

# PORTLAND

\$1.50

AUGUST 1986

# ATARI CLUB

## Next General Meeting

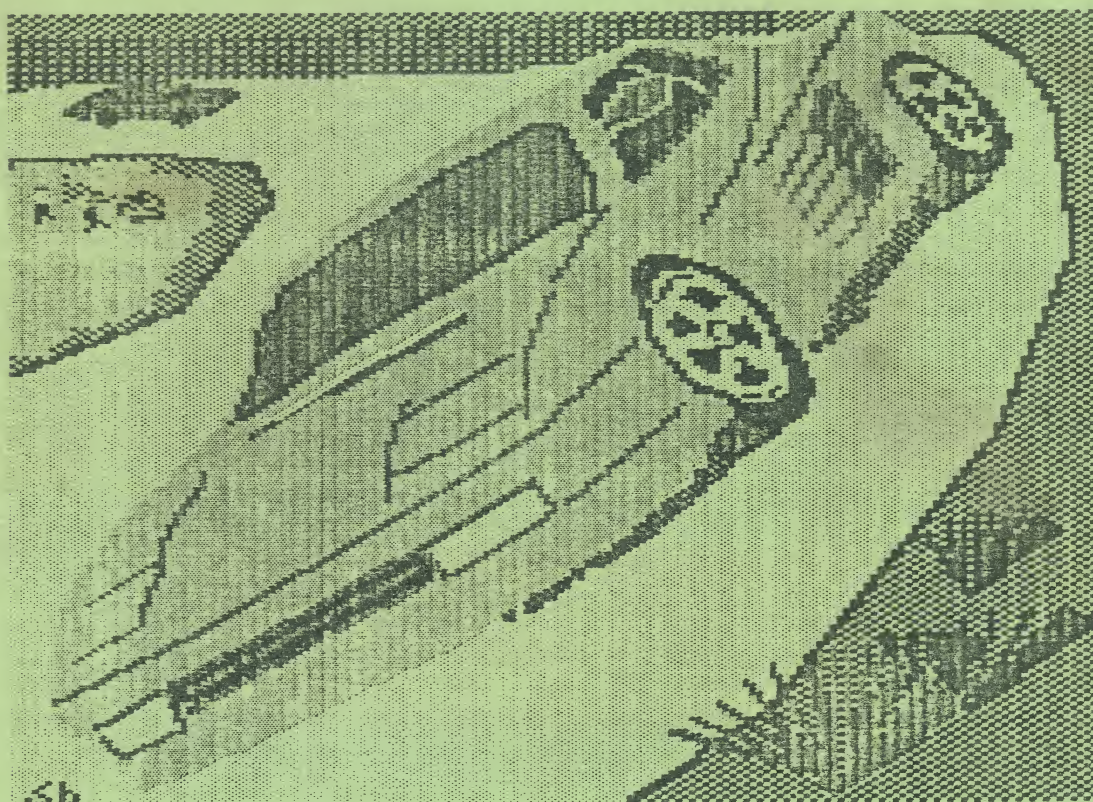
Monday, August 4, 1986, at 6:30 p.m.  
Northwest Service Center  
1819 N.W. Everett St.

PAC Bulletin Board Systems  
24 Hours - 7 Days a Week

#1 - (503) 245-9405 - 300/1200 BPS  
#2 - (503) 245-4608 - 300/1200 BPS

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# PORTLAND ATARI CLUB

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**Commercial Advertising Rates:** full page (7 X 9 1/2) - \$50, half page (7 X 4 1/2) - \$25, quarter page (3 1/4 X 4 1/2)- \$15. Ads must be prepaid and a 1/3 discount is given for 3 consecutive ads. The copy may vary in content, but the space must be the same in each issue. Send camera ready copy and check payable to PAC at the address below. Ad deadline is the 5th of the month prior to publication. Please **contact Lee Gassaway** (591-5252 or 642-2455) on all matters pertaining to advertising.

**Membership** is \$20 per year and includes a subscription to this newsletter and access to members-only functions. Single copy price of the newsletter is \$1.50. General meetings are open to the public and start at 6:30 p.m. on the 1st Monday of each month (2nd Monday in the case of holidays) on the date and at the location listed on the cover of this newsletter.

Exchange newsletters, articles, correspondence and ads should be sent to the following address:  
Portland Atari Club, Attention: (appropriate board member), P.O. Box 1692, Beaverton, OR 97005

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**EDITOR'S COLUMN**

R. DeLoy Graham

Summer has captivated most of our regular writers this month, but we did receive a few very good articles and are reprinting several items of value from other newsletters.

**HABA SYSTEMS OFFERS SOLUTION**

Jim Berry announces that IB Computers has arranged with Haba Systems to take back all **Hippo C** Compilers. In exchange, Haba Systems offers **Hippo C** owners any current Haba software title for only \$10. We just return our **Hippo C** disk and manual to IB Computers, choose the program we want, and pay \$10.

Jim will collect **Hippo C** disks during the next few weeks. Then he will return them along with our orders for exchange software. Please note that Haba Systems will send the software to IB Computers for dispersal, so we will have to wait to get our new software. I feel this is a very fair move on the part of Haba Systems and applaud their efforts to boost customer satisfaction.

**"MORE THAN 200 FREE ST PROGRAMS AVAILABLE"**

I'm spending more and more time on electronic bulletin boards. Atari, recognizing the interest being shown in bulletin boards, has chosen that means to provide us with easy access to public domain software. The following is a quote from an article posted recently on their board:

"Did you know that there are more than 200 public domain programs for the ST available from a central source, not to mention the more than 100 ST pictures and 100 8-bit programs? If you were signing into the Atari Corp. BBS regularly, you'd know this and a lot more. The Atari Base is the official BBS of Atari Corp. located at headquarters in Sunnyvale. You can also get any questions you have answered by our staff experts. . . . The Atari Base BBS can be reached by any computer with modem by calling 408-745-5308, any time any day, 300 or 1200 baud."

**ATARIAN BBS**

Former PAC member Mehdi Attaran has set up an excellent local board called the Atarian BBS. Recently upgraded to run on an Atari ST, the Atarian BBS uses the same software as the official Atari BBS mentioned above.

Mehdi suggests it would be to our advantage to call his local board to become acquainted with the software before calling Atari BBS. To further help us save money, Mehdi has posted on his board three files containing all the available files for downloading from Atari BBS. By downloading his files and making our download selections before going long distance, we can get on, get what we want, and get off much faster.

Call the Atarian BBS at 245-9730.

Clyde Pritchard has uploaded several files to PAC Board #2 containing lists of 8-bit files available for download from CompuServe. Use them before calling CompuServe.

**SUBMISSION GUIDELINES**

Although I accept articles in many formats, I would like to inform any of you interested in submitting material what my preferences are. These guidelines will lessen the amount of work that I must do to put together the newsletter.

I prefer to have submissions uploaded to PAC BBS #2 in the Newsletter Section. Enter T for text when asked what language the file is written in. Also, leave a short message for me in E-Mail with the name of the file.

If you don't have a modem, I prefer you give me a disk containing your article at the monthly PAC general meeting, or get together with a friend who has a modem to upload it. I will return your disk as soon as I can. Please be sure your name is on the disk.

Of course, I will never turn down typewritten material, but please don't assume we can just photocopy your work. I must retype it. If you submit program listings, we will try to photocopy them, but they must be printed with a very dark ribbon or they will not reproduce well in the newsletter.

I am presently using **Regent Word** to edit, write, and print articles. If you have **Regent Word**, please write your submissions with it. In any case, please do not format your text--use NO control codes. I have to remove all of them and insert the ones we normally use. Also, please leave only one space between sentences and no blank lines between paragraphs.

I am still waiting for an ST wordprocessor that creates double columns. **ST Writer** has that option, but it has a bug that makes it virtually unusable. Let me know if you find something that works.



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**SPECIAL INTEREST GROUPS**

Tom Brown

**BUSINESS APPLICATIONS SIG**

8 &amp; 16 Bit Atari Computers

No meetings until September

Time/Place: call

Leader: Tom Brown

Phone: 646-5237

Ron Chaffer

283-5691

**PASCAL/MODULA-2 SIG**

No meetings until September

Time/Place: call

Leader: Tom Cloyd

Phone: 643-9192

**ST EXPLORER'S SIG**

No meetings until September

Time/Place: call

Leader: Richard Barhitte Phone: 206-573-0292

**ST FORTH SIG**

No meetings until September

Time/Place: call

Leader: Tony Roth

Phone: 222-4999

**GENERAL ST SIG**

Dates: 2nd &amp; 4th Thursdays

Time/Place: 7:00 p.m. / Tektronix, Bldg 50

Leader: Pat Warnshuis

Phone: 246-3724

**MODEM & COMMUNICATIONS SIG**

Dates: 2nd Monday

Time/Place: 7:00 p.m. / Call

Leader: Jerry Anderson

Phone: 655-3914

**8-BIT EXPLORER'S SIG**

Dates: 2nd &amp; 3rd Wednesdays

Time/Place: 7:00 p.m. / Call

Leaders: Tom Comerford

Phone: 246-4694

Wayne Winterbottom

Phone: 669-1367

**NEWSLETTER SIG**

Date: Wednesday following general meeting

Time/Place: 7:00 p.m. / Call

Leader: R. Deloy Graham

Phone: 649-6993

For information on SIG activities, call SIG  
leaders or Tom Brown.

