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THE #1 MAGAZINE FOR ATARI® COMPUTER OWNERS

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Krazy Katerpillars
Screen Scroller

ST COVERAGE:
ST software reviews
Using picture files in ST BASIC



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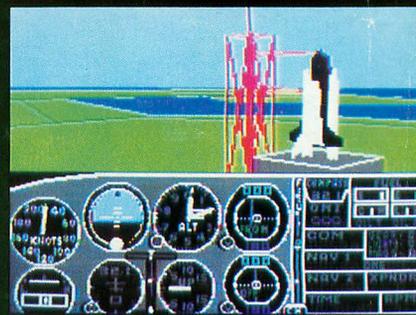
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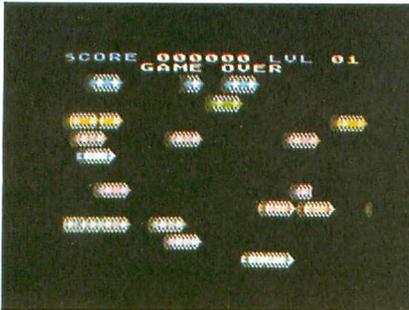
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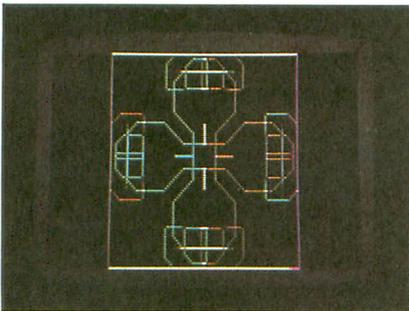
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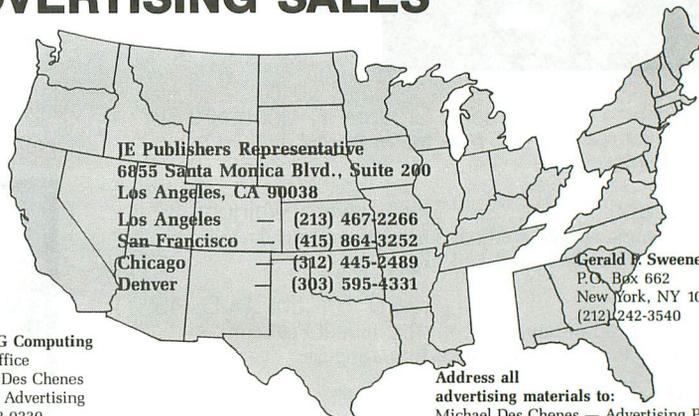
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Due, however, to many requests from Atari club libraries and bulletin board systems, our new policy allows club libraries or individually-run BBSs to make certain programs from **ANALOG Computing** available during the month printed on that issue's cover. For example, software from the July issue can be made available July 1.

This does not apply to programs which specifically state that they are not public domain and, thus, are not for public distribution.

In addition, any programs used must state that they are taken from **ANALOG Computing** magazine. For further information, contact **ANALOG Computing** at (617) 892-3488.

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When submitting articles and programs, both program listings and text should be provided in printed and magnetic form, if possible. Typed or printed text copy is mandatory, and should be in upper- and lowercase, with double spacing. If a submission is to be returned, please send a self-addressed, stamped envelope.



Editorial

Those of you who examine magazine covers *carefully* will have noticed. Those of you who subscribe to **ANALOG Computing** were informed last issue, in a special letter on the insert sheet at the front of the magazine.

We did it.

ST-Log is, as of this January 1987 issue, a separate magazine—the first monthly for 16-bit Atari owners from the people you *know* you can trust.

We thank all of you who responded to our request for opinions on the subject of separation. Your input was a deciding factor. The majority of our readers said that they felt removing **ST-Log** from **ANALOG Computing**'s pages, and leaving a section to keep 8-bit users informed on 16-bit doings, would make for fairer coverage of both computer lines. So, as of this issue, that's what we've done. You'll still find **ST** coverage in these pages, because we believe it's important to keep you up to date on the entire Atari community.

But the bulk of **ANALOG Computing** is devoted to the programs, reviews and tutorials Atari 8-bit owners need. Our current subscribers will be receiving this, and the February and March **ST-Logs**, free of charge with **ANALOG Computing**. After March, they'll be getting **ANALOG Computing** only, unless we've been notified of another preference by January 15, 1987.

