Your Own Affordable Home Music Studio

Arithmetic Packages For Kids

Mike Pinder: The New Voice Of Atari

Reviews:
- Touch-Up
- Unispec
- Spectre 128
- Diamond GOS
- Take Note
- X*Press
- Orbiter
- Road Raider
- Crash Garrett
- Techno-Cop
- Downhill Challenge
- Deja Vu II
- Alien Syndrome

AUGUST

44Mb of Removable Storage For Atari ST Computers

SPECIAL REPORT

Expanding the Megafile line of ST-compatible hard disk drives, Atari announced the Megafile 44 — a removable-media hard disk drive based on the Syquest technology licensed for use with the PC4 AT-compatible (see above). The removable-media system offers the advantages of a fixed disk in terms of access speed and storage volume, while eliminating the problem of transporting data between worksites: the user has only to pop the disk out of the drive and either mail or carry it to its destination.

Watch upcoming issues of Atari Explorer for reviews of these exciting new products!

ST-Compatible Laptop Stretches Technology

Atari Debuts The Stacy,

First Handheld PC-Compatible

NEW PC4 OFFERS IBM PC-AT POWER WITHOUT THE PRICE

In a surprise move calculated to strike at the heart of the PC-compatible market, Atari has announced the PC4, an IBM AT-compatible desktop system. Based on the Intel 80286 chip running at 12 Mhz and sporting a full megabyte of RAM, the Atari PC4 is capable of running all MS-DOS applications. It is also optimally configured for running OS/2 — IBM's multitasking environment — and GEM-like graphical user interfaces, including GEM's own Presentation Manager.

New Hardware Makes Headlines
Atari Computers Are In The News

Garry — Let me know when these are available. I've got a ticket on the next shuttle — Leonard

FEATURES

REVIEWS

DEPARTMENTS

Cover Photograph by Jeff MacWright.

Beautiful Music

Dear Editor:

In the May/June issue of *Explorer* in the article "Report from NAMM," you asked us to tell you if MIDI and music coverage was our bag.

Indeed it is, for me! I use my 520 ST exclusively for music and have been discouraged by the lack of good articles about MIDI and music in *Explorer*. I also teach piano and am looking for good software to use in teaching theory to my students—ear training, etc.

I hope this goes a long way toward encouraging you to cover the music industry in a more comprehensive way.

Leland Peck
4110 7th Ave. N
St. Petersburg, FL 33713

Setting the Date Straight

Dear Editor:

Having just bought a 520 ST at a really good price, I rushed out to buy a few of the magazines for which I had had no use in the past. The profile of Ron Luks in your Jan/Feb '89 issue prompts me to write . . . and I haven't even gotten the ST hooked up yet.

The article states the Ron ordered an IBM PC in late 1979. That date seems wrong, because I have in my mind that the IBM came out toward the end of 1981.

This may seem like nitpicking, but either people have a bad memory or they don't know history when it comes to the early days of small computers. This particular item isn't significant, but I think it is important to keep the present in perspective by remembering the past correctly.

Michael Black
16 Anwoth Rd.
Montreal, PQ H3Y 2E7

We admit it: we slipped up. Part of an editor's job is to catch and correct just such errors, and we failed. Of course, the IBM PC was introduced in August of 1981; we ought to remember, because we attended the press conference at which the announcement was made! As for keeping the present in perspective by remembering the past, we try very hard to do just that. Our editorial staff, although small, probably has more combined years of involvement with personal computers than the staffs of most other magazines in the indus-

try—even those 10 to 20 times our size. Every issue we publish is carefully enveloped in just the perspective you seem to want. We hope you will forgive us this careless oversight.
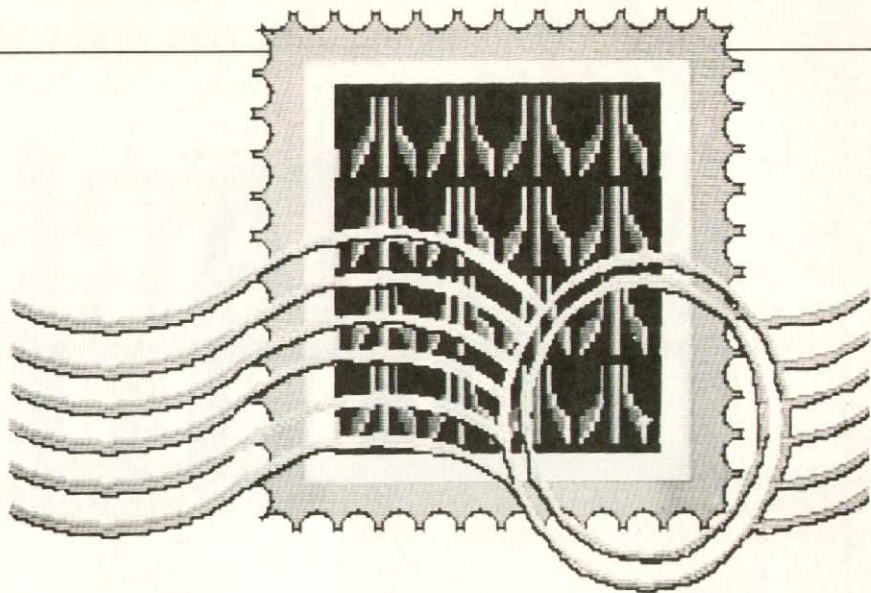
Looking for Answers?

Dear Editor:

Are you tired of getting stuck on your fantasy and adventure games and then having them collect dust on some shelf? Do you need help getting over that one impossible hurdle?

Well, I have the answer. I will cost you, though—some ink, paper, time, and a stamp or two.

I specialize in most of the great fantasy games—*Rogue, Phantasie I, II, and III, King's Quest I and III, Ring of Zilfin, Dungeon Master, Questron I and II, Space Quest, Shadowgate, Wizard's Crown, Ultima IV*, and other SSI games, as well as some arcade games—and will try to help you over those rough spots if you will send your question to me along with an SASE.

Wise Old Owl
18735 Ivan St. SW
Rochester, WA 98579

Atari Dream Machine

Dear Editor:

What the 8-bit Atari really needs from Atari Corp. is not merely to promote its features but to modify those features and promote the benefits that derive from the improvements.

For example, if Atari wants to sell the 130XE, they should include a Basic XE cartridge that would allow 100K RAM, so you could write longer, more complex programs.

They could go even further and offer a 260XE with 256K of RAM (with 12 banked RAMs), Basic XE, a DOS that would support a 128K RAMdisk, and 128K of Basic XE/OS RAM. I made these modifications to my system and added four function keys with parts I bought from Radio Shack. My turbocharged Atari XL burns rubber!

I would also like to see a 20-plus Mb hard disk drive especially for the XL/XE.

But my real dream machine is what I call the Atari CKSM (for Clark Kent/Superman). In Clark Kent mode, it is a souped-up 260XE with 8-bit addresses and the usual OS locations, but it has a switch that changes it into 16-bit Superman mode. This 16-bit mode uses the same 5¼" disks, hard drives, and formatting as the 8-bit, but it can use 3½" disks, as well, having linear memory to more than 16Mb.

In addition, the Atari CKSM computer maintains compatibility with all earlier 8-bit Atari computers in CK mode.

C'mon, Atari, don't let the 8-bit barrier make the XL/XE obsolete as consumers defect to 16-bit machines. Let's turn the VW Rabbit into a Chevrolet Camaro. Let's beef up the hardware, and software support will follow.

David Tanny
6322 Lake Arago Ave.
San Diego, CA 92119

Letters To The Editor

ATARI EXPLORER
THE OFFICIAL ATARI JOURNAL

Letters To The Editor

Thanks, Atari!

Dear Editor:

Over the past few months I have seen and heard nothing but complaints about the way Atari Corp. is handling the 8-bit machines. I would like to reverse that gloomy trend.

I live, for six months of the year, on a small, isolated, island about 350 miles from Florida. As there are no Atari dealers in the Bahamas, I have in the past had to rely on my infrequent trips to the U.S. for software. Up until this year, I have had no luck; the situation in South Florida was deplorable.

Imagine my delight, then, when I went on one of my trips and found a new authorized Atari dealer; I could finally find a few 8-bit software titles. There has also been a marked increase in the number of toy stores that carry 8-bit products—no doubt at Atari's urging.

Perhaps a few games and utilities do not excite every computer enthusiast.

But this means that I—and others—have a start where we can shop for some of the newest software. I will be forever grateful to Atari Corp. for trying to help the 8-bitters of South Florida.

David Sherwin
P.O. Box S.M. 30-141
Stella Maris, Long Island
Bahamas

A Market Niche?

Dear Editor:

I have an Atari ST with hard disk and SLMC804 Laser printer. I am having trouble getting the system to work with Timeworks *Publisher ST* and am now communicating with a technical support person at Timeworks.

My observation, as a newcomer to the personal computer field, is that instructional material is needed. In most cases, user manuals are worthless; I have simply stumbled on most of the information I currently have.

Are there scripts available to provide step-by-step instructions for accomplishing certain results? I would be willing to pay someone to prepare scripts like the following:

1. Turn on everything but the computer switch.
2. After 15 seconds, turn on the computer.
3. When icons appear, double-click on the disk C icon with the left mouse button.
4. In the disk C directory, double-click PUBLISH or WDWRITER.
5. Click on PUBLISH.APP or WDWRITER.APP.

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.

.

etc.

Such a script would take the beginner through the steps necessary to get something out of the laser. Other scripts are needed for other tasks.

Why is it that an amateur such as myself came up with this idea instead of you professionals?

Glen G. Cooper
Box 8762
Chula Vista, CA 92012

Fortunately, newcomers to the personal computing community don't stay beginners for very long. Unfortunately, it seems, they forget very quickly what it was like to be beginners. We're sure that by now the steps you lay out in your script have become second nature to you; maybe you, too, have even forgotten how it felt to be baffled by the desktop.

In theory, the documentation that comes with each piece of hardware and software should start at the level you describe, assuming that the user knows nothing. As we have noted many times in these very pages, however, ST documentation in general leaves a great deal to be desired. Rather than suggesting that an additional financial burden be placed on the user, who would have to buy the scripts you propose, we reiterate our suggestion that software publishers invest more time and money in the manuals they distribute with their programs.

Until that happens, maybe some of our enterprising readers can make a few bucks selling scripts on the doorsteps of local Atari dealerships ... Pssst ... wanna know how to load Degas?

NEW

Products

The latest hardware and software releases for Atari 8-Bit and ST computers

High-Speed PC Emulator

Avant-Garde systems announces a hardware-based emulator that runs most popular IBM software on all Atari ST computers. The device boasts XT compatibility and AT-like performance at an Atari ST price.

The Norton SI rating for PC-Ditto II is 3.0, compared with the IBM PC XT rating of 1.0, the IBM PS/2 Model 30 rating of 1.8, and the Zenith EZ-10 rating of 2.6. Features include up to 640K of usable memory (on machines with a minimum 1Mb of memory), monochrome and color graphics capabilities on all Atari monitors, a fixed disk adapter with automatic access to all Atari partitions, Microsoft-compatible mouse-support, Atari clock/calendar date and time support, full serial and parallel port emulation, and support of 3.5" 80-track drives and optional 5.25" 40-track drives. Updates will be available at no charge.

PC-Ditto II carries a retail price of $299.95. Version 3 of the original *PC-Ditto* software emulator sells for $89.95. Registered owners of current versions of the software package will automatically receive a discount coupon worth $150 toward the purchase of the new product.

Avant-Garde Systems, 381 Pablo Point Dr., Jacksonville, FL 32225, (904) 221-2904.

Keep A Clean Screen

Screenwipe is a patented screen cleaning system. Packaged in a small foil pouch, the lint-free carrier fabric is impregnated with a chemical that removes dust and dirt from the monitor screen and reduces the static charge.

The manufacturer further asserts that Screenwipe will not damage screen coatings or plastic overlays. A package of 50 packets retails for $22.50.

Lensclean Incorporated, 74 Louis Ct., Dept. M2, S. Hackensack, NJ 07606, (800) 524-1058, (201) 641-7555.

Computing Construction Kit

Fischer America has released a Computing Construction Kit designed to allow Atari ST users to conduct experiments in "measuring, controlling, and adjusting."

The manual provides an introduction to the programming of machines and robots and describes the experiments in detail. Experiments include motors and switches (an introduction), switching with light, measuring and evaluating incidence of light, measuring and adjusting temperatures, turtle: motion strategies and route planning, turtle: sensors for light obstacles, and methods of artificial intelligence.

The kit, which includes interface, software, and power supply, sells for $379.

Fischer America, 175 Route 46 W., Fairfield, NJ 07006, (201) 227-9283.

ENTERTAINMENT SOFTWARE

Swiftar, a new science fiction arcade game for the ST from **Accustar**, places you in the role of one of the pilots of the Swiftar planetary defense squadron. The planet Akaron is in trouble; alien Cyborgs have gone berserk, infiltrating Akaron's support systems and dispersing Force Field Crystals across the planet. Your job is to retrieve the Crystals and restore peace. $39.95.

Accustar Software, P.O. Box 0457, Rochester, MI 48308, (800) 777-1690.

Artisan Software has released *Word Quest* for the ST, a GEM-based program designed to construct hidden-word puzzles. Puzzle size can be adjusted from 5×5 to 20×20 characters, and words can be entered individually or in list form. Sort routines assure that longer words are placed first, while hard copies of word lists are printed out in alphabetical order. Most commands are accessible via keyboard or mouse. $29.95.

Artisan Software, P.O. Box 849, Manteca, CA 95336.

Jet from **SubLogic** puts you and your ST in control of an F-16 Fighting Falcon or an F/A-18 Hornet. Standard equipment includes an arsenal of combat ordnance, search radar, an automatic target tracking computer, and an ejection seat. You can sharpen your skills in free flight mode or engage in a dogfight with an intelligent computer-controlled enemy MiG-21 or MiG-23 fighter. A multi-player option allows

MIDI Thru/Out Adapter for ST

Practical Solutions announces the release of the MIDI Thru/Out Adapter Cable for the Atari ST. The new cable converts the non-standard MIDI Out of the Atari ST to a standard MIDI Out *and* MIDI Thru, making the ST compatible with a wide range of MIDI equipment.

Because the MIDI port on the ST handles both Thru and Out signals on the same jack, some ST users have had problems with cables inadvertently combining the two signals. In addition, users previously had to purchase a MIDI Thru box to take advantage of the MIDI Thru capability.

The Practical Solutions cable, which sells for $14.95, provides completely separate MIDI Thru and Out on standard female connectors.

Practical Solutions, 1135 N. Jones Blvd., Tucson, AZ 85716, (602) 332-6100.
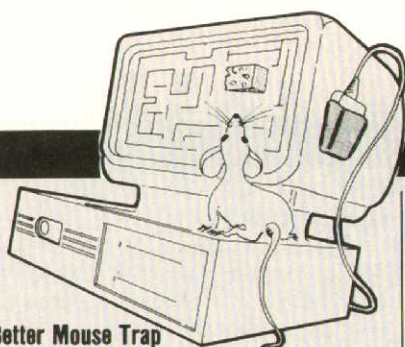
A Better Mouse Trap

Designed specifically for mouse-driven computer systems like the ST, the Better Mouse Trap protects your mouse and keeps your work area free of rodent clutter.

The vinyl pocket, which attaches to the side of the monitor, stores the mouse out of harm's way when it is not in use. The Better Mouse Trap sells for $8.95.

Peri-Peripheral Company, 1201 204th Pl. SE, Bothell, WA 98012, (206) 486-3003.

Network For Audiophiles

Sound-Net is an electronic bulletin board information system dedicated to audio, acoustics, music, MIDI, electronics, and CAD. The network can be accessed from any computer equipped with a 1200 or 2400 baud modem and communications software or through the university electronic mail network, UUCP.

Sound-Net is sponsored by the Audio Engineering Society, Toronto Section, and is non-profit. A $35 membership fee is required for A.E.S. members; non-members pay $45.

For more information, contact Paul Gonsalves, System Administrator, Sound-Net, 164 Sunnyside Ave., Ste. 100, Toronto, ON M6R 2P6, (416) 530-4423. UUCP address: dciem!snd-net!paul.

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two players using separate machines to fight with each other via the modem port connectors. $49.95.

SubLogic, 501 Kenyon Rd., Champaign, IL 61820, (800) 637-4983, (217) 359-8482.

Electronic Arts announces *Zany Golf* for the ST. You must negotiate flashing lights and crazy music in the Pinball Hole, putt under a jumping burger in the Hamburger Hole, and dodge laser beams, particle rays, and transporter pads in the Energy Hole. The ball may careen unpredictably, disappear in a burst of fireworks, and be transported to another level. $39.95.

Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, (800) 245-4525.

Thunder Blade by **Sega Enterprises** puts you in command of an attack helicopter. The game offers dual visual perspectives—top-down and from behind the powerful chopper—as you fly over skyscrapers, mountains, deserts, and the sea, attempting to accomplish the near-impossible mission of defeating the enemy. $49.95.

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

Data East USA has announced a new game for the Atari ST. *Batman, The Caped Crusader*, allows you to battle for justice in Gotham City by thwarting the Penguin's plot to take over the world with an army of robot penguins. At the same time, the evil Joker has kidnapped Robin. The search for the Teen Wonder leads you through the sewers of Gotham to the Fair, where the fun house isn't much fun and a ride on the roller coaster could be your last. $39.95.

Data East USA, 470 Needles Dr., San Jose, CA 95112, (408) 286-7074.

Cinemaware announces three new games in the new Spotlight Software line. *Deathbringer* is a fantasy role-playing game in which your ability to interact with the game determines the degree of success you will have in achieving most of the goals. $39.95.

Federation is a strategic space trading and combat adventure with a built-in space flight simulator. You work your way up in rank from Space Courier to Admiral of the Space Federation as you tackle 15 increasingly difficult missions in a hostile universe. $49.95.

Total Eclipse is an adventure in which you become an archaeologist who must explore a giant pyramid to locate and destroy a secret shrine. Treasures and traps abound as you pursue your mission with nothing but a revolver, a compass, and a wristwatch. $39.95.

Cinemaware, 4165 Thousand Oaks Blvd., Westlake Village, CA 91362, (805) 495-6515.

Tape Backup for ST

ICD has announced the FA-ST Tape Backup for the Atari ST. Capacity is 133.7 Mb on a single data cassette, and average read/write speed is 116.2K bytes per second.

A clock with battery backup is included along with SCSI and DMA output ports for daisy chaining.

The FA-ST Tape Backup sells for $899.95.

ICD, 1220 Rock St., Rockford, IL 61101, (815) 968-2228.
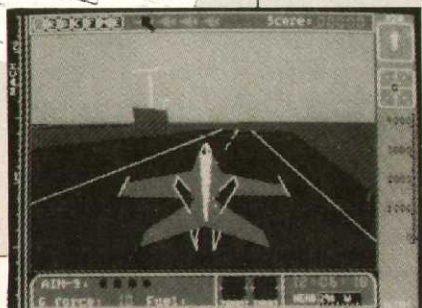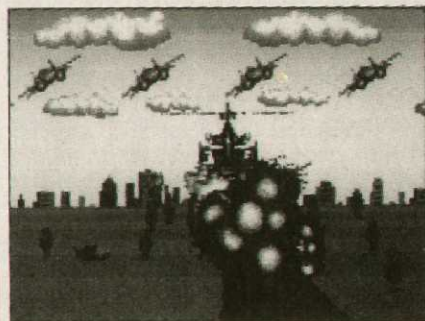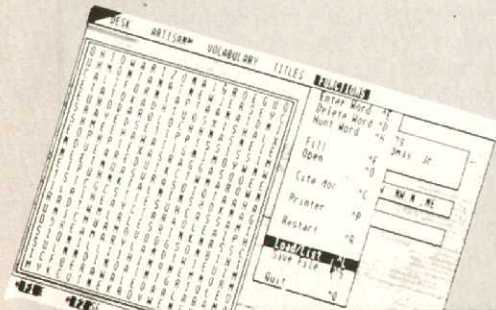
Drawing With A Microcomputer

Camelot Publishing Company has released *Drawing With A Microcomputer* by Donald and Susan Spencer.

The book introduces the reader to computer drawn images, microcomputer systems, and a typical paint program. Examples from which readers can learn include landscapes, natural forms, still life, portraits, animals, geometric figures, modern art, fantasy, cartoons, and digitized art. Also included is information on photographing the computer display, making slides, and producing images using printers and plotters.

Drawing with a Microcomputer carries a retail price of $19.95. A catalog of other educational computer science materials is available from the publisher at no charge.

For those who learn their drawing lessons well, Camelot is sponsoring a Computer Art Contest. Winning entries will be published in *Computer Images 1990*. Categories for entries are Secondary School (grades 6-12), Color; Secondary School, Black and White; College/Adult (over 18 years of age), Color; and College/Adult Black and White.

Entries must be received by December 31, 1989. Rules and guidelines are available from the publisher.

Camelot Publishing Company, P.O. Box 1357, Ormond Beach, FL 32075, (904) 672-5672.

PRODUCTIVITY SOFTWARE

Artisan Software announces *Graph Maker* for all Atari ST computers. This GEM-based graph mapping package is designed to construct professional-looking bar graphs, line graphs, and pie charts "without intimidating commands or complicated printer drivers." Built-in features allow for importation of *NeoChrome* and *Degas* images.

Additional features include color and monochrome compatibility, merging, background options, positionable text strings, pie segment analysis, and online printer configuration. $59.95.

Artisan Software, P.O. Box 849, Manteca, CA 95336.

The Sterling Connection has released *Templicity* version 1.5 for the Atari ST. The new version consists of 60 spreadsheet templates for home and small business use. New templates include IRS forms 1040, A, B, C, D, E, SE, 2441, 8606, and 4562. Annual upgrades will be offered for $5.00. Also included are templates for personal financial planning, real estate decisions, and accounting for both novice and experienced spreadsheet users.

Version 1.4 is available for *LDW Power*, *Logistik*, *MasterPlan*, *SwiftCalc ST*, and *VIP Professional*. $29.95.

The Sterling Connection, Box 4850, Berkeley, CA 94704, (415) 655-2355.

Blue Turtle Software announces *Today/ST*, a database designed to remind users of important events. The included editor allows users to edit, view, and browse through as many as 5000 dates. A beep at bootup reveals the presence of a date reminder. $14.95

Blue Turtle Software, c/o Peter A. Ritchie, 55 Jackson Ct., Kanata, ON K2K 1B6, (613) 592-0203.

Magnetic Images has announced two new fonts for GDOS programs, both of which are compatible with *Publisher ST*, *Easy-Draw*, *WordUp*, *Fleet Street Publisher*, and other desktop publishing programs, and both of which are identical in style to the original series of Magnetic Images fonts. They are available in a variety of point sizes and include printer fonts for Epson-compatible printers. $34.95.

Also available is a series of upgraded line fonts, which are now compatible with *PageStream* and *Publishing Partner*. $34.95. Users can upgrade to the new fonts by sending the original disk and $5.00 per disk to Magnetic Images.

Styles available for both font series include Avant Garde, Courier, Calligraphy; Times, Helvetica Narrow, 16-bit: Chancery, Bookman, Chicago; Palatino, Schoolbook, Computer; Dingbats, Symbols, 8-bit; a complete set of Postscript printer screen fonts; Script, Devine, Gothic; and Brush Script, Marlow, Chamfer.

Magnetic Images, P.O. Box 17422, Phoenix, AZ 85011, (602) 265-7849.
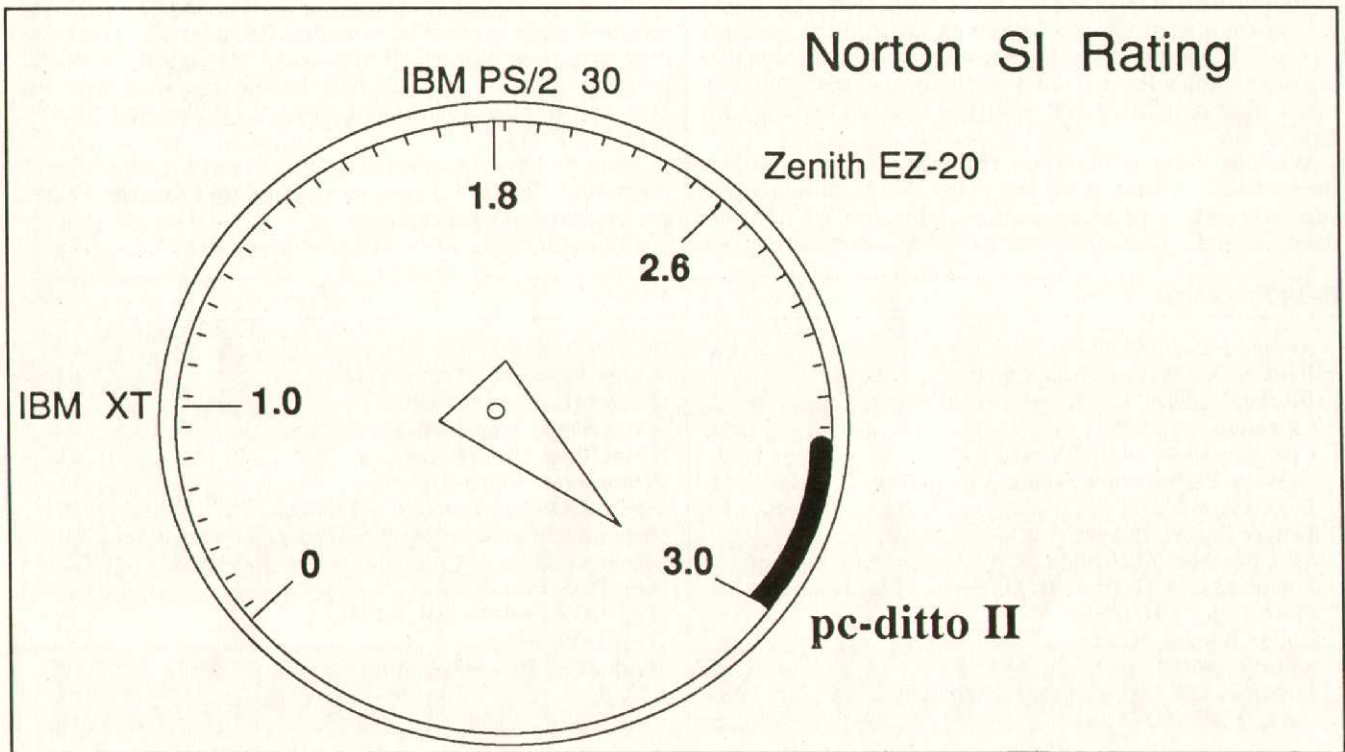
New and Improved

Need to know the latest version of a software package? Find it here.

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

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

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

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

•Bullets indicate a new listing or program update.

8-Bit Programs

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

ST Programs

•**1st Word Plus**, Prospero	3.14	**DigiSound**, Alpha Systems	1.62
1st Word, Atari	1.06	**Disk Library**, Classic Image	1.2
Accounting Series, Hi-Tech Advisers	4.00	**Dollars & Sense**, Monogram	1.2
APL.68000, Spencer Organization	6.05C	**DynaCAD**, ISD Marketing	1.42
Aegis Animator, Aegis Development	1.2	**EZ Calc**, Royal	1.33
Alice Pascal, Looking Glass	1.5	**EasyDraw**, Migraph	2.3
Animatic Animation System, Kinetic Microsystems	1.0	**Edit-8000**, Savant Audio	1.1
•**ASM 32**, Memocom Development Tools	3.0	**Edit-DSS**, Savant Audio	1.0
Athena II, Iliad	1.9	**First CADD**, Generic	1.0
Award Maker Plus, Baudville	23716	**Flash**, Antic	1.6
BB/ST, QMI	1.12	•**FlashBack**, ICD/OSS	2.3
BBS Express ST, ICD/OSS	1.3	•**Fleet Street Publisher**, MichTron	2.0
Backup, MichTron	1.94	**Fontz**, Neocept	1.11
CAD 3D, Antic	2.03	**Fortran for GEM**, Prospero	2.14
•**Calamus**, ISD Marketing	1.09	**Fuel-Pro**, Hi-Tech Advisers	4.00
Church Manager, Hi-Tech Advisers	2.0	**GFA Basic**, Antic	3.0
ComputerEyes Color, Digital Vision	1.32	**Hard Disk Accelerator**, Beckemeyer Development	1.13
ComputerEyes Mono, Digital Vision	1.0	**Hard Disk Toolkit**, Beckemeyer Development	2.00
Copy II ST, Central Point	2.5	**Interlink ST**, Intersect	1.85
Cyber Mate, Antic	1.1	**Inventory Manager**, La Foret	1.2
Cyber Paint, Antic	2.0	**Inventory Master**, Royal	1.5
Dac-Easy Accounting, Dac	1.0	•**Inventory-Pro**, Hi-Tech Advisers	4.10
Dac-Easy Payroll, Dac	1.0	**LDW Basic Compiler**, Logical Design Works	2.03
Data Manager ST, Timeworks	1.1	**LabelMaster Elite**, Migraph	1.0
DataTrieve, Abacus	E2.05	•**Laser C**, Megamax	2.01
Degas Elite, Electronic Arts	1.1	•**Laser DB**, Megamax	1.0
dbMan, Atari	4.0	**MT C-Shell**, Beckemeyer Development	1.20
DeskCart, QMI	1.02	**Magic Sac**, Data Pacific	6.1

•**Mail Merge**, Regent	1.3	**ST Hard Drive Utility Disk**, Supra	3.19
Mail-Pro, Hi-Tech Advisers	2.10	**ST Sprite Factory**, Future Software Systems	1.1
•**Mark Williams C**, Mark Williams	3.0.9	**ST-Replay**, MichTron	4.0
Master Tracks Pro, Passport Designs	3.0	**ST-Talk Professional**, QMI	2.0C
MasterPlan, ISD Marketing	1.0	**STAccounts**, ISD Marketing	2.0
Micro C-Shell, Beckemeyer Development	2.73	•**Sales-Pro**, Hi-Tech Advisers	4.10
Micro RTX Developer Kit, Beckemeyer Dev.	1.13	•**Sales-Pro Plus**, Hi-Tech Advisers	4.10
•**Mighty Mail**, MichTron	2.1	**Solapak**, Solar Powered Software	3.0
Modula 2, Jefferson	1.5	•**SQL Database**, Regent	11/27/88
Modula-2, TDI	3.01A	**Super Directory**, MichTron	2.0
Multi-Manager Professional, New World	1.6	**SuperBase**, Precision	1.049
Multi-Manager, New World	1.0+	**SuperBase Professional**, Precision	2.03
•**Navigator**, Antic	2.0	•**Super Sales-Pro**, Hi-Tech Advisers	4.10
NeoChrome, Atari	1.0	**SwiftCalc ST**, Timeworks	2.0
PC-Ditto, Avant-Garde Systems	3.01	**SwitchBack**, Alpha Systems	2.0
Partner ST, Timeworks	1.0	**The Chameleon**, Future Software Systems	1.0
Pascal for GEM, Prospero	2.14	**The Navigator**, Antic	2.0
Payroll Master, Royal	2.3	**Thunder**, Electronic Arts	1.32
Personal OS-9/ST, Microware	2.2	**True Basic & Run-time**, True Basic	2.0
•**Personal Pascal**, ICD/OSS	2.05	**TuneUp**, MichTron	1.25
•**Phasar**, Antic	3.0	•**Turbojet**, Neocept	1.20
Power Print, Alpha Systems	2.1	**Turbo ST**, Softrek	1.4
Print Master Plus, Unison World	2.0	**Tweakit**, Savant Audio	1.0
Professional OS-9/ST, Microware	2.3	**Ultra-Speed Plus**, Computer Software Services	1.5
•**Prospero C**, Prospero	1.13	**Universal Item Selector**, Application & Design	2.0
•**Pro Text**, MichTron	4.0	•**Utilities Plus**, MichTron	1.1
Publishing Partner, SoftLogik	1.03	**VIP Professional**, ISD Marketing	1.2
Real Basic, Computer Crossware Labs	1.3	**Video-Pro**, Hi-Tech Advisers	3.0
•**Regent Base 2**, Regent	12/18/88	**Word Writer ST**, Timeworks	2.0
•**Regent Word 2**, Regent	9/14/88	**WordPerfect 4.1**, WordPerfect	08/01/88
Regent Word Student, Regent	9/14/88	**WordUp**, Neocept	1.30
Revolver, Intersect	1.1	**Zoomracks II**, Quickview Systems	1.0
ST Control, Trio Engineering	1.5		

Puzzles & Problems

By DAVID H. AHL

Experts disagree about the true significance of IQ tests. Your IQ will not determine whether you will succeed in college, business, or romance. Nevertheless, we seem to have a continuing fascination with IQ tests, and at least one group, Mensa, limits its membership to those people who score in the top 2% of the population on IQ tests.

All of our problems in this issue are taken from various IQ tests. The time limit is 15 minutes. Start now.

Answers are on page 73.

1. Thermometer is to temperature as clock is to _____.

2. Pamela's brother Felix has one more brother than he has sisters. How many more brothers than sisters does Pamela have?

3. Which symbol in the bottom row goes with the three symbols in the top row?

(a)   (b)   (c)   (d)
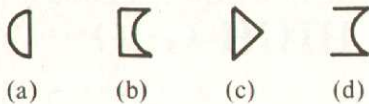
4. What is the next term in this series: 7, 12, 27, 72, . . . ?

5.
is to ⬜ as a cube is to
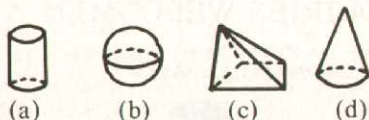
(a)   (b)   (c)   (d)

6. If M×E=6, N×S=20, E×S=15, E×N=12, S×A=30, then M×E×N×S×A=?

7. What word means the same as the left hand word in one sense and the right hand word in another sense?
    hard_____company

8. Which diagram completes the series in the top row?
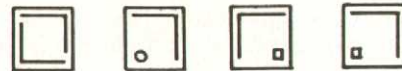
(a)   (b)   (c)   (d)

9. What letter is next in this series: B, E, I, N . . . ?

10. Dopey is younger than Sneezy. Bashful is older than Dopey. Therefore,
    (a) Sneezy is older than Bashful
    (b) Bashful is older than Sneezy
    (c) Dopey is the youngest

11. Which one does not belong?
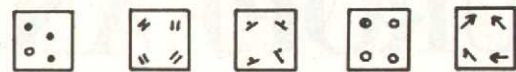
(a)   (b)   (c)   (d)   (e)

12. What is the missing number in this array?
    3   4   7
    7   5   12
    10 9   ?

13. Which diagram completes the series in the top row?
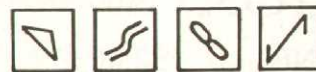
(a)   (b)   (c)   (d)

14. 3 is to 9 and 18 as 2 is to 8 and ?