**8-BIT EXPLORER'S SIG**

Wayne Winterbottom

I'd like to begin by restating the purpose of the 8-bit Explorer SIG. Our goal is to reach both beginners and intermediate Atari 8-bit users, answering questions and trying to fill the needs of the members. Twice a month we look at and discuss hardware and software from the simplest to the most complex.

June was an interesting month for the Explorers! Chris Hudetz (Computer Service Repair at IB Computers) took apart an Atari 800XL. He first showed us how he runs tests to determine the problem area on a computer brought in for repair. He then repaired a joystick trace (broken connection), explaining each tool and its use.

For our second meeting, Scott Burr led a fascinating demonstration of a program called **DISK WIZARD II** by C.A.P. Software. Of particular interest was the disk edit portion. Scott scanned the sectors, finally locating the sector he wanted to edit. When the program was rebooted, the title screen read "Scott's Wizard II". He then changed it back to the original title. Do not try this yourself unless you are experienced with sector editors!!

**NOTE:** Our meeting night has changed until school begins in fall. We now meet the second and third Wednesday of every month instead of Tuesday. For directions or more information call Tom at 246-4694 or Wayne at 669-1367. We'd like you to join us in the near future.

\*\*\*\*\*

**PAC Help Hotlines**

The following people have generously offered to take telephone queries in the areas indicated.

Adventure Games	Russell Schwartz	646-6418
Assembly Language	Leroy Baxter	653-1633
BASIC Programming	Nick Yost	981-0838
	Lee Gassaway	642-2455
BBS Usage	Steve Billings	246-1751
	Don Adams	245-7168
	Russell Schwartz	646-6418
C	Randal Schwartz	285-5764
Cassette Operation	Lee Gassaway	642-2455
DOS Operation	Wayne Winterbottom	669-1367
FORTH Programming	Ron Chaffer	283-5691
	Ricky Wooldridge	224-7163
Operating System	Nick Yost	981-0838
	Leroy Baxter	653-1633
ST General	Chuck Hall	626-3717
ST Fundamentals	Richard Barhitte	206-573-0292
ST Business Prog	Dean Nickel	281-5117



## ATARI NEWS

Gigi Bisson - Antic Online

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## INDUS IS OUT

Prospective Indus disk drive owners be warned; the Chatsworth, CA-based peripherals manufacturer is no longer in business. A company called National Logic took over the new Indus MIDI sequencer product line, and Future Systems, Inc. purchased the rights to the Indus GT Atari and Commodore-compatible floppy disk drive line.

Future Systems has notified registered Indus owners that their Indus warranties are no longer valid. A service contract can be purchased from Future Systems for \$24.95.

According to Future Systems President Gary Grewal, the company intends to release several products Indus had in the works before the reorganization, including a CPM/BIOS RAM charger that plugs into existing disk drives. The new address is: Future Systems, 9811 Owensmouth, Suite 9, Chatsworth, CA 91311. (818)407-1647.

## MIRAGE FILES CHAPTER 11

Mirage Concepts, makers of the **H & D Base** database and other ST products in the Holmes & Duckworth Micronomists software line, have filed for Chapter 11 protection.

Due to their inability to fulfill a \$175,000 business loan, their bank "physically appropriated the company's assets on May 21," Mirage Vice President Michael Reinhold said in a prepared statement mailed to creditors. As their Fresno, CA offices have been shut down, company officials were not available for comment.

## ACTIVISION/INFOCOM MERGE

Activision, the Mountain View, CA entertainment software company, has reached an agreement to merge with Infocom, the Cambridge, MA interactive fiction game developer.

Activision Chairman and Chief Executive Officer James Levy said that Activision will exchange 2.0 million shares of Activision common stock, valued at \$7.5 million, for all outstanding shares of Infocom stock.

Infocom will maintain separate product development and marketing operations in Cambridge. The merger will not be official until a final agreement is signed on June 30, 1986.

Activision has also recently acquired Gamestar, creator of **Championship Golf**, and **GBA Championship Basketball**, two ST games slated for Fall release; and Creative Software, a productivity software company. Activision was founded in 1979 when five dissatisfied employees left Atari Inc. to form their own VCS game cartridge company.

## REMOTE CONTROL PETSTERS?

Nolan Bushnell, Atari Inc. founder and current President of Axlon Inc., the company responsible for Petsters, those adorable fur-covered robots, is rumored to be considering a merger with Steve Wozniak's CL-9 company. Axlon would acquire Woz's remote control interface venture in a stock swap that would involve no cash. Teddy Ruxpin, watch out.

## MORE PEOPLE USING ATARIS

Judith Cohn is conducting Cell Image Analysis research at NASA with the aid of an Atari ST computer and the **DEGAS** graphics program from Batteries Included. Cohn is currently writing an ST program which will she hopes will help her partition digital images of human reticulocytes (individual cells which form a network of cellular tissue in the human body) into two groups.

## FREE PUBLICITY

Trying to sell your product to the education market? Put it aboard the Teacher Resource and Computer Training Center, a roving computer "mobile unit" equipped with Atari ST and Apple II computers, textbooks, software, comfortable couches and, of course, hot coffee. The mobile unit cruises the parking lots of 25 school districts in the Wayne-Finger Lakes area of upstate New York, giving 2700 teachers hands-on experience with educational software and computers.

To get your Atari ST educational product on the bus, send a complimentary sample of software conspicuously marked with the name and address of your sales representative, to: J.C. Crawford, Wayne-Finger Lakes Area Teacher Resource and Computer Training Center, 3501 County Road 20, Stanley, NY 14561 (716) 526-6431.



### MIDI MAGIC

Sweet symphonies drifted through the Antic offices when Carl Bacani of Computer Support, our friendly, neighborhood Atari dealer, popped in to show off his MIDI musical compositions.

It sounded better than live music or any recording -- sharp, clear, each note distinct. Yes, you too can create stunning music with Activision's \$49 **Music Studio** program and \$5,000 worth of hardware.

Bacani's MIDI set-up included an Atari 1040ST computer hooked up to a Roland TR-727 Rhythm Composer, Casio CZ-101 synthesizer, Yamaha RX 15 Digital Rhythm Programmer, Yamaha TX 7 FM expander, Casio TB-1 MIDI Thru Box, and a BOSS BX 600 6-Channel Stereo Mixer. An FM stereo receiver and two speakers amplified the sound.

Bacani will help Atari Corp. "unofficially" display the ST's MIDI prowess at The Bay Area Music Fair, sponsored by Electronic Musician Magazine, Windham Hill Productions, and several of big stereo dealerships and synthesizer companies.

Focusing on MIDI and digital music, the three-day show features live music performances, workshops and booths. Highlights include a speech by music publicist Augie Blume, and seminars by such notables as Gary Leuenberger, a synthesizer expert who has worked with Quincy Jones, Julian Lennon, Toto and Billy Joel. Hybrid Arts will be showing off the Atari ST-compatible DX Droid at the fair.

### WHY DYORAK LEFT

Don't turn to the last page and expect to find that familiar bold-faced type in InfoWorld. John Dvorak, long-time InfoWorld institution and once editor of the publication no longer graces the pages of the weekly microcomputer industry tabloid.

Sources close to InfoWorld say Dvorak was unhappy with the publication's recent emphasis on the dull business market in an attempt to woo the MIS (Manager of Information Services) reader. MISs make major microcomputer purchases within corporations.

Dvorak continues his controversial column in Computer Currents, a California weekly tabloid, and writes a non-computer column for the San Francisco Examiner.

### AND YOU THOUGHT \$699 WAS A DEAL...

During a 10-day Father's Day promotion, Atari has slashed the price of the monochrome 520ST to \$499! Will it ever end?

### WHICH WILL YOU BUY?

This Christmas, Commodore will sell the re-designed Commodore 64 for \$200 while Atari Corp. delivers the 65XE for under \$100.