If you want to subscribe to either magazine (or both), you'll find the options and prices listed on the new subscription cards at the back of this issue. And, of course,

you'll be able to buy them for \$3.50 each at newsstands which now carry **ANALOG Computing**.

So check out the newest for Atari owners. We think you'll agree that **ANALOG Computing** and **ST-Log** give readers the highest quality material—anywhere—on Atari personal computers.

Now, to start the new year, this is our "graphics" issue. Our favorite musician/programming whiz, Charles F. Johnson, has contributed a utility/tutorial (the man *never* does just one thing at a time) called **Picture Storage Techniques**. It's the first time we've seen explanations of different picture file formats in one article. The Picture Converter file included lets you incorporate the format(s) you want, to achieve a desired total effect.

There's plenty of information inside, too, on programming with vertically and horizontally scrolling text, in **Screen Scroller** and **Scroll-It**. Use them to give your software more: more mystery, more information . . . more of whatever you need.

Trails in Action! brings readers a hypnotic, animated kaleidoscopic effect, for hours of entertainment. And, in **Textually Graphic**, the hard-typing Clayton Walnum shows you how to make text displays more pleasing—not to mention more understandable.

Bits & Pieces this time takes us step-by-step through the construction of a joystick-based mouse. Try it—you'll like it. Rodent has an ease of use you'll never find with a conventional mouse (unless you happen

to have a 10-square-foot computer desk, with nothing on it to restrict movement).

Finally, there's an update to the **ANALOG Computing Index** (last seen in issue 37). It encompasses issues 37 through 49, and will give you a clue as to where that program you were cleaning the closet for has been hiding all this time.

Next month marks **ANALOG Computing**'s sixth year of publishing for the Atari community, so it's fitting that we've just announced the new **ST-Log**. We're pleased that Atari's STs are doing well and Atari itself is thriving. As the #1 Atari magazine and the #1 ST monthly, we'll make sure Atarians have the very latest information, to grow apace.

Whether you're a confirmed, old-school hacker or a first-time computer user, on an 8- or 16-bit machine, the 1987 **ANALOG Computing** and **ST-Log** will bring you no-nonsense reviews, valuable software and years of programming experience. We want you to get the *most* from your Atari.

Diane L. Gaw
Managing Editor
ANALOG Computing

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—*Infoworld*

"We have spent the last three months evaluating the Atari and have come to the conclusion that it can't be beat as a low-cost telecommunications terminal, drafting workstation, or for quick graphics visualization."

—*Microtimes*

"We are most impressed with the clarity of the graphics, with the speed of the disk I/O (input/output), and with the ST's value."

—*Byte Magazine*

"With the impressive ST, Atari has delivered on its promise of power without the price."

—*Family Computing*

"Faster and with better graphics capabilities than an IBM®/AT™, it could be a great vehicle for low-cost networks, desktop publishing and visual database management software."

—*Microtimes*

"All of the displays are clear, sharp, readable, and flicker free. We were particularly impressed by the clarity of the high-resolution monochrome."

—*Byte Magazine*

PRAISE.

"The ST's readily apparent strong point is speed. Compared to the Macintosh™, working with the ST is extraordinary."

—*John Dvorak, San Francisco Examiner*

"Since the pinouts are standard, it is also possible for various software packages to support an even wider range of output devices—even faster printers and high-end plotters."

—*Microtimes*

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"From here on you had better think of Atari as a major player in the computer game."

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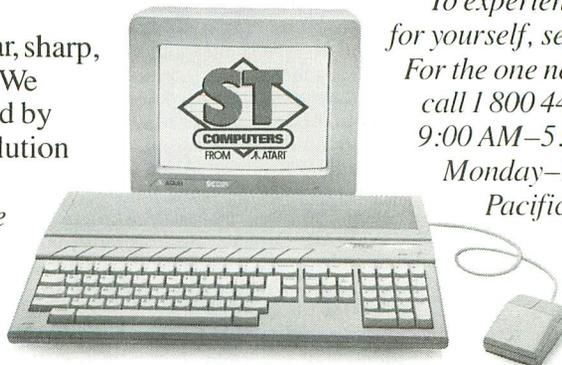
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Reader comment

More magic.

When first using **Magic Spell** (*ANALOG Computing's* issue 46), it can take a while to build up the size of your dictionary. The following BASIC program will create a program called "Fast Loader," which will allow you to build a dictionary much more quickly. Fast Loader is simply a modified copy of **Magic Spell**, which unconditionally adds all the words in a document to the dictionary. Of course, this assumes you have proofread the document in advance and are sure all the words are spelled correctly.