15. These arrows represent a simple code. What word could they spell when rearranged?

↑ ↓ ← →

Atari Classroom

By FRANK AND SALLY NAGY

Does the word *fun* seem incongruous in the same sentence with the word *math* or *arithmetic*? We used to think so, but no longer. As we delved into the library of available educational software, we found that with the help of Atari computers, you and your kids can, indeed, have fun practicing the third R.

The following reviews of packages for 8-bit and ST computers will help you choose the best programs for your family's needs.

Monkeymath

Artworx's *Monkeymath* for Atari 8-bit systems places a monkey behind a conveyor belt full of numbers. Using the joystick to control the ape, you must hit the number that correctly solves the problem presented and send the number into the answer bin. Additional monkeys carry off the correct answers and supply new problems.

Although the game lists children aged 4 through 10 as the target audience, a problem becomes evident as soon as the program boots; you must be extremely accurate in swinging the simian's scraggly arms. Younger children will, therefore, find their hand/eye coordination challenged to a greater extent than their arithmetic skills.

Knowing the right answer is only half the battle; the youngster must also be able to make the ape hit his mark. If you fire a hair too soon, this unforgiving operator can't reset fast enough to catch the next number. Delicate split-second pacing is required, and 8- through 10-year-olds will find that their arcade games skills come in handy.

The program drills counting, number order, addition, subtraction, multiplication, and division.

The manual encourages parents to have children read the story, "Marc and the Math Factory," because the writers of the story feel that having the child identify with Marc will provide valuable incentive toward skill development.

The concept is cute, and the characters are engaging, so why does it appeal to only a small part of the suggested age range?

We found that children who were challenged by the counting skills of level one were soon frustrated with the me-chanics of getting their correct answers acknowledged. On the other hand, the low-level math was too easy for the older, more coordinated kids who could hit the number targets.

Monkeymath requires only 16K of available memory, which is probably part of its problem. In our opinion, the manufacturer ought to have harnessed more power (doesn't everyone have at least 48K these days?) to make the program accessible to a larger portion of its young audience.

We would like to see this nice concept taken back to the drawing board to eliminate some of the clunkiness that makes the game more challenging than it needs to be.

If your child lacks coordination and has trouble with math, *Monkeymath* will improve neither his arithmetic nor his self esteem. It may, however, be a good choice for older children who need to work on *either* math *or* coordination skills.

1st Math

Animations of familiar scenes reward children aged 4 through 8 as they develop early math skills in *1st Math* for the Atari ST. Eight activities, involving equations and numerical sequences with odd and even numbers, provide the challenges.

Pictures, which represent the various elements of the equations presented, line up in the top half of the screen in the Equation section. As aids to understanding addition and subtraction, coiled snakes flick their tongues, jack knives unfold, rabbits pop out of top hats, and magnets attract paper clips to themselves.

Each correct answer is rewarded visually throughout the program. In the Construction section, individual pictures are added one-by-one, until the solution of a set of problems brings them to life with animation. For example, a bird hops onto a clothesline full of wash, pulls a pin off the socks, and watches both drop.

The Acme Freight Depot presents adding, subtracting, and number sequencing of even and odd numbers using cranes, bulldozers, and trucks. You can use the mouse or the arrow keys to select your answer.

Parents can adapt *1st Math* to each child's skill level and then increase program difficulty as skills develop. Equations can be set up so that the child is challenged to find either the sum or one of the elements of the equation.
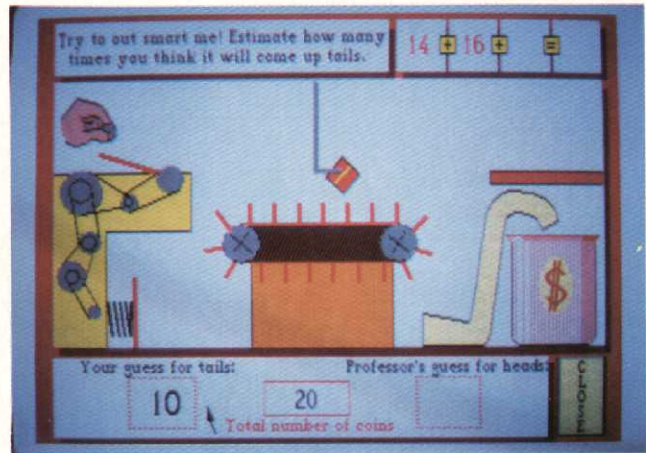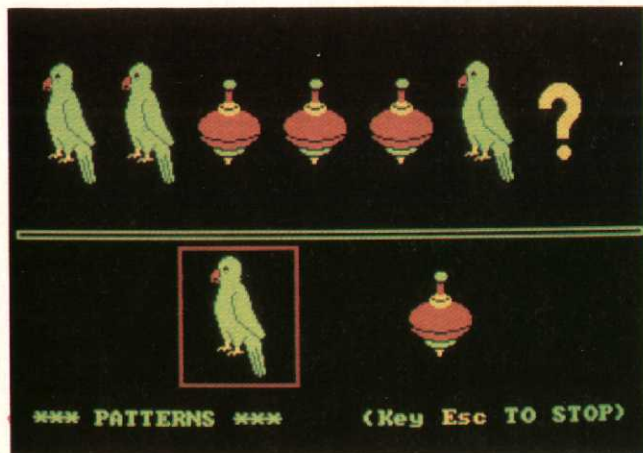
1st Math

System: Atari ST

Required equipment: Color monitor

Copy protection: No

Summary: Cute graphics help kids understand arithmetic concepts and develop skills

Price: $39.95

Manufacturer:
Stone & Associates
7910 Ivanhoe Ave., Ste. 319
La Jolla, CA 92037
(619) 459-9173

In the Patterns section, you must predict the next item in a sequence. Four levels of pattern identification can keep children busy developing important prediction skills.

Our playtesters found *1st Math* very satisfying. They especially enjoyed the animated pictures and the array of equipment used at the Depot. The colorful picture menu makes selecting activities easy for youngsters, and while some programs just ignore incorrect responses, this one proffers the correct answer after three attempts.

1st Math is well-implemented and seems to have been thoroughly tested on children in the target age group. We recommend it for 4- to 8-year-old mathematicians.

MathTalk Fractions

The gimmick in *MathTalk Fractions* for the ST is the voice of kindly Professor Matt A. Matics, who is just mad about mathematics.

Selecting the New User option elicits helpful vocal instruction in decimals,

fractions, and percents. Changes in the speed, pitch, and volume of the computer speech can be accomplished from the control panel.

To begin the game, you select one of four learning modules—Problem Factory, Fraction Shuffle, Fun House, or Team Challenge—via the pictorial point-and-click menu.

The Problem Factory presents decimal and fraction problems of your own making. The Professor and his talking calculator check the answers and give hints to help you correct any mistakes. You can switch back and forth between decimals and fractions.

The Fraction Shuffle is a card game that builds skill in addition, subtraction, multiplication, and division of fractions. Twelve cards are dealt face down. One fraction and an operator appear at the bottom of the screen. You draw one of the 12 cards to select the last element of the problem. Now all that remains is to enter the answer . . .

"Hold it right there, Pilgrim. This here's a card game. Ya gotta ante up sometime." Wagers make the game more interesting. Bet 0 if you don't think you can figure it out, or sweeten the pot with part or all of score you have accrued, if you're confident you can complete your problem correctly, because winning wagers are added to boost total scores.

All answers must be reduced to the lowest common denominator in the case of proper fractions and mixed numbers or written as whole numbers.

Three games challenge those who enter the Fun House; all three must be completed to receive a final Fun House score.

Magic Laser asks you to tell whether two numbers are fractional equivalents or to compare the part and the whole

MathTalk Fractions

System: Atari ST

Required equipment: Color monitor

Copy protection: Yes

Summary: Speech synthesis and a variety of tasks keep fraction practice interesting

Price: $49.95

Manufacturer:
First Byte
3333 E. Spring, Ste. 302
Long Beach, CA 90806
(800) 245-4525
(213) 595-7006

and enter the answer that best describes the relationship displayed. Bonus points are achieved by coloring in objects to match a given fraction.

The midway game, Popper, bursts into decimal, fraction, and percentage problems. How many balloons will you attempt to pop? With each correct solution, another balloon bites the dust.

In Coin Drop, you must estimate the number of times heads or tails will come up and convert your answers to fractions and percents.

In Team Challenge, you compete against three of six possible players. When you select Tell Me About Them, you hear a description of each player's skill and experience. You can choose to play against a top notch, average, or easy-to-beat math student while the Professor emcees.

In the manual, you find a glossary of words to remember; instructions for converting back and forth between fractions, decimals, and percents; and other helpful hints to help you deal with the problems at hand.
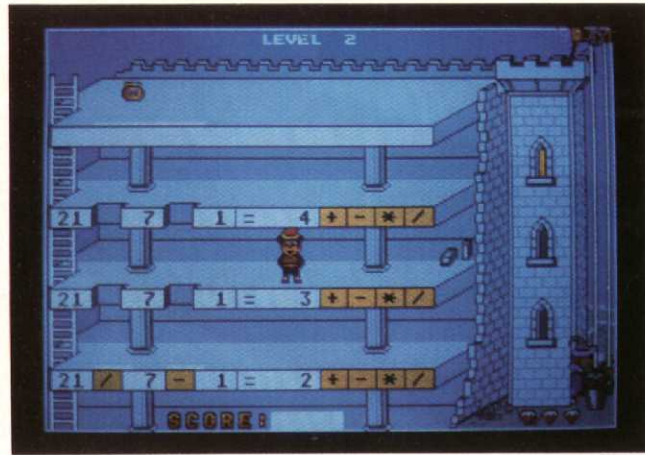
Magical Math III

System: Atari ST

Required equipment: None

Copy protection: None

Summary: Bentley Bear races against time to solve fraction problems

Price: $29.95

Manufacturer:
Atari Corp.
P.O. Box 61657
Sunnyvale, CA 84088
(408) 745-2000

Equation Builder

System: Atari ST

Required equipment: None

Copy protection: None

Summary: Bentley Bear completes the castle floor by supplying missing numbers and operators

Price: $29.95

Manufacturer:
Atari Corp.
P.O. Box 61657
Sunnyvale, CA 84088
(408) 745-2000

Magical Math III

In *Magical Math III* for the ST your task is to help Bentley Bear with his fractions before lazy Freddie Bee awakens. (See the September/October 1987 issue of *Atari Explorer* for reviews of *Magical Math I* and *II*.)

You can choose simple equations with common denominators or harder ones that require you to find the common denominator. And you can practice addition, subtraction, multiplication, division, or all four. You must also decide how much time you want to give yourself to accomplish these tasks.

You control Bentley with the mouse, as he runs back and forth along the numbered cells of a honeycomb at the bottom of the screen, seeking correct numerators and denominators. Meanwhile, the weight on the cuckoo clock in the background inches toward the head of the sleeping Freddie. If the weight gets to the bottom before Bentley solves the problem, it bops the lazy Freddie, who makes a bee line for the honey Bentley has been collecting for himself.

The Queen Bee, who sits in the center of the screen watches Bentley's every move. Wrong answers elicit a regal shake of her head, but you can use any time remaining to try another answer.

Success is sweet. A trumpeter bee sounds a fanfare as Professor Bee dips honey into Bentley's huge pot. The correct answer is displayed, whether or not you find it for yourself.

A sergeant-at-arms bee displays the current level and score. All of our young testers enjoyed this program and said that they would be happy to play the game over and over again. Bentley was such a good tutor that they wanted to take him home with them.

The manual tells teachers and parents that they can use any word processor or text editor to adjust speed and add questions. We suggest that you limit your changes to backup copies until you are sure you know what you are doing. Our first attempts bombed.

Equation Builder

In *Equation Builder* for the ST, Bentley Bear has quite a job finishing the floors of his castle. He needs help, or the witch will steal three jewels from his yard and make off with his honey.

Even kids new to the mouse were able to operate it well enough to move Bentley and help him place his building blocks.

As the game begins, you select either addition and subtraction or addition, subtraction, multiplication, and division. You then help Bentley choose the mathematical sign that makes each finished equation correct.

The manual states, "in problems that include multiplication and division, the order of operations for the equation, from left to right, is multiplication and then division, followed by addition and

then subtraction."

It is fine for the program developers to create such a arbitrary rule, but we all know that mathematics in the real world doesn't work this way. When we tested the program, it was hard to keep this artificial dictum in mind, and we think that there are enough rules for a kid to remember in math without confusing him with one that applies only to one piece of software. Fortunately, this irritating rule did not come into play very often in our testing.

One other disturbing thing we noted was that some of our playtesters liked watching the witch steal the jewels and honey. The result of answering correctly—another level to conquer—was nowhere near as rewarding as the result of answering incorrectly.

All things considered, however, it appears that the time kids spend building with Bentley will give them a firm foundation in arithmetic skills that will stand them in good stead as they build their own personal dream castles later in life.

Space Math

System: Atari ST

Required equipment: Color monitor

Copy protection: None

Summary: Challenging arcade game motivates arithmetic practice

Price: $14.95

Manufacturer:
IntraCorp.
14160 S.W. 139th Ct.
Miami, FL 33186
(800) 468-7226

Space Math

Reviewed previously in the November/December 1988 issue of *Atari Explorer*, *Space Math* for the ST is good enough and different enough to warrant another mention.

Space Math is a lander game with arcade-quality graphics and all the expected action. *But*, the design of the game is complex enough—with eight levels and 27 difficulty settings—to make it challenging for everyone over the age of 8. Even adults who want to brush up on their skills won't have time to be bored.

You must quickly complete math problems to collect fuel, move left or right, and provide upward thrust to land the craft safely.

It might have improved the program if the designers had grouped like skills of addition and subtraction in one mode and multiplication and division in another. As it stands, you must choose all operations or only one at a time.

Consider buying this program even for kids who don't need a lot of help with their math skills; it is worth a great deal more than the suggested retail price of $14.95. ∎

Boobytrap (Neo) by Alfredo Hidalgo, Socorro, TX.

Graphics Gallery

Butterfish Reef (Seurat) by Margaret Gunn, Atwater, CA.

Kanawha City (Neo) by Christopher David, Pacifica, CA.

With the coming of warm weather, readers must be abandoning their computers for the out of doors; we have had fewer than the usual number of entries for Graphics Gallery entries this issue. Balancing our dismay at the drop was our pleasure in receiving several images done in *Easy-Draw*, a new medium for Graphics Gallery images.

You may use any package you wish to create your images for Graphics Gallery. However, we must ask you to submit entries only in *NeoChrome*, *Degas* or *Tiny* format. Also, we ask you *not* to submit disks full of five or ten images; *you* should make the initial cut down to your one or two best ones.

We invite you to enter our ongoing contest, but *please abide by the rules*.

•Submit your image on disk in *NeoChrome*, *Degas* or *Tiny* format. Print your name and address on the disk.

•Include a self-addressed, stamped envelope (# 10 size) with 45 cents postage for the return of your disk. We will return your disk with *ten new images*.

•Include on an $8\frac{1}{2} \times 11''$ sheet of paper your name and address, the file name of your image, and the following statement: "I certify that the image submitted is my own personal work and that no portion was copied from any image belonging to another person or organization or from copyrighted printed or video material. I give *Atari Explorer* the right to print it, use it in promotional material, or distribute it via telecommunications service, BBS, or disk.

•Winners will receive a subscription to *Atari Explorer*. If you are already a subscriber, include an address label or copy so we can extend the correct subscription if you win.

By DAVID H. AHL
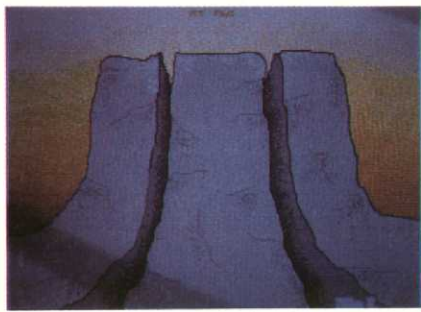
Fuji Mountain (Degas) by John Evans, Nurenberg, Germany.
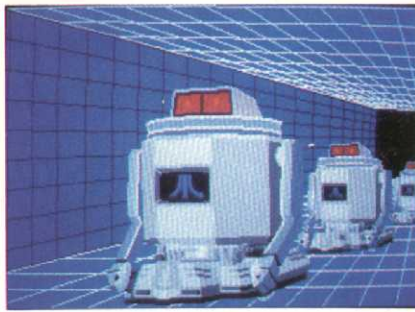
Robots (Neo) by Vin Newtguy, Los Angeles, CA.

Drumset (Degas) by Rob Mitchell, Seattle, WA.

Cheval (Degas) by Genevieve Cadieux (age 10), St. Mathias, Quebec.

Starfish (Easy-Draw) by Mel Motogawa, Watsonville, CA.

Super JX (Neo) by Keith Meiere, Indianapolis, IN.
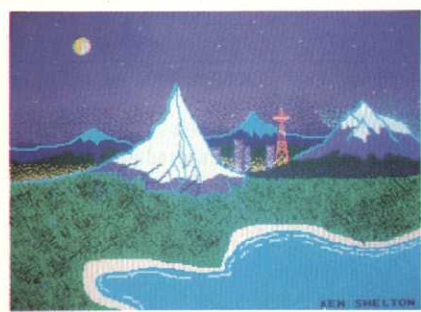
Skylight (Neo) by Ken Shelton, Moses Lake, WA.

Simone (Neo) by James Dupree, Jr., Baltimore, MD.
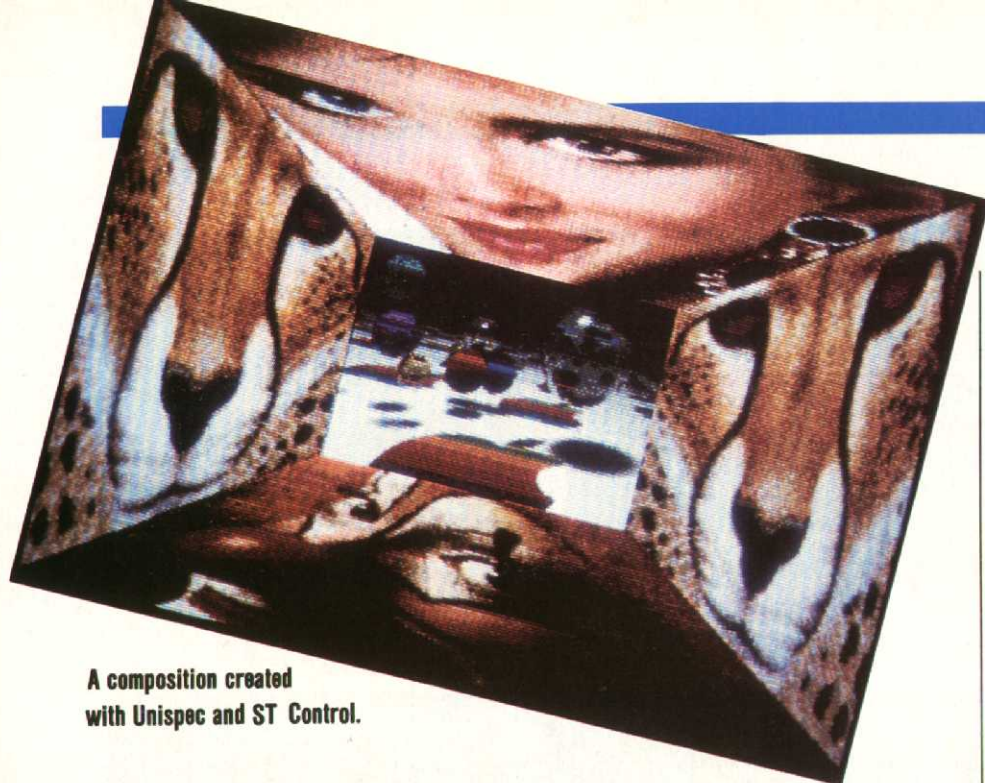
A composition created with Unispec and ST Control.

Unispec

Trio Engineering improves upon its own masterpiece

Until recently, *Spectrum 512* was the paint program that offered Atari ST users the most features and flexibility. Now, however, Trio Engineering has gone its own fine product one better with *Unispec*, an add-on to *Spectrum 512* that makes an excellent program even better.

Perhaps the most useful thing *Unispec* does is allow you to turn your copy of *Spectrum 512* into an easy-to-access desk accessory. This is accomplished by running UNISPEC.PRG as described in the documentation. The process takes only a few minutes and leaves you with a file called UNISPEC.ACC on your disk.

From then on, each time you boot your computer, *Unispec* loads automatically and prompts you to enter a memory allocation for its picture buffers. (The manual includes a chart that tells you which values should be used with which applications.)

That done, the screen goes blank for a few seconds. The familiar *Spectrum* title screen then appears briefly, and a second or so later, you find yourself on the ST desktop. *Unispec* is installed and easily accessed from any program via GEM.

New Features

To enter *Unispec* from any application, you have only to move the mouse pointer to the Desk menu and choose one of the five options offered there.

You choose an option based on what you want to bring into *Unispec* from the other application you are running.

For example, the Spec option takes you right to the *Unispec* title screen without carrying along any graphic baggage from your main program. The b-s (block-to-screen) option transfers a block you specify to the *Unispec* screen. The b-b (block-to-buffer) option transfers a block to the *Unispec* buffer. The s-s (screen-to-screen) option transfers a full screen to the main screen of *Unispec*, and p-p (palette-to-palette) transfers a 4- or 16-color palette to the *Unispec* custom palette.

If you choose to run *Unispec* as a stand-alone paint program, you will no-

tice many new features on the menu. These include Line Cache, a Snap function, Dithered Blur, a Rotate command, and a built-in 16-color converter.

We found the new Dithered Blur to be a great improvement over the original Blur function found in *Spectrum 512*. Dithering softens the look of an image by interlacing pixel patterns in two or more colors. With the old function, the effect was good, unless you set the level of blur a little higher than normal, which resulted in the appearance of bands of color on your image. With Dithered Blur, the colors blend well and have less tendency to separate.

Block Functions

Unispec offers some great additions to the block functions found in *Spectrum*. Just the fact that the new program offers the ability to capture all or part of an image and store it in a buffer screen is worth getting excited about. But there is more.

With the original program, you could use block functions to resize or distort an image and then paste it wherever you wanted it on your picture. Now, improvements include dithered resizing, the ability to add, subtract, and average pixel values in different blocks, and the ability to rotate images in 90-degree increments.

Dithered resizing allows you to impose dithering on any block that you resize.

In Add mode, the red, green, and blue (RGB) values of the block or *source* pixel are added to the RGB values of the screen or *destination* pixel. Subtract subtracts the source values from the destination values, and Average adds the values and then divides by 2 to yield a pixel value that is an average of the destination and source.

By ROB AND TOM MITCHELL

A catalog of pictures prepared with Unispec.
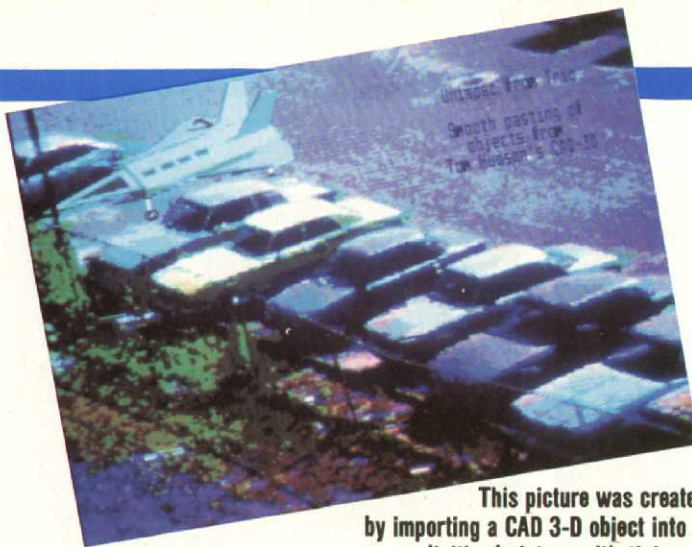
This picture was created by importing a CAD 3-D object into a digitized picture with Unispec.

Red Planet: an example of the effect created by dithered blur.

This image was enhanced by using the anti-aliased cut and paste feature of Unispec.

Unispec

System: Atari ST

Version reviewed: 1.11

Required equipment: Color monitor; Spectrum 512

Copy protection: None

Summary: A beautifully-implemented collection of graphics functions improves the utility and flexibility of Spectrum 512

Price: $49.95

Manufacturer:
Trio Engineering
P.O. Box 332
Swampscott, MA 01907
(617) 964-1673

The full spectrum, 512-color palette converted to 16 colors by the Unispec 16-color converter.

Line Cache

The new Line Cache is a storage area in memory for "no-zag" lines. *Unispec* will redraw previously-drawn no-zag lines at the touch of a button. The only limitation of this feature is the number of corner points along the lines you have drawn; the maximum number of points the cache can contain is 500.

The manual describes an "anti-aliased lasso cut-and-paste" technique that takes advantage of the Line Cache to eliminate jaggies associated with cut-and-pasting. The technique is difficult to master, but the effects you can create with it are definitely worth the effort.

16-Color Conversion

With *Spectrum 512*, you could convert your 512-color masterpieces into 16-color images for use in programs such as *Cyber Paint*, but you had to quit the program and load in a separate conversion program to do it. And, you had to have saved your work in uncompressed format for the conversion to work.

Unispec has a built-in 16-color converter that works much better than its predecessor and offers some nice additional options. To access the converter, you simply click the right mouse button on Quit. A dialog box appears, offering three options—Exit, Palette, and Screen.

Selecting Screen leads to the Palette dialog box, which asks you to choose New, Custom, or Current. Current invites *Unispec* to do its best to interpret your 512-color picture using the current 16-color palette. Custom invokes the same conversion, substituting the *Unispec* custom palette for the current palette of the main program. New gives *Unispec* free reign, allowing it to create the 16-color palette best suited to the image you are converting.

The new converter has an adjustable dithering function, which can be used to give the illusion of more colors in an

The main Spectrum menus.

The Unispec magnify window.

image. Dithering is not a panacea, however; you will still find that not all of your pictures convert well, but dithering really helps.

We converted a few pictures that we thought might present problems and were surprised by how well they turned out. In fact, our local Atari dealer was stunned when he discovered that he was looking at only 16 colors.

Using Unispec as an Accessory

To run another application in tandem with *Unispec*, you need at least 1Mb of RAM. The manual says that *Unispec* will work "perfectly" as a stand-alone program on a 520ST. We tried it, and everything does work—except the anti-aliasing functions. These are among the best features in the program, and it is a real shame that they must lie dormant

some no-zag lines, edit the color, and save it to disk—all without rebooting!

When you have the picture in finished form, you can use the 16-color converter to change it back to a *Neo-Chrome* or *Degas* format image and return it to *Cyber Paint*, load it back into the picture buffer of *CAD 3D*, or just save it to disk.

Obviously, this is much faster than quitting and rebooting between changes. And for lengthy animations, it is the only way to achieve effects, such as dithered blur and gradient fill, that other programs just don't offer.

Documentation

The 94-page typeset user manual, written by Darrel Anderson, is not as easy to follow as the manual provided with *Spectrum 512*, but it is reasonably

scribed for each feature.

The Tips/Techniques section of the manual contains some interesting suggestions; we tried some of them and got great results. We would like to see more of these tips from Anderson, who has some excellent artwork to his credit.

Conclusion

The remaining useful features of *Unispec* are too numerous to describe in detail here. Suffice it to say that features such as Auto Palette Interleave (for Edit Color functions), Value-Based Color Change (an alternative to 16-color conversion), and the 512-color animator (creates Delta sequences) will make your graphics chores much easier.

The program does more than most of us ever thought possible. It is so good, in fact, that it whets your appetite for more. We hesitate even to make suggestions, for fear of seeming greedy, but one improvement we would like to see in the next version is the ability to rotate blocks in increments of 1 degree. Another is the ability to view the colors used in a custom palette arrayed in order from light to dark. And a magnify window in the buffer would offer even greater precision in drawing.

If you want to do long 512-color animations, you should consider purchasing *ST Control*, another program from Trio Engineering, which can automate any series of mouse or keyboard operations (see the review of *ST Control* in the March/April 1989 issue of *Atari Explorer*).

If you are looking for a feature-laden paint program that includes anti-aliasing, animation capabilities, and excellent block functions, the *Spectrum 512/Unispec* combination is the best bet for you and your ST.

until the 520 owner upgrades to a meg.

If you have that meg of memory, you will find *Unispec* easily accessible from any application you care to run. If you are in *CAD 3D*, for example, you can access *Unispec* via the GEM menu bar. From non-GEM programs such as *Cyber Paint*, you access it by holding the Control key while selecting SAVE (or whatever calls up the file selector). You can then move your image or any part of it into *Unispec*, touch it up with

comprehensive.

Unfortunately, there is not one screen illustration in the entire booklet. This is a far-from-insurmountable obstacle, but the omission of graphics in the description of a graphics program seems almost ludicrous.

We would also like to see additional examples in the discussions of some of the more esoteric features, such as Line Cache. The examples given are good, but rarely is more than one use de-

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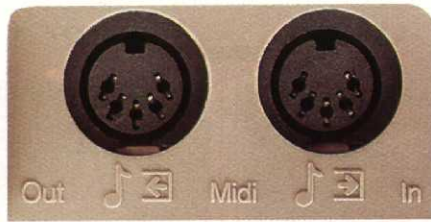
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Here's what we mean.

MIDI. The Key to Electronic Music.

As you may already know, the MIDI interface is the key to electronic music.

If you're unfortunate enough to not be working with an Atari, you'll have to buy an interface separately.

And make sure it's compatible with the rest of your equipment, not to mention your software.

And then you'll have to make sure everything is installed correctly.

What's that like?

You know the song, "What are you doing for the rest of your life?"

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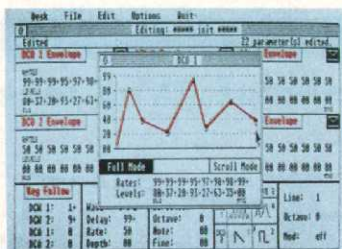
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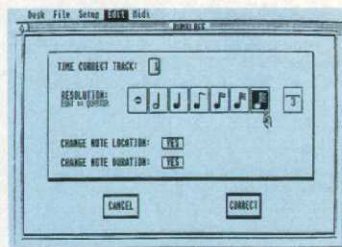
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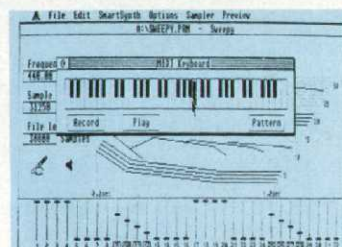
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No other computer company has made the commitment to music and musicians the way Atari has.

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We're working in harmony with all the major music software houses to produce the software you want to make music with.

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Like our MEGA File 20™ 20-megabyte hard disk for storing your magnum opus.

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Clipping — 44Mb storage:

44Mb of Removable Storage For Atari ST Computers

SPECIAL REPORT

Expanding the Megafile line of ST-compatible hard disk drives, Atari announced the Megafile 44—a removable-media hard disk drive based on the Syquest technology licensed for use with the PC4 AT-compatible (see above). The removable-media system offers the advantages of a fixed disk in terms of access speed and storage volume, while eliminating the problem of transporting data between worksites; the user has only to pop the disk out of the drive and either mail or carry it to its destination.

Watch upcoming issues of *Atari Explorer* for reviews of these exciting new products!

Clipping — Stacy laptop:

ST-Compatible Laptop Stretches Technology

Atari Debuts The Stacy, ... MR RAM

of the ST monochrome monitor. To per-... use of graphic and window-... "pro-management ... has underwritten its first punch-bond of-...

Clipping — PC4:

EW PC4 OFFERS M PC-AT POWER HOUT THE PRICE

urprise move calculated to he heart of the PC-compatible tari has announced the PC4 T-compatible desktop sys-on the Intel 80286 chip run-Mhz and sporting a full me-RAM, the Atari PC4 is nning all MS-DOS appli-also optimally configured S/2—IBM's new multi-nment, which features a aphics interface called anager.

odels feature a single ppy drive capable of d writing to disks in 60K) and "quad-den-e lower-priced of the so features a 60Mb

sers, an alternative tures Atari's new edia drive. The new ys technology b:

censed from Syquest, stores data on self-sealed magnetic disk cartridges ap-proximately the size of a compact audio disk. The cartridges, which retail for about $150 each, are said to be so dura-ble that they can stand up to mailing.

Clipping — Portfolio:

First Handheld PC-Compatible

tari has released e-esign specifications for najor MS-DOS software s and expects many stan-applications to be released his format.

eantime, a British firm, Dis-Information Processing, has a suite of ROM-based appli-hat will be distributed with the o. These include a spreadsheet reads and writes Lotus v1.0-and ormat wks and wk: files), a word essing program, an agenda manag-a calculator, and communications

software. The basic operating environ-ment of the Portfolio incorporates a clipboard feature that permits easy ex-change of information between these and future applications.

Standard serial and parallel ports can be added to the Portfolio via snap-in modules. In addition, Atari expects release a smart extension cable that w give the Portfolio access to devices stalled on the bus of a standard PC compatible. A PC-compatible st alone RAM-card drive will also be fered to ease the task of inform transfer between the Portfolio and

Additional featu dard PC bus, RS-23 printer ports, and graphics. The PC4 ment in May. With disk, the computer

Photograph by Jeff MacWright

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tari Corp. stunned the Spring Comdex audience recently with announcements of significant enhancements to its flagship ST personal computer line and the launch of a new line of products that should have a major impact on the IBM-compatible market.

Stacy—Finally a Portable ST!

To some seasoned Atari-watchers, the most exciting event of the show was the first formal showing of the long-promised laptop ST, the Stacy. Weighing in at just 15 pounds, the new machine offers all the power of an Atari 1040ST in a portable package.

Stacy is based on the Motorola 68000 microprocessor, running at 8 Mhz. The new computer runs TOS version 1.4—the newest version—and, like other machines in the Atari ST line, supports the GEM operating system and graphic environment. A full megabyte of RAM gives Stacy the power to run sophisticated applications on the road.

For good visibility, the laptop features a backlit "supertwist" LCD screen with resolution identical to that of the ST monochrome monitor. To permit the use of graphic and window-based applications even where there is insufficient desk or lap surface to operate the mouse, the sleek Stacy keyboard sports a two-button track-ball.