### JACK'S A TOYS R US KID

The Atari invasion in the nationwide Toys R Us retail toy store chain seems to finally have taken effect. Our roving shopper reports seeing an entire shelf in a local Toys R Us store dominated by 8 and 16-bit Atari hardware and software.

### DID YOU KNOW?

\* "Hackers" author Steve Levy is rumored to be working on a Broadway musical based on the MIT programmers of the 60's called "Leader of the Hack." Rather than act, the actors will sit around eating Chinese food and discuss different ways to make the theatre's sound system better.

\* Chris Crawford's latest game: "Balance of Checkbook"

\* The plan to stop software pirates by joining forces with National Child Watch, the folks who print those messages on milk cartons.

\* Or how about buying software at 7-11? "I can't wait to get technical support from the convenience store staff... Give me four twinkies, two of those Beef & Bran burritos, and tell me, when I'm doing an asynchronous download in XMODEM, do I have to adjust the parity bit to Odd or Even?" writes Frank Simon, in a parody editorial.

These and other humorous, high-tech pseudo-news stories can be found in Comedy By Wire: The Computer/Comedy Newsletter. A one year subscription to the monthly, four-page, publication is available for \$9 from: Comedy By Wire, 431 West 45th Street, New York, NY 10036.

### KNOW SOMETHING WE DON'T?

Publicize your Atari-oriented computer show, seminar, class, swap meet or event (no users group meetings, please) in the new Events section of Antic Online.

Just send us a message in the Online Feedback section noting the date, time, location, cost, sponsor and highlights of the event.



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**CORRESPONDING WITH ATARI USERS  
in Foreign Countries**  
Lee Bole - PAC

For about six months, Margaret Manning and I have been exchanging letters, software, information, and general good will with Atari users in other countries. It has been lots of fun, some degree of work, and generally most rewarding.

It started with Margaret's reading an article in Atari Explorer which listed a host of user groups in foreign lands. She wrote to a few of these user groups, asking their members if they would like to exchange letters, disks, magazine articles, etc. About a month went by and one day we received two packages from different cities in England. One package contained a couple of issues of Page Six, a British Atari magazine, and the publisher-owner-editor wrote an accompanying letter saying he'd put our letter in his magazine's "Contacts" page. His letter also contained little vignettes of Atari user happenings in his area of England. The other package contained a friendly letter from Preston, England. It also contained a copy of the Preston Atari Club (PAC) newsletter and a disk of Friday Fun Club games. Some of these games have now been made available to our PAC members in a club disk.

It is really fun to receive a letter and a disk or two from some Atari user in, for example, West Berlin. We trot right to the computer room and boot up his disks to see what they are, and lo and behold, much of it is in German! So we have to call Elanna Schlichting to translate.

As time went by, we began receiving letters from England, from Scotland and Ireland, and then from Australia. Then New Zealand, and Holland, France, Germany, and Italy. We have even received a letter from an Atari user behind the iron curtain in Budapest, Hungary!

All of them have said they read our letter in Page Six and Monitor (another British Atari magazine which we did not even contact). By the way, we have since sent in a subscription to Page Six, and it is a pretty good magazine. So is Monitor.

Most of the writers say they really enjoy reading our PAC newsletters, which we try to include in the letters. One club offers a newsletter from a foreign Atari user group to members who bring in new members.

We have had more letters than we can or want to handle, so if anyone in the club would like to take over some friendly correspondence with Atari users abroad, please let us know. We have tried to see that every letter gets at least a polite response. Chuck Hall and Pat Warnshuis have graciously taken over for us some ST user letters.

One person is really into printer graphics and has sent me many of his "creations" which are charming drawings boosting the great graphics capabilities of Atari computers. Some of his works use foreign slang I'm not sure about. Another is really involved with TurboBASIC XL and compiling BASIC programs. I sent him "APPCAL" (on our BBS #1), which he compiled and returned to me. It does run faster.

I have learned that **AtariTexte** (**AtariWriter** in French) alters the keyboard, and the German version has a German character set.

We now have a world map on the wall with little pins at the cities over the world where we have made Atari friends. It's bringing the world to us.

And how alike we Atari users are! The New Zealand lad writes, "One basic program that I am keen on getting is **Biffdrop** from Antic magazine. I have developed a hate for Antic over this program. [He's kidding.] I'm sure that they did not print the full listing. I typed it in myself and checked it countless times, spending hours upon hours at it. I have checked it against their new typo codes, and while everything finally matches, when I type RUN, I just get a black screen and nothing happens. If you know anyone with a running copy of it, please send it on to me... it has been driving me nuts." Does that sound familiar?



EVERYTHING (ALMOST) YOU WANTED FROM PRINT SHOP  
BUT WERE AFRAID TO ASK FOR  
A Review of Print Shop Companion  
Bill Pike - PAC

You loved it as a banner. You swooned over it as a sign. You cried over it as a greeting card. Anyhow, you went slightly crazy over **Print Shop**. But then the glow of first love faded and you wished for more from your companion. From the far corners of the universe, from the planet of IRATA and C.A.P. came more graphics, but still you were unsatisfied. Your tastes had become jaded and the old program just wasn't enough any more.

Now, from the land beyond BEYOND, from the edge of the universe, from the mysterious planet named BRODERBUND comes

[we will pause here for a few moments to allow your excitement to build]

THE PRINT SHOP COMPANION

With the help of the **Companion** your **Print Shop** program will accomplish almost anything you could ask it to do. You can edit, create, and save fonts. You can edit, create, and save new borders. You have a much superior graphics editor/creator. You can create new tile patterns as well as edit old ones. There is even a Creature Maker that will print out a drawing for the kiddies. Last but by no means least, there is a perpetual calendar that will print out a weekly or monthly listing of appointments, holidays, etc. This can be printed in various fonts and can include your own little pictures on the top.

One of the first things that you will read as you scan the documentation is the disclaimer that this program will not work with an unauthorized version of **PRINT SHOP**. The **Print Shop Companion** re-writes your original **Print Shop** program, so if you don't have a copy of **Print Shop**, either go get one or don't bother with this program. After you have followed the setup instructions you will see that your **Print Shop** menu is now in living color rather than blue and white. The **Companion** has 12 new fonts and 50 new borders, as well as new graphics (from Broderbund games) and an invitation to send in your own graphics for inclusion on a new graphics disk.

When you exit **Print Shop Companion** from the main menu, it restarts the computer, so be sure to **SAVE** everything before quitting.

The Graphic Editor+ is far superior to the one on **Print Shop**. It has most of the features of one of the early Atari graphics programs and it has fill and negative and mirror. You can edit/create a new border. You can also edit/create a new font for use in **Print Shop**. The fonts can also be printed in double height mode. You may also create monograms and logos from the font editor.

The calendar section of the program has a perpetual calendar that allows you to create and save a appointment calendar by the week or by the month.

All in all, this is a very valuable program addition for anyone who uses **Print Shop**, and at a cost of \$31.95 it won't bankrupt you, for long anyway.

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**DRAPER PASCAL****Review**

R. DeLoy Graham

For a long time, I have awaited an implementation of Pascal for the 8-bit Atari line which I could recommend for use by students enrolled in our high school's Advanced Placement Computer Science Course. To be considered, such an implementation must adhere closely to the standard definition of Pascal, although extensions for the Atari would be acceptable. Included must be the ability to create data types that make Pascal such a desirable language for use in computer science courses.

Unfortunately, **Draper Pascal** is not the answer. It simply lacks too many of the features required in many computer science classes. For example, it does not contain a **TYPE** statement, which means that not only can you not create your own types, but you cannot pass other than simple data types as parameters to procedures and functions. Of course, that is really not much of an issue in **Draper Pascal** anyway, since you cannot declare variables to be of data structures other than single-dimension arrays. Lack of the **TYPE** statement means no records, no pointers, and no user-defined types. So as a language being considered for our Advanced Placement Computer Science course, **Draper Pascal** is unacceptable.

However, as an alternative to Atari BASIC, **Draper Pascal** will do quite nicely. It does give the programmer a set of control structures that are much more readable than those of Atari BASIC, whose control structures generally must be written with the infamous **GOTO** statement. (I will concede without argument that there is nothing inherently wrong with the **GOTO** statement, but it is often abused, over-used, and improperly used, which leads to highly unreadable spaghetti code that is difficult to modify and to debug.) I personally prefer **Action**, but programmers may find **Draper Pascal** an easy introduction to Pascal, and some have even found it acceptable in introductory Pascal and math courses.