To create the Fast Loader program, copy the **Magic Spell** binary load file as **FASTLOAD**. Place the disk containing **FASTLOAD** in drive 1 and execute the following BASIC program.

Fast Loader executes exactly like **Magic Spell**, except that all words are added unconditionally, with no stops for prompts. remember that it's very important to only feed in documents which contain correctly spelled words, since no spell-checking is done during Fast Loader execution.

I think you'll find Fast Loader a real friend when you're trying to add all those little words like *this*, *that* and *those*. I hope you like it.

Sincerely,
Angelo Giambra
Largo, FL

```
10 OPEN #1,9,0,"D:FASTLOAD"
20 TRAP 60
30 READ A
40 PUT #1,A
50 GOTO 30
60 CLOSE #1
70 END
```

```
80 DATA 232,73,234,73,76,2
29,38,184,77,184,77,96,208
,72,210,72,76,113,36,33,80
,43,80
90 DATA 70,97,115,116,32,7
6,111,97,100,101,114,224,2
,225,2,0,64
```

The following two patches will allow owners of XL and XE computers to run **Magic Spell** (*ANALOG Computing*, issue 46) without using a translator disk. Just insert the disk containing the **SPELLER** and **SPMAINT** program files into your drive and run the two programs below. The new versions will be created automatically. Be sure the filenames found in Line 10 match those on your disk. —Ed.

```
10 OPEN #1,9,0,"D:SPMAINT"
20 TRAP 50
30 READ A:PUT #1,A
40 GOTO 30
50 CLOSE #1
60 END
70 DATA 15,66,16,66,169,2,
224,2,225,2,0,64
```

```
10 OPEN #1,9,0,"D:SPELLER"
20 TRAP 50
30 READ A:PUT #1,A
40 GOTO 30
50 CLOSE #1
60 END
70 DATA 56,70,57,70,169,2,
101,75,102,75,169,2,224,2,
225,2,0,64,
```

Compugenesis.

In the beginning, man created silicon technology and the 6502 microprocessor, and it was good.

But the people said, "Our screens are void and without form."

So man said, "Let there be the GTIA and ANTIC Chips." And the people were glad and saw that it was good.

But the hackers were wroth and cried, "How can we understand thy handiwork?"

So man said, "Let there be player-missile graphics, character set animation, display list interrupts, page flipping and fine scrolling!"

And lo!, great confusion fell upon the land, and a blight of computer magazines rained down like a plague of locusts. And the people cast themselves into pits and trembled.

So man said, "Let there be **ANALOG Computing**."

And behold!, the people arose and rejoiced, and great blessings were bestowed unto them.

And man further said, "Let there be Clayton Walnum to explain thy technical difficulties." And the people saw it and knew that it was good.

A *sniglet*: "premature hackulation" — A highly infectious malady afflicting programmers who attempt to hit the RETURN key after dialing someone's number on a Touch-Tone phone (relaxing when dialing is usually helpful).

Sincerely,
Andy Grey
Southampton, PA

The ADB fix.

Oops. There's a bug in the **ANALOG Computing Database** (issue 47). If you've made a file with 255 records in it, you've probably found this bug. When you are reading records in a file this large, and you pass record 255, you're supposed to be



Reader comment *continued*

placed at record 1. Well, you're placed on record 0, and there is no record 0 in your file. Now, if you were to try to delete record 0, you would cause your trusty olde Atari to go off to la-la land. This is not good.

The following short BASIC program will patch some new instructions into ADB, thus fixing this nasty bug. While writing this patch, I decided to add in a little time-saver, so I'll explain that now.

When you try to read/edit/delete records, you must pick the record you wish to operate on by going through, locating this record, pressing RETURN, and so on. If you're editing records, this gets to be quite time-consuming — since ADB always starts you at record 1. Now (after patching) ADB will start you on the record number shown next to Rec.# on the screen. So, after editing record 57, you're returned to record 57, to choose another record to edit.