Like a 1040ST, the standard Stacy comes equipped with one double-sided 3½″ disk drive. An alternative configuration adds a 20Mb internal hard disk for power computing on the road. Stacy offers all the standard ports found on the full-size ST (RS-232 serial, parallel, external DMA, external floppy, moni-

Announces New Products

The Stacy is a laptop version of the 1040 ST.

tor, mouse, joystick, and MIDI In/ Out), so it can be used with a standard mouse, external RGB color or monochrome monitor, and other non-portable peripherals as the centerpiece of a powerful office or home computing system.

The Stacy is the first popular-priced portable computer to come with its own, native window-based operating system. Because GEM is so easy to learn and use, the portable ST will doubtless appeal strongly to traveling executives and salespeople who have been frightened off portable computing by the more primitive MS-DOS machines that dominate this quarter.

The Stacy is also expected to become standard equipment in several vertical markets where portability and full ST-compatibility are required—particularly the music market, where touring professionals have long awaited a road-ready equivalent of studio systems

based around desktop ST and Mega machines.

Stacy will begin shipping in August to select Atari dealers worldwide. In its one-floppy version, the machine is expected to list for a surprisingly affordable $1495; $1995 with 20Mb fixed disk.

PC4—Putting the AT in Atari

In a surprise move calculated to strike at the heart of the PC-compatible market, Atari has announced the PC4, an IBM AT-compatible desktop system. Based on the Intel 80286 chip running at 12 Mhz and sporting a full megabyte of RAM, the Atari PC4 is capable of running all MS-DOS applications. It is also optimally configured for running OS/2—IBM's new multitasking environment, which features a GEM-like graphics interface called Presentation Manager.

All PC4 models feature a single 1.2Mb 5¼" floppy drive capable of reading from and writing to disks in IBM standard (360K) and "quad-density" formats. The lower-priced of the two PC4 models also features a 60Mb internal hard disk.

For true power users, an alternative configuration features Atari's new 44Mb removable-media drive. The new drive, which employs technology licensed from Syquest, stores data on self-sealed magnetic disk cartridges approximately the size of a compact audio disk. The cartridges, which retail for about $150 each, are said to be so durable that they can stand up to mailing.

The PC4 is an IBM AT-compatible desktop system.

Additional features include a standard PC bus, RS-232 serial and parallel printer ports, and EGA-compatible graphics. The PC4 was slated for shipment in May. With 60Mb internal fixed disk, the computer lists for $2295; with 44Mb removable-media drive, for $2495.

The Portfolio

Even given their tradition of offering the most advanced technology for the lowest possible price, Atari's second PC-compatible product announcement was a stunner: a handheld PC set to retail for an amazing $399.

The portable, dubbed Portfolio, incorporates a small, but easy-to-type-on, full-travel QWERTY keyboard and a 40-character by 8-line LCD screen. MS-DOS version 2.11, the most widely-implemented version of Microsoft's PC operating system, is burned into ROM, leaving 128K of standard RAM (ex-

By JOHN JAINSCHIGG

The Portfolio is an MS-DOS-compatible hand-held.

pandable to 640K in 128K increments) fully available to applications software. The machine runs for about 48 hours—equivalent to six to eight weeks of normal use—on three AA batteries.

About the size of a VHS cassette and weighing about 1 lb., the pocket-sized portable obviously doesn't include a disk drive. Instead, the system is designed to accept applications in the form of ROM cards that can hold up to 4Mb of information and write data files to RAM cards. Atari has released e-

quipment and design specifications for these cards to major MS-DOS software manufacturers and expects many standard PC applications to be released shortly in this format.

In the meantime, a British firm, Distributed Information Processing, has designed a suite of ROM-based applications that will be distributed with the Portfolio. These include a spreadsheet (which reads and writes Lotus v1.0- and v2.0-format WKS and WK1 files), a word processing program, an agenda manager, a calculator, and communications software. The basic operating environment of the Portfolio incorporates a clipboard feature that permits easy exchange of information between these and future applications.

Standard serial and parallel ports can be added to the Portfolio via snap-in modules. In addition, Atari expects to release a smart extension cable that will give the Portfolio access to devices installed on the bus of a standard PC or compatible. A PC-compatible standalone RAM-card drive will also be offered to ease the task of information transfer between the Portfolio and desktop PCs.

Megafile 44

Expanding the Megafile line of ST-compatible hard disk drives, Atari announced the Megafile 44—a removable-media hard disk drive based on the Syquest technology licensed for use with the PC4 AT-compatible (see above). The removable-media system offers the advantages of a fixed disk in terms of access speed and storage volume, while eliminating the problem of transporting data between worksites; the user has only to pop the disk out of the drive and either mail or carry it to its destination.

Watch upcoming issues of *Atari Explorer* for reviews of these exciting new products! ∎

A New Voice For Atari

Mike Pinder talks
about music, computers, and
the evolution of the human spirit

Michael Pinder is not your typical rock star. As a founding member of The Moody Blues, he and his musical arrangements played a major part in defining the group's trademark sound: a combination of musical sophistication and intelligent lyrics that produced many hits, including the classic "Nights in White Satin."

Michael's unique vision extends beyond music to the world of computers, and his interest in Atari computers has sparked a growing involvement in various Atari projects, including commercials and appearances at shows such as NAAE and the recent World of Atari show in Anaheim, CA. During that show, we had a chance to talk with Michael about computers, life on the road, and human evolution . . .

Atari Explorer: It looks as though 1989 is the year for Atari to make a major move in the American market. Part of this effort includes a number of commercials aimed at letting people know about Atari. I understand that you were involved in producing them.

Michael Pinder: Yes, we have worked on three Atari TV commercials during the past few months. I did the music and voice-overs for all three, using Atari computers and the C-Lab Notator for sequencing with a SMPTE lock to tape. I then edited the visuals at a post-production facility in Sacramento.

One is a 60-second spot on desktop publishing and another is a 30-second one that deals with musicians and the Atari. I am also working with Frank Foster on a "Musicians and the Atari" video, which should run about 35 minutes and will encompass the whole music/MIDI spectrum. It will include interviews with many famous musicians, including Mick Fleetwood, Jimmy Hotz, and Dave Grusin (who recently

"Atari is bringing power to the people in a different way. I'm very enthusiastic about that.*" — Mike Pinder*

By MIHAI MANOLIU

Special Section
Atari Music

won the Oscar for Best Score for his work on "The Milagro Beanfield War").

We are currently compiling and editing, and will eventually be showing the video through user groups. There is no question that Atari is now gearing up for a major push in the U.S. market.

AE: Are you working on a new album?

MP: I'm always working on new material. I have a studio at home, with a lot of material in the can, and if it all clicks

which was an analog sampler [the Mellotron was a keyboard instrument that used sound samples recorded on magnetic tape]. In fact, I am currently sampling the original Mellotron sounds.

Now I use the Roland SD30 and Casio's FZ-1 and FZ-10, which I really like—they have a nice, crisp sound. It's all a lot of fun; computers and samplers just came as a natural progression for me. Way back in 1977 or '78 I became aware of computers and learned as

Atari is bringing power to the people in a different way. I'm very enthusiastic about that. My kids have a 1040ST on which they run GFA Basic, game design software, and some nice music education stuff. And we recently got *Phasar*, Antic's financial program, so we're pretty much an all-around Atari family.

AE: How would you describe your role with Atari?

MP: I guess you could call me the voice of Atari. I did the commercials, and I'll probably do some radio. I'm also hosting some of the concerts and shows. I'll probably do more of these World of Atari and NAAE shows (I did the last two). I've done a lot of Atari shows, actually; we started with the first one in Glendale about four years ago.

I have a good working relationship with all the people at Atari, from the guys in the shipping department to the Tramiel brothers. I try to touch base with everyone there; the relationship is ever-growing. It's fun, and I like a lot of the people I'm working with. To me, human relationships are the bottom line.

"Like great music and great art, great technology seems to come from some eternal source."

I'll put an album out. But it doesn't concern me too much. I've adjusted my lifestyle to the way I want it. I'm not going to fall all over myself to do an album or knuckle under to some of the ridiculous pressures that exist in various record companies and the whole media-market. I don't particularly want to be hassled by that.

Working with Atari has filled my schedule comfortably. It leaves me enough time to spend with both my music and my family. I've spent too many years on the road.

AE: Are you still going on the road?

MP: No, I actually gave that up about 15 years ago. Having done nearly 20 years on the road, I didn't want to continue in that path. Once you've done something over and over again, it ceases to be a challenge. And I wanted life to be a challenge.

I'm very happy with the way everything turned out for me. I took the bull by the horns and decided I didn't want to do the Moodys thing anymore, and I've been very happy with that decision.

AE: When you started out with the Moody Blues and with music in general, did you know that was what you wanted to be?

MP: Oh yeah. By the time I was 12, I wanted to be a musician.

AE: When did computers first start to be important in your life?

MP: I first got into the Atari 8-bit in 1980 or '81; I was intrigued by it. Then came the samplers, which were very interesting to me, because, for many years, I had been using the Mellotron,

much as I could about the technology and its possibilities. Here we are 12 years later, and everything that was promised back then has happened.

AE: I remember building a 16K Sinclair back in 1980 . . .

MP: The original Atari 800 had 16K and could be boosted all the way to 48K. Now we use that much for the desk accessories.

AE: What are some of the other uses you find for Atari computers?

MP: I use my Mega ST4 primarily for studio work—for MIDI and sampling. I have sampler editors, patch librarians, all that stuff. I have a 16-track ½" 30 ips recording system, which is sufficient, because with MIDI I only have to record vocals and acoustic guitar anyway, so there are more than enough tracks.

My sequencer of choice at this point is the C-Lab Notator; I'm waiting for version 2.1, which should iron out some of the small bugs. There are some other nice things coming out now, too—*Realtime* by Intelligent Music and the Steinberg software, for example. I'm also very pleased with my newest hardware acquisition, rack-mounted 120 Mb Astra hard drives.

My wife does desktop publishing for her business, and she has the whole package with the SLM804 Laser and the Timeworks program (we'll probably end up getting *Calamus*, as well). The $4000 that Atari charges for that whole system with 4Mb is what you might play for just a laser printer from other manufacturers (which is what the commercial is about). It's phenomenal, and it's one of the reasons I like Atari.

News From The World of Atari

Rock stars and hardware developers steal the show

The Disneyland Hotel in Anaheim, CA, seemed an appropriate venue for the World of Atari show, which featured "Beyond the Threshold," billed as a musical tour of today's new technology. This evening event was hosted by Michael Pinder (formerly of the Moody Blues) and included guest appearances by Sam Tramiel, Mick Fleetwood, Jimmy Hotz (inventor of the Hotz Translator), and other Atari-using musicians.

Speaking, rather than singing or playing, Sam Tramiel stressed that

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AE: Have you done any programming yourself?

MP: No, it's bad enough having to learn how to use new programs and systems. With the sampling and MIDI gear, each one is a computer within itself and that's a big enough challenge for me.

AE: What do you think all this equipment does for the actual process of creating music?

MP: I think it dulls the process, because we lack both a universal language and real compatibility. Many people get stuck in the grey areas, but I think that this is gradually improving.

AE: What are you looking forward to seeing in the music market?

MP: I'm very excited about the Hotz Box [the Hotz Translator is a new musical technology being introduced this year by Atari. See *Atari Explorer*, May/June 1989, p. 28]. I think it has tremendous potential. Everything that could be desired is actually coming about: the laptop ST, the Stacy, is finally here, and the new TT and the 286 are also very exciting.

One thing that is very important from the point of view of a professional musician is Atari's intention to market a "professional" version of the Stacy, which will go up to 4Mb. That means you will be able to take all of the powerful software you use with your full-blown Mega 4 studio system, load it into your Stacy Pro, and take it on the road. This and the new rack-mounted computers should be great news for musicians.

In general, however, the new announcements from Atari encompass the whole personal computing market; they are not leaving anyone out. It's just that for me, it's especially nice to see that they're paying attention to music and film, which is another growing market. The SMPTE lockup is fabulous—no problems implementing it.

AE: What are some of your thoughts on the larger issues of computer technology and its implications?

MP: I think that it's very interesting to look at the advent of the personal computer on the planet. Generally speaking, humanity has tended to look at itself very much from the natural point of view—as a species that has evolved from animals. That's one point of view which we have to keep in mind, but at the same time I see that through understanding how computers work and store information, we can now draw analogies between humans and machines that we couldn't 10 or 15 years ago.

For example, humans store tremendous amounts of information in very economical ways. It's possible that information such as character and personality could be stored, just like computer data, in some sub-directory of the subconscious mind/brain. At the total system crash (death), one might speculate that this information could be stored on some medium, transported to another place, updated to rev. 2, and rebooted into the 32-bit vehicle—the next generation of hardware. Maybe that's what Christ was talking about, and he showed us the 32-bit machine when he rose and showed himself to several hundred people.

It's a great way of being able to look at ourselves now. Man thinks he creates

Jazz musician Dave Grusin, far right, composed his Academy Award-winning musical score for "The Milagro Beanfield War" on an Atari ST. Shown here with Grusin are Lee Rittenour, left, and Don Grusin.

1989 is the year Atari plans to make the big move back to the American market and added that the Hotz Translator is slated to be a significant part of the company's marketing strategy.

Musical performances were provided by Jake Leder, guitarist with the fusion group Maze, and James Lee Stanley, who played selections from his recent album "Simpatico." The stage set included a large screen for projecting video images and graphics, which was used very effectively during Leder's guitar/MIDI compositions. It was also used to screen a clip from the movie "Colors," for which Atari was presented a gold record (an Atari was used to produce parts of the soundtrack). Another interesting clip showed Dave and Don Grusin using an ST in their studio (Dave Grusin won an Oscar for his soundtrack to the "Milagro Beanfield War").

Greg Whelchel and Mark Ritter (keyboard players for the Pointer Sisters Band) demonstrated how simple it is to piece together basic tracks using an ST running sequencing software. The show ended with a demonstration of the Hotz Translator, in which Jimmy Hotz and Mick Fleetwood invited members of the audience to participate. The purpose of the demo was to show that novice musicians and non-keyboard-players can play along with a complex musical piece like Holst's Jupiter Suite and sound okay.

Mike Pinder closed by saying that this evening reminded him of the introduction 22 years ago of the first Mellotron. The unique sound of the Mellotron, he noted, colored the music of a generation. In similar fashion, the Hotz Translator marks a watershed in the development of musical instrument technology.

Other products introduced at the show included Atari's Stacy laptop computer, Avant-Garde Systems' PC-Ditto II, David Small's Spectre GCR, and Imagen's *UltraScript ST*.

The ST-compatible laptop that was on display had a nice feel, with a solid keyboard and a surprisingly sharp screen. If, however, you are looking for IBM XT emulation, PC-Ditto II can deliver it as a hardware accessory with a Norton SI Rating three times that of the XT.

If you are looking for a Mac emulator, Small's Spectre GCR is the answer. This update to the Spectre 128 (see review elsewhere in this issue) can read and write Macintosh disks at very high speed, using standard Atari ST disk drives. Both of these emulators list for $299.95.

UltraScript ST provides PostScript emulation for the Atari SLM804 Laser, HP inkjet, and Epson-compatible dot matrix printers.

Also on display were two new programs from CodeHead—*HotWire Shell*, which sells for $39.95, and *MIDImax*, a real-time MIDI performance tool that sells for $49.95. Wuztek's Omnimon series Rainbow and GS graphics enhancements provide ST color using all three resolutions for $699 or greyscale multi-resolution for $349. And ArtisTech was showing *Da Vinci*, a powerful art/animation program priced at $99.95. ∎

things, but wisdom says that there is nothing really new under the sun. We're really just drawing from a spiritual realm of pre-existing paradigms.

I think mathematics is a spiritual concept, and the formation of crystals is a wonder of nature. That combination—the combination of logic and silicon—brought about the advent of the personal computer, so I see it as coming down from higher realms. Like great music and great art, great technology seems to come from some eternal source . . . as if it were poured out from some large vial by angels, if you like. It's a wonderful time for us to be living right now, and we're seeing something very positive coming out of new technology.

The space race and the weapons race are helping us indirectly to see ourselves in a new light. It's important to have a new viewpoint for understanding the possibility of life beyond this planet.

I'm not exactly sure where it's all going to lead, but I think that one of the most important things is that the computer is going to bring freedom to a lot of people—freedom to have time to think and grow. I've been very lucky in my life, because I've had time to think and study and develop by travelling around the world, seeing the human condition, and meeting thousands of people. And these are the things that are dear to me.

Technology can really help us; we have to get to the stage where physical labor is brought under control as well as all the other problems we suffer from, especially pollution in all its aspects. It is one of the keys to our freedom—freedom of mind will bring freedom to discover the truth, and if we discover the truth, it will set us free.

I'm excited about the world growing up and becoming whole, for the sake of the planet as well as the people . . .

(At this point strains of "Nights in White Satin" begin to float out of the concert hall where preparations are under way for the evening concert.)

AE: What a great song. Did you write the lyrics or the music?

MP: I did the musical arrangement, basically. That was in 1967, and it's still around, still standing up. The reason for that is the love we put into it and the love that we have. And love doesn't fade, even if it's on vinyl or CD. That moment in time, with all the feelings behind it . . . that's why people still come up to me and say, "I grew up with your music," "I got married to your music," whatever. That's the real payoff—that we touched people. ∎

Putting It All On Tape

The affordable home music studio: Part 1

With its built-in MIDI interface, the Atari ST is fast becoming the standard computer for music making, both in the commercial studio and at home. Professional and aspiring musicians, amateurs and hobbyists, even parents who want to bring the joys of music to their children in new and exciting ways, are all discovering that a kind of magic happens when you plug an ST into an inexpensive MIDI keyboard instrument. Software now exists for recording and sequencing MIDI input for playback, on-screen note entry and editing, music instruction . . . you name it.

Still, although the connection between your ST and a MIDI instrument is an important one, making it is only the first step toward realizing your full musical and creative potential. To go farther, you need access to studio tools: additional instrumentation, mixers, sound reinforcement and signal-processing apparatus, multi-track tape recorders, and the like.

Five years ago, before the microprocessor revolution, assembling these tools for private use was out of the question for all but the most accomplished and successful professionals. Nowadays, anyone with a yen to make a demo can assemble a workable, high-quality, modular, expandable home recording studio at very reasonable cost.

Why a Home Studio?

There are many good reasons for a musically-inclined Atari ST owner to explore the possibilities of setting up a home studio. The most important of these is that a home studio lets you hear your work in its totality. By making recording an integral part of the creative process, you can separate the arduous work of composition from the more pleasant task of listening to your own music in a critical and creative

By MIHAI MANOLIU

way. The result: better concentration, more rapid progress, and ultimately, better music.

Second, a MIDI studio/recording setup will let you exploit your musical talents to the utmost. Suppose you play several instruments and want to include them all in an arrangement, or want to dub in a voice track over a complex instrumental line? Multi-track recording makes this easy. Drum machines and other types of musical "robots," in combination with MIDI sequencing and instrument control can add that vital "third hand" to your ensemble, letting you experiment with new ideas before even committing to tape.

The new and surprisingly affordable MIDI guitar and wind controller interfaces can free you from the hegemony of the keyboard as the composer's most-used tool. And, through the miracle of micro-electronics, the advantages of professional sound reinforcement and signal processing can be put to work to make your music sound better than ever before. Polyphonic sound synthesis, CD-quality digital sampling, delay, reverb, compression, chorus, flanging, and numerous other effects are available in inexpensive and easy-to-use modules.

All this equipment speaks the same language—MIDI—saving you countless hours of frustration and allowing you to edit with precision and customize the technology to your personal style. And the best is yet to come; MIDI is just the first step in harnessing the musical power of the digital revolution. Advances like DAT machines, SMPTE code for locking music to video, and AI Expert systems will continue to expand the power of home studios to produce exceptional music.

And with the introduction of such impressive technology as the Hotz Translator, Atari is assuring that it will remain an undisputed leader in the music market. You can thus be certain that your machine will continue to be a well-supported dynamic entity, as will the studio you set up around it.

Making Choices

As any musician will tell you, buying equipment can be an expensive habit. With a little planning, however, the process of acquiring the components of a home studio can be gradual and painless.

The first step is to analyze the basic equipment found in modern studios (see Figure 1). Of primary importance is some sort of storage medium on which

Equipment	Beginner	Intermediate	Professional
Software	$0-150	$100-400	$250-1,000
Master MIDI Controller	200-1,000	500-1,200	500-2,500
Drum Machine	100-500	250-800	450-900
Processing (reverb, etc.)	200-450	300-800	450-900
Mixer	25-200	100-800	350-1,000
Multi-track Recorder	200-450	350-600	450-1,500
MIDI Switcher	30-80	30-150	30-400
Extra MIDI Sound Module	200-500	200-1,000	200-1,500
Other (mikes, cables, etc.)	50-500	150-800	500-2,000
Total	$1,005-3,730	$1,980-4,600	$3,230-10,000

The Cost of a Home Studio. As can be seen here, there is a great deal of overlap between a beginner's and a professional musician's home studio. With careful planning and selection you should be able to achieve both quality and versatility, no matter what your budget.

to record musical information. This could be a multi-track tape recorder, a multi-track MIDI sequencer (either software or hardware based) or a DAT (Digital Audio Tape) recorder, or a plain cassette recorder. A typical studio uses a combination of the above.

The most important thing to decide is what kind of editing abilities you need. The greatest flexibility is provided by a software-based sequencer used in conjunction with a multi-track recorder, the tracks of which are, in turn, mixed down to stereo onto Digital Audio Tape. Good sequencing software allows a virtually unlimited number of separate tracks and very precise editing of MIDI notes and control functions, while the multi-track tape makes it possible to record vocals and other instruments, then add volume, stereo separation, and equalization for separate tracks as the mix is being recorded onto the master (the finished product).

Digital Audio Tape, while still rather expensive (Casio introduced a unit at the January National Association of Music Merchants Show that will list at a low $1495) is quickly becoming the ultimate medium for master recording. DAT recordings can be copied repeatedly and played without signal degradation.

Another very high quality recording medium is provided by VHS and Beta hi-fi video recorders used in conjunction with a pulse-code modulation (PCM) encoding device. The full half-inch width of the videotape is used by the encoder to store digital information. A VCR can also be used to record music in analog form. Just take the stereo Out lines from your multi-track and plug them directly into Audio In on your VCR. You will be rewarded with a

crisp, very dynamic sound with negligible wow, flutter, and distortion and a high signal-to-noise ratio.

Even a stereo cassette recorder/player can be used effectively in a home studio setting, although it tends to emphasize high frequencies. Use metal tape, try noise reduction (DBX or Dolby C), and record "hot" (set the recording level so that it hovers just below the peak line on the VU meter).

Choosing a Sequencer

Let's begin to assemble our affordable home studio by choosing the brains behind the Atari workhorse—a MIDI sequence program. A sequencer is like a multi-track tape recorder, but instead of recording sound, it records the MIDI note and control data sent out when you play a MIDI instrument. Sequences of MIDI events can be edited (either as raw data or—in some more advanced products—in conventional sheet-music form), saved on disk, linked to and mixed together with other sequences, automatically sped up or slowed down, time-corrected (quantized), transposed, and finally played back, causing your MIDI instruments to play the corrected sequences under remote control.

Buying a sequencing program requires some serious thought and, if at all possible, some hands-on comparison shopping. A good place to start is by reading software reviews of the most popular sequencers on the market (see the next issue of *Atari Explorer* for a review of two excellent packages, *Realtime* by Intelligent Music and *Master Tracks Pro* by Passport). Dr. T's MPE (Multi-Program Environment) offers many options, including the very competitive *Level II KCS*, while packages made by Hybrid Arts, Sonus, and Stein-

Figure 1. A typical wiring diagram for a high-quality home studio set up for recording multiple parts together on each of the multi-track channels, then mixing them onto one of the mix-down decks. Notice effects sends on both the mixer and recorder and the use of MIDI Through to chain MIDI devices.

Diagram labels:

- (4) DRUM MACHINE
- (7) MIDI THROUGH BOX OR SWITCHER
- SYNTHESIZER — AUDIO OUT
- (8) MODULES
- SOUND PROCESSING
- (6) REVERB — IN / OUT
- DELAY/CHORUS FLANGING — IN / OUT
- NOISE GATE — COMPRESSOR — IN / OUT
- GUITAR EFFECTS DISTORTION, WAH... — IN / OUT
- (1) SOFTWARE: SEQUENCERS, PATCH EDITORS/LIBRARIANS, NOTATION, SAMPLE EDITING, EDUCATION
- ST/MEGA COMPUTER
- PRINTER
- SAMPLER — AUDIO OUT
- (2) MASTER KEYBOARD — AUDIO OUT
- (3) GUITAR CONTROLLER — AUDIO OUT
- RECORDING ACCESSORIES: MIKES, STANDS, ETC.
- (9) MULTI-TRACK RECORDER — SND EFFECTS RCV / INPUT CHANNELS / STEREO OUT
- (13) MIDI AUTOMATED MIX CONTROL
- (5) MIXER 4 - 24 CHANNELS — AUDIO OUT / SND EFFECTS RCV / AUDIO IN
- INSTRUMENTS: ACOUSTIC GUITAR, BASS, DRUMS, PERCUSSION
- (10)
- (12) AMPLIFIER PARAMETRIC EQUALIZER — IN / SP / IN / OUT
- MIX-DOWN DECKS — OUT
- CASSETTE DECK
- HI-FI VIDEO
- DIGITAL AUDIO TAPE — IN
- (11)
- (13) L / R — MONITOR SPEAKERS

Legend:
- MIDI CONNECTIONS ———
- MIDI IN ▶
- MIDI OUT ◁
- MIDI THROUGH ○
- AUDIO CONNECTIONS ‑‑‑‑‑

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berg are noteworthy as well. Ultimately, you must decide what is most useful and comfortable for you.

Possible tradeoffs may involve ease of use and learning, graphics, extensive editing capabilities, MIDI File support, real-time control, and full-featured standard notation. Price is also an important variable; prices for decent sequencers start at around $100 and quickly rise to the $500 range for "professional" software tools. In a sense, you get what you pay for. Because the software is the control center of your ever-growing studio, you may end up spending years together, so it seems worthwhile to invest in a powerful program, no matter what your level of musicianship.

The MIDI Controller

Let's assume you love the *Master Tracks Pro* interface and have just spent more than $300 on it. What next? You need to invest in some type of MIDI instrument—ideally something flexible enough to act both as the main controller for your studio setup and—

for a while, at least—as your main sound source. Later on, you will be able to add synthesis and other capabilities in flexible "rack-mount" (keyboardless) units, saving some money on hardware and keeping studio crowding to a minimum by driving these "slaves" from your main controller, via MIDI.

Many possibilities confront you at this point. Still, we can narrow the field somewhat if we agree on a few points. First, you will get better value from an instrument that incorporates a fullsized, velocity-sensitive keyboard and a full range of patch controls. That way, the keyboard will be capable of providing a full range of MIDI performance and control data to other instruments when you eventually acquire them. Second, a sampling keyboard is, for the moment at least, probably a more flexible tool than a synthesizer—particularly when you consider that synthesizer sounds can be sampled as easily as realworld sounds.

On the other hand, certain characteristic synthesizer sounds (Yamaha DX-series, for example) have become *de ri-*

geur in various types of popular music, and it may ultimately be more convenient to generate these sounds directly from one of the brand name synthesizers than to produce them yourself.

The rule: shop conscientiously, and try everything in your price range. And don't forget to look at the spec sheets. Often, you can't hear important differences between instruments just by playing them—particularly when it comes to features like polytimbral capability, which are designed to be exploited only under MIDI sequencer control.

The Synthesizer

In the price range we are considering here, few synthesizers fare as well as the classic Ensoniq Mirage as a master keyboard and the Casio MG510 guitar synthesizer as the MIDI guitar controller. Both are as affordable as you can get without sacrificing key features. The Mirage offers high-quality sampled sounds, a 61-note velocity sensitive keyboard, and access to a huge sound library, all for as little as $699 new or $500 used. Even more important is the

Dr. T's KCS (Keyboard-Controlled Sequencer) control panel. KCS is one of the most powerful and popular medium-priced ST sequencer programs.

The Yamaha MT-100 four-track recorder, a popular-priced, high-quality tape deck designed for small studio work.

open-ended architecture Ensoniq employed in designing the machine.

The Mirage is essentially a powerful computer (including a disk drive) dedicated to sequencing, sampling real sounds, and playback. The original operating system is eight-voice polyphonic with only two different "patches" available simultaneously and rather limited master functions. However, third-party developers have stepped in to extend the usefulness of the Mirage far beyond that initial configuration.

Triton has developed a new operating system that allows the Mirage to play in multi-timbral mode, thus making it possible to play eight different sounds simultaneously by playing them on different MIDI channels. The sounds are a combination of sampling and additive synthesis, providing ample opportunity for programming a unique and personal sound library.

This operating system is what sold me on the Mirage. The sounds are great and include pianos, organs, synth sounds, flutes, and many others. For $245 you can turn your Mirage into a powerhouse that is comparable to much more expensive synthesizers.

Another excellent third-party developer has added a range of powerful features to the Mirage. Upward Concepts' Dick Lord has produced four revolutionary disks that once again demonstrate the benefits of an open-ended architecture. The *Super-MIDI* disk adds four-octave transpose range, MIDI volume control from an assignable controller (mod or pitch wheel, breath controller, etc.), sostenuto pedal to allow normal play over sustained notes, and other more obscure goodies, including microtonal response (the RT-1 option). This is a great deal for $39.95.

The serious micro-tonal enthusiast will be thrilled to buy the *User-Defined Micro-tonal Scales* disk for the same low price. The pitch of each keyboard key can be defined to 0.17 cents to create a scale of any number of notes per octave. Two tables can be made at the same time by using the sustain pedal to switch between them. The 16 scales that come with the disk (including four used by Wendy Carlos) are a good introduction to the micro-tonal realm—an area that remains largely unexplored by western musicians.

The *Multi-Tempérament* disk is only $29.95 and comes with 14 historical tunings that include Pythagorean, Meantone, Silbermann, and Werkmeister. And for serious hackers, there is the

tem Exclusive librarian.

The Mirage has become a classic because of its flexibility and reasonable cost. Get one if you need an inexpensive master keyboard; you can always upgrade by adding more sound modules later.

The Casio guitar is not the ultimate in MIDI guitar, but it includes a very solid Stratocaster copy (with single coil and humbucking pickups, tremolo) and a pitch-to-MIDI converter built in. There is tracking delay, especially for the lower notes, but a good sequencer can shift the difference easily. Priced in the $600 range, the Casio is a good choice for the beginning MIDI guitarist.

The Ensoniq Mirage. Note the almost-full-size (61-note) keyboard and disk drive slot.

OS-1 Monitor disk, which allows you to re-write your own operating system, using a computer or terminal to examine and modify the software. The disk comes with hardware notes (you'll need them, along with a good understanding of 6809 assembly language).

Other great disks available for $39.95 include *The Chameleon*, a collection of 15 diagnostic and disk utilities, and *The Iguana*, which turns your Mirage drive into a generic MIDI System Exclusive librarian.

Now that you have a controller and a sequencer, you can begin the ascent to MIDI proficiency, learning how to take advantage of the many features available to you: transposition, quantize functions, multi-track MIDI layering (simple notes become a symphony by using multi-timbral mode), real-time recording and step-time entry, and single-note and global editing.

Spend some time getting to know your synth by programming sounds and

experimenting with program changes, filtering, and MIDI Through, which creates a loop that echoes MIDI In data out the MIDI Out port and back to the synth. The duplicate data thus generated, creates the illusion of two synths playing together.

Additional Accessories

Depending on your musical tastes, your next purchase could be a drum machine to add that necessary "groove" or a signal processor that offers reverb for a feeling of "space." Both machines are in the same price range ($400) and both can transform an otherwise tedious musical passage.

My choice for the drum machine would be the Alesis HR-16. A wonder of modern engineering and 16-bit high-rate sampling technology, the HR-16 sounds crisp and solid—no more tacky cymbals and hollow snares. The 49 samples are velocity-sensitive, tunable over an octave and a half, and assignable to any of the 16 pads. They can be routed and panned to one of two sets of stereo outputs, a feature that is especially necessary for creating realistic drum patterns.

The HR-16 is easy to program, offering 100 patterns, each of which can be assigned its own drum set, and 100 songs. I prefer to program mine using the Mirage keyboard with Local Off and MIDI Through on the sequencer echoing the data to the drum channel. The graphics on my sequencer and the much more powerful editing functions make it a breeze to program patterns in this manner. Stacking samples by assigning more than one pad to the same MIDI note trigger makes it easy to create a big powerful sound.

Signal processing is a must, if you want to create a "modern sound"; from reverb to digital delays and chorusing, the addition of tasteful processing can make a mix come to life. Reverb adds space and depth by simulating the sound reflection properties of a room, and delay creates a certain thickening effect by adding decaying repetitions. Chorus adds warmth and movement, while flanging/phase shifting makes the sound seem to turn inside out.

The range of dynamic density can be controlled through the use of variable gain amplifiers such as compressors and limiters, which make the loud parts quieter and the quiet parts louder, or expanders and noise gates, which increase the dynamic range. Equalization adds

Glossary of Terms

Analog Recording. The process of recording sound by transducing its waveforms directly onto a recording medium. A conventional tape recorder is an analog recording device. Its microphone transforms the physical energy of a sound into a fluctuation of electric current, which more or less directly controls the fluctuation of a magnetic field around the recording head. The pattern of magnetic fluctuations is recorded on the surface of the tape, which is covered with a ferrous (or other metallic) substrate. The fidelity of the recording is limited by a number of factors, the most important of which is the frequency response of the recording medium. (See **Digital Audio Tape**).

Cent. In modern Western music, the smallest unit of difference between successive notes is the semitone or half-step (e.g., the pitch difference between middle C on the piano and C-sharp (the black key immediately to its right)). A cent is $1/100$th of a semitone.

Chorus. An audio effect produced by analyzing an incoming waveform and enhancing certain of its harmonics to produce additional pitches offset from the input pitch by various intervals.

Compression. An audio effect produced by "squeezing" an input waveform to produce a narrower (less harmonically rich) output waveform at the same pitch.

Digital Audio Tape (DAT). A modern recording medium that works by converting sound to numeric (digital) information and recording this information on tape in much the same fashion as computer data is stored. The fidelity of digital recording is very high, because the frequency response of the recording medium does not affect the accuracy with which digital information can be stored. (See **Analog Recording**).

Delay. An effect produced by copying an input waveform and releasing the copy into the signal path a certain number of microseconds after the onset of the original signal. Short delays can be used to enrich a sound, while longer delays are used for special effects such as echo.

Equalization. A process by which specific frequency ranges can be enhanced or suppressed, causing audible changes in sound quality. Equalization is sometimes used purely for effect—to suppress bass frequencies in a high-pitched lead guitar line, for example. It is also often used to compensate for the irregular frequency response of recording equipment and recording media.