The transition from Atari BASIC should be found to be trivial, since **Draper Pascal** includes several familiar extensions, including **POKE**, **PEEK**, **COLOR**, **SETCOLOR**, **GRAPHICS**, **LOCATE**, **PLOT**, **SOUND**, **NOTE**, **POINT**, **STICK**, **STRIG**, **PADDLE** and **PTRIG**. Other niceties include **XCTL** (used to transfer control to another Pascal program), **XIO** (implemented as in BASIC), **OPTIONS** (used to perform various actions, such as disabling the

break key), **OPTIONKEY**, **SELECTKEY**, **STARTKEY**, **KEYPRESS**, and **WAIT**. Overall, there is so little new to learn that **Draper Pascal** would be a slick and easy way to get into Pascal.

Some of the standard Pascal functions which are missing from **Draper Pascal** are **ROUND**, **PRED**, **SUCC**, and **TRUNC**. Also missing are **WITH**, **NIL**, **NEW**, **DISPOSE**, **PACKED**, **GET**, **PUT**, **FORWARD**, **IN**, **SET**, **GOTO**, and **LABEL**. **Draper Pascal** does include **GOTOXY**, **RND**, **SHL**, **SHR**, and **CVTREAL** (convert to REAL). String functions and procedures included are **CONCAT**, **LENGTH**, **INSERT**, **DELETE**, **POS**, and **COPY**.

Version 1.6 of **Draper Pascal** provides ramdisk support with DOS 2.5. Once the supervisor has been loaded from the supplied, copy-protected disk, you can then remove the disk from the drive (Version 1.5 required that the disk be in drive 1 at all times). It will run on any Atari 8-bit computer with at least 48K for the compiler.

**Draper Pascal** comes with its own editor, compiler, and runtime supervisor. It does not include nor use a linker. However, machine language programs can be loaded and called. **Draper Pascal** does not use page 6 of memory. Also available to the programmer are locations \$80-\$9F.

The editor, used to enter and modify the source code, is line oriented. The source code for the editor, which is written in Pascal, is included and can easily be modified. The programmer can append, insert, list, print, edit, change, delete, add, and scan (search). These functions are chosen from menus. The editor can hold only 250 80-character lines, but by using include files, the source code is limited only to the size of the memory in your computer. Although the editor uses line numbers, they are not entered by the user nor are they saved with the program; they are used only for reference while editing. Lines are renumbered automatically anytime a line is inserted or deleted. The editor does not provide a means to copy or move lines, nor to restore deleted lines.

The supervisor, which contains all the runtime routines, simulates a 16-bit stack-oriented pseudo computer. The compiler creates pseudo-code which is run by the supervisor, which means you must include the supervisor with any distributed programs so that

(continued on page 14)



**ST BOOKSHELF ON A LASER DISK**  
**3-Second Search of 540MB Data**  
Nat Friedland - Antic

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(Special extra-early look at a key excerpt from Antic's exclusive interview with the man who developed CD ROM for the ST computers. The entire article will appear in the October Antic Magazine, on sale in September.)

The Atari exhibit at the Chicago CES in June was packing them in to see something genuinely new -- the 540 megabyte CD ROM system (Compact Disk, Read Only Memory) running on the 520ST computer.

Software by the Activenture Corp. of Monterey, California put the 26-volume Grolier Encyclopedia on a CD ROM disk -- along with a smart database that finds all references for any word in the encyclopedia in three seconds flat.

This system will be premiered only with Atari ST computers. Atari is committed to release a CD ROM player -- targeted to retail at \$599 -- by the end of the year. Grolier will probably price the CD ROM encyclopedia disk at around \$150-200.

**HOW COMPATIBLE?**

How different is CD ROM from standard digital audio disk technology? Could you use CD ROM on any compact disk player?

"No, it's not 100% compatible with digital audio. But the idea is to keep down CD ROM costs by using as much as possible of the CD audio technology," said Rolander. "And there is a universal CD ROM standard that has been accepted by Philips, Sony, Hitachi and all the other major manufacturers involved in the field. So there won't be any problems with competing formats."

Similarities between CD ROM and CD audio include the same 4.75" disk size, with identical mastering and duplicating processes. This keeps expenses low. It costs no more than \$4,000 to make a master disk for pressing. The cost for pressing 1,000 disks is \$4 apiece.

All CD players share the same principles of laser optics, the same motor and drive specifications. However, CD ROM requires greater precision in mechanically positioning the laser head and mirror.

Also, CD ROM needs a higher degree of error correction accuracy. It uses 10 to the minus 12th power -- meaning you might get a typographical error once in a trillion times. This is accomplished by adding 288 bytes of error correction code onto every data "block" of 2,048 bytes. An unformatted CD ROM disk could actually store 600 megabytes.

"CD ROM needs these more precise tolerances because you cannot have the two-or-three bit error factor that's acceptable for compact disk audio reproduction," said Rolander. Accordingly, he wouldn't be surprised if top-of-the-line CD ROM players also include audio disk capability in the near future.

**WHAT'S ON TAPE**

"Any text that's stored on magnetic tape can be machine read and automatically indexed by our software," said Rolander. This immediately brought up the question of how much reference material was now available on magnetic tape.

His answer was that just about all printed matter of any substance that has been published within the past five years could be found on tape. That's because the largest state-of-the-art typesetting machines, such as the Compu-Graphic 8600 and the top-line Mergenthaler model, normally keep the text data on electronic tape.

"Also there are the huge libraries of information already processed electronically for online databases," Rolander added. "A surprising amount of this material is in public domain, often because it has been prepared by the government."

Rolander sees Activenture as an "optical typesetter." Paid by royalty fees, Activenture offers the service of creating a fast, interactive index for existing reference material and databases. When Rolander isn't hurrying to finalize his software in time for Atari's September deadline, he's flying East to meet with traditional publishers and sew up more CD ROM rights.

**HOW IT'S DONE**

The CD ROM disk has four different sections. First is the raw data -- which is nothing more



than all of the encyclopedia, from A to Z. Then comes the index, or table, which contains pointers to all unique words in the encyclopedia. Next is the directory, which is similar to the file management sectors of a floppy disk. It tells the program where to find a file on the disk.

Finally, there is the Facts and Figures software, which loads into the computer and runs the show. At this writing, Rolander was uncertain whether this section would be on the CD ROM or on a separate floppy disk. It depended on whether Atari made the CD ROM Player a self-booting peripheral.

All the Activenture CD ROM software was programmed entirely in the C language. After Rolander wrote his minicomputer indexing program, it took the VAX no more than six hours to read the approximately 58 million characters in the Grolier Encyclopedia and create the index table.

The program counted the number of unique words at just around 141,000. Some 30 "stop words" -- including but, a, and, of, the, etc. -- were ignored in the index.

At the same time, the unique words were also alphabetized and every one of their locations in the encyclopedia was mapped. One reason for the lightning speed of the Facts and Figures software is that it searches references in the index, not in the encyclopedia.

Interestingly, the fully mapped index takes up 50 megabytes, almost as long as the 58 megabytes of the encyclopedia itself. However, the entire encyclopedia and index only require one-fifth of a standard compact disk!

The encyclopedia text files must be usable with video monitors that have different resolution formats. So the software formats the text in real time as it is going into display.

"To keep the program moving fast, it calls up very large buffers," said Rolander. "In fact, it will use whatever free memory is available." The storage buffer requires a minimum of 64K, and the Facts and Figures software will also need its own 64K of RAM.

Transfer rate of the CD ROM is 150 kilobytes per second. An important design element of the ST, to speed this huge data transfer, is the DMA (Direct Memory Access) chip. And it's no accident the ST has this capability. Rolander and Atari ST hardware designer, Shiraz Shivji, worked closely together, once it was decided the ST would have CD ROM as a peripheral.

#### CD FILE FORMAT

The format of a standard floppy disk consists of tracks in concentric rings, each consisting of a number of sectors. Optical laser disks have two standard formats: CAV (Constant Angular Velocity) and CLV (Constant Linear Velocity).

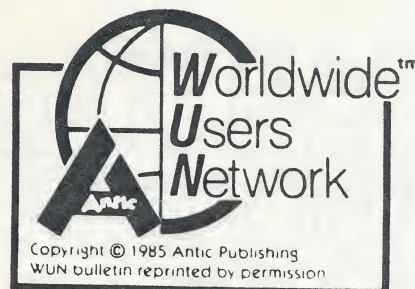
CAV is similar to floppy disk formats. The tracks are concentric rings, each containing a number of sectors -- except the sectors are called "frames" or "blocks." The CAV format wastes a great deal of space. The outside tracks are longer, but they contain the same number of blocks as the shorter inside tracks. However, CAV is easier to program for read-write access, and some laser video players use this method because it permits "freeze-frame."

CLV is a spiral format, much like a phonograph record. All the blocks in CLV are equidistant along one long spiral. So there are three times as many blocks per track at the outer edge as there are towards the center. The CD ROM's 540 megabytes in CLV format are divided into 270,000 blocks, with 2,048 bytes in each block. CLV is the format of CD audio and some video players. Rolander chose the CLV format for his CD ROM system because it permits far more storage.