Another great way to use this is to hit the SEARCH command, to get a specific record on-screen, and then go the editor — blammo, you can edit the record right now!

```
260 ? CHR$(125):? "The ANA
```

```
LOG DATABASE PATCHER":? :?
270 ? "Insert ADB Program
disk, and press":? "RETURN
"
280 OPEN #1,4,0,"K":GET #
1,A:CLOSE #1
290 OPEN #1,4,0,"D:DB.COM"
300 OPEN #2,8,0,"D:DBP.COM"
"
310 FOR I=0 TO 8116:GET #1
,A:PUT #2,A:NEXT I
320 FOR I=0 TO 71:READ A:P
UT #2,A:NEXT I
330 CLOSE #1:CLOSE #2
340 ? :? "DBP.COM has been
patched."
350 END
400 DATA 255,255,0,5,32,5
410 DATA 165,181,240,7,205
,187
420 DATA 68,240,4,144,2,16
9
430 DATA 1,133,175,76,180,
55
440 DATA 240,247,205,187,6
8,144
450 DATA 5,240,3,76,11,5
460 DATA 76,185,55,176,55,
178
470 DATA 55,76,0,5,244,55
480 DATA 246,55,76,18,5,41
490 DATA 56,42,56,240,201,
16
500 DATA 56,18,56,76,11,5
510 DATA 224,2,225,2,165,6
1
```

This program will only add 72 bytes onto the ADB disk file, but won't affect the amount of RAM used for record storage. When the program is run, it asks you to enter your ADB program disk and press RETURN. Please do so. Also, make sure there's enough room left on the disk for a copy of ADB (about 70 sectors). Then just sit and wait; the process takes a few moments. After the program is finished, you have a file called DBP.COM. This is the new version of ADB, ready to go. Sorry about this mess, folks.

Sincerely,
Bryan P. Schappell
Madison, WI

Pick a C compiler.

I just want to take a moment to pose a question to you: which C programming language for the ST would you suggest for typing in your extraordinary articles? I was going to skip them, but they're just too tempting. Price is not a large factor, but I would like to keep it below \$100.00.

I have used the 8-bit Ataris for many years; they're the superior product in computing, just as this magazine is the superior Atari magazine. I have enjoyed ANALOG Computing since the first issue I found.

I have only one complaint: your covers keep ripping off! The fact that your magazine is growing is pushing the staples to their limit. I can sympathize, though; binders are awfully expensive.

Hope you can help; those programs are very inviting!

A loyal Atarian
Mike Valant
Fizban at 1200 baud

Finding a C compiler for the ST priced under \$100.00 is close to impossible. Your only option is to dig up a copy of Haba Hippo-C, which goes for about \$80.00. It may be hard to find, though, since Haba is no longer marketing it. It wouldn't serve your purposes, anyway, since none of the C listings in ST-Log were developed with Hippo-C.

Both Megamax C and Mark Williams C are fine compilers, and may be obtained for just under \$200.00 each. As for which C is appropriate for our published listings, that depends on the article. Each author has his own compiler preference, though most are still using Alcyon C, which comes with the Atari Developer's Kit. You should check the article or listing to see what compiler you'll need. Once you purchase a compiler and become familiar with it, you should be able to modify the magazine listings to fit your own compiler's conventions.

—Ed.

What's in a name? Plenty!

Our apologies to author Mathew Spolin, whose Alert boxes in ST BASIC appeared in issue 48's ST-Log. We spelled his name incorrectly (Matheu) in the by-line for the article. It won't happen again, Mathew!

—Ed.

The price is now right.

Thanks for including Micromod 3.0 in your issue 47 8-bit news!

The price was incorrectly printed as \$179.95. It's actually \$79.95. This will increase to \$149.95 as of January 1, 1987. There will be a more extensive manual and several new features added, most notably a complete payroll program.

There has been a lot of confusion concerning the Micromod price. ANTIC reported it as \$19.95 at one point, overlooking information about an increase and using the price in the original submission, six months earlier.

Again, the price is \$79.95 through this Christmas, and will be \$149.95 as of January 1, 1987.

