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October 92

AtariUser

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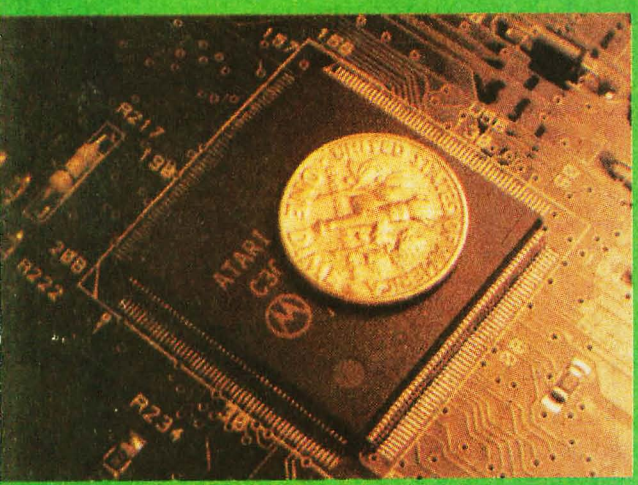

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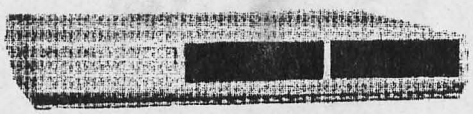

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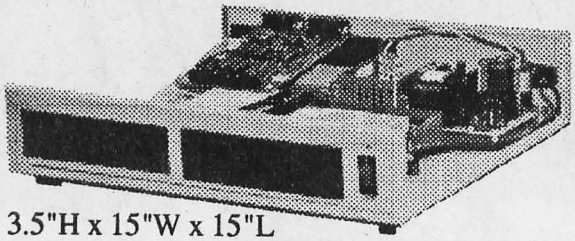

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AtariUser

October 1992

Inside...

■ Change...

AtariUser is growing and changing, thanks to our readers and advertisers. And also because Quill, the parent company of AtariUser, is growing and changing.

Quill has started another magazine, and AtariUser is now a separate division, with our own staff. We've moved AtariUser operations to a separate office, closer to the people who are doing most of the work for our magazine. So, we have a new address and phone number. Please use them!

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Live phone support will be typically available on Fridays, but feel free to call anytime and leave a message for us to act on. Other ways to reach us at AtariUser include the GEnie telecommunication system: public messages and general support is in the ST Roundtable, Page 475, Bulletin Board Category 15 (Magazines), Topic 10 (AtariUser). Our GEnie Mail address for private E-mail and file transfers is ATARIUSER. Or, reach us via The CodeHead Quarters BBS, 213-461-2095 (validation required), at addresses John Nagy or John King Tarpinian. More details of our move are in the NEWS section in this issue.

Speaking of this issue, we're proud to bring you an extended FALCON section, with pictures of the innards like never shown before in any magazine. We've also got a close-up review of what the machine can do and how Atari plans to make it a commercial success. You'll want to keep this issue for future reference. Norm Weinress has a great article on the confusing variety of memory chips that our machines use, Stephen McDonald does MIDI, and the Glendale show caps our News section. And I want to particularly thank Al Fasoldt, who wrote an outstanding viewpoint on PC vs. Atari internals that will raise many an eyebrow. It's our High Resolution column this month in AtariUser.

What's next? Gear up for the holidays with lots of reviews, plus a report from the WAACE AtariFest, coming in the November AtariUser. Don't miss it.

-- John M. Nagy, Editor-in-Chief, AtariUser Magazine

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HIGH RESOLUTION

A Letter to a Friend about Staying with Atari -- by Al Fasoldt

I am sorry to hear about your decision to abandon the ST. I am tempted to try to dissuade you, but instead I'd like to tell you about my own disillusionment over the ST and Atari in general and what became of it.

About a year ago, I'd finally reached the bottom of my willingness to wait for Atari. I was sick of reading about and hearing about all the new and wonderful things that were going on in the other camps — the **PC** and **Mac**. By the end of 1991, I'd made up my mind. I was switching to my PC, and leaving my ST for the occasional fun program and game, or maybe for running a BBS.

So I got smart. Instead of moving to Windows, which I already knew would not satisfy an ST user, I bought **GeoWorks.**

"...a funny thing happened on my way out the door when I tried to abandon Atari.... But it was more than funny; it was eerie."

GeoWorks is amazing. There's no doubt about it. It can make any PC run rings around Windows. It multitasks with any PC, even the oldest and slowest model. If there were any single graphical interface that makes a PC behave like a computer should behave, it would have to be GeoWorks.

As you know, for a decade or more I have used Ataris professionally. I did all my writing on them — first, an 800XL, then a 130XE, then a 576K 130XE, then a 520ST, then a 1040ST, then a 4-meg 1040ST, and now a 4-meg, 16-mHz 1040ST. I used them for many other purposes, too. I did that because I like them; I like the way they respond. I guess they would be the sports cars of the PC world. I like sports cars.

I got deep into GeoWorks. But within a few months I found myself writing again on my ST. I found myself organizing my next book on my ST. I found myself learning new ST programs, enjoying them, looking for others, hoping to find some of the software I would have liked to have had on the PC.

I'd like to say, "Then a funny thing happened on my way out the door when I tried to abandon Atari...." But it was more than funny; it was eerie. I like the ST too much; I *love* the ST too much. It's not just a syrupy crush. The kind of love that I have is based on some cold, hard realities.

The ST is not like a PC. It is a little like a Mac and a little like an **Amiga**. Let's start at the beginning.

PC's use 80x86 series CPU chips, either from **Intel**, their inventor, or from chip makers who have cloned the CPU's. All 80x86 chips must follow the same internal architecture of the first chip in the series, the 8088. Instead of creating new chips that didn't have the failings of the 8088, Intel decided to keep them all compatible.

So what?

Well, for starters, those chips, even the 80486, address memory in a strange sort of way. They grab only 64K at a time. This is called a memory segment. If you have ever looked at the length of ".COM" files — the standard PC executable program, comparable to an ST ".TOS" file — you may have noticed something odd: None of them are more than 64K in length. They can never be longer than that. Not now, not in the future. That's because no PC, no matter how new or old, can address more than 64K of memory at once; it just can't, no matter what else has been done to make it fast or sleek.

You are surely noting that this is just *1/10th* of the memory limit that you are accustomed to hearing about in the PC world -the 640K limit. Yes, a PC can only address 64K at a time; the 640K limit is the standard maximum for *all* the memory that can be addressed when the segments are pulled to and from RAM one at a time. This standard has been bent and massaged and altered by very clever programming, so that most modern DOS systems can now allow the CPU to address something like 700K or even more — but only after a painful process or trial and error, to see what memory can be redistributed.

How, then, can a PC work with a program larger than 64K? It uses ".EXE" files, which can be 600K or more in length. An ".EXE" program tells the PC to load it 64K at a time. And this means that an 8 mHz PC, which has the same processor speed as a standard ST, is nowhere near as fast in actual memory access and execution. A 16-mHz ST is comparable to a 33-mHz PC; a 40-mHz SST (from **Gadgets by Small**) cannot be matched by any PC, even a 66-mHz clock-doubled **Hewlett-Packard**. The laws of physics tell us so, as do the benchmarks, because of the way the ST's **Motorola** chip works. It has a flat memory model, which is fancy talk for the way it addresses memory linearly. The ST can grab 4 megs at a time; the Falcon can grab 14 to 16 megs at a time.

You have heard about PC's with oodles of extra memory, no doubt. PC's must have an 80286 or higher CPU to address that extra memory, unless they use a bank-switching technique pioneered by **Apple** in the Apple II and used by Atari very effectively in the 130XE.

Windows cannot make use of that bank-switched memory, which is why Windows will not run adequately on an older PC. Windows must use what is called extended memory, which takes advantage of a property of

more...

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HIGH RESOLUTION

■ **Al Fasoldt is a syndicated columnist for Newhouse News Service and author of The Technofile, which is distributed to 100 newspapers in the United States and Canada. He is also a pagination supervisor and programmer at the Syracuse Newspapers in Syracuse, New York.**

■ AtariUser welcomes letters with Atari questions and reactions to materials presented in our issues. Send them to us at 249 North Brand Boulevard, Suite 332, Glendale, CA 91203

the 80286 and higher CPU's enabling them to switch into a different operating mode so that they can reach up past the old limit of 640K.

That mode switching also takes processor time, and is yet another reason why a PC is not as fast as an ST in the way it works. So most PC programs are 640K-compatible programs that never have anything to do with extra memory, and it will always be that way. It cannot be any other way.

This, in turn, means that software that runs on PC's cannot work as smoothly as software that runs on any of the Motorola-chip machines (the ST, the TT, the Falcon, the Mac and the Amiga). It can't. Period. This is not theory. It just plain can't.

What about the **Mac**? Macs are getting cheaper, and that's good. But let's talk about how Macs work. First, Mac files have two parts — a data fork and a resource fork. A Mac file isn't just in one place; it's in two. The Mac itself does its own housecleaning, so that when you drag a file to the trash can, the Mac knows enough to delete both parts.

But that odd way of splitting up files gets in the way of normal operations; it makes many of the typical things the Mac does much slower, and it guarantees that life with a Mac will be dictated by the Mac and not by what you want to do with it. The Mac is not easy to use; it is, for someone who knows how delightful an ST can be, exceptionally cumbersome.

But that's just the start. The Mac's operating system is not just on ROM chips as TOS is. It's in ROM and on a system disk. That system disk (or hard disk) must be present at all times, precisely the way PC's work.

Let's back up to point one. Since Mac files live in two places, and since the Mac (point two) has its OS on disk and in ROM, the Mac accesses its HD or its floppies constantly, just to do its normal work. The ST can run for months without accessing anything but memory — the way computers should operate.

Macs also have very small screens, unless you pay a lot of money and buy one of the modular Macs.

I see the **Amiga** as an unfinished computer; it cannot be compared with the ST. It's a nice hack, but not a serious computer except for graphics.

So, what would you find as an ST user if you turned to a PC? A lot of software to choose from, and a very dull life. And a lot of configuration problems. And clunky daily use.

And the Mac? Expense or slowness; you have a choice.

This is a pivotal time for Atari. The Mega STe is perhaps one of the finest personal computers around, and it costs $600 to $700. Memory can be dropped in because it uses SIMMs; it can handle two modems at once (even three, if you aren't doing anything truly fancy with the third); it has stereo digital sound output; it offers 16 gray-scale monochrome (which the Mac can't do except for the high-priced models) and a 4,096-color palette (which the cheaper Macs can't come within 4,094 colors of matching); it even has a wonderful detached keyboard and a VME slot for any sort of add-on. And of course it now has a 1.44-meg floppy.

The **Falcon** is an unknown, but an exciting one. In its favor will also be an inexpensive price, along with amazing graphics.

"Is this a good time to leave the ST platform? In my opinion this is the best time to STAY *with the ST."*

This is also a pivotal time for Atari software. **NeoDesk** and TOS 2.06 both bring much of the Mac's desktop design to the ST (drag-and-drop from the desktop, a full range of installed applications, and more), and they make the ST more powerful than a Mac because they add full macro abilities (press an Fkey to run a program in NeoDesk, or to do that and more with TOS 2.06). The Mac cannot do this without add-ons.

Word-processing and desktop-publishing software on the ST is finally at the same plane as on the Mac, and much better than on the PC. Databases and spreadsheets are as good in most ways, better in others. And of course MIDI on the ST has no peer.

Even support is better in some vital ways on the ST. Sure, Atari eats swamp water, but so does Apple, and so do all the others. Just monitor the other areas of **GEnie** and you'll see. ST users give each other more support than the users of any other computer; GEnie has made it clear that its busiest support area has been the ST roundtable for many years. (**Bob Brodie**, Atari's director of communications, got more than 1,000 E-mail letters *alone* from GEnie when he said he was reconsidering where to spend his on-line time.)

Is this a good time to leave the ST platform? In my opinion this is the best time to *stay* with the ST. - *Al Fasoldt* n

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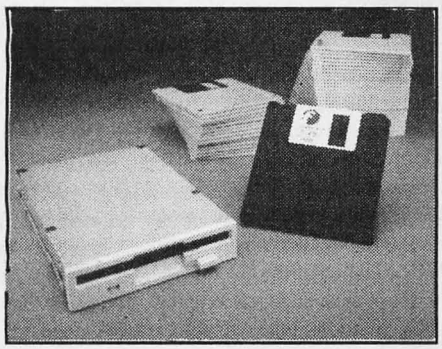

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AtariUser NewsEdge

■ New Mag for 8-Bit Atari Owners

Brought to life by the gradual death of Atari 8-Bit computer coverage in other magazines, a new magazine will be born this fall. Former Current Notes writer Ben Poehland is Managing Editor of Atari Classics (AC), a new bimonthly effort exclusively devoted to the Atari 8's. The philosophical orientation of AC is to be "of, by, and for the Atari 8-Bit user". Ben conducted a mail survey in early 1992, and got feedback on what was desired and who would support such a magazine, and the result will be seen in the premier issue to be released in October at the WAACE AtariFest. Unicorn Publications (AIM Magazine) will publish AC as an independent publications.

Ben has been surprised at both the late upsurge in interest and requests for commercial advertising. It will be distributed free to the people who sent in commitment cards during the Mail Campaign, and should also be available at WAACE. A subscription is offered at $25 for six bimonthly issues. Features will be user applications, hardware tutorials and modifications, programming, and software reviews. Paid subscribers will be able to place free ads in AC to buy, sell or trade their personal 8-Bit treasures. A disk subscription will be available separately. Contact Atari Classics at 179 Sproul Road/Route 352, Frazer, PA 19355.