Flanging. A process (also referred to as "phase-shifting") by which treble and bass frequencies in a sound are alternately enhanced and suppressed at a particular rate of speed. This causes a sound to take on a rhythmic, "whooshy" quality. Before electronic methods were developed for producing this effect, studio engineers managed it by placing a hand on the flange (hence the name) of the recording spool, forcing the tape to slow down and speed up by degrees.

Local Off. A MIDI command which causes a synthesizer to disconnect its keyboard from its sound-generating circuitry. The effect of Local Off is to cause the instrument to send MIDI data, but not to produce sound.

MIDI. The Musical Instrument Digital Interface. A standard hardware and coding system designed to allow musical instruments to communicate.

MIDI File Standard. A standard format for recording MIDI sequences designed to permit their transfer from one brand of computer or MIDI sequencer to another.

MIDI Through. Ideally, a MIDI-compatible instrument should have three MIDI ports. The first, labeled In, accepts MIDI data from an external source. The second, labeled Out, outputs MIDI data generated by the instrument itself. The third, labeled Through, is optional and outputs a copy of data received at MIDI In. The ST MIDI Out port can be made to work as a MIDI Through port under software control.

MIDI Controller. A source of MIDI performance data. This can be a synthesizer keyboard, a specially-modified instrument such as a digital saxophone, or a pitch-to-MIDI converter that turns the pitches produced by a conventional instrument into MIDI messages.

and subtracts from the mix of frequencies to emphasize particular ranges and suppress unwanted ones.

You might want to begin exploring the world of signal processing by finding a used Alesis Microverb or Microverb II. These tiny devices provide a set of 16 preset rooms, ranging in size from very small to very large, and a few gated settings. For about $100 you can experience the difference these little boxes make, and you will soon find yourself craving more . . . and more . . .

When your craving for more becomes uncontrollable, you can start to think about the latest Alesis masterpiece, the QuadraVerb, aptly named for its endearing ability to do simultaneous processing. It features four main modules: 11 bands of graphic equalization and 5 bands of parametric equalization; ste-

From reverb to digital delays and chorusing, the addition of tasteful processing can make a mix come to life.

reo digital reverb; stereo pitch detuning; and stereo delay/chorus/flanging/ phase shifting. It also has 100 program memories, with unlimited storage through Sysex Data Dump, and a complete MIDI implementation that supports program changes and real-time parameter control.

For $499 you can be in MIDI Effects Heaven. Compression, noise gate, and guitar effects may prove to be irresistible once the effects bug bites. Check around for the used stuff.

About this time in the development of your home studio, you realize that the $25 mixer from Radio Shack just doesn't seem to cut it anymore. But not to worry; Alesis has a board for you. For a ridiculously low $799 you can get a 16-channel mixer with two busses and six effects sends (with two stereo, and four mono returns). Although this may seem like overkill at first, you will soon find uses for most of the features.

Again, there is plenty of inexpensive, quality used gear available, but be especially thorough in checking it out; you definitely don't want a malfunctioning board.

Microtonality. The field of music concerned with scale systems based on units smaller or larger than the standard semitone. Though always of concern to academics—particularly ethnomusicologists—alternative scale and tuning systems have recently become popular in the West as a source of new musical ideas, largely through the work of the composer/synthesist Wendy Carlos. (See **Cent**).

Mixer. A device used to control the consolidation of multiple recorded tracks onto a stereo master tape.

Multi-Track. A device capable of recording sound (or data) onto multiple, parallel tracks for later editing and consolidation. Multi-track recording permits an arrangement to be built up instrument-by-instrument or line-by-line.

Noise Reduction. Technology used to reduce "hiss" or other unwanted noise in a recording. Dolby and dbx are two popular noise-reduction systems.

Patch. Nowadays, the word "patch" is used to refer to a single timbre or sound quality—one of many that a given synthesizer or sampler may be able to produce. The term derives from first-generation analog synthesizer technology, wherein cables (patch cords) were used to physically link the various oscillators, filters, and other components to produce distinct sound qualities.

Polyphonic. Capable of producing more than one pitch at a time. A piano, because it can be used to play chords, is a polyphonic instrument; a flute is not. Most modern synthesizers are polyphonic; their circuits are capable of producing between four and eight or more simultaneous notes.

Polytimbral. Capable of producing more than one timbre, or sound quality, at a time. Most modern synthesizers are polytimbral under MIDI control, meaning that they can play data received on a single MIDI channel through two or more different patches (patch-layering), or channel data from several MIDI channels into a range of patches, producing the effect of an ensemble.

Quantization. In digital audio, quantization refers to the rate at which an input waveform is sampled; higher sam-

pling rates produce more accurate, higher-fidelity recordings. In sequencer terminology, quantization refers to a process by which a recorded sequence can be time-corrected to the nearest whole, half, quarter, eighth, sixteenth, or smaller note-value.

Reverb. An effect similar to echo that adds a sense of space to a sound, as if a performance were occurring in a concert hall, an empty stairwell, or other acoustically interesting environment.

SMPTE. A time-coding process supported by the Society of Motion Picture and Television Engineers (SMPTE) that permits the synchronization of video, film, and audio.

Sampler. A digital recording device that "samples" real-world sounds with very high fidelity, saving them to RAM memory. Sampled sounds can then be played back at different pitches, for use in musical compositions.

Signal-to-Noise Ratio. The relative strengths of desirable signal and spurious "noise" in a recording. (See **Noise Reduction**).

Step-Time. A manual method for entering melodies into a sequencer on a note-by-note basis. Used when great precision is required or when a musical line is too difficult to play at full speed. Once entered, the line can be played at high speed, without error, by the computer.

Temperament. When instruments are tuned to a mathematically-accurate series of pitches, music played in any given key sounds fine, while modulation between different keys can cause unpleasant dissonance. "Even-temperament" is a method by which instruments are systematically de-tuned, slightly increasing the dissonance within given keys so as to decrease dissonance on modulation between keys. The innovation of even-temperament permitted the development of classical and modern Western music, in which complex modulation is the norm.

Velocity-Sensitivity. The ability of a MIDI keyboard to detect how fast (hence how hard) a key is depressed. Sensitivity to this information permits a MIDI system to record a more dynamically accurate rendition.

If you want more modules to expand your MIDI vocabulary, for a mere $995 you too can line up to wait for E-mu's Proteus, a 4Mb monster (expandable to 8Mb) of 16-bit samples selected from the Emulator III library. It features 32-voice polyphonic and up to 16-part multi-timbral capabilities and offers six polyphonic outputs configurable to three stereo with panning, two stereo effects loops, and 192 presets. Those on a tight budget might consider a Yamaha TX81Z or even a Casio CZ101. You may also need to add a MIDI-Through box to take care of MIDI signal routing/switching. They cost from $30 on up.

The Recorder

The final component to consider is a multi-track recorder. A Yamaha MT100 could be the perfect complement to a high-quality board and a good effects-processing rack. The sound is crisp and transparent for such a low priced deck ($499), and it offers electronically controlled transport, double tape speed, dbx noise reduction, and an 85 db signal-to-noise ratio. The frequency response is 40Hz-18kHz at $3\frac{3}{4}$ ips and 40Hz-12.5kHz at $1\frac{7}{8}$ ips.

You should already have plenty of equalization, so you will not regret Yamaha's decision to keep things cheap and simple by not adding a bunch of useless pots. The deck sounds great when your music is recorded with care and mixed tastefully onto metal tape or hi-fi videotape. You should be able to buy it on sale for less than $400.

Wiring up a complete studio can be a real project. Don't complicate it by placing your hardware in an inaccessible position in your studio; try to locate all equipment so you can get at connectors and cables easily. Figure 1 shows one possible wiring diagram for the main components. The basic wiring remains the same for most applications.

The finishing touches on your studio should be a solid amplifier and a set of good monitor speakers that do not color the sound too much. And don't forget a mike or two, stands, and other instruments.

There you have it—powerful, modular, expandable, and affordable. By building in small, well-thought out chunks, you can keep large bills to a minimum and enjoy your studio while it grows.

In the next issue, we'll be examining some studio setups in more detail and looking at some ways to bring the various components under MIDI control. ■

Sequencing: The Basics

First in a series on MIDI tools for the ST musician

A sequencer, or MIDI recorder, is the software cornerstone of the modern music studio—the most-used implement in the electronic musician's toolbox. Versatile, it can function as a simple recorder for laying down well-practiced tracks, as a musical sketchpad for combining riffs into full-blown compositions, or as a master controller, running an entire onstage rig. Making a sequencer perform these tricks is a matter of practice, careful application, and a good understanding of how MIDI sequencing works.

Sequencer Basics

A sequencer is a data recorder designed to handle MIDI information in all its forms—channel voice and mode messages to control the details of performance on and interpretation of data by specific instruments, system common and realtime messages to control the behavior of sub-sequencers and keep things in synch, and even system exclusive messages to reprogram equipment in real-time.

If you are not already familiar with MIDI and studio terminology, check out the sidebar on MIDI basics and "Putting It All On Tape" elsewhere in this issue, before you continue reading.

Sequencer functions can be broken down into two main groups: recording and playback functions on the one hand and editing functions on the other. The recording and playback functions of most sequencers are similar to the same functions on a multi-track analog tape recorder. Incoming data are recorded on "tracks" (actually in RAM buffers), which can be played back in parallel to permit the building up of whole compositions from individual parts.

Unlike audio tracks, of course, sequencer tracks contain MIDI data that describe the minutest details of a performance. These include not only "playing" information, such as key presses and releases, but control information of all kinds—patch changes, controller movements, and other data. In addition to MIDI data, sequencers also maintain timing information that serves several purposes.

At the track level, all sequencers time-stamp incoming information so that the precise temporal characteristics of a performance are preserved. This may be done on a byte-by-byte basis, on a message basis, or in terms of message groups, depending on how the programmer wishes to manage the trade-off between precision and volume of data maintained.

At a somewhat higher level of abstraction, sequencers also deal in more rigid time frames, corresponding to metronome beats and measures in a selected tempo. The playback timing of individual tracks can be forced to conform to these more rigid timing systems either globally—as in quantization, where the onset and duration of notes in a track are coerced to produce a perfectly-timed performance devoid of rubato—or more precisely—as when the beginning of an otherwise freely-played section is caused to occur at a particular instant in a performance. The actual

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timing quanta can be produced internally by the ST clock chip or, depending on the sequencer, derived from one of a variety of external sources—MIDI clock, SMPTE timecode generator, or audio click track—interfaced to the ST.

A modern sequencer gives you an extraordinarily large number of tracks with which to work—60 or more is not uncommon. The purpose of all these tracks is not, as one might suspect, to control a large number of individual instruments; the MIDI protocol itself differentiates only 16 channels. Rather, the additional tracks are commonly employed to break out different classes of MIDI data in various ways for parallel broadcast to a more limited number of instruments. Alternative input features such as step-time recording, editing features, and filtration all do their part to simplify the process of generating multiple tracks.

Editing Features

Sophisticated sequencers permit global editing of virtually every detail of a given track. Editing functions fall into two broad groups, which might be called "global" and "direct."

Functions in the first group are applied automatically to a range of data and are employed much like the search-and-replace functions found in word processors. Functions in the second group permit more precise editing and event entry, either by the direct modification of MIDI data in hexadecimal form or, more and more commonly, by means of a graphic user interface employing standard musical notation.

Some of the more common global functions include automatic transposition, which changes note data in a track by a given interval; quantization (time-correction), which forces the timing of notes in a track to conform to a given subdivision of a rigid meter, producing a perfectly-timed, mechanical performance devoid of rubato; humanization, which adds small, evenly distributed timing errors back into quantized tracks, returning some human "feel"; mixing, which combines the contents of multiple tracks into a single track in orderly fashion; and unmixing, which applies one of a variety of algorithms to break out different musical voices, sets of events, and/or species of MIDI data from a single, mixed track into separate tracks.

Direct editing and event entry functions are difficult to describe in limited space. However, there is one function common to almost all sequencers that

deserves special mention: step-time recording, which permits the entry of note or other MIDI data in precisely-timed fashion. Under step-time recording, the position and duration of a MIDI event is entered using the keyboard or mouse; then data corresponding to the event are recorded from the external instrument.

Step-time not only permits the entry of passages too rapid or difficult to play

at normal, or even reduced, tempo, but also provides a means for recording precisely-timed sequences of patch change, system exclusive, or other MIDI events in parallel with note information.

Basic Sequencing Techniques

A sophisticated sequencer can maximize both your musical creativity and the capabilities of your MIDI instruments. Here are some tips on how to get the most out of your ST sequencer and MIDI rig.

●Start by using the sequencer as a sketchpad. Most modern musicians compose at least partially by "noodling," or improvisation. By doing your noodling on a MIDI instrument con-

nected to your ST sequencer, you can save and incorporate your improvised passages into final works.

One caveat: if you intend to build a multi-part composition on top of one basic improvised part, it is best to keep the timing of that part fairly accurate. One way to do this is to pick a time signature and tempo that you like, then enable the sequencer metronome before

Incoming data are recorded on "tracks," which *can be played back in parallel to permit the building up of whole compositions from individual parts.*

switching it on and starting to improvise. The audible tick of the metronome will keep your improvisation more or less on cue.

●Learn to use charts. Having a single master reference to the different parts of a composition can be a great help in keeping the sequencing process organized. Develop a system of notation that will help you keep track of non-musical MIDI events, such as patch changes, in parallel with the actual notes.

●Think in terms of voices, not chords. You get the most mileage out of MIDI recording if you enter one voice per track, monophonically, rather than entering multiple voices simultaneously, by chording.
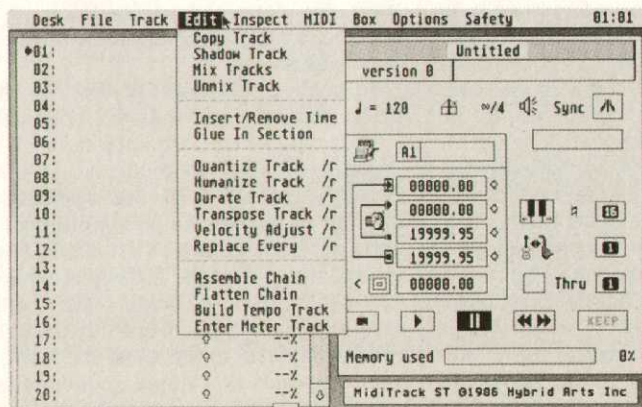
Figure 1. The main screen of EditTrack, a sophisticated ST sequencer published by Hybrid Arts of Los Angeles, CA. At the right side of the screen you can see the tape recorder button icons used to control record and playback functions, icons used to control tempo and metronome settings, the synchronization selector (currently set to draw timing information from the internal clock), and the "punch-in, punch-out" display. Also note the enormous variety of global (trackwise) editing functions available from the Edit menu on the left.
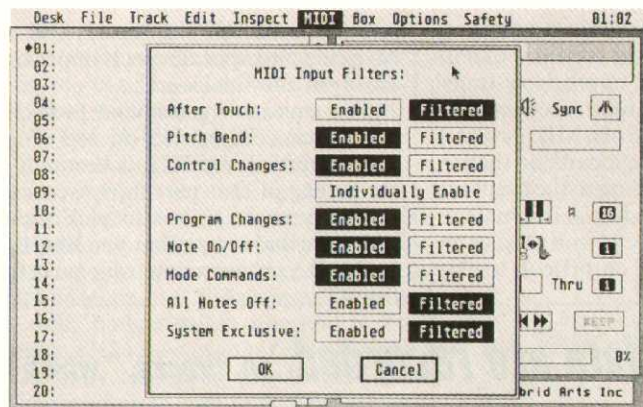
Figure 2. The EditTrack data-filtration control dialog, showing default settings for accepting or rejecting different types of MIDI events on input. Efficient use of filtration helps to produce clean tracks, devoid of spurious and unwanted event information (accidental patch changes, etc.).
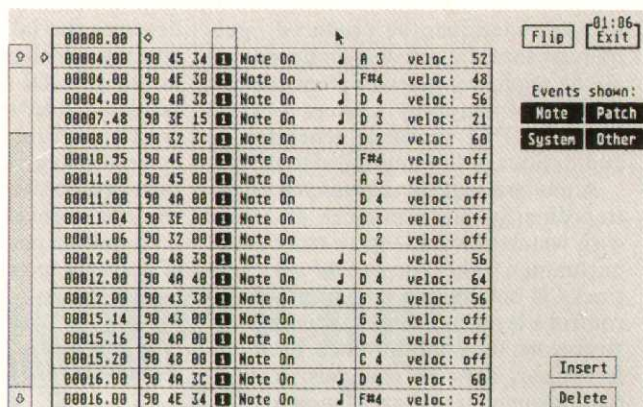
Figure 3. A musical passage displayed as interpreted MIDI data via the EditTrack Event List editing feature. Data can be examined and changed conveniently on an event-by-event basis.

Alternatively, learn to use the unmix facilities of your sequencer to break individual voices in chorded passages out into their own tracks. This way, individual voices can be sent to separate instruments along different MIDI channels, or the polytimbral capabilities of a single instrument can be used to realize separate voices using different patches.

• Use as many tracks as you like to subdivide different classes of MIDI data. Ideally, keep the note data for a part isolated on one (or more) tracks and enter (or unmix) all patch-change, system-exclusive, and other types of data to separate tracks. This way, for example, you can edit the sequence of patches used to play a part without affecting the notes and vice versa.

• Be careful with global editing. Once a basic track is laid down, save it either to disk or to an unused track before applying any irreversible global editing function to it. Quantization, in particular, sometimes introduces errors; over-correcting the timing of certain sections, causing notes to drop out or overplay one another.

In future issues, we will be examining sequencing techniques in greater detail and looking at how the sequencer can be used to good effect with different types of MIDI equipment. ∎

MIDI Basics

MIDI is a control language produced and understood by modern electronic instruments. The language employs two basic classes of statement (or "message"), called "channel" and "system." The former class is concerned with real-time aspects of performance on specific instruments in a MIDI network, while the latter class is concerned with higher-level network control. The two general classes can be broken down further into five sub-classes: two for channel messages, three for system.

The first type of channel message—called "channel voice"—describes in very simple and mechanical terms precisely what happens to the keyboard and controls of an instrument as it is played: keys are pressed and released with varying degrees of force, controls are triggered, pedals pushed, pitch and modulation wheels turned a certain amount, etc.

The second type of channel message—called "channel mode"—describes four different modes for interpreting channelized performance data

of the type described above. In mode 1—called "Omni On/Poly"—the instrument responds to all incoming performance data, regardless of channel specification, playing all notes through one basic patch.

In mode 2—"Omni Off/Poly"—the instrument also responds polyphonically, but only to performance data on a specific channel. In mode 3—"Omni On/Mono"—all data are responded to—but monophonically; simultaneous notes are shunted, on a first come, first served basis, through a designated series of patches (this mode makes little practical sense and is often only partially implemented; in this case, the instrument responds as a single, monophonic sound generator, playing only the first of a group of simultaneous notes, and ignoring the rest.)

In mode 4—"Omni Off/Mono"—data within a given range of MIDI channels are responded to as if by multiple, monophonic instruments—shunting the performance data for each channel through a designated patch.

The first class of system message—

called "system common"—is used primarily to control sub-sequencers in a MIDI network, such as the pattern-oriented song sequencers in drum machines. Among other things, commands to start sequencing, stop sequencing, and locate the MIDI "song pointer" at a particular place in a song are supported.

The second class of system message—called "system real-time"—performs a variety of system-wide functions of an interruptive or time-critical nature. The MIDI clock pulse—broadcast 24 times per quarter note by the master sequencer—is, for example, sent as a real-time message.

The final class of system message—called "system exclusive"—is used to broadcast equipment-specific information across a MIDI network. Patch parameters, for example, which are coded differently for various synthesizer brands, can be transmitted as system-exclusive messages. So can various control functions peculiar to particular instruments or pieces of MIDI equipment and not covered by aspects of the standard protocol. ∎

Take Note

A powerful ear-training tool for serious music students

Ear-training is the meat and potatoes of introductory music study, forming the bulk of the first year's required instruction in most university music programs. The object of ear-training is twofold. First, the student must develop a familiarity with the terms and conventions by which music is represented—be it on the staff or in other shorthand forms. Second, he must develop skill in the conversion of musical information between these representations and music as we hear it.

The usual course in ear-training involves (if I remember correctly at ten years' remove) long, bitter winter afternoons spent in overheated practice rooms, being drilled on pitches, modes, intervals, and triads by a bored and inattentive grad student. It was not much fun, to say the least. And it worked only because it *had* to; there is no escape from this material if you ever want to communicate musical ideas in standard fashion. Still, human energy, imagination, and motivation always falter in the face of drill-and-practice.

Computers, however, do not falter. With the proper software, in fact, an Atari ST has a bored grad student beat all hollow when it comes to generating ear-training practice exercises. And the right software, in my opinion, is *Take Note*—flagship product of the company of the same name.

Take Note might be described as an ear-training environment, completely unlike the "curricular" music instruction software written for the last generation of personal computers. *Take Note* presents you with a single operating screen, the largest portion of which is taken up by a concert staff (bass and treble clefs), an image of a piano keyboard, and a grid designed to represent the neck of a guitar. Any one of these grids—or indeed, any MIDI instrument coupled to the ST—can be used to enter notes.

This feature alone would be enough to make me sit up and take note of *Take Note*. As a guitarist, I have come to resent the fact that most ear-training systems are keyboard-centered.

Take Note functions in three modes—Sample, Study, and Spell. The first is used primarily to familiarize the student with the mechanics of the program: how to enter, play, and identify
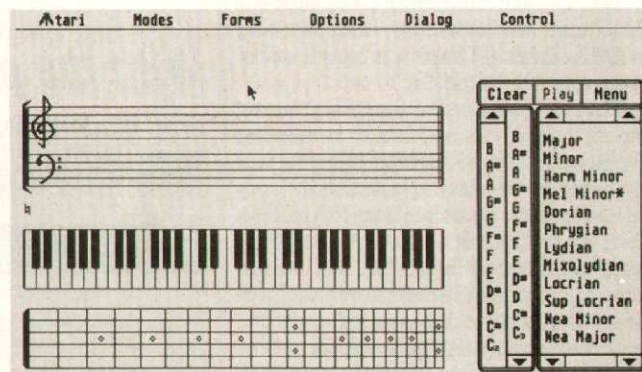
The main workscreen with menu bar displayed.

notes, intervals, and more complex musical forms.

In Study mode, the program generates ear-training drills, playing any desired combination of pitches, intervals, chords, or scales, and requiring that you identify them by entering equivalent

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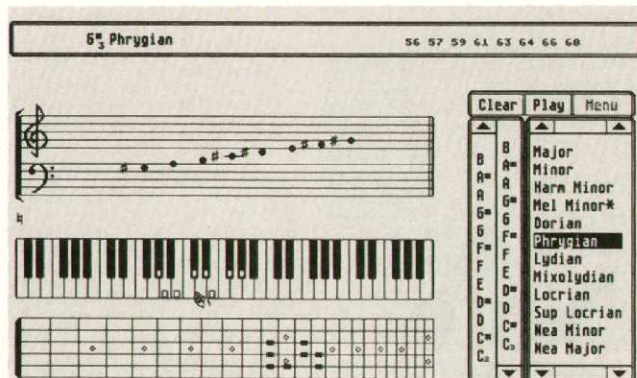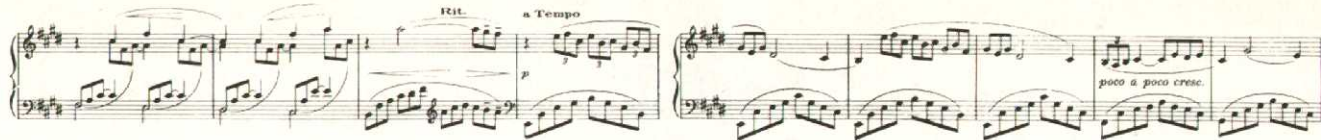
The main workscreen with Phrygian scale selected and displayed. The menu bar is hidden.
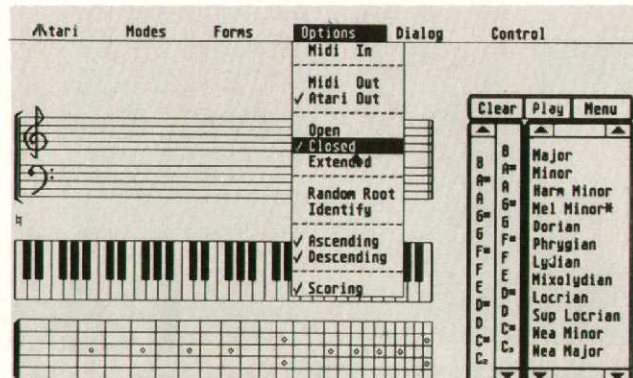
A sample mode screen, showing the Options menu.

pitches on one of the grids.

Spell mode generates basic note drills, teaching you to recognize the names and locations of notes on the staff, the piano keyboard, and/or the guitar.

Installation and Use

Take Note is copy-protected and must, therefore, be executed from the distribution disk. Drill scores, which are maintained by the program in cumulative fashion, can (and probably should) be saved elsewhere.

Take Note is a huge program, occupying some 202,944 bytes on disk, with an additional 128,000 bytes of resource. This may have something to do with the program's having been written partially in GFA Basic—I mean, it's a nice program and all, but 200K?

The enormous size makes running the program on a 520ST somewhat problematic. It will work, but you will probably have to remove extra desk accessories and disable your RAMdisk. On a larger machine, *Take Note* should work uncomplainingly, but I have noticed incompatibilities between the program and certain accessories and resident environments that either abort execution or prevent effective return to the desktop (it seems to be incompatible with *NeoDesk*, for example). The moral: for a minimum of worry, execute *Take Note* on a close-to-virgin system.

Though the actual coding seems a bit shaky, production and design values for the program are actually fairly high. *Take Note* is an attractive piece of software, designed for ease of use. Dialog boxes employ Macintosh-like italic bordering and sport button-bars and sliders of unusual and ergonomic design. Menu bar, on-screen controls, the mouse cur-

sor, and other graphic elements are uniformly employed to good effect. Obviously, someone took a good deal of care to ensure the visual appeal.

Using the program is fairly simple, once you get the hang of how *Take Note* is intended to work. The best way to do this, in my opinion, is to skip the body of the manual and go directly to the sample walkthroughs provided for each of the three modes. Working through them step-by-step helps clarify relations among the program's many options.

In summary, *Take Note* functions as a drill generator, reinforcement, and score-keeping system for autonomous

both. Current settings can be saved on disk.

Options and Docs

An enormous number of options is offered. Notes over broad or narrow ranges of pitch; intervals from unison to 14ths; every main chord type in various inversions, with or without octave doubling; 31 distinct standard, modal, and miscellanous abstract, historic, and ethnic scales . . . the number and range of drills *Take Note* can create is amazing.

Unfortunately, while the program is itself capable of performing miracles, the documentation is woefully insufficient to guide the student in using the

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With the proper software, an Atari ST has a bored grad student beat all hollow when it comes to generating ear-training practice exercises.

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instruction. Drills under the main, or Study mode, can be composed of examples for note, interval, chord, arpeggio, and scale recognition—either individually, or in any combination. Note ranges and interval, chord, arpeggio, and scale (mode) types to be tested can be selected from various menus and dialogs.

Beginning students can elect to have all examples presented with the same root tone; more advanced musicians can select random roots in order to train absolute pitch recognition. Melodic and arpeggiated forms can be set to play in ascending or descending fashion, or

program to best advantage. It is a basic summary (admittedly complete) of program functions, but contains little musical information—none whatsoever presented in curricular fashion.

Ideally, *Take Note* could be used as a formal supplement to a conventional course in ear-training, allowing the student to employ written course materials as a guide for setting the program up for drills. Alternatively, with the proper texts, a student might approach *Take Note* without too much trepidation. In either case, prospective buyers should take note that *Take Note* is not, in any sense, a course of study. ∎

Figure 1. Hardware and software that comes with the X*Press startup package. Note decoder and Y cable splitter.

Tune In To The Wire Services

X Press/X* Change offers round-the-clock news and sports*
information—without connect-time charges

Analysts say the United States had approximately 46.8 million cable TV subscribers in 1988. By the end of 1989 that number is expected to grow to 49.2 million. The hardware that supports this huge subscriber base—cable, distributors, decoders, etc.—forms an attractive medium for distributing more than just movies, MTV, and 24-hour news. Many enterprising companies are looking at ways of using the cable networks to carry data—bits and bytes—for display and manipulation not on TV sets, but on personal computers.

One of the pioneers in the cable-data industry is X*Press/X*Change, a comprehensive, one-way information service delivered via subcarrier on the CNN (Cable News Network) and TBS (Turner Broadcasting System) cable networks. The service is available in most major metropolitan areas in the U.S. and Canada.

What is X*Press/X*Change?

X*Press/X*Change is part of your basic cable service, which means there are no extra monthly fees. To receive the service, you need a decoder—essentially an FM modem that peels the subcarrier signal off TBS and converts it to a 9600 baud serial data stream—and proprietary terminal software for displaying and capturing this data (appropriate terminal software for the Atari ST, as well as IBM, Apple, and Amiga, is included in the initial purchase price of the service).

Two services are, in fact, offered—X*Change and X*Press Executive. X*Change is the basic service, available on an unlimited basis for a single $125 startup fee. It offers news, business, and financial information, including stock market reports updated three times daily—at opening time, midday, and closing. Executive is an enhanced version of X*Change with a higher startup fee and an extra monthly charge for unlimited use; it offers continuous stock exchange reports on 15-minute delay and certain extra categories of business news.

In either case, the startup fee gets you a decoder, some cable TV accessories, and terminal software. And, yes, the hardware is yours to keep, forever. There are no other fees or charges for use of the service, aside from the monthly fee if you opt for X*Press Executive. You can use X*Change to your heart's content without emptying your pocketbook.

Hooking up the X*Press decoder is easy. A splitter (provided with the startup kit) is installed to divide your cable TV wire into two lines. One of these goes to your TV; the other to the decoder. The processed signal comes out of the decoder through a DB-25 connector, cabled to the RS-232 port on your ST—just like a modem hookup. X*Press/X*Change provides all the necessary cables and offers very clear instructions.

Like a modem, the decoder has three status lights—for power, data, and carrier. A power adapter connects the decoder to a wall outlet. Unfortunately, the decoder has no power switch, so it remains on unless unplugged (or con-

X*Press/X*Change

System: Atari ST

Version reviewed: 1.00

Required equipment: Cable TV

Summary: A fascinating information link between your ST and cable TV

Price: X*Change, $125; X*Press Executive, $225 plus $19.95/month

Distributor:
Information Services, Ltd.
4643 South Ulster St.
Denver, CO 80237
USA:(800) 7PC-NEWS
Canada:(800) 445-7444
CO: (303) 721-5130
Tech Support: (303) 721-5400

By BARON SEKIYA
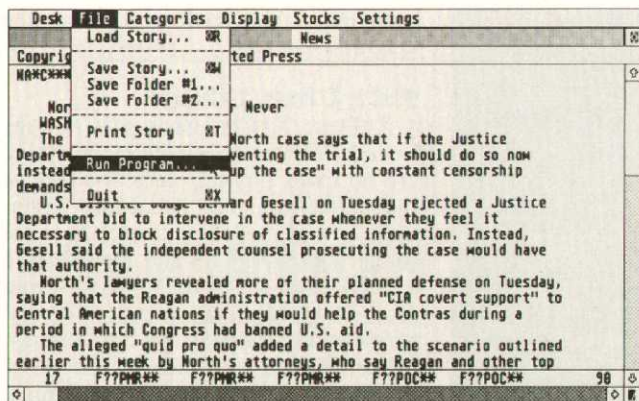
Figure 2. Using the Run Program option, you can download information from X*Press while working with another program.

Figure 3. The raw data stream from X*Press displayed without interpretation. X*Press employs a proprietary screen protocol.

nected to a switched outlet).

If you already use your serial port for a modem or printer, you must switch plugs when you want to use X*Press/X*Change. Alternatively, you can buy an A/B RS-232 switch box to control which RS-232 device is connected. Or, you can simply use an RS-232 Y cable to connect both devices (modem and decoder) to the RS-232 port at the same time and turn off power to the unused device.

Software

The Atari ST software for X*Press/X*Change was written by Alan Page of *Flash* fame. Page has done an excellent job of incorporating the GEM interface and has made the program compatible with all STs. Among other capabilities, the software can capture information from X*Press/X*Change in the background while another program is running in the foreground (Figure 2), though certain foreground applications cause Out of Memory errors.

Using X*Press/X*Change

As a "passive" service, X*Press/X*Change offers no interactive way of choosing which type of information it sends to you—your computer receives everything the service is sending out (Figure 3). The terminal software, however, offers a variety of ways to select and capture specific types of information from this data stream.

One way of doing this is to configure a set of categories (Figure 4) for the kind of items you wish to capture. For example, because I am taking a Spanish class, I wanted to read some stories from the Mexican news service, Notimex. So, I mark the Notimex category, and the software automatically selects and cap-

tures all items identified as coming from that source (Figure 5).

Some of the categories have sub-categories as well, allowing you to refine your selection. For example, under Football, we find News, NFL, and CFL. Under the News sub-category, a wide variety of national and international sub-sub-categories are available. If you are interested in the stock market, you can specify which stocks you want to watch. When all your categories and settings have been selected, you can save the configuration as the default.

As the software works, saving items coming over the cable in appropriate categories, you can check a status report (Figure 6) that shows how many stories you have captured, how many you have deleted, and how much memory you are using. Because so much information comes over X*Press/X*Change, the software automatically compresses the information before storing it in RAM.
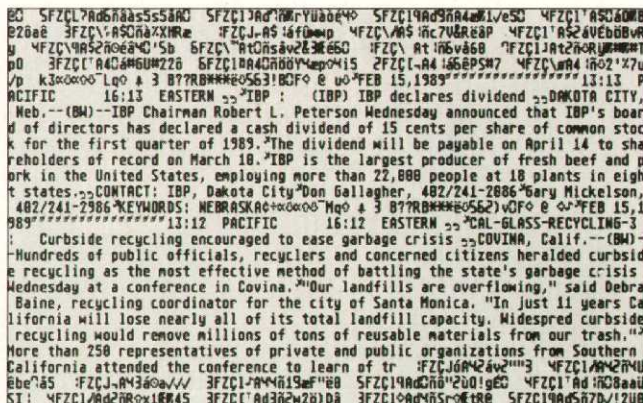
Viewing the information is as easy as flipping through your Sunday newspaper. Choose the category you want to view, and the program shows you the stories captured from that category. You can even print and save stories to disk in ASCII format.