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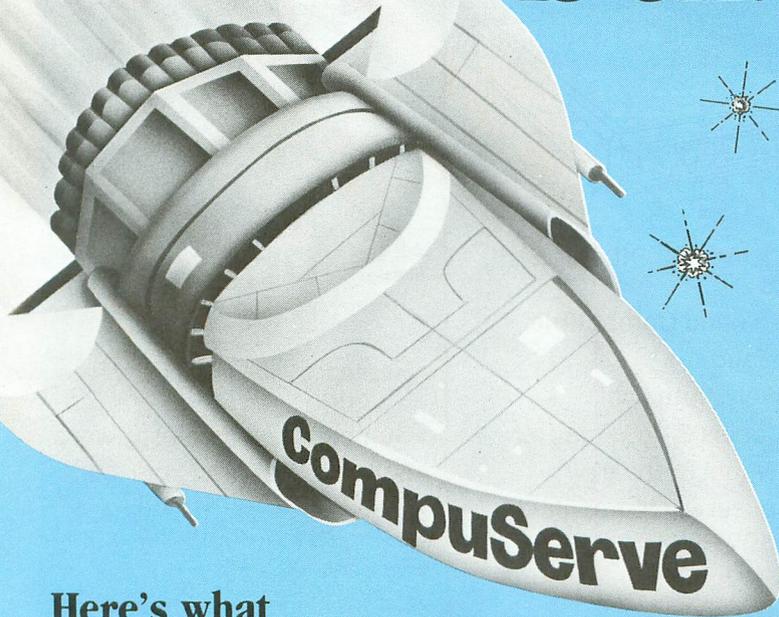
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| Tymnet surcharge | none | \$2.00 hr |

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SYSTEM REQUIREMENTS: 48K Atari, disk drive, modem.

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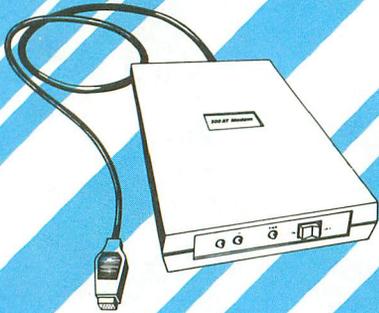
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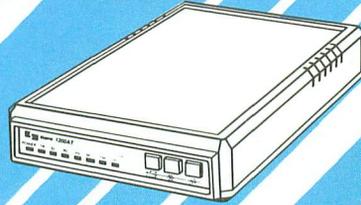
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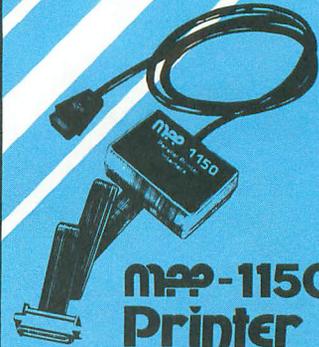
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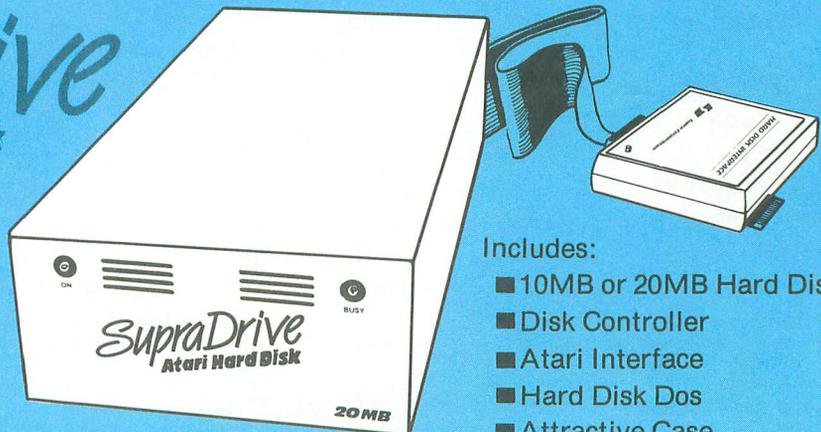


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CIRCLE #105 ON READER SERVICE CARD



Reader comment *continued*

zine. After reading the **Status report** on both the 8-bit and the ST-line, I need to express my opinion.

I have been using an Atari for about four years. The important word here is *using*, for I am not a programmer, but a "user." I also use a Commodore SX-64 and a Tandy 1000. My wife teaches on an IBM at a local high school. The company that I work for repairs Atari and Commodore computers and peripherals.

I read with great interest about the new products and software coming for both the 8-bit and ST-line, and was very excited about the proposed TT. Which brings me to my point. What about service? Nowhere in this article was there a mention of service. Is it a bad word? Is it obsolete? Not to our customers. Service is very important to them, and to us. That is why we are so disappointed when we must wait months for parts which should be readily available, while our customers sit and stare at a blank monitor screen, or watch their beards grow while they load from cassette because their disk drive is still waiting for parts.