#### AND THE FUTURE

We have told our typesetter (the same one since Antic began) never to erase any of the magazine's floppy disk files from now on. It would not be a bad idea to bring out a CD ROM disk containing every issue of Antic. All topics and all listings ever printed in the magazine would be instantly accessible via the CD ROM database.

And while we were at it, we also might as well include every program in the Antic public domain library on the same disk.





**MUSIC STUDIO AND N-VISION**  
**(Part Two of a Two-Part Review)**  
Randal L. Schwartz - PAC

Mother Nature was not very kind to me between the middle of June and the first part of July. She failed to provide the required number of rainy weekends to work on PAC Newsletter articles. However, Father Time (in the shape of one DeLoy Graham), continued his march, moving closer and closer to the July 12th newsletter deadline. Next time I commit to a two-part article, it will be in the winter (hee hee).

This is the second of a two-part article; the first part appeared in last month's PAC Newsletter and covered some general things about **Music Studio** and **N-Vision**, two nifty programs written by the folks at Audio Light, Inc. The first article also went into detail about **Music Studio**, so it is only fair (and necessary, if I am to keep my literary license) to complete the report with some words about **N-Vision**.

As some of you may have noticed in last month's newsletter, apparently Audio Light has turned over the responsibility of marketing **N-Vision** to Activision (the same people that distribute **Music Studio**). They've also (as reported by the same source) decided to call the program **Paintworks**. Whether this is a good thing or a bad thing seems to make no difference, since I will continue to use the word **N-Vision** until at least the end of this article.

A capsule summary of **N-Vision** begins with the word "slick". This program has the same easy-to-use style as **Music Studio**. It is easily the best drawing program currently available for the ST machines, with clear advantages over the "freeware" **Neo 0.5** (sorry, Vern), **DEGAS**, and that (ahem) **Typesetter ST** reviewed in last month's PAC Newsletter.

**N-Vision** is usable in all three ST resolutions, although I haven't yet used the program on a monochrome monitor (I don't have one), and I've spent only a few minutes in medium-res, since low-res is so much more colorful.

When you begin **N-Vision**, you are presented with a blank screen in the center, with cute little icons strategically placed around the edges of the screen. For full-screen work, the right mouse button toggles the icons out of the way, and back in the way, or you can smooth-scroll the picture window up and down a bit to get at the edges. As in **Music Studio**,

nearly all the operations are performed by moving the mouse so that the pointer is pointing at an icon, and then possibly dragging the icon down (or up, if at the bottom) to reveal a menu of further choices. However, **N-Vision** is so jam-packed with features that you have even more options, reached by pressing the right mouse button while the pointer is up along a status line on the top. Menus, menus, everywhere.

Initially, you are in plain-old "push the button and draw a line" mode, with a black "pen" (two dots horizontal, one dot vertical) on a white background. Since even ol' Neo does this, let's talk about some fancier stuff. Presume us to be in low-res mode for the remainder of this description.

Along the bottom center of the screen is the color palette: clicking on one of the 16 colored boxes picks a new pen color. You can also set a background color (used for some operations) by selecting the "background" icon before clicking on a color.

To the right of the individual colors lie five color patterns. If you click on one of those, your foreground color becomes a pattern, and your pen will change colors as you move. You say you don't like any of those patterns? Click the right button while you are in the pattern area, and fifteen more patterns appear. Don't like any of those? Click on "load", and pull some off the disk. Still not satisfied? Select a pattern, and click "edit", and begin creating your own pattern (which can be saved on the disk). By the way, you can capture any screen area as a pattern as well. Features, features, features.

So, you don't like the colors? Click on that good old right button while in the color selection palette, and up comes the color map editor. Features here include: entering the color via the RGB numbers, or by playing with a little color-mixer board, blending two colors to produce a few or many hues in between (when you want to get shades between blue and green, for example), swapping colors, rotating colors, and so on. From this part, you can also get into the color cycling section, to create slides that contain primitive animation. Again, features galore. You can establish over 100 steps, each step containing an entirely separate color for each of



the sixteen (low-res) screen colors, and having its own display time. These slides will be displayed according to the cycling information when you run the slide show program, allowing a wide variety of displays in your slide shows.

Back to the main screen: to the left of the color palette are the paintbrush control boxes, where you select the size and shape of the brush and how "airbrushy" it is. If you don't like any of the sizes and shapes, you can select one of the patterns to be used as the brush, and get anything you want.

Further left, you find the scrolling control. For machines with enough memory (like a ROM-based 512 or a 1024), you are actually editing an entire 8.5 by 11 inch page, which can be dumped directly to an Epson-compatible printer. Since the screen is only half of that, the scrolling control allows you to move the screen view up and down along the page, either a little at a time, or in major jumps. An icon serves as both the major jumper and the indicator of how far along the page you are.

Proceeding clockwise around the screen, we find the text icon in the upper left corner. With this you can add text to your pictures, or (as I did, since I'm not much of an artist) make pictures consisting entirely of text. Custom fonts can be loaded, although I didn't find any way to edit the fonts with anything that was provided in the package. Surprisingly, the documentation was weak on that point -- strange, considering the quality of the rest of the manual. Text sizes are selected with the paintbrush size control. Text can be relocated, resized, recolored, or refonted on the screen until the text is painted in by pressing "return" (good when you want to put a label on a portion of your art).

To the right of text, we find the fill icon, controlling four different kinds of fill: flood (spread everywhere until you reach a different screen color), horizontal and vertical line (spread that direction only, until you reach a different screen color), and polygon (you draw a bounded polygon on the screen, and the fill spreads just in that area). Fills can be either solid colors or in patterns, and can even reverse the colors in the filled area (selected by the current drawing mode, a sort of one-line menu in the upper right corner of the screen).

Next to fill is copy, complete with its own oodles of options, such as copy from block, capture pattern, and exchange colors in a block

(like swap all occurrences of red and blue in this rectangle, but leave the other colors alone). Copy allows you to bring in images from other pictures: a "clipboard" scratch area exists in addition to the current editing picture, and you can edit one picture, shove part of it onto the clipboard, edit a second picture, and grab things over from the clipboard with copy.

To the right of copy is the eraser. You can create an eraser of any size, from one dot to the entire screen, and then wipe things out with it. The menus also provide erase for the entire screen, and the entire page (the clipboard stays intact).

In the top center of the screen is the status box. Part of the status box contains the cursor "x, y" coordinates (useful for lining up text lines or creating screens for programs). Another part contains the useful "undo" button: any single operation can be undone, including undoing the undo. A third part indicates whether the screen is currently displaying the main picture or the clipboard, handy since they operate nearly the same.

To the right of the status box is the pencil or brush selector. The pencil is always one dot high by one dot wide, while the brush can be any size selected by the stuff in the lower left of the screen). Nearly any drawing command can be coaxed into using either the pencil or the brush, depending on which instrument you have "in your hand" at the moment, as selected with this icon.

Moving further right, we find the line-drawing operations, with straight lines, connected lines (previous line ending is next line beginning), radiating lines (all lines have same starting), and restricted lines (all lines are either fully horizontal or vertical: no diagonals).

Further right, still more icons select square-ish things and round-ish things, including rectangles (with or without rounded corners), ellipses, and circles, either filled or unfilled.

As if all of those features weren't enough, you can get to even more by pressing the right button while pointing to a status line at the top of the screen. From there, you can select options to save and load pages, screens, clipboards, fonts, patterns, and generate hardcopy of things onto your Epson-compatible printer. You can also select various text styles (such as underlined or bold) for the text options, and reach some of the other tools if you forget how to find them the other way.

(continued on the following page)



(**N-VISION**, continued from preceding page)

One tool is the zoomer. With this tool, you can expand an area on the screen to 2X, 4X, or 8X original size, and work down deep and dirty on the pixel-by-pixel level. However, from time-to-time, I still miss the "fat bits" continuous display of **Neo** for those fine tuning applications (see, Vern, I can say something nice about **Neo**).

As you can see, **N-Vision** is jam-packed full of features. And, they are surprisingly easy to use. At just \$39.95 (or less), this program is a steal.

If you have both **Music Studio** and **N-Vision**, you can put together slide shows. Along with the **N-Vision** program on the disk comes the **Alite** slide-show. To make a slide show, you create your music and your pictures (including animation with color cycling, if you wish), and stick them onto a common disk. Then, you edit a file called "SLIDE.SCP" with your favorite text-editor. "SLIDE.SCP" contains a script, much like a director gives to an actor, indicating the order and combinations of pictures and music. You also

need to put a copy of the **Alite** program into the same directory as your script. To begin the presentation, just click on "ALITE.PRG", and your slide show begins. Pretty nifty. I have it on good authority that **Audio Light** has recently released an updated version of "ALITE.PRG" that allows for more sophisticated scripts, but the current version can only present one picture for each song, and vice versa.