The wealth of information will astound you. News agencies represented on X*Press/X*Change include Associated Press, Agence France-Presse, *USA Today*, CNN, Deutsche Presse-Agentur (W. Germany), Xinhua (China), Notimex (Mexico), TASS (the Soviet wire service), and OPEC. You read world news as it happens! For example, I have read Associated Press stories that did not appear in my daily newspaper until two or three days later.

The sports reports are much more complete than those that appear in newspapers and news broadcasts, many of which get their information from the same wire services. In the area of professional sports, all the defensive and offensive statistics—material normally seen only by working sports reporters—are available.

X*Press/X*Change provides up-to-the-minute national and international weather information from the National Weather Service. You can also find lists of best-selling books and review the *Billboard* list of best-selling records. There are even capsule summaries of the day's popular soap operas.

Though the X*Press/X*Change service is itself one-way, toll-free telephone numbers and a user mailing address are

> ## The software can capture information from X*Press/X*Change in the background while another program is running in the foreground.
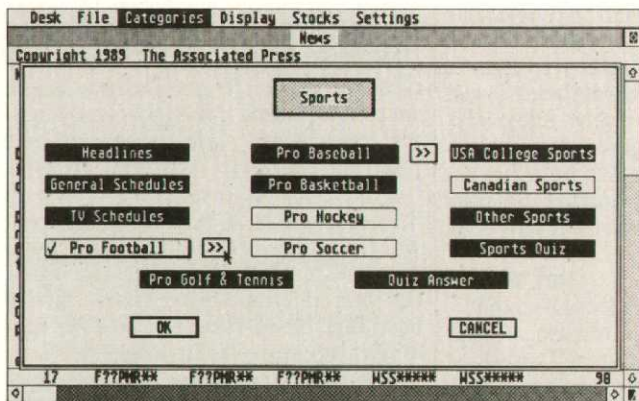
Figure 4. Dialog used to select subcategories of interest in the field of sports.

Figure 5. The X*Press software automatically selects and captures all items coming from Notimex, the Mexican news service.

provided for those who want to offer opinions on a variety of posted topics. There is even a flea market in which you can place classified ads for free.

In addition, you can make selections using logical AND expressions. For example, you can capture only stories with the words "Iran" AND "Contra" in

my TV cable. A special X*Press/X*Change bulletin category will tell me about software updates and advise me when to set up for download. The X*Press/X*Change software package includes a transfer program that will automatically download software at a pre-set time—usually late at night while you sleep.

I have read Associated Press stories that did not appear in my daily newspaper until two or three days later.

Folders

One of the most powerful features of the X*Press/X*Change software is the ability to search incoming data for keywords, assembling the results in one of two "clipping folders" (Figure 7). For example, if you were to choose the keyword "Atari," any story that mentioned the maker of your favorite computer would be tucked into the clipping folder.

them, bypassing stories containing neither or only one of these words. Clipping folders can be saved to disk for future use.

New Software

I am currently using version 1.00 of the X*Press/X*Change software. If there is an update, though, I won't have to send my disk back. Instead, I can simply download the latest version over

Conclusion

As a photojournalist, I am always looking for new sources of information to give me an edge in the news business. I live in Hawaii, so I set up my clipping folder with keywords like "Honolulu" and "Hawaii" to give me the latest-breaking news stories affecting my area.

With the X*Press/X*Change Information Service and your Atari ST, you can have at your fingertips a wealth of information you never knew existed. Now, I listen to my MTV and read breaking news at the same time. How's that for multi-tasking? ∎

Figure 6. A status report shows how the items coming in over the line have been sorted.
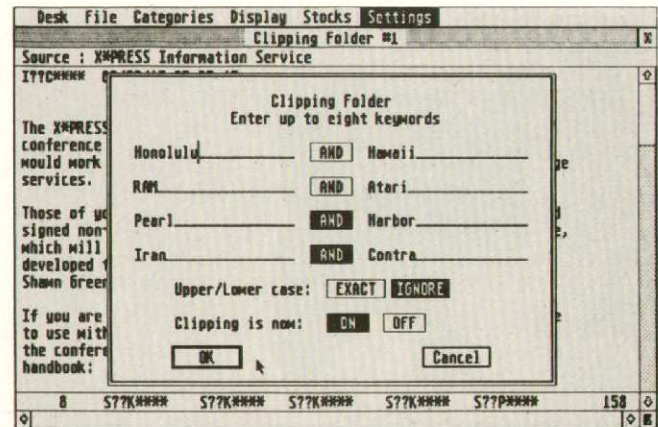
Figure 7. Setting up a clipping folder to search incoming data for keywords.

Touch-Up

Migraph releases an indispensable tool

for graphic artists and desktop publishers

Thank goodness Migraph hasn't deserted the Atari ST market; Liz and Kevin Mitchell have been supporting and improving *Easy-Draw* since 1986. Their most recent contribution to the "serious" ST application market is *Touch-Up*, a GEM-based virtual-page image creation and editing program.

... wait a minute. What was that again? OK, in layman's terms, that string of jargon tells you that *Touch-Up* provides a way to create images that are not limited to the screen display area.

Touch-Up can import files in .IMG, *Degas*, *Degas Elite*, *MacPaint*, *Neo-chrome*, .PCX, .TIF, and .GEM formats. I can, for example load (import) a *Degas* file, tweak the picture, and then save the same file in a variety of formats.

The program saves files in all the above formats except .GEM. Although a .GEM file is automatically saved along with the image file whenever work is saved in .IMG format, this .GEM file is used for printing only and cannot be loaded back into the program.

System Requirements

My Atari system consists of a 520 ST upgraded to 1Mb, dual 720K disk drives, a Supra 20Mb hard drive, color and monochrome monitors with an Astra switch, and a Hewlett-Packard DeskJet printer. With the exception of creating color *Degas* format screen snapshots, I used a monochrome monitor exclusively while evaluating this program.

Touch-Up requires at least 1Mb of memory, and even with a full meg you will find a few limitations, which I will discuss later. A dual-drive system is better than an single-drive system, and a hard-disk based-system is best for running this feature-laden program.

The disks themselves are not copy-protected. Unfortunately, however, to their dismay and ours, Migraph has found it necessary to copy-protect the program by including a Program Security Key (PSK). The PSK, sometimes called a "dongle" by hackers, is a device about an inch long that plugs into the parallel printer port of your ST, which places it between the computer and the printer cable. Aside from the additional inch added to the back of the ST, the device is unobtrusive. *Touch-Up* will not run without it though, because the program periodically checks for its presence.

The PSK doesn't interfere with any other programs, because it is essentially a pass-through device; all information sent to the printer via the parallel port passes right through it. The only problem I encountered with the PSK occurred when one of my husband's curious cats evidently noticed the new addition and stepped on it during one of its nocturnal walks across my computer desk. In the morning, I found the cable partially dislodged from its connection.

I received one of the early releases, which included the 225-page 6×9 three-ring manual, a program disk, and

By PAMELA RICE HAHN
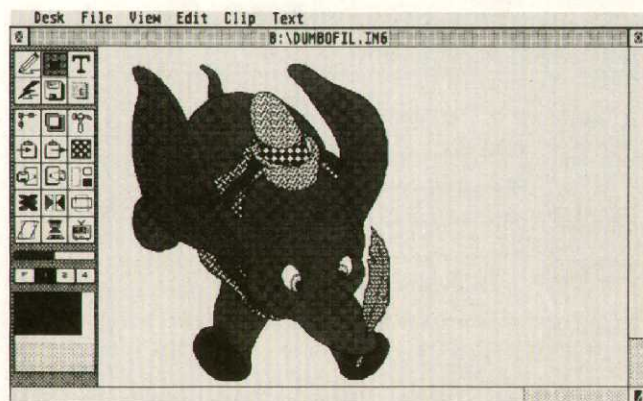
Figure 1. This picture of Dumbo began as an .IMG file, a picture from a coloring book that had been scanned sideways. The image was repositioned in Clip Mode and "colored in" with Fill patterns.
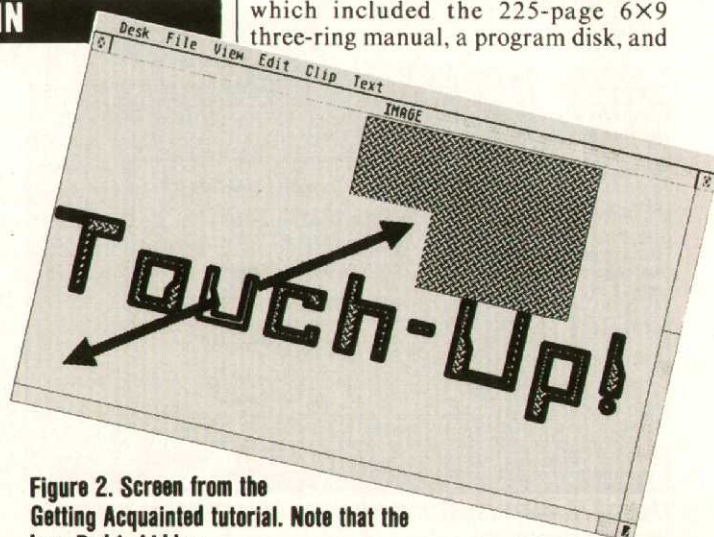
Figure 2. Screen from the Getting Acquainted tutorial. Note that the Icon Pad is hidden.

a disk containing 147K of .IMG file examples. In addition, Migraph also includes a program for converting *Print Master* images to a format usable within *Touch-Up* and vice versa.

Another useful addition is the .IMG slideshow program. Similar to other graphics slideshow programs which allow you to view *Degas* and Tiny files from the desktop, IMGSHOW.PRG is supplied specifically for viewing .IMG files. The program can be run as a program or installed as an application and allows you to view monochrome .IMG files in any resolution—low, medium, high, or Viking 1.

Features of IMGSHOW.PRG include the ability to display optional file information about each slide and the following choices: a black or a white background, a cycling slide show or one that ends automatically after last file, a keypress to cue the next image displayed or

a user-defined delay. A script file option can be implemented to include all the above attributes and determine the order of the slide display.

Anyone who regularly works with desktop publishing programs or *Touch-Up* will find IMGSHOW.PRG an invaluable aid. Having the ability to preview .IMG files is a real time-saver!

A Guided Tour

Touch-Up requires GDOS, which must be present in your AUTO folder on boot-up. The first thing the program does is look for the file INTROPIC.IMG, which is then displayed on the screen while the program initializes.

This provides you with your first opportunity to impress your friends. Any .IMG file named INTROPIC.IMG will be displayed, so all you have to do is rename the default file and rename the .IMG file of your choice—say, with your name displayed as the program creator—as INTROPIC.IMG, and henceforth, your custom image will be displayed during initialization.

The basic *Touch-Up* screen consists of the standard GEM menus across the top of the display area and a series of Icon Pad menus at the left of the screen (Figure 1). All commands can be accessed via either the drop-down menus or the icon pad. The icon pad can be hidden (Figure 2) or moved (Figure 3).

For those who prefer keyboard shortcuts, the manual also lists a a series of commands that can be invoked via Function or Alternate key combinations.

Documentation

Speaking of the manual, at 225 pages it provides a well-written tour of the capabilities placed at your fingertips by *Touch-Up*. Unfortunately, it doesn't have an index—an omission I personally find unforgivable in a program of this caliber. There is a detailed table of contents, which compensates somewhat for the lack of an index, but there will always be times when nothing but a good index will lead you quickly to the solution of a problem.

The manual does include some tutorials to help flatten the learning curve, but even with that help, I initially found it frustrating to work with. I am not a graphic artist; thus, I found myself wishing for a general discussion of the entire image creation process.

Because certain functions are available in more than one mode, they are described in more than one place in the manual. In some places, the manual does a commendable job of explaining these functions; in other places explanations are left incomplete, so you must hunt back through the manual to find the missing information.

I did eventually overcome these hindrances and master the various processes, but I would have become friends with the program much sooner if more hand-holding had been included in the documentation.

Even without the manual, the image display options are easy to figure out. They range from full screen (Figure 4) to actual size (1×) to 2× and 4× magnification.

Loading Color Images

Touch-Up loads monochrome images automatically, but color pictures must first be converted to black and white. The conversion processes, called *mapping*, range from simple to complex. The manual explains that "your choice of method will depend upon image complexity, image size, and the result you prefer." In other words, be prepared for some trial and error.

Among the factors that influence the

Figure 3. The Icon Pad can be moved to any convenient location.
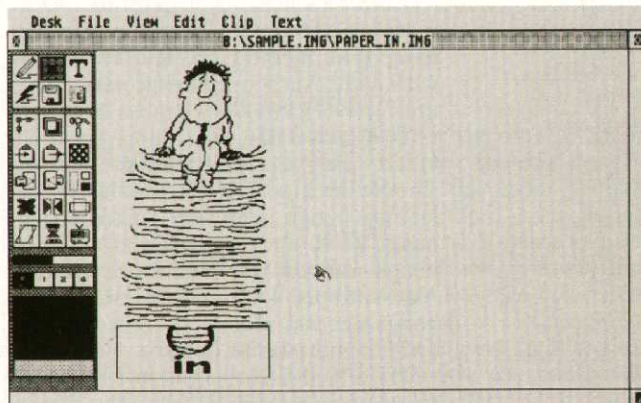
Figure 4. The full image can be displayed on the screen.
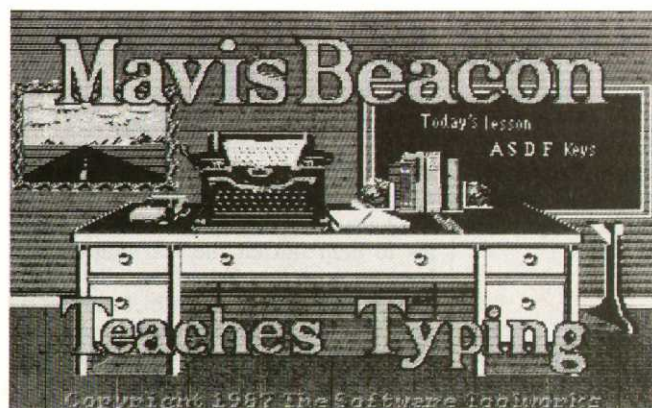
Figure 5. The full-color title screen of Mavis Beacon Teaches Typing has been converted using the Auto Map 2×2 Simple option and saving the image at 150 dpi.

Figure 6. The same image saved at 80 dpi. Note that an excess of horizontal and vertical lines makes the image less appealing.

Figure 7. Using Auto Map 4×4 creates a checkerboard background.

Figure 8. The Burke algorithm created this fuzzy image.

Figure 9. The Floyd-Steinberg algorithm created this fuzzy image.

conversion method you chooose is the resolution of your printer. For example, it would be inefficient to save an image with a printer resolution of 300 dpi if you are using a 9-pin dot matrix printer capable of only 120 × 144 dpi.

Another factor is the degree of intensity of the colors to be converted, i.e. subtle differences in color, such as four shades of blue, versus a cartoon-style image comprised of only six or eight bright, clear colors. The amount of memory available is also a consideration.

To illustrate the conversion varieties, I chose from *Mavis Beacon Teaches Typing* a lo-res *Degas* image that contained quite a few colors and fill patterns.

Colors can be mapped to black using the Simple option, which converts most colors to black. Auto (mapping) 2×2 employs a method whereby each pixel in the original image is converted into a 2×2 matrix or four pixels of information. Figure 5 illustrates the image that results from using Auto 2×2 and saving that image at 150 dpi; Figure 6 is the same converted image saved at 80 dpi.

Auto 4×4 maps each pixel to a 4×4 matrix or 16 pixels. In this particular case, that method created an image with a checkerboard background (Figure 7).

Two conversion algorithms are provided—Burke and Floyd-Steinberg. The Burke algorithm created a fuzzy-looking image (Figure 8). Saving this image at 80 dpi resulted in a 4″×2.5″ image—almost the same size as the Auto Mapped 4×4 image. (In my case, image size was often determined by my 1Mb memory limitation.)

The Floyd-Steinberg algorithm produced an image fuzzier than the previous example (Figure 9). This conver-
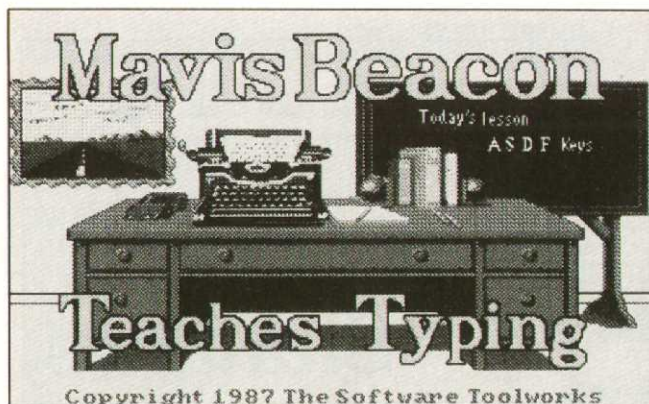
Figure 10. The title screen after the image has been loaded into Degas and the background color changed from blue to white.

Figure 11. A variety of brush strokes created in Lightning Mode.

sion also resulted in a 4″×2.5″ image when saved at 80 dpi.

Finally, I loaded my original snapshot into *Degas* and doctored the image, changing the background color from blue to white. Figure 10 is the result of using the Simple Map to Black method with the Some option enabled to convert the altered .PI1 file. Subtle color differences and complex colored fill patterns usually respond best to this method, which requires a bit more effort but produces an image very suitable for a newsletter-style printout.

Lightning Mode

Lightning Mode is actually a full-featured paint program within *Touch-Up*. While this mode limits the work area to the screen size, it provides other advantages that more than offset this minor restriction. Whenever I want to continue my work to an area not currently displayed on the screen, I simply exit Lightning Mode, reposition my image, and return to Lightning Mode to complete the job.

Because work done in Lightning Mode is initially stored in a buffer rather than pasted into the image as in other modes, you can feel free to experiment, relying on the Undo key to obliterate unsatisfactory results and restore your original if necessary. Fill pattern experimentation, for example, is best done in this mode, because it gives you a chance to correct leaks (unconnected lines in the image that cause the fill to bleed into other areas of the picture) without destroying your image.

Lightning Mode does its job quickly, too, because by limiting the work area to the screen size it eliminates the additional buffers required by the other modes. It also offers additional tools, including Spray and Lasso, that are not available in the other modes.

Parameter options for Spray include a round or square brush style with a choice of small, medium, or large brush tip. Spray saturation can be set at any of eight levels, ranging from 12% to 100%. You can even control the speed at which the paint flows from the can and create special effects by spraying with a fill pattern. Combinations of spray parameters that work well for you can be saved and made default settings.

You can choose virtually any style brush you desire. Simple brush types include ellipses, arcs, pies, boxes, and rounded boxes. B-spline curves can be created with up to 32 control points; Bezier curves can have four control points. Both curves have a maximum of 127 line segments, or 128 points, which is sufficient to avoid a jagged appearance.

The Lasso option further increases your brush style options, because any portion of any image displayed on the screen can be chosen as a brush design. In addition, virtually any object created within Lightning Mode can be used as a brush (Figure 11).

At first, I found this versatility somewhat disconcerting, confusing the choice of a brush style with what I expected to be an object creation tool. But once I became familiar with the possibilities, I was enthralled. A click of the mouse button gives me individually placed objects; holding the mouse button down while I move the mouse creates the sweeping brush strokes displayed in Figure 11.

For my work in desktop publishing, I use a large number of scanned images, and for me, the most useful tool in *Touch-Up* is FatBits (Figure 12), which

You can feel free to experiment, relying on the Undo key to obliterate unsatisfactory results and restore your original if necessary.

allows you to edit images a dot at a time. The actual image is displayed in the upper left-hand portion of the screen, so you can see how your changes are affecting the overall design. And if you don't like those changes, you can abort the entire operation and return to the original image.

Drawing Mode

Drawing Mode is the other mode in which you can create and edit images. Tools available in this mode include Fill, Box, Circle, Ellipse, Line Styles, Freehand Sketch, and B-spline and Bezier Curves. In addition, you will find the Inkwell, which sets the color used for drawing; Shadow (Figure 13), which offers eight angle of light choices and selectable shadow (by number of dots) offset; 36 fill patterns with resolutions of 75, 150, or 300 dpi; a Pen com-
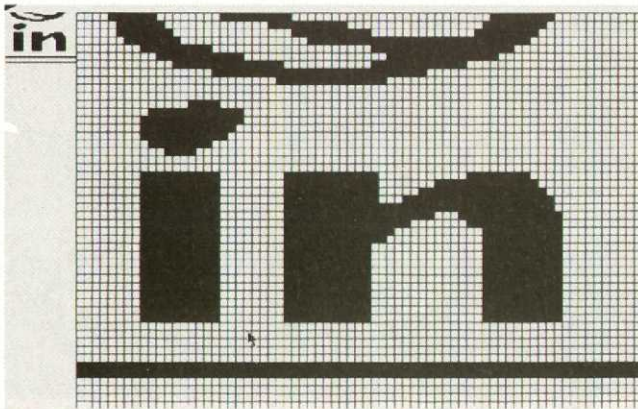
Figure 12. A FatBits close-up invites precise, dot-by-dot editing.
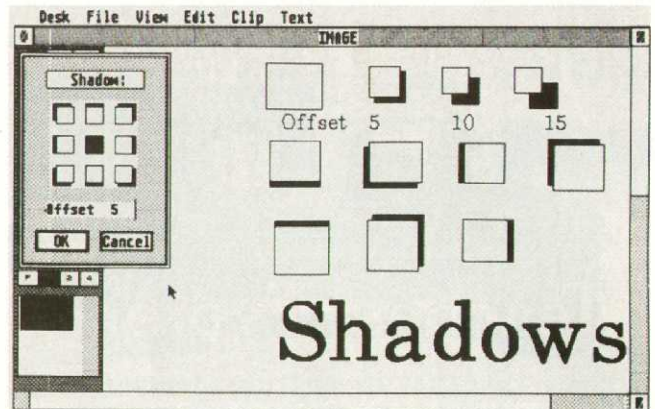
Figure 13. A variety of shadows can be created in Drawing Mode.
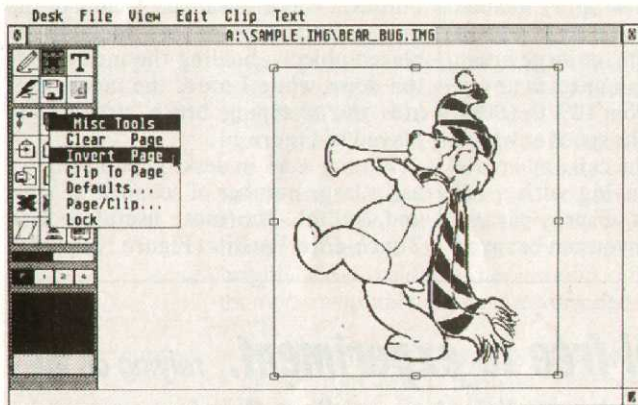
Figure 14. The Miscellaneous Tools menu.
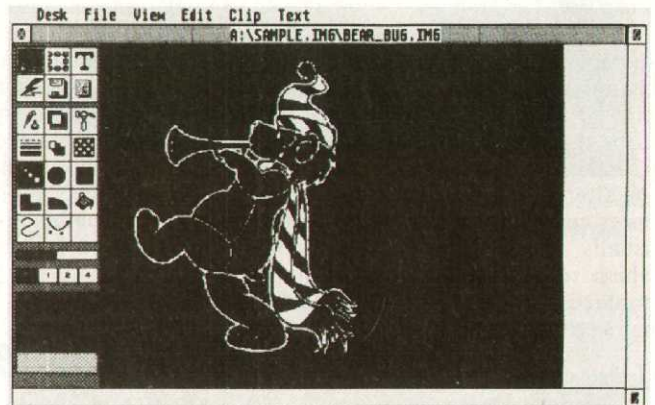
Figure 15. Inverting the colors on a page creates different effects and helps identify leaks.
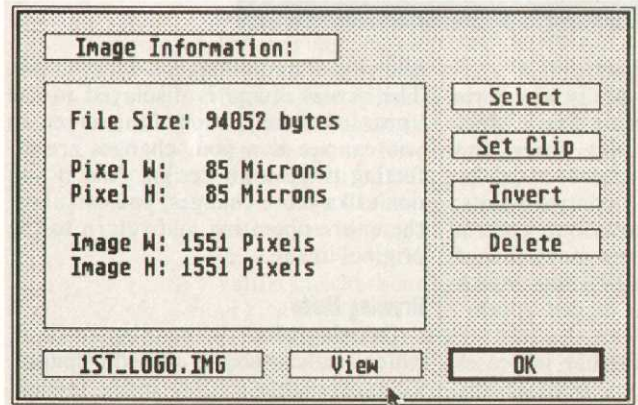
Figure 17. The .IMG Viewer lets the user preview an image before loading it into the program.
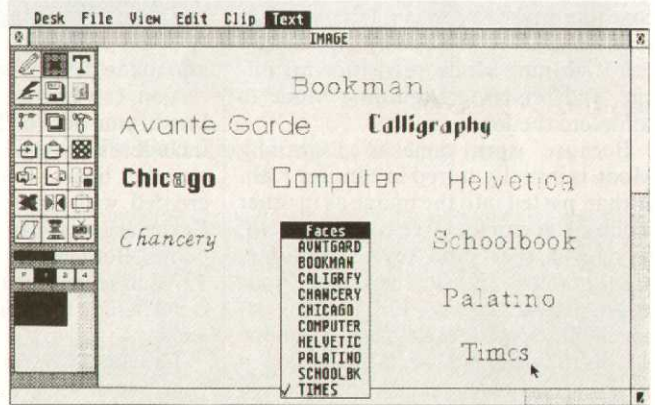
Figure 18. Text Mode offers a variety of useful fonts.

mand, which offers four possible point widths; Polyline, which is used for drawing any number of connecting straight lines; and Arc/Wedge, which is used for creating elliptical and circular arcs and wedges.

Clip Mode

Clip Mode is the option used to select a screen or any area of a screen for modification. Special effects you can employ include Flip—horizontally, vertically, or both; mirror—left, right, up, or down; and slant—horizontal or vertical. In addition, the Rotate command will rotate the clip area by 90 or 180 degrees.

The Process command includes a Cleanup tool, which eliminates stray dots from the clip area, and an Outline command, which outlines any black area of the image—a feature that is useful for altering the fill patterns in a picture. A Mask command allows you to alter fill patterns to create additional special effects.

The Miscellaneous Tools section contains a variety of frequently used tools (Figure 13). Clear Page does just that; it erases everything on the page. Invert Page reverses the colors in your image (Figure 14); this is especially useful for finding leaks prior to adding fill patterns.

Clip to Page automatically enlarges the clip box so that it encompasses the entire page, which is useful for special effects such as stretching the whole image. It also provides a quick way to clear the page. The Page/Clip menu option brings up the Page/Clip Information dialog box (Figure 16) from which you can choose the size and dpi of your image.

Clip boxes can also be used to move sections of the image and to replace the trash can. For example, I have several .IMG files made up of several scanned images on a page. Isolating the images is easy; I place a clip box around each one and save it as I go. If I want to isolate one part of an image and concentrate my work on it, I place a clip box around the unwanted portions of the image and delete them. (A large eraser is also available in both Draw Mode and Lightning Mode for erasing smaller areas.)

You an also create a clip box prior to loading an image. The proportions of the image can then either be preserved, which keeps the dimensions intact, or ignored, which distorts the image as it expands or contracts to fill the box.

The aforementioned .IMG slideshow program is a convenient way to preview an image before entering *Touch-Up*. If, however, you need to view an image while using the program, you can use the .IMG Viewer command available in Clip Mode (Figure 17).

While this option does not always display a true on-screen representation of the image, the display is sufficient to give you an idea of which filename corresponds with which picture, thus eliminating a lot of guesswork. The .IMG Viewer also tells you the size of the file and the image. A clip box can be preset from within the viewer to ensure that the image isn't distorted when it is loaded. .IMG files can be deleted, if unwanted, or loaded directly into *Touch-Up* or into the presized clip box, which is the

Figure 16. The Page/Clip dialog box reveals data about the size and dpi of the image.

suggested way to merge images onto a page.

Text Mode

Text Mode allows you to create text using scalable outline fonts, which can be filled with patterns (Figure 2). You can have up to 35 characters in a text line, and your characters can be anywhere from 1 to 999 dots in height. Text styles include normal, outline, italic, bold, light, backslant (reverse italics), filled, underlined, and fat. Fonts are Avant Garde, Bookman, Calligraphy, Chancery, Chicago, Computer, Helvetica, Palatino, Schoolbook, and Times (Figure 18).

File Mode

The fifth active mode, File Mode, is used for loading, saving, and printing files.

The Print option from within *Touch-Up* is enabled only for systems with 2Mb or more RAM, so I was unable to

test this feature. *Easy-Draw* users will be familiar with the alternate print feature, Outprint. *Touch-Up* saves a .GEM file along with the graphic files created, enabling images to be printed with the stand-alone program.

Images printed in this manner are placed dead center on the page, so it is not the most cost-effective way to paper archive your work. It is, however, more convenient than entering another program, combining several images on a page, saving that work, and then printing out the result.

Outprint also maintains the size of your image in the printout.

Extras

The program files disk contains a folder called Extras, which contains the README.DOC files with provide updates to the manual. It also contains MOUSDBLR.PRG, a mouse doubler program, which doubles the movements of your mouse in both directions in hi-res or in the X direction in medium-res.

Touch-Up includes printer drivers for only FX-80 and LQL-800 printers. Additional printer drivers for the HP LaserJet, HP DeskJet, and Toshiba 24-pin printers are available from Migraph. The HP drivers cost $24.95; the Toshiba driver, $12.95.

The sixth program mode, Scan Mode, is disabled in the current version. When implemented, it will allow images to be scanned and edited into *Touch-Up*. Migraph has not yet released information on which scanners will be compatible.

If you would like a demonstration of what *Touch-Up* can do, you can obtain a demo disk. Prepared and released by Migraph, this slideshow provides additional details on the program functions. You can get a copy from most user groups or by sending $5 to Current Notes, 122 N. Johnson Rd., Sterling, VA 22170.

This has been a difficult review to write. Not because the program is difficult to use—quite the opposite! I just hated to quit working with *Touch-Up* long enough to write about it. I kept finding one more thing I wanted to try—some other area of the program I wanted to explore—before setting it aside to write the review.

I have spent many hours with the program and expect to spend many, many more, so I feel qualified to assert that anyone who does any desktop publishing whatsoever should buy *Touch-Up*. ∎

Reviews of some great and not so great new games

Alien Syndrome

First of all, you should know that even though Mindscape distributes *Alien Syndrome* in the U.S., Sega of America has retained the responsibility for registering warranties, etc, which indicates to me that Sega has more than a passing interest in this conversion of one of their popular arcade coin-ops.

As the game begins, you find yourself in the unenviable position of having to rid your own spaceship of an alien infestation. The decision to destroy the ship has already been made, but the countdown has not yet reached zero, and there is still time to save the people on board.

Alien Syndrome is like several other ST adventures, including *Gauntlet* and *Time Bandit*, in that it uses a multiscreen, multi-directional scrolling technique to present the inside of the spaceship. In other words, the area available to you is much larger than the initial screen presented on the ST monitor. With a joystick (or for a two-player game, a combination of keyboard and joystick or two joysticks), you control your on-screen character simply by moving the stick in any of the eight possible positions.
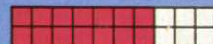
EASE OF LEARNING
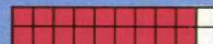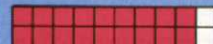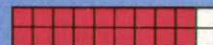
CHALLENGE

GRAPHICS

DOCUMENTATION
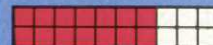
OVERALL RATING

System: Atari ST
Required equipment: Color monitor; joystick(s)
Copy protection: Yes
Summary: Exciting shoot-'em-up; arcade conversion
Price: $39.95
Distributor:
 Mindscape
 3444 Dundee Rd.
 Northbrook, IL 60062
 (312) 480-7667

To destroy the aliens, a press of the joystick button fires the current weapon—vertically, horizontally, or diagonally.

In Round 1 of *Alien Syndrome*, you are attacked by grub-like aliens and their offspring. The grubs are large and can be easily dispatched, while the

Bobo

Europe is currently the source of much of the new ST game software being introduced in the U.S., and one of the most recent additions to the roster of importers is Terrific Software, with *Bobo* from Infogrammes.

Based a European comic character, the game requires players to guide Bobo, a prisoner, in six of his prison activities. Each activity can be done separately, or all six can be tied together and played in sequence.

Three of the activities concern his duties within the prison. One finds him serving porridge to impatient inmates. If he takes too long, his fellow lodgers will dump his pot on him and end the sequence. Another kitchen task requires Bobo to peel potatoes, racing against time and a seemingly endless flow of unskinned spuds.

His third challenge is to keep the hallway clean enough to pass the warden's surprise inspections. Unfortunately, Bobo's fellow inmates are none to fastidious, and the task often seems insur-
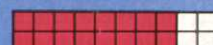
EASE OF LEARNING
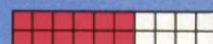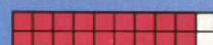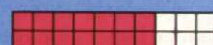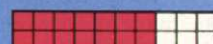
CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST
Required equipment: Color monitor
Copy protection: Yes
Summary: Great graphics and a variety of tasks aren't sufficient to make this arcade game a winner
Price: $29.95
Manufacturer:
 Terrific Software
 544 Second St.
 San Francisco, CA 94107
 (800) 234-7001
 (415) 957-0886

mountable.

The next two activities involve the inmates' attempts to escape from the prison. First, Bobo must carefully ma-

young'ns are smaller and require more care in aiming.

These grubs don't exactly look like rocket scientists, but they are, in fact, quite intelligent, and even on this first level, their peregrinations are unpredictable. This lack of predictability makes the game more interesting; the only things you can count on not to change from one game to the next are the locations of the human hostages and the more powerful weapons.

Some of the grubs like to attack blindly, while others seem, at first, rather cowardly but then strike when you are otherwise engaged. Also, the kamikaze grubs produce dumb kiddies, while the cowardly grubs spit brats that pursue your character relentlessly.

The attention to detail inside the ship is very realistic and enhanced further with each round as your view changes to a different location within the spacecraft. With each new round comes a new kind of alien for you to conquer, and it is nice to be able to report that the 68000 microprocessor handles all this activity easily, so fluid animation never bogs down.

The only real complaint I have about the graphics is that the horizontal scroll jumps, instead of moving smoothly as the vertical scroll does. This distracting "feature" diminished my enjoyment of the game and is the sole reason for my rather tepid rating on graphics.