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Falcon Rolls out in Boston

The Atari Falcon030 made its official US premier at a press conference at a Boston Computer Society meeting on September 23. This was the "rollout" for the new computer that had already made sneak preview appearances at the California Glendale Show as well as at Atari Messe in Germany. Over 400 people were expected at the Wednesday night event that reprised Atari's revelation of the original ST computer at BCS in 1985. However, only about 150 people attended the meeting that featured Atari's Sam Tramiel, Bob Brodie, Bill Rehbock, James Grunke, and designer Richard Miller. Despite the small turnout, Atari surprised the group by giving away a Falcon030 as a door prize for the meeting. A press reception at Boston's Copley Hotel before the event drew a satisfying mix of Wall Street Journal, television news networks, and newsletter editors. Overall, reactions to the machine have been universally positive, even if the enthusiasm hasn't been as widely distributed as hoped. The presentation of the new line of computers is being tailored to promote Atari's Falcon as "the first system designed for Personal Integrated Media" (see the Close-Up feature on the Falcon in this issue of AtariUser). Television tapings were conducted with Atari on Thursday following the introduction for a series called "PCTV" that claims 40 million viewers. Watch for airings of this segment in your area.

FSM GDOS Revamped

Announced for release "real soon now" for over a year, Atari's FSM GDOS is being completely replaced with a new and superior product even before it was generally available. The user base will benefit, however, as the scalable-font technology in the final FSM will use industry standard and inexpensive Type 1 fonts, to be supplied by Bitstream, one of the largest font providers in computer software. The new FSM GDOS, used to generate very flexible printouts of infinitely scalable and rotatable fonts, is based on the German product called SPEEDO, while Atari has abandoned the plan to use Ultrascript's proprietary system that required their unique and pricey fonts. SPEEDO is, as its name implies, also very fast, and it should make a much more satisfying product for Atari. It turns out that the debate between Speedo and Ultrascript has been part of the seemingly endless delay of the product release. Now, when will we see Speedo/FSM? Real soon.

Atari 2nd Quarter Losses

Atari Corporation announced its second quarterly 1992 financial reports in September, showing a net loss of 39.8 million dollars. Sales were down by 50% from the same period in 1991, which also showed $30 million gain resulting from a $40 million sale of a Taiwan plant. The newly reported loss includes a $34.1 million write-off against old inventory that has been carried on the balance sheet as an asset until now. That includes 2600, 7800, and 8-bit computer products that were liquidated overseas and in South America, causing an increase in on-hand cash even while reflecting a long-term loss on paper. The funds released by the sale and write-off of the old inventory will support current efforts to produce and promote the new Atari computers. Sam Tramiel, Atari President, said even with the loss, the company remains strong. "The company has over $60 million in cash and a strong balance sheet," he said. The launch of the Falcon computers this fall and winter will both use these assets and return Atari to a competitive position in the computer market.

Up Next: WAACE AtariFest

The 8th annual WAACE AtariFest '92 will be October 10th and 11th at the convention facilities of the Sheraton Reston Hotel in the Washington, DC suburb of Reston, Virginia. The WAACE AtariFest is known as the "Premier Atari Show on the East Coast" and will feature nearly 40 vendors, developers and dealers, exhibiting and selling their products. Numerous seminars and demonstrations will be available, along with door prizes, and a banquet on Saturday night. Contact Russ Brown at GEnie address R.Brown127 or call 703-803-6126.

Shows Canceled

The Chicago ComputerFest by Atari 1993 and the Northern California Atari Expo have been canceled. The Chicago show was to have been a continuation of the successful cooperative venture between the Lake County (Illinois) Atari Computer Enthusiasts and Atari Corporation, the show has fallen victim to recent downsizing in Atari itself, as well as a redirection of internal policy. The Computerfest was planned for May 15 and 16th 1993 at the Ramada Hotel O'Hare, near Chicago. LCACE is uncertain at this time as to possibilities of a local-oriented effort such as the two shows prior to the November 1991 ComputerFest.

The San Jose area's planned Northern California Atari Expo planned for December 1992 has also been canceled due to ongoing problems with scheduling and prior commitments. However, the show, to be a joint effort of user groups A.B.A.C.U.S., S.L.C.C., and S.S.T., may be rescheduled to a new date and place.

Massive Memory for Portfolio

Perhaps the most exciting new products anywhere for the Atari Portfolio palmtop computers are the new 1, 2 and 4 meg Flash Memory Cards from Optrol Inc.. These massive storage cards fit entirely inside the Portfolio memory card slot. The nonvolatile read/write memory has 10 year data retention with no batteries. Driver software on the card allows the user to read and write from the Portfolio or the PCcard Drive just as if it were a huge ramcard. The software also allows the user to flash erase 64k blocks of memory up to 100,000 times to make them available for reuse. List prices are $179, $254, and $399 for 1, 2, and 4 meg cards. Optrol Inc., P.O. Box 37157, Raleigh, NC 27627, 919-779-3377.

Glendale: Super Show of the West

The Earth moved again in Southern California last month. Nearly 2,500 people scrambled to meet falling prices and rising expectations, while a strange new bird circled overhead on Saturday and Sunday, September 12 and 13, 1992.

It was the **Southern California Atari Computer Faire, Version 6.0**, and it was another major success for organizer **John King Tarpinian** and his **HACKS** user group. Held in the Glendale Civic Auditorium (as usual) in Northeast suburban Los Angeles, the show featured 40 exhibitors plus Atari itself. And while attendance was down from 3,500 last year, **this year's crowd matched the 1990 draw of 2,400 plus.** According to the retailers and many developers at the show, Glendale sales were never better than this year. As for the show-goers, who were each handed a copy of the September **AtariUser** with their ticket, the mood on the whole was uplifting, hopeful, and excited about the new Falcon.

This year's show featured a **preview of the long awaited Falcon030 computer.** Crowds thronged around the demo machine on the stage of the auditorium, as demos of the Falcon's outstanding audio and video performances were given by Atari's **Bill Rehbock**. Also on hand from Atari were **James Grunke** and, as always, **Bob Brodie.**

Atari donated the use of **a half-million dollars of equipment** for the show, supplemented by personal machines brought in by the nearly 50 volunteers from area user groups. Proceeds from the show go entirely toward show expenses and advertising, plus a startup fund for next year's show. As part of Atari's general cutbacks in spending, there was no supplemental funding of advertising, resulting in smaller ads and less overall promotion of this year's show. However, **Atari donated a full-fledged Falcon as a DOOR PRIZE!** Winner by drawing of the 14 megabyte with 65 meg hard drive Falcon030 was Jason Spoor, who had also volunteered many hours of his time in support of the show.

An Atari Corporate seminar was held on Saturday, with Bob Brodie and Bill Rehbock presiding over the standard Q&A, plus a detailed **demo of the Falcon** (see the Feature Story in this issue). Two sold-out **Calamus SL classes** were held on a reservation-only basis, conducted by Mario Georgiou of DMC Publishing.

An interesting contrast was offered to multi-platform developers in that an Amiga show was simultaneously being held across town. Migraph and ICD had booths at both shows, and marveled at the difference in costs—the Amiga show was larger by far, but more expensive in the extreme. **BYTE Magazine writer Jerry Pournelle attended** both shows, and was treated to a private showing of the Falcon at Glendale (he liked it).

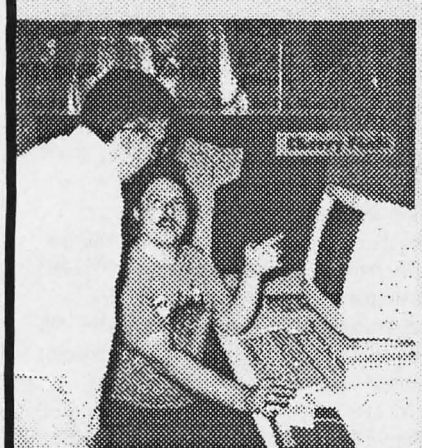
The most outstanding booths were done by the two major LA area retailers. **The Computer Network** (TCN) took a full 8 booths and curtained it off into a private sales floor even larger than that at their store! It was in a "backstage" motif complete with bright pink "stage passes." It paid off, with sales topping any two-day period in their history. Another L.A. retailer, **Mid Cities,** was not to be outdone by the TCN folk. A MIDI band gave continuous performances and demos of hot music software featuring the development team at Barefoot Software, and a DTP area was showing Goldleaf and ISD products. It worked, as at least 11 TT's left the Mid Cities booth, along with a ton of software at prices so low that they would frighten small children and animals.

Above, Mid Cities Comp Soft set a dazzling display at great prices

Left: Charles F. Johnson of CodeHead in one of his lightning fast demos.

Below: If Best Electronics doesn't have it, it's just not something you need!

New products were everywhere, as Glendale has been a tradition release date for new Atari offerings. An overview of new and hot items:



Beckemeyer Development: A new kit that allows installation and use of standard SCSI tape backup drive with an ST or TT.
Branch Always Software: Darek Mihocka had his GEMulator for sale for the first time anywhere, enabling IBM PC's to run ST software. It really works—if the PC is really fast.
CodeHead Technologies: WARP 9, now at V.3.72 with EXTENDO-SAVE, an extensible screen saver. They sold out on Saturday.
Gribnif: CARDFILE 4, the address book/appointment calendar ACC was the hot ticket at Gribnif Software.
ICD: The new LINK is ICD's modular answer to the question of how to use a SCSI hard drive, Floptical, or CD ROM on a standard ST or STe with ACSI/DMA ports.
Lexicor: Lee Seiler, the graphical genius, simply dazzled audiences with his animations and art, plus MONA LISA, a forthcoming SGI and Falcon title.
Migraph: The new "WAND" full page scanner plus upgrades of Touch-Up and the Migraph Optical Character Recognition software.
Oregon Research Associates: Diamond Back II V.2.50 plus a pair of premiers for Glendale: "Diamond Edge" repair for hard drives and "Ultimate Virus Killer."
Wintertree Software: Phil Comeau's new Spelling Sentry is everything that Thunder and the writing accessory Abbreviator were, together in an ACC.

Also appearing with their prime products were: **Atari Explorer Magazine** (welcome, Mike and Darren), **Best Electronics** (you name it), **Bio Illustrations** (fab IMG art), **Clear Thinking** (EdHak), **Compo** (That's Write), **Computer Safari** (fonts and more), **D.A. Brumleve** (Kidprgs), **DMC** (ISD/Calamus SL), **Dragonware** (PowerNet), **Fair Dinkum Technologies** (Cyberdrome), **Fast Technologies** (Turbo030), **Freeze Dried Software** (FDTerm), **Gadgets by Small** (Megatalk), **GEnie** (also showing Storm terminal from DC), **JMG** (Hyperlink), **Maxwell CPU** (Silhouette), **McDonald & Associates** (ST Informer), **Micro Creations** (Gimeterm), **S.D.S.** (Photoman), **Sudden Inc.** (Sudden View), **Z*Net** (just reporting and schmoozing), **Zubair Interfaces** (Z-Ram).

Hosting, without a booth, was the **HACKS** user group of Glendale. Other groups at the show included **ACAOC, RAM, LOCH, SBACE, NOCCC/ST SIG, and ACES.**
John King Tarpinian has announced the dates of next year's Southern California Atari Computer Faire: **September 18-19, 1993. Same place, same time.**—*Story by John Nagy*

there's more...

■ AtariUser Moves

As part of the diversification of Quill Publishing, AtariUser Magazine has established its own separate office and staff. The new address and phone numbers for AtariUser Magazine will enable readers and advertisers to get faster response and better service from the growing AtariUser staff. Please begin use of the new address and phone numbers IMMEDIATELY:
AtariUser Magazine
249 North Brand
Boulevard, Suite 332
Glendale, CA 91203
Telephone/Voicemail: 818-246-6277, FAX: 818-242-2129. (Call on Fridays for live Customer Service.)

Editor-in-Chief John Nagy, with the assistance of John King Tarpinian, will continue to lead AtariUser. Well into its second year of production, AtariUser Magazine continues to distribute more monthly issues than any other Atari publication. Quill's Steve Lesh will continue as Art Director and consultant, while Matt Sheldon and P. Kevin Horn have turned to duties in COMP, Quill's new PC magazine.

AtariUser's new office, plus the addition of new sales staff members Tara Jacobs and Steve Blackburn, and Distribution Manager LaMar Pugh, are making AtariUser even more responsive to the needs of Atari Users everywhere. Production of AtariUser is moving towards a 100% Atari pre-press system, with Lou Rocha overseeing the conversion to Calamus SL for layout and publishing.

Dealers, show promoters, and user groups are encouraged to call AtariUser to arrange quick quantity shipments. Individual subscriptions are $15 a year (12 issues) for US regular delivery, $25 for quick US First Class delivery, and $30 a year for delivery outside of the USA. Visa and Mastercard accepted. Call AtariUser today!

MIGRAPH's New Scanner, Software

The leaders in imaging products for the Atari computers, Migraph, is introducing a new very affordable full-page scanner, as well as an upgraded Touch-Up software package. The new **PS-400 WAND** is essentially an 8.5" wide hand scanner, enabling collecting a full standard page as a single scan. The new scanner has twice the grayscale power of the Migraph hand scanner, recognizing up to 64 grayscales, and with Touch-Up software conversion, 256 grayscales can be reproduced. It offers four dither settings plus line-art and 100 to 400 DPI resolutions (selectable in 10 DPI increments via the new Touch-Up). The PS-400 WAND will retail directly from Migraph only for under $600, about half the cost of most full page scanners. Final retail pricing is still in flux; check with Migraph for their direct purchase prices.