In summary, for a picture editing program, I can't imagine many other features that I would want (or could fit in a desktop computer, for that matter). **N-Vision** is my pick for the buy-of-the-month. Special thanks to the kind folks at IB computers for loaning me a review copy of the program, and for providing some hands-on time with **Typesetter ST** (belch) and **Degas**, and providing me with **Audio Light** rumors.

By the way, the first 500 copies of **N-Vision** come with a limited edition picture drawn with **N-Vision** and hand-signed by the artist. IB Computers still has a couple of those on the shelf (I have one here, hee hee), and they're worth getting if you are into that sort of thing.

(**DRAPER PASCAL**, continued from page 9)

others can run them. Draper Software offers a royalty-free license to distribute the supervisor, provided you sign the included form and return it. A main menu program can be rewritten by the programmer to run his/her own programs. 32K RAM is required to run a compiled program.

Some purchasers of **Draper Pascal** have used it successfully in college math courses. As long as the subject matter does not deal with data structures, I suppose **Draper Pascal** would work as well as, or better than, Atari BASIC and would be readable by anyone familiar with Pascal. As for me, I'm going to stick with OSS Pascal on the ST. If I were still using my 800, I would choose **Action** over **Draper Pascal**. There still exists no Pascal for 8-bit Ataris which I can recommend; however, I have not tried **Kyan Pascal**. Could someone using **Kyan Pascal** write a review for us?

**Draper Pascal** retails for \$44.95. A backup disk is included. It is available from

Draper Software  
307 Forest Grove  
Richardson TX 75080  
(214) 699-9743

## MEMBERSHIP NOTES

Jim Miller

I wish to welcome the following new members and families to the PAC.

Dick Janz	John Stranberg
William Jepson	Gary Anderson
Tim Rader	David Tracy
Sean O'Connor	Bill Chan
Michael Woods	Pearl Anderson
Lorena Walker	Thomas Moore
William Parker	Great Cover-ups
Michael Scott	Steven Avent
Robert Santesson	Michael Regan
Herb Wheeler	Laura Sykes
Neldon Wagner	John Seger Sr.
Jon Lind	

I've successfully converted our **Synfile** data over to **dbMAN**, but I'm waiting to see **Regent Base** before I make a final decision. For those of you who have files on **Synfile**, there is a program out from **Action Pak** that makes it very easy to convert to **dbMAN**.



## ST APPLICATIONS: DATABASE MANAGEMENT

### Atari Base BBS

[This article is an excerpt from a file that was download from Atari Base BBS. -Editor]

One of the strongest uses for a computer is to manage your data. Recently there have been several strong software titles for the Atari ST computers in this category. Two of these, **DB Master One** and **dbMAN**, have found their way into many different departments here at Atari. We thought we'd share our experiences.

Sam Tramiel's secretary uses **DB Master One** to manage his business cards. As the president of Atari, Sam meets a multitude of people. Rather than deal with an unweildy pile of cards, he has them typed into this program. When he needs to contact someone, the information is available almost instantly. This particular ST is equipped with a monochrome monitor to take advantage of the very high resolution, displaying 50 lines of information on the screen at a time.

In the service department, Randy Hain also uses **DB Master One**. He keeps track of service centers and applicants. He has created many custom report formats for his own use and for use by others in the company. For example, when the customer relations department asked for a list of all service centers with complete addresses so customers can be referred to them, he quickly changed one of the existing reports to create the customized one that was needed.

Both of these departments started using **DB Master One** with its original release last Winter. Since then, they passed reports of problems and requests for additional features back to the program's designers. Most of their requests were implemented in the latest release which has just become available to you.

For more sophisticated data management tasks, we are making extensive use of **dbMAN**. With the features of **dbASE III**, we have drawn on the experience of people in the company to create very complete applications.

The customer relations department is using the ST for order processing. They process a tremendous number of requests for manuals, spare

parts, and other items. Instead of typing and filing and manual report generation, the entire process of order entry and reporting is automated. The inventory items and their descriptions are in one file, open orders are in another, and sales tax for the state in a third. Orders go through the system faster and more accurately than ever. Because **dbMAN** is a true relational database, more files can be added as the department learns how this program can help them even more. We don't just start with the solution, it grows as we think of more ways it can help us.

Likewise, the finance department uses **dbMAN** to store and track outstanding loaner systems to members of the press and others. Each system can be tracked so we always know what our outstanding inventory is, which machines are overdue, and who within Atari is responsible for each computer sent. This information was impossible to maintain with the older manual system.

As time goes by we are finding more and more ST's cropping up within our own company. Along with the applications mentioned here already, we find them used by secretaries for word processing, by the controller and other finance people as spreadsheets, by the data processing department as terminals, and of course by the programmers as development tools. It may seem obvious that Atari would use its own computers, but there were once many IBM PC's and DisplayWriters and Wang systems here to do the same jobs that are now being done better by our own inexpensive ST systems. Our Chairman makes us all work our hardest and save every penny we can -- the ST is part of the way we do our jobs.

\*\*\*\*\*

#### UNCLASSIFIED ADS

Dave Tracy (654-9826) has 64K add-on memories for the Atari 600XL. He also has add-on power pack adapters for XL and XE machines.

\*\*\*\*\*



## PASCAL

## Lesson One: Special Symbols

R. DeLoy Graham - PAC

Pascal is one of over 170 high-level programming languages. It is one of the twenty such languages in widespread use. When Niklaus Worth introduced Pascal in 1971, his intent was to provide students with a language that would facilitate learning the concepts of structured programming. Today, Pascal is the most widely used programming language for teaching computer science.

This series of lessons will present an overview of the Pascal language as implemented by OSS's **Personal Pascal** and will introduce the reader to the principles of structured programming and to the data structures which can be implemented in Pascal. Furthermore, we will examine the process of accessing GEM routines through **Personal Pascal**.

High-level languages were developed both to achieve machine independence and to hide low-level operations from the programmer. Machine independence means that Pascal is basically the same whether you program on an IBM PC, an Apple IIE, or an Atari ST. There are certainly more similarities than a comparison between various versions of BASIC would reveal. We will still find some differences, however, because most implementations provide extensions to the standard in the form of calls to machine specific operations. **Personal Pascal**, for example, provides an extensive library of routines to access GEM so that we can produce our own menus and dialog boxes, manipulate windows, and make use of the mouse. The actual workings of these routines are "hidden" from us; all we have to do is provide the required information and the library routines carry out our wishes.

In reality, every Pascal statement we write is really a "token" that represents a series of machine language instructions. After we have written our program source code using a text editor, we must then use a language processor to translate that source code into machine language (the object code). Most implementations of Pascal use a translator program called a compiler. On the other hand, BASIC generally uses a translator program called an interpreter; each statement is translated as the program runs. Interpreters make programming very interactive. We can make a change and immediately run the program to try the change. However, interpreted programs run much

more slowly than compiled programs because the translation takes place just before each statement is executed. Conversely, a compiled program has been converted to machine language before it is ever run; therefore, the translation does not slow down the execution of the statements.

Some compilers produce pseudo code (P-Code), an intermediate code which is later processed by an interpreter when the program is run. This type of compiler has the advantage of working with source code which is more transportable because its translation is for a simulated computer rather than the actual computer on which it is written; however, because the P-Code is interpreted during the run of the program, the result is not as fast as a fully compiled program. **Personal Pascal** is a native code compiler -- its final results are completely compiled and ready to run.

Many compiled languages add another step in the production of a program -- linking. A linker creates an executable program by combining the object program and any subprograms that it calls. The object program may call several subprograms which are stored in files (one of which is a runtime library) which are kept on some auxiliary device such as a floppy disk drive. Some calls to subprograms are made by the programmer, but many are made directly by the object program without the knowledge of the programmer.

In summary, a Pascal environment generally includes a text editor, a compiler, and a linker. We will learn how to use each of these components of the **Personal Pascal** development system. But first, let's examine Pascal's syntax (the rules governing the writing of valid statements).

**Pascal Tokens**

Pascal uses several special symbols, some of which will be familiar to a BASIC programmer while others will not. New to some may be the use in Pascal of the following symbols: the period ( . ), the semicolon ( ; ), the equal sign ( = ), the assignment operator ( := ), braces ( { } ), brackets ( [ ] ), parenthesis ( ( ) ), the single quote ( ' ), and the period ( . ).

