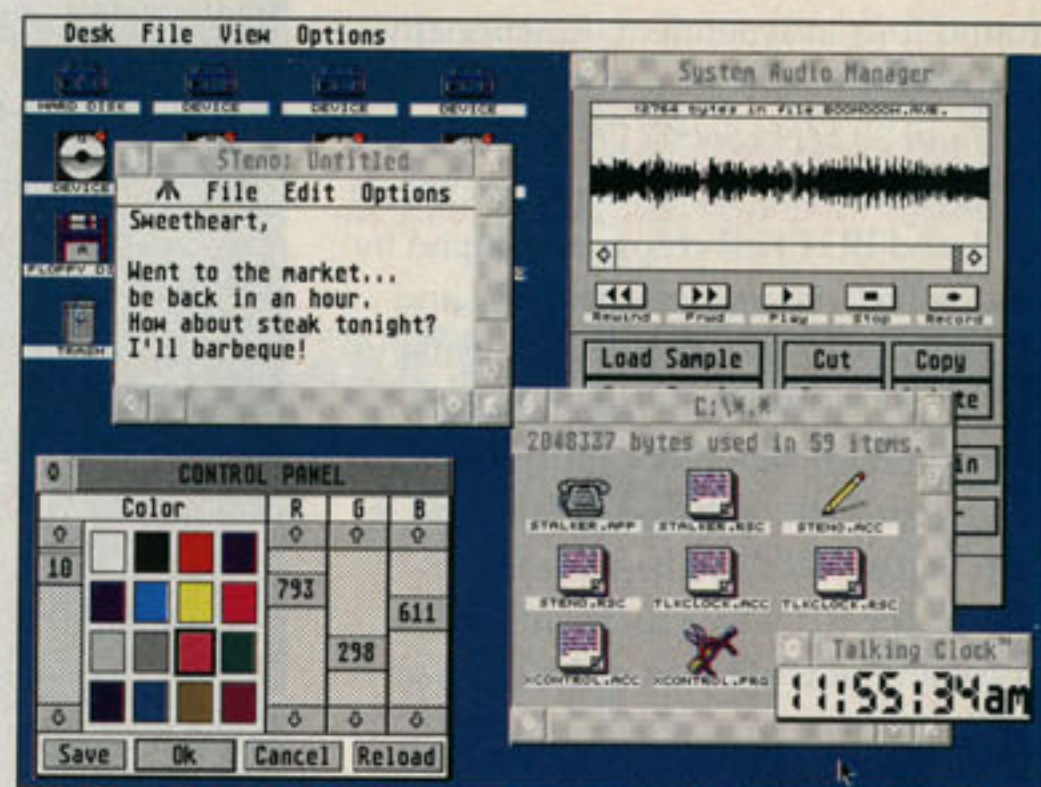
The Motorola DSP can analyze a signal in realtime, using Fast Fourier (FFT) and LaPlace transform techniques. Likely applications include frequency shifting and pitch-to-MIDI conversion, voice recognition and high-quality text-to-speech conversion are sure to follow.

Realtime signal analysis also permits the DSP to function as a high speed fax/data modem, requiring only a simple connector to the DSP port to adapt to phone line requirements. Atari Falcon030 is thus gifted with impressive telecommunications capabilities, built right in.

The DSP's math capabilities also extend to formal operations. Its built-in array processor can perform matrix transformations at extremely high speed, in parallel with Atari Falcon030's CPU. Array-processing has obvious implications for 2-D and 3-D graphics, and animation.

Perhaps most exciting, the 56001 DSP can be used to compress and uncompress data "on the fly." This feature will powerfully enhance Atari Falcon030's ability to capture and replay long-running video clips at broadcast frame rates, and can also be employed in telecommunications, voice mail and audio recording, and still-imaging applications. Both "lossless" and "lossy" protocols can be employed, so compression can be fine-tuned to emphasize data-fidelity or compression-efficiency, depending on the requirements of a particular application.

According to Miller, although the Motorola 56001 DSP is currently used in high-end NeXT and Silicon Graphics workstations, Atari Falcon030 is the first consumer-priced computer to employ



The Atari Falcon030 sports a new and much improved desktop—full color animated icons are just the tip of the iceberg. Look for new applications as well—System Audio Manager for example.

the component, and the first to provide access to all of its advanced features. Because Motorola also makes the Atari Falcon030 CPU and is involved in fabricating other key components, the company is making a strong show of support for the machine. Motorola representatives were on-hand for the BCS presentation, and their promotional materials comprise a portion of the Atari Falcon030 media kit assembled by Atari's PR firm, Redgate Communications.

Demonstrated Excellence

Following Richard Miller's remarks, Bill Rehbock and James Grunke took the floor to demonstrate some of Atari Falcon030's capabilities, and show off some of the software that will be bundled with the machine. Atari Falcon030 carries the latest version of TOS in ROM, complete with a newly-enhanced GEM desktop offering animated icons and enhanced color-windowing capability. The machine will also likely ship with MultiTOS, Atari's new, pre-emptive multitasking operating system (for a preview of MultiTOS, see Atari Explorer, July/August 1992, page 6), as well as a vector-font-management package.

Additionally, eight complete applications will ship with the machine. These include D2D, a stereo, single-channel

direct-to-disk recording package, and Audio Fun Machine, a simple interface to the 56001 DSP's effects-processing system. Both these audio applications were impressively demonstrated by Bill Rehbock, during the BCS presentation. Grunke, in turn, demonstrated the Atari Falcon030's conventional music capabilities, driving a MIDI-interfaced Korg M1 music workstation from Steinberg's Cubase sequencer. He also reminded the audience that Atari Falcon030's digital audio facilities are completely compatible with Steinberg's eagerly-awaiting digital recording/sequencing package, Cubase Audio, expected in the first quarter of 1993.

A New Commitment

With the release of Atari Falcon030 and the Personal Integrated Media stan-

dard, Atari has taken a bold step towards reclaiming a significant portion of the committed, low-end computing market, both in America and abroad. But the Atari Falcon030/Personal Integrated Media initiative represents more than just new hardware and a nifty marketing angle. According to Sam Tramiel, Atari has taken a long look at its recent history and decided to make some fundamental changes in the way it supports users and dealers. First on the agenda is the creation of a new customer-service division, accessible by 800-number, which will stand ready to answer questions, direct users to dealers, and provide other timely information. A national service infrastructure will shortly be in place. And insiders suggest that Atari may soon announce the formation of a direct-marketing division, to

speed access to new hardware for customers, nationwide.

As the Atari Falcon030 release draws closer, Atari is expected to begin to mobilize its newly-acquired marketing muscle—in the form of Redgate Communications and an as-yet-unnamed advertising agency—to garner substantial exposure for the new system. At the same time, some thirty third-party manufacturers are readying Atari Falcon030 hardware and software products for release. Look for hands-on reviews of Atari Falcon030, and breaking reports on exciting new Personal Integrated Media software, in coming issues.



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Migraph PS-400 Wand and Touch Up v1.84

By Rob Schilling

I HAVE BEEN USING THE **Migraph Hand Scanner** and **Touch Up (V1.84)** for several years now in my graphic design business, and have found them to be solid and reliable. Users of the above products, however, have been anxiously awaiting the release of the next generation scanning hardware and software from Migraph. I'm happy to report that it has arrived in fine form.

In this review, we will cover three new products. First, the *PS-400 Wand* scanner, a full-page width, hand-held scanner. Next, the sheet-feeder/cradle hardware option for the *Wand*. Finally, we will take a brief look at the latest release of *Touch Up*, version 1.84, Migraph's high-resolution monochrome image editor.

The Wand

I caught my first glimpse of the *PS-400 Wand* in September at the Glendale, California Atari show. The Migraph

★ PS-400 Wand Scanner (w/Touch-Up v1.84 & OCR)

Requirements: Works with all ST/TT computers.

Price: \$899.00

Manufacturer:

Migraph, Inc.
32700 Pacific Hwy. S., Suite 12
Federal Way, WA 98003
(206) 838-4677

booth was surrounded three deep for most of the day by people trying to get a close-up look at the *Wand*. The Migraph representative was fielding non-stop questions from the crowd all weekend.

Physically, the *Wand* bears almost no resemblance to the original hand scanner. It is 9 3/4" wide, 4" deep and 2 1/4" high—roughly similar in form to a sleek hand-held cordless telephone, but slightly heavier and more substantial. The controls are familiar, but the level of precision of some scanning parameters have been increased significantly.

As on the hand scanner, there is a start button to initiate the scanning process. This is located directly on top of the *Wand*. On the side, you will find the light/dark contrast dial. This control adjusts the contrast of each scan and is infinitely adjustable from zero contrast (white/light) to full contrast (black/dark).

The dither selector, also positioned on the top of the *Wand*, has been upgraded from that of the hand scanner. It now includes four pre-set dot sizes instead of three, in addition to a letter or line-art setting. There are five LEDs, one above each setting, to readily indicate the current mode.

Adjacent to the dither control is the resolution/dpi adjustor. This sets the hardware scanning resolution (software resolution is set separately within *Touch Up*) to the desired number of dots per inch. Resolution may be defined anywhere between 100 and 400 dpi in increments of 10 dpi. This allows a great

degree of flexibility in scanning for different applications. A nice touch is the inclusion of a digital readout on the top of the *Wand* indicating the current resolution setting. This display lights automatically during initiation of any scan and turns off upon completion of the scan.

The Sheet Feeder

The sheet feeder (or cradle) is an absolutely wonderful addition to the *PS-400 Wand*. At 13" wide, 7 3/4" deep and 10" high (with feed-tray fully extended), its footprint is relatively small, allowing a nice fit on most desks.

The design of the cradle has a very sleek European look. All edges are softly rounded, lending a very simple, uncluttered look to the unit. It is housed in a sturdy, light-grey plastic case.

There are only two controls on the feeder. On the left side, toward the front of the cradle, is the power switch. At the top and front of the feeder is the stop/eject control. This will interrupt a scan in process or eject a document from the scanner at the conclusion of the scanning procedure. At the back of the sheet feeder is a paper tray with a sliding, adjustable paper guide to hold documents of various widths (letter, A4, A5, B6, etc.) steady while being fed to the scanner. The tray folds down while not in use, to further reduce the space requirements of the hardware.

Touch Up 1.84

Perhaps the most anticipated

upgrade to my current software library was *Touch Up* 1.84. This program works as a software interface to the Migraph and Golden Image hand scanners as well as the *PS-400 Wand*. *Touch Up* allows selection of scanning parameters such as page/clip size, software scanning resolution, scan length, etc., as well as providing image editing and manipulation with various tools.

This new version boasts many significant improvements over older versions. Of immediate concern to many current *Touch Up* users is the speed of program operation. Version 1.84 has improved speed in several areas.

First, the loading of IMG files was always a bit slow. Speed here has been increased about four times. While never a major drawback for me, it is very nice to have the newly loaded image on screen that much faster.

Another area of speed increase is in the rotation of images. I remember working on an old 1040 ST with only 1 meg and having to wait overnight for a large clip to be rotated with version 1.5. This was incredibly frustrating and proved to be a major weakness in the program. I was quite happy to see that the rotation speed has been increased forty times over previous versions. Rotating 90, 180 or 270 degrees is almost instantaneous. Rotating in increments between those settings is dramatically improved.

Zooming in on an image at the 2X and 4X modes is also much faster now. This makes moving in for detailed work far less time consuming and thus more practical.

Touch Up's screen interface has also undergone a minor face lift. Gone is the "Lightning" mode; having been replaced by the "Paint" mode. This appears to be a change primarily in icon design and designation. Several other icons have been slightly redesigned or repositioned to increase the program's functionality.

When performing program operations such as loading and rotation, prior versions of *Touch Up* have shown a bar-



graph representation on screen to give the user an indication of how long the operation was going to take. This has been supplemented in the current version with a numeric percentage figure superimposed over the bar graph. This is a tremendous improvement over the standard Atari "busy bee." I would love to see other programs implement this feature.

The dialog box for scan settings has also been redesigned. Many features now have slider controls for adjustments. In addition, there is a "start scan" button directly inside the box—very handy.

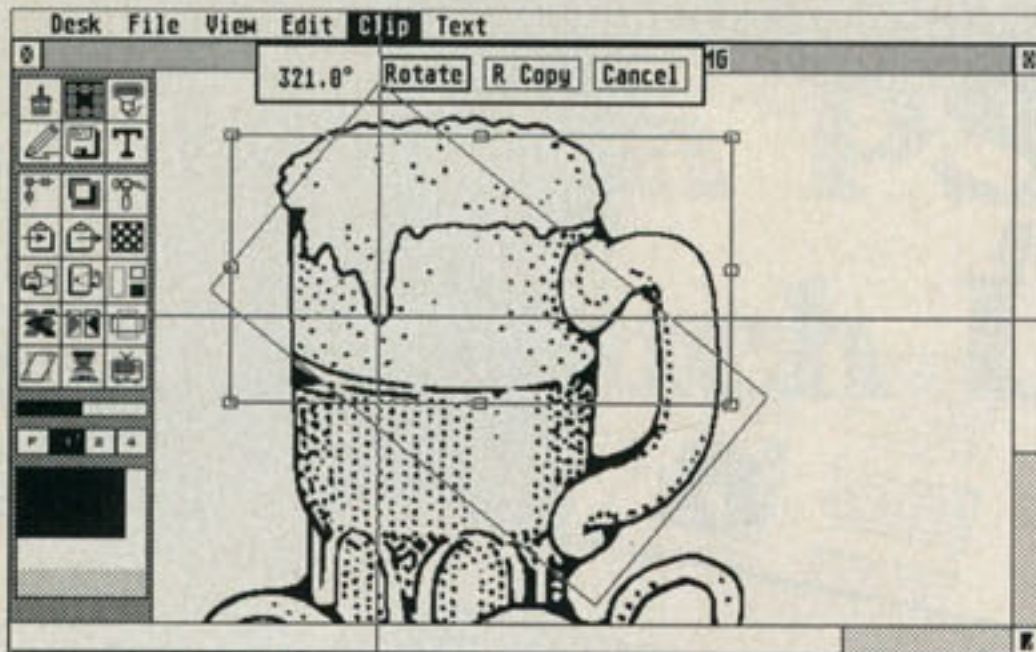
Scanning now displays directly to screen in realtime, in most resolutions. This allows the user to see the scan as it is being created, and abort the process if the initial results are unsatisfactory. An exception to this is scanning at 320 dpi or greater, which may not display the image on screen until the scan is completed, depending upon the speed of your computer.

One of the most useful new features

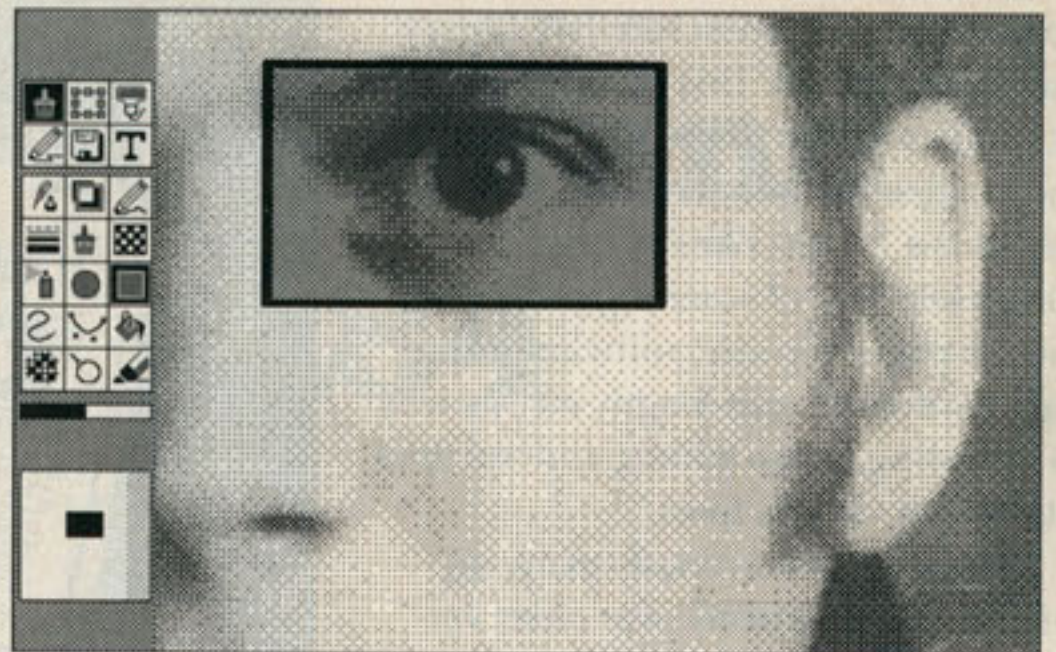
for desktop publishers is the enhanced Greyscale TIFF support. This enables the user to export near photographic quality scans to desktop publishing programs like PageStream 2.2 or Calamus SL. Migraph hand-scanner users can save scans in 128 level greyscale TIFF files, while Golden Image hand-scanner and *PS-400 Wand* scanner users can save in 256 level greyscale files.

The greyscale save feature will "halftone" scanned photos so that they may be output on high-end image processing equipment like the Linotronic imagesetter, and then reproduced in printed material with astonishing results.

To test the quality of the "save as greyscale" feature of *Touch Up*, I imported several 256 level greyscale TIFF's, scanned using the *Wand*, into PageStream. I resized the photos to fit the needs of my client, set the lines per inch or "frequency" within PageStream, and printed a PostScript file to disk. I then dropped the disk off at my local service bureau for Linotronic output at



Rotation of a clip may be specified in increments of 1/10 of a degree. The center of rotation may also be set by the user.



Photos may be retouched in a variety of ways. For example, placing a screen over a portion of the image to darken it.

1200 dots per inch.

The results of this test were amazing. The greyscale files, although resized, were a nearly perfect reproduction of the original photograph. This process can save some desktop publishers the expense of paying print shops to screen or halftone photos prior to reproducing them in a printed document.

Putting It All Together

Now that we have looked at the *PS-400 Wand*, the sheet feeder, and *Touch Up* 1.84 individually, let's look at how they work in conjunction with each other.

Primarily, the *Wand* is wide enough to scan an 8.5 inch page full width. No longer will you have to scan 2 half-pages and then merge them together using *Merge-It* or *Coalesce*. For *Migraph* OCR users this feature alone is worth the price of admission. (*Migraph* OCR was reviewed in the May/June '92 issue. The latest version offers support for the *Wand*.)

Also of interest to current hand-scanner users is the increased stability of the *Wand*. Being wider and heavier than the hand-scanner, the *Wand* can perform almost perfectly straight scans on any smooth surface. Adding to the stability of the unit are four rubber-like rollers on the underside of the scanner. These rollers make it very difficult for the *Wand* to slide off-course during a scan.

As rock-solid as the *Wand* scanner is on its own, the sheet feeder option must

be experienced to be believed. The *Wand* snaps gently into a recessed area on the top of the cradle and locks solidly into place. From this point on, the two pieces operate as a seamless unit.

To perform a scan using the feeder/*Wand* combination from within *Touch Up*, first the scanning resolution of hardware and software must be set. *Touch Up* makes this part easy from a software perspective. Simply call the scan settings dialog and make the necessary adjustments. Changing the *Wand*, however, is a little more time consuming. The scanner must first be removed from the cradle, then "Set DPI" must be selected from the program's dialog box. Next, using the hardware control pad, the scanner's internal settings must be changed. Finally, the *Wand* must then be moved a short distance in a mock scan, to confirm the new resolution. This procedure is a little inconvenient, but the typical user probably won't change resolutions often enough for this to be a major drawback.

Next, position the page to be scanned in the paper feeder and adjust the width guides to the edges of the page. This will insure a straighter scan.

After adjusting the resolution, page length, dither settings, and placing the page in the feeder, press "OK" and the scan will start automatically. The feed motor is so quiet as to be inaudible over the din of a hard drive. The mechanism gently, but firmly draws the document

into the feeder and under the scan head. At the conclusion of the scan, approximately one inch of the page is retained underneath the scanner. The page must be manually ejected from the cradle using the Stop/Eject button on top of the unit.

Once an image has been scanned into the computer's memory, it can be further manipulated or cleaned up using *Touch Up*'s paint and clip tools. Masks can be applied to lighten or darken scanned images. Stray pixels, either black or white, or both, can be cleaned up. Line art can be processed to produce an outline of the original scan, then refilled with a pattern of the user's choice. Images can be mixed with text from one or more of *Touch Up*'s ten included fonts. These features are supplemented by many others in the program, allowing images to be processed to the needs of the user.

When the image has been refined to the point where it can be saved, *Touch Up* offers several bitmap formats which allow broad compatibility across platforms. Obviously, the .IMG format is supported, as well as .GIF, .PCX, .TIF (greyscale), Degas, IFF-ILBM, and MacPaint.

Touch Up allows the user to save a full page, or to save a defined clip area. The latter option is very useful for most scans, where saving the whole page would be a needless waste of disk space.

Disks, Docs and Requirements

The *PS-400 Wand* scanner comes with 20 page, 6x8", soft-cover manual. All functions and features of the *Wand* and sheet feeder are covered thoroughly in an easy to understand tutorial style. For all that it can do, the *Wand*/feeder combination has a very flat learning curve. After having read the manual once or twice and using the hardware a few times, you're unlikely to need the documentation again.

Touch Up v1.84 comes on 2 double-sided, double-density disks. A 233 page revised hard-cover manual accompanies the disks. Revisions and changes include a new section on understanding greyscales and the greyscale mode, plus information on the new icons and interface features. The manual for version 1.84 is

strongly recommended by Migraph. The program will run in all ST and TT resolutions, however, ST low or high, or TT medium resolutions are recommended by the manufacturer due to the screen pixel aspect ratio.

If you wish to print from within *Touch Up*, you must use GDOS or its equivalent and the Outprint shell program supplied on the master program disks. This will slow the program down and is not really a very efficient method of printing. Users may prefer to export images to their favorite DTP program and print out directly from there.

Tech Support and Upgrade Policy

On the few occasions I needed some questions answered, Migraph's support staff was available during normal business hours. In addition to being very

courteous, the people in tech support seem to have a very good working knowledge of their products. Unlimited support is provided free of charge for registered Migraph owners.

Minor upgrades (usually bug-fixes) are typically offered at no cost to current users.

Major upgrades are priced commensurate with the level of new features added to the hardware or software. Migraph takes good care of their client base in offering an upgrade path for their hardware, as well as software products.

Conclusions

After using the *PS-400 Wand* scanner and sheet feeder, I'm going to find it very hard to go back to my hand scanner. This equipment is just so easy to use, that I've become spoiled by it. The sheet feeder performed flawlessly, with

a couple of minor exceptions. When scanning photographs smaller than the paper guides would adjust to accommodate, some scans were slightly crooked. Also, the sheet feeder had a little trouble with the thick-backed photography paper on some of the photos I scanned. The mechanism fed the photos properly, but there was some audible noise as the photo went through the feeder, and a few striations and glitches appeared in the resulting scan. Rescanning the same photo several times would eventually yield an acceptable image.

Touch Up 1.84 appears to be a very stable product. I did not discover any bugs in my run-through of the program. The 128/256 greyscale save feature is outstanding, as are the speed improvements. The updated interface is also a welcome change. I would like to see more flexibility in the processing of images ala' *Retouche*, or *Photoshop* on the Mac. Color support would be nice for a future high-end version of *Touch Up*.

The manual is really pretty good, but it could benefit from some tightening up. A lot of the same functions are covered in several different chapters, in varying degrees of complexity. This is a little confusing when trying to ascertain the operation of a certain function and not knowing exactly where to turn for complete information.

Overall, these are top-rate, quality products. I highly recommend the *Wand*/feeder combination to serious DTP'ers and hobbyists alike. As for *Touch Up*, a very good program gets much better. If you are using an older version of the program, it is well worth the upgrade to take advantage of the wonderful new features of version 1.84. If you want to get into desktop publishing and/or image scanning/manipulation, you will be well served by purchasing these three fine products from Migraph.



Additional Migraph Prices

Sheet Feeder/Cradle Option	\$249.00
Touch-Up 1.84	\$149.00
Migraph OCR 1.2	\$299.00
Migraph OCR upgrade 1.x to 1.2	\$ n/c
PS-400 Wand upgrade from Migraph Hand Scanner (Plus applicable Touch-Up upgrade fee)	\$349.00
PS-400 Wand upgrade from Golden Image Scanner (Plus applicable Touch-Up upgrade fee, requires new interface, included in upgrade price)	\$424.00
Touch-Up upgrade 1.6x to 1.84	\$ 30.00
Touch-Up upgrade 1.5x to 1.84	\$ 40.00
Touch-Up upgrade 1.x to 1.84	\$ 60.00

a significant improvement over the prior manual. While still a little ambiguous in some areas, the documentation is very good overall. Just be prepared to do a little digging through the various chapters.