It will come with all hardware, interface, and power supply, as well as the new Touch-Up Version 1.8. Optionally, owners of the Migraph or Golden Image hand scanners can get the WAND and software upgrade without the interface for a discounted price. A powered sheet-feeder option for the WAND that can automatically handle 10 pages at a time is also available for about $200 extra. It enables effortless and flawless straight and repeatable scans, ideal for use with **Migraph's Optical Character Recognition** software. **Touch-Up** Version 1.8 (up from 1.65) has much faster loading of files, improved (up to 256 shades) grayscale conversion, and STe Cache compatibility, as well as special features for WAND owners.

Version 1.8 is available direct from Migraph as an upgrade for 1.6 and up owners for $20. Older versions can be upgrades for slightly more; contact Migraph. PC products from Migraph, including a $99 converter card with PC Touch-Up, will allow your ST scanner to do double-platform duty. Migraph, Inc., 32700 Pacific Highway S. #12, Federal Way, WA 98003, 800-223-3729.

GRIBNIF's CardFile 4

Premiering at the Glendale show was the latest version of the desk-accessory Rolodex style database, **CardFile,** from Gribnif Software. Version 4 features a new look, new features and enhancements, and a re-written 60+ page manual. Most of the new features and enhancements came directly from customer suggestions. The address cards now offer extended note areas, up to 4 phone numbers per card, smart area code autodialing, an appointment calendar with notes, versatile label and address printing, data exchange with the Portfolio, and pipes to most any GEM program for transferring data from CardFile to your applications. **CardFile 4** retails at $39.95, and upgrades are available from Gribnif at a discount. Gribnif Software, P.O. Box 779, Northampton, MA 01061, 413-247-5620, Fax 413-247-5622.

New Diamonds

Oregon Research Associates presented an upgraded **Diamond Back II** plus two new programs at Glendale: Diamond Edge and The Ultimate Virus Killer. **Diamond Edge** provides an advanced set of Disk Management tools available for the Atari ST including disk diagnostics, optimization and defragmentation, repair of damaged disk structure and files, and mapping of bad sectors. **Diamond Edge** can save, restore, and edit critical disk information to restore even very badly damaged disks or recover crashed disks, as well as undelete files. Other functions include hard disk partitioning, copying, zeroing, wiping, etc. Oregon's **Ultimate Virus Killer** recognizes and deals with repairing damage from 67 viruses including the dreaded "link viruses" that attach themselves to every program that runs and can destroy all your data. It also provides ways to immunize your disks. Diamond Edge's introductory price is $69.95, and the Ultimate Virus Killer is $29.95. Diamond Back II owners should contact Oregon regarding upgrades. Oregon Research Associates, 16200 S.W. Pacific Hwy., Suite 162 Tigard, OR 97224, 503-620-4919, FAX: 503-639-6182.

Purple Mountain: New Peaks

GEMulator: Darek Mihocka's ST emulator board for the PC is now a Purple Mountain Computers Inc. product, while Darek will retain the rights to sell his evolving driver software as a separate shareware product. This plan has reduced retail price for the Gemulator hardware board, TOS 2.06 ROMs already installed, and the shareware Gemulator software from $499.95 to $299.95.

Registration gets you a more advanced version of the software plus upgrades as they come out. You can install up to four versions of TOS 1.0 to 2.06 at once, have access to the STE 4096 color palette, use all three ST screen resolutions (on one VGA monitor), and have remarkable compatibility, running major software such as Calamus, PageStream, Sierra graphic adventures, Flash, Sim City, and most everything else. Speed of execution depends on the PC, with a 486DX at 33 MHz giving realistic fullspeed execution of ST software. 386 and lesser machines will not give satisfactory speeds, but will operate. You can use the PC's printer and hard drive too, but the present shareware version will not write to the hard drive. Floppies or ramdisks work fine, and files can be loaded from hard drives. GEMulator is even Windows compatible.

Freedom Floptical Disk Drive: You've heard of Flopticals, putting 21 megabytes on a 3.5" disk? Yes, but not at the low $399 introductory price that Purple Mountain is offering. An external case and power supply, Floptical drive, SCSI interface, a single 21 meg disk, PLUS a LINK interface and software from ICD makes up the "Freedom Drive." It'll read and write all standard floppy disks, including 1.44 and 2.88 meg, plus the special 21 meg disks, available from Purple Mountain for $24.95 each in packs of two.

Stealth PMC: You may remember Stealth as a telecommunications program with too many bugs. PMC reworked Stealth and has an upgraded version (1.3) that they're offering free to owners of earlier versions. They claim that all known bugs have been squashed, and a new manual, re-written from scratch, is included on disk.

A free "Infinite Books" catalog of over 2,000 computer books is available, as is **ST NEWS,** a newsletter/catalog from PMC (formerly PDC). Purple Mountain Computers, Inc. 15600 NE 8th Street Suite A3-412, Bellevue, WA 98008, 206-747-1519, GEnie PMC.INC, CompuServe 72567,302

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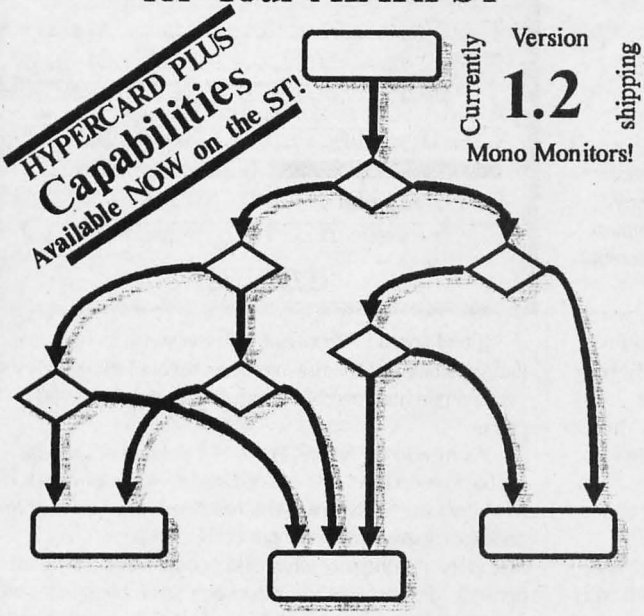

Full text-Database: Free positioning of data without fields or masks- Search for words or fragments of text in a tenth of a second! Create your own data networks! Hypertext: Make buttons and graphics to set up search paths, selectable via mouse click. Relate images to data by creating a link button on the image. Its easy, its fun, and makes your ST a remarkable information tool.

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RE:Views

PowerNet

ST, STe, TT, Falcon ■ We've seen several attempts at economical networks for Atari computers to share hard drives, printers, and other devices. While the software/hardware packages I tried out did work, they were either too limited or buggy. One even destroyed information on my hard drive.

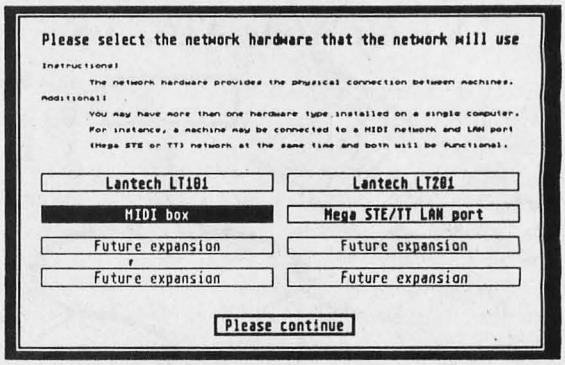
Then I tried **DragonWare's** new **PowerNet** software, which has proven to be one of the most solid and useful utilities I have seen for my Atari. It's so user friendly you don't even need to read the manual. Just load in the "Install" program and follow a few simple prompts. In a few minutes your computers will be happily chatting with one another.

PowerNet is a computer networking utility that allows you to connect your computers using any of several different hardware devices. This allows you to share hard drives and printers (even the Atari Laser printer) with other computers connected to the network. It was written by **Chris Latham,** who was the author of the *Universal Network* (another networking package sold by a different company), and the *Universal Item Selector.*

Once PowerNet is installed (it's easy), you can forget about it. There is nothing to monitor since everything is handled in the background. You simply install the drive icons on your desktop, and access the network just like a regular hard drive. You can grant or restrict access to any drive on the network. You can arrange all of the network drives as folders in a single drive icon, or use the "alias" program included with PowerNet to install an individual drive (or even a single folder) icon for direct access. The "alias" system circumvents configuration problems with programs that expect to find resources in specific locations which may vary from node to node.

MIDI interfaces are very slow, but they're inexpensive, which makes them the most likely connecting device for most of us. But how slow? About half to one-quarter the speed of a floppy disk on the average. That means that, for example, **Flash** (Classic), which loads in 3 seconds from local hard drive and 8 seconds from a floppy, takes 1.14 minutes to load from the network via MIDI cables. PageStream (31 seconds from hard drive) took 3.12 minutes to load from MIDI. Small files seem to go much faster through the network. File copying is faster, too, at just above one-half floppy speed.

PowerNet works with most networking hardware devices including **SGS-Net, MIDI-Net, and LanTech cartridge.** To use the LAN port on the new Atari computers, a Phone-Net adapter is required for each machine. They're available from any Macintosh dealer for $13-$30 each, and provide performance midway between floppy and hard drive speeds.



If real speed is important, you may wish to wait until the Appletalk or Ethernet interfaces become available, or you can purchase one of the cartridge interfaces ($300 a pair).

As mentioned before, PowerNet does all of its work in the background with the use of DragonWare's **PowerDOS Multitasking Software.** With other networking software packages, there was a very noticeable slowdown on the host (server) computer when disk access was done by the network. PowerDOS has improved this problem to the point where network access barely interferes with any program running on the server. PowerNet uses PowerDOS to handle the I/O, allowing you to bypass TOS and take full control of any drive on the network. This feature alone makes PowerNet superior to the other packages on the market.

PowerDOS? The entire documentation for PowerDOS is included on a couple pages of the manual. A multitasking kernel, PowerDOS is being released as freeware by DragonWare, and I'd think that the PowerNet package should have more about it. PowerDOS makes the whole system work, and has potential for far more system enhancements.

If you plan to use a network with more than 6 nodes, you may wish to purchase the Administrator software to allow individual file control over the entire network, granting or restricting access and/or passwords to any node.

I have not yet found *ANY* software compatibility problems. That includes **PageStream, Calamus, ST-Aladdin,** and dozens of other popular programs. Some system enhancing programs may cause a problem unless loaded after PowerDOS in the Auto Folder. Many problems can be cured by setting the priority to a higher setting (described in the manual). PowerNet works on any Atari ST/STe/TT computer and any version of TOS. I found no compatibility problems in the choice of hard drives or host adapters, proving that this is a very solid program.

Price: 2 Nodes (software only) $84.95, 1 Node (software only) $54.95, 2 Nodes with MIDI Network adapters $99.95, 1 Node and MIDI Cable (expander kit) $59.95, 6 Nodes and Administrator software $329.95, 6 Nodes and Administrator Software with MIDI Network adapters $349.95. **DragonWare Software, PO Box 1719, Havre, MT 59501-1719, (406)265-9609.** *—Jerry Cross*

The Falcon...

Close-up and Inside

***Sightings began in Germany** in April 1992, but even by that time, the Atari public knew some of what to expect. A little at a time, more details leaked out from every corner of the world. Before the Falcon030 made its first public showing (again in Germany in September), we had collected hundreds of pages of information, some detailed and some in rough rumor form.*

Then, after online conferences by Atari officials and technical experts, a sneak preview of the machine at the Glendale show, and the final official rollout at the Boston Computer Society meeting, the lid came off. Figuratively and literally. The first photos of a production Falcon, inside and out, are now yours, here, now, along with more real Falcon operational information than has been assembled in one place to date. Also, see last month's AtariUser for the full official Falcon specifications, and check out the Glendale Show and Boston Computer Society coverage in the NewsEdge in this issue.

▼ **Distinguishing Marks:** Look closely or you'll miss them. The Falcon has a multicolor ID tag and dark keys. Otherwise, you'd swear it was a 1040STe.

Outside

Unassuming to look at, the Falcon030 shown to date is to be in standard ST grey, looking like a 1040STe but for dark keys with white letters and a multicolored "ATARI" logo on the otherwise familiar front panel ID flag. Even before it was shown at Atari Messe, there was much talk about a rumored "business Falcon" with this model seen as an introductory version or game machine.

Although Atari denied that another version of the Falcon would be coming anytime very soon, Jerry Pournelle of Byte Magazine says he was told that a tower/separate keyboard version might be shown as soon as at the November COMDEX. It might not be commercially available until sometime in 1993, when rumors also say that there will be at least one 68040 model Falcon above the Falcon030 and at least one Falcon model BELOW the currently shown Falcon030.

Inside

The Falcon is everything that an STe is, plus more of it. It operates the same familiar way with the GEM desktop, but the differences show up as you work with it. The differences are the CPU (a Motorola 68030 at 16MHz instead of a 68000 at 8MHz), a new operating system (TOS) that can use the higher functions of the new CPU, a digital signal processor (DSP, for incredibly fast manipulation of any signal), plus vastly enhanced audio and video.

TOS 4.0 is part of the new Falcon. The TOS ROM (now one chip) contains all the difference resources for each country, including German, English, French, Italian, Spanish, Swiss German, and Swiss French. The country and appropriate keyboard layout are stored in Non-Volatile RAM and read when the Falcon030 starts up. A CPX that will allow you to configure the Falcon030.