The **period** is used to indicate to the compiler where the source code terminates. It follows the word END, which is used with BEGIN to indicate the main body of Pascal code.



```

BEGIN
  (* main body *)
  (* of program *)
  (* goes here *)
END.

```

Between BEGIN and END, we can write either a single statement or a compound statement which consists of several statements, each separated by a **semicolon**. Note that the semicolon only separates the statements; it is not a part of the statement as it is in C, where it identifies the line as a C statement or instruction. Semicolons are also used in Pascal to terminate definitions of variables and constants.

```

CONST
  NUM = 10;
VAR
  VALUE : INTEGER;
BEGIN
  VALUE := 100 * NUM;
  WRITE (VALUE);
END.

```

Although the semicolon causes much grief to the beginning Pascal programmer (inadvertently omitting the semicolon usually results in a compile-time error), it does allow us to write our source program in free format -- we are not bound to a certain line size, spacing or structure. Formatting can be used to greatly improve the readability of a program, as we will see in future lessons.

The **equal sign** is used in Pascal to make assignments in constant declarations and to determine equivalency in comparisons. In the following example, we compare A to B and then assign the value of C to A if A is equal to B:

```

CONST
  A = 10;
  B = 10;
VAR
  C : INTEGER;
BEGIN
  IF A = B      (* a test *)
  THEN C := A;  (* an assignment *)
END.

```

Note that the assignment of the value held by variable A to variable C is not performed with the equal sign, but with the colon and equal sign

combination (**assignment operator**), which is read "becomes," or "is assigned the value of," rather than "is equal to."

**Braces** are used to put comments into our code. The open brace marks the beginning of the comment and the close brace marks the end of the comment. Anything in between is ignored by the compiler, except in the case of special compiler directives which we will examine as the need arises. **Personal Pascal** also accepts the use of a combination of parentheses and asterisks to represent comment symbols:

```

(* This is a comment *)
{ So is this }

```

**Brackets** are used to enclose array subscripts and set elements. Other uses for brackets will be introduced later.

```
LIST [3] := 0
```

**Parentheses** are used to enclose parameters or arguments which are passed to functions or procedures (program submodules). Parentheses must be paired properly, or compile-time errors will cause compilation to abort.

```
WRITE (VALUE)
```

**Single quotes** are used to delimit strings of characters. For example, 'This is a string.' could be written to the screen, or assigned to a string variable.

```

VAR
  PHRASE : STRING[25];
BEGIN
  PHRASE := 'When the going gets rough';
  WRITE (PHRASE);
  WRITE (' the tough get going.')
END.

```

Most errors made when using these special symbols are caught by the compiler. We will have to return to our text editor, edit the error, and run the compiler again. **Personal Pascal** makes this easy by offering us the option to return to the editor whenever it finds such an error. It runs the editor, reloads our source program, and even places the cursor at the location of the error.

Next time we will learn about identifiers and data types in Pascal.



**ST DISK DIRECTORY**  
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For those of you who have gone from the 8-bit Atari computers to the 16-bit Atari ST's, there have been many surprises for you in the past months. Among them are "What do I do with all of this extra memory?", and maybe "The graphics on this system sure are something," and one of my favorites, "That disk holds a lot of data."

All of these statements are true for obvious reasons. For the longest time there was only 48K of ram available in the ATARI Systems, so jumping to 512K is a fantastic leap. The same holds true for the graphics capability of the new ATARI, by going to a monitor and improving the resolution, another big leap has been made. But, one of the most important improvements to me has been the disk storage. After using an ATARI 810 disk drive for several years, going to 360K per disk is great.

Now, since I have that off my chest, I would like to go a little deeper and try to explain some of the differences in the way the ST disks (single sided) are handled.

The ST disk is divided into 80 tracks (0 thru 79), 9 sectors per track (1 thru 9), and is written in QUAD density (512 bytes per sector). When a disk is formatted, a Boot sector (track 0, sector 1), the File Allocation Tables (it starts at track 0, sector 2) and the Directory (it starts at track 1, sector 3) are established using all 18 sectors in the first two tracks. The remaining sectors (tracks 2 thru 79, sectors 1 thru 9) are initialized in pairs or by cluster (two sectors = one cluster). As a cluster is initialized the File Allocation Table (F.A.T.) is updated to indicate the status of the cluster; this continues until all 351 data clusters have been completed. If a cluster cannot be formatted or initialized, the corresponding entry in F.A.T. is marked not available and will remain that way until the disk is reformatted or thrown away. If a cluster is marked as bad, the F.A.T. entry will contain a number between \$FF0 and \$FF7. That range of numbers simply means the cluster is unusable and will never be used to store data.

The ST disk uses track 2, sector 1 thru track 79, sector 9 to store any files you write to the disk. All filenames are listed on the disk directory in the order they are entered. The directory is seven sectors long and has room for 112 entries, with each entry being 32 bytes in length. Each entry contains the Filename and Extension, the File Attributes, the Time the last change was made to the file, the Date the last change was made to the file, the number of the first cluster in the file, and the length (in bytes) of the file. In addition, there are ten bytes that have been reserved for future use (see fig. 1).

**fig. 1**  
**ST Directory Fields**

1) Filename	8 bytes	bytes 0 thru 7
2) Filename Ext.	3 bytes	bytes 8 thru 10
3) Attributes	1 byte	byte 11
4) RESERVED	10 bytes	bytes 12 thru 21
5) Time of Last Change	2 bytes	bytes 22 and 23
6) Date of Last Change	2 bytes	bytes 24 and 25
7) First Cluster Number	2 bytes	bytes 26 and 27
8) File Size (in bytes)	4 bytes	bytes 28 thru 31

The Filename and Extension are the first two fields in each entry of the directory. They take up the first 11 bytes of an entry and follow the same format as the Atari 800 or the IBM PC, with one small exception. If the first character of an entry is \$E5, the file has been deleted and is no longer available for your use. If no changes have been made to the disk since the file was deleted, it may be possible to recover it by using one of the many sector editors available.

The Attributes field is one byte long and contains a number that indicates any special or unique characteristics about this entry. There are only five bits of the entry used on the floppies at this time, and they are listed in fig. 2.



**fig. 2**  
**Attributes**

Bit 0 = Read Only (not set if the file is Read-Write)  
 Bit 1 = Hidden  
 Bit 2 = System  
 Bit 3 = Volume Label (Name assigned to the disk)  
 Bit 4 = Sub-Directory (Folder Name)  
 Bit 5 = Archive (This will be used on the Hard Disks)  
 Bits 6 & 7 are not used at this time

The next field is marked RESERVED and is 10 bytes long. This field will be filled with 00's on all disk entries and no plans for its use are known at this time.

The Time of Last Change field is 2 bytes long and is updated each time you write to a file. This field contains the HOURS, MINUTES, and SECONDS(/2) of the last change to the file. This field is in the low-byte, high-byte format and uses all 16 bits. Starting with the highest bit, it uses 5 bits for the Hour, 6 bits for the Minutes and the last 5 bits for the Seconds. (The value in the seconds portion of the field must be multiplied by 2 to get the correct seconds count.)

The Date of Last Change field is handled almost the same as the previous field. This field is changed along with the Time of Last Change, and is also in the low-byte, high-byte format. Starting with the highest bit, use 7 bits for the Year, 4 bits for the Month, and the last 5 bits for the Day. Don't be too surprised when the year equals a 5 (as most files will) because the year stored has 1980 subtracted from it.

The First Cluster field contains the number of the first cluster used for the file. The cluster information is stored in high-byte, low-byte order and should never go above \$15F (351), since there are only 351 clusters.

The File Size field is a value equal to the number of bytes used in the file. This number divided by 1024 (1K) will tell you how many clusters are being used for the file (cluster \* 2 = sectors).

The File Allocation Table (F.A.T.) starts on track 0, sector 2, and may be the most important table on the disk. F.A.T. is used to keep track of the sector linkage for all data sectors. It is also used for files listed in Folders (sub-directories, see Attributes). The F.A.T. is five sectors long and is valuable enough to be have a duplicate table on the same disk. The location of the second F.A.T. is currently track 0, sector 7, but that is subject to change at any time.