Touch Up runs on all Atari 16 and 32-bit computers with at least 1 megabyte of memory. The program supports hard drive caching, allowing a hard drive to supplement system RAM. This process slows the computer way down and most users will not want to rely on hard drive caching too often. While a hard disk is not required to run *Touch Up*, it is

G-Man v3.0

Automated GDOS Management

By Peter Donoso

THE CONCEPT OF TYPE AND font management on computers can be quite frustrating to the new user—often inciting much lamentation and gnashing of teeth during late night installation sessions. Dogged perseverance will normally yield at least moderate success, but then again, computers were supposed to make things easier—weren't they? Plug-and-play applications are what every computer user longs for, despite their insistence that cryptic manuals and endless long-distance calls to customer support are the birthright of all computer owners.

Fortunately, the idea of separate installation programs has moved beyond its original purpose of simply rendering an application operable. Now installation/configuration programs are practically becoming the defacto standard for providing first-time users (and their experienced yet often-perplexed older cousins) with a simpler method for easily adapting software to their specific hardware, and software, set-up.

✧ G_MAN v3.0

Requirements: Any ST, ST^E or TT computer with double-sided drive and 520K RAM minimum.

Price: \$44.95, Includes S&H

Distributed by:

Dragonware Software Inc.
P.O. Box 1719
Havre, MT 59501-1719
(406) 265-7300

G_Man, from Dragonware Software, has moved the auto-install application idea to center stage, ingeniously applying it to the often daunting task of not only creating what, in GDOS lexicography, is known as the dreaded ASSIGN.SYS file, but also automating the installation of all relative fonts and the correct driver for your particular type of printer. The process has been rendered quite painless, and with the exception of a few simple choices that the program prompts you to select, *G_Man* does it all!

What Is GDOS?

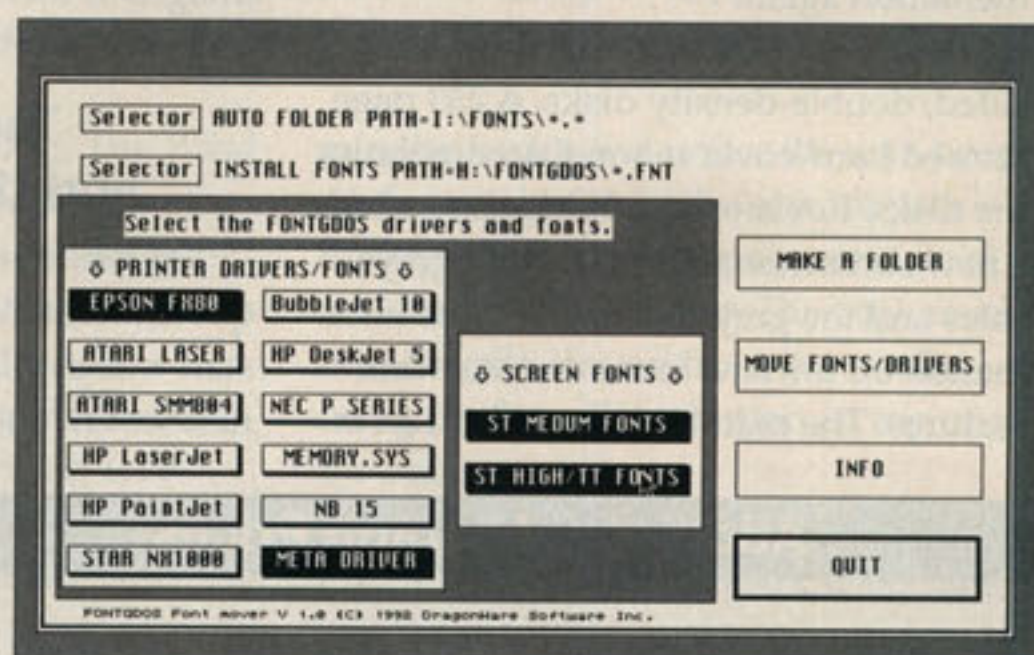
GDOS is a standard interface used to communicate with graphics devices such as monitors, plotters and printers. Most of us, though, know it as a font management system, offering a choice of alternative typefaces, styles and sizes, which can be assigned to text for print-out from any GDOS compatible program. Atari's recent release of FONTGDOS features better system memory management for improved system speed, along with a reduction in the overall amount of time it takes to print a document. The fonts used are in a category referred to as bitmap-based, or non-scalable type, which remain fixed

and cannot be re-sized.

This means that in order to print different sizes of the same font in its highest quality, a separate file needs to be created for each point size. The other determining factor has to do with the type of application for the font itself.

There are screen fonts, which relate to the resolution (low, medium or high) you will be booting your computer in. Then there are the various fonts that are compatible with your specific category of printer. Finally, there are drivers which interpret the data contained in each font file and translate it into a language that your particular printer will be able to understand.

The road map that tells GDOS the location for which drive and folder you store your fonts and device drivers in is known as the ASSIGN.SYS file. This is the file that GDOS looks for when you



F_MOVER.PRGM is another separate program which helps in the loading of all fonts and printer drivers pertinent to the user's specific hardware.

first boot up your system. GDOS must be installed within your AUTO folder, and it normally expects your ASSIGN.SYS to be in the root directory of your boot drive, outside of any folders. Refer to the side bar for a look at how an ASSIGN.SYS file is set up, and what the information in it means.

Anyone who's used a GDOS compatible program has come to discover that in order to use GDOS, they must first load the sample ASSIGN.SYS file into a text editor or word processor and may have to alter: (1) the file's default font folder path, (2) the list of fonts compatible with their printer, and (3) the appropriate printer driver to match their own set up. That's not so bad, you might think, you only need to do this once, and then you can use that ASSIGN.SYS file for any program. Ah, if only that were true!

Although some programs let you select from whatever fonts have been loaded by GDOS, there are a number of others—Timeworks Publisher is one that immediately comes to mind—which assign fonts to names that are part of the program's menu. This can get very confusing when you choose one font and end up with a completely different one on your screen if you haven't first made sure that your ASSIGN.SYS file only includes those particular fonts that originally came with the program.

This means you have to keep a copy of each program's ASSIGN.SYS file, copy and replace the one that may be presently on your boot drive's root directory and then re-boot your computer every time you want to change between two programs that use GDOS. Whew! Seems like a lot to have to manage in order to just get started. But—wait a minute—look. Up in the sky. It's....

G_Man To The Rescue

G_Man has the ability to fly through any size GDOS font folder and emerge with only what's relative to your printer, bend ASSIGN.SYS files to conform to any GDOS program with amazing ease, and take on the toughest font selection

Figure 1

The following is an ASSIGN.SYS file created by G_Man. The [;], used to insure the integrity of the file while allowing a comment to be entered, can be found in different parts of the file listing. Being positioned at the beginning of a line indicates the line contains nothing relevant to the actual file other than the comment itself. When [;] occurs after a line of text, it constitutes the end of the line as read by GDOS, allowing a comment to be attached without interfering with the execution of the file itself. Here, G_Man gives a thorough explanation of each section of the file, however, G_Man has an option which can disable this automated annotation feature if so desired.

```

PATH=H:\FONTGDOS\
; --No Default fonts--
; --START OF SCREEN FONTS--
01p screen.sys ; Default ----- For those older programs that
02p screen.sys ; ST LOW RES COLOR FONTS      required a Default screen font.
03p screen.sys ; ST MED RES COLOR FONTS
04p screen.sys ; ST (high) MONO FONTS
05p screen.sys ; TT Low Res
06p screen.sys ; TT Medium Res
07p screen.sys ; ???                          Reserved by Atari for future
08p screen.sys ; TT High Res                  use.
;          Font ID#   Points   FontName
ATSS10.FNT;    2       10      Swiss
ATSS12.FNT;    2       12      Swiss
ATSS18.FNT;    2       18      Swiss
ATSS24.FNT;    2       24      Swiss
ATTP10.FNT;   15       10      Typewriter
ATTR10.FNT;   14       10      Dutch
ATTR12.FNT;   14       12      Dutch
ATTR18.FNT;   14       18      Dutch
ATTR24.FNT;   14       24      Dutch
; --END OF SCREEN FONTS--
21 SLM804.SYS ;default printer driver
ATSS10LS.FNT;  2       10      Swiss
ATSS12LS.FNT;  2       12      Swiss
ATSS18LS.FNT;  2       18      Swiss
ATSS24LS.FNT;  2       24      Swiss
LIST06LS.FNT;  1        6      Listing
RAZB10LS.FNT; 241       10      Razor Bold
RAZI10LS.FNT; 242       10      Razor Italic
RAZR06LS.FNT; 240        6      Razor
RAZR10LS.FNT; 240       10      Razor
TYPE10LS.FNT; 16       10      Typewriter Abridged
31R META.SYS ;Meta Sys Driver
ATSS10MF.FNT;  2       10      Swiss
ATSS12MF.FNT;  2       12      Swiss
ATSS18MF.FNT;  2       18      Swiss
ATSS24MF.FNT;  2       24      Swiss
ATTP10MF.FNT; 15       10      Typewriter
ATTR10MF.FNT; 14       10      Dutch
ATTR12MF.FNT; 14       12      Dutch
ATTR18MF.FNT; 14       18      Dutch
ATTR24MF.FNT; 14       24      Dutch
;These screen and printer fonts account for
;502K Bytes of disk space
;376K Bytes memory when installed
;GDOS ASSIGN.SYS file made by THE G_Man 3.0
;(c)1992 DragonWare Software Inc.

```


job you can think of, faster than a 8ms hard drive—well, at least it looks that way to me.

The first time user may not really be that interested in all the nuts and bolts of how GDOS works—they just want to get going as soon as possible. By merely disabling all but a few choices in the Preferences menu, these can then be saved as the default configuration whenever the program is run again. Once this is done, simply answer the brief series of dialog box choices and *G_Man* cuts straight to the chase by doing all the rest in a matter of minutes.

Those users who have already had some experience with GDOS will appreciate the number of options offered: installation using older versions of programs that may require default fonts are covered; owners of the Atari TT030 are fully supported; WordFlair users with an early release of FSM GDOS, which Atari is readying for a much-improved re-release (see sidebar) can take advantage of *G_Man*'s complete FSM GDOS compatibility; Timeworks Publisher users, and other programs that do not strictly conform to the Atari font standard, may find the annotated ASSIGN-

.SYS option, which attaches comments to each font listed in the file with the name referred to by the program, can be a useful reference to print out.

Two other programs included with *G_Man* provide additional automation for various tasks. FONTFIX.PRG will automatically convert the header of *very* old GDOS fonts to conform to Atari's standard. As well, it will convert and correct the header and file name formats of Publisher 2 fonts. To use, simply define the path of your original font folder and then choose where you want the converted fonts. Instant update!

F_MOVER.PRG saves you some space on your hard drive by selecting only the fonts that are relevant to your system and printer. Why store fonts that hold no meaning for your monitor's resolution or your type of printer? Simply highlight what resolution you run in most, what general type of printer you use, and where you want to store your fonts. F_MOVER knows what to do, and promptly sets you up with a little more room to spare on your drive.

Versatile Support

G_Man supports large screen monitors, including the Moniterm and Atari TTM195, has improved error handling, is network compatible, is fully compatible with all ST/ST^E/TT models. *G_Man* comes with a total of five disks, which contain the three programs, a copy of FONT GDOS, along with related CPXs for use with Atari's Extended Control Panel, equivalent desk accessories for those users who may need them, the entire family of current FONT GDOS fonts, and a twenty page manual, all contained in a hard-shell vinyl folder.

The manual has a brief but concise description explaining GDOS for those who are interested, full descriptions of each menu listing and its function, and a tutorial which leads even the most timid of users through the step-by-step procedure for using *G_Man* so that they can quickly get started using their GDOS application. Although the manual is well written, some users may bemoan

...Again, Just What is GDOS?

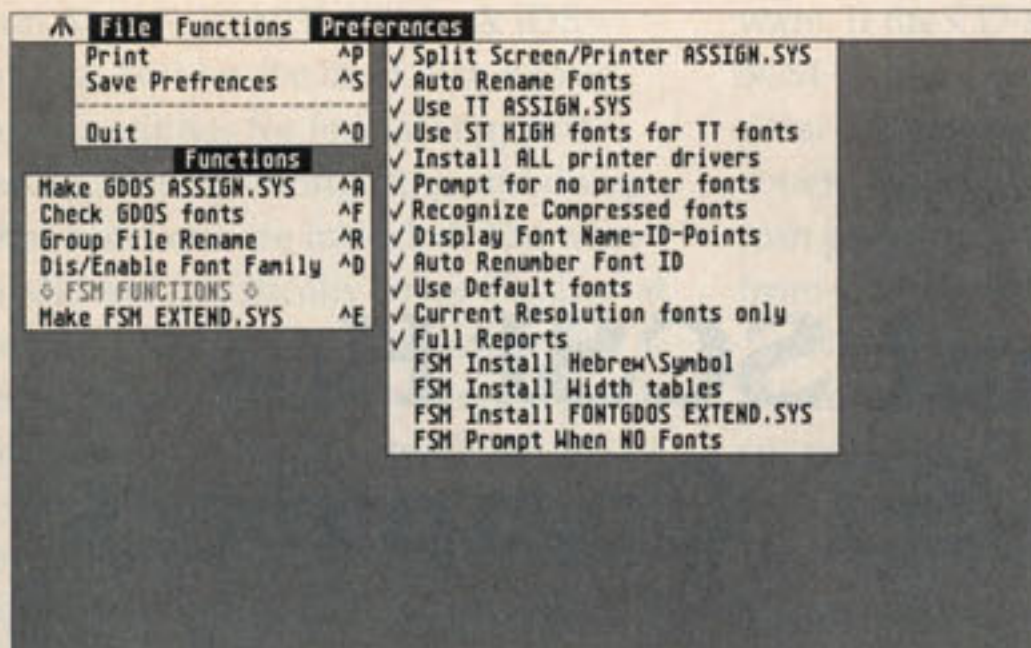
GDOS—is Atari's font management system, offering a choice of alternative typefaces, styles and sizes, which can be assigned to text for printout from any GDOS compatible program.

GDOS 1.0—Atari's initial Graphic Device Operating System gave users a basic family of non-scalable bit-map fonts and drivers. There was some interference with system speed, and usage of RAM is defined by the ASSIGN.SYS file's number of fonts and drivers listed, which GDOS automatically loads into memory upon boot-up.

FONT GDOS—Improved system memory management is complimented by a RAM cache that only loads those fonts being currently used for any one document, thereby also improving over-all printout time. Allows for installation of different ASSIGN.SYS files on-the-fly through the renaming of the current file without having to re-boot. Support for Bezier curves is built in. Is still limited to bitmap fonts only. Accessible through its related XCONTROL (Xtended Control Panel) CPX module and equivalent desk accessory.

FSM GDOS—Originally released in Europe and included with WordFlair II, a word processor that was the first program to use Atari's initial version. Although capable of handling scalable fonts, a new version is scheduled for future release which uses the Bitstream Speedo Engine resulting in an overall speed increase, better error handling, and widely available Bitstream fonts. RAM requirements are based on the number of fonts loaded and cache setups. Also incorporates all the capabilities of FONT GDOS for handling any older GDOS bit-map fonts. Accessible through its related XCONTROL CPX module and equivalent desk accessory.

G+Plus—CodeHead Technologies' utility which addresses some limitations of the original GDOS. Different ASSIGN.SYS files can be stored and loaded with each application through the use of the included desk accessory, which loads the appropriate fonts along with the program without having to re-boot. Also eliminated the system slowdown of GDOS 1.0.



G_Man's File and Functions menus all have key-command equivalents. The Preferences menu features a list of options pertaining to the creation of your ASSIGN.SYS file. A check mark indicates the feature is active.

the smaller type and somewhat crowded appearance of some pages, but in order to make the program affordable for the widest number of users, the developer has tried to keep his overhead to a minimum. Large type manuals are available for a nominal fee by contacting Chris Roberts of Dragonware.


Although you may find the information in the manual of interest, the program is so easy to use that you can just dive right in and read through it later—and that's the beauty of it. The very objective of the program, namely to make installing GDOS as easy as possible, is reflected in the actual use of the program itself. No muss, no fuss, no worries mate.

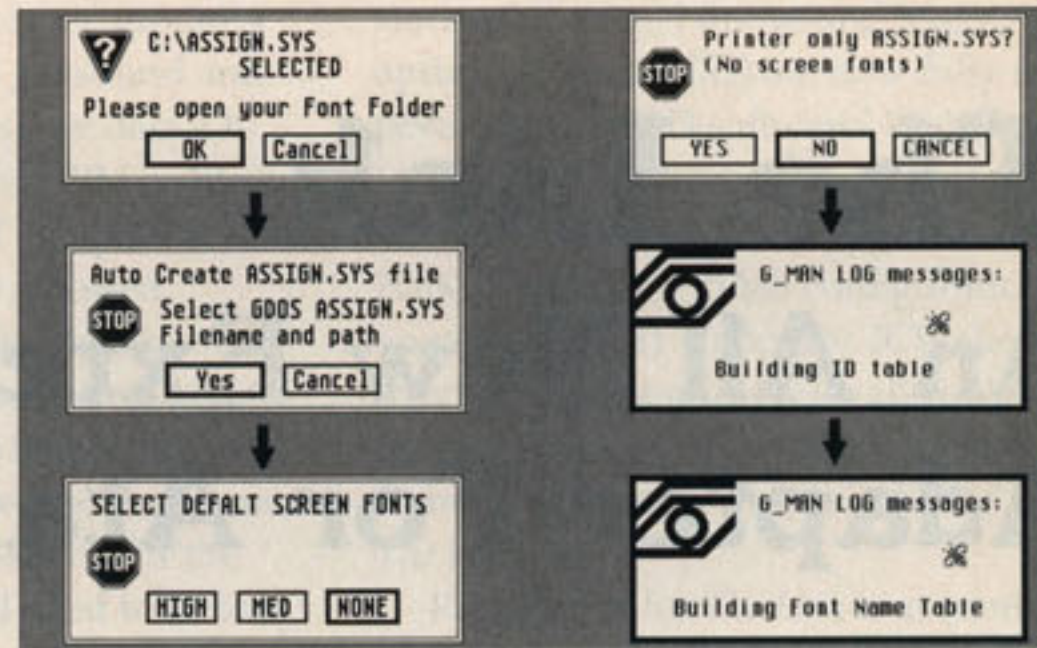
Users of CodeHead Technologies' G+Plus will be delighted to know that G_Man is also fully compatible with this excellent utility. In addition, G_Man is fully compatible with Atari's forthcoming revision of FSM GDOS.

Owners of G_Man V2.0/2.01 who mailed in their registration card should have already received a postcard offering them a special price to update to version 3.0. Owners of earlier versions can upgrade by sending \$24.95, along with their original disk, or registration card, but this offer is only good until December 31st, 1992.

Even if you only own one program that uses GDOS, you'll find yourself

well compensated for the small investment. If you've ever wished there was an easier way to install GDOS, and find yourself throwing up your hands in

frustration towards the heavens, G_Man is the answer from above. Once you use it, all your GDOS problems will go up, up—and simply fly away. 



The sequence of dialogue boxes and options that are presented after selecting "Make GDOS ASSIGN.SYS". The G_MAN LOG Messages boxes are an optional feature that inform you of each step in the process and seem to have covered every eventuality.

Figure 2

AT SS 10 LS. FNT

- ↑ Manufacturer's Code—In this case, Atari.
- ↑ Typeface—Sans Serif Swiss style of font.
- ↑ Point Size—The height of a font.
- ↑ Device—This is a 300dpi font.
- ↑ Atari's GDOS designated three letter file extension.

EP—Epson-compatible fonts for use with a wide variety of 9 pin dot matrix printers that emulate the Epson standard.

LB—Originally designed for the Atari SMM804 9-pin dot matrix printer. Replaced by EP fonts.

LS—300dpi resolution font, for use with Atari's SLM804/605 Laser Printer and most other laser and bubble-jet printers.

CG—A Color Graphic screen font that is for use with ST medium resolution only.

MF—A Meta File, a related information file used by GDOS to store and retrieve .GEM files.

SP—360dpi resolution, for use with some 24-pin dot matrix printers and any printer capable of printing 360 dots per inch.

AT—Atari fonts from GDOS 1.0.

Fonts that have a blank space after their point size are ST High, ST Low and all TT screen resolution fonts—used for monitor display purposes only.

The Link

An All New External SCSI Host Adapter For Atari ST Computers

By Ron Robinson

FROM THE FOLKS WHO have one of the best lines of peripheral hardware and software enhancements for Atari computers—ICD, Incorporated—comes *The Link*, a fully integrated VLSI external SCSI host adapter for all Atari ST computers. With *The Link*, you can directly connect standard SCSI devices to your Atari ST.

The Link is an external SCSI host adapter designed to plug into a standard 50 pin centronics style SCSI connector. Amazingly, the adaptor itself is molded into the SCSI connector—just 2.5" by 3" by .75" thick. Adding to the convenience, power is provided by the drive to which it is connected.

The Link serves the same purpose as the original ICD AdSCSI Host Adapters. The major differences are that it:

- 1) It's self-contained and does not need an external case or power supply.
- 2) It connects to the 50 pin centronics-

style connector on the rear of most standard SCSI devices.

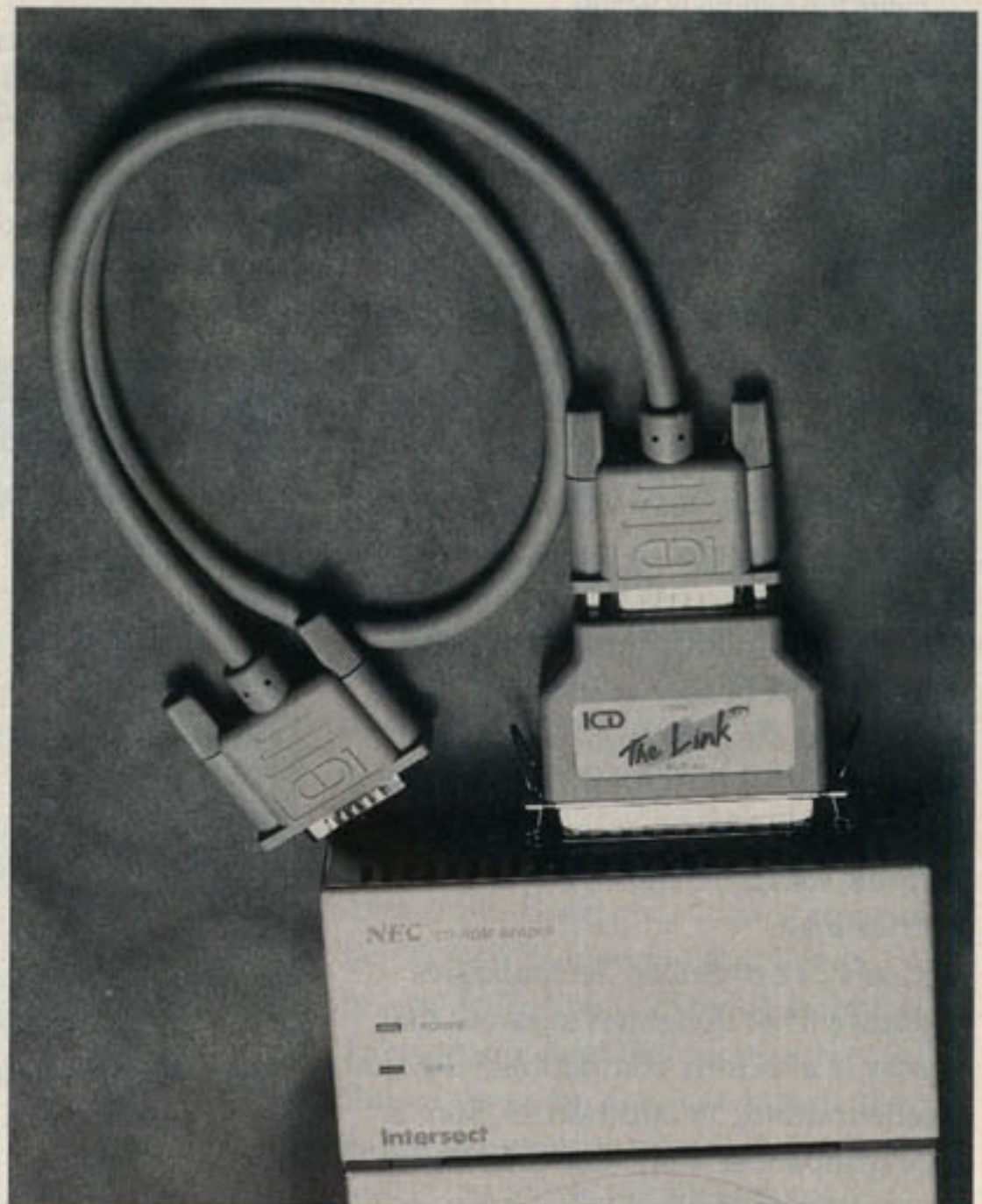
- 3) It's very small.

As we just stated, *The Link* plugs into the 50 pin SCSI port of a standard SCSI drive. To complete the connection, a 19 pin ACSI cable plugs from *The Link* to the ACSI (DMA) port of the Atari ST, ST^E, or Mega ST^E.