"Falcon TOS" internal support for programmers to control hierarchial menus, pop-up menus, 3-D window and dialog objects, and full-color animated icons. When you select an icon, it will flip to a second image, giving an animated effect. While much has been said about the new icons, they add more to owner pride than to operational value.

MultiTOS, the multi-tasking environment, is not yet in the ROM, and may be having some problems in late development. Reports are mixed as to the stability of the system, mostly due to programs that were written to assume they alone "owned" the computer. The easiest way to understand MultiTOS is to think of every application as though it were a loadable/unloadable Desk Accessory, available and running at all times regardless of what else is running. Compatibility will have to be bulletproof before Atari releases it on ROM; in the meantime, a disk loaded extension system is being used for developers, and this might be the way MultiTOS starts off in commercial release.

Features of MultiTOS include expanded interprocess communication and drag and drop standards. You can grab a file from a open desktop window, drop it on a window of a currently running application, and that application will react accordingly. It can also minimize windows and applications so that the desktop doesn't get cluttered.

It's too early to say whether or not the features of TOS 4.0 will be put together into an upgrade kit for older TOS machines. But MultiTOS is planned for use on TT machines after it is available on the Falcon. Other ST's may never get a version, as the memory management in 68000 computers won't protect separate processes.

The Falcon uses the Motorola 68030 CPU and 56001 DSP, plus a CODEC with 16 bit A-D and D-A converters. Custom chips include VIDEL (handles video functions, in-

STEEL TALONS

Lynx ■ Once again, the Lynx dares to go where other portable systems fear to tread, with an adaptation of **Steel Talons**, the arcade helicopter simulator. Your goal is to fly a military chopper through twelve missions, blowing away enemy armaments and camps.

The disappointing Hard Drivin' convinced me that filled-polygon simulators were beyond the Lynx's abilities. Surprise! **John Sanderson** and **NuFX** have learned a lot from their earlier effort, making Steel Talons the cutting edge of Lynx software technology. Only three arcade features are absent: two simultaneous players, fuel limits, and the (hard!) Apache helicopter simulation option. Everything else is preserved.

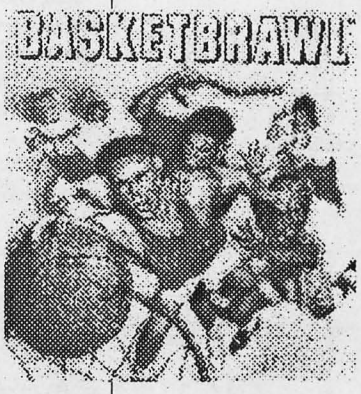
As a simulator, Steel Talons gives you total control of your helicopter, and instruments show everything from structural integrity to the location of targets. The game can be viewed from behind your chopper, or in the cockpit for double points. An on-board computer tracks and aims for you, though your supply of bullets and missiles is limited. The instruction manual is a little sparse on details, leaving more for players to discover.

Missions have different terrains and weather conditions, growing progressively harder, keeping the game challenging. The yoke, pedals, and stick of the original game are naturally simplified, using all of the Lynx's buttons, alone and in combinations. The controls feel properly responsive and reasonable, and learning the scheme takes about ten minutes.

Filled polygon graphics are used everywhere, drawing enemies and terrain alike. The screen is updated four times a second; while not incredibly fast, it's sufficient and doesn't hurt the game. Instruments are visible without obscuring the view, and other graphics are done very nicely. There aren't many sounds, but they're used appropriately. The drumming of the chopper blades is mixed with the sounds of gunfire and missiles, with warning klaxons and assorted explosions thrown in. Finally, a slightly garbled voice gives tips, and musical tunes play throughout.

Steel Talons on the Lynx is a lot of fun and a surprisingly successful conversion. If realistic air combat action stirs your blood, buy this game and take off! **Atari Corp., $34.95.** -*Robert Jung*

BASKETBRAWL



Lynx ■ For some reason, combining basketball with violence is a popular video game trend. Now joining titles like Arch Rivals and Punkshot is **Basketbrawl**, a Lynx version of the Atari 7800 game. Pick your character from a pool of ten players, then play against another team, trying to score more points for six minutes of "anything goes." Players fight and mutilate opponents for the ball, while spectators join in the fray. Weapons and power-ups appear on the field, giving benefits such as speed or health. Beat five other gangs, and win the championship. A password allows you to skip stages and continue games, and two players can ComLynx for a team-up.

When Basketbrawl took away the rules, it also took away the fun. Neither the brawling nor the basketball aspects are done well. Shooting consists solely of jabbing a button, fight moves are limited, and aiming attacks is difficult. Defense is nonexistent; you can't block shots or passes, steal the ball, or resist attacks. The basketball action is disrupted by fights, or seen a different way, fights are interrupted by the need to score points.

The pace is frantic and confusing. Some spectators attack players randomly, with another throwing knives at everyone. It's difficult to tell when you have the ball, and you can throw it away accidentally. In the end, there's a lot of frenzied button-pressing but little satisfaction.

Basketbrawl takes an idea loaded with potential, then removes the excitement with weak sports and combat action. The only thing to do is to wait for an authentic basketball game; Lynx owners may be eager for sports titles, but they're not desperate. **Atari Corp., $39.95.** —*Robert Jung*

KUNG FOOD

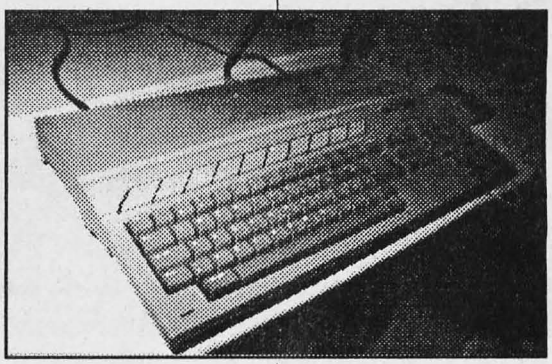
Lynx ■ Your boss at the video-game company wants to put the mutagen Rynoleum into the newest games. Acting on your conscience, you steal the toxin, haul it home, and put it in the freezer. Unfortunately, something goes wrong, and now you've been turned green and six inches tall! Worse, your groceries have gained sentience, and are planning to conquer the world! Can you fight your leftovers, cure yourself, and stop this plan cold?

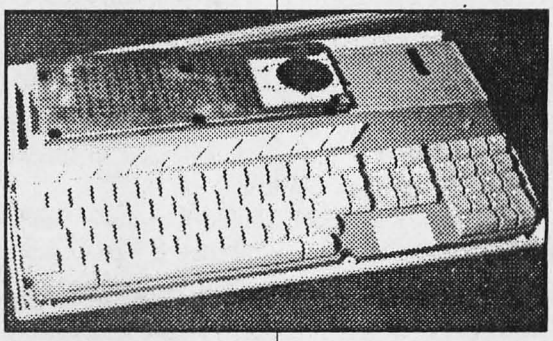
That's **KUNG FOOD** for the Lynx, the video game with the goofiest plot ever devised. It's a generic "beat everything in sight" video game, as you walk left to right through five levels, battling hopping peas and potato men who block your way. You start with three lives, and helpful power-ups are scattered throughout, but you're constantly outnumbered.

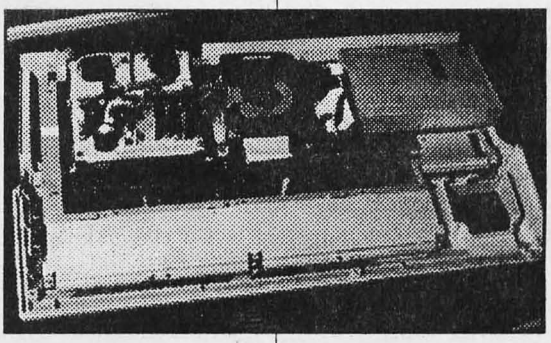
The graphics on KUNG FOOD are among some of the best on a Lynx. There's great use of color, detail, and animation, and elaborate opening and closing sequences. Game sounds are good and match the action, but the background and theme music are repetitive and grating. Fortunately, OPTION 2 lets you turn the music off.

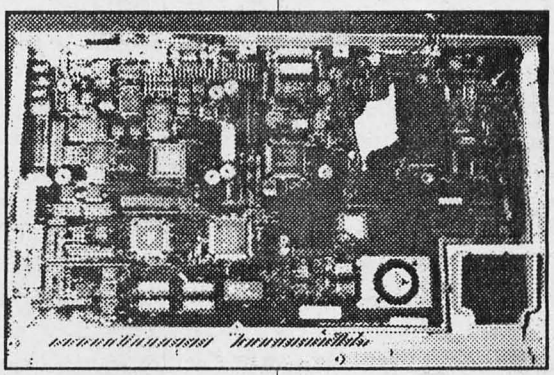
Take away the story, and KUNG FOOD comes across as a very average fighting game. The awkward controls and a few quirks may irritate some players, but fight fans should embrace the silliness and give this a try. **Atari Corp., $34.95.** —*Robert Jung*

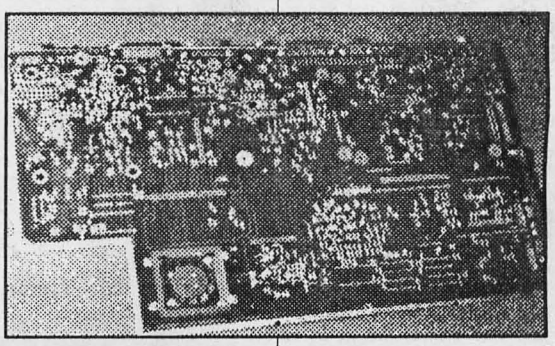
■ **Put on some stripper music,** we're plucking the Falcon. Stock plumage in the top photo yields to a revealing shot of the internal speaker as the lid comes off. Peel back a bit more, and you see the hard drive and memory board. The fully exposed bird shows fine breeding and a six-layer or more PC board, with plenty of components even on the *bottom* side of the board.











cluding overlay, overscan, true color); COMBEL (system manager and BLiTTER); SDMA (sound matrix and sound DMA control); Keyboard Processor (on board the keyboard, enhanced for higher resolution mice).

Memory

Debate rages as to why Atari should bother having a 1 meg model of the Falcon030, as most applications that exploit the power of the processors will want more. Officials say it's purely economics, to have a base machine that's as cheap as possible. The Falcon TOS can only "see" 1, 4, and 14 megabyte memory configurations. Unlike the TT, the Falcon is, out of the box, a 24 bit machine, that is, only the first 24 bits of the 68030 address bus are connected to anything. This is required in order to be thoroughly compatible with the ST software that is not "32 bit clean".

Pricing for 1 meg Falcons will start at $799 retail, and 4 meg units with a hard drive (probably 65 meg) will be $1399. The full-blown 14 meg units might be near $2,000, but Atari won't commit to a price due to rapid RAM price fluctuations. Other configurations with and without internal hard drives will be available at intermediate (unannounced) prices.

Third party development of RAM boards won't take long, as the custom board has nothing but RAM and a few capacitors, with industry standard pin connectors. The decision to put RAM on a daughterboard allows creative possibilities of third-party video and alternative memory add-ons as well as competitive RAM pricing. A third party can add "TT RAM", since TOS 4 has all the appropriate support built in. However, adding TT RAM-type boards will change the system into a 32 bit device, with both the advantages and the incompatibilities of the TT.

Expansion

Direct access to the DSP (and DMA) is available via a standard (NeXT type) port on the back of the Falcon. A high-density SCSI II port makes for instant connection to a flock of third party drives and devices designed to interface a MAC, Amiga, or NeXT. ACSI (Atari DMA) is gone, but you can connect most old hard drives by bypassing the host adapter or use of a third party SCSI-to-DMA adapter, which will also be required in order to use Atari laser printers.

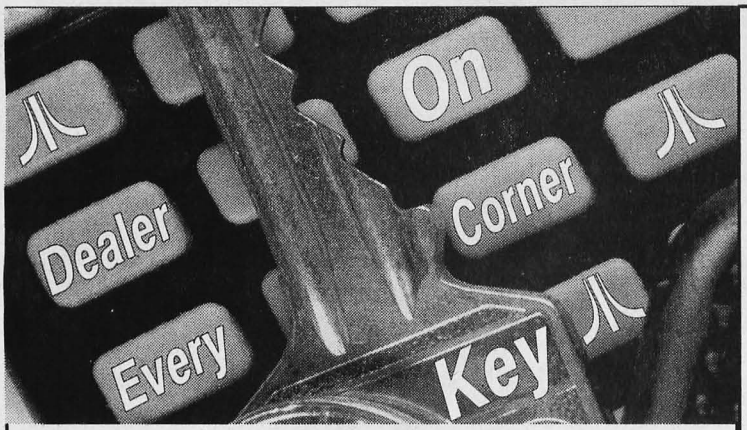
A math coprocessor socket on the motherboard will allow use of standard 68881 chips to speed up software designed for it, but many designers are more intrigued at the possibilities of using the DSP to do math at even faster speeds.

Of interest to hackers is the internal expansion bus. Consisting of a double set of pin connectors, anything could be attached here. Jumpers are installed from the factory on the "through" lines to the CPU—this means that the installed add-on boards can completely take over the machine at will. That means that a complete 386 or MAC computer (not just an emulator!) can sit inside the Falcon and intelligently talk to the Falcon for peripheral handling. Such a 386SX unit was shown at Atari Messe and might be as cheap as $200.