Finally, the sound effects add a great deal of realism to the contest, from the digitized warning, "The bomb has been set," to the excellent explosions. The heart-pounding musical background can be turned off but not without eliminating the other nice sound effects. Actually, the music creates an atmosphere of tension that enhances the experience.

Even though there are only four levels of difficulty, each one is a significant challenge—even for the arcade fanatic. You will quickly find yourself caught up in the game, adrenaline flowing, palms sweaty, and your joystick locked in a death grip. *Alien Syndrome* is a great conversion; I look forward to future releases from Sega. —*Frank Eva*

neuver a trampoline to send jumping prisoners flying over the guard wall. Then we find him racing along the electrical wires in his own attempted escape. Finally, after he is recaptured, Bobo settles down for a night's sleep only to find five snoring bodies in his cell. Only by settling them down can he get the rest his body so desperately needs.

The graphics and animation through which Bobo's adventures are presented are outstanding. Even though they are not the most detailed I have seen, their cartoony appearance makes them some of the best currently showing on ST screens. Each activity also features its own separate tune, which provides a pleasant musical backdrop for play.

The joystick provides an effective, but occasionally awkward, control for game action, and the game does take advantage of the second floppy drive, which is a plus.

On the negative side, the game does not seem to have been completely converted for U.S. hardware. Some of the keys are transposed, so some experimentation can be required when entering a name. The Escape key does not work as advertised, and you can't return to the main screen after playing a single sequence without resetting the computer.

Nor does the play action maintain its appeal after many games. Even though six different tasks are required, none is very difficult, so they can become boring after a bit of play. In the end, the fantastic graphics and animation in *Bobo* are not quite sufficient to rescue it from its repetitive themes. Be sure to try this one before you buy it. —*R. Bradley Andrews*

Fire and Forget

EASE OF LEARNING	
CHALLENGE	
GRAPHICS	
DOCUMENTATION	
OVERALL RATING	
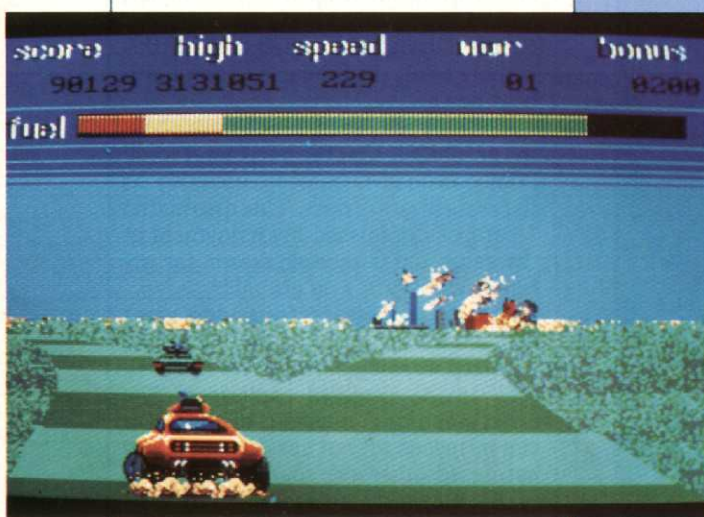
In *Fire and Forget* by Titus software the Earth has been overrun by terrorists, and you have the only means of salvation. Available for your use is the high powered and heavily armed Thunder Master, a tank with a V16 triple-turbo engine and tetranuclear propulsion missiles. Also available, for a friend's use, is the Thunder Cloud, an armed aircraft that flies along above the Thunder Master to provide additional firepower.

Each of three conflict levels in the game features six trouble spots that you must pacify by successfully driving your Thunder Master between the two bases in that area. Assorted obstacles hinder your progress. Passive ones—boulders, blockades, and mines—are randomly strewn about the road, daring you to pass too close. The more active ones—tanks, fortifications, and helicopters—actually shoot at you and can ruin your whole day. Your fuel supply is drastically diminished each time you are hit, so even though a hit does not end the game, it is important to avoid your opponents' shots.

Both vehicles use large amounts of special Omega-Kerosine fuel. Fortunately, you will find cones of this fuel scattered along the way to the second enemy base. Each cone contains enough fuel to refill the tanks of either the Thunder Master or the Thunder Cloud. The game immediately ends if both vehicles run out of fuel.

The game lives up to its name—you are forced to fire a shot and then immediately forget about it as you focus on yet another threat to your ship. This frantic pace is one of the shortcomings

System: Atari ST

Required equipment: Color monitor; joystick optional

Copy protection: Yes

Summary: A frustrating, strategy-free shoot-'em-up

Price: $39.95

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

of the game; the only strategy seems to be to shoot and move as rapidly as possible, hoping to avoid destruction.

The other deficiency of the game is the complete randomness of the placement of the fuel cones. Often, a large number of cones will appear at the beginning of your run; then the landscape will be barren for a long time, causing you to run out of fuel through no real fault of your own.

The graphics and sound in *Fire and Forget* live up to the standards set by Titus Software. The obstacles and enemy vehicles are all rendered in detail and provide a good backdrop for play. Digitized sound is used effectively, improving the audio quality of the explosions and other actions that occur during the game.

While this game is definitely not for the easily frustrated, ST owners who like to relax with a little mindless competition will probably enjoy it.

—*Brad Andrews*

Downhill Challenge

Experience the thrill of victory and the agony of defeat; with Broderbund's latest entry in the Sports Challenge series, you can do both without leaving the comfort of your computer room or risking bodily injury.

Downhill Challenge comes with a 12-page instruction manual, which mistakenly assumes that everyone knows everything there is to know about downhill skiing. It states, for example, that four different events are included—Slalom, Giant Slalom, Downhill Skiing, and Ski Jumping—but offers no explanation of what skills are required to succeed at each.

Although the documentation does tell you how to use the keyboard or a joystick to control your on-screen counterpart, you are told little else. For example, in the ski jumping competition, which is probably the most difficult of the four events, you are not told that the side view does not appear unless the trigger button is pressed. Nor is the scoring system or the difference between "split time" and "elapsed time" explained.

So, now you know why *Downhill Challenge* rated only an average score for documentation. But don't worry; it's all uphill from here.

Another of Broderbund's sports challenges, *Superbike Challenge* had graphics that made the ST conversion look like a direct import from the colorless world of the IBM. Thankfully, *Downhill Challenge* lacks this port-from-a-less-capable-computer look; the game appears to have been tailor-made for the ST. The colors are very realistic, and the background is artistically detailed.

The implementation of multi-direction split-screen scrolling is quite impressive. The upper portion of the screen scrolls left and right with the movement of the skier. The lower portion not only displays the course, a la *Pole Position* but also scrolls up and down, simulating hills and valleys. The entire effect is brought off with speed and grace.

Finally, the animation of the skier is accurate and amusing, especially when an accident occurs and he winds up rolling into a ball of snow. Another nice touch is the shadow the skier throws on the snow.

The sounds are not digitized, but they do give the feeling of skis on snow. I especially like the sound made when a skier lands after shooting a hill—very

realistic.

As many as six players can compete at once, or a single player can compete against the computer. And it's nice to see that the *Downhill Challenge* computer player is fallible and can be beaten. The computer opponent in many sports games is so talented that playing against it becomes an exercise in frus-tration.

The use of the joystick in *Downhill Challenge* is intuitive; it does not re-quire physical gyrations to control the on-screen skier.

The game does save high scores to disk B, but only the top three can be displayed at any time. There are two modes of play—Training and Competi-tion—and three levels of difficulty.

Because the number of modes is lim-ited, it is difficult to predict the long-term appeal of this game. Suffice it to say that *Downhill Challenge* will surely please armchair athletes, and may even entertain the arcade enthusiast looking for pleasant change from shooting up the galaxy.
—*Frank Eva*

Crash Garrett

EASE OF LEARNING
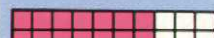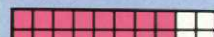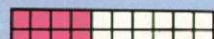
CHALLENGE

GRAPHICS

DOCUMENTATION

OVERALL RATING

System: Atari ST
Required equipment: Color monitor
Copy protection: Yes
Summary: Slightly off-the-wall graphic adventure
Price: $29.95
Distributor:
Terrific Software
544 Second St.
San Francisco, CA 94107
(800) 234-7001
(415) 957-0886

Prospective purchasers, please note the address listed in the accompanying "report card," because this imported package includes a warranty card that has no U.S. address. (The warranty itself is printed in French.) I hope this is not because the U.S. distributor, Terrific Software, doesn't want to be responsible for returns. I'm not saying that this product is defective, but it is nice to know that a disk that goes bad, can be replaced by English-speaking fellow countrymen.

Crash Garrett purports to be based on "the very popular Arbeit Von Spacekraft movie by the same name." Now, I don't know about you, but I have certainly never heard of any such movie.

This is unfortunate, because the sparse documentation seems to assume familiarity with the film and makes many references to it. For example, "This game, based on the Arbeit Von Spacekraft film, is the perfect demonstration of this principle. (If you've seen the movie, don't worry: the game's got a few surprises in store!)."

Then, a really nice storyline is alluded to, only to be sullied by a silly sub-plot. You find out that Garrett is a reformed criminal, who is now sole owner and pilot of an air transportation service that ferries Hollywood celebrities around the country. The game is set in the late 1930's, and Nazi spy and sabotage networks are being established right here in the good old USA.

You begin to think that your mission will be to expose the Nazi plot and put an end to the threat. But then this overworked sub-plot is thrown in: Garrett has had a voice in his head ever since he was injured in an accident. You are the voice, and one of your objectives is to discover who or what the voice is and

where it comes from! I'm sure any avid adventurer will be able to count at least a half dozen games that have already exploited this type of plot. Furthermore, the documentation provides no other real information about your purpose in playing the game, noting just that "other objectives will become clear during the story."
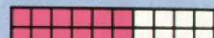
Crash Garrett does use some nice new graphic touches that set it apart from other similar adventures. For example, even though it boots up in the 16-color low-resolution mode, a special medium-resolution font is used to print text to the screen. It is printed, one character at a time, to a five-line box at the top of the screen and into thought/speech balloons.

These balloons issue forth from pictures of the characters that are so clear they appear to be digitized. (Some of them even seem to be taken from real-life characters; Garrett looks surprisingly like Arnold Schwarzenegger, and Mongrel the Mechanic, like Gene Hackman.)

Furthermore, Garrett himself changes expressions, based on the mood of the moment. He looks quizzical when he can't understand a command; angry when he thinks you are wasting his time, etc. When the picture of a character is no longer needed, it either scrolls off the screen or dissolves pixel by pixel.

Actually, what we have here is an animated comic book. When Garrett punches an adversary, a fist icon scrolls out of the center of the screen and touches the enemy. The word BAM then appears onscreen—just as in the old Batman television series.

The backgrounds are decent but not exceptional. A box at the right-hand side of the screen holds and displays

your current inventory.

The parser for *Crash Garrett* is definitely sub-standard compared with parsers found in other high-powered ST adventures. For example, only one action can take place at a time; you can not pick up two objects without specifying each individual action separately.

Also, the language barrier rears its ugly head from time to time. Commanding Garrett to "fly" somewhere, for example, does not always produce the desired result, but typing "run" causes him to climb into his plane and fly away.

Furthermore, if it is not the right time for a specific action, even though Garrett is capable of carrying out the action, he won't be able to do it and you will get an obtuse response, such as "That's not unusual or mysterious."

A few nice features are also worthy of mention. The opening title screen is accompanied by a nice digitized big band theme song. During play, other appropriate sounds are provided.

You can load and save a game in progress from or to a blank formatted disk, but again the language barrier pops up, replacing "load" with "game" and "save" with "disk."

Adventurers who are familiar with adventures by Magnetic Scrolls will surely wish for more background in *Crash Garrett*—perhaps a mini-novel based on the movie—and a more thorough explanation of acceptable commands.

Players lucky enough to have actually seen the movie (are there any of you out there?), will find *Crash Garrett* an amusing novelty.
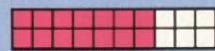
To those who fall between the cracks, I say, "Good luck with *Crash Garrett.* You'll need it!"
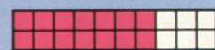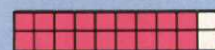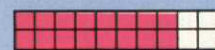—*Frank Eva*

Techno-Cop
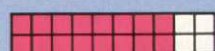
EASE OF USE

PERFORMANCE

ERROR HANDLING

DOCUMENTATION

OVERALL RATING

System: Atari ST

Required equipment: Color monitor; joystick

Copy protection: Yes

Summary: Futuristic cops-and-robbers caper

Price: $49.95

Manufacturer:
U.S. Gold
P.O. Box 8020
Redwood City, CA 94063
(415) 366-0606

Techno-Cop actually combines the best features of several games into a single highly addictive package that has few faults.

As the game begins, you assume the role of a techno-cop, in a futuristic society ruled by crime mobs, referred to as DOA (death on arrival). You are armed with technologically advanced electronics and weapons and equipped with a souped-up police car, the VMAX. Throughout the game, you receive assignments to apprehend or eliminate certain kingpins of DOA.

The game begins with the techno-cop cruising along a highway in a scene reminiscent of *Pole Position* and *Outrun*. The road scrolls smoothly toward the car, simulating forward movement. Even the trees and road signs scroll past very gracefully. The distant background does not move left or right very much, but it does scroll up and down when the program is attempting to simulate driving up and down hill.

The VMAX itself and the other cars, trucks, and motorcycles on the road are all highly detailed and well animated. Initially, the VMAX is equipped with a machine gun that can fire forward. The shots smoothly change size, again accurately depicting movement away from their source. The attention paid to detailing the vehicles will truly be appreciated. Color is also used very nicely to simulate three dimensions; pipes, fins, and weapons are all displayed clearly and artistically.

Inside the VMAX and displayed in the bottom half of the screen is a view of the dashboard. Readouts of RPM, speed, gear, and video communications are displayed, again, with an artistic flair for realism.

Sound effects are also very realistic—from the engines revving through their gears to explosions and the digitized cries of fallen antagonists.

The DOA vehicles actually seem to carry intelligent mobsters, for they do their very best to run the VMAX off the road. Time and operational efficiency are both factors that contribute to your success, so being side-swiped and forced off the road can be detrimental to any operation in progress.

Once you receive a communication from headquarters, you have a set period of time in which you must arrive at the scene of a crime. Get there on time, and you can earn a promotion or an improved weapons system. Arrive late, and you forfeit the goodies but must pursue the villain anyway.

The joystick is used very logically in controlling the VMAX. The button is used to fire the current weapons system. In addition to the machine gun, you can qualify for a turbo charger, hydraulic wheel rams, rapid-fire cannons, and even nuclear bombs.

A bulletin from headquarters consists of a warrant (text) and a mugshot of the criminal specified in the warrant. The mugshot is done so well that it resembles a digitized black and white photograph. Not that it is essential in identifying the criminal when he is eventually found; that is done by other sophisticated gear that the techno-cop has strapped to his left arm.

When you reach the scene of the crime, the car pulls off the road and stops. You are prompted to insert disk B, and one of 11 tenement buildings is loaded into the computer. From here on, you control techno-cop. The view of the VMAX dashboard is replaced by a view

of the sophisticated gear strapped to your left arm, and the tenement builing scrolls into view at the top of the screen.

The joystick is used to move techno-cop left/right and up/down (via elevators) and to make him crouch/stand. Again, pressing the button activates on of the current weapons systems, of which there are two—an .88 Magnum and a restraining net.

If a warrant says "dead or alive," you can use either weapon. If it says "apprehend," only the net can be used to complete the scenario properly.

By the way, the gore really flies when a baddie gets dusted. So parents may want to check this game out before allowing youngsters to play.

Since the only inkling of difficulty levels is the existence of 11 tenement buildings, it is difficult to judge the long-term appeal of the game. *Techno-Cop* is, however, highly addictive and with all of the possible play mechanics, it should be quite a while before you improve your rank from rookie to techno-cop.

The game, while copy-protected, does allow you to save the top scores and rankings to disk B.

The only real negative aspect of *Techno-Cop* is the fact that disks must be swapped—not just at the beginning of the game, but each time you enter a new phase of play. I can only hope that 1040ST owners will eventually be able to qualify for a double-sided upgrade at a reasonable cost.

Techno-Cop will appeal primarily to arcade purists, but a limited amount of strategy must also be used, making the game somewhat appealing to adventurers, especially those with a secret love for a good shoot-'em-up —*Frank Eva*

RoadRaider
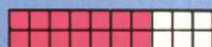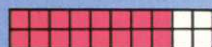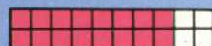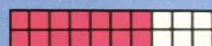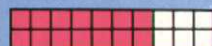
EASE OF LEARNING	▰▰▰▰▰▰▰▰□□
CHALLENGE	▰▰▰▰▰▰▰▰▰□
GRAPHICS	▰▰▰▰▰▰▰▰□□
DOCUMENTATION	▰▰▰▰▰▰▰▰▰□
OVERALL RATING	▰▰▰▰▰▰▰▰□□

Required equipment: Color monitor; joystick

Copy protection: Yes

Summary: A challenging, frustrating game of survival

Price: $49.95

Manufacturer:
Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
(312) 480-74667

Mad Max strikes again in *RoadRaider*. It seems that several years ago, Dr. A. Noid developed a food substitute called slu, the most addictive substance known to man. After the first bite, any person who tries slu is forever driven to find more.

The proliferation of this dangerous foodstuff caused the Great Biological Holocaust, and now only a few cities remain intact. Mutant hordes control the rest of the landscape.

Since the holocaust, your skills as a bounty hunter have gone untapped. No

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Lost in Las Vegas is the sequel to the popular *Deja Vu: A Night-mare Comes True*. The classy case features a 3D plastic insert of the main character, Ace Harding, an unlucky private detective.

As the story opens, you have just been acquitted of the murder of a notorious Chicago racketeer, Joey Siegel, who had been running the Chicago operation for Tony Malone, an equally notorious mobster from Las Vegas. Siegel's untimely demise left $112,000 of Malone's money unaccounted for, so you quickly find yourself at the top of Malone's most-wanted list.

Malone has kidnapped you and brought you to Las Vegas, where he has presented his final ultimatum: Cough up the $112,000 or face the music!

That the *Deja Vu* series was programmed first for the Macintosh and then ported over to the ST is all to obvious. The Mac, of course, features a high-resolution black and white display that offers 80 columns of text. To take advantage of the superior color capabilities of the ST, the programmers elected to use the lo-res, 16-color mode. While this makes *Deja Vu II* very colorful, it reduces the text to 40-column mode, rendering the display of long sections of text quite slow. It's really too bad that a hi-res version is not available for use on monochrome systems.

Other than this minor complaint,

Deja Vu II: Lost in Las Vegas
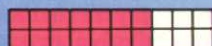
EASE OF LEARNING	▰▰▰▰▰▰▰▰□□
CHALLENGE	▰▰▰▰▰▰▰▰▰□
GRAPHICS	▰▰▰▰▰▰▰▰□□
DOCUMENTATION	▰▰▰▰▰▰▰▰▰□
OVERALL RATING	▰▰▰▰▰▰▰▰□□
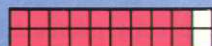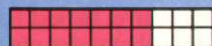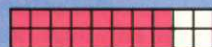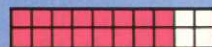
System: Atari ST

Required equipment: Color monitor

Copy protection: Yes

Summary: Icom presents a new graphic adventure with an impressive interface

Price: $49.95

Manufacturer:
Icom Simulations
648 S. Wheeling Rd.
Wheeling, IL 60090
(312) 520-4440

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

one is interested in having slimy mutants hauled in, and your business has dropped off to nothing. But recently you learned that the evil doctor is on the loose, with a large bounty on his head. So you have decided to forsake the relatively safe confines of your city in an attempt to bring this man to justice and earn a nice profit in the process.

Your mission leads you through three cities, which must be conquered in succession. You must find the hidden arena pass and then face off with the city's nastiest drivers in a demolition derby from which only one car will emerge. Success in the first two arenas provides access to the other cities, and Dr. Noid himself awaits you in the final arena for a fight to the death.

You are well equipped in this mission. Your ATV sports a high-powered gun, 50 cannon shells, and a built-in ram-car. You must use the gun to obliterate the opposing cars and the rubbish that blocks your path through the city. You can then call on the ram-car to clear the arena of opponents.

Many valuable items, ranging from food to better personal weapons and a powerful radar system for your ATV, have been left lying around in the old warehouses and stores in the cities. To collect these valuables, however, you must alight from your vehicle and proceed on foot.

Food, the only remaining currency, can be used to purchase goods and services at gas stations. From bullets and fuel to overhauls, these remnants of an earlier civilization offer nearly everything you might want.

The graphics in *RoadRaider* hold their own against current ST standards. In views of the streets, shops, and arenas, you can see your vehicle or body from overhead and a status display at the bottom of the screen. The joystick controls the action in two separate modes, but you will need a great deal of practice to master either one.

Frequent disk accesses during play make the game quite slow. Fortunately, you can use both drives on a dual-drive system to eliminate the many disk swaps required during a normal game. You can also save one game in progress, so you can work your way through the game over a period of time.

And time is what you will need to complete the game successfully. As mentioned, the controls can be difficult to master, and you will probably spend several hours in the first arena alone before you figure out how to destroy your opponents *and* avoid falling into the bottomless pit.

The copy I had froze up during arena play several times, requiring a frustrating reboot of the computer.

RoadRaider is a game with a lot of potential. It provides an enjoyable framework, requiring both arcade skill and strategic planning to complete, but my enjoyment was diminished significantly by the amount of time I spent waiting for disk accesses and the speed with which death overtook me in the arena. —*R. Bradley Andrews*

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there is little wrong with *Deja Vu II*. I experienced some difficulties with the save and restore function, occasionally bombing all the way back to a locked desktop, but, other than that, *Deja Vu II* is a slick product.

It is certainly not your average graphic adventure. The interface, for example, makes the keyboard almost obsolete; the only time you have to type is when you want to speak with one of the other characters in the story.

The screen is divided into a several zones, so the windowing capabilities of the ST play an important role. Movable, resizable windows are displayed on the left and right sides of the screen. One displays the current inventory; the other shows the available exits.

A scrollable 40-column text window appears at the bottom of the screen. The window in the center of the screen displays nicely drawn 16-color illustrations of story locales.

Above this is an alternating dialog box/button panel. The dialog box is used primarily when there is more text than can fit in the text window, in which case it says Click to continue. After you click, the button panel appears, offering the following commands on separate buttons: examine, open, close, speak, operate, go, hit, and consume. Clicking on one of these buttons, in combination with another object produces just about the entire gamut of normal text adventure commands—minus the typing and the frustration that a temperamental parser can cause.

In addition to the nice illustrations, Icom has thrown in some minor animation. A dealer actually deals cards at the blackjack table; the train pulls in to the station; a bird flies across the screen. These touches add interest to the game, but must be loaded from disk the first time they appear, so they do slow the game down somewhat.

A really nice feature is the sound effects. These are not just white noise; they seem to be actual digitized sounds. And if they aren't digitized, then they come just about as close to the real thing as I have ever heard in a synthesized sound.

It is hard to judge the overall difficulty of an adventure game, but from what I've seen, I would have to say that *Deja Vu II* lies somewhere between moderate and difficult. Speaking to the various little computer people you encounter is the most difficult aspect of the game—and seldom results in anything very helpful.

There are many dead ends and many ways to get yourself killed, so be sure to use the save feature; the availability of the standard GEM file selector makes it easy to save and restore games.

Dedicated adventurers—particularly those who enjoyed the original *Dega Vu* will enjoy this sequel.—*Frank Eva*
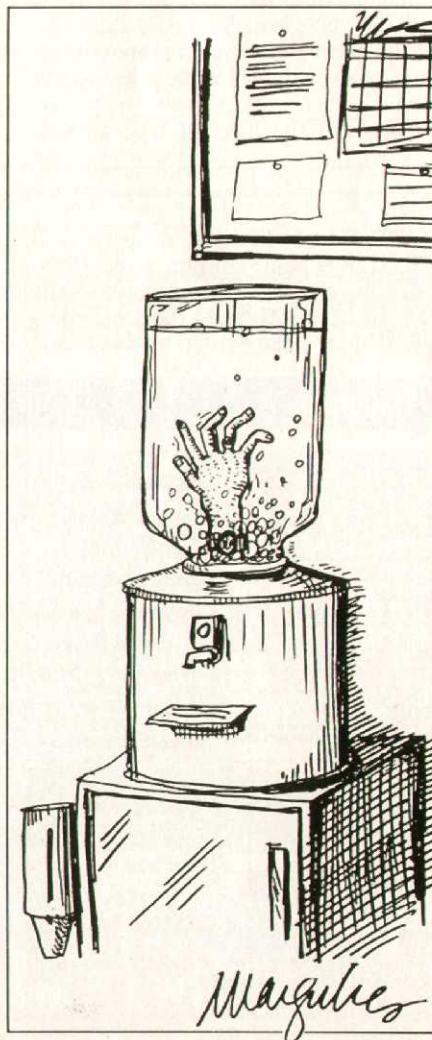
Orbiter
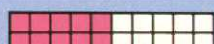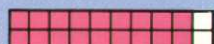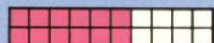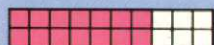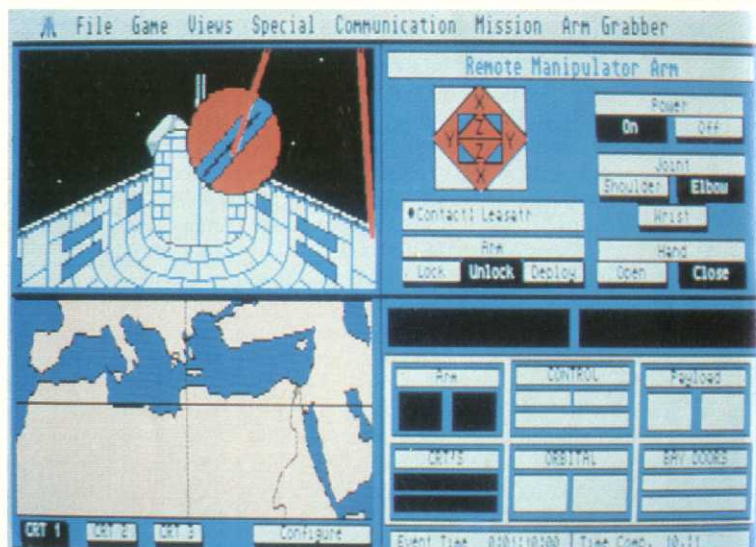
My first taste of a simulation was an Atari product that allowed the computer user to manage a nuclear reactor. It took about ten minutes to load into my 32K Atari 400 from a cassette tape player. And the management of that power plant would probably have been happy to see me go, for the plant experienced more than its share of melt-downs while I was at the helm.

Gone are the days of true simula-tions, which were often too difficult to really qualify as entertainment. We now have fine new-style simulations, such as *Silent Service*, which offer computer users the opportunity to participate in a real life drama—and enjoy it. In this fine tradition comes a new entry, *Orbiter* by Spectrum Holobyte.

The nice thing about *Orbiter* is that you can take a walk-through training mission that follows the manual step by step. You are even prompted to pause

the game at specific points and consult the manual.

The first screen, a full view of the forward main station can be seen only at the beginning of each new game. Once the game starts, the screen is divided into four quadrants, three of which can display a required sub-station, a view outside the shuttle, or a map. The fourth quadrant always displays either the forward main station or the aft main station.

The Activision UK conversion of the popular coin-op game *Rampage* turns the tables on arcade enthusiasts who assume that their mission is to save the planet, solar system, or universe. In this game, you play the mutant monster—George the Gorilla, Lizzie the Lizard, or Ralph the Werewolf—whose task it is to destroy as many buildings and eat as many people as possible.

One of the best and most unusual features of *Rampage* is that up to three people can play at one time, so you can create real havoc as you and your

Rampage
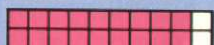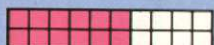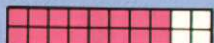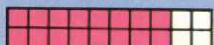
During the training mission, you must deploy a Hubble Telescope, and even though the mission is just for practice, a few random events are thrown in to keep you on your toes. For example, I'm embarrassed to report that I allowed an electrical fire to burn in the cargo bay, and all lives were lost. I just couldn't remember which sub-station would allow me to activate the extinguishers!

Compressed time is another nice function. Several degrees of compression are available, including one that actually slows down real time. All options are readily available from the menus.

Orbiter can be configured for three phases of operation—launch, orbit, and landing—in each of five missions—training, satellite repair, rendezvous, satellite deployment, and Mission Control's choice (a random selection).

Orbiter also features synthesized sound. I opted for the condensed speech option, because the full implementation was difficult to understand. The volume of speech is programmed rather low, and turning the monitor up adds a lot of noise that can be distracting. To enjoy the full effect of the speech, plan to play in a very quiet room at a time when other distractions will be limited.

All functions of the orbiter are available from keyboard or mouse, but mouse entry can be painstaking and slow. To save time, you can enter commands for running certain tests and functions directly from the keyboard, using abbreviations and number codes.

Starting thrusters can be as simple as clicking on a Start button. At times, however, you must watch a specific readout for proper positioning of the shuttle; for example, you must be at a particular angle to initiate re-entry. This is accomplished, also quite simply, by clicking again on the Start button, effectively extinguishing the already started thrusters, once the correct position has been attained.

A monochrome monitor actually enhances play, because most of what you need to see is text readouts. The higher resolution improves legibility, but not without a price. You must be willing to send disk 2 and an additional $12.50 to Spectrum Holobyte to obtain the monochrome version.

All things considered, *Orbiter* is a profound simulation that will challenge the best ST gamers, while providing much needed diversion from blasting aliens.

— *Frank Eva*

friends tramp through the city, scaling buildings and eating everything in your path—turkey, toast, berries, and even *homo sapiens*.

The cities that appear on your screen are made up of from one to eight buildings; your goal is to demolish them all. Needless to say, the armed forces and police are not pleased by your king-sized vandalism. Their counter-measures include snipers in the buildings, tanks on the ground, helicopter gunships in the air, and a demolition expert assigned to blow up whichever building you are standing on.

Every hit these commandos succeed in landing diminishes your stamina, and when your stamina is gone, you revert to human form—*naked* human form . . . oh, the embarrassment!—and scurry off the screen to escape the predations of other monsters, who now consider you fair game.

The programmers who translated *Rampage* into the ST format did a terrific job; the game is good for hours of fun. The three-player option is especially exciting, because it offers the additional possibilities of team-destruction and beating on your fellow monsters.

The only drawback to three-player play is that, while two players use the joysticks, the third must control his monster via the keyboard, which can be difficult. But if you know a gamer whose hand/eye coordination is equal to keyboard control, you can participate in some mighty impressive rampages.

The graphics are wonderfully cartoony, producing a faithful rendition of the arcade version. I especially like the way the monsters turn and look at you as they chew their food.

As for sound effects, the game has a funky little musical theme that plays in the background throughout the game, but my favorite is the rewarding smash you hear when you pound a building with your gargantuan fist.

All in all, I can recommend *Rampage* highly to any ST arcade fan who is not too high-minded to enjoy helping a monster win for a change.

— *Clinton Smith*

[*Editor's note: Rampage, which originally sold for $39.95 is now available as one of five games sold in a package called Five Star.*]

System: Atari ST

Required equipment: In general, none. Most utilities work with all STs, even those lacking TOS in ROM. A few are only useful on STs equipped with color monitor.

Summary: Enormous collection of popular ST utility programs

Price: $59.95

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

Utilities Plus

MichTron releases

an enormous collection

of useful utilities for the ST

When MichTron released the original *Utilities* package for the Atari ST, they created an instant hit and brought author Timothy Purves into the exclusive pantheon of "well-known ST programmers." Now, almost two years later, the company has released *Utilities Plus*, a package that combines the original MichTron *Utilities* with four other ST utility and system software collections, all originally published under separate covers. The utilities include STuff, a collection of autoboot programs, GEM, TOS, and TTP applications; SuperDirectory, a powerful disk cataloging program; M-Disk Plus, a ramdisk/print-spooler; and DOS Shell, an MSDOS-compatible command-line shell.

Utilities

Utilities itself is what is commonly referred to as a "sector editor," a program that helps you access, examine, and change individual sectors and bytes on a disk, copy sectors, format individual disk tracks, and other high-tech stuff. In the hands of technically competent users, *Utilities* can be used to repair damaged disks, patch programs *in situ*, or subvert copy-protection schemes. But the major selling point of the program, at least for the average ST owner, is that like Peter Norton's *Unerase* for the IBM PC, *Utilities* automates the process of recovering accidentally deleted files.

This apparent miracle is possible because GEMDOS, like most operating systems, doesn't actually erase the sectors used by a file when that file is deleted. Instead, it simply marks the file as deleted in the File Allocation Table (FAT) and marks its sectors as unclaimed, meaning that the system can use them as necessary. A sector editor such as *Utilities* can "undelete" a file by simply re-activating its name in the FAT and then tracing its sector links, reclaiming sectors as they are found.

The smart GEM menus and point-and-click architecture of *Utilities* make simple file reclamation easy, even for the novice. You begin the process by asking to view the disk directory, using the File Attributes menu selection. Erased files appear in the directory with the first character of their names changed to a question mark.

Clicking on the filename brings up a new dialog, which shows you the contents of each linked cluster in the file. You click on buttons to reclaim or bypass sectors, as you think necessary. Finally, you can save the new sector image to disk under a modified version of the old filename and hope for the best. The process works very well when performed immediately after accidental file erasure, when the possibility that sectors belonging to the deleted file have been claimed by files recently written onto the disk is low. Older deletions may be difficult or impossible to reverse.

The documentation includes instructions for performing this and other common operations, such as recovering sectors of a damaged disk and repairing damage to a disk by single-track formatting. While too difficult, perhaps, for the complete beginner to undertake without some prior study, the programmer or power user will swiftly be able to make use of some, if not all, of this material.

Other functions of general interest supported by *Utilities* include the ability to generate a map of allocated sectors on a disk, which is useful for determining, for example, if poor hard disk performance is the result of fragmentation.

Supplementary programs include Snapshot, a utility that intercepts the Alternate-Help key-combination and captures an image of the current screen on disk; Format, a 9- or 10-sector per track formatting utility; M-Copy, an optimized copy program that permits fast duplication of conventionally-written diskettes; and M-Dupe, a true "sector copier" that copies a disk sector-by-sector, rather than file-by-file, letting you subvert certain types of copy protection—for archival purposes only, of course.