When you connect *The Link* to a SCSI drive, power for the host adaptor is derived from the termination line (pin 26) of the SCSI device. Since a

clock is not included in *The Link*, up to 8 SCSI devices can be supported by the

adaptor. This allows the Atari ST to use standard external SCSI drives originally designed for other computers. (Macintosh, IBM, etc.) Just plug *The Link* into the SCSI drive, connect a cable from your ST to *The Link* and go. Since most drives require no modifications, *The Link*



With *The Link* from ICD, owners of any Atari ST series computer can now access the myraid of SCSI peripherals such as scanners, CD-ROMs, Floptical Disks, and other such power tools.

won't force you to violate the drive manufacturer's warranty.

The Link includes ICD's very powerful hard disk software that supports the full SCSI-2 command set (group 0 through group 7 commands). ICD's drivers allow access to DMA, SCSI, and

★ The Link

Requirements: Works with all Atari ST computers, includes cable.

Price: \$ 119.95

Manufacturer:

ICD, Inc.
1220 Rock Street
Rockford, IL 61101 USA
(815) 968-2228
(815) 968-6888 FAX
(815) 968-8550 Sales

even Atari Falcon030/ST Book IDE devices. Besides the hard disk driver, various utilities for formatting, partitioning, testing, configuring and doing other functions are included. The manual did not specifically cover *The Link* at the time of this review, but otherwise is very good at explaining everything you would want to know about hard drives.

The software provided with *The Link* now supports CD-ROMs! Since *The Link* supports extended SCSI commands, ICD and Atari MetaDOS drivers that support the SCSI-2 standard for CD-ROM players are included with the soft-

ware. If the CD-ROM player supports SCSI-2 sound, you will get sound and data. If not, you will just get data. Of course the ST can not run IBM or Macintosh programs, only ST compatible data from CD-ROMs can be accessed.

The Link does not directly support Macintosh hard drive software, such support would need to be provided by Mac Emulator (e.g., Spectre) developers. You can use a drive designed for the Macintosh but it would need to be formatted as an Atari drive. Spectre format partitions are supported.

Are you ready for big time optical

storage? Floptical drives and Magneto-optical drives (MOD) are now fully supported by the ICD software! With the Insite Floptical drive you can read and write IBM-compatible floppy disks at 720K, 1.4Mb, and 21Mb configurations on your Atari ST computer. ICD claims they now support virtually all R/W optical drives in the 3.5 and 5.25 inch formats with the software included with *The Link*.

Retail price for *The Link* is around \$100 without the DMA cable (the DMA cable is available for around \$20), and comes with a full one year warranty. *The Link* performed flawlessly on my SCSI SyQuest 88 drive—ICD has another winner in their product line. I highly recommend *The Link* to anyone wanting to add the popular standard SCSI devices to their ST.



The following general Link support information was provided by ICD:

There are two important requirements for *The Link* to function properly with a SCSI drive:

- 1) The drive must have parity disabled. This is usually done with a jumper. The new Quantum ELS SCSI drives do not have the jumper. Quantum engineers have promised to add a parity disable function in the next revision of firmware. BOOTFIX is already set up to disable parity on these drives but you will need an AdSCSI Plus or AdSCSI ST to disable the parity on an ELS drive. The other Quantum drives all have parity jumpers so this is not a problem with them. IF you have a choice, get an LPS Quantum drive (120 or 240 MB) since these are much faster than the ELS drives anyway.
- 2) The drive must supply termination power on pin 26 of the SCSI bus. This is the middle pin on the side of the 50-pin that has the notch. Termination power should read around 4.7 volts DC. If the drive does not support this, there are usually jumpers on the drive to change this—or in the worst case you will need to run 5 volts from the drive PCB to this pin. "Proper" SCSI specification termination power also includes a 1 amp fuse and a diode for protection.

If the termination power isn't there, look for a blown fuse on the drive. This is also a common fault. The fuse (sometimes called a "pico fuse"—Ed) will usually look like a resistor with no color code and sometimes 1A marked on the body. You should read around 5 volts on both sides. IF one side reads 5 volts and the other 0 volts, then the fuse is bad (open).

Insite Floptical drives are shipped from the factory with termination power disabled but a jumper change easily enables it. All PLI drives have termination power.

The SCSI IDs will still be 0-7 since *The Link* looks just like an AdSCSI to the computer and software.

The Link will be a bit faster than the ICD AdSCSI with some drives. It does support a drive at ID 6 which were not previously supported by ICD host adaptors. (The clock used ID 6.) *The Link* does not have a clock.

If you have problems, call Howard at ICD Technical support (815) 968-2228 from 10-2pm CST.

Some Related Terms

ACSI—Atari's form of SCSI—the name given to the hard drive or DMA port on the ST computer. Similar to SCSI, but different enough.

DMA—Direct Memory Access, a method of transferring data very rapidly, often refers to the hard disk port on the ST.

HARD DISK DRIVER—The program that allows you to use a hard disk with your ST. Atari, ICD, Supra, BMS and others provide such programs with their respective hard drive hardware.

HOST ADAPTOR—Hardware adaptor that converts ACSI to SCSI.

SCSI—A standard interface for hard drives, tape drives, CD-ROMs and floppies used by most all computers. The Atari Falcon030 and TT computers come with built-in SCSI interfaces.

VLSI—Very Large Scale Integrated circuit, often a custom integrated circuit designed to perform a specific function at reduced size, power and cost.

Gemulator v1.00

An ST Emulator for PCs

By Ron Robinson

AN EMULATOR IS A PRODUCT that allows one computer to run software written for a different computer. Emulators have been relatively popular products for the ST with a number of PC emulators and the Gadgets by Small "Spectre" series of Macintosh emulators. Now PC owners are able to get in on a little of the fun by purchasing an ST emulator for their PC.

Gemulator is a PC based product from **Branch Always Software** that is advertised to emulate a 68000-based Atari ST computer with 2 megabytes of RAM, color and monochrome video output, floppy disk drives, a keyboard, a mouse,

and a printer port. Sound, MIDI, the serial port, joysticks, and the blitter are not currently emulated. This rules out the use of ST telecommunications software along with some game and music software. According to the developers, most everything else should work.

What You Need And What You Get

To run the program, you need a 386SX or better computer with 4 meg (8 meg recommended) or more memory and an empty 8 bit slot. (Which rules out most laptops.) For all practical purposes, you need greater than 5 meg of XMS memory free to run the program. Branch Always software indicates future versions of the program will need less memory.

Gemulator consists of the software plus a small \$299 "ROM Reader" board from **Purple Mountain Computers** which includes a set of TOS 2.06 ROMs. This board plugs into a PC 8 bit expansion slot. The board is necessary to protect Atari's copyrights on the TOS software. The remaining 6 sockets are available to install additional versions of TOS ROMs to provide multiple TOS version capability. It only takes a few minutes to pop the hood on your PC and install the board.

An introductory shareware version of the emulation software is provided with the package. Upgraded versions of *Gemulator* software are not included in the cost of the board. An additional \$59.95 fee must be sent to Branch Always Soft-

ware to register the software and qualify for upgrades. Registered users will receive printed documentation and newsletters alerting them to newer versions of the *Gemulator* software. The first software update after registration is free.

Getting It Running

With the board installed, software setup is a very simple process of retrieving the programs from a self extracting archive. Once extracted, batch files are thoughtfully included for running the necessary programs under the DOS or Windows environments. Just run the appropriate batch file to start up the emulator.

The program begins with a configuration screen where you select the monitor type, pick which floppy is drive A:, select which version of TOS you want to run (if more than one set is installed on the board) and other configuration settings. Enter the Install TOS command and if all is well, you will soon see the familiar Atari logo in the upper left corner of your VGA monitor and then the Atari GEM desktop! The on disk documentation does a very nice job of walking you through potential setup problems, PC memory voodoo and describing how to tune DOS and Windows for *Gemulator*.

How Well Does It Work?

Our time to work with a *Gemulator* beta version was very limited and we are not yet prepared to state what ST software does and does not work. Run-

* Gemulator ROM Reader Board

Price: \$299 (subject to change)

Distributed by:

Purple Mountain Computers
15600 N.E. 8th St. Suite A3-412
Bellevue, WA 98008
Phone/Fax: (206) 747-1519

* Gemulator Software

Price: \$59.95 shareware registration

Distributed by:

Branch Always Software
14150 N.E. 20th Street Suite 302
Bellevue, WA 98007
(206) 885-5893

Requirements: DOS compatible 386SX computer (486 at 33 MHz to run at 8 MHz ST speed) with VGA graphics, one 8 bit expansion slot and a minimum of 4 meg memory (8 meg recommended).

ning *Gemulator* under DOS, the number of ST programs that seem to load and startup was amazing! But we really need more time and testing to make sure everything works. Branch Always Software claims the following Atari ST programs currently run with *Gemulator*:

PageStream, Calamus, First Word Plus, LDW Power, Avante Vector, Silhouette, Degas Elite, Prism Paint, GFA BASIC, GDOS, WordFlair, NeoDesk, HotWire, MultiDesk, DC Desktop, Laser C, MadMac, Gemini, Tempus, Infocom adventures, A Mind Forever Voyaging, Hero's Quest, Sierra Online games, and ChessMaster 2000.

Testing on a 486 33MHz PC with 8 MB of memory under DOS provided results roughly equivalent to an 8 MHz, 2 MB ST. Screen response is noticeably slower than the ST but screen accelerators such as Warp 9 help here as they do on the ST. *Gemulator* was not quite so successful running TOS under Microsoft Windows due to intermittent crashing. The developer indicates this will be improved in the next version. You need in excess of 5.5 MB memory free under Windows for the program to load.

Looking back at the Magic Sac (the original Macintosh emulator for the ST), *Gemulator* is comparatively well ahead in functionality out of the starting gate. You have to admire the work of the developer in getting the emulator working, particularly considering 68000 code is running on a very different 80XXX microprocessor. In my opinion, part of the success here should also be attributed to the Atari programmers who designed TOS—particularly when compared to the Macintosh operating system. David Small spends most of his development time fixing Macintosh software problems. ST applications developers should also get some credit here for sticking to the programming rules set by Atari.

Problems?

Since *Gemulator* is in its first release, a few problems and limitations should not be surprising. Hard disk access is lim-

ited to read only access of the first 32 MB of the C drive. You may have to move the files or re-partition your PC hard drive to use it with *Gemulator*. The beta version can not write to the hard drive or perform low level format of floppies. I had problem: convincing the program to switch from drive C to A and other difficulties accessing drive C. Branch

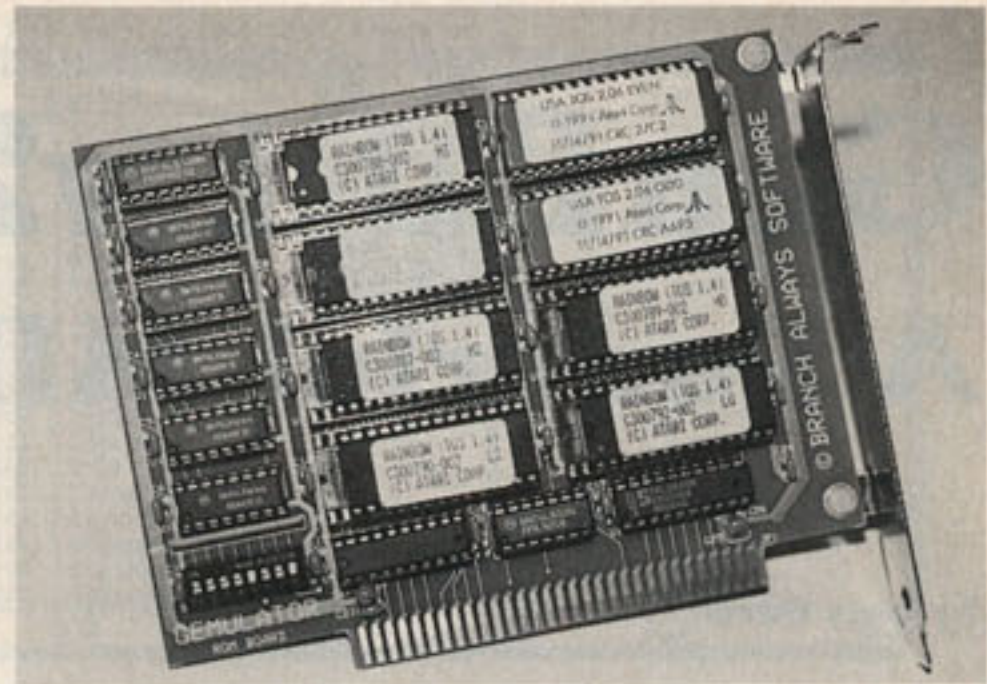
Always Software indicates most of these problems should be among the first things addressed in the next release of the software.

Telecommunication is not possible under *Gemulator*, there is no support for the RS-232 ports. Mouse response is sometimes erratic. Joystick and MIDI ports are not supported. The time and date are not set at boot. Programs that are timing dependant or make rapid palette color changes will not run (Spectrum, probably some games). Copy protected software probably will not load due to the floppy controller hardware differences.

Planned Upgrades

Purple Mountain Computers and Branch Always Software are providing excellent support of the product via online services such as GENie. They have been very upfront with the bugs and limitations and are working to resolve the problems as much as possible. According to Branch Always Software, updates to *Gemulator* are in work with the first update scheduled to be mailed to registered users in November. They state the update includes improved hard disk support, optimizations for 486 computers, 10% to 20% speed increase over the shareware release and that it will include the ability to emulate a 4 or 8 megabyte ST.

Future plans include a SuperVGA mode to allow the use of 800x600 screen resolutions with Atari ST software, and a version which has a built in custom



hard disk driver to overcome the 32 MB hard drive limit. Later, Branch Always Software is considering adding features such as joystick support, RS-232, and possibly even using the Sound Blaster card to allow sound and MIDI capability.

Conclusions

Gemulator is certainly an amazing hack in the sincerest sense of the word. I definitely can see where former Atari owners who have left the flock and moved on to the PC world would enjoy having access to Atari software again. However, I wouldn't throw my ST computer away just yet. Until the hard drive support is improved, even minimal application use is difficult at best—hard drive updates should be released soon. RS-232, MIDI sound and joystick support are in work but availability may be a few months away. You should evaluate your own needs to see if the \$360 investment is worth being able to run the ST software you use with the noted limitations under *Gemulator* on the PC.

We hope to follow up on the progress of *Gemulator* as well as perform detailed software compatibility testing in a future issue once the released version of the software is available. In the meantime, if you are interested in the *Gemulator*, we recommend you carefully consider the practicality of the product in your situation before buying, and keep in touch with Branch Always Software on the status of the latest versions.



GenEdit v2.0

A Powerful MIDI Editor/Librarian

By Jerry Davis

WITH THE RECENT SALE OF HYBRID ARTS, BAREFOOT SOFTWARE has acquired the rights to all Hybrid Arts software products. This new company will concentrate only on MIDI software, and with increased resources, will continue to support and refine all Hybrid Arts software including GenEdit.

GenEdit v2.0 is a program designed to communicate with virtually all MIDI capable hardware. The primary focus of GenEdit is to provide librarian and editing functions for synthesizers and tone modules. When used in this manner, you can create, load, edit and save custom banks of sounds or patches for most popular devices. But, it doesn't stop there. With the ability to record and save practically any type of MIDI related data, it can be used for everything from sending patch changes and microtuning tables to setting up an entire MIDI studio.

Due to the complexity and variation

of the different editing Templates, I will not attempt to go into detail on the specific editing functions of GenEdit.

Instead, I will try to give an overview of the many features of the package. Users of previous versions of GenEdit should be pleasantly surprised with the new features contained in version 2.0, especially the Device List and new librarian functions.

Being a universal MIDI controller, editor and librarian, GenEdit performs the functions of several dedicated editor/librarian packages. The ability to control all of your MIDI devices from within one program is one of GenEdit's most appealing qualities. Configurations and templates are available for over seventy different devices, with more in the works. In addition, you can utilize GenEdit's own programming language to create custom Configurations and Templates for instruments not currently supported.

Essentials

GenEdit v2.0 will run on any Atari ST, ST^E or TT with a double sided drive and 512K of RAM. While almost all configurations and templates perform well within 512K, some of the more intensive editing templates will require a maximum of one megabyte of RAM. The program runs on both high resolution mon-

ochrome and medium resolution color monitors. Key disk copy protection is implemented in GenEdit, which means that you will need the master disk in your floppy drive to boot the program. But, the program will also recognize SMPTE-TRACK's hardware interface as a key, an added plus for those currently using SMPTE-TRACK. (SMPTE-TRACK is Barefoot Software's top-of-the-line sequencing package.)

Compatible with HybriSwitch, version 2.0 now supports C-Lab's SoftLink, and Steinberg's MROS multiple program switching environments. Other new features added, include:

- Sort command, which alphabetizes patches.
- Find Duplicates function that searches banks of patches for duplicate patch names, patch data, or both.
- Studio Setup feature, which remembers patch bay routing, port, filters, channel, and transmission speed for each device in your system.

A well written users manual leads you through GenEdit's features in a tutorial manner. In addition, a concise table of contents and an extensive index provide quick and easy information for setting up and using the numerous features of this software.

★ GenEdit v2.0

Requirements: 512K of RAM, double-sided disk drive, and color or monochrome monitor.

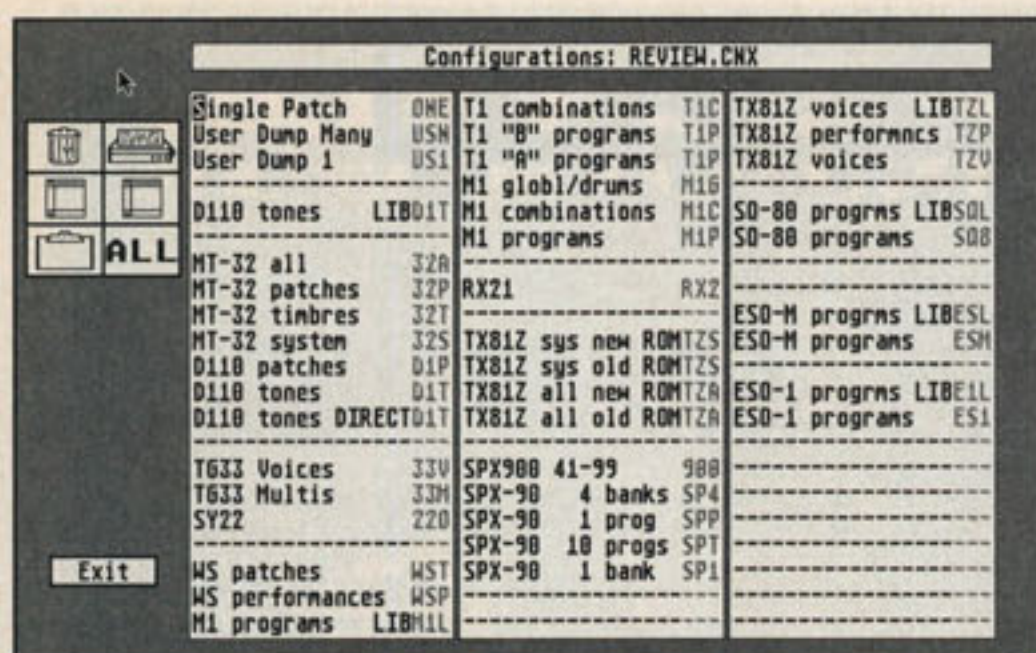
Copy Protection: Key-disk or SMPTE Track interface.

Summary: Registered owners of v1.1 can upgrade to v2.0 for \$99.

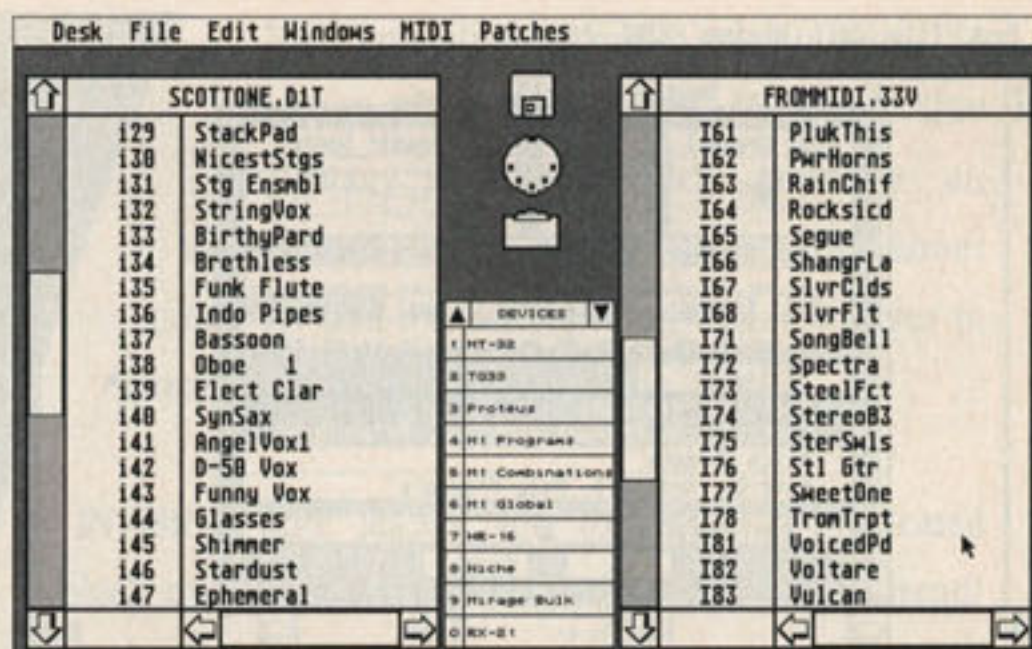
Price: \$199.00

Manufacturer:

Barefoot Software, Inc.
19865 Covello St.
Canoga Park, CA 91306
(818) 727-7143



The Configuration Editor is used to organize the different files *GenEdit* requires to communicate with specific devices.



GenEdit's main screen utilizes windows and icons to transfer patch data between the computer and different devices.

Configurations & Templates

GenEdit relies on Configuration files which contain instructions that allow it to communicate with specific devices. These files are used in much the same way a word processor uses printer drivers. It is these Configuration files that provide *GenEdit* with the means of organizing, editing and filing different patches, banks, combinations, etc. It is important to note here that all Configurations are not created equal. Some Configurations do not provide patch or parameter editing functions, while others do. It would probably be wise to download the demo version of *GenEdit* and the configuration files for the devices in your setup from one of the on-line services. Or contact Barefoot Software to determine if the particular functions you need are supported.

Templates allow *GenEdit* to provide a graphic display of knobs, sliders, buttons, waveforms, envelope settings, etc., used to control specific functions for a device. These Templates tell *GenEdit* how to look like a patch editor for a given device. In conjunction with configuration files, the Templates give you access to the many parameters and patch editing functions for each instrument.

The *GenEdit* package comes with all librarian Configurations and three Manufacturers Templates. Additional Templates can be downloaded from one

of the major on-line services, or purchased from Barefoot for \$10 per set.

Setup And Main Screen

By following the tutorial section of the users manual, it is relatively easy to learn and understand how *GenEdit* operates. The examples in this tutorial are a must for first time users. Once you have a grasp of the internal workings of the program, it is easy to set it up to accommodate your particular equipment.

GenEdit's intuitive main screen displays two windows which are employed to show patch names and location numbers. These windows are used for organizing banks of patches. In addition to the standard menu bar, there are icons representing MIDI, a disk drive, and a clipboard. By clicking and dragging these icons, data can be sent or retrieved from the MIDI port(s), disk drives, or the clipboard.

Below these three icons is the new Device list. This list can store configuration data for up to 60 devices. Each device can be configured to transmit and receive on a particular MIDI channel and/or port. Options are provided for transmit speed and filtering of different types of MIDI data. An editing Template can also be linked to each device. After a device has been set up, data can be exchanged between it and the different icons and windows.

Sys-Ex Spoken Here

Let's assume you have *GenEdit* configured for your needs, and you want to load a bank of patches from one of your tone modules. You would click on the name of the desired module in the Device list and drag it to one of the windows. If everything is configured correctly, the tone names will appear in the window. You would then be able to audition, organize, edit and transfer individual or entire banks of patches. Once past the initial set up, this click and drag method of moving data makes dealing with System Exclusive data almost painless.

When used for organizing patches, *GenEdit* offers a means to sort banks of patches alphabetically. Patches can also be compared in one or both windows to locate duplicates. You can even print out the patch lists from the two windows. These features enable creation of custom banks of patches that can be saved to disk.