Audio

The Falcon030 has built-in 16-bit analog-to-digital converters (ADC) and digital-to-analog converters (DAC) that will allow stereo sampling at rates up to 50KHz. The built-in base frequencies are set for STe DMA sound compatibility. The Falcon allows injection of any clock into the sampling system to get 44.1KHz for CD and 48KHz for DAT mastering recorders via an AES/EBU SPDIF interface. It's also possible to use the DSP to correct the system to playback 44.1 or 48 KHz samples. Full 8 track (4 Stereo) recording and editing is possible by adding the external (third-party developed) box with additional DACs/ADCs and clock in it.

The audio system was changed in mid-development based on developer input at CeBIT. The DMA system and DSP interface is now remarkably flexible. The Falcon's SDMA provides a miniature switchboard to connect internal and external inputs and outputs. Any or all of the sources (external audio input, DSP transmit, ADC, DMA playback) can be "patched" to any receiving device (DMA record, DAC, DSP receive, or external audio output). Direct-to-disk recording uses the DMA sound, and need not use the DSP. So, you could be doing direct to disk recording while you use the DSP to add special effects, and still be doing MIDI at the same time. And yes, the Yamaha 3-channel sound of the ST series is still available too—compatibility, you know.



Wouldn't it be better to have a local Atari dealer? Wouldn't it be great to have a place within easy driving range to see the latest Atari offerings? Of coarse it would. Unfortunately, most computer dealers either don't recognize the tremendous potential of the Atari ST, STE, MEGA STE, and the amazing TT030 line of computers, or, for some reason or other, they don't want to deal with Atari. They lack the skill and contacts needed to survive in the Atari "business is war" environment.

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

Cut to the chase.

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

Overstocked Games

1st Word	$4.95	Downhill Challange	$9.95
Starglider+	$4.95	Foundations Waste	$9.95
All Aboard	$4.95	The Games ,Winter	$9.95
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Starquake	$4.95	Hyperdrome	$9.95
Swiftar	$4.95	I Ludicrus	$9.95
Alcon	$4.95	Impossible Mission II	$9.95
Arkanoid+	$4.95	Karateka	$9.95
Battleship	$4.95	Overlord (WWII)	$9.95
Boulder Dash		Paint Pro	$9.95
Constuction	$4.95	Phantasm	$9.95
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A simple-to-use Stereo direct-to-disk recording and edit system (shown at Glendale and Boston) will be shipping free with the Falcon030 production machines. D2D takes about 11 megabytes per minute of CD quality sound, eating hard drive space quickly!

Video

A chart with comments on the many Falcon video modes concludes this feature—check it for lots of details on what monitors can produce what resolutions.

True Color is the most important advancement in the Falcon video handling. True color differs from paletted colors in that each pixel on the screen can have its own color assigned, and that more colors can be selected from than there are pixels to display them. The Atari Falcon 030 doesn't just offer Super VGA graphics, it has true color 15- and 16-bit modes (up to 640x480 resolution and up to 65,536 on-screen colors).

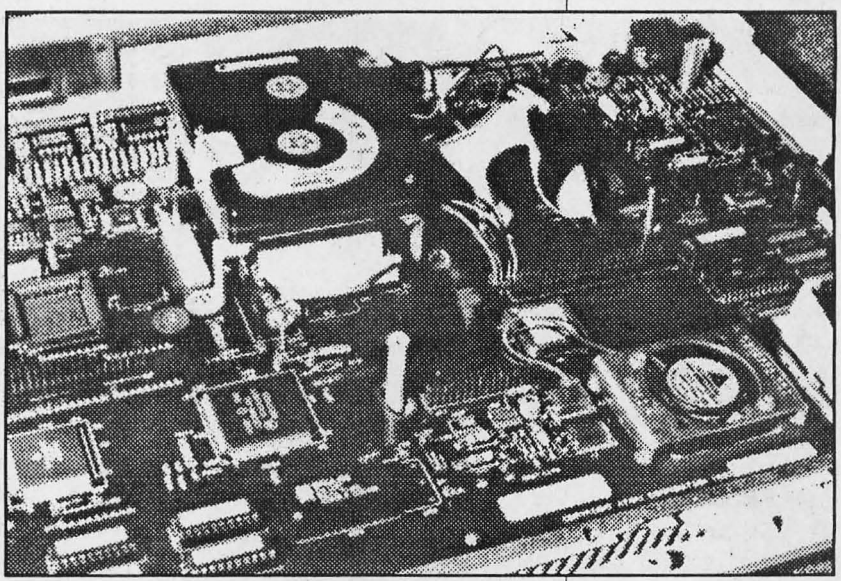
The Falcon does not have built in abilities to capture video. It can (via a cheap external adaptor) accept external video sync for high-quality genlock and overlay computer graphics on a video source using one bit of the 16 bit color information as an overlay bit. When you use the overlay bit, you get over 32,000 colors (5 ST adapter for SC and SM monitors, a SCART/Peritel cable, and a composite video/mixed mono audio adapter. The Falcon will then only offer resolutions that your monitor can display. Adapters will be sold separately due to the variety of monitor options.

What Can it Do?

Demos at Atari Messe, Glendale, and Boston leave the imagination spinning. The real-time Tina Turner video played off the hard disk was stunning: full motion video in the center of the screen, while selected still images were repeatedly blitted around the border at breakneck speed, while CD quality audio was playing. The true-color slide shows brought oooh's and aaah's from everyone. But what can you expect to sit down and do with the Falcon that you can't already do with your ST?

A bundle of goodies will be shipped with the Falcon030 to get creative juices (and fun hormones) going. The most fun at the shows has been via the D2D audio recorder and editor that also accesses the DSP for special effects. Set up echo, reverb, phase distortion or flanging, etc. A visual graphic equalizer is also part of this CD quality recorder. If you get some effects you like, tie them to keys with SAM, the System Audio Manager. SAM allows you to use your own (or any standard format sound file) sounds to replace any or all keyclicks, or accompany the various AES events, such as window openings and closings, the file selector, etc.. You can map a particular sound to every key to make a talking keyboard, a spelling/learning application, or just to fool around. The sounds will be available in full stereo and/or through a single internal speaker under the top cover of the Falcon, and they do NOT slow down the machine while playing.

Want concert and stadium effects for your CD player or surround sound for your TV? You'd pay as much for audiophile equipment to do these things as you'll pay for the Falcon itself, and it's set to do that and more out of the box.



▲ **That's a 2.5" IDE hard drive on stilts** at the center rear of the Falcon innards. Note the empty coprocessor socket to the left. In front of that is the CPU bus, two double rows of pin connectors with jumpers. Foreground is an internal-battery 10-year clock, and to the right is the tiny fan that keeps the Falcon cool. Behind the fan is the double set of pins where the memory board attaches.

Other inclusions are CalAppt, a Personal Information Manager that has the ability to import and export delimited file formats as well as Portfolio databases. ProCalc, a True-Color Breakout game (with digitized sound), a game called Landmines, and a talking clock accessory come with the machine, too.

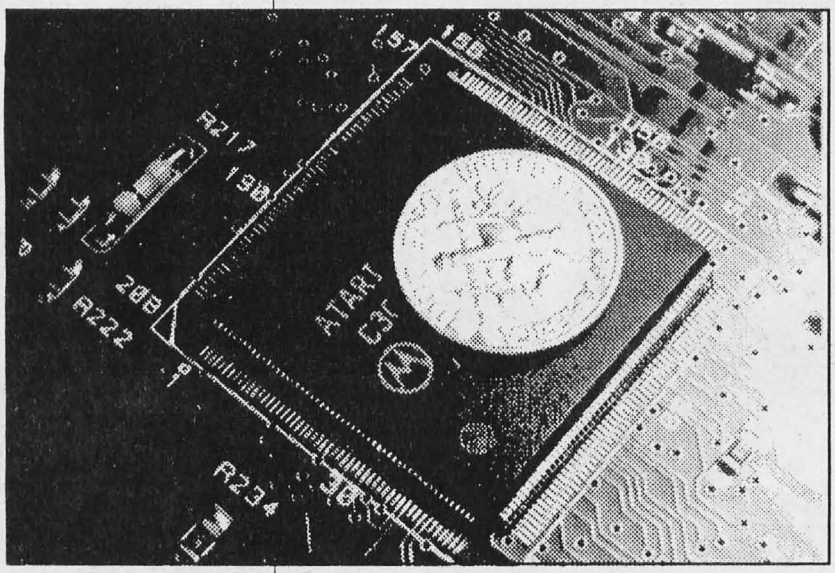
The third party market is gearing up for the Falcon line of Atari computers as well. At Atari Messe, there were new color versions of the products from Trade-It (Avant Vector and Repro Studio) and Shift (Arabesque & Convector). New Falcon software includes InShape, a slick 3D modeler that does Keyframe rendering with ray tracing and texture mapping in 24-bit animations. Digital Arts (Retouche CD) previewed a new true-color image editing application. HiSoft showed a true-color paint package. Eurosoft showed a Falcon version of their Paint package, Studio Effects. In the USA, Lexicor has project ready for the Falcon, including the true color drawing system called Mona Lisa, also compatible with Silicon Graphics workstations.

For business uses, Atari is developing an MS-Works-type integrated application called Sutra. It reads Excel files and lets you add voice annotations to cells!

What's next? Lots. The Falcon's DSP can be exploited to produce a synthesizer which out-performs almost everything. Or, it could be used as a low-cost video phone (an application that may be ready to show at COMDEX in November!).

There are many new Atari-specific games on the horizon: SPACE JUNK from Imagitec Design, a space-oriented adventure game; Road Riot 4WD from Images, Steel Talons from Kovcos, Llamazap from Jeff Minter; Raiden from Imagitec;

The Falcon... Close-up and Inside



▲ **The Falcon shows fine breeding** and high-tech construction. Look at this 200-plus pin chip, and consider if repairs will be a home project.

and Cyber Assault from Koveos are among them, to be available between January and June of '93. They'll push the special features of the Falcon to the extremes.

Meanwhile, the Falcon030 is downward compatible, even moreso than the TT. PageStream, Calamus, TouchUp, EasyDraw, and all of the favorites work quite well—and FAST. Not as fast as a TT, but squarely between the speed of a MegaSTe and a TT030. Preliminary Quick Index numbers (a benchmark developed by Darek Mihocka) indicate that CPU processes will be up to 500% faster than an ST, and about half of a TT doing ST software in ST memory. Software written to addresses the DSP for doing computations will be much, much faster yet.

Who's Gonna Buy it, and When?

Atari says that the Falcon030 has passed FCC Type B testing (approved for consumer as opposed to just business sales), and that sales in the USA can begin almost as soon as the permit tags arrive. The plan is to place at least two Falcons at every dealer by the end of October, with sizable production to fill orders by January.

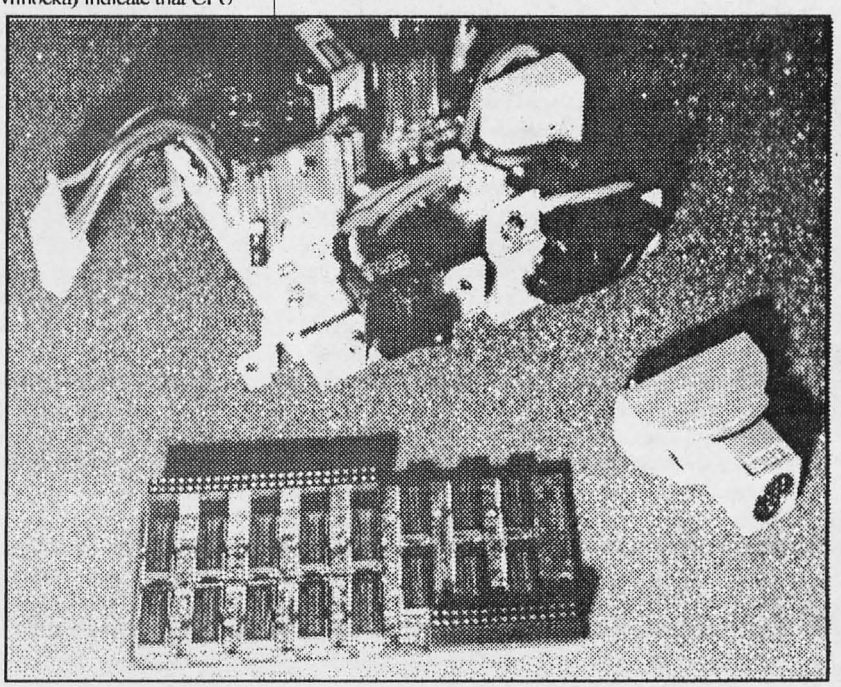
A major power in the advertising industry, Redgate Communications, is handling PR and advertising in North America. The advertising is going to be done in close connection with dealers in market areas—it's useless to advertise where dealers don't yet exist. Southern California, the California Bay Area, Chicago, and New York will be the primary targets at first. National sales coverage should be just after Christmas and into January, with regional advertising tracking the dealers that order product. The Canadian market will be handled by the area managers, the same as the USA.

Of course, the Falcon030 will be selling in Europe as well, where the hard-hit US dollar makes the product even more price attractive. Europe has far more active high-end developers than the USA, so Atari will be certain to guard its cash crop with good product delivery overseas. But Atari is wise to the American users' jealousy of what is quite reasonable favoritism of other, more profitable markets, and isn't saying much in public HERE about what they are doing THERE.

So?

The Falcon is coming fast, it's real, and it may bring Atari back to the forefront of popular computing options. Production and promotion will be driven by the reception it gets as the Falcon makes its way across the globe. It might become a revolution; it's at the very least going to be interesting.