The best way to think of the F.A.T. is as a puzzle. Each entry of the F.A.T. is 12 bits long (not bytes, bits), and the values range from \$000 to \$FFF (see fig.3). Byte 0 of F.A.T. tells what density the disk is formatted in (\$F7 is normal for byte \$00), and bytes 1 and 2 will be \$FF as they are not used. The rest of the table is used as follows. (I'll be using the F.A.T. from the disk I have been working on for my examples. see fig. 3) Before I begin I should point out that 12 bits per entry means that 2 entries equal 3 hex characters (bytes). We will start with bytes 03, 04, and 05 for our first two entries (see fig. 3). Byte 03 will be bits 0 thru 7 of the first 12 bit entry, and bits 0 to 3 of byte 04 will be bits 8 thru 11 of the first entry. As you can see in the first example, the number is \$FFF. In F.A.T., if an entry contains \$FF8 thru \$FFF it means the cluster is the last cluster of the file (EOF). Also, if an entry contains \$FF0 thru \$FF7 it means the cluster is not usable for some reason. Now, if you will return to byte 04, you will remember that we have only used 4 bits (0 to 3). Bits 4 thru 7 of byte 04 will become bits 0 thru 3 of the second entry and byte 05 will be used as bits 4 thru 11. This entry indicates that cluster 4 will be the next cluster for this file and it continues in that manner for the rest of the table.

Now you know what cluster to look at but maybe you want to know which track and sector that is. The quickest way I've come up with is one of the following formulas:

$$\begin{aligned} \text{a) To convert from Cluster to Track and Sector:} \\ & (( (\text{cluster \#} + 9) * 2) - 1) / 9 = \text{track} \\ & (( (\text{cluster \#} + 9) * 2) - (\text{track \#} * 9)) = \text{sector} \end{aligned}$$

$$\begin{aligned} \text{b) To convert from Track and Sector to Cluster:} \\ & (( (\text{track \#} * 9) + \text{sector \#}) - 17) / 2 = \text{cluster \#} \end{aligned}$$



### A brief explanation

Data sectors start at Track 2, Sector 1. That means 18 sectors (or 9 clusters) have to be accounted for in the formula. Also there are two sectors per cluster so you must multiply by 2 at some point. Here is an example. In which cluster is Track 22, Sector 3?

I'll put the numbers into the formula.

$$\begin{aligned} ((22 * 9) + 3) - 17 &/ 2 = \text{cluster \#} \\ ((198 + 3) - 17) &/ 2 = \text{cluster \#} \\ (201 - 17) &= \text{cluster \#} \\ 184 &/ 2 = \text{cluster \#} \\ 92 &= \text{cluster \#} \end{aligned}$$

If there had been a remainder, it would have been the second sector in the cluster. That's all there is to it, but just so you can practice a little, I included a chart with some of the Clusters marked with the Track and Sector (see fig. 4).

fig. 3 (in hex)

-- F.A.T. --

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	F7	FF	FF	FF	4F	00	05	60	00	07	80	00	09	A0	00	0B
10	C0	00	0D	E0	00	0D	00	01	11	F0	FF	13	40	01	15	60
20	01	17	F0	FF	19	A0	01	1B	C0	01	1D	E0	01	1F	00	02
30	21	20	02	23	40	02	25	60	02	27	80	02	29	A0	02	2B

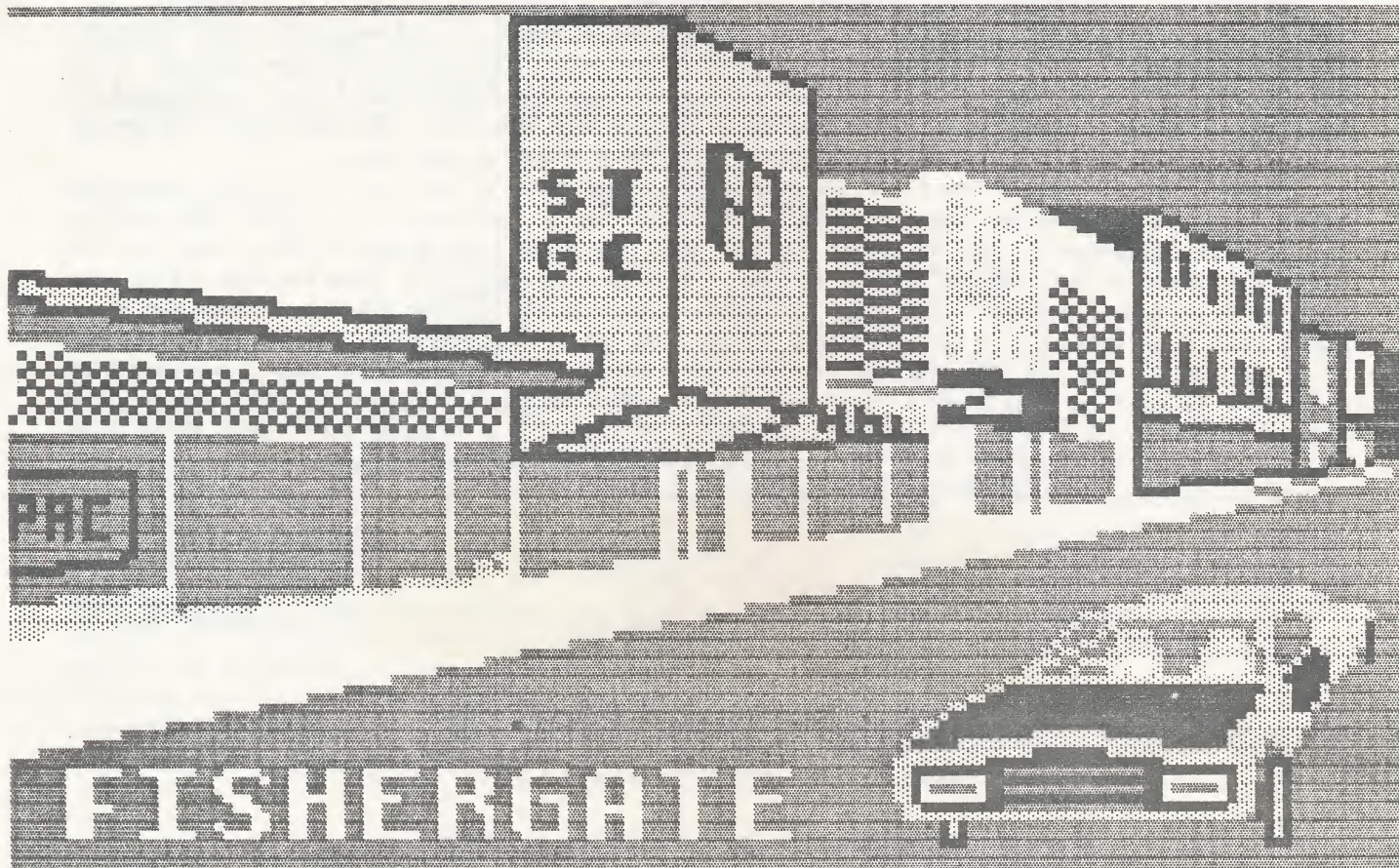




fig. 4  
Track & Sectors = CLUSTERS

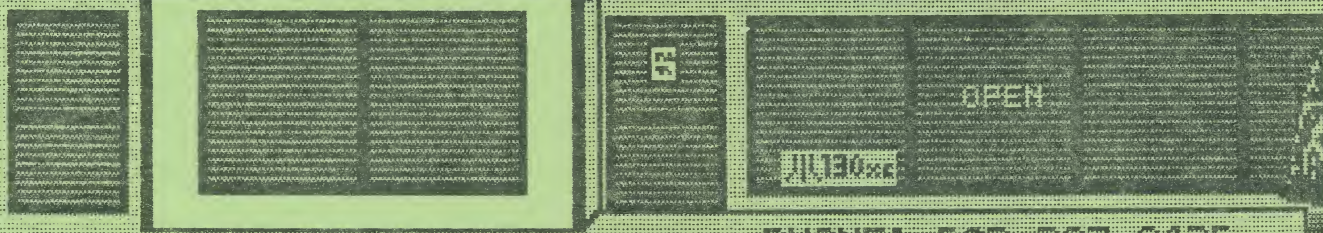
BOOT									
SECT	<			FAT #1			>		FAT
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	
#2	>			Disk Directory			(7 Sectors)		>
1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	
< CLU #2 > < CLU #3 > < CLU #4 > < CLU #5 > < CLU									
2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	
#6 > < CLU #7 > < CLU #8 > < CLU #9 > < CLU #10 >									
3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	
< CLU #334> < CLU #335> < CLU #336> < CLU #337> < CLU									
76.1	76.2	76.3	76.4	76.5	76.6	76.7	76.8	76.9	
#338> < CLU #339> < CLU #340> < CLU #341> < CLU #342>									
77.1	77.2	77.3	77.4	77.5	77.6	77.7	77.8	77.9	
< CLU #343> < CLU #344> < CLU #345> < CLU #346> < CLU									
78.1	78.2	78.3	78.4	78.5	78.6	78.7	78.8	78.9	
#347> < CLU #348> < CLU #349> < CLU #350> < CLU #351>									
79.1	79.2	79.3	79.4	79.5	79.6	79.7	79.8	79.9	

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