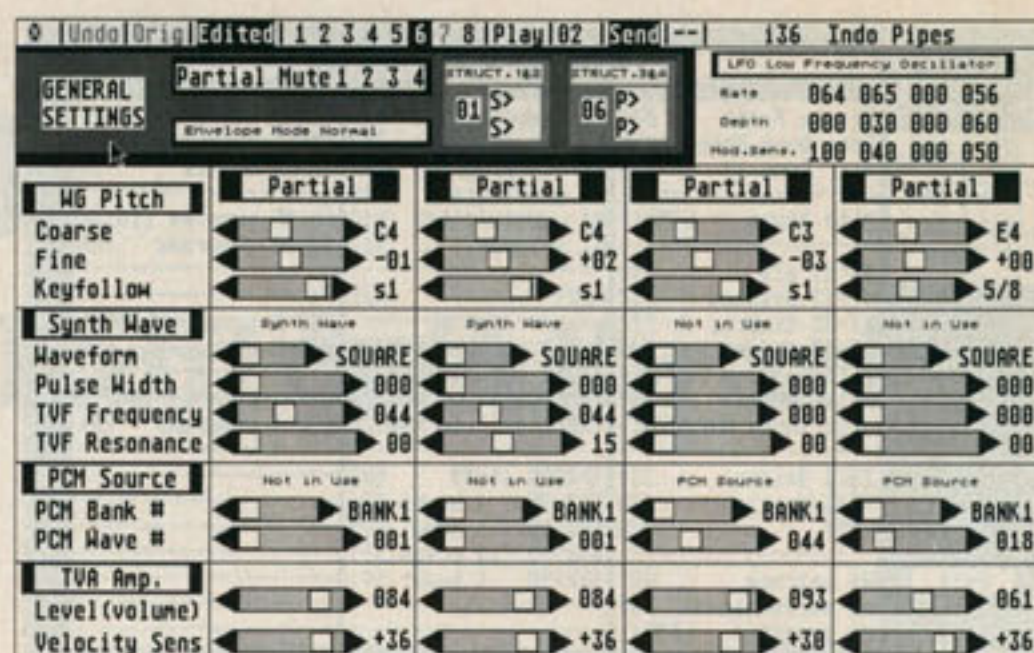
There is a Multi-Block feature that will allow you to save patches for different devices in one file. This file can then be loaded and sent out the MIDI port(s) to load custom patch banks into several devices with one transmission.

Editing

Right-clicking on a patch or choosing the Edit option from the Patches selection in the menu bar invokes the editing



Through the Device Configuration, communication parameters can be customized to accommodate each piece of equipment in the Device List.



A page of one of the many Manufactures Templates supported by GenEdit. Notice the extensive use of sliders for controlling specific functions in the editor.

Template. These Templates can contain from one to eight pages of text and graphics. Each page normally relates to a specific function or group of functions. One page may be used for editing particular patch data, while another may control overall settings, such as reverb, pan, partial reserve, etc....

Since the Templates are programmed by different programmers, they vary in appearance. But overall, the different Templates operate in a similar fashion. With the ability to edit the Templates, you can add, modify or delete an object's appearance or data. I would recommend that you be comfortable using Sys-Ex data and the technical information supplied with your MIDI devices before attempting to edit Templates. This is one feature that is definitely intended for the more experienced user.

As most synth owners can attest, front panel editing of patch data can be a royal pain. GenEdit's extensive use of graphics in the editing Templates tend to ease this pain and in some cases, even make it fun to edit those waveform and envelope parameters that used to take wading through page after page of text on a tiny LCD display. Being able to actually see a graphic representation of a waveform, change it with a touch of the mouse, and then hear the result instantly makes creating and altering patches a much more enjoyable

experience.

Automated editing functions: Distort, Randomize and Average allow the creation of new patches. User defined parameters are used to control these functions. Although the results are not always predictable, they are nonetheless interesting and with a little experimentation can yield some useful new patches.

Macros

One of my favorite features is the Macro function. Using a dedicated editor, 36 different keystrokes can be assigned to transmit any type of MIDI event. The data used for Macro keys can be displayed in hexadecimal, binary, decimal or ASCII format. The Macro editor also allows cut, copy and paste as well as printing of Macro data.

Different Macro files can be saved to and loaded from disk. Again, a thorough understanding of MIDI code is required for implementing the Macro functions to their fullest. Once a Macro file has been loaded, the different Macro commands can be sent out the MIDI port(s) from any of the various GenEdit screens.

I was able to successfully create Sys-Ex Macros for controlling an ancient SMPTE to MIDI Time Code convertor that I still own. Keep in mind that Macro data is not limited to Sys-Ex commands alone. Any type of MIDI event can be

contained in a Macro, including Patch Changes, Pitch Bends, and MIDI Time Code.

In The End....

Overall, GenEdit v 2.0 is an extremely powerful package. If you own one or more MIDI devices, you probably need a product like GenEdit. Users of dedicated editor librarians can load files from most of these packages directly into GenEdit.

This program is very solid, and I experienced no incompatibility problems, other than a couple of older public domain desk accessories. All other commercial desk accessories and AUTO programs I used worked flawlessly.

GenEdit's editing functions are the strong point of this software, and match or beat those found in most other similar packages. The librarian capabilities, however, are somewhat lacking. It would be nice to have a few more tools available for sorting and organizing patches. Perhaps future versions will offer more extensive functions.

I am impressed with GenEdit's attention to detail, and would not hesitate to recommend it to anyone considering the purchase of a universal editor/librarian. It has given me total control over the various equipment used in my small studio. And, what it lacks in organizing features is redeemed in its power, flexibility and compatibility.



INVISION

E L I T E

DMC Publishing is proud to announce the release of INVISION Elite. INVISION Elite has many features which make it an indispensable tool to anyone serious about creativity and irresistible to anyone who likes to enjoy themselves while working.

INVISION Elite allows you to create sophisticated black and white raster images. Stretch! Skew! Bend! Copy! Thin! Thicken! Rotate! Outline! Anything! If you can think of it, chances are INVISION Elite can do it. Using images that you create in the program, or ones from other sources, you can manipulate graphics to achieve stunning visuals. For example, you could load a page from Calamus and bend it into the shape of an "S". The graphic on the left was produced entirely within Invision Elite.

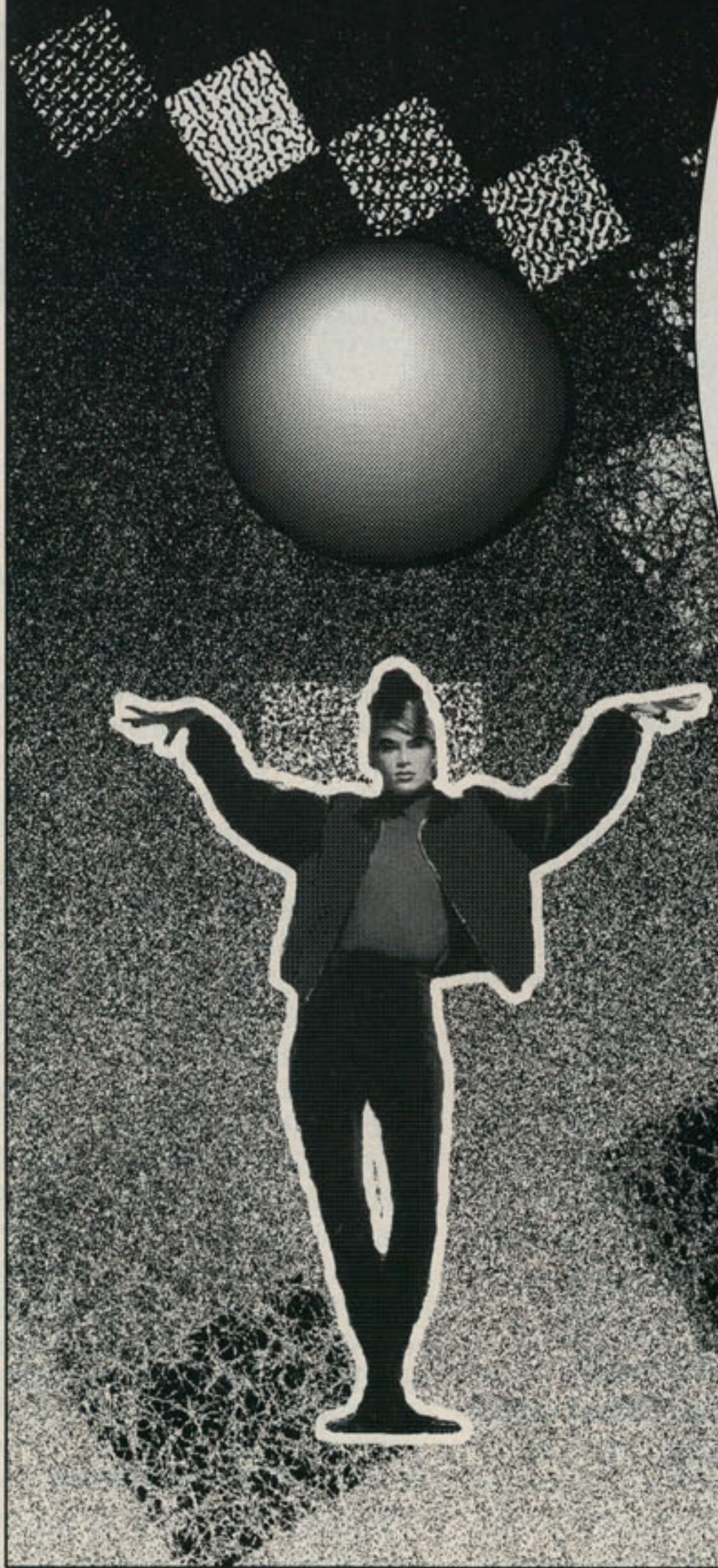
INVISION Elite unleashes your creativity. The suggested retail price is US \$129.95, CDN. \$149.95.

- Custom Iconic Interface
- Powerful intuitive design featuring the Icon Bar allows you to get started in minutes.
- Instant Access Panning makes working with large images a joy.
- Keyboard equivalents.
- Fully definable snap function, with single pixel increment capability.
- Coordinate memory.
- Horizontal and vertical lock.
- Multiple Image handling; load up to 25 images at once.
- Virtually unlimited image size.
- Extensive Commands: lines, curves, freehand, stipple, graduated fills and ellipses, squares, rectangles, circles, ellipses, and polygons.
- Powerful, unlimited size, user definable patterns.
- Undo and redo feature.
- Fast and accurate configurable magnification.
- Innovative Block Functions: copy entire image, rectangular or irregular areas.
- Paste blocks using any of four copy methods: Transparent, Cover, Inverse or Overlap.
- Create automatic and custom masks.
- Scale, skew, mirror, and rotate, even in one degree increments.
- Transfer blocks and masks to and from windows.
- Ultra fast special effects: Inverse, Thicken and Thin, Outline, Smooth using white or black, Erase stray dots.
- Image Manipulation: Bend, Distort, Crop, Insert & Remove sections.
- File Exchange: Atari Clipboard Support. Color file import. Calamus Vector Graphic import.
- And much, much more.

An INVISION Elite demonstration version is available for downloading from GEnie and Compuserve. INVISION Elite is a welcome addition to any graphic workstation. Please place your order now.

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Tune-Up Your Hard Disk Before it Gets Zapped!

By Ron Robinson

WHILE HARD DRIVES can make your computer system faster and easier to use, there is a down-side to living with them. Too many users simply plug in their new hard drive and sit back as the drive hums along happily hour after hour, speedily recalling and saving data. Like all good things, a hard drive is often taken for granted. Before it's ever noticed by the user, small data errors creep in. Eventually, the drive itself seems to lose its pep and everything slows down.

A key to avoiding disaster is to fix small problems before they become big. There are precautions you can take to prevent a disaster from wiping out your data. The first is to always backup your hard disk files, and do it regularly. The second consideration you should ponder is to often use a program to test the integrity of the file structures so you can catch problems early. Finally, you can optimize the placement of files on your hard disk and restore maximum performance to your system.

Skuzzy What?

For those who are not familiar with SCSI (pronounced "skuzzy"), this acronym stands for Small Computer System Interface, a protocol for communicating with peripheral devices such as a hard drive. The ST series of computers support a similar but somewhat different standard called ACSI (Atari Computer System Interface), and need an adapter (provided by companies such as



ICD, Supra and BMS) to interface to a SCSI device. The Atari Falcon030 and TT030 computers have full built-in SCSI interfaces.

SCSI drives are the latest standard in data storage technology, represented by high speed intelligent drives. One of the many features normally available in these hard drives is the ability to "map out" (substitute) a bad area on the drive with an alternate good area specifically reserved for such purposes. Disk utilities can take advantage of this feature to keep hardware problems from affecting your data.

The latest SCSI hard drives are very reliable, but errors can still creep in and affect data on your disk for a number of reasons: hardware fails, power glitches, programs hiccup, viruses attack, people goof, and Murphy shows no mercy.

Murphy Strikes! (Not Brown, The Other One)

Every time you experience a power glitch, it is possible for "droppings" of unwanted data to be written to the disk, damaging your files. You can guarantee this happening by shutting off power

while the computer is writing to the disk or deleting a file.

Physically jarring your disk while it is running can also cause bad things to happen to your hard drive. The disks inside a hard drive spin at several thousand revolutions per minute. A little bump to the drive can result in the read/write heads in your drive "crashing" into the disk. This may result in varying degrees of damage.

However, human-induced errors are probably the most common cause of data loss in today's hard drives. People make mistakes by deleting files they still need. Errant programs crash and overwrite critical information. If you ever see bombs pop up on your screen while writing to disk, you may have a problem. Perhaps the most perverse human generated problems are computer viruses that deliberately attack your data and could cause the loss of all the information on your disk drive.

Disk Structures

The good thing about the programs we will cover shortly is that they know how files are stored on your disk—you

really don't have to worry about this stuff. You may, however, find it helpful to have some understanding of how files are handled by your computer.

With your hard disk utility software, you can split a drive into logical sections called partitions. These partitions then look like separate (logical) disk drives even though they are on the same (physical) disk drive. There are five primary data structures on a hard disk drive: the Boot Record, Boot Sector, Directory Sector, Partition Table and File Allocation Table (FAT).

The **Boot Record** (or Physical Sector 0) is a specific physical area on the disk that contains key information about the disk that allows software to access information on the disk and get things started. This includes how the drive is partitioned and how information is stored on the partitions. Errors in the boot area usually mean you have to reformat the disk.

Within the Boot Record there is data called the **Partition Table** that allows the hard drive to be broken up into several sections known as "partitions", each of which can be used as a separate logical drive by the rest of the system. The hard disk driver is a program that is responsible for taking a request to read or write data with one of these logical drives and translating it to access the right part of the physical hard disk. The Partition Table contains housekeeping information used by the driver software to tell it where each partition starts, how big it is, and other such things, such as bad sector lists and partition types. (GEM, BGM, XGM, ACK, OOP, etc.) Errors in the partition area are often fatal unless you can restore a saved copy of the table.

Now that we have the disk drive broken up into chunks, we can talk about the data structures each partition needs. First is the **Boot Sector**, which is always the first sector on each partition. The data in this sector tells the hard disk driver how to get to the data within the partition. This information includes bytes per sector, sectors per cluster,

number of FATs, number of sectors, sectors per track, number of sides, and more.

The **File Allocation Table (FAT)** is a data structure that contains the status of all the clusters (groupings of contiguous sectors) on the disk. The ST uses a data structure for the FAT that is closely compatible with the IBM PC. The operating system uses the FAT to find existing files or to figure out where to put a new file.

Information in the FAT tells the operating system whether a cluster in question is available, defective, or already in use by a file. When marked as "in use," the FAT data for the cluster points to the next cluster/FAT location of the file or indicates if it is the last cluster of the file. Disk diagnostic programs can follow how clusters are chained together to determine if there is a problem.

Entries in the FAT may be marked as bad to identify clusters the disk controller can not read. Since two copies of the FAT are maintained by the operating system software, some FAT errors can be repaired.

The **Directory Sector** contains information indicating the size of the file, filename, attributes, time/date stamp, and the address of the first sector of the file.

Bear in mind that there are two types of Directory Sectors, one for the root directory and one for subdirectories (folders). The size of the root directory is set when you partition the disk. Any entry in the root directory can refer to a subdirectory or a file. Subdirectories can be expanded as needed, but expansion can create additional fragmentation problems.

Disk Performance

You may notice your hard drive seems to slow down over time as you use it. This slow-down can often be attributed to "fragmentation." Fragmentation occurs as your data files grow in size and become scattered across your drive. For example, suppose we had three files on our drive (A, B and C).

When first written, the files would be physically grouped together much as follows:

```
AAAAAABBBBBCCCCC
```

Now let's add information to file B:

```
AAAAAABBBBBCCCCCBBBBBBB
```

The next time you need to access file B, the hard drive has to find the beginning of B, read the first group of data, and then spend time moving to the second grouping of B data to read the rest of the file. The file is broken up into "fragments." This would be much like reading a book that jumps to different pages every few paragraphs. Efficient... NOT! You can imagine how the problem will continue to become worse as you add data to your hard drive during normal operation.

Subdirectories also become fragmented. The analogy here is instead of only jumping between pages to read our book, the book's Table of Contents is also scattered across different pages in the book. It is easy to see how efficiency can drop with continued use.

One way to address the problem is to back up your drive, reformat it, and restore the data. Most people would not be in favor of this option due to the time, risk, and trouble involved. An acceptable alternative is to use a hard disk optimizer program that will automatically regroup your files and restore the fast access speed you enjoyed when you first used your drive.

Disk Tools

Using the proper tools, you can detect damage before there is a major loss of data and reorganize the information on your hard drive to provide maximum performance. This month, we are covering a couple of the better tools available for the Atari ST—Hard Drive Sentry from Beckemeyer Development (pg. 36) and Diamond Edge from Oregon Research Associates (pg. 38). You will also find two performance comparison charts on pages 41 and 42.

Hard Disk Sentry 1.3

BECKEMEYER DEVELOPMENT's *Hard Disk Sentry* is a disk of utility programs designed to help you take care of your hard drive by providing the ability to analyze, repair and optimize the data on your drive. These utilities can even be used on floppy drives. The programs come on a single floppy with documentation contained in a 20 page pamphlet. As with most Beckemeyer products, the documentation is very technically oriented.

Tools

Features provided by the program include:

- Disk test surface analysis
- File structure testing and correction
- Disk map fragmentation display
- Disk optimization
- Optimize without moving PC Ditto system files
- Easy to use GEM interface
- Most features work on floppies

The "Disk Test" program can be used

✦ Hard Disk Sentry

Requirements: Works with all ST/TT computers.

Price: \$49.95

Manufacturer:

Beckemeyer Development
P.O. Box 21575
Oakland, CA 94620
(510) 530-9637
(510) 530-0451 (FAX)
(510) 530-9682 (BBS)

to scan your hard disk for physical defects. By performing a surface analysis of your disk, physical sector errors can be detected and intelligently mapped out if you wish.

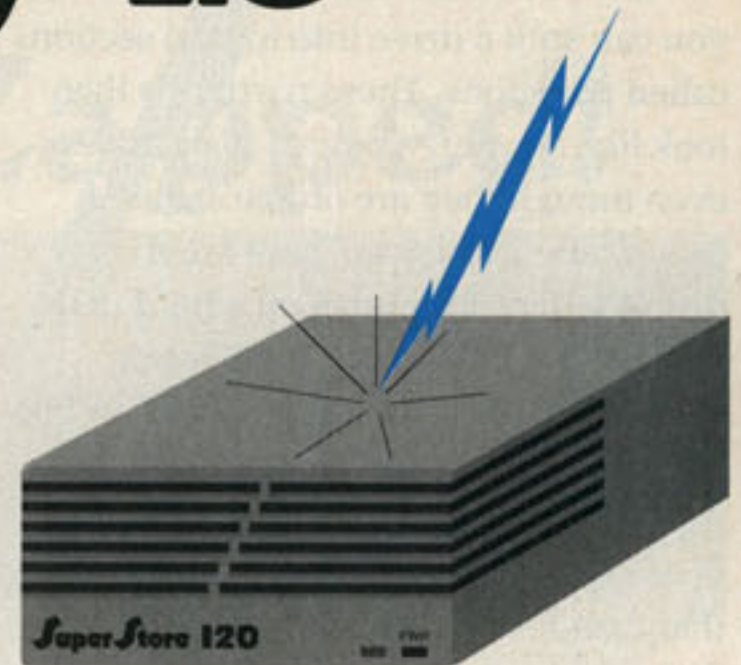
The "Sentry" program tests the files on your drive, and helps repair, or at least minimize, the damage to the data on your drive. Tests within the program can determine the integrity of the File Allocation Table (FAT) along with the directory and file structures on your disk. Don't be confused, Sentry can not repair broken hardware. It only repairs certain kinds of damage to the file structure on your hard drive. Sentry can also determine the level of fragmentation and reorganize the files on a hard drive to optimize access speed.

The *Hard Disk Sentry* documentation is very insistent in how you start your computer before using the program. You must avoid loading other programs that may interfere with disk access. An important safety precaution isn't mentioned—back up your hard drive first. A power failure or program crash during disk optimization or repair can result in the loss of all data on your hard drive.

You should always be sure to back up your hard drive before using any disk optimizer or repair program! I have found *Hard Disk Sentry* to be very reliable, but still strongly recommend a backup of your data before use.

Repairing The Damage

The read/write heads on your hard drive spend most of their life accessing directory information. This also means the probability is quite high that these file structure areas will be where any damage occurs. The test and repair pro-



gram starts out checking the file structure on the drives you select. It then traces through your files to verify they are linked together properly. *Hard Disk Sentry* will give you a report including the following information:

- Bad File Endings
- Invalid Fat Clusters
- Chain Collisions
- Orphan Files
- Recoverable Clusters
- Free Clusters
- Unknown Clusters
- Unusable Clusters
- Orphan Descendants
- Recoverable Clusters
- Orphan Clusters

The *Hard Disk Sentry* documentation provides brief explanations of the meanings of each of the above.

Hard Disk Sentry will try to recover or repair any damaged files, if you request it. It will even take a best guess as to what type of file it is trying to recover. I induced a few "Orphan" files on one of my drives and *Hard Disk Sentry* happily repaired the problems as it has like other times over the years that I have used it.

Optimization

A neat addition to the latest version of *Hard Disk Sentry* provides a graphical map of the data on your hard drive to help you determine if you need to perform optimization. If you see a large number of files scattered all over your drive, you know it is time to optimize your drive.

After testing your drive for errors, *Hard Disk Sentry* will optimize any or all the partitions you select. Disk optimization is very important to maintain fast file access response time. *Hard Disk Sentry* optimization will reorganize the information on your hard drive such that all the files are placed in consecutive clusters. The program will allow you to set aside space in the front of your disk for future files. This "write gap" will speed up disk writes by minimizing a program's search for disk space.

According to Beckemeyer, the current revision of TOS has a very slow search of the FAT entries. This means every time TOS has to allocate more space for a file, it must start at the beginning of the partition and search until it finds free space. This can take several seconds on a full partition, and optimization will make this even slower since it would pack everything completely at the beginning. The write gap is space left near the beginning of the disk (after the directories) so that new files can be created very quickly. This means that TOS will find free space close to the beginning of the disk so adding (a few) files should take a fraction of a second.

PC Ditto Friendly

A very clever feature of *Hard Disk Sentry* is the capacity to look for the DOS files needed by PC Ditto. PC-DOS requires the operating system files to be located in a specific physical location on a hard drive. *Hard Disk Sentry* will not move these files, allowing PC Ditto users to optimize their hard drive safely.

Conclusions

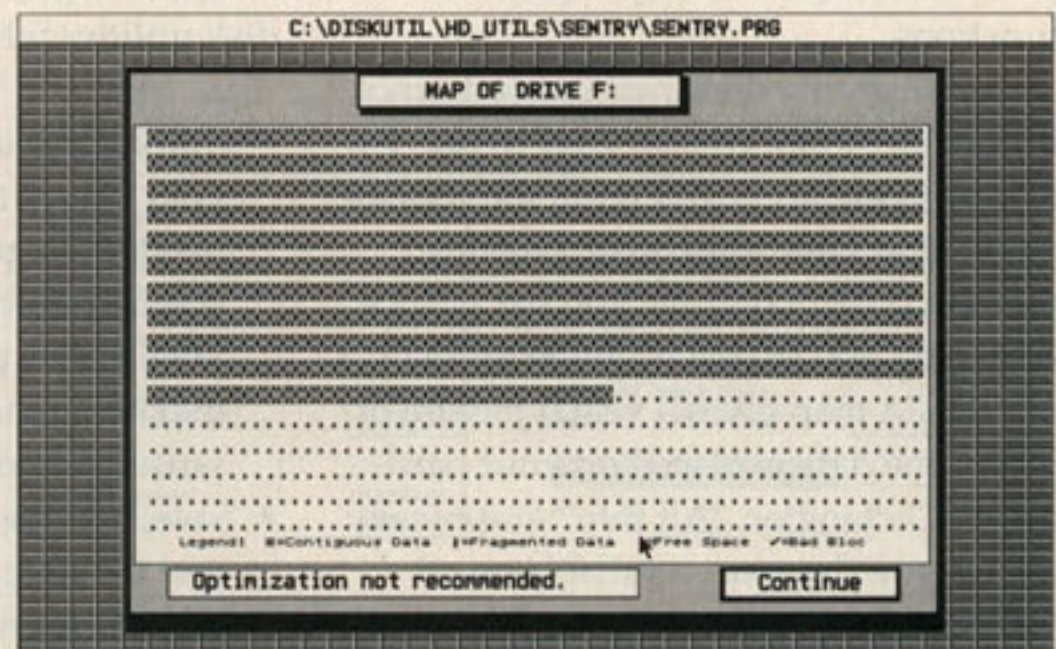
Hard Disk Sentry has been around for a number of years. The program has proven to be very reliable across a wide range of systems and hard drives. The program is easy to use, and gets the job done. I highly recommend *Hard Disk Sentry* to all hard drive owners.