STuff

The second part of *Utilities Plus* is STuff—a grab-bag of nifty little programs for system configuration. Some of these are designed to be executed from the AUTO folder and add convenience functions such as letting you reboot the machine by pressing Control-Alternate-Delete, forcing the system to do the equivalent of a cold boot on soft reset, locking out the CapsLock; remembering the last date set; and other functions. Included with this group is STSELECT, a management program that lets you pick and choose what AUTO folder programs you want executed each time you reboot.

The second group consists of only one powerful program: AUTOGEM.ACC, a desk accessory that takes over the system on bootup, waits for the GEM desktop to come up, then performs the mouse moves, clicks, and other magic passes necessary to execute a selected GEM application.

The third group consists of two GEM

applications: AUTOFOLD, a utility that lets you re-order the files in your AUTO folder, changing the order in which they are executed, and FILELOCK, a very sophisticated file-encryption utility that provides up to three levels of security—perfect for maintaining confidential records on office systems that are accessible to many employees (or diary entries on systems that are accessible to Mom).

The fourth group consists of two TOS applications: 512K, which turns an expanded 520 or 1040ST into the electronic image of a plain-vanilla 520, creating the proper execution environment for certain finicky first-generation ST programs, and KEYCODE, a programming utility that returns the 24-bit scancode for any key pressed.

The last and, in many ways, the most useful group contains a variety of .TTP utilities, some of which are modeled after Unix development tools. These include GREP (Generalized Regular Expression Parser), a powerful tool for searching text files; TOUCH, a utility that updates the date-time stamp on files, used in conjunction with "make" utilities and other programs that work with file-creation data; and FC, which works like Unix diff to note the differences between two files. Certain programs in this last group make use of shell-style pathnames (which may include wildcards) and Unix-style command switches—single-character parameters—that let you select among several functions of a program.

Included with this last group is a public domain ST Basic program called PATCHER.BAS, which is designed to simplify the job of making small changes and corrections to executable files. The documentation indicates that if minor corrections are ever required for any program in the *Utilities Plus* package, they may be distributed as PATCHER files. Users will employ PATCHER to modify copies of their original programs instead of downloading corrections from a BBS or returning distribution disks to the manufacturer.

From the above descriptions, it is easy to see that some of this stuff is pretty trivial. Still, there is enough gold in this package—particularly AUTOGEM, FILELOCK, and the Unix-like utilities—to really add to the value of *Utilities Plus*. Even the more trivial utilities in the STuff set all seem to work, and each user will find favorites among them.

Superdirectory

Part 3 of *Utilities Plus* is Superdirectory, which is essentially a database program optimized for managing disk collections. You can add the directory data from a disk into a Superdirectory database with a single command. Thereafter, you can complete the database by adding single-character category markers (e.g., B for Business) and up to 25 characters of remarks per file. Databases can be sorted and searched on any field, and subsets saved separately or printed out.

The problem with this program, as with other disk databases, is that there is no convenient, automatic way to update the database to reflect changes in disk contents. Thus, it is terrific for managing a large collection of disks the contents of which never change, but almost useless for managing work disks the contents of which change frequently.

Even in a hard disk environment, where everything is accessible fairly quickly, a more efficient approach would be to figure out how to correlate each file and directory to a remark and record the remarks in such a way that the database is automatically modified to reflect current disk contents.

M-Disk Plus

The fourth package in *Utilities Plus* is M-Disk Plus, a combination of Tim Purves's original RAMdisk program, M-Disk, and Soft Spool, a software print spooler that lets you print to RAM and then continue with other work while a parallel process feeds data to the printer. A separate configuration program is used to set the amount of memory reserved by each utility. Thereafter, the utilities can be installed in the AUTO folder (and an appropriate disk icon created for M-Disk and added to the DESKTOP.INF file) and booted automatically. Alternatively, they can be in-

stalled separately or together after power-up.

The programs are reliable and function transparently. I have both of them installed on my system and have experienced no problems. The spooler, in particular, is a great help when working with a conventional printer. I have yet, however, to try it with the Atari Laser printer, which communicates not by BIOS print calls (which the spooler is designed to intercept) but by DMA. Hope it works!

DOS Shell

Finally, there is DOS Shell, a nice, TOS-based command-line environment that duplicates most of the standard features of MSDOS (the user interface for the "rest of them what don't use Macintoshes"). If you are already super-comfortable with MSDOS and can't quite get the hang of using a window environment, this program could be a lifesaver. Or, if your boss insists that you learn to use an IBM PC at the office, it could be a job-saver.

Seriously, however, there are a few reasons to learn to use a command-line system of this kind. First, it lets you

If you are already super-comfortable with MSDOS and can't quite get the hang of using a window environment, this program could be a lifesaver.

perform multiple deletes, copies, and other operations, using complex wildcard expressions to refer to files. Second, it lets you create and execute batch files—lists of commands that can be used to automate common procedures. Third, it lets you use .TTP programs in combination with redirection and piping, letting you link general purpose software tools together to perform complex tasks.

Because the DOS Shell commands are all built in, they operate very fast. In fact, the shell functions at a brisker and more responsive pace than MSDOS itself. Most of the standard commands (type, which displays the contents of a file on-screen; dir, which displays a directory; copy, which copies files, etc.)

are supported and function pretty much as an MSDOS user would expect.

Some, in fact, have been transparently enhanced so that they function better than their MSDOS analogs. DOS Shell type, for example, unlike the version of type that comes with MSDOS 2.11, will accept wildcard expressions, letting you display the contents of all .DOC files in the current directory by entering a com-

Utilities Plus offers such a capacious grab-bag of tools that you would expect the documentation to be perfectly awful—non-standardized, hard to understand, and ugly. Not so!

mand such as type *.doc. The dir command, on the other hand, is somewhat hampered over its MSDOS counterpart; it will not accept the \w parameter, used for creating a wide-format directory listing.

I/O redirection (via >, <, >>, and <<) is supported to and from files and the standard devices AUX: (RS-232), CON: (keyboard/screen), and PRN: (printer). The command dir > list.doc, for example, causes the dir command to execute, creating a directory list and writing it to the file list.doc, instead of to the screen.

Piping (via |) is also permitted. Piping is like redirection, except that it has the effect of executing a group of programs in sequence, using the output of the first as input for the second. The standard filters, SORT, which sorts its input, and FIND, which searches for a given text string or pattern in its input, are also built in. Used in combination, the facilities of redirection, piping, and filtration let you build powerful commands for automating repetitive data processing tasks.

The most powerful feature of DOS Shell, however, is its ability to mimic the batch-processing features of MSDOS. Batch files are essentially macros—text files containing lists of DOS Shell commands. Special commands that permit looping and conditional execution can also be included in a batch file, variables can be used, and arguments can be passed into the batch file from the command line as the file is executed.

Taken as a whole, the batch-processing capability of DOS Shell is very much like a programming language. A special batch-file name, AUTOEXEC-.BAT, is searched for when the shell is first activated and executed automatically—a convenient way of configuring a system. The shell itself can be executed from within the AUTO folder, though this will prohibit the execution of GEM programs, because AUTO programs are executed prior to GEM startup. Alternatively, MichTron's AUTOGEM might be used to auto-execute the shell after GEM initializes. The AUTOEXEC.BAT feature might then be employed to configure the fully-active system.

Among the other nice features of DOS Shell is a RUN command that can be used to execute a GEM application, provided the shell is not started from the AUTO folder, as noted above.

Some not-so-nice features: there seems to be a bug, whether in TOS or the shell, I don't know, that affects the way DOS Shell arbitrates an attempt to write to a write-protected disk. This process terminates in a bus error,

though the system seems to recover without ill effects.

Documentation

Utilities Plus offers such a capacious grab-bag of tools that you would expect the documentation to be perfectly awful—non-standardized, hard to understand, and ugly. Not so! The disk comes with a 246-page, perfect-bound manual that documents the installation and use of each and every program and feature in the collection in a clear, concise, and consistent way, and includes a comprehensive index.

To be sure, some of these programs require, and are given, no more than a few explanatory lines. (What can one say, after all, about a program that turns off the write with verify feature of GEMDOS to improve the speed of disk access? Only that you should be careful using it.) The more powerful programs, however, are given whole chapters, illustrated with copious examples. The sections on *Utilities*, the sector-editor, and DOS Shell, in particular, are really quite exhaustive.

Summary

I cannot even pretend to evaluate this many programs in a review of reasonable size. For this reason, I have attempted to describe the highlights of MichTron *Utilities Plus* to give readers some feel for the range of tools included in the package and their overall value. This value, I feel, is truly extraordinary. *Utilities Plus* is a Must Buy for any serious Atari ST owner. ∎

"Miss Wysiwyg, I'd like you to meet Mr. Qwerty. I believe the two of you have a lot in common."

W hat's faster than a speeding Macintosh Plus? Able to leap small screen sizes in a single bound? It's a bird! It's a plane! It's Spectre 128 on the Atari ST!

When last we saw mild-mannered programmer/hardware hero David Small, he was in retirement after creating the Magic Sac Macintosh emulator using 64K Apple Macintosh ROMs. But people kept telling him they really wanted a device that would incorporate the 128K Mac ROMs, so they could run *HyperCard*, *Adobe Illustrator*, and other wonderful state-of-the-art applications that wouldn't run on the Magic Sac.

So Dave started his own company, Gadgets by Small (GBS), and produced the Spectre 128 cartridge, a device that turns the Atari ST into a full blown Macintosh Plus (see Figure 1). Spectre 128 boasts a 30% larger screen and an overall speed increase of 20% over a real Mac Plus. Many Mac programs that were incompatible with the earlier Magic Sac now run fine. And starting with version 1.9F of the Spectre software, the device even supports Macintosh sound.

Setting It Up

After you to buy the Spectre 128 from GBS, you must buy the 128K Apple ROMs from someone else. The 64K Apple ROMs also work, but they don't take full advantage of the Spectre 128 software. The 128K ROMs are available from a variety of sources for prices ranging from $100 to $200 a pair. Addresses for several suppliers, including I.B. Computers and B&C ComputerVisions, are listed in a flyer that comes in the package.

The manual walks you through the ROM installation and set-up of your Spectre 128 cartridge. In fact the manual is written in a style that makes you feel as if ol' Dave Small is standing right there, guiding you every step of the way. Dave thinks "computer manuals are dull" and has gone out of his way to make sure that this one isn't. By the time you're finished with the installation, you'll know not only how to use Spectre 128 but the names of his wife and cat, along with a few Pink Floyd lyrics.

During normal ST operations, Spectre 128 can remain in your cartridge slot, where it is, for the most part, trans-

Figure 1. Spectre 128 (right) is much smaller than the older Magic Sac, but doesn't have built-in clock.

Spectre 128

Dave Small now lets you turn your ST into a faster, better Macintosh

parent. If you use another cartridge, such as DeskCart or IMG Scan, you must remove it and insert the Spectre 128 cartridge; Spectre doesn't have a pass-through connector.

Setting Up the Spectre Software

When you start up the Spectre software you are presented with an assortment of GEM menus (See Figure 2). These allow you to set up memory configurations, format floppies and hard disks in a special Spectre format, assign printer ports, activate sound, etc. GEM desk accessories are available in Spectre software versions up to 1.75, but for some reason you can't access them with versions higher than 1.9F.

The big problem with the Atari ST is that it can't read/write Macintosh disks directly. Mac disk drives are variable speed and run between 300 and 600 rpm in a weird GCR (Group Coded Recording) format, while the ST drives run at a constant 300 rpm in MFM format. So GBS has devised a special Spectre for-

Spectre 128

System: Atari ST

Version reviewed: 1.9F

Required equipment: 64K or 128K Apple Mac ROMs; monochrome monitor strongly recommended

Copy protection: None

Summary: Excellent Macintosh emulator. Does not read Mac disks directly

Price: $179.95

Manufacturer:
Gadgets by Small
40 W. Littleton Blvd. #210-211
Littleton, CO 80120
(303) 791-6098

By BARON SEKIYA

Spectre 128-Compatible Software

The following commercial products have been tested with version 1.75 of the Spectre 128 with 128K ROMs, using Finder 6.0/System 4.2 and Epstart 2.5 on a 1Mb ST configured as a 832K Mac. Unless otherwise noted, all applications that work, do so under that configuration.

Every effort has been made to test all the features of each product. It is, however, possible that some odd combination of key strokes or commands may cause a crash in a program listed here as working with the Spectre.

Application	Version	Comments
Aatrix Payroll	3.02	Works
Acta	1.0,2.0	Works
Adobe Illustrator	1.1	Works
Adobe Illustrator '88	1.6	Needs 2Mb and hard disk
Ancient Art of War	-	No; protected
AutoMac III	1.0	Works
Back to Basics Accounting		Locks up
Balance of Power	1.03	No; protected
Battery Pack	1.1	Unstable
Business Class	1.0	Needs 2Mb
Calendar Maker	3.0	Works
Calculator Construction Set	1.0	Works
Canvas	1.01,1.02	Works
C.A.T.	1.01	Works
Chessmaster 2000	1.0	No; protected
Clipper	2.0	Works
ColorPrint	2.03	No
ComicWorks	1.0	Works
Copy II Mac	6.4	Locks up
CricketGraph	1.1	Works
CricketDraw	1.0,1.1	Works
Cricket Presents	1.0	Works, flakey after printing
Cricket Paint	1.0	Unstable
Crystal Quest	-	Works (unprotected)
Curator	1.02	Works
Dark Castle		Locks up
Day Keeper	1.41	Works; crashes on exit
Data Base Builder	1.01	Works
Deadline	-	Works
Decision Map	1.01	Works
DBase Mac	1.0	Works
Deja Vu	1.03	Works (unprotected)
Design	2.0	Works
Design Scope	1.0,1.14	Works
Design Works	1.11	Works
DeskDraw	2.0	Works
DeskPaint	2.0	Works
Digital Darkroom	1.0	Needs 2Mb
Dimension	1.15	Works
Dinner at Eight	-	Works
Disk Express	1.06,1.10	Works only on floppies
Diskfit	1.4	Works with 400K disks only
Disk Ranger	3.0	Works
DiskTop	3.04	Works
DMAC III	1.07	Works
Dollars and Sense	1.4	Works (unprotected)
Double Helix	1.25	Locks up
Double Helix II	2.0	Locks up
Dreams	1.0	Needs hard disk
Dungeon Revealed	1.1	Works
Easy 3D	1.0	Locks up
Electric Checkbook	-	No; protected
Enchanted Scepters	-	No; protected
Eureka	1.0	Works
Excel	1.06,1.5	Works
Expressionist	1.0	Locks up or crashes
Factfinder	1.2	Works
Fastback	1.02	No
Fedit Plus	1.1	Works
Ferrari Grand Prix	-	No; protected
4th Dimension	1.01	Works
Filemaker Plus	2.00,2.1	Works
Filemaker 4	4.0	Crashes
Filevision	1.0	Crashes
Findswell	1.0	Works
1st Base	2.0	Works
Flight Simulator	1.0	No; protected
Focal Point	1.0	Unstable
Fokker Triplane	1.0	No; protected
Fontastic	2.6	Locks up
Fontastic Plus	2.02	Works
Fontographer	1.5	Works w/ Finder 5.4 and under
Fontographer	2.3	Crashes
Font/DA Juggler	2.0	Locks up
Font/DA Juggler Plus	1.0	Locks up
Fox Base +	1.1	Works
FreeHand	1.0	Works
FreeHand II	2.0	Works; locks up after printing
Front Desk	1.1	Works
Full Paint	1.0	Works
Full Write Professional	1.0	Needs 2Mb and hard disk
Graphic Works	1.0	Works
Graphidex	1.01	Works
General Ledger	1.1	Works
Gato	1.3,1.42	No; protected
Grappler LS	1.0	Works (Deskjet driver)
Guide	1.0	Works
Habadex	1.1	Works
Habaword	1.8a	Works
Hard Ball	-	No; protected
Harrier Strike Mission	-	No; protected
Harrier Strike Mission II	-	Locks up
Hitchhiker's Guide	-	No; protected
Home Accountant	1.03	Works
HyperCard	1.0,1.1,1.2.1	Unstable
HyperDA	1.02,1.1	Works
Image Studio	1.0	Works
Jazz	1.0	No; protected
KaleidaGraph	1.0	Works
Laser FX	1.0	No (Appletalk)
Leather Goddesses of Phobos	-	Works
Letra Studio	1.0	Crashes
Letter Invaders	1.0	Crashes
Lightspeed Pascal	1.0	Works
Lode Runner	1.0	No; protected
LogiMac	1.2	Works
LogicWorks	1.3	Works
LookUp	1.0a	Works
Mac 3D	1.1R1,2.0,2.1	Works
Mac 68000 Dev System	-	Works
Mac-A-Mug	2.0	Works
Mac-A-Mug Pro	1.0L	Works
Mac Atlas	-	Works
McCad PCB Designer	3.1	Works
MacAuthor	1.2	Crashes
MacBlob	-	Works
MacCalc	1.2	Works
MacCalligraphy	2.0	Works
MacChallenger	1.0	Works
MacCheckers/Reversi	-	Works
MacCoach	1.0	Works
MacDasher	1.52	Works
MacDraft	1.1	Works
MacDraft	1.2a	Unstable
MacDraw	1.9.5	Works
MacDraw II	1.0	Works
MacGolf	-	No; protected
MacGolf Classic	3.0	Works (unprotected)
MacinTax	'88	Works
MacinUse	1.0	Crashes
MacJack	1.0	Works
Mac Labeler	2.2	Locks up
MacLightning	2.0	Works
MacLion	3.0	Locks up
MacMoney	2.03	Works
MacOffice	-	Works
MacNosey	2.097	Works
MacPaint	1.5,2.01	Works
MacPerspective	3.01	Works
MacPlaymate	-	Works
MacPlot	1.5	Works
MacProject	1.0,1.2	Works
MacProof	2.0S,3.0	Works
MacPublisher	1.25	Works
MacSpec	1.3	Works
MacSlots	-	Works
MacSpell+	1.07	Works
MacSpin	1.0	Works
MacSpin	1.1	Crashes
Mac the Knife Vol. 1 & 2	-	Works
MacTerminal	2.2	Can't control modem
MacTools	6.3,5.4	Works, except Disk Copy
Mac Vegas	1.0	No; protected
Mac Wars	-	No; protected
MacWrite	2.2,4.5	Unstable
MacWrite	4.6,5.01	Works
MacZap	4.5,5.0,5.1	Works except Disk Copy
Make Millions	-	No; protected
MapMaker	1.0	Works
Mastertype III	-	Works
Mastertype IV	-	Works
Math Blaster	1.0	No; protected
Math Type	1.01	Works
MaxRAM	2.5	Crashes
Mazewars+	1.1	Crashes
McMax	-	Works
Mega-Filer	1.01	Works
MegaMax C	2.1	Crashes
Mega-Merge	2.1	Works
MenuFonts	1.0	Works
MenuFonts II	2.0	Works
MGM Station	2.09	Works
Microphone	1.1	Works
Microphone II	2.0	Works
Millionaire	-	No; protected
MindWheel	-	Works
MindWrite	1.0	Works
Minicad	2.0	Locks up
Minicad Plus	1.0	Works; will not print
More	1.1,1.1c	Works
More II	2.0	Works
Mouse Stampede	1.0.0	Works (unprotected)
MS Basic	1.0,2.0	Works
MS Chart	1.0	Works
MS File	1.0	Out of Memory error
MS File	2.0	Works
MS Fortran	2.2	Works
MS Word	3.01,3.02	Unstable, works w/ 64K ROMs
MS Works	1.1,2.0	Works
MS Write	1.0	Works
MSFL:Football	2.0	Works
Multiplan	1.02	Works
MultiWrite	.091	Works
My Disk Catalog	2.1B	Works
NFL Challenge	1.2	Works; remove Macintalk
ODS/Consultant	1.6	Works
OMNIS 3+	3.24	Won't print
101 Excel Macros	-	Works
One On One	-	No; protected
On Que	1.3	Works
Orbiter	-	Works
OverVue	2.0a,2.1d	Won't print
Panorama	1.0	Works
Pagemaker	3.0	Needs hard disk
Patton vs. Rommel	-	No; protected
Phoenix3D	LVL1.0	Crashes
Pensale	1.1	Works
Perplexx	1.0	Works
Pinball Construction Set	2.5	No; protected
Picture Base	1.0	Works
PixelPaint	1.0	No; wants a Mac II (sigh)
Plot It	2.0	Works
Poster Maker Plus	2.5	Works
Power Draw	1.0	Locks up
Power Draw	2.0	Works
PowerStation	1.1	Works
Power Math	1.0	No; protected
PowerPoint	1.0	Works
Print Shop	1.0	Works (unprotected)
Printer Interface III	-	Works (Deskjet driver)
Printworks	3.2	Works
Professional Composer	2.0	Works, but no sound
Profit Stalker II	1.2	Works
Pro 3D	-	Locks up
PFS File/Report	A.03	Works
PFS Rescue	A.00	Works
Psion Chess	-	Works
Pyro II	3.3	Works
Quark Express	2.0	Unstable; won't print
QuarkStyle	1.0	Unstable; won't print
Quick & Dirty Utilities	1.6	Works
QuickLetter	1.0	Works
Quick Keys	-	Works
Quicken	1.03	Works
Ragtime	1.0	Works; crashes after printing
Ready Set Go	4.0a,4.5	Works
Ready Set Show	1.0	Works
Record Holder Plus	3.0	Works
Reflex	1.01	Works
Red Ryder	10.3	Works
Reflex Plus	1.0	Works
Sargon III	1.0	Works (unprotected)
Sentinel	1.0	Works
Scrapmaker	1.0,2.0	Works
Shanghai	-	No; protected
Shadowgate	1.0B1	Works (unprotected)
Sidekick	1.10b,2.0	Works; won't print
Silicon Press	1.1	Works
SkyTravel	1.0	Works
SmartForm Assistant	1.0v1	Works
SmartForm Designer	1.0v1	Works; crashes after printing
SmartScrap	2.0	Works
Smash Hit Racketball II	1.0	Works (unprotected)
Snap	1.0	Locks up
Sorceror	-	Works
Spellbreaker	-	Works
Speliswell	1.2d,1.3a,2.0f	Works
Squire	-	Works
Statview 512+	1.0	Works
StatWorks	1.1	Works
Stella	1.3	Works
Stepping Out	1.0,1.1	Works
Stepping Out II	2.0	Locks up
Strategic Conquest	1.1	No; protected
Sub Battle Simulator	-	Works
Suitcase	1.2.1	Works
Suitcase II	1.2.2	Works
Super Paint	1.1	Works
Surgeon	1.5	Works
Swivel	1.0	Works
Symantic Utilities	1.0	Most work
Tellstar	1.0	Works
Tempo	1.2	Works
Tempo II	1.0	Works
Terrapin Logo	-	Works
The Witness	-	Works
The Right Word	3.0	Works
Thinkfast	1.0	Works
ThinkTank 512	1.30	Works
Thunder	1.01	Works
TK Solver	1.5R	Works
TopDesk	1.3	Works
TOPS	1.0	Crashes
Trapeze	-	Crashes
Train Set Simulator	-	Works
Transylvania	-	Works
Turbocharger	2.0D	Works
Turbo Pascal	1.1	Works
] In a Mac	-	Works
Tycoon	1.0	Works; locks up on exit
Typing Tutor III	1.5	System error
Typing Tutor IV	1.0	Works
Ultima III	1.0	No; protected
Uninvited	-	Works (unprotected)
Versaterm Pro	1.0	Works
VideoWorks	1.00	Unstable
VideoWorks II	2.0	Works
View to a Kill	1.0	No; protected
Wet Paint	-	Works
Wizardry	-	Works (unprotected)
Word Finder	2.0	Works
Word Perfect	1.0	Works
Works Plus Spell	1.0A	Works
Works Plus Command	1.1	Works
World Builder	1.1	Locks up
World Class Fonts	-	Works
WriteNow	1.0,2.0	Works
XLisp	1.2	Works
Xyphus	-	No; protected
Z-Basic	4.0	Works
Zork I, II, III	-	Works with Finder 1.1g
Zork Zero	-	Works

Figure 2. GEMDOS screen showing memory-setting menu for a 2.5Mb Atari ST.

matter, which allows your disks to emulate the Mac GCR format at 300 rpm. You can also use shareware formatters by Double Click Software.

I set up my 42Mb hard disk with three 10Mb GEMDOS partitions and one 12Mb Spectre partition. You can run Spectre using floppy disks, but a two-drive system is recommended (or you can use a RAMdisk).

Once the Spectre software is configured, the final hurdle in your journey into Macintosh country is the request for a Macintosh StartUp disk in the Spectre format.

Two files, System and Finder, reside in the System Folder on the StartUp disk. The System Folder is similar to the Atari AUTO folder and contains the fonts, desk accessories, and other things essential to Mac operation. Finder controls the windows interface, file management, etc. Obviously, this folder is essential to the operation of your pseudo-Macintosh

There are several ways to get System and Finder onto a Spectre disk. You can download them in the ST mode and use Doug Wheeler's excellent Transverter program, which is included in the Spectre package, to transfer them from a GEMDOS disk onto a Spectre disk.

Or, you can find someone with a Translator One (a hardware device that lets the ST disk drives read real Mac disks) and copy a real Mac disk onto a Spectre disk. This latter process takes about 15 minutes.

Once you have a Spectre-formatted disk, the reads/writes are very fast. If you have used any of Small's other progams, you will already appreciate his obsession with speed (and Rock-n-Roll). Version 2.0 of the Spectre software promises to speed floppies 50%-100% over existing read/write speeds.

Another source of Spectre formatted StartUp disks is the body of Magic Sac/Spectre 128 users who already have StartUp disks in the Spectre format. Check your local Atari user's group for names of helpful fellow Atarians.

In the Mac Mode

Having accomplished the transition to Macintosh mode, you hear the familiar Mac bong and find yourself on the Macintosh desktop. If you are using a color monitor, you will be very disappointed by the sluggishness of the screen display and the small text, which is difficult to read. On a monochrome monitor everything is crystal clear, a perfect emulation of the Mac screen.

Figure 3. Adobe Illustrator 88 running on the Atari ST.
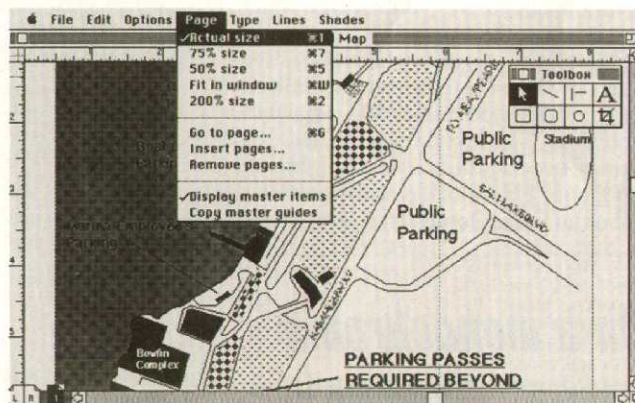
Figure 4. Aldus PageMaker v3.0 running on the Atari ST. Note that the larger ST screen allows you to view almost the entire width of the page in Actual Size mode.

Figure 4. Mac-A-Mug Pro demo running on the Atari ST. In this case, the smaller size of the Mac Plus screen is preserved.

At this point you are, for all intents and purposes, using a Macintosh Plus. If you have never used a Macintosh, you should probably find and read a Macintosh book or manual, because operation is not identical to that of the ST.

The Mac desktop looks very similar to the desktop of the ST, but there are some very important rules to follow:

• You must always have the System folder available, whether in a drive or on a RAMdisk. The Mac simply won't run without it.

You should, therefore, use a hard disk with a System Folder, a two-drive system, or a RAMdisk. Unfortunately, you cannot use a RAMdisk on a 520ST, because insufficient memory remains for your applications.

• Real Macs don't have disk eject buttons. All disk ejects are accomplished via a menu or keyboard command or by dragging the disk to the trash can (yes, this is a proper way to eject a disk on the Mac; it won't erase the disk). Spectre lets you know when to remove a disk by flashing the letter A or B on the menu bar, indicating which disk drive to pop.

(Note to ST owners who want to feel superior: When a real Macintosh locks up, you can't eject the disk. Under such conditions, Mac users resort to the rather primitive expedient of a straightened paper clip. The Mac has a tiny hole next to the slot in the floppy drive, and insert-

On a monochrome
monitor everything is crystal clear, a perfect emulation of the Mac screen.

ing the pointed end of the paper clip into this hole forces a mechanical eject—a technique that is sure to inspire a feeling of superiority in any ST owner.)

Running Mac Software

Once you have your Mac software transferred onto Spectre formatted disks or your hard disk, you are in business. I use real Macs at work, but programs like *Adobe Illustrator 88* want at least 2Mb of memory and a hard disk. Our Macs have only 1Mb, so I put my
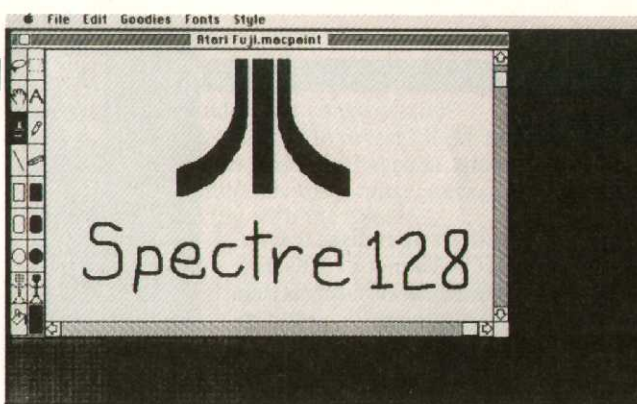
Figure 6. MacBillboard running on the Atari ST. Again, the size of the Mac screen is preserved.
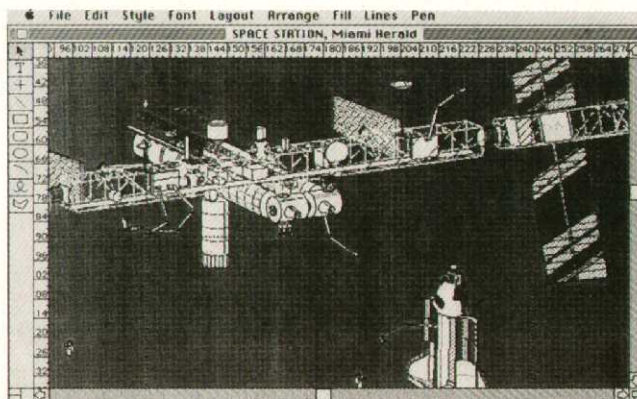
Figure 7. MacDraw running on the Atari ST.
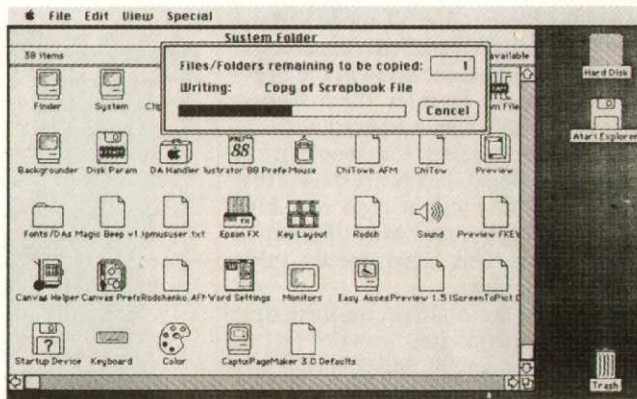
The Macintosh desktop on the ST. Note the Finder and System files in the System Folder Window.
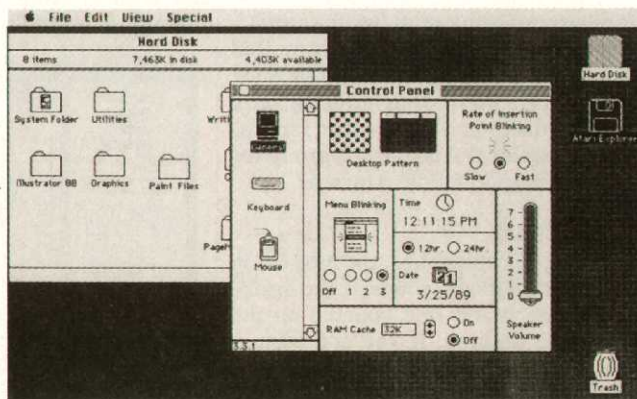
The Macintosh desktop on the ST, showing the Control Panel. The trash can is bloated, because a file has just been discarded. As in real life, discarded items can be retrieved from the trash can until it is emptied.

2.5Mb ST to work and amazed co-workers.

Many Mac programs are able to take advantage of the larger screen size of the ST. Figures 3 and 4, for example, show *Adobe Illustrator 88* and *Page-Maker* making full use of the larger screen. Other programs, including the *Mac-A-Mug Pro* demo and *MacBill-board* (Figures 5 and 6) run in a window the size of the Macintosh Plus screen. Complicated *MacDraw* files (Figure 7) are drawn faster, because of the faster clock rate of the ST.

Printing

Using a dot-matrix printer with Spectre poses a problem. The Macintosh assumes that you have the Apple ImageWriter, and if you want to use something else, you must buy a printer driver. Softstyle in Hawaii sells an Epson printer driver that works well; another is available from GDT Software (P.O. Box 1865, Pt. Roberts, WA 98281, (604) 291-9121 for information, (800) 663-6222 for orders). Hardware printer drivers, such as the Grappler, also work well.

GBS has incorporated a driver to do screen dumps to the Atari SLM804 Laser printer. There is also *Quick Draw* support for the Atari Laser via a built-in Epson MX-80 emulator that works with Softstyle's printer driver. You will need at least 2Mb of memory to work with the Atari Laser, however.

Plans to exploit 300 dpi and Ultrascript, a PostScript driver for the Atari SLM804 Laser are in the works. If you want 300 dpi quality right now, you can go through the long process of saving a PostScript file to disk, converting it to a GEMDOS file, and then outputting it via Ultrascript on the Atari Laser.

Conclusion

The Mac is a memory hog and a disk-accessin' fool, so 1Mb and two floppies are about the minimum useful configuration. Sophisticated programs like *PageMaker* and *Adobe Illustrator* further demand a hard disk.

Running Spectre 128 on a 1040ST gives you an 832K Macintosh, which doesn't leave much room for *Hyper-Card*, which wants at least a meg of memory. So, check the memory and hardware requirements of any Mac software that catches your fancy *before* you buy it.

User support from GBS can only be described as excellent. Newsletters keep you informed as to what's going on in development, and if you have access to Compuserve or Genie, you will find the latest info from GBS and hints from other Spectre users.

If you need a Macintosh emulator, I highly recommend Spectre 128. It is a very solid program that continues to improve. By the time you read this, Dave Small will have unveiled the Spectre GCR, an upgraded cartridge that allows the ST to read/write real Macintosh disks. The GCR will sell for $299.95, and GBS will offer a $75 rebate to registered Spectre 128 users. Also in the works is better support for the Atari Laser printer and faster read/write speeds for floppies. ∎

"Like milliamps through a circuit board, these are the nanoseconds of our lives...."