And, like me, I'll bet you'll want a Falcon030 as soon as you can get it. Regardless of whether it changes the rest or the world, the Falcon will make home computing better for you and me, the ones who already know Atari. —*John Nagy* ■



■ **A beefy new power supply assures** a mighty wingspan. In front, the custom memory board has surface mount chips and little else. The plug is a monitor adapter—this one is for ST monitors.

■ Falcon030 Video Resolutions...

© 1992 Atari Corp

■ **Unlike previous machines, there are just too many resolutions** to give each resolution a name. Therefore, I'll do my best to describe what the resolution is and which monitor it is on. TV and a Color Monitor are the same.. by Color Monitor, I am talking about the standard SC1224/SC1435. By VGA, I mean a standard VGA Monitor.

▼ 40 column modes

4 color, normal, TV	320x200	4 colors, 2 planes
16 color, normal, TV	320x200	16 colors, 4 planes
256 color, normal, TV	320x200	256 colors, 8 planes
True color, normal, TV	320x200	true color
4 color, interlace, TV	320x400	4 colors, 2 planes
16 color, interlace, TV	320x400	16 colors, 4 planes
256 color, interlace, TV	320x400	256 colors, 8 planes
True color, interlace, TV	320x400	true color
4 color, normal, VGA	320x480	4 colors, 2 planes
16 color, normal, VGA	320x480	16 colors, 4 planes
256 color, normal, VGA	320x480	256 colors, 8 planes
True color, normal, VGA	320x480	true color
4 color, line-doubling, VGA	320x240	4 colors, 2 planes
16 color, line-doubling, VGA	320x240	16 colors, 4 planes
256 color, line-doubling, VGA	320x240	256 colors, 8 planes
True color, line-doubling, VGA	320x240	true color

▼ 80 column modes

2 color, normal, TV	640x200	2 colors, 1 plane
4 color, normal, TV	640x200	4 colors, 2 planes
16 color, normal, TV	640x200	16 colors, 4 planes
256 color, normal, TV	640x200	256 colors, 8 planes
True color, normal, TV	640x200	true color
4 color, interlace, TV	640x400	4 colors, 2 planes
16 color, interlace, TV	640x400	16 colors, 4 planes
256 color, interlace, TV	640x400	256 colors, 8 planes
True color, interlace, TV	640x400	true color
2 color, normal, VGA	640x480	2 colors, 1 plane
4 color, normal, VGA	640x480	4 colors, 2 planes
16 color, normal, VGA	640x480	16 colors, 4 planes
256 color, normal, VGA	640x480	256 colors, 8 planes
4 color, line-doubling, VGA	640x240	4 colors, 2 planes
16 color, line-doubling, VGA	640x240	16 colors, 4 planes
256 color, line-doubling, VGA	640x240	256 colors, 8 planes

A Few Quick Notes...

There are compability modes for ST Low, ST Medium, and ST High on both VGA monitors and SC1224 monitors. (On a color monitor, ST High is achieved by using the interlace mode). Also, the ST Monochrome monitor (the SM124) will work with Falcon030 as well. However, it only supports one resolution: ST High Resolution.

All modes on a TV can be overscanned. This means multiplying the X and Y resolution by 1.2. For example, modes with 320 pixels of horizontal resolution (X res) will become 384 pixels across, and modes with 640 pixels will become 768 across. Overscanning is done in the X and Y resolution. You can't do them independently.

On a VGA monitor, overscan is "faked".. since the video hardware doesn't have the capability to do overscan on a VGA monitor, we made it so that if a overscan mode is set on a VGA monitor, you still see the normal size screen, but the screen is a window onto the bigger overscanned image. Make sense? We did this for compatibility. This way if a game that has an overscanned starup picture can use the same pic on both the VGA monitor and the TV monitor.

Overscan can *not* be set from the desktop. The AES and Desktop will work just fine with it, but because you can't see the parts of the screen, we thought that that option shouldn't be available from the desktop. We don't want to confuse people. However, Overscan can be set using a new XBIOS call (Vsetmode()).. so it is still available.

—*John Townsend*, Atari Corp ■

More Falcon Video:

Resolution is set by selecting from the "Set Video Mode" dialog/menu item. Popup one asks for the number of colors (2, 4, 16, 256, True Color), the second asks the number of columns (40 or 80), and the third popup depends on the monitor being used. On a VGA Monitor, it says "Line Doubling (On/Off)" and on a TV or RGB monitor it says "Interlace (On/Off)."

A standard TV or an ST color monitor like the SC1224 will show all resolutions except those with 240 or 480 vertical resolutions. Even the ST High (monochrome) resolution can be shown on a TV or color ST monitor by using the interlace modes. To achieve higher apparent resolution, interlace shows every even numbered line in one display frame, then the odd lines in the next. This adds flicker, but remains quite usable, especially on a TV which has a longer screen phosphor persistance that masks the flicker.

A VGA monitor can't interlace, and the bandwidth required to produce 640x480 and 640x240 true color modes is too much for the VGA video hardware to handle. Therefore, the 640x400 interlaced true color mode is on the TV/Monitor.

Why so many resolutions? Says John Townsend, "Basically, Leonard [Tramiel] and I went nuts on the software interface to the video hardware. If the video hardware was capable of doing a mode and the mode worked, we allowed for it. The reason I would like to think that those resolutions might be useful is because they are blindingly fast. A small screen and a small number of planes, combined with a redesigned 16MHz BLITTER is equal to screaming eagles!"

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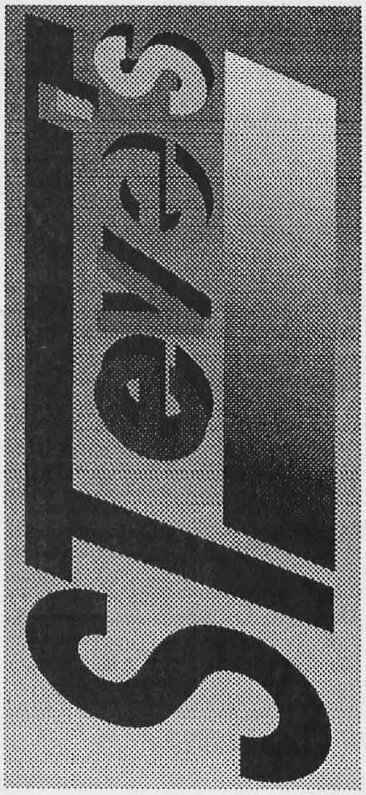

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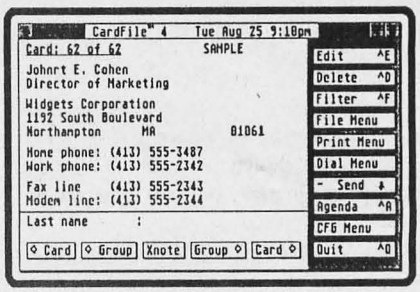

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Robert Jung

THEORY AND PRACTICE

AtariUser Interviews A Lynx Designer

Stephen Landrum: I've been programming computers since 1975 and video games since 1980. I joined **StarPath** in 1981, where we developed the SuperCharger for the Atari 2600. In 1983, StarPath merged with **Epyx**, where I [worked] on Summer Games, Pit Stop, Super Cycle, and the Temple of Apshai Trilogy.

In 1987 I went to **Electronic Arts**, and in 1988 I rejoined Epyx to work on the Lynx. For the Lynx, I wrote Blue Lightning, the internal ROM code, a lot of system code in every game, and the "hidden" games in Chip's Challenge and Zarlor Mercenary. I joined too late to have a large influence over the early design, but I was able to contribute to the hardware design and did the majority of testing.

LYNX ALERT ■ The maximum Lynx cartridge size is 2 megabytes. The hardware can support up to 18 players, but the ComLynx software may support a maximum of 16 players. ■ **The Lynx is not limited** in the number of objects that can appear on the screen at one time, but a game will slow down at some point if you draw too many. You can easily draw hundreds of sprites and still have reasonable speed. ■ **The size of screen objects** is limited only by the borders of the Lynx screen. If you scale a sprite really big on the Lynx, it can effectively be many times larger than the screen. The maximum width or height is 65,535 pixels. ■ **Lynx Titles expected** through October, 1992: LYNX CASINO, PINBALL JAM, PIT FIGHTER, ROLLING THUNDER, SHADOW OF THE BEAST, STEEL TALONS, WORLD CLASS SOCCER.

It's interview time at AtariUser again! Our guest is Mr. Stephen Landrum, one of the engineers on the Epyx "Handy" project, the machine we all know today as the Atari Lynx.

AU: Before the Handy/Lynx, Epyx was best known for its software. Why did Epyx go into hardware?

SL: Epyx wanted to grow into other areas besides game development. Epyx tried getting into VCR games (a really bad move), and was involved in other projects that never made it to the public.

AU: What were the principles and design objectives of the Handy project?

SL: Epyx wanted a system that would make money, they could write games for, and provide revenue through licensing. For the design team, we wanted to make an affordable game system, to design new hardware, and try out ideas about graphics. In many ways the Lynx was an experiment.

AU: What did you learn? What "mistakes" would you fix in the Lynx?

SL: We found out a lot about chip design, prototyping, LCD displays. There are some design errors in the Lynx; the hardware divide doesn't work properly — the remainder is frequently garbage. There are small errors in the rendering logic. The "blinking pixel" [a blin' g dot on some new Lynx models] was an error in the first design, but was masked because of the way things worked.

AU: Are there features of the Handy that are not in the Lynx?

SL: The Lynx IS the original Handy. If you're wondering if there were other features that we wanted, the answer is yes. When designing any new hardware, you start with a wish list, then work it down to the practical. One way the Lynx design did change was that originally games were loaded from magnetic media. The "cartridges" were going to be a looped tape. These would have been cheaper than ROM cartridges at the time.

AU: Early reports said that the Lynx could play multiplayer games with one copy of a game. Was this part of the tape idea?

SL: The idea was that games would load, you could remove the tape, plug it into another unit, and start the game there. As it turned out, 64K of RAM was not enough to store a game and have room for other features.

AU: In your estimate, how does the Lynx does compare to some of the other portable systems today?

SL: The sound hardware in the Lynx is somewhat limited. If the hardware is used completely to make sounds, the Lynx does not compare well. But it is possible to do interesting things with software, since the Lynx allows direct control of the DAC [digital to analog converter]. Very good digitized sounds can be produced. I don't know of any other system with a game that sounds as good as Klax on the Lynx!

The graphics are in many ways superior, but not in every way. Since it was the first color LCD system to come out, others saw what was done and use better technology, as with the TurboExpress. The Lynx beats the pants off other systems in the hardware to manipulate graphics, but unless games take advantage of this, it doesn't make any difference. Atari games in general don't stretch the capabilities of the system.

AU: Like what? You know some graphics effects no one has put in a game yet?

SL: Some take advantage of the scaling, but most limit their special effects to title sequences. Blue Lightning made extensive use of the graphics features. Gates of Zendocon and Slime World use hardware to generate animation without changing image data. Warbirds and Hard Drivin' use the ability to fill regions of the screen.

AU: There's a rumor that the ComLynx port can access the entire architecture. Is there room for expansion?

SL: The ComLynx port is just a serial port used for communication. You could build a modem, or a printer interface, or a box to connect to any other device. The ComLynx port was going to hook up to a device that allow Lynxes to connect via infra-red [transmission], and the communication software is called "Redeye" because of that. [But] I doubt that there will be any other peripherals for the Lynx. — *Robert Jung* ■

■ Robert Jung is a 24-year-old software engineer, longtime video gamer and die-hard Lynx fan who's bought and reviewed every title ever made. He can be reached c/o AtariUser, or on the Internet at rjung@usc.edu.

Steve McDonald

MIDI ALERT ■ The advent of Atari's own MultiTOS operating system will/should/might open the door to more inter-MIDI-software compatibility. We'll be monitoring that area closely, as many musicians could benefit from mix-and-match program combinations, running simultaneously. You'll find out how it will work, HERE in AtariUser, direct from professional musicians who use Atari in the studio every day.

MIDI returns to AtariUser!

MAKING MIDI MORE

■ There's a trend towards alternative (non-keyboard) controllers, with an accent on percussion controllers, although experiments with guitar controllers continue. These include devices such as the Roland percussion controllers, the Kat series and Jimmy Hotz's Hotz Box. The reason for using something other than a MIDI keyboard is straightforward enough—a desire for more natural input. While drummers CAN create wonderful percussion sequences via step recording using a keyboard, the results sound better overall when a drummer can drum the data into the computer via drum pads or triggers.

For the record, I'm **Steven McDonald** and I'm a writer, composer and **GEnie** sysop.

I've released seven independent cassettes, each one a result of MIDI production based on the Atari ST and a variety of software packages.

This column is going to serve a number of purposes for you and I. Obviously, it's going to provide me with an excuse to beg mercilessly for any data I can acquire (the **GEnie MIDI RoundTable** has already trained me in this exercise) so that I can pass said information to you. It's also going to be a forum in which to discuss the pros and cons of various set-ups, software packages, and in-house combinations of software. That's the tip of the iceberg—**there's a LOT going on in the MIDI arena right now.**

The combination of Atari and MIDI, of course, is a natural one. Atari is the only company currently including a MIDI interface as part of the computer (**Yamaha** did this with their MS-DOS based C1 for a while, but that system has been discontinued) and this is not going to change in the foreseeable future. In fact, Atari seems determined to create a system that's perfect for musical applications. The **Falcon** specs that have been made available to date indicate that the machine is designed with hard disk recording in mind. In terms of live performance, the **STacy** was compact enough to be a perfect choice (if you look, you'll see one in use on **Arsenio Hall**) and the **ST Book**, when it's finally released, is likely to be an even better choice despite the smaller MIDI sockets.