C:\DISKUTIL\HD_UTILS\SENTRY\SENTRY.PRG 10:40:10

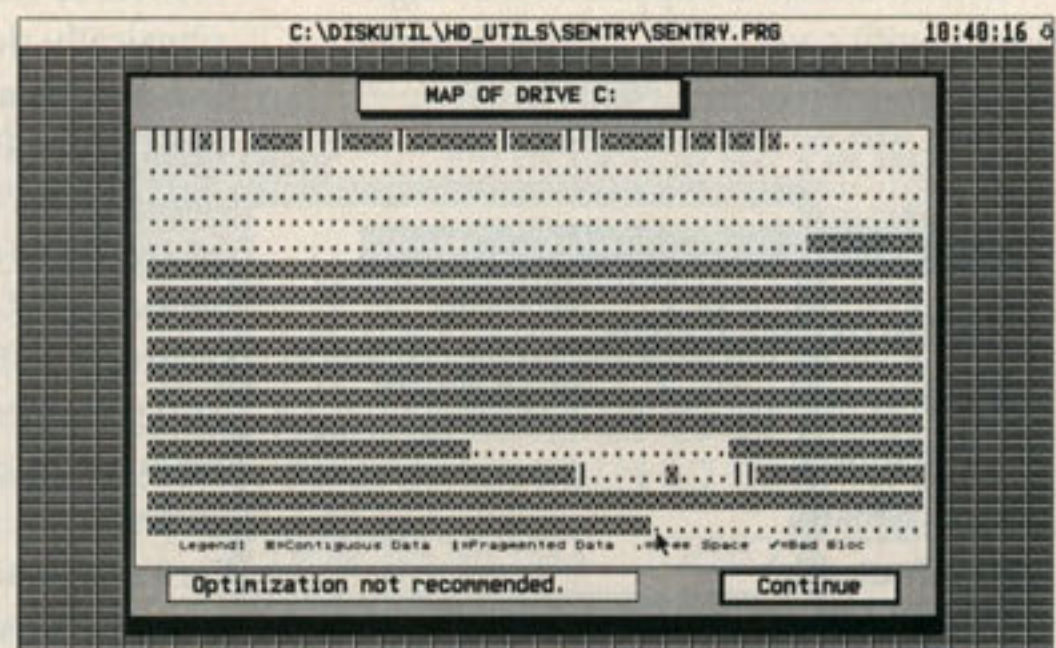
Total FAT clusters	27228	Bad File Endings	0
FAT File Starts	1783	Invalid FAT clusters	0
FAT File Ends	1783	Chain collisions	0
Contiguous Clusters	17488		
Non-contiguous Clusters	64		
Total Files	1783	Orphan Files	0
Total File Clusters	19335	Orphan Descendants	0
Free Clusters	7892	Orphan Clusters	0
Recoverable Clusters	0		
Unuseable Clusters	0	Total Errors	0
Unknown Clusters	0	Total Good Files	1783

Status display for Volume C

Hard Disk Sentry will check your hard drive for a number of file structure problems and generate a report. The program can then automatically repair many forms of damage if you want.



After optimizing your drive, you will get a nice organized grouping of files on your hard drive. This partition was optimized with no write gap.



Hard Disk Sentry provides a graphical map of the data on your hard drive to give you an idea whether optimization is really necessary. This drive was previously optimized using a write gap. Notice how most of the fragmented files are now at the beginning of the partition.

Diamond Edge

DIAMOND EDGE, THE NEW-est and possibly the finest hard disk repair utility, has arrived. Oregon Research's latest program features a very easy to use graphical interface and a comprehensive collection of disk diagnostics, undelete, protection, repair and optimization functions.

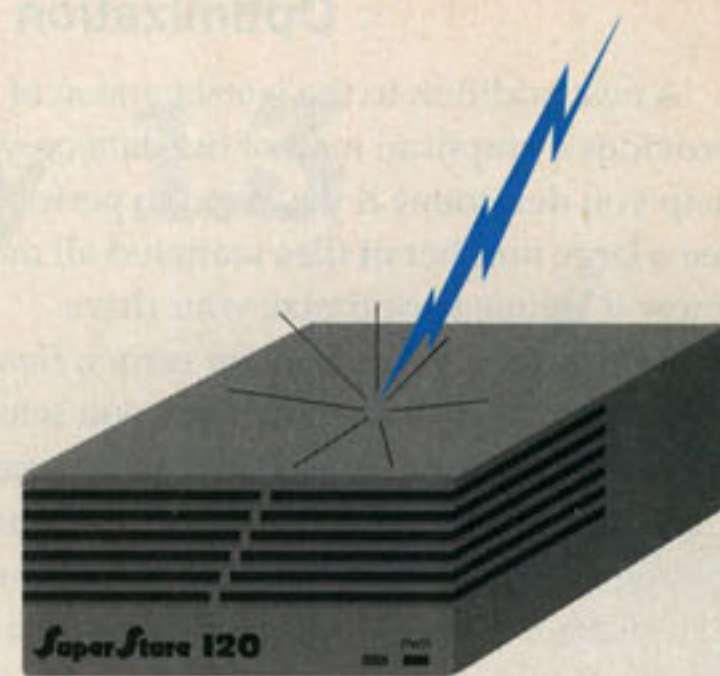
An elegantly designed user interface makes the program very easy to use. All functions are accessible from the control screen and GEM drop down menus. Graphical displays give you bar graphs depicting percentage fragmentation by file size. A map gives a visual picture of where the data is placed on your hard drive. Clicking on "All Info" graphically shows you the space available on all your drives. Most operations can be performed on one, any or all of the partitions on your hard disk with a single command.

Diamond Edge Anatomy

Diamond Edge is supplied on a single floppy with a very well written 76 page spiral bound manual. The manual

includes an excellent tutorial on the "Anatomy of a Disk Drive." This tutorial goes a long way towards clearing up some of the mysteries of disk drive technology and provides enough information to understand the "what's" and "why's" behind using *Diamond Edge*. *Diamond Edge* provides a wide range of disk utilities which can:

- Graphically and statistically examine your drives to see if optimization is needed. Regroup your files and directories for faster access speed. Files can be placed on your drive to maximize the speed of reading or writing to and from your disk.
- Save, edit and restore critical partition and file data. This allows you to recover from hard disk crashes or repair damaged drive information.
- Test and repair physical errors on your hard disk. Sectors with defective media can be marked to prevent their use by programs. Data can be recovered from files that include physically defective sectors.
- Test and repair file errors on your hard drive. File and disk structure damage can be detected and corrected. Files and directories can be recovered. A memory resident "Mirror" utility automatically saves critical information allowing the recovery of deleted files and directories.
- Perform partition maintenance operations such as: configure, zero, un-zero and wipe.
- Test the data integrity of the files on your drives using checksum and/or CRC data. Use this data to verify that optimized or restored files are good.



- Perform partition to partition copies as image or defragmentation copies.
- Provide on-line help for most functions.
- Work well (most operations) on floppy disks also.

Starting Up Diamond Edge

When first run, *Diamond Edge* starts things off with a fully automated installation program that asks for information allowed by the Geneva Convention such as your name, address and serial number. The program files and auto folder programs are then automatically decompressed and installed on the drive you choose.

You are wisely advised to perform a back-up and read the manual before using the program. In the event you're struck by a disaster, the manual walks you through the generation of an "Emergency Disk" that can be used to restore file, partition and SCSI information. By periodically saving this information, you can protect yourself from future hard drive crashes or even virus attacks.

Diamond Edge is now ready for a test flight. You can first set up your preferences for using the program. All configuration settings are saved and reloaded the next time you use the program. An "Expert/Novice" mode controls the level of help warnings you get before performing operations. An extra level of warnings can be enabled—handy when

⚡ Diamond Edge

Requirements: Works with all ST/TT computers.

Price: \$69.95

Manufacturer:

Oregon Research Associates
16200 S.W. Pacific Hwy., Ste. 162
Tigard, OR 97224
(503) 620-4919
(503) 639-6182 (FAX)

first using the program to ensure you do not do something you may later regret.

An "Active Drive" window across the bottom of the screen allows you to select the drive you wish to test. A "Disk Information" screen provides you with everything you would ever want to know about your hard drive and the files it contains. The "Fragmentation Map" graphically shows the physical relationship of the files on your drive. Files, free space and fragmentation are all visually displayed along with the appropriate statistics for the partition or drive. This display fills in the same order as a real directory search would, giving you a very good indication if the drive speed would benefit from optimization. The "Fragmentation Map" is also fun to watch! An "All Drive" information display gives you a bar-graph display for each of your drives indicating the percentage of space used along with some additional statistics for the drives.

Disk Repair Shop On A Disk

A "Medic" disk repair feature allows you to test and repair the file structure of your hard drive. A brief description of the types of errors *Diamond Edge* can detect and help you correct includes:

- Boot Sector—disk structure information can be restored from archived data.
- FAT Fault—File Allocation Table (FAT) info is stored in two identical tables. If they do not match, "Medic" will help you determine which are most correct and assist you in a repair.
- Invalid Directory—garbaged directories can be truncated or deleted.
- Unreadable Directory Sectors—damaged directory sectors are adjusted or deleted.
- Illegal File Names—invalid characters in filenames are corrected as well as two files in the same directory with the same name.
- Bad Directory Entries—directory entries that aren't valid are deleted.
- Inconsistent File Size—if the number of clusters allocated to a file do not match the count contained in the directory, the directory is adjusted to match reality.
- Bad FAT Entries—entries that point to illegal or nonexistent clusters are deleted. Files are truncated and the file size adjusted.
- FAT Chain Collisions—if two or more files think they own the same cluster, copies of each file are made and you can then decide which is correct.
- Lost Clusters—clusters in the FAT that don't belong to any of the files are adjusted.

The *Diamond Edge* documentation provides very good explanations for each of the above types of problems. While running, a visual screen shows you where errors are detected. "Disk Medic" can automatically repair errors and/or log errors

Drive	Total Bytes	Used Bytes	Free Bytes	%Free
C	27,879,424	19,799,840	8,080,384	28.9
D	58,624,512	34,789,376	15,835,136	31.2
E	21,425,152	19,238,912	2,186,240	10.2
F	21,425,152	14,328,640	7,104,512	33.1
G	31,988,544	27,678,720	4,301,824	13.4
H				
I				
J				
K				
L				
M				
N				
O				
P				
Grand Total	153,334,784	115,826,688	37,508,096	24.4

With a single click you can see the distribution of free disk space across all your drive partitions.

Bytes per Sector:	512	FAT Encoding:	16 bit
Sectors per Cluster:	2	Sectors per FAT:	187
Bytes per Cluster:	1024	Number of FATs:	2
Sectors per Track:	49	Start of FAT #1:	1
Tracks per Cylinder:	4	Start of FAT #2:	188
Total Sectors:	54687	# of Root Dir Sectors:	16
Control Sectors:	238	Maximum root entries:	256
Total Clusters:	27343	Start of Root Dir:	215
Data Clusters:	27226	Start of Data Area:	231
Total Bytes:	27879424		
Used Bytes:	19799840		
Free Bytes:	8080384		

Percent Disk Full: 0 20 40 60 80 100

Detailed information on a hard drive partition is just a mouse click or two away with *Diamond Edge*.

Restore Disk Information

Restore the:

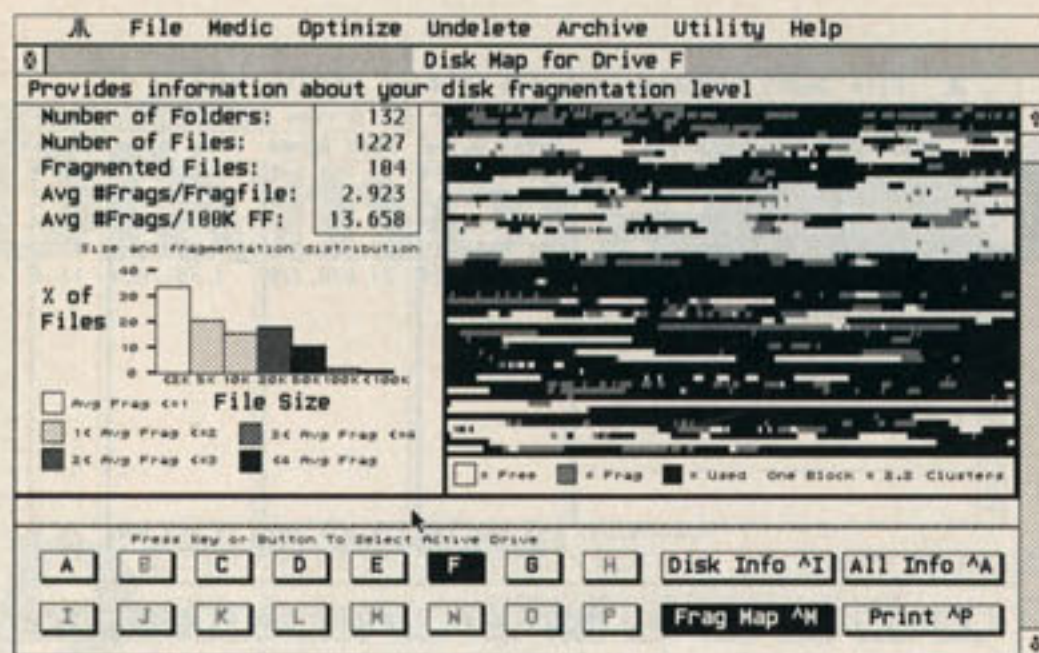
Boot Sector FAT Table Root DIR

to drive:

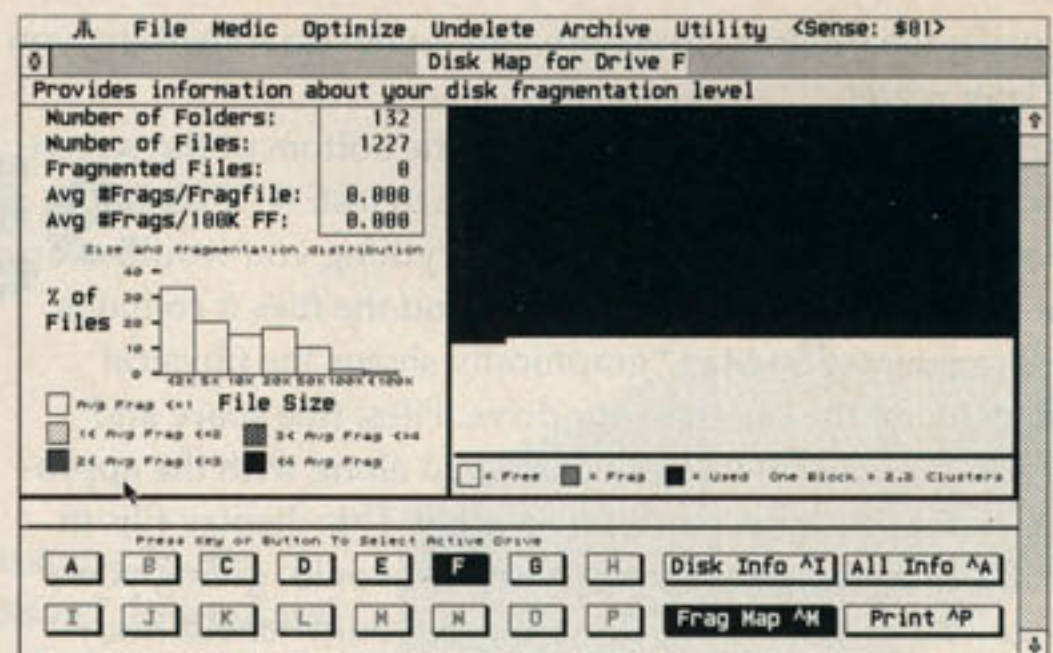
A B C D E F G H
I J K L M N O P

Select Disk Info File Cancel

You can save important SCSI and disk info in the event an errant program wipes this information out. This may allow you to recover unreadable partitions.



A very badly fragmented test partition is shown here. Fragmented files are displayed in a lighter grey. Notice the bar graph shows % fragmentation by file size.



The same partition after defragmentation—all the files are now grouped together providing faster disk performance. You'll think you got a whole new computer!

to a file if you choose. A built-in file view utility can be used to display any affected files.

The integrity of data on your disk can be validated using Diamond Back II compatible CRC and checksum files of the information on your drives. This file contains a unique number that identifies the content of each file. The file can then be used to make sure the information within each of your files has not changed since the last time you performed a checksum or CRC.

You can save hard disk configuration information using the "Archive" features that allow you to save the file structure and SCSI partition info. The complementary function provides restoration of the file structure and SCSI partition info if needed. This capability allows you to restore even very badly damaged disks or recover crashed disks.

As a non-scientific test of the repair features of *Diamond Edge*, I have reset the computer in the middle of an optimization. (Don't do this at home folks.) *Diamond Edge* was able to recover the partition automatically—no muss, no fuss.

Bad Sector Mapping

A "Map disk" operation will verify that the sectors on your drive are good by finding and marking any bad sectors that may have cropped up. Three types of bad sector mapping are available:

- Read/Read Non-destructive—each sector is read twice. If the reads do not match, an error is noted.
- Read/Write/Read—each sector is read, written back and read again. If the second read does not match the first, an error is noted.
- Write/Read (destructive)—random patterns are written to the disk and read back. If the data does not match, an error is noted. Data on the drive is overwritten while doing this and should only be used if you have backed up the data on that drive.

Again, the documentation provides clear explanations of each of the tests. A graphic screen tracks progress through the tests and displays bad sectors. Bad cluster numbers are also displayed.

Data Recovery

The Diamond Mirror system automatically saves critical disk information that allows you to recover deleted files. The "Mirror" program automatically runs from your autofolder to keep track of changes in the FAT resulting from deleted files and saves that information for future recovery. The program's intelligent undelete feature will automate recovery of the files. If Mirror has not been run, undelete will still help recover files if possible under TOS.

Using Mirror, even fragmented files and subdirectories can be recovered. The

program uses FAT and directory information stored in the mirror data files to help reconstruct a deleted file. The program will validate the integrity of the undeleted file if you have a current set of validation files. Data from lost clusters or zeroed disk partitions can also be identified and recovered.

General Disk Management

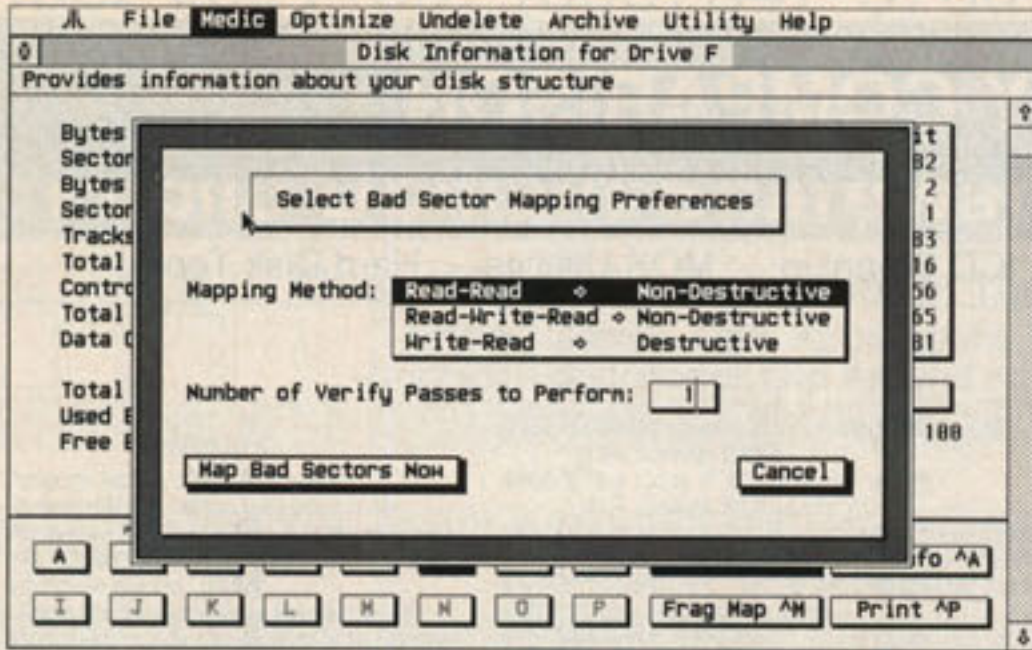
A wide variety of powerful disk management and information tools are available within *Diamond Edge*. These utilities include hard disk partitioning, copying, zeroing, wiping, etc.

A utility to edit the partition map of the drive is available within the program. SCSI drive partitioning is supported for most of the Atari ST and TT standards (Atari, BMS, ICD, Supra). You can modify your partitioning scheme, hide partitions, save and restore partition information.

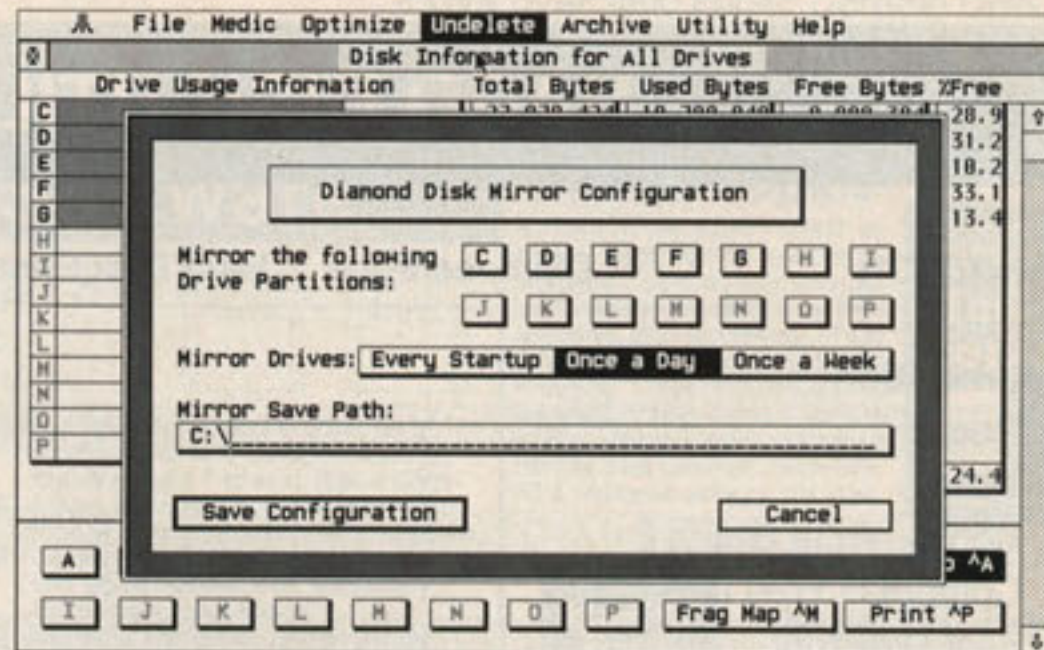
Backup utilities provided with *Diamond Edge* include hard drive to hard drive backup capabilities to copy a partition with defragmentation or to do an image copy partition for very fast backup—handy for SyQuest owners.

Optimization

The "optimizer" part of the program can restore speed to your hard drive by regrouping files and directories. A fast "compress free space" mode minimizes the time to group files together. Read/-



Using sector mapping, the ability to read and write sectors on the disk can be evaluated.



An auto folder program helps keep track of disk info in the event you need to recover a deleted file.

Write speed prioritization can be used to tune your drives for the way you use them. The drive is automatically tested before optimization using the "Disk Medic" functions. As your drive is optimized, a graphic status screen shows the files being moved on the drive map display during optimization.

Diamond Edge performs a full optimization by defragmenting directories and placing all of the directory sectors consecutively on the disk. This will speed file searches, and places all of the files within each directory consecutively to optimize disk performance. This means *Diamond Edge* always performs a

complete disk optimization where other utilities may only un-fragment files.

Documentation And Support

Oregon Research Associates has a very good reputation for taking care of their customers who own their *Diamond Back* hard disk backup utility. Existing *Diamond Back II* owners can take advantage of a special limited time offer and purchase *Diamond Edge* for \$50 plus \$5 for shipping and handling. Just furnish your *Diamond Back II* owner's registration number when ordering.

Got A Hard Drive? You Need The Edge!

Diamond Edge is a genuine bargain at \$69.95—particularly when you consider there are several programs in one: optimizer, disk diagnostics and repair, data recovery, delete protection and disk utilities. Not only does it perform superbly, but all of its various functions are controlled through an excellent user interface.