We had the same problem with Commo-

dore when Jack Tramiel was in charge. His main interest seemed to be with sales, not support. Now the tables have been turned. Commodore gives us excellent support and technical help, while the great support we had from the old Atari has vanished.

We understand that the new Atari is still trying to reduce enormous debts in order to survive in this depressed market. However, if the new Atari ever hopes to make inroads into the business field, they had better be ready to offer the corporations some service after the sale. No corporate executive is going to be interested in purchasing a "VAX-in-a-box" that's merely a "JACK-in-a-box."

All puns aside, the new Atari needs to take the matter of service more seriously. It's one thing to have your \$79.00 800XL tied up for weeks or months waiting on a part, and something entirely different to have a whole business office of networked STs sitting idle while the host TT is in the shop.

I hope you don't think from this that I am anti-Atari, because I am not. I love my Atari, and I want to see it continue to serve me long into the future. And when I finally

purchase my ST, my 800XL will not be cast aside, but will sit with deserved honor next to the ST.

I hope all of you at **ANALOG Computing** will continue to enjoy success and support both the 8-bit and ST lines. I've always felt your magazine gave the least amount of lip service to Atari and reported more of the truth. Thanks for everything.

Sincerely yours,
Robert L. Newman
San Antonio, TX

Send your letters to:

Reader comment

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CARINA - THE BETTER BBS

Presenting the most powerful bulletin board ever written for the Atari 8-bit computer. The Carina BBS is absolutely the most expandable bulletin board for your Atari. It has features that you will find on most bulletin boards plus many other features that make telecommunications easier, more fun, and a lot less monotonous.

WHY IS THIS BBS SO MUCH BETTER?

The power of this system is mostly attributed to the Modem Operating Environment. It makes possible the ability to run BASIC programs WITH LITTLE OR NO MODIFICATION on your bulletin board. It also allows you as the Systems Operator (SysOp) of the Carina BBS to drop into BASIC ON-LINE at any time and make modifications to your program from across the country if need be. No other Atari bulletin board has this feature.

YOU MEAN I CAN CHANGE THE PROGRAMS?

Yes, the Modem Operating Environment eliminates the need to perform modem operations. The bulletin board is written in understandable BASIC and is, in fact, designed with modification in mind. The Carina BBS is also module based. This means you are no longer restricted by the memory of your computer, but rather by the amount of on-line storage on your disk drives and your ramdisk. The Carina BBS itself is not 1 but 7 separate programs. It is a massive system that can be expanded beyond your imagination.

WHAT PROGRAMS COME WITH IT?

The modules included are: The waitcall module which performs user logon/logoff functions, the bulletin board itself which controls all message bases and databases, the file-transfer module with X-Modem upload/download transfer protocol, the message editor (with extensive word processor-like functions), the SysOp commands with the most powerful functions available for any bulletin board on-line, the sub-commands module which contains miscellaneous extra functions, and an on-line trivia game. The Carina BBS has a total of 44 commands including 17 SysOp functions. It is easy to add any other modules of your own, plus there is plenty of room to add any other functions in different modules.

WHAT ELSE CAN IT DO?

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- Run BASIC programs with little or no modification, program in BASIC, or even go to a ram-resident DOS (Like SpartaDOS) on-line!
- Electronic mail system
- Uses macros or full-word commands
- Allows editing of messages already posted
- Virtually an unlimited number of message bases, and databases
- Can work with subdirectories
- Read new mail function
- On-Line games (you can convert your own games to work easily too)
- A day calculating clock plus a 5 line status window at the top of the screen holding 16 items of user information
- Message editor with many editing commands and word-wrap
- Self-Compacting message bases eliminating the need for constant maintenance.
- Automatic validation and access control configuration.

For an in-depth on-line demonstration, call 305-793-2975

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Now, get the Carina BBS at the reduced price of only \$55.00 (this includes shipping and tax where applicable).

Supra (MPP) 300 baud modem owners include an extra \$10.00 for the Bitwise System's MPP-Hayes emulator. And now, XM301/1030 (with ring detector) owners, also add \$10.00 for the Bitwise System's XM301-Hayes emulator. Please specify Modem type when ordering.

Carina Software Systems
322 Natchez Court
Jupiter, FL 33477

CIRCLE #106 ON READER SERVICE CARD



M/L Editor

For use in machine language entry

by Clayton Walnum

M/L Editor provides an easy method to enter our machine language listings. It won't allow you to skip lines or enter bad data. For convenience, you may enter listings in multiple sittings. When you're through typing a listing with M/L Editor, you'll have a complete, runnable object file on your disk.