High Tech Soap Opera

Diamond GOS

A graphic operating system

for Atari 8-bit computers

Diamond GOS desktop, showing menu bar, three floppy drive icons, and trashcan icon. The directory for drive A is displayed in the open window in the middle of the screen.
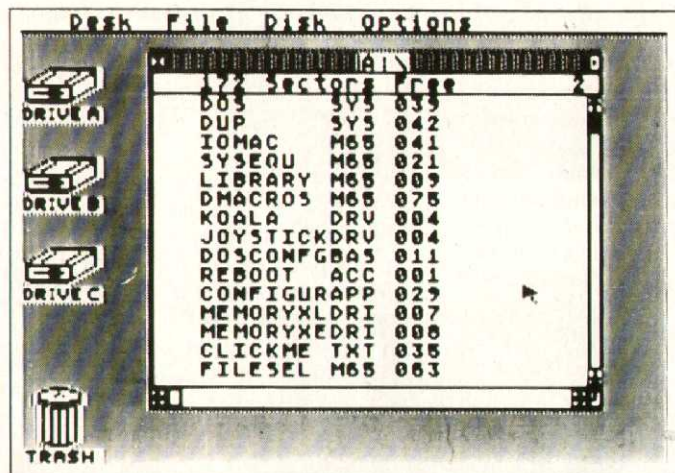
For some time now, I have been looking forward to doing a head-to-head review of two "super cartridge"-based graphic environment operating systems—Reeve Software's Diamond GOS and Total Control Systems' GOE. I even held off using GOS, while awaiting the already-advertised GOE, so that I could view both packages with an equal lack of familiarity. I fully expected to title this review "The War of the Graphic Operating Systems."

But it was not to be. Numerous phone calls to Total Concept Systems have produced no opponent for GOS. There can be no war as long as one of the combatants is a no-show. So, rather than keep you waiting any longer, I decided to go ahead with my review of the product that *is* available.

The GOS cartridge comes boxed with two disks and two manuals. The cartridge itself is a piggy-back cartridge; another cartridge—a language cartridge, for example—can be inserted into the top of it. The disks are the Diamond GOS utility disk and *Diamond Paint*. The manuals are the Diamond GOS user's manual and the Diamond GOS programmer's manual.

As I am neither a programmer nor an artist, I shall not attempt to assess the quality of either the programmer's manual or the paint program other than to note that the manual is un-indexed and fairly technical and the paint program appears to lack documentation entirely.

I don't care much for manuals anyway and only use them when I get into trouble, so I began the review process by

Diamond GOS

System: Atari 8-bit

Required equipment: ST mouse

Summary: A nicely-implemented GEM-like graphic operating system for 8-bit systems

Price: $79.95

Manufacturer:

Reeve Software
29W 150 Old Farm Lane
Warrenville, IL 60555
(312) 393-2317

placing the cartridge into the cartridge slot of my 256K XL, inserting the utility disk into my 1050 drive, and booting the system.

The drive whirred reassuringly, and suddenly my screen was filled with a GEM-like desktop. There on my monitor were representations of a floppy drive and a trash can (our ST friends call these icons) and a bar across the top of the screen bearing the words Desk, File, Disk, and Options, which I quickly learned were menu headings.

Having gotten this far without incident, I decided to check the manual. Conspicuous by their absence were the most basic components of a reference tool—table of contents, index, and page numbers.

The manual explains that the default

DOS for GOS is Atari's DOS XE, but that the utility disk is formatted in Atari DOS 2.0 and is configured for the ST mouse in port 1, which, just to keep you on your toes, is where you plug in joystick 2. I decided to stick with DOS 2.0 and plugged in my ST mouse. The mouse adds $39.95 to the cost of the system, but I was strongly advised to use it instead of a joystick, Koala pad, or track ball, all of which are supported.

Anyone who is familiar with navigation via GEM on the ST screen will note that GOS works in essentially the same way. When you place the mouse pointer on one of the menu titles, the corresponding menu appears below the line, allowing you to make a selection by clicking the mouse button on the item of your choice.

The Desk menu provides a reboot accessory. The File menu allows you to open and close files, generate folders (in DOS XE and in Sparta DOS), duplicate files, and learn the status of files. The Disk menu allows for formatting and copying of disks.

Finally, the Options menu allows you to customize the desktop by installing additional drive icons and by changing various display parameters, specifying, for example, that your directory be displayed in text- rather than icon-form.

Learning to Use the System

I must admit that, as an 8-bitter used to menu-driven or command-driven DOSes, I had some difficulty getting the hang of the graphic operating sys-

By DAVID NOYES

tem. This is not a criticism of either myself or the operating system; it is simply a recognition that this system is very different from the system most of us veteran Atarians have been using for so many years.

That said, let's look at exactly how GOS does work. To begin with, it allows you to work in up to four different windows at a time, copying, loading, running, programming, listing directories, performing file maintenance—accessing any function or program you normally access from DOS. The difference is that you need to develop a new set of techniques to accomplish the old tasks.

Now, let's look at the key element of a graphic operating system, the window. The largest part, of course, is the work area, which can be even larger than the window itself; the window is just that—an opening through which you can view your work. The second most-obvious item is the title/drag bar that appears across the top of the window. At opposite ends of this bar appear the little geometric shapes on which you click with the mouse to close the window or make it fill the entire screen.

At the right of the window, you see the up and down arrows, which allow you to scroll through your work area a line at a time, and the vertical slider, which allows you to move directly to any vertical position in the work area.

Across the bottom of the window is the horizontal slider, which allows you to move the window horizontally over the work area. At the ends of the horizontal slider are the left and right arrows, which allow you to move the window horizontally one character at a time. And in the lower right-hand corner of the window is the sizer, another little shape, which you use to drag the window into the size and shape you want. (The main reason for changing the size of window, by the way, is to make room for other windows that you want to have open at the same time.)

Making the Switch

Even after you have mastered the ways of windows and rodent navigation, you may want to return to Atari DOS 2.0 from time to time. This is accomplished easily by double-clicking on DUP.SYS. Thereafter, a quick reset of the system puts you right back into RAM-resident GOS.

I have not tried other DOSes with GOS, but the manual states that both DOS XE and Sparta DOS will work with it; the documentation does not of-
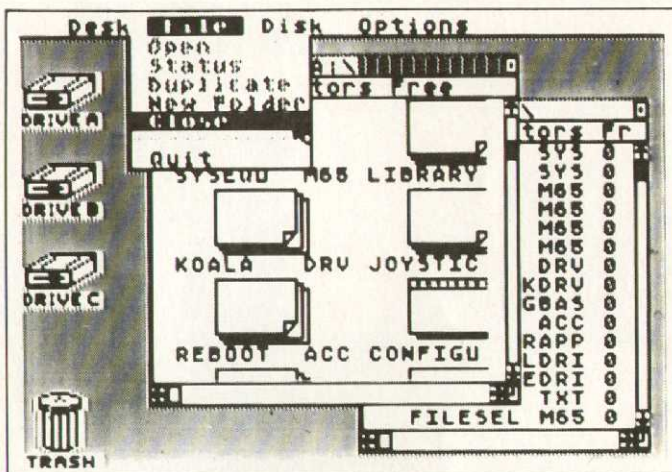
Overlapping windows display directory for drive A in text- and icon-format. The File menu has been opened and the Close option selected.

fer much help on the subject of incorporating "other" DOSes, however. I infer from the manual that operation in densities other than single, although possible under some conditions, is not a strong suit of GOS.

The manual avoids any discussion of RAMdisks, so I haven't the foggiest idea how you would go about incorporating one into GOS, although by switching virtual and actual drives on my MIO (by ICD) I was able to access one.

It is nice to see on-going development in the 8-bit world; GOS undoubtedly took a great deal of time and effort from inception to realization. And bundling *Diamond Paint* and the Programmer's Kit with the GOS cartridge is certainly an intelligent way to market the product. I commend Alan Reeve for his contributions to the 8-bit Atari world.

I understand that other Diamond GOS-compatible titles, including a

word processor and a desktop publishing program, will be available in the near future. These will obviously enhance the value of Diamond GOS considerably.

Well then, what is the bottom line? When you add the $39.95 price of the ST mouse to the $79.95 price of the cartridge, you get just about $120. For me, $120 is a *lot* of money—a lot for for a package that simply allows me to do what I have been doing in a different way.

If you have some extra cash and really want a state-of-the-art interface for your 8-bit operating system, by all means, buy Diamond GOS; it works as advertised. If, however, you don't anticipate spending much time on your desktop, you might want to wait and have a look at the applications that Reeve plans to integrate into a total GEM-like system before you make up your mind. ∎
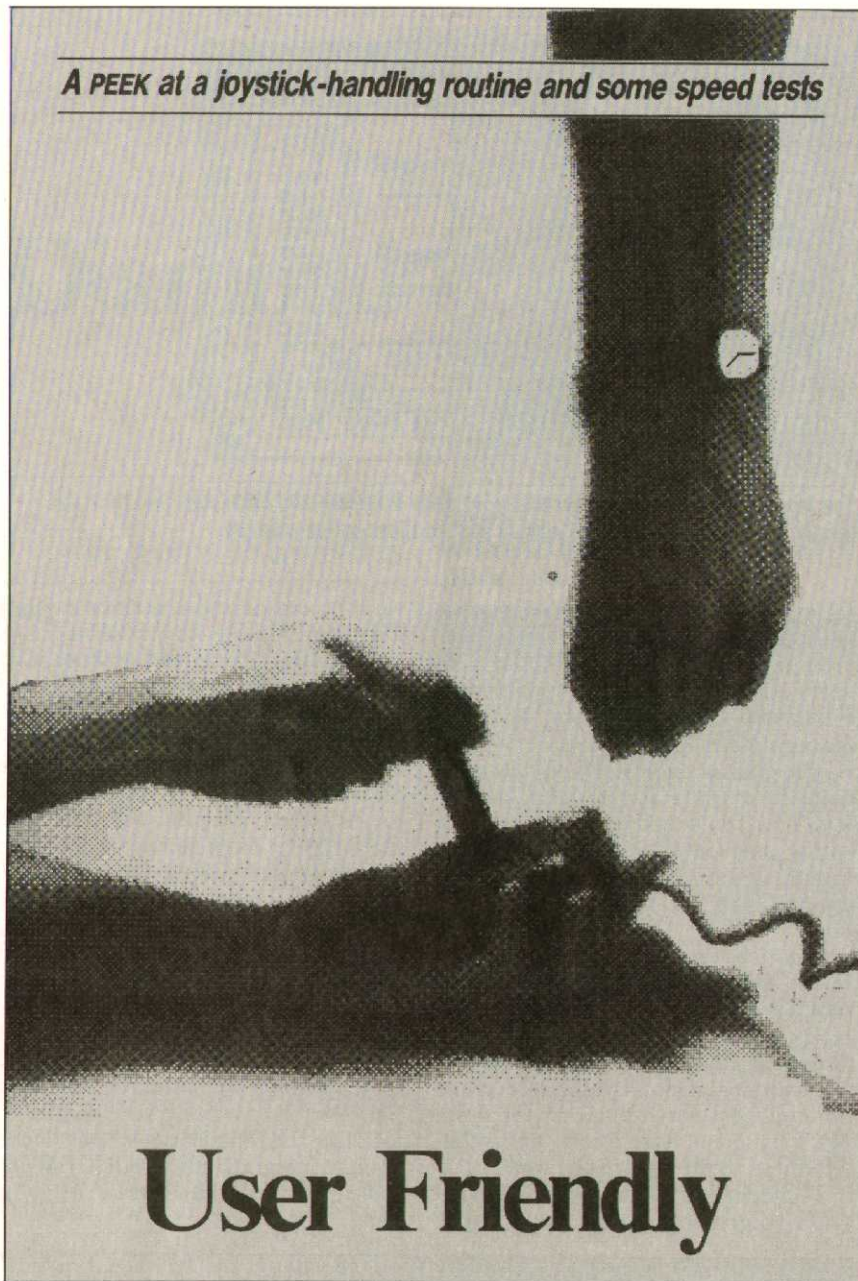
Puzzles & Problems

ANSWERS

Problems are on page 14.

1. time
2. three
3. c

4. 207
5. b
6. 720 (M=2, E=3, N=4, S=5, A=6)
7. firm
8. d
9. T
10. c
11. c
12. 19
13. b
14. 24
15. The code is North, South, West, East. You could spell news, sewn, or wens.

A PEEK at a joystick-handling routine and some speed tests

User Friendly

By DAVID NOYES

This month, we first travel to Sheboygan, WI, via the PACUS Report, The Official Newsletter of the Packerland Atari Computer Users Society. In their April 1989 issue, Disk Librarian Ron Starkey has provided a short Basic joystick-handling program.

The action of the program presented in Listing 1 revolves around PEEKing memory location 632 to read the value reported by joystick 0. Joystick 0 is attached to control port 1 (the leftmost port on an Atari 800). The procedure used in this sample program is one of the fastest ways to read and respond to a joystick using the Basic programming language. It involves reading location 632 for the disposition of the joystick. The values reported to location 632 by the nine possible joystick positions are as shown in Figure 1. A 15 is sent when the joystick is in the neutral vertical position.

One factor that increases the speed of

this program is the use of the calculated GOSUB in line 100. The value read by PEEKing location 632 determines the subroutine to which the program is sent. Note that each of the nine short subroutines found in lines 5 through 15 increments X and Y in a direction corresponding to the position of the joystick.

For example, if the joystick is pushed to the right and down, the value 5 is sent to location 632. Line 100 then indicates GOSUB 5. Line 5, which is the entire subroutine, adds 1 to X and 1 to Y. It then RETURNs to the remainder of line 100 for the PLOTting of the new X and Y values. After PLOTting, the program is instructed to GOTO the beginning of line 100 again.

Line 100 is essentially the entire program control. The PLOTting off-screen error is error-trapped to line 300. In line 300 the TRAP is reset to line 300, and program execution is returned to line 100 to read the joystick value again. Lines 200 through 240 set up the Graphics 7 screen (without text window) and the initial X and Y values, along with the value of joystick memory location ST0.

Type in the program and RUN it. Plug a joystick into port 1 and draw on the screen using the joystick. The other joystick port can by accessed by PEEKing location 633 for joystick 2. On the Atari 800 ports 3 and 4 can be accessed by PEEKing 634 and 635. If you need to include a fast Basic joystick handler in your program, try this one.

In a Jiffy

We now travel to northern New Jersey and the December 1988 issue of the JACG Newsletter (The Journal of the Jersey Atari Computer Group). As part of an Action language tutorial, Dave Arlington offers three short programs that illustrate speed differentials in three languages—Atari Basic, Turbo Basic, and Action.

Essentially the same, the sample programs in Listings 2, 3, and 4 are not benchmark tests, but simple loop-and-add-number programs. Type them in, run them, and see what you get. Remember, a jiffy is 1/60 of a second.

If your tests came out as expected, you found that in Atari Basic the little program took 84 or 85 jiffies (or about a second and a half) to run. In Turbo Basic, it probably went for about 39 jiffies (about 2/3 of a second).

In Action it should have taken only 3 or 4 jiffies (about 1/10 of a second or less). That's about 21 times faster than Atari

```
1 GOTO 200
5 X=X+1:Y=Y+1:RETURN
6 X=X+1:Y=Y-1:RETURN
7 X=X+1:RETURN
9 X=X-1:Y=Y+1:RETURN
10 X=X-1:Y=Y-1:RETURN
11 X=X-1:RETURN
13 Y=Y+1:RETURN
14 Y=Y-1:RETURN
15 RETURN
100 GOSUB PEEK(ST):PLOT X,Y:GOTO 100
110 TRAP 110:GOTO 100
200 REM SET UP
210 GRAPHICS 7:COLOR 1:POKE 752,1:X=80:Y=40:ST=632:TRAP 110
220 PRINT "MOVE JOYSTICK TO DRAW"
230 PRINT:PRINT "PRESS <BREAK> TO STOP"
240 PLOT X,Y:GOTO 100
300 REM OFF SCREEN ERROR CORRECTION
310 IF X<0 THEN X=0
320 IF X>159 THEN X=159
330 IF Y<0 THE Y=0
340 IF Y>95 THE Y=95
350 PLOT X,Y:TRAP 310:GOTO 100
```

Listing 1. A joystick-handling routine.

```
10 POKE 20,0:POKE 19,0
20 SUM=0
30 FOR X=1 TO 250
40 SUM=SUM+X
50 NEXT X
60 PRINT "The sum is   ";SUM
70 PRINT "That took   ";
80 PRINT PEEK(20)+PEEK(19)*256;
90 PRINT "  jiffies"
```

Listing 2. Atari Basic

```
10 Dpoke 19,0
20 Sum=0
30 FOR X=1 TO 250
40   Sum=Sum+X
50 Next X
60 Print "The sum is   ";Sum
70 Print "That took   ";
80 Print Peek(20)+Peek(19)*256;
90 Print "  jiffies"
```

Listing 3. Turbo Basic

Figure 1.

```
PROC main()
  CARD sum=[0], time
  BYTE ctr, t1=19, t2=20
  t1=0 t2=0
  FOR ctr=1 to 250
    DO
      sum==+ctr
    OD
  PrintF("The sum is %U%E", sum)
  Print ("That took   ")
  time=t2+t1*256
  PrintC(time)
  PrintE("  jiffies")
RETURN
```

Listing 4. Action

Basic in just this short program. In longer programs the speed differential is much greater.

Why? Because Basic interprets every line as it comes across it, putting it into instructions that the machine can understand. In Action, a compiled language, you write in a section called an editor, go to the compiler and compile it, and finally run it. By compiling, you translate each program statement into machine-understandable form only once. ∎

Atarifest Set For October

This year's Washington D.C. area Atarifest will be held on Saturday, October 7, and Sunday, October 8, 1989.

The show will again be at Fairfax High School, 3500 Old Lee Hwy., Fairfax, VA, and will be sponsored by WAACE (Washington Area Atari Computer Enthusiasts) and the Fairfax County Public Schools Office of Adult and Community Education. Hours will be from 10:00 a.m. to 5:00 p.m. on Saturday, and from 1:00 p.m. to 5:00 p.m. on Sunday.

For additional information, contact Gary Purinton, 12727 Magna Carta Rd., Herndon, VA 22071. ∎

Recently, I've been working on a software project—a program for ST and MIDI keyboard that lets a beginning musician play like a pro, turning simple chordings into complex patterns of accompaniment in a wide variety of musical styles. In the process, I've learned a lot about working with MIDI data in real time.

Realtime programming is the issue whenever a program has to respond swiftly to events that occur at unpredictable intervals. One way of handling realtime events is to have a program poll frequently for input . . . fine, so long as the program can afford to sit and wait for data. However, if your code must manage a complex user interface or maintain other asynchronous activity in tandem with input processing, polling will produce unsatisfactory results.

Interrupts

Where high performance is the goal, there is only one way to handle asynchronous input—via interrupts. Peripherals transmit interrupts to the CPU when they need looking after—when they have received a full byte of data, registered an error condition, etc.

For example, when you press a key on a synth hooked up to the ST MIDI IN port, a certain number of data bytes are written onto the MIDI line. As each byte shows up at the ST, it is received by one of the two 6850 ACIA chips—sophisticated components that handle MIDI, keyboard, and mouse I/O. The 6850, in turn, generates an interrupt to the 68000 CPU via the 68901 GPIA.

Upon receiving the interrupt, the CPU stops what it is doing, saves its registers, and calls an interrupt-handling routine the address of which is stored at a location in low memory. The handling routine begins by accessing the status registers of the 6850 to determine the cause of the interrupt—whether MIDI-, keyboard-, or mouse-related. Depending on the result, the CPU then jumps, via a simple subroutine call, to a subsidiary handler appropriate to the type of input received. Addresses for these 6850-related subsidiary handlers are also stored in a memory table.

The subsidiary MIDI-input handler reads the input byte out of a location in high memory and stores it in a ten-byte-long ring buffer that is accessed by BIOS functions. It then returns, via an RTS (Return from Subroutine) instruction, to the main handler, which resets the GPIA so that it knows its input has

Sound Chip
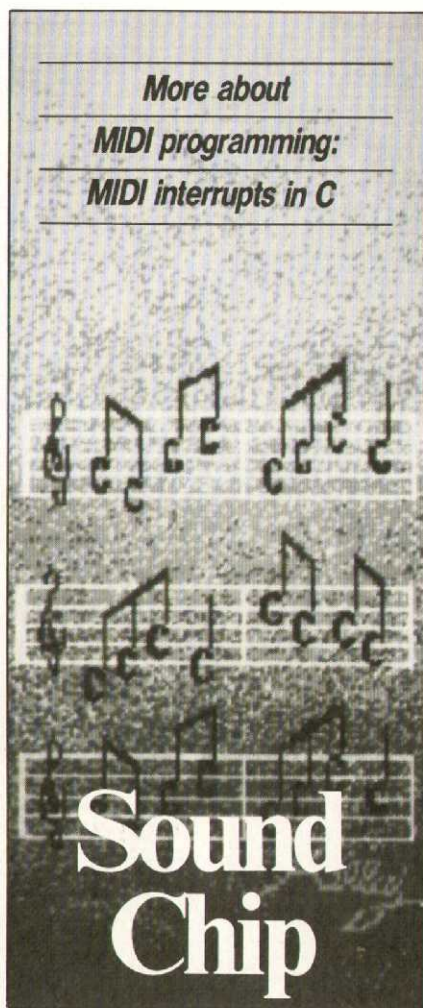
By JOHN JAINSCHIGG

been retrieved. Finally, the main handler terminates with an RTE (Return from Exception) instruction, causing the CPU to reload its registers and resume execution of mainline code.

Vector Stealing Made Simple

How do we go about exploiting the MIDI interrupt in our own programs?

The normal process of arranging to field a hardware interrupt involves composing a full, low-level handler, terminating with an RTE, and inserting its address (while in 68000 "supervisor" mode) in the main handler address table in low memory. Though this can be done in C (most compilers can be told to terminate a function with an RTE instead of the normal RTS and most offer library functions for accessing the 68000 supervisor mode), it is unnecessarily complex and redundant in this case.

Instead, thanks to the elegant, two-level 6850 interrupt-handling system offered by the ST, we can do something much simpler: compose a new subsidiary handler for MIDI input and insert its start address in the subsidiary handler address table. By doing so we leave the main interrupt handler in place to field the initial 6850 interrupt, handle other kinds of input (from the keyboard and mouse), reset the 6850, and terminate properly (with an RTE).

Because our subsidiary routine is called via a standard JSR instruction, it can be a standard C function, provided the compiler we use observes the standard C calling conventions. Most do. Moreover, we don't have to worry about supervisor mode or other 68000 technicalities to install a replacement handler at this level. The subsidiary handler address table is stored in main memory, where any program can get at it, and the OS includes a call (usually supported as a library function by C compilers) to determine its base address.

Writing the Handler

Still, there are a few restrictions that must be observed in writing any code that will be executed during an interrupt-handling sequence. The first is length; the longer handler code takes to execute, the longer it will be before another interrupt can be serviced. Trying to do too much in an interrupt handler

```
struct kbdvbase {
    void (*kb_midivec)();      /* MIDI input data vector */
    void (*kb_vkbderr)();      /* keyboard error vector */
    void (*kb_vmiderr)();      /* MIDI error vector */
    void (*kb_statvec)();      /* keyboard status packet */
    void (*kb_mousevec)();     /* keyboard mouse packet */
    void (*kb_clockvec)();     /* keyboard clock packet */
    void (*kb_joyvec)();       /* keyboard joystick packet */
    void (*kb_midisys)();      /* system MIDI vector */
    void (*kb_kbdsys)();       /* system keyboard vector */
};
```

Figure 1. The keyboard handler vector structure

can bog down the system and cause data loss if input is overwritten by subsequent data before it can be handled.

The second restriction involves the fact that our handler is replacing a portion of the lowest level of the operating system. The ST OS is not infinitely "reentrant"—meaning that if OS code is being executed when an interrupt occurs, the interrupt handler cannot access OS functions without doing awful things to the system.

Our handler must avoid the use of high-level BIOS and GEMDOS functions entirely and instead must deal directly with the ST hardware in terms of both retrieving MIDI data and processing it.

This last, luckily, is fairly simple. The 6850 MIDI data input register is mapped into main memory at location $FFFFFC06 and can be read directly by our handler. The register is bi-directional, meaning that writing to it will cause the 6850 to send out a byte along the MIDI line. To see if the 6850 is ready to accept a byte for transmission, bit 1 of the control register at location $FFFFFC04 can be examined. If it is set, the byte can be written directly to the I/O register.

Installing the Handler

Once the handler is written, installing it is simple. The XBIOS function Kbdvbase( ) (function 34) returns a pointer to the base of the subsidiary handler vector table. The table can be framed as a structure as shown in Figure 1.

Figure 1 is drawn directly from the structure declaration found in the file osbind.h, included with the Mark Williams C-Language Development system. Your compiler environment may use different names for the components of this structure, or you may have to declare it yourself.

The first vector in this table points to the start of the default MIDI input handler and is the vector we shall be changing to point to the start of our own routine. Changing the vector is a simple process of saving the original pointer so that it can be restored when our program terminates and writing the address of our handler function into the structure variable.

A Practical Example

To demonstrate all these techniques, let's compose a simple MIDI interrupt handler that acts as a data filter, recognizing MIDI NOTE ON events and trans-

```
#include <osbind.h>                              /* OS binding header */
#include <xbios.h>                               /* Extended BIOS binding header */

#define CONTROL         0xFFFFFC04L              /* MIDI control register */
#define DATA            0xFFFFFC06L              /* MIDI data register */
#define STATUS          0x80                     /* MIDI status byte */
#define NOTE_ON         0x90                     /* MIDI NOTE ON message */
#define NOTE_OFF        0x80                     /* MIDI NOTE OFF message */
#define OK_SEND         0x02                     /* MIDI output status */

/*********************************************************************/

int interval = 0;                               /* global transposition variable */

/*********************************************************************
The MIDI input-interrupt handler: Keeps track of MIDI running status
and recognizes NOTE ON and NOTE OFF events. Transposes key data for
these events by desired interval, and returns messages to synthesizer.

*********************************************************************/

void handler()
{
static unsigned char rstat;                     /* MIDI running status variable */
static int flag;                                /* Flag variable */
unsigned char data;                             /* MIDI data byte variable */

data = *(unsigned char *)DATA;                  /* Get data byte */

/* If this is a status byte, set the running status, and set the flag
   if the byte in question is NOTE ON or NOTE OFF (flag set indicates
   that next byte received will be key value for transposition). If
   status byte was not NOTE ON or NOTE OFF, clear flag. */

if (data & STATUS){
        rstat = data;
        if ((data & 0xF0) == NOTE_ON || (data & 0xF0) == NOTE_OFF) flag = 1;
        else flag = 0;
        }

else

/* Else, we assume we've received a data byte. If the running status
   is NOTE ON or NOTE OFF, and the flag is set, we must transpose this
   byte, otherwise we just pass it through and set the flag. */

if ((rstat & 0xF0) == NOTE_ON || (rstat & 0xF0) == NOTE_OFF){
        if (flag){
                data += interval;
                flag = 0;
                }
        else flag = 1;
        }

/* Then, we wait until bit 2 of the status register is clear, and
   write the (possibly modified) data byte to the MIDI I/O register. */

while(!(*(unsigned char *)CONTROL) & OK_SEND);
*(unsigned char *)DATA = data;
}

/*********************************************************************
The mainline code: Installs the new handler in the MIDI interrupt
path, and accepts input of a new global interval value for
transposition (enter '999' to terminate). Prior to termination, main
routine restores old handler vector.
*********************************************************************/

main()
{
struct kbdvbase *kbp;                           /* Keyvector structure pointer */
void (*oldvec)();                               /* Storage for old MIDI vector */

kbp = Kbdvbase();                               /* Get pointer to Keyvec structure */
oldvec = kbp -> kb_midivec;                     /* Save old MIDI input vector */
kbp -> kb_midivec = handler;                    /* Install vector to our handler */

do {
        printf("Current interval is %d ... input new interval:",interval);
        scanf("%d",&interval);
        } while (interval != 999);

kbp -> kb_midivec = oldvec;                     /* Restore old vector! */
}
```

Listing 1.

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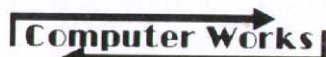
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posing them by a given interval before sending them back to our synthesizer. If the synthesizer is in OMNI ON/POLY mode (the normal default), each key-press will produce two note sounds: one at the pitch corresponding to the actual key pressed, the other transposed up or down by the interval we specify. We shall design our program so that the transposition interval can be changed at will, via a mainline function, demonstrating our ability to handle realtime input while doing other useful work.

A MIDI NOTE ON event is a three-byte data packet, the first byte of which has the hexadecimal format $9X, where the four bits of the low nybble contain the MIDI channel. The second byte indicates the key pressed, and it is this value that we must modify to achieve transposition. The third byte is a velocity value.

All our handler needs to do, then, is recognize the start of a NOTE ON packet, passing the first byte through and setting a flag so that it is ready when the second byte appears. Then, it must modify the second byte by adding or subtracting an appropriate interval, write this byte through, and reset the flag so that when the third byte appears, it will be passed through without modi-

Realtime programming is the issue whenever a program has to respond swiftly to events that occur at unpredictable intervals.

fication.

Fixing things so that the transposition interval can be modified by a mainline routine is just a matter of placing the interval in a global variable that can be accessed both by the handler and by the interval-setting routine.

Installing the handler address in the kbdvbase table is done by pointer reference to a structure, using the → operator. The original value is saved before handler installation and restored when the program terminates.

The full program, composed in Mark Williams C, is shown in Listing 1. Adapting it for other ST C compilers should be fairly simple. ∎

Reset-Proof RAMdisk Caution

ST HELP KEY

Using an auto-booting, reset-proof RAMdisk is a great way to speed up work on an ST system with one or two floppy drives. However, if you have installed the RAMdisk as drive C, beware! If you change something on the desktop, then choose Save Desktop from the Options menu, the DESKTOP.INF file will sometimes be written to the RAM-disk, instead of to your A drive.

Even worse, if the RAMdisk is really reset-proof, pressing Reset afterwards will sometimes cause your system to reboot with the new desktop settings in place, just as if the file had been correctly written to drive A. Why? Because the ST operating system automatically assumes that drive C is a hard disk and that, when a hard disk is installed, it should save DESKTOP.INF files on its root directory. At boot time, the ST searches for a DESKTOP.INF file first on drive A, then on drive C—which, in this case, is your reset-proof RAMdisk.

So the system ends up acting just as if the DESKTOP.INF file had been saved where it should have been, though in fact, it wasn't. The moral: Check to see where your new DESKTOP.INF file is saved, and copy it to the proper disk, if necessary.

From *The Atari ST Book of Tips, Instructions, Secrets and Hints,* © 1988 by Ralph C. Turner.

## Avoiding Fragmentation on Floppies

ST HELP KEY

When you delete a file from a disk, a gap is left where the deleted file used to be. If you later add or copy onto this disk another file that is larger than the original, deleted file, the new file won't fit into the existing gap. Part of the new file fills up the gap and whatever is left is put somewhere else on the disk.

This situation is called *fragmentation*—a fragment of the file is at one location on the disk, and another fragment is somewhere else. This results in slower disk access time. It takes more time for your computer to access a fragmented file than it does a non-fragmented file.

If you copy a fragmented disk by dragging its icon to that of another disk, the copy will end up fragmented as well. This is because the ST copy-disk function duplicates a disk exactly, sector-by-sector. But if, instead, you rubberband all the files and folders on the source disk with the mouse, then pull these over to the target disk icon, the disk will be copied one item at a time, each file occupying sequential sectors insofar as space on the target disk allows. Providing the target disk is newly formatted, the copy will not be fragmented.

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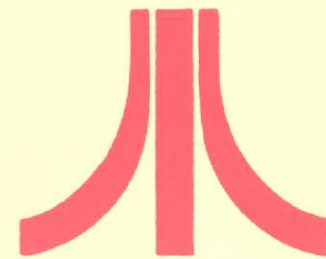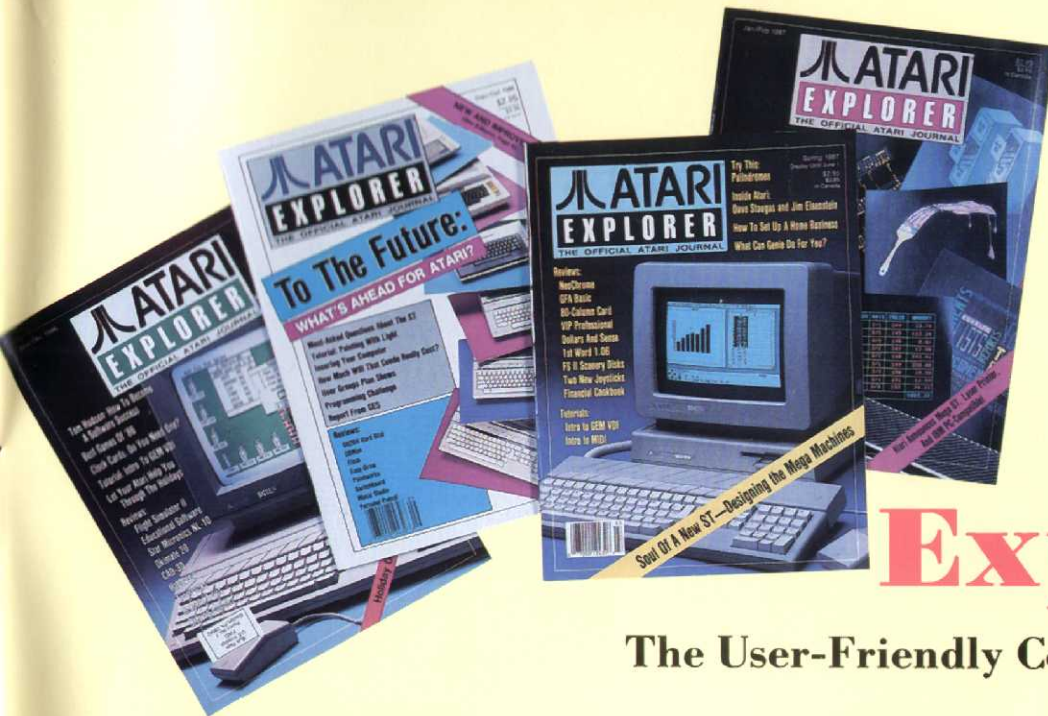
Atari Explorer

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