If a utility program saves a critical file from a crashed hard disk just once, the product will more than justify its price. This is why I would strongly recommend purchasing more than one disk utility as a check/backup. You may find a situation where one works where the other does not. I feel everyone who owns a hard drive should check out *Diamond Edge*—it's a winner!

OPTIMIZATION TEST

Benchmarks to compare optimization speeds of several utilities were performed on a very, very fragmented partition. As a reference point, the first item in the table is a "partition to partition" image copy.

After defragmenting the partition, each program was run again to see what the minimum time would be (second column)—optimizing a partition that essentially did not need defragmentation.

Test Partition:

Total Bytes	21,425,152
Used Bytes	18,993,152
Number of Folders	83
Number of Files	1,002
# of fragmented files	121

Product	Before Optimization	After Optimization
Diamond Back Image Copy		228 sec
Diamond Edge (OR Res. Assoc.)	451 sec	26 sec
MOS Utilities (Max Out. Soft.)	685 sec	54 sec
HD Sentry (Beckemeyer)	1,040 sec	103 sec
HD Toolkit (MichTron)	1,854 sec	363 sec

Test hardware was a MegaST^E connected to a fairly slow (in today's terms) external hard drive (old ICD host, CDC Wren drive). The above results may not reflect the latest versions for some of the programs listed—your mileage may vary.

HARD DISK UTILITY COMPARISON

FUNCTION	Diamond Edge	Hard Disk Sentry	ICD CleanUp	MOS Utilities	Hard Disk Toolkit
Optimization					
Read	Y	Y	n/a	Y	Y
Write	Y	Y	n/a	Y	Y
Config. Write Gap	N	Y	n/a	N	N
Compress Free Only	Y	N	n/a	Y	N
Fast Directory	Y	N	n/a	N	N
Statistics	Y	Y	n/a	Y	Y
PC Ditto Safe	N	Y	n/a	N	N
Speed Test (higher is better)					
Min, MB/min	2.5	1.1	n/a	1.6	0.6
Max, MB/min	43.8	11.0	n/a	21.0	3.2
User Interface					
Integrated	Y	N	Y	N	Y
Graphics Display of:					
File Structure	Y	Y	N	N	Y
Optimization	Y	N	N	N	N
Progress Indicator	Y	Y	N	Y	N
Statistics	Y	N	N	N	N
File Utilities					
Test	Y	Y	Y	Y	Y
Repair	Y	Y	Y	Y	Y
File Undelete	Y	N	N	N	N
Advanced Undelete	Y	N	N	Y	N
Disk Media					
Test	Y	Y	Y	Y	N
Repair:					
SCSI Restore	Y	N	Y	Y	N
SCSI Map	Y	N	Y	N	N
Partition	Y	N	Y	Y	N
FAT	Y	N	Y	Y	Y
Sector	Y	N	Y	Y	N
Miscellaneous					
Backup Utility	Y	N	Y	N	Y
Partition Edit	Y	N	Y	Y	N
Disk Edit	N	N	N	Y	N
Zero Disk	Y	N	Y	Y	N
Wipe Disk	Y	N	N	Y	N

Note: ICD CleanUp, MOS Utilities, and Hard Disk Toolkit may not reflect currently shipping versions. They are included for reference only.

BRE Software

Order Toll Free: (800) 347-6760

Order Line Hours: Mon.-Fri. 8:00 AM-5:00 PM, Sat. 10:00 AM-3:00 PM Pacific Time

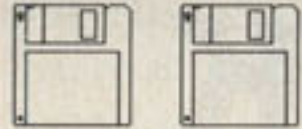
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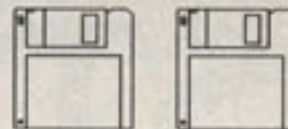
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Games

- #511 - Dungeon Master Maps for Levels 1-7
- #720 - Dungeon Master Maps for Levels 8-14
- #835 - Adventure Game Toolkit - A shareware pkg that allows you to create your own top quality adventure games. (DBL)
- #898 - Chaos Strikes Back Maps for Levels 1-10
- #957 - Mystic Mirror: Adv. Game Similar to Dungeon Master. 2 Players (Color)
- #960 - Wheel of Fortune V3.0 (Color)
Stellar Starfighter - Shoot'em Up
- #962 - Space War V1.0 - The Classic Space Shoot'em Up for 2 Players (Color Only)
- #963 - Go Up V1.0: Lode Runner Clone (Mono Only)
- #993 - Monochrome Games: Pac Man & Columns
- #1015 - Cartographer Demo: Maps out or Edit your Dungeon Master or Chaos Strikes Back saved games. (1 Meg)
- #1040 - Sorry V1.8 - Just like the board game. For 2-4 players. (Color Only)
Valgus V2.0 - Tetris clone for 1 or 2 players simultaneously. (Color Only)
- #1180 - Hac Man 2 - Professional quality Pac Man Clone. (Color/1 Meg RAM/DBL)
- #1220 - Tetris - 1 or 2 players simultaneously
Best version on the ST so far!
- #1222 - MORIA - Single player dungeon simulation (1 Meg RAM/DBL)
- #1252 - Captive Helps Files, Gaming Digest 12/91
- #1255 - Jeopardy V3, Hearts (Color Only)
- #1258 - Llamatron V1.0 - Arcade game (1 Meg)
- #1277 - Mystic Well: Similar to Dungeon Master (Clr)
- #1295 - Daniel's Dungeon V3.0
- #1353 - Klatrix: Tetris/Klax Combination (Color)
- #1366 - Rolling Ronny: Super Mario type game (Clr)
- #1371 - Blackjack Plus 3 Demo
- #1389 - Grav: Rotate & thrust game (Color)
- #1409 - Shoot'em Ups (Color)
- #1410 - Strabble: Similar to Scrabble for 1-6 players 45,000 word dictionary (1 Meg RAM/DBL)
- #1411 - Deathbringer Demo (Color)
- #1421 - Unkulian Underworld - Text Adv. (1 Meg)
- #1422 - Baby Jo in "Going Home" - Super Mario type game with good graphics/sound effects (Clr)
- #1440 - Revenge of the Mutant Camels (Color)
- #1447 - Dem. Man V2.0, Oh Craps, Poker Night (Clr)
- #1448 - Triples - Puzzle game (DBL/Color)
- #1458 - DUNGEON LORD - A very well written role playing game. (Color/1 Meg RAM/DBL)
- #1505 - Omega: Dungeon Exploration (1 Meg/DBL)
- #1508 - Arcade Shoot'em up: Tanks & Plans (Mono)
- #1514 - DC Snowball Fight (Color/DBL)
- #1523 - Poker Dice - Great poker game w/dice (Clr)
- #1533 - Gold Seeker, Cops & Robbers (Color)
- #1535 - Golden Axe, Flipped (Color)
- #1538 - Game Cheats/Hints
- #1554 - Quest for Tanda - Adventure Game (Color)
- #1559 - Warriors Delight Vol 1 - 5 Games (DBL/Clr)

- #952 - Address Labeler V2.0 - Create, Print, and Store address labels
- #988 - Fast Copy III, NX-1000 Set Up
H.P. Deskjet Print Utility V1.4
- #991 - Label Printing for H.P. Deskjet & Avery 5260 Labels, Desktop Formatter, Disk Sector Edit.
- #1008 - ICONDESK - Set up different looking icons
- #1038/1039 - DC Desktop Icons
- #1078 - Monitor Emulators
- #1130/1332/1434 - DC P.O.W. Utilities - Handy utilities from Double Click Software.
- #1174 - Address/Labeling Programs
- #1175/1176/1177 - Programming in Assembly (DBL)
- #1209 - German to English translator, STE Fix
- #1214 - GFA Basic Programs/Files
- #1267 - Atari Advanced Hard Disk Utilities
- #1300/1301 - Atari ST Topics (Book) Programs
- #1304 - GFA Basic Utilities
- #1310 - Virus Killer Programs
- #1319 - GFA Basic V2.0
- #1322 - KAOS Desk - GEM Desktop Replacement
- #1367 - Latest Supra Hard Disk Utilities (DBL)
- #1393 - Address Label V3.3, SLM804 Adjust
- #1398 - Freeze Drive Terminal V2.10 Demo
- #1404 - Stalker 3 Demo - Great new terminal prg
- #1406 - ST Tools V1.5, Mega STE Throttle Cable
- #1414 - Direct Drive V1.0 - Disk organizer & labeler
- #1416 - Mega STE Config Set, Pin Head V2.1
- #1429 - Extensible Control Panel V1.0
- #1435 - Make 1 Meg, MultiDesk Deluxe Demo
- #1441 - Your second GFA Basic 3.0 Manual
- #1442 - GFA Basic Compiler Shell Plus V1.0
- #1474/1475 - DC Desktop Icons
- #1486 - TAC CAT V2.22 - Disk cataloging system
- #1497 - Ultimate Virus Killer V5.40 - Usable Demo
- #1498 - TT Utilities: Collection of utilities for the TT
- #1499 - Super Boot V7.2 - All in one bootup utility
- #1502 - German to English Translator V1.9
- #1510 - Diamond Back II V2.42 Demo
- #1539 - Mouse Boot V3D - Mock GEM Autobooter

- #1338 - Cascade Script, Kuenstler Script Black Albatross, Kuenstler Script, Mediciscript, Kuenstler Script Two Bold, Nuptial Script
- #1339 - Ashley, Miami Nights, Muriel, Park Haven, Pixifont, Playbill, SanSerif, Style, Toulouse
- #1340 - Caraway Bold, Davys Ribbons, Dragonwick, Eire, Goudymedieval, Polo Semiscript, Roost Heavy, Saint Francis
- #1341 - Flintstone, Franktimes, Helena, Griffidin
- #1342 - Caligula, Crillee, Greencaps, Inkwell, Mira, Isadoracaps, Middleton, Rudelsberg, Wedgie
- #1343 - Andromeda, Lower and Upper East Side
- #1344 - Graphiclight, Manzanita, Nordic, Parismetra
- #1356 - Ambrocap, Dubiel, Flinstone, Middleton
- #1557 - Aarcover, Adinekimberg Script, Dobkin Script, Medusa, Romulous, Harrington

Calamus Fonts

- #1150 - Architect, Broadway Engraved, Counter Point, Fancy Chancery, Swiss Medium
- #1153 - Lucifer, Bodoni, Bodoni Italic, Drurylane, Drurylane Italic, Halibats
- #1179 - Complete Glib font from FontAbility
- #1190 - Micron, Tiempo, Swiss Medium, Leecaps, Medici, Windzor, Zalescap
- #1223 - Chicago, Comet, Cursive, Gaudy Cond, Gallia, Gillies, Goudy, Legend, Old English
- #1329 - Chili Pepper, Diane, Diego1, Fifties, Mini 6, Galledis, Moscow Regular, Premier Light
- #1330 - Recycle Book, Shalom, Tiempo 2.0
- #1331 - Albatross Medium, Alexandria Medium, Diane, Krazy, Merlin Caps, Moscow Regular
- #1566 - Andromeda Medium, Ann Stone, Caligular

IMG Clip Art

- #917 - 4th of July, Valentine's Day, Easter Day
- #972 - 1, 5, and 10 dollar bills
- #973 - 20, 50, and 100 dollar bills
- #1213 - Office Equipment/Scenes (DBL)
- #1272 - Religious oriented
- #1273/1274 - Military vehicles
- #1289 - Camping scenes
- #1312 - Religious oriented
- #1346/1347 - Christmas Clip Art (DBL)
- #1351 - Restaurant Clip Art (EPS Format)

Applications

- #810/811 - SHEET V2.5P - Shareware Spreadsheet.
- #989 - Paperless Accountant
- #1000 - Spelling Checkers
- #1106 - Checkbook programs
- #1305 - Gramslam Grammer Checker V3.20
- #1306 - Hyperlink V1.51 Demo (1 Meg/DBL)
- #1361 - Book Database, Calendar Printer V1.02
- #1370 - Stock Smart V3.2 - Stock charting program
- #1385 - Cal V6.0 - The calendar desk accessory
- #1426 - Inventory Pro V6.0 Demo (DBL)
- #1444 - SPELL ONE V1.1 - Spelling Checker
- #1457 - Cocktail Selector / Recipe Box V3.1
- #1486 - Tac Cat Librarian V2.22 - Disk cataloging
- #1500 - ST Writer V4.8 - Simple easy to use word processor with extensive documentation on disk. H.P. Deskjet Driver included.
- #1519 - Vanterm V4.0 - Great terminal program
- #1529 - Crossword Editor V2.0
- #1537 - Secrets of Flash & 'DO' files
- #1550 - Telebase 1.82 - GEM based phone/fax mgr
- #1580/1581 - DB Writer: Word processor with 40,000 word dictionary (1 Meg/DBL/Mono)

Children's Programs

- All Children's Programs Require a Color Monitor
- #551 - Kid Shapes For ages 2-8
- #552 - Kid Shapes Plus For ages 8 & up.
- #667 - Benjamin's ABC's (DBL)
- #699 - Kid Adder, Kid Color, Kid Story V1.4
- #920 - Simply Math, Picture Puzzler
- #1172 - Math Circus, About the House
- #1192 - Math Quiz V1.1
- #1403 - Spelling: Object Recognition & spelling
- #1424 - Math Facts V1.0, Spider Spell
- #1491 - Eliemouse's Rock, Paper or Scissors

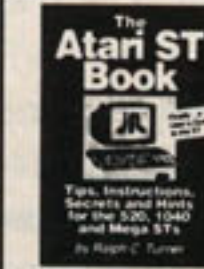
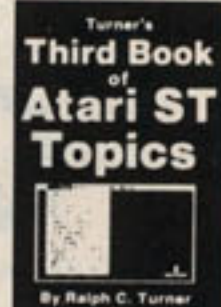
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The Best and Fastest Disk Duplicator for the Atari ST. Backs up a complete floppy disk faster than the ST can format a disk. No internal wiring or cartridges needed. It doesn't matter if the disk is copy protected or not. Program & Accessory versions. Requires 2 disk drives.

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- 3D/4 (520STFM/1040ST) \$99.95

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- #514 - Monochrome Emulator V3.0
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- #768/838/1165 - NeoDesk Icons
- #801 - Label Printing Programs
- #888 - Atari ST Subjects (Book) Programs
- #951 - DC Show It V1.1, Head Start V1.1, Little Green Item Selector V1.6C

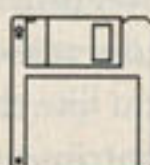
Adobe Type 1 Fonts for PageStream 2

- #1337 - Classica Heavy, Roman, Italic, Faustus Rhyolite Vertical, Sharktooth, Windsor Demi, Zaleski Caps



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QUESTION MARK

Q: What are "modems?" What can they do for me?

A: Modems are gadgets used by computers to communicate with each other over phone lines. If you've used a credit card lately, your charge was probably "validated" by a machine with a built-in modem; such machines call a central computer and exchange your card number, purchase amount, and other information for a charge authorization.

You can use a modem with your Atari to communicate with national "online" services, like GEnie or CompuServe, where (for a fee) you can chat with other users, send and receive electronic mail, "download" free and low-cost software, search through an electronic encyclopedia, retrieve stock quotes, and plenty more. There are also "Bulletin Board Systems," which are much like the national services, but on a smaller-scale and local. User Groups and other organizations often use BBSs to communicate with their members and others interested in their cause.

Q: How much will it cost to use a modem with my Atari? What do I need?

A: As with so many things, you can spend as much as you want (and if you truly can't, send the excess cash to me and consider it spent). On average, expect to spend somewhere between one and three hundred dollars for all the pieces you need to make a modem work with your Atari: the modem, a cable, and software.

Modems are available at your Atari dealer or almost anywhere you find computer products. You don't need a modem that specifically says it works with Atari computers, but you should follow the guidelines outlined below.

For your Atari ST, TT030, or Falcon030, you'll want an "external" modem. External modems sit outside your computer, with their own power supplies, indicator lights, speakers, and RS-232 serial ports. "PC Internal" modems lack some of the features needed to make them usable with other computers, and include stuff that let them plug directly into PC clones. Because internal modems lack things like their own case and power supply, they're almost always a little cheaper than external modems, but they won't work with

Atari STs, TT030s, or Falcon030s.

You'll also want your modem to be "Hayes-compatible," a reference to the "command set" the modem understands. To make a modem do something, like dial the phone, you send it commands. The Hayes Smartmodem established a standard for these commands, and most modems today follow that standard. Buy a modem that uses the Hayes command set; most software will understand how to talk to it, and if you have problems, there are plenty of people you can ask questions. If you buy a modem with a non-Hayes command set, expect to spend a lot more time with the modem manual, finding your way through unfamiliar territory.

Modems also come in different speeds, typically indicated by a "bps" (bits per second) number on the packaging; as a point of reference, most people can read fast enough to "keep up" with a 1200bps modem. You can buy anywhere from a 300bps to a 14400bps modem, and usually, the more you spend, the higher the speed. Buy at least a 2400bps modem, perhaps with some kind of error correction/data compression capability (see below). There are plenty of choices, so pick something capable, but still comfortable for your budget.

Next, you'll need a cable. You can usually get one of these the same place you buy your modem, and any Atari dealer should be able to set you up with exactly what you need. If your dealer doesn't have them, you'll need either a "PC type" or "AT type" RS-232 modem cable, depending on the model of Atari computer you're using; see **Table 1**. Avoid "null modem" cables, which are used to connect one computer directly to another, because they won't work between your computer and a modem.

Finally, you'll need software. If you're looking into telecommunications for the first time, it's hard to go wrong with a public domain or shareware package like Uniterm, available from your local user group and many Atari dealers. Such programs are written by dedicated Atari users who sometimes ask for donations or registration fees, usually quite reasonable, if you plan to continue using the product. If you like the program, be sure you support their efforts by contributing.

Table 1

"PC type" modem cables are also called "DB25 female to DB25 male RS-232 serial cables," and "AT type" modem cables are also called "DB9 female to DB25 male RS-232 serial cables." The type you need depends on the Atari computer you have:

If you have:	You need:
520ST, 520ST ^E	PC type
1040ST, 1040ST ^E	PC type
MEGA ST2, MEGA ST4	PC type
STacy	PC type
Mega ST ^E	AT type
TT030	AT type
ST Book	AT type
Atari Falcon030	AT type

On the other hand, you can buy a full-featured commercial program "off the shelf," and take advantage of whatever support the company affords. One of the most flexible and well-liked packages is STalker, from Gribnif Software. It operates as either a GEM program or a desk accessory, handles all the various serial port combinations available to TT030 and Mega ST^E users, and includes a programming language so you can teach it to automatically log you into whatever services you choose. There are also several other packages available, including Flash II, from Missionware Software, and a new entry, Storm, from Advantage Software. Each has its strengths, so try before you buy, or at least ask other users.

GENie users will want to try Aladdin, a custom-written program that automates and simplifies GENie access. You tell Aladdin what you want to do on GENie by pointing and clicking, and when asked, the program connects to GENie and carries out your instructions. It's very handy, and a way to keep down your connect charges. There is also a less sophisticated program available for CompuServe, called QuickCIS, which does some of the same things as Aladdin. Again, check with a user group, dealer, or these services themselves for copies of these programs.

Q: What are "error correction" and "data compression?" Some modems offer them, others don't; do I need these features?

A: Error correction and data compression are features offered in some new modems, in particular those which feature "MNP5" or "V.42bis."

Error correction helps the modem automatically compensate for a noisy phone line, so if it's usually hard to tell what Aunt Paula is saying at the other end of the line, you may want to invest in a modem with error correction.

Data compression tries to squeeze the last drop of speed from the telecommunications turnip by automatically compressing data before sending it over the phone. With a 2400bps modem, you can send data at 2400bps, but with a 2400bps modem with data compression, you could potentially send data at 9600bps. Some data, like human-readable text, compresses well, programs compress less, and data that is already compressed compresses again hardly at all.

Most of the time, if you buy a modem with either error correction or data compression, you get some of the other: MNP5 includes both error correction and some data compression, and V.42bis includes MNP5 capabilities and better data compression. Read the modem package carefully, however, since some modems don't really have these features built-in, but depend on special software to implement them. If the box copy says the package contains special "error correction/data compression software for computer X," or if it's not clear, beware.

There is one very important caveat with these modems: the modem you call must support the same error correction and/or data compression methods as yours, or they won't be used. If you call a plain-vanilla modem with your V.42bis modem, you'll be able to communicate, but without the benefit of V.42bis. If you call an MNP5 modem, yours will "step down" to the correction and compression MNP5 can handle, and if you call another V.42bis modem, they'll connect with the best methods your phone lines will permit. As more V.42bis modems are sold this becomes less of a problem, but right now, many modems you connect to won't let yours live up to its full potential.

"Question Mark" is written by Mark Jansen, a Project Leader on Atari's Research and Development staff. He has worked on numerous products, including the new Atari Falcon030. If you have questions for Mark, please send them to: Atari Explorer Magazine, Question Mark, 1196 Borregas Ave., Sunnyvale, CA 94089. Unfortunately, we cannot guarantee a personal response to every inquiry.



Vendors Mentioned

GENie
1-800-638-9636

CompuServe
1-800-848-8199

Gribnif Software
P.O. Box 779
Northampton, MA 01061
(413) 247-5620
(413)-247-5622 FAX

Missionware Software
354 N. Winston Drive
Palatine, IL 60067-4132
(708) 359-9565

Advantage Software
P.O. Box 610121
Houston, TX 77208
(713) 526-6436

The Portfolio Files

By BJ Gleason

QUESTIONS, QUESTIONS, QUESTIONS! MY NEW editor has tons of Portfolio questions setting on his desk and asked for my help in answering them. So for the next few issues, I'll be answering some of the most commonly asked questions. (For more answers, look at the file PORT.FAQ on CompuServe in the APORTFOLIO forum, which contains the answers to about 60 of the most frequently asked questions.) If you have more questions about the Portfolio, send them in to Atari Explorer. My editor will love it!

Q: Are there any RAM cards larger than 128K?

A: Perhaps the most exciting new products for the Portfolio are the new 1, 2 and 4 megabyte Flash Memory Cards from Optrol Inc. which fit entirely inside the Portfolio memory card slot. The nonvolatile read/write memory has 10 year data retention with no batteries. Driver software on the card allows the user to read and write from the Portfolio or the PCcard Drive just as if it were a huge RAMcard. The software also allows the user to flash erase 64K blocks of memory up to 100,000 times to make them available for reuse. List price \$179, \$254, \$399. Optrol, Inc., P.O. BOX 37157, Raleigh, NC 27627; (919) 779-3377.

Q: Is a Technical Manual available for the Portfolio?

A: If you are an amateur or professional developer and want to write programs that take advantage of the inner workings of the machine, there is a Technical Reference manual available from Atari for \$60. Call Gail Bacani at (408) 745-2022 for more details. The manual includes emulation software for the PC that will allow you to run Portfolio software on the PC to ease the development process.

Q: What programming languages are there for the Portfolio?

A: BASIC—There are two versions of BASIC available for the Portfolio. The first is Atari's PowerBASIC compiler. This is a reasonable straight forward compiler. It allows for text and graphics on the same screen, but does not allow you to easily access Portfolio-only interrupt calls. List price \$99.95

The other is PBASIC version 4.9, a freeware BASIC interpreter. PBASIC is available in the APORTFOLIO forum on CompuServe. PBASIC is an almost complete implementation,

lacking only Random Access Files. To its credit, PBASIC does allow easy access to the Portfolio-only features.

FORTH—Essex Marketing Services, 272 Old Farms Rd, Simsbury, CT 06070; (203) 651-8284, has developed a FORTH-83 compiler for the Portfolio. It has a kernel of just 8K, leaving a lot of room for programs and data. There are versions available for the Portfolio, PC, and the HP95LX, allowing for easy development across platforms. List price \$75.

A86—Eric J. Isaacson's A86 is not only one of the fastest assemblers, but it is one of the few assemblers that will run on the Portfolio. Version 3.12 has been tested on the Portfolio. Warning—some earlier versions of this shareware assembler may cause the Portfolio to lock up.

TURBO PASCAL 3—On CompuServe, in the APORTFOLIO forum, there is a document called PURBO.TXT that describes how to modify the compiler to run on the Portfolio. After making a simple modification to the compiler with DEBUG, you then set the DISPLAY to TRACKED and REFRESH to BOTH, and you are ready to run. You can edit, run and compile TP3 programs on the Portfolio.

Q: Will the PDD1 or PDD2 from Radio Shack work on the Portfolio?

A: Yes. There are drivers for both units. The devices do not act as disk drives, but as mass storage devices.

History Lesson: For the Radio Shack Model 100 computer, Radio Shack developed a 3.5 inch Portable Disk Drive (PDD) that could be plugged into a Serial Interface. There are two models, the PDD1, which can hold 100K of data, and the PDD2 which can hold 200K. It is not very fast (about 1.9kbps), but it runs on batteries and is about the size of a box of 5.25 inch disks. The PDD1 is no longer available, but can often be found used at computer festivals. The PDD2 is still sold by Radio Shack for about \$220. It often goes on sale for about \$170. To use either PDD with the Portfolio, you will need the Serial Interface, and a program to access the unit. PDD1.ZIP and PDD2.ZIP are both written by Brian C. Woodcox and are available in the APORTFOLIO forum on CompuServe.