We'll also be following some of the trends in MIDI, large and small. The truth is that the biggest trend of them all is MIDI itself—modern production techniques depend very heavily on various aspects of MIDI, from synthesizer and sampler operation to lighting and system automation. It's impossible to think of MIDI as the wave of the future because that future is here, affecting the music you hear on the radio, the performers you see on stage, and even the TV shows and movies you see in the studio, there are a number of interesting trends that we'll be taking a closer look at. Most important of these, for Atari users at least, is the push towards integrated software packages. This takes two forms, with both forms sometimes coming from the same manufacturer.

The first form is a means of integrating all or several software packages from the same company. This is usually done by incorporating a software switcher or installing an overriding shell. **Hybrid Arts** (whose software is now marketed by **Barefoot Software**) accomplished this with Hybriswitch, allowing the user to easily switch between SMPTEtrack, EZ-Score+ and Genedit. **Steinberg-Jones'** MROS system accomplishes the same thing by providing an overriding shell.

The second method is single-package integration. This method involves creating a software package that includes a sequencer and notation software. This is the direction used for Cubase from Steinberg-Jones, Notator from **C-Lab**, and Omega from **Dr.T's** Software. SMPTE time synchronization is available through these packages as well, but requires additional hardware — unless you're working with **Fostex** equipment. The Fostex R8 multitrack recorder, combined with the MTC-1 controller, was designed to work with MIDI Machine Control (MMC), allowing the user access to SMPTE synchronization—very important for video and film work in particular.

Single-package integration allows a great deal of flexibility. In the case of Cubase, for example, the user has access to powerful sequencing tools, impressive scoring capabilities, control of system exclusive functions, the ability to switch patch banks on keyboards (via the Satellite accessory, which also allows the user some basic editing controls) and access to other Steinberg-Jones software via the MROS shell.

The single-package approach is also being applied to editor/librarians for synthesizers, with programs such as Genedit (Barefoot Software) and X-oR (Dr.T's Software.) These programs are designed to work with an expanding range of keyboards, allowing the braver users to create new templates and configurations to accommodate newer or rarer units. The advantage to this approach is its cost-effectiveness—individual editor/librarians often cost in excess of $100 each. Genedit lists for $189 and the template library is available on **GEnie** and **Compuserve** for the cost of the download time.

Direct digital recording is another trend we'll be examining in the near future. **Digital EFX** has taken over the Hybrid Arts Digital Master system and will be producing an improved version in the near future, while Steinberg-Jones is getting ready to introduce Cubase Audio.

Along the way we'll be talking to software and hardware companies, discussing some unusual ways to use an Atari ST for recording, looking at low cost ways to get started with MIDI on the Atari, and even seeing how to produce an album without spending a scary amount of money. MIDI, contrary to popular opinion, doesn't *have* to mean *"Music Is Debt Intensive"!* -- *Steve McDonald*

■ Steven McDonald lives in Burbank, locked into a room with too many computers and too few cats. For more information, FAX him at (818) 563-1615.

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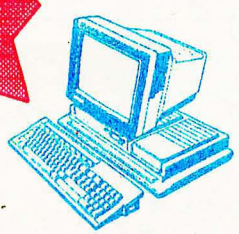

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PORTFOLIO ALERT ■ Many users use the serial port and a modem, but most would like to see a modem that will just plug right into the Portfolio Expansion Bus. Well, Megabyte Computers in Texas has found a solution! They've found a way to squeeze a Practical Peripheral Pocket Modem into the case for the serial port! Send them your serial port and the PPI modem, and they'll combine them for only $50. They'll also sell the serial ports and modems, so you can buy from them. For more information, call Megabyte Computers at 817-589-2950.

BJ Gleason

Build Me the Perfect Portfolio...

An Open Letter to the Atari Corporation

Dear Atari,

While the Portfolio has been a success in the Palmtop market, holding it's own against the Poqet, HP, and others, it is beginning to show its age. Now's the time to develop the Portfolio II. **It's no secret, Atari, that you're making such plans**—so let us help you define what's to come.

As I have travelled and have communicated with other Portfolio users around the world, they have suggested improvements to the beloved Portfolio. I've compiled this list to let you know what your users would like to see.

Consider these suggestions, but strive for compatibility. There's a lot of software the current Portfolio. If the new unit will not run the old software, users might be tempted to move to another system.

HARDWARE

I like the size and design of the Portfolio - Don't change it!

Keyboard - Already the best of all the Palmtops. But add to the keyboard a "sticky" shift ability.

Memory - Increase internal memory to 512k standard, or even higher. For the memory cards, change to the PCMCIA standard. This will reduce costs and increase the sizes of RAM cards available. Provide an adapter to allow use of the older cards.

Screen - Larger would be nice, but I like it the way it is. If the screen hardware is changed, it could easily break almost all the graphics software that has been developed for the Portfolio.

System Clock - In the FAST mode, the timer tick is once per second. Add a FASTEST mode to conform to the 18.2 ticks per seconds like the PC. Modify the automatic powerdown so that the amount of time could be set, or disabled.

Speaker - Increase the volume, possibly as an option in SETUP.

Peripherals - Put the flashdrive software in ROM.

SOFTWARE

Obviously, fixing all the current bugs in the software is a must.

DOS - It would be nice to upgrade the Internal DOS to 3.3 [or higher]. Put XCOPY in ROM, to allow for easier copying between memory cards.

General - **Increase the file handling size** of the Internal applications to all available memory. Build in PGC/PGX graphics/animation support. Build in a programming language, like BASIC. If PowerBASIC is used, put the runtime module in ROM so that it's always available. Allow developers access to the internal floating point library that is used in the Spreadsheet, since that can greatly reduce the size of applications. Adding in access to the routine that displays the file list [used in most application] would also ease development. Give us a utility to determine how much battery life is left. The screen refresh in graphics mode is very slow—speed it up. Add in the software for printing text on the graphics screen. Allow filename parameters with the APP command.

File Manager - Put it in the system ROM. Allow for the addition of files extensions. The file extension list could be stored in a datafile in the \SYSTEM directory.

Spreadsheet - Bring it closer to Lotus 2.1 compatibility, and add Macros.

Diary - Add in a World Clock, and a Stopwatch. Add a TO-DO list.

Setup - Add an option that will allow a user to cold boot. This will help developers greatly.

Editor - Fix the cursor in the editor so that it does not automatically move to the 1st character when moving up or down a line. Interface the editor to the internal language.

Calculator - Add more features (sin, cos, etc...). Turn it into a business calculator.

RUN files - Add a utility to automatically check a RUN files for fragmentation.

File Transfer - Include a serial communication program in ROM. Modify the file transfer utility to work over the parallel and serial port. Allow programmers to easily access serial buffer input/output from the terminal package. Supply the Portfolio Applications on Disk for easier access to the datafiles that are transferred to the PC.

Privacy - Add password protection that can be enable from either manual and/or automatic powerdown. An owner's name and address file that can be displayed on reboot or power-on would be very nice.

Other - Put some games in ROM. Do more Advertising! Price it as low as possible, but $400 or less would be nice--obviously, the lower the nicer!

Atari, we know that you are pondering a Portfolio II. We know that some of these ideas are already in consideration for the new machine. The balance of the ideas come from heavy users with high hopes, ideas gathered from users, readers, and developers in the United States, England, Poland, Germany, and around the world. The bottom line from all these people is - **We love the Portfolio. We'll love a better one even more.**

Sincerely,
BJ Gleason

"As I have travelled and have communicated with other Portfolio users around the world, they have suggested improvements to the beloved Portfolio. I've compiled this list to let you know what your users would like to see."

■ BJ Gleason is an Instructor of Computer Science at The American University in Washington DC.. He's the author of PBASIC 4.9 and dozens of other Portfolio programs. Reach him on Compuserve [75300,2517] or on the Internet at bjgleas@auvm.american.edu.

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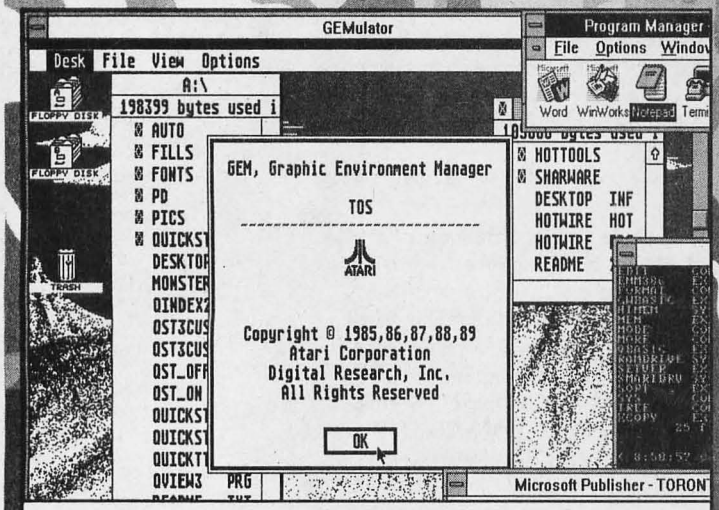

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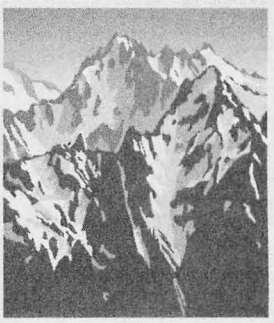

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Norman Weinress

The Tech Room:

Memory!

"Thanks for the memories..."

Have you heard terms like cache memory, TT fast memory and TT slow memory, and wondered what they meant? Well, they aren't really hard to understand, and knowing what they mean will give you a better feel for how your Atari computer works.

Several kinds of memory reside in your Atari ST or TT, and the computer moves information from one kind of memory to another. The information stored and moved makes up both programs and the output data of those programs. Inside the computer there are also permanent programs, called the operating system. In Atari's case, it's named **TOS** ("The Operating System" or "Tramiel Operating System", your choice).

TOS is built into a kind of memory called read-only memory (ROM), which may be read but not rewritten. It was set up at the factory, and can never be changed except by chip replacement. The rest of the memory in you computer is "random access memory" or **RAM**. This memory can be read or written to, and is used to store all the temporary programs and data.

While the ROMs retain their information even when the power is turned off, the RAMs lose everything they hold if the power is off. The word **"volatile"** is used to describe this capacity; RAM is volatile, ROM is non-volatile.

Inside an Atari computer, the RAM is theoretically divided further into two functional parts, although in reality, the memory area is continuous. One part is the screen memory, which holds all the data needed to describe what is being seen on the monitor. The rest of RAM is used for general storage.

Killing Time

The central processing chip **(CPU)**, the 68000, needs to read and write the memory all the time while operating. The display system also needs to read the screen memory all the time, to constantly redraw the picture you are seeing. Since the Atari ST screen memory is really just a part of the regular memory, the CPU changes the picture by simply rewriting the RAM portion that is used as screen memory. But, both the CPU and the screen display circuits are running at the same time. They can't both read the memory at the same time, so they share!

Inside the standard ST, the RAM is capable of being accessed (read or written) **four million times a second**. The processor and the display system take turns, each accessing memory two million times per second.

One of the differences between an ST and TT is that the TT may have a lot more RAM than the ST. But, to make the software written for the ST work on the TT, Atari made the first four Megabytes of RAM in the TT operate the same as in the ST. In other words, software written for the TT must keep the screen memory within the first four megabytes, which is the maximum size memory the ST was designed to use. But this means that any additional RAM in the TT may follow new rules, and it does!

The first four megabytes are now called **standard memory**. Anything beyond that is called **fast memory**. Because it doesn't need to share its access times with the screen, fast RAM can be accessed at the full four million times per second.

When your computer contains the regular 8 mHz 68000 processor, those two million accesses per second are all it can handle. But, if you have an Atari with a faster processor, whether because it came with one (the TT or Mega STe) or you bought a third-party accelerator, that slow memory rate is slowing you down. If your processor is twice as fast, using TT fast memory will speed up operations. But if you have an even faster processor, you're stuck again!

By the way, this bottleneck is not only an Atari phenomenon. All those PC's out there suffer from this in spades. One answer to the problem is to move processes that are "normally" done in the bottlenecked RAM to other, faster memory.

Now, ROM chips (for TOS) that are fast enough to be accessed at a higher rate are expensive. In the ST and TT, TOS is always accessed at the slower (original ST) rate, so cheaper chips can be used. But, a copy of the operating system can be written into very fast RAM, so that the processor can read there for operating routines, instead of ROM. And since this memory is as fast as the CPU, there is no slow down. Fast memory used for this ROM copy purpose is called **"shadow RAM"**.

Fast memory is still too expensive to be used to replace all RAM. But no program uses the entire RAM at any one time, so it's possible to copy a portion of regular RAM containing program code and/or data to fast chips, so that the processor can access them much faster. Fast memory used in this manner is called **"cache RAM"**.

The complications of cache RAM involve deciding which portions of RAM to copy, and when, and when to put the data back into RAM. So there is software (and sometimes special hardware) to manage the very fast RAM. Of course, shadow and cache RAM only are useful when your CPU is capable of faster processing than your standard RAM can support.