A driver for the PDD2 is available on a ROM card from John Feagans, Monterey Bay Whaling Company, 2681 N. Rodeo Gulch Road, Soquel, CA 95073; (408) 475-4290. The

cost is \$70.00 for the drivers on a ROM card, or \$40.00 for the programs on an MSDOS compatible disk.

Q: Is there a Hard Disk for the Portfolio?

A: The BSE Company, 2152 N. 4th St., Flagstaff, AZ 86004; (602) 527-8843, has developed the Flashdrive hard disk unit. This battery operated unit, about the size of a box of disks, interfaces to the Portfolio via the Parallel Interface. The 20MB version lists for \$225. Contact BSE for details.

Q: Can I increase the internal memory size of the Portfolio?

A: Yes. There are three approaches. Megabyte Computers in Texas, will upgrade the Portfolio to 512K of memory internally. The \$250 modification includes a six month warranty for the work, and requires you to send your unit to Megabyte. The modification takes about 3 days, and then the unit is shipped back. You will then have 512K of memory in your unit. The first thing you will notice is that drive C: is now 128K! It can be reduced to as low as 8K, or increased as high as 464K. For more information call, (817) 589-2950.

Best Electronic has recently announced the PF640. This internal memory expansion upgrades the Portfolio to 640K and requires installation by a qualified technician experienced with surface mount technology. The PF640 is priced at \$230 plus installation. Best Electronics, 2021 The Alameda, Suite 290, San Jose, CA 95126; (408) 243-6950.

The third approach comes from The BSE Company. Their new Universal RAM I/O Interface peripheral is an external 512K RAM upgrade that plugs into the Portfolio's expansion bus providing a total of 640K RAM. The peripheral also includes a parallel and serial port plus a 128K EPROM containing utility software accessible as drive B. List price \$199.

Q: What is a PREAD file?

A: This package is designed to add a simple text viewer onto a document file. This will make the document executable, and

can be read by typing in its name. The file can then be compressed with PKLITE or LZEXE, both do a great job on text—50% to 80% or better. In general, the larger the file, the better the compression.

Alice in Wonderland, Through the Looking Glass, and The Hunting of the Snark have all been converted and compressed using the PREAD technique, so you can easily take these classics with you on the road for some light reading!

Q: Is there a program to capture the Portfolio Screen?

A: PGCAP is a program on CompuServe that will "capture" a screen image on the Portfolio and save it to a disk file. This Terminate and Stay Resident (TSR) program requires less than 1K of memory, and is activated by pressing ALT-S. This will copy the contents of the screen to a file on your disk. Depending on the screen mode, the file extension will be .PGT if in text mode, or .PGF if the screen was displaying graphics. The main filenames will be "SCREENA", "SCREENB", etc. Once you have captured the screen images, you can use PGCONV to convert them into a form that can be used by a desktop publishing package. PGCAP will import .PGC, .PGT, and .PGF files and export .PGC, .PGF, as well as .IMG (GEM) and .WPG (WordPerfect).

Q: Is there a modem designed for the Portfolio?

A: Many users use the Serial Interface and a modem, but most would like to see a modem that will just plug right into the Portfolio Expansion Bus. Well, Megabyte Computers in Texas has found a solution! They have found a way to squeeze a Practical Peripheral Pocket Modem into the Serial Interface case. Send them your Serial Interface and the PPI modem, and they will combine them for only \$50. They also sell the Serial Interface and modems, so you can buy one from them. For more information call Megabyte Computers at (817) 589-2950.



BSE to Ship New Peripheral Interface Products for Atari Portfolio

BSE has announced that they will begin shipping their new Universal I/O and Universal RAM I/O Interface peripherals for the Atari Portfolio in November.

The Universal I/O Interface peripheral provides serial (RS-232) and parallel ports, plus a 128K EPROM which contains BSE utilities, public domain software, XTERM communications software, UPDATE.COM, and READ.ME docs. The parallel port used by this peripheral is configured as a PC standard port and allows PC standard software to address it. The internal EPROM is 128K and is addressed by the system as drive "B". It may be removed by the user and reprogrammed by a standard EPROM burning system.

The Universal RAM I/O Interface peripheral offers the same features as the standard model, plus includes a 512K RAM upgrade, expanding the Portfolio's memory to 640K.

The Universal I/O (\$99) and Universal RAM I/O (\$199) Interfaces are both encased by a standard peripheral box (ala Parallel Interface) and snap easily into the expansion port of the Atari Portfolio palmtop computer. When used with BSE's existing hard drives for the Portfolio, the entire system (including Portfolio) can be powered by one AC connection.

For more information, contact BSE, 2152 N. 4th St., Flagstaff, AZ 86004; 602-527-8843.

Three Books for Coders

From GFA to Assembly to the AES

By Travis Guy

AS A GENERAL RULE, PROGRAMMERS love to look over someone else's code, constantly seeking to improve their own. If you take programming at its fundamental level, it is nothing more than problem solving. I had almost said "structured problem solving" in that last sentence when I realised that not just a few programs in this world are well structured. Which leads this introduction back to where it started—programmers looking to better what they do.

Taylor Ridge Books is fast becoming the best source of good instruction for Atari programmers. Following up on

✦ The GFA BASIC Toolkit, Volume 1

Summary: 116 pages, spiral bound, disk included.

Price: \$ 34.95

✦ Assembly Language Workshop

Summary: P261 pages, Indexed, perfect (flat) bound, disk included.

Price: \$24.95

✦ AES Quick Reference

Summary: 91 pages, perfect (flat) bound.

Price: \$11.95 (\$5 extra for disk)

Publisher:

Taylor Ridge Books
P.O. Box 78
Manchester, CT 06045
(203) 643-9673

their initial success, Clayton Walnum's *C-Manship Complete* (a must-have for anyone learning or programming "C" on an Atari), are Walnum's *ST Assembly Language Workshop, Volume 1* and *AES Quick Reference*, and John Hutchinson's *GFA BASIC Toolkit, Volume 1*.

A Place to Assemble

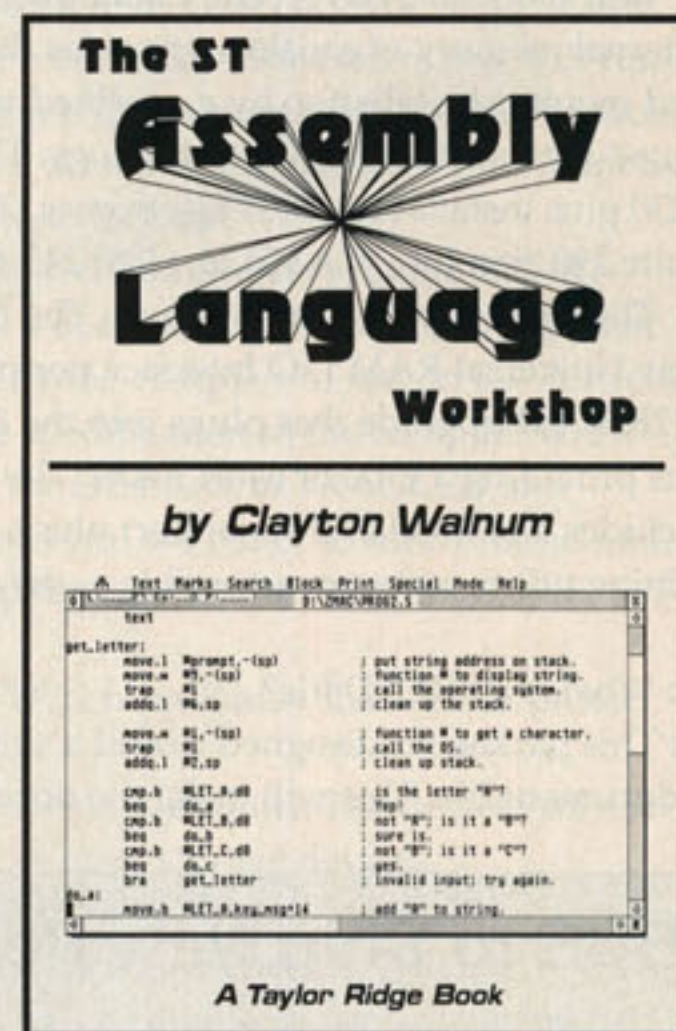
Clay Walnum's *Assembly Language Workshop* is a tutorial, styled to teach assembly to everyone. The book starts out with examples of pseudo-assembly programming to give the reader an understanding of how a computer executes code. Then a quick switch is made to real Motorola 68000 code, and before you know it you are hip deep into your Atari's native language.

From there on, each chapter presents new topics and subjects: binary and hex math, registers and addressing modes, code "style" and macros. Every chapter ends with a summary of the ideas presented in the chapter, and a type-it-in source code listing of a demonstration program. Not to worry—a companion disk includes source (and assembled) files for each listing.

Having the disk relieves you from the burden of the olden "don't-make-a-mistake" typing sessions. Having the source code in the book keeps it always at hand. (If you were to, let's say, take the book along to the beach... like a good programmer would.)

The example programs cover rudimentary aspects of programs (printing to the screen, reading the keyboard), and

move along to trickier items like: getting and setting the system date and time, reading and writing to a disk file, and loading a Degas file. All of the programs are heavily commented, and the narrative text in each chapter really makes



learning assembly fun.

Walnum uses DevPac, the development system from HiSoft to write in. Unlike many high-level languages, transferring code to another assembler is fairly easy (the only trouble comes from macros, assembler commands, and syntax). An appendix details the changes that must be made to bring the included source code into Atari's MadMac format.

Another appendix lists the 68000

instruction set, giving brief notes covering each instruction. It's not a complete replacement for a general 68000 reference book, but it's a handy reference for those just starting out.

As the book's title indicates, it is the first in a series of Workshops. Future volumes promise to take the fledgling assembler deeper into the intricacies of the Atari system.

The *Assembly Language Workshop, Volume 1* is a must read for all programmers. Even if your language of choice is a high-level language, most higher-level languages have some method to allow calling of machine language routines (typically useful for time-critical sections of code). I recommend the *Assembly Language Workshop* to all but the most advanced assembly programmers. It is easy to understand and enjoyable to read.

As a personal note, I've been a dabbler in 68000 assembler for the last six years. As such, I "knew" everything covered in this book—but that didn't lessen the book's appeal. Although I haven't touched my assembler in a year, Walnum's style and logical presentation of material intrigued me enough to seriously rekindle my interest in assembly. I can think of no higher praise for a book than to say that it inspires!

Tools for GFA Basic

A few Atari-platform programmers are of the opinion that GFA BASIC is our premier prototyping language. (Reports from the PC world indicate serious interest in GFA BASIC for Windows as well.) That may be, but GFA BASIC is certainly an interesting language—witness its vocal devotees and equally vocal detractors (*Note to Editor: That's You Mike*). In the ever-growing list of support for GFA programmers, John Hutchinson of Fair Dinkum Technologies has compiled over 50 practical and serviceable routines in *The GFA BASIC Toolkit, Volume 1*.

The *Toolkit* is not a tutorial, it is a collection of routines—it teaches by example only. As with all other Taylor

Ridge books, the *Toolkit* comes with a disk containing the routines, ready to MERGE into a GFA program. (For those who don't have need of a particular routine, but would like to see it work anyway, there are two demo programs



on disk that can call any routine in the book. Nice.) The routines themselves are free of copyright (they may be freely used in anyone's program), but the collection itself is copyrighted (don't dupe the disk and photocopy the book).

The routines comprising Volume One of the *Toolkit* are grouped into four areas which include: graphics, sound effects, I/O, and general purpose utilities.

The graphics section includes routines that do page flipping, palette setting, displaying of Degas, Tiny & Spectrum files, and various video wipes and effects. Audio functions include twelve SOUND & WAVE routines, eight digitized samples, and thirty XBIOS 32 sound effects.

The I/O section is slimmer, dealing with disk copying, file locking/hiding, floppy disk formatting, and the like. The miscellaneous routines cover mundane tasks such as setting a BLITTER, checking to see if a printer is ready to accept characters, and setting the caps lock key. For good measure, two day-of-week

functions are included. Whew.

As for the book itself, it's divided into three sections: an introduction and general instructions for use of the routines; a page-by-page synopsis of each routine; and printed listings of each routine.

Each synopsis explains the use of the routine, lists any parameters, and covers any special remarks or hints for the routine's use. Related routines are referenced, the on-disk filename is given, and the GFA language version numbers that the routine will work on are provided. Concise, but thorough.

Most of the book is taken up with the program listings—again, even though they are included on-disk, it's handy to have them in hardcopy form. The code is well commented where it needs to be, and (to my delight) style and variable usage conventions are followed from routine to routine.

Closing out the book are three appendices covering conversion of routines to earlier versions of GFA BASIC and listings of the GFA distributors and other info resources for GFA programmers.

Hutchinson's style is friendly and energetic. He is genuinely brimming over with enthusiasm when he writes about programming in GFA BASIC. The code itself is straightforward and logical, and for the most part, free from the annoying clumsiness that plagued earlier packages that claimed to help GFA programmers. (Anyone remember GFA Companion?) I recommend the book to all general purpose GFA programmers looking to flesh out their code libraries. Personally, I'm glad to see some neat XBIOS 32 sound effects. (I'm off now to replace the annoying ding-after-ding-after-ding in my programs.)

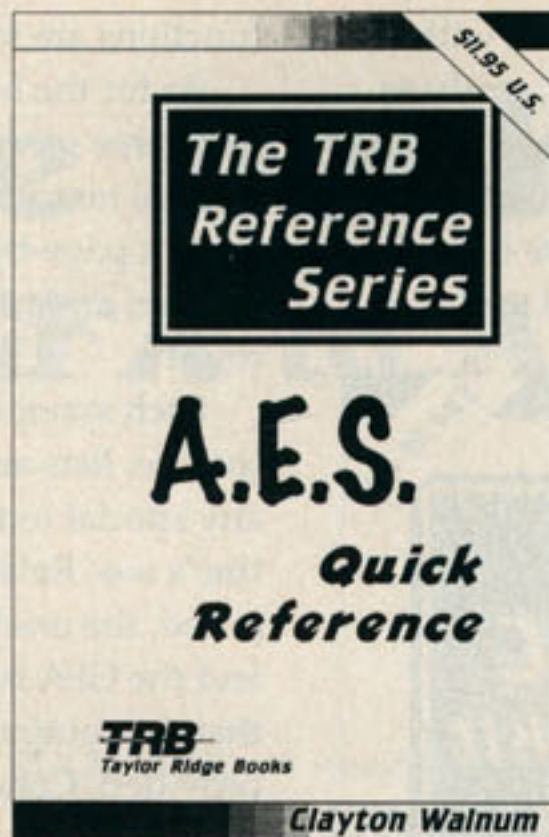
Clearing the Environment

The Application Environment Services (AES) is the part of TOS that deals specifically with the GEM user interface. Menus, dialogs, windows, event programming—all of these elements are ruled by the AES.

The latest book from Taylor Ridge's

Clayton Walnum, and the first in their TRB Reference Series, is the *AES Quick Reference*. The book is true to its title. Every AES call is listed (alphabetically) on a separate page along with an explanation of the call, and assembly language and "C" examples of each call. The book's introduction consists of a quick history of GEM and an overview of TOS. An appendix documents GEM messages and gives their meanings.

There's not much to be said about this book—and that's not bad. It is a ref-



erence book to the AES, each call is clearly laid out, and being listed alphabetically, each call is easy to look up (no index needed). The disk includes a shell for both assembly and "C" to properly include AES calls as well as a simple window demo program (again, in both assembly and "C").

It's accurate, it's to the point, and with the sole exception of leaving out the only AES function (#91, *fsel_exinput*) that doesn't work under TOS 1.0 and 1.02, it's complete. I can recommend this book to assembly and "C" programmers looking

for an accurate guide to the AES.

Conclusion

If you're a programmer, I highly recommend any of the Taylor Ridge books that fall into your purvey. The GFA series looks to provide standardized routines, the TRB Reference Series (with the second installment—the V.D.I. Quick Reference just off the press) is a welcome updating of the old Abacus books, and Clay's tutorials on "C" and assembly (with the second volume of the Assembly Workshop due in early '93) are fun to read—and enticing.

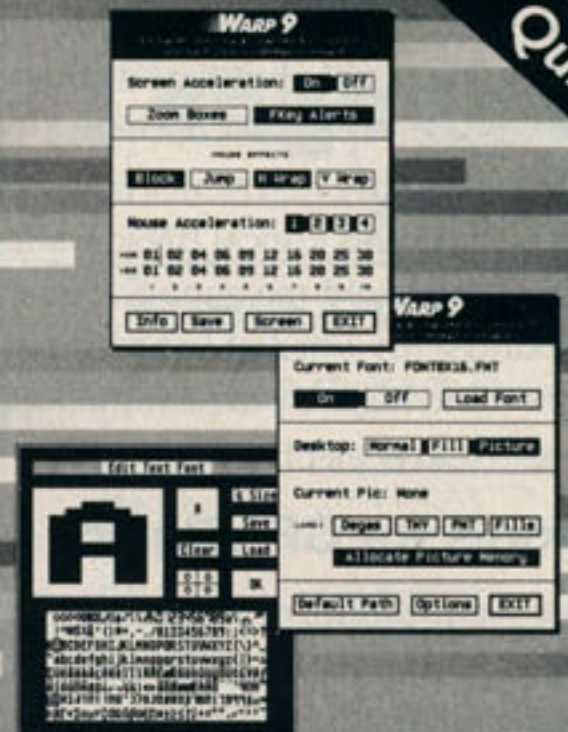
Travis Guy has programmed on Atari computers since buying an Atari 400 (Membrane keyboard! 16K RAM! Cassette storage!) back in 1979.



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The Lynx Line

By Clayton Walnum

IF THERE'S ANYTHING THAT'S constant in the world of Atari, it's change. This goes double for the magazine market. Case in point: One month I'm writing The Lynx Line for *Atari Advantage* magazine and suddenly I find myself moved to *Atari Explorer*. That's fine with me, though. I liked what John Jainschigg did for *Atari Explorer*, and I'm confident that its new editor, Mike Lindsay, will keep *Explorer* right on track.

Of course, all this talk of magazines has little to do with the Lynx. I did want to say though, before we get down to business, that the *Atari Explorer* version of The Lynx Line will be very similar to, and in fact continue from, my former column in *Atari Advantage*.

As Arsenio would say, let's get busy.

Pinball Jam

Price: \$39.99

Shadow of the Beast

Price: \$39.99

Electrocop

Price: \$19.99

Manufacturer:

Atari Corp.
P.O. Box 61657
Sunnyvale, CA 94088-1657

Pinball Jam

One of the newest games for the Lynx is *Pinball Jam*, a pair of pinball contests that'll have even flipper masters sweating to stay in play. It's double the pleasure, double the fun, with two different machines to play, including *Elvira* and the *Party Monsters* and *Police Squad*, each of which is loaded with bumpers, slides, ramps, bonus targets, and every type of contraption you'd expect to find on a modern pinball machine.

These are noisy machines too. Lots of boops, beeps, sirens and electronic sounds make you feel as much like the conductor of some alien rock band as the mere manipulator of two flippers. Two skill settings—easy and hard—ensure that pinball players with any amount of experience can enjoy the action.

When playing *Elvira*, you'll not only be treated to all the game's electronic sounds, but also *Elvira's* sexy voice as she invites you to play or bemoans your failures. "Leaving so soon?" she croons when a ball goes down the drain. "How about another ball?" *Elvira's* machine includes such goodies as the *Bat Lane*, the *Monster Slide Ramp*, the *Boogie Eject Hole*, the *Skull Passage*, the *BBQ Coffins*, and the *Wake The Dead Head Targets*. With a set of freaky contrap-

tions like that, you know you're in for serious pinball partying.

In the *Police Squad* game, too, digitized voices enter the action. In addition, a new set of electronic contraptions wreak havoc with your ball. The voices



PINBALL JAM

in *Police Squad* mimic a police radio, muttering things like "Robbery in progress. Subject is armed and dangerous" and "Unit four, he got away. We're going to try again." Gadgetry includes the *Firing Range Spinner*, the *Top Cop Bulls-eye*, the *City Jail*, the *Machine Gun Croc Hole*, the *Gun Lane*, the *Handcuff Bonus Eject Hole*—not to mention the *Drug Rat*, *Diamond Weasel*, and *Loan Shark* targets.

In both games, the action is fast and furious, requiring nimble fingers on the flipper buttons, as well as a light touch

on the tilt control, which lets you give the machine a nudge for extra ball-bouncing power. With Pinball Jam, Lynx pinball wizards will get hours of flipper frolic.

Shadow Of The Beast

Over the years, Psygnosis has earned a reputation for great action games featuring sensational graphics. Now, with the Lynx version of their popular jump-climb-and-shoot contest, *Shadow of the Beast*, they're ready to take on the portable gaming market. The results are impressive, and although the Lynx graphics can't hold up to those on the ST, they are state-of-the-art for the Lynx, including finely detailed creatures, well rendered backgrounds, and parallax scrolling for a realistic 3D effect.

In this fantasy adventure, you play a demon warrior who has discovered he was once a human child, but was cursed by the Beast Lord to take on a horrible demonic shape. Obviously, no demon warrior worth his fangs would let anyone get away with rearranging his face, so it's off to find the Beast Lord and settle the score.

One thing's for sure: Shadow of the



SHADOW OF THE BEAST

Beast is an action adventure with no shortage of enemies. You'll face off against everything from the more mundane spiders, snakes and bats to creatures from the realm of the fantastic, including demons, dragons, floating eyeballs and other bizarre beasts. Each creature, of course, has its own mode of attack. It'll take some time for you to master each.

As you move from level to level,

you'll pass through such locales as outdoor scenes and underground dungeons. Each location must be thoroughly searched, since you'll have little chance of completing your quest without special items like keys, which open the way to new levels; and magical items, such as hearts and potions that restore your life line and transporters that zap you from one place to another.

In each level, you'll keep your Lynx controller smoking. Not only must you battle the Beast Lord's cronies, but you must also negotiate tricky pathways through deep caverns. Before you reach the end of a dungeon level, you'll leap from moving platforms, swing on ropes, dodge falling rocks and icicles, and much more. These places are dangerous!

All in all, Shadow of the Beast is a terrific game, one that'll have you exploring and grinning for weeks. Don't miss it.

From The Archive: Electrocop

While most of the new Lynx titles are pretty hot, one shouldn't overlook some of the earlier, classic Lynx games. If you've just purchased your Lynx, you especially won't want to ignore the best of the past. A case in point is *Electrocop*, a 3D maze adventure that should be in every Lynx collection.

The story: Electrocop has just received a phone call from the president, who is pleading with him to take on a new assignment, one that may be his toughest ever. The Criminal Brain has kidnapped the president's daughter and will return her only if he's given control of the entire world. The Steel Complex, Criminal Brain's fortress, is a treacherous place, filled with electric floors, wall-mounted guns, booby-trapped doors, and every type of robotic creature imaginable. Electrocop must explore every one of the building's 12 floors if he's to find the president's daughter.

Electrocop contains 12 levels of robot-smashing action. The levels are intercon-

nected by a series of teleportation exits; however, the exits don't always take you where you expect. You might, for example, go through an exit in level 2 and wind up in level 7. The farther you get into this electronic labyrinth, the



SHADOW OF THE BEAST

crazier the exits become.

Computers throughout the building offer several helpful services. When you find a computer, walk up to it and press the A or B button on your Lynx. You can then access several systems. In addition, the Steel Complex contains three types of doorways: open doors, which contain no traps; trapped doors, which feature electric beams or other nasty devices; and locked doors, which open only if you enter the proper code.

During your mission you'll battle six types of robot enemies, including Walkers, Viruses, Mines, Stingrays, Wall Cannons and Pythons. Luckily, you'll find five types of weapons in the Steel Complex, including lasers, plasma guns and disruptors.

Electrocop Basic Strategy

You can't play the levels in numerical order, so don't bother to try. Some exits bounce you forward as many as five levels at a time. Keep track of which exits go where. Once you have all the exits figured out, determine the shortest route to your goal. Little by little, you'll close in on the Criminal Brain and the president's daughter.

Map each level. You have only 60 minutes to rescue the president's daughter and get out. You can't afford to waste time trying to find your way around.

Until you know a particular level, advance slowly. Unexpected hazards lie around every bend, and each step may stir up deadly trouble. Fortunately, the levels are identical each time you play, so once you've learned a level, you will know what to expect and can move faster. Still, when you first play *Electrocop*, don't sweat over the timer. You won't live long enough for it to matter!

When you find a computer, use it—



ELECTROCOP

heal yourself and repair your weapons. Also, activate the ice-breaker program. That's the only way to get the code to the door. When ice breaker cracks the code, you'll hear an alarm, so don't stand around while it works. Blast some robots and explore, returning only when the alarm signals. Before leaving a computer terminal, activate the stasis program to temporarily freeze your enemies.

When you find a weapon, if it's equal to or better than the guns you already have, take it. Refresh your fire power every chance you get. Also, remember that, when you're attacked, both you and your weapons may suffer damage. Keep an eye on all the damage status lines. Without your weapons you're robot feed.

Most doors in the Steel Complex are guarded, so when approaching one, expect trouble. Advance slowly. When your enemy comes into range, blast it before it can get off a shot.

Learn your enemies' strong and weak points. Only then can you advance quickly enough to rescue the president's daughter in the time allowed. Use the computer to get brief descriptions of the

Criminal Brain's robots. Then experiment. Here's some extra creature hints:

- Walkers roam up and down the length of corridors. Before stepping into a new corridor, stand before the door and blast the walkers as they pass by. In many cases, you can clear the corridor without even stepping into it.
- Viruses hop in any direction, making them difficult targets. They're strong, too, usually requiring several hits to destroy. If you're faced with multiple viruses, use the EMP Disruptor to take them out. Otherwise keep blasting with your lasers.
- Mines are easy to destroy. Unfortunately, they're also easy to walk into. When in a mined area, move slowly. If you get too close to a mine it'll explode. Advance until the mine is just on the edge of the screen. Then line up your shot and blast away.
- Stingrays are by far the most dangerous enemy. Their anti-matter cannons can destroy your weapons almost instantly and can kill you with only a few hits. Use your EMP disruptor to take these babies out, because you can use the disruptor while behind the safety of a door jamb.
- Wall Cannons are usually clustered in groups and fire quickly. It's almost impossible to get past them without taking some damage. Luckily, their shots are weak, and a single blast from your laser will usually melt the cannons into scrap iron. You may not have to destroy all the cannons in a cluster to get past them—if you hug the wall as you move forward.
- Pythons rise from the floor when they sense your presence. Learn where they appear (usually at doorways). Then zap them into robot dust. If you're fast enough, none of their mortars will explode.

Next time, we'll examine several of *Electrocop*'s levels.

Tricky Tricks

Are there any *Slime World* players who would like to be invincible? Try this: Wait for the game's title screen. Then hold down Option 1, Option 2, and up & right on the control pad. Release all buttons simultaneously and you've got it. This stunt is a little tricky to get working, so keep trying until you master it.

You Lynx golfers may get a kick out of this cheat that's sure to increase (er... decrease) your scores. When you start up *Awesome Golf*, enter your name as LANDLORD. Now, on any hole, you can press Option 2 for a perfect tee off. Tap Option 2 while the ball is in the air, and you'll get a hole in one. Awesome golf, indeed!

Clayton Walnum, the former editor of ST-Log and ANALOG Computing, has been writing about computers and gaming for a decade. He has sold over 300 articles to such magazines as Atari Explorer, Compute, Computer Gaming World, The Writer, and VideoGames & Computer Entertainment. In addition, he is the author of six books: C-manship Complete, Master Populous, Beyond the Nintendo Masters, The First Book of Microsoft Works for Windows, The ST Assembly Language Workshop, Volume 1, and A.E.S. Quick Reference.



DO YOU GET LYNXED?

Send Your Lynx Tips, Hints, or Questions to:

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c/o Atari Explorer Magazine
1196 Borregas Ave.
Sunnyvale, CA 94089

The Atari Clipboard

Data Exchange Made Even Easier

By Scott D. Sanders

WHILE IT MAY NOT BE evident to the end-user, Atari has recently been taking some important steps to provide developers with the means to create higher quality application software. Of note, Atari has defined several development protocols which allow applications to maintain a consistent look-and-feel and to work well with each other. In this article I will limit my discussion to the **Atari Clipboard**. Specifically, what it does for a user and, if you are a programmer, how to use it.

For Users

If you've ever used an application's *Cut*, *Copy*, or *Paste* functions, then you've already used some form of a clipboard. The main purpose of a clipboard is allow data to be exchanged easily between different documents. Depending on your software, you might use a clipboard to store a block of text from a word processor, a graphic frame from a desktop publishing package, or a portion of an audio sample from within a digital sound editor.

Up until now, the main limitation of clipboards has been that most applications used a "private" clipboard that only it could access and understand. You could, for instance, transfer data from one part of a document to another or even between two documents from within the same program, but that was the limit. The Atari Clipboard standard allows the exchange and use of clipboard data between applications as long

as they can utilize the format the particular data is in. The clipboard has now become a public resource rather than a private one.

How Does It Work?

In order for all applications to have access to clipboard data, the data is written to disk with the filename SCRAP.??? where ??? can be any file extension (.TXT, .IMG, etc.) which represents the data format. For example, in a word processor that supports the clipboard standard, selecting *Cut* or *Copy* causes the currently selected data to be written to your disk drive in a file called SCRAP.TXT. The data is stored in your current clipboard directory (A:\CLIPBRD\ or C:\CLIPBRD\). The location of the clipboard directory can be set to your preference with a CPX such as one I released as Freeware, available by modem on the GENIE ST Roundtable.

When *Paste* is selected by any application in the system (including the one that originally wrote the data to the clipboard), the data stored on the clipboard is inserted into the application. The data last written to the clipboard will remain there between applications and even when you turn off your computer because it's located on disk rather than in memory.

Due to the nature of the clipboard, only one "scrap" can exist on the clipboard at any given time, although a *scrap* can consist of several files that store the data in different formats. Each subsequent *Cut* or *Copy* will erase the previous *scrap* before writing the new information.

Why Now?

One point interesting to note is that the capability to handle this type of data exchange has been present ever since TOS 1.0. The dilemma that existed was that the usage of it, from a programmer's perspective, was never defined

AppName	File	Edit
		Undo UNDO
		Cut ^X
		Copy ^C
		Paste ^V
		Delete ^Y
		Select All

Fig. 1—The familiar *Edit* menu is where clipboard access is controlled. This example illustrates how to set up the *Edit* menu as well as the new standard for the *Desk* menu.

clearly until late last year in an article written by Mike Fulton, an employee of Atari Corporation, in the official developer's newsletter. This document explained the clipboard protocol in detail and how programmers could

implement it. Now it is simply a matter of time before Atari programmers adopt this standard and update their products. In fact, many recent products already support it.

For Programmers

This section should be useful to any programmer familiar with the "C" programming language. The example was done specifically in Lattice C v5.5 but should be easily portable. You can place these routines in a custom "C" library so that they can easily be called from within your own applications.

A Matter Of Style

Every application that manipulates a piece of data that could be meaningful to another application should utilize the clipboard. This includes, but is certainly not limited to, text, bitmap graphics, vector graphics, waveforms, icons, etc. When this protocol was first defined, many programmers stated that they wouldn't add clipboard support because it wasn't applicable to their applications. Currently, there are very few applications that couldn't use the clipboard for some purpose.

Every application that uses the clipboard should have an *Edit* menu.¹ This menu is placed to the immediate right of the *File* menu which is to the immediate right of the *Desk* menu. *Edit* menu entries should look similar to the example in **Figure 1**.

Please note the use of the keyboard equivalents. These are standard, platform independent keys assigned to the clipboard functions.²

It is also suitable to supplement this menu with other edit functions (ex: *Find* and *Replace*), however, you should be sure to place any additions below clipboard entries and separate them with a disabled line.

Applications can also remove entries which

1. With the release of MultiTOS, Atari has clearly defined a new standard for the design of menu bars. The first menu title (far left) should always be the application's name. This supercedes older methods of using "Desk" or the Atari Fuji symbol. With this method, the user will always know which application currently has the input focus.

2. Atari has suggested to its developers that key equivalents involving the Alternate key be avoided. The Alternate key provides access to foreign characters in some countries and can therefore cause conflicts.

Listing One

```

/*
 * Header file for clipboard support library CLIPLIB.C
 */

#ifndef _CLIPLIB_H_
#define _CLIPLIB_H_

#include <PORTAB.H>

#define FOLDERSPEC    0x10           /* Includes subdirectories. */
#define SCRAPSPEC    0x22           /* Includes files/hidden files. */

BOOLEAN ScrpInit(char *);
VOID ScrpClear(char *);
BOOLEAN GetClip(char *,char *,char *);

#endif

```

Listing Two

```

/*****
 *      Scrap Library Routines      *
 *  Written by Scott Sanders in Lattice C5 *
 *****/

#include <AES.H>
#include <PORTAB.H>
#include <OSBIND.H>
#include <STRING.H>
#include "cliplib.h"

/* I'm including this to make it a little more portable. Many C compilers
 * define this differently.
 */

typedef struct {
    char resv[21];
    char attr;
    LONG time;
    LONG size;
    char name[14];
} DTASTRUCT;

/* Procedure ScrpInit(char *cpath): returns system clipboard directory
 * in string pointed to by cpath. If no clipboard is defined, it is
 * defined as folder \CLIPBRD\ on the user's boot drive. Returns FALSE
 * if no error occurred, TRUE otherwise.
 */

BOOLEAN
ScrpInit(char *cpath)
{
    BYTE *cp;
    LONG drv,err;
    DTASTRUCT new,*old;

```


Listing Two Continued

```

if(!scrp_read(cpath))
    cpath[0] = 0;

if(cpath[0]) {
    /* Someone has scrp_write()'ed */

    old = Fgetdta();
    Fsetdta(&new);

    if(cpath[strlen(cpath)-1]!='\\') {
        /* No trailing '\\' */

        if(Fsfirst(cpath,FOLDERSPEC) {
            cp = strrchr(cpath,'\\');
            *cp = 0;
        }
    }
    else
        cpath[strlen(cpath)-1] = 0;

/* In case someone wrote just C:\ or A:\ */

    if(strlen(cpath) == 2 && cpath[1] == ':')
        return FALSE;

/* Now, verify a good directory. */

    err = Fsfirst(cpath,FOLDERSPEC);

    Fsetdta(old);
    /* Restore DTA */

    if(!err) {
        /* If good directory, return. */
        strcat(cpath,"\\");
        return FALSE;
    }

/* else continue with \CLIPBRD\ folder create on boot drive */
}

/*
 * Procedure only continues if scrp_read() returns error or
 * isn't valid.
 */

drv = Drvmap();
/* Get list of mounted drives */

if(drv & 4L)
    cpath[0] = 'C';
else
    cpath[0] = 'A';
cpath[1] = 0;
strcat(cpath,"\\CLIPBRD");

if(Dcreate(cpath) {
    /* Returns non-zero on error */
    cpath[0] = 0;
    return TRUE;
}
strcat(cpath,"\\");

scrp_write(cpath);
/* Tell the AES what we've done */

```

don't apply to them as long as they maintain the correct ordering and use the same key equivalents.

Implementing "Cut" And "Copy"

An application that implements *Cut* and *Copy* should follow the steps as outlined below:

- Do a *scrp_read()* to determine the location of the current clipboard directory and handle its return value appropriately (see below). The function *ScrpInit()* is included in the sample source code to assist you.
- Enter a loop which deletes all files with the name SCRAP.* in the current clipboard directory. The function *ScrpClear()* is included in the sample source code to assist you.
- Write data to the clipboard as SCRAP.???. The question marks should be replaced with the file extension which represents the data you wish to store. Do not write the data as read-only or as a hidden file. It is recommended that you store the data in as many formats as your application supports. An image program might write two files, SCRAP.IMG and SCRAP.TIF for example. A DTP program might store a text block as a graphic representation of the text showing fonts and styles (SCRAP.GEM) as well as the raw text (SCRAP.TXT). Current formats recommended for use are listed in **Figure 2**. This does not preclude you from using an internal format but it will insure your data is recognized by a wider variety of applications.
- If you are performing a *Cut* delete the data internally.

Implementing "Paste"

An application that implements *Paste* should follow the steps as outlined below:

- Do a *scrp_read()* to determine the current location of the clipboard directory and handle its return value appropriately. Again, *ScrpInit()* can serve this purpose.
- Use *Fsfirst()/Fsnnext()* to determine what SCRAP.* files exist. You may use *GetScrp()* from the sample source code for this purpose.
- If a scrap file(s) exists that your application recognizes, load the file which contains the most information your program can utilize and insert the data.

Implementing "Undo" & "Delete"

The *Undo* and *Delete* functions are not handled by the system clipboard management routines. *Undo* should simply reverse the last action the user took. However, if the last function the user selected was *Cut*, *Copy* or *Paste*, it would be appropriate to call the complementary function to restore the data. *Delete* should simply erase any selected data without writing it to the clipboard.

Handling *Scrp_Read()*

The source code in Listing 2 contains utility functions including one called *ScrpInit()*. *ScrpInit()* will help you parse the return value from *scrp_read()*. It should be called prior to every clipboard operation to keep the clipboard path specification current. Keep in mind that it is possible for the user to modify the clipboard path while using your application with a CPX or similar utility.

ScrpInit() contains enough code to ensure that the string returned is a valid directory. If you replace *ScrpInit()* with your own code you should provide error checking as well.

Pass *ScrpInit()* the address of a global string array of at least 128 bytes. On return it will be filled in with a valid pathname to the clipboard directory formatted with a trailing backslash (ex: C:\CLIPBRD\) and a trailing NULL (ASCII 0) if no error has occurred. The function returns 0 (FALSE) if no error has occurred or non-zero otherwise.

Handling *Scrp_Write()*

An application should only call *scrp_write()* when the clipboard directory has not been previously set or is found to be invalid. (As shown in the source to *ScrpInit()*.) Never arbitrarily call *scrp_write()* to reset the clipboard directory. In addition, never allow the user to set the clipboard path from within your application. The clipboard is a system resource and as such should only be configured by a CPX or accessory.

The format for the pathname passed to *scrp_write()* is very specific. Do not trail the pathname with a filename but do include a trailing backslash and a drive specifier. The default clipboard directory is always C:\CLIPBRD\ or A:\CLIPBRD\ based on whether a hard drive is present.

Listing Two Continued

```

        return FALSE;
    )

/* Procedure ScrpClear(char *wpath): clears the directory contained in
 * wpath (assumed to be the system scrap directory) of all read-write
 * files. Actually, a clipboard application should never write a read-
 * only file, but just in case. This procedure should be called before
 * a Cut or Copy operation.
 */

VOID
ScrpClear(char *wpath)
{
    char opath[200], dpath[200];
    LONG ret;
    DTASTRUCT new, *old;

    old = Fgetdta();           /* Save DTA */
    Fsetdta(&new);

    strcpy(opath, wpath);     /* Setup temporary path */
    strcat(opath, "SCRAP.**");

    ret = Ffirst(opath, SCRAPSPEC); /* Only read/write files */
    while(!ret) {            /* Delete all files in loop */
        strcpy(dpath, wpath);
        strcat(dpath, new.name);
        Fdelete(dpath);
        ret = Fnext();
    }
    Fsetdta(old);           /* Restore old DTA */
}

/* Procedure GetScrp(char *scrp_path, char *outpath, char *ext) looks
 * for a scrap with extension ext in the clipboard directory scrp_path
 * and if found, fills in outpath with the full path/filename and returns
 * TRUE. If it is not found the function returns FALSE.
 */

BOOLEAN
GetScrp(char *scrp_path, char *outpath, char *ext)
{
    char path[200];

    strcpy(path, scrp_path); /* Create full file/path spec */
    strcat(path, "SCRAP.*");
    strcat(path, ext);

    if(!Ffirst(path, 0x03)) {
        if(outpath)
            strcpy(outpath, path); /* We have a winner */
        return TRUE;
    }
    else
        return FALSE; /* No SCRAP.ext found. */
}

```


Figure 2

.TXT	ASCII Text (CR/LF after each line)
.ASC	ASCII Text (CR/LF after each paragraph)
.IMG	GEM Bit-Image
.GEM	GEM Metafile
.AVR	Sound Waveform
.XIC	Extended Icon Format
.ICN	GEM Icon Format
.RTF	Microsoft Rich Text Format
.CVG	Calamus Vector Graphic
.EPS	Encapsulated Postscript
.DIF	Data Interchange Format (Spreadsheet)
.TIF	Tagged Image File Format
.TGA	Targa Bit Image

Other Utility Functions

Also in Listing 2 is source code for *ScrpClear()* and *GetScrp()*. These should be useful to anyone adding clipboard functions to their own applications.

ScrpClear() is passed the current clip-

board directory string. (As filled in by *ScrpInit()*.) It deletes all files in this directory with the filespec SCRAP.*. This function should be called during each *Cut* or *Copy* operation to clear the directory of prior scraps before writing new data.

GetScrp() returns the full pathspec for a clipboard scrap you can use. Pass the function three character pointers. The first pointer points to the current clipboard directory. (Again, as filled in by *ScrpInit()*.) The second pointer should point to a string array of at least 128 bytes which will contain a valid path/filename on return for use in *Fopen()*. The last pointer should point to a string containing the file extension you are interested in reading (ex: "TXT"). If

the function returns 0 (FALSE), the string pointed to by the second pointer you passed in will contain a valid path/filename. Any other return value indicates that a scrap with the file extension you specified does not exist in the clipboard directory.

GetScrp() could be called multiple times to search for different formats of data.

Conclusion

The implementation of the Atari clipboard is just one method of application data sharing. Many more powerful methods exist that we have yet to look forward to. For now it is important that developers support this standard to make data sharing an easier task.

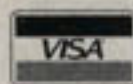


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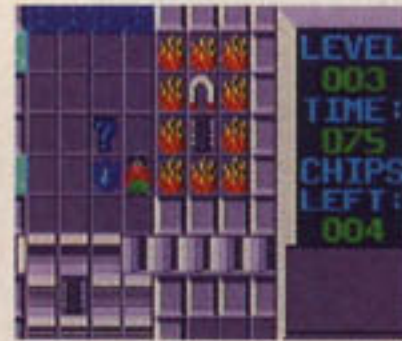
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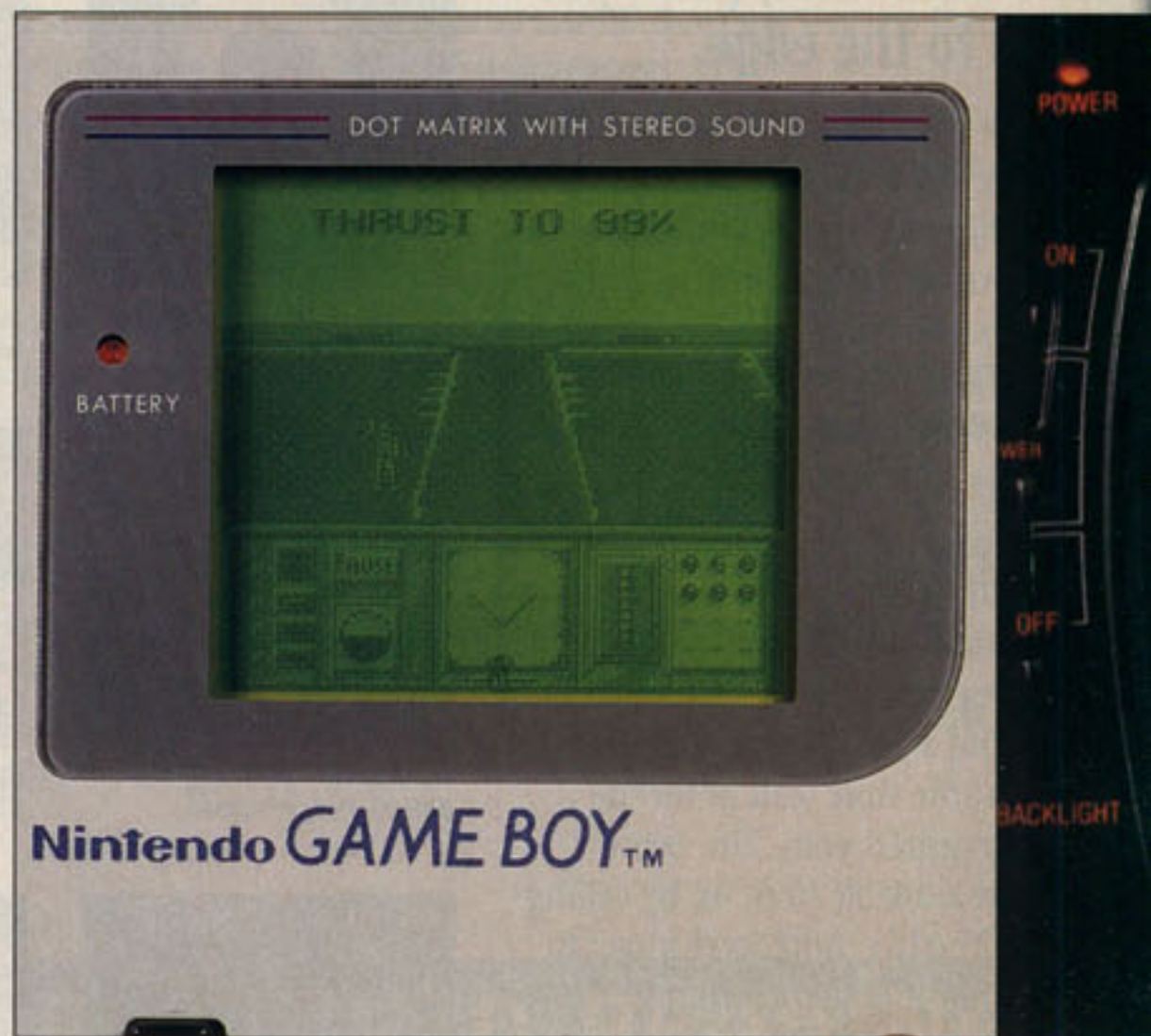
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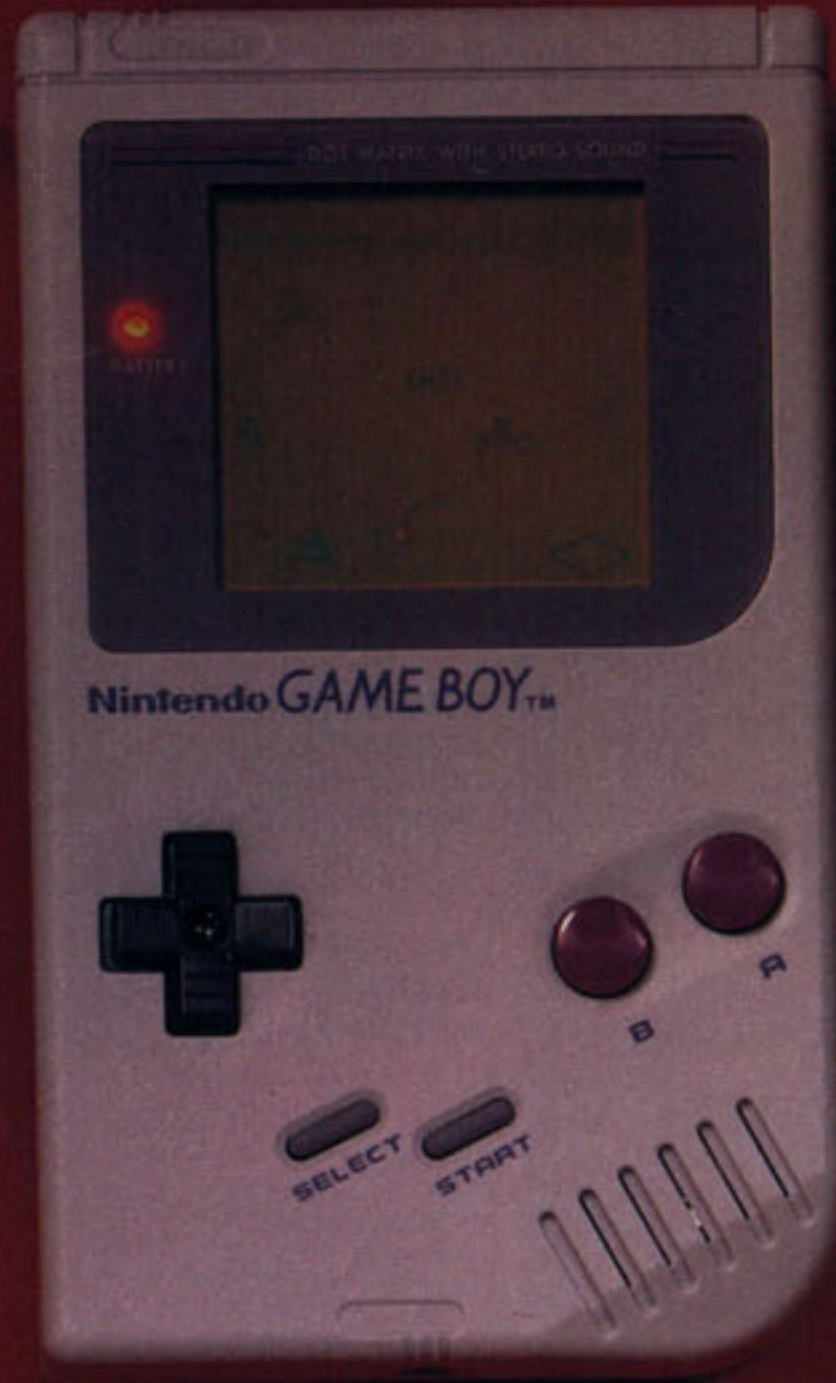
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