Another kind of memory we should mention is **"virtual" memory**. Sometimes a program requires a great deal of RAM to operate, usually to hold a large amount of data to be processed. But the program may need to read only a portion of this at any one time. So, some clever supervisory software can jump in, grab the data in RAM and write it out to a temporary file on the hard drive, and then read in the next data to worked on from the drive and put it in RAM.

more...

n Memories may be read only one word at a time, but the term "word" is variable. In some machines, it's defined as a byte (eight bits), or it can be 16 bits, 32 bits, or anything else. In Atari ST's, a word is 16 bits wide.

The ST series of computers used all DIP package chips. The STacy was next, and had SIPP boards in some units. The STe computers use SIMMS, the easiest to install and most common package today. Atari's TT030 must have custom Atari-specific memory boards, as they have memory management as part of the memory package. The Falcon memory arrangement is different again, using a custom board, but with no proprietary chips on it. Tiny surface mount memory chips make up to 16 MEG on plug-in boards that third-party manufacturers will be certain to be offering.

■ A newer form of packaging for memories uses small printed circuit boards to contain enough chips for a byte-wide memory. That is, eight bits for ST's and Mac's, nine bits for PC's. Ones that have just gold plated tongues (called "board edge" connectors) are called SIMM's for Single Inline Memory Module. Others, that look just the same except they have pins (like a SIP) are called SIPP's (Single Inline Pin Package).

Norman Weinress

■ Another bunch of abbreviations everyone runs into are the ones describing IC (Integrated Circuit) packaging. The first IC's were put into the familiar "caterpillar" black block with legs on two sides, called DIP's, for Dual Inline Package. Some IC's with on only one side are called SIP's (Single Inline Package). SIP's take less space, but some circuits require more legs than a SIP can accommodate. So the legs are made closer and bent alternately to each side in a zig-zag pattern. These chips are called ZIPs (Zig-zag Inline Pattern).

Reading and writing to hard drives can be so quick that you don't notice it. The program you're using doesn't know that it is swapping memory to disk—it's as though the computer had as much memory in it as your hard drive has available. Some Atari programs, like **Calamus SL** and **Touch Up**, do this operation by themselves. Virtual memory is also what makes **Windows** on the PC's possible.

"Memories are made of this..."

So far, we've described the different uses of memory in Atari computers. Now let's sort out the alphabet soup of the memory chips themselves: **DRAM, SRAM, VRAM, EPROM, EEPROM**, and the latest, **Flash RAM.**

Above, we spoke of RAM and ROM. These stand for Random Access Memory and Read Only Memory, which says something about them, but not everything. Though it might be confusing, a ROM is also "random access memory!" That only means you may access (read or write) any memory location on the chip with no regard to the last, previous access you made.

There are non-random access memories too. In a **"shift register,"** for example, all the data is stacked up, like in a tube. You can shove data in at the top, and take it out at the bottom, but to get at something in the middle, you have to push out everything in front of it. This is fine if you will be using the data only sequentially, in the order it was stored.

ROMs

A **ROM** (sometimes called Masked ROM) is a memory chip whose data is etched in place during manufacture, and can never be changed. A **PROM** (Programmable ROM) comes without anything written to it. The user "burns" in the data he wants, but then it cannot be rewritten. An **EPROM** (Erasable PROM) has a mechanism that can erase all the programmed info at one time, so that the PROM can be reused. An **EEPROM** (Electrically Erasable PROM) can also erase old data, but usually one byte at a time, so you can selectively rewrite only portions of it.

RAMs

Nearly all of the RAMs most people have ever seen are either **DRAM** or **SRAM**. DRAM (Dynamic RAM) is made from cells of one transistor for each bit it stores. SRAM (Static RAM) is made of cells that use four to six transistors for each bit.

The data stored in a dynamic cell will fade and be lost in just a few thousandths of a second if the computer doesn't read the row of bits where it resides. The reading causes the electrical charge on the cell to be refreshed and renewed for another few thousandths. The need to keep reading every bit of data over and over (whether you're using the data or not) makes for slower access to the data you really want. But dynamic RAM chips are denser, able to store more bits on the same size chip than static RAMs, so they're cheaper.

Static RAMs cost more, but since they don't need to be refreshed, they can let you work much faster. You don't need to keep addressing all the rows all the time, making memory fetches both time and power efficient. Because they can be made so very fast, SRAM is used for cache and shadow memories. Although it's not done in any Atari computers except the ST Book, the static RAM's power can be backed up using a battery. This means you can retain the information even if the computer is off, using SRAM as a form of non-volatile memory.

Another kind of RAM you sometimes hear mentioned is **VRAM** or Video RAM. This is really a regular DRAM combined with a shift register. These devices are useful for holding the screen data for computers like PC's that can't keep up with the screen while doing other business, a function that isn't needed in ST/TT's. What makes them faster for this work is the VRAM's ability to transfer a whole bunch of words between the two kinds of memory in one access time, all within the same chip. Instead of having just sixteen or thirty-two data lines between them to transfer information, there can be a thousand or more!

Some new RAM devices of which you're likely hear more soon, are **Flash memory** and **synchronous dynamic cache RAM**. Flash RAM is a cross between ROM and RAM. It uses only one transistor per bit, and a captured electrical charge tells it whether to be a one or a zero, but it doesn't have to be recharged every few milliseconds. The write process takes a lot longer than the read, and the electrical charge must be really heavy. Flash memory keeps its data when the power is off, like a ROM, but it's possible and reasonable to rewrite individual bytes, like RAM. Flash memory won't replace regular RAM because writing takes too long, but it'll be used in special situations like floppy and hard disk replacements.

We spoke of cache RAM, usually made of SRAM, with cost keeping us from using very large cache memories. A new device, the synchronous dynamic RAM, is a large DRAM combined with a smaller, fast SRAM. Called **EDRAM** by some manufacturers, the SRAM part is used as a cache memory, like normal, and the DRAM part is used for regular RAM memory. But, like the VRAM, there can be a thousand data lines inside, connecting them, and lots of data can be exchanged in one access time. This means the cache memory can work much more efficiently than with two separate chips. This idea should make cache memory cheaper and more popular in new computers.

Here's to pleasant memories! — *Norm Weinress* n

Norman Weinress is AtariUser's electronic elder statesman. A veteran of the early days of computing, his current projects include enhanced graphics systems for the Atari computers.

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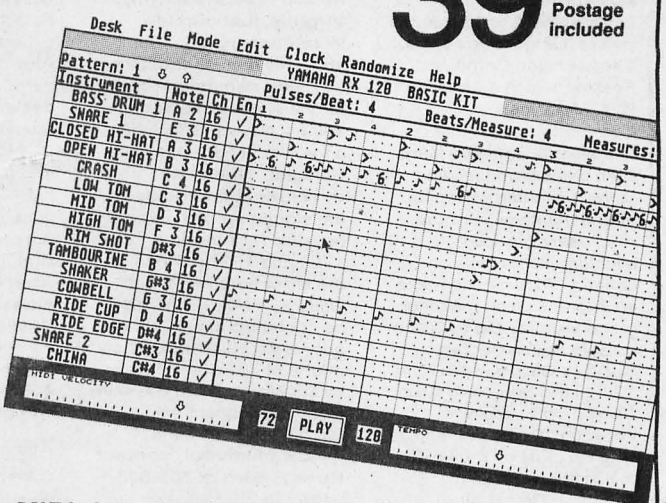

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Atari Connection, Atari Age, APX, Antic, Analog, & all Video or Computer Game Magazines. *Wanted to Buy.* Frank Polosky, PO Box 9542, Pgh., PA 15223 [6/92]

For Sale: ICD FA-ST 50mb HD, w/ICD under monitor case, ICD ADSCSI+ Host w/clock, Latest ICD HD Utilities/ Manual, cables Inc. $375, **FREE SHIPPING**, call 908-572-2372

FOR SALE: Atari 520ST w/ SC1224 & SF354. $300 OBO. Brian K Boggess 4801 Denison Ave, Cleveland, OH 44102 [8/92]

AtariLand Calendar

October 4th - The Washtenaw Atari Users Group (WAUG) will sponsor Atari ShowOFF '92 in **Southfield, Michigan** as part of a larger trade show, The Michigan Computer Festival, which will include IBM, Macintosh, Commodore, and Atari hardware & Software Items. Atari dealers and music stores have committed to attend the show, as have Atari users groups from Michigan, Ohio, and Ontario. They plan to make an impression on the other-brand visitors. **Up to 3,000 people are expected Sunday October 4th** from 10-4 at the Southfield Civic Center, on Evergreen between 10 Mile Rd. and 11 Mile Rd., just off the I-696 exit in the Northwest suburban Detroit area. **Contact WAUG at (313) 971-6035 or (313) 451-0524 (BBS).**

October 10th-11th - The Washington Area Atari Computer Enthusiasts (WAACE) present the 1992 8th in the annual series, will be held on **Columbus Day weekend, October 10th and 11th.** The location is once again the Sheraton Reston Hotel in **Reston, Virginia, just outside Washington, DC.** The show will feature shopping bargains, demonstrations, tutorials, lots of seminars, and social events including a traditional Saturday night Banquet. **Nearly 40 developers and dealers** are signed up, with more possible by showtime. The 1990 and 1991 editions of the show attracted *2,000 visitors.* WAACE Inc. can be contacted via GEnie at address S.HOFFMANN, by phone at 703-569-6734, or by US Mail at 5908 Bayshire Road, Springfield, VA 22152-1146. For last minute information, contact **Russ Brown at 703-803-6126.**

November 16th-20th - Fall COMDEX, the biggest computer trade show in the USA with 2 million square feet of show floor. Atari will again have a major presence at the **Las Vegas, Nevada** show, and has been soliciting for up to 50 third-party developers to participate in the huge Atari area at the **Sands Convention Center.** The Falcon line of computer is expected to dominate the Atari booth, with outstanding demonstrations for the dealer and distributor attendees to consider. COMDEX is where dealers and distributors make their marketing decisions of what to carry in their stores for the coming year. **It's said that a glimpse of future Atari machines may be seen as well.** Contact Bob Brodie at Atari Corp for information on attendance or exhibiting at **COMDEX,** 408-745-2052. **AtariUser will be there!**

December 12th-13th - CANCELLED - The Northern California Atari Expo has been CANCELLED according to an announcement by the sponsors on September, 8 due to problems with scheduling and prior commitments. The show was to be a joint effort of user groups **A.B.A.C.U.S., S.L.C.C., and S.S.T.,** and after negotiations with Atari Corp, the show may be rescheduled to a new date and place. **Contact the Northern California Atari Expo c/o SLCC, P.O. Box 1506, San Leandro, Ca 94577, or call 510-352-8118. GEnie Address: M.WARNER8.**

December 25th - Christmas! AtariUser can be there—a subscription is a perfect gift! Only $15 a year, or $25 for fast-fast first class delivery ($30 for outside the USA). You can have the hottest news in AtariLand—only in **AtariUser Magazine,** every month. Subscribe NOW and take our discounted rates! Send check, money order, or VISA/Mastercard number (with signature, Bank name, and expiration date) to **AtariUser Magazine, 249 North Brand Boulevard, Suite 332, Glendale, CA 91203. Or, call in your VISA/ Mastercard order anytime at 818-246-6277.** Sure, this is a shameless plug, but you're reading it, aren't you? **Good.** Now order your subscription. **Merry Christmas!**

January 1993 - The Winter Consumer Electronics Show comes to **Las Vegas, Nevada. CES** is an electronic playground. Games and entertainment items like the Atari Lynx are big here, and Atari will attend with a hotel suite showroom. Contact **Atari Corp** for more information on seeing their display at **408-745-2000.**

February 1993 - NAMM is the largest conclave of musicians each year. Held in **Los Angeles** at the Anaheim Convention Center, Atari was the first computer manufacturer to ever display at NAMM in 1987, and has become a standard at the shows, a **trade show for music** stores, distributors, and professionals of every strata. AtariUser will be there! Contact James Grunke at Atari Corp for more information at 408-745-2000. ■

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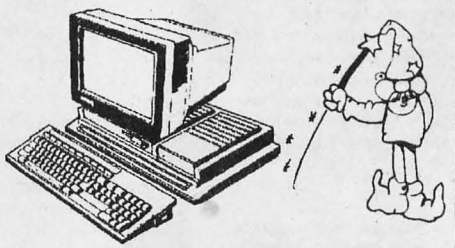

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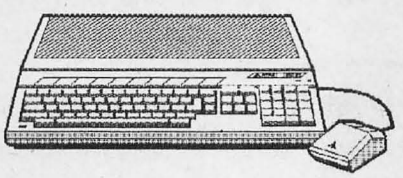

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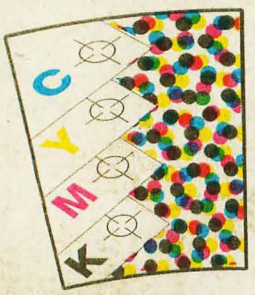

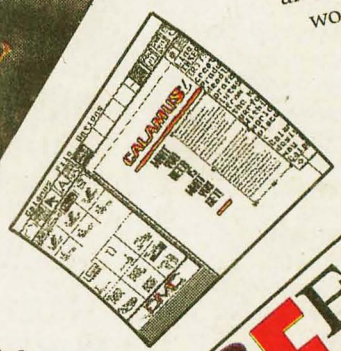

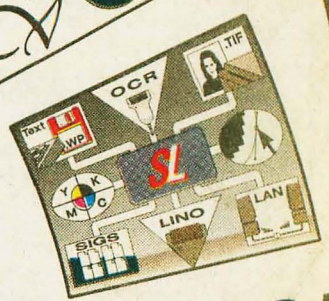

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