There is one hitch: it's for disk users only. My apologies to those with cassette systems.

Listing 1 is M/L Editor's BASIC listing. Type it in and, when it's free of typos, save a copy to disk, then run it.

On a first run, you'll be asked if you're starting a new listing or continuing from a previously saved point. Press S to start, or C to continue.

You'll then be asked for a filename. If you're starting a new listing, type in the filename you want to save the program under, then press RETURN. If there's already a file by that name on the disk, you'll be asked if you wish to delete it. Press Y to delete the file, or N to enter a new filename.

If you're continuing a file, type in the name you gave the file when you started it. If the program can't find the file, you'll get an error message and be prompted for another filename. Otherwise, M/L Editor will calculate where you left off, then go on to the data entry screen.

Each machine language program in ANALOG Computing is represented by a list of BASIC data statements. Every line contains 16 bytes, plus a checksum. Only the numbers following the word DATA need be considered.

M/L Editor will display, at the top of the screen, the number of the line you're currently working on. As you go through the line, you'll be prompted for each entry. Simply type the number and press RETURN. If you press RETURN without a number, the default is the last value entered.

This feature provides a quick way to type in lines with repetitions of the same number. As an added convenience, the editor will not respond to the letter keys (except Q, for "quit"). You must either enter a number or press RETURN.

When you finish a line, M/L Editor will compare the entries' checksum with the magazine's checksum. If they match, the screen will clear, and you may go on to the next line.

If the checksums don't match, you'll hear a buzzing sound. The screen will turn red, and the cursor will be placed back at the first byte of data. Compare the magazine listing byte by byte with your entries. If a number's correct, press RETURN.

If you find an error, make the correction. When all data's valid, the screen will return to grey, and you'll be allowed begin the next line.

Make sure you leave your disk in the drive while typing. The data is saved continuously.

You may stop at any time (except when you have a red screen) by entering the letter Q for byte #1. The file will be closed, and the program will return you to BASIC. When you've completed a file, exit M/L Editor in the same way.

When you've finished typing a program, the file you've created will be ready to run. In most cases, it should be loaded from DOS via the L option. Some programs may have special loading instructions; be sure to check the program's article.

If you want the program to run automatically when you boot the disk, simply name the file AUTORUN.SYS (make sure you have DOS on the disk).

That's M/L Editor. Use it in good health. ☐

The two-letter checksum code preceding the line numbers here is *not* a part of the BASIC program. For further information, see the *BASIC Editor II*, in issue 47.

Listing 1.
BASIC listing.

```

AZ 10 DIM BF(16),M$(4),A$(11),B$(1),F$(15)
      ,F1$(15)
LF 11 DIM MODS(4)
BN 20 LINE=1000:RETRN=155:BACKSP=126:CHK$
UM=0:EDIT=0
GO 30 GOSUB 450:POSITION 10,6:? "Start or
Continue? ";GOSUB 500?: CHR$(A)

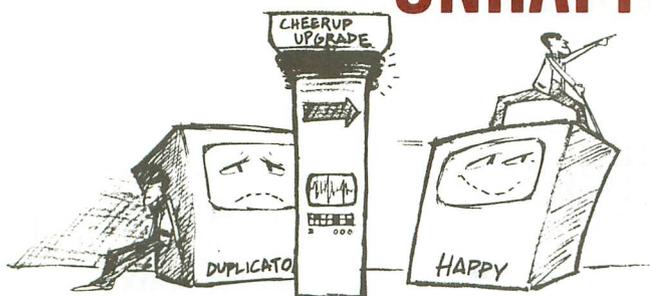
```

```

ZG 40 POSITION 10,8:? "FILENAME":INPUT F
$;POKE 752,1:? " "
FE 50 IF LEN(F$)<3 THEN POSITION 20,10:?
" "
NF 60 IF F$(1,2)<>"D:" THEN F1$="D":F1$<
32:F$=GOTO 80
KL 70 F1$=F$
TN 80 IF CHR$(A)="S" THEN 120
FD 90 TRAP 430:OPEN #2,4,0,F1$:TRAP 110
HQ 100 FOR X=1 TO 16:GET #2,A:NEXT X:LINE
=LINE+10:GOTO 100
HM 110 CLOSE #2:OPEN #2,9,0,F1$:GOTO 170
VT 120 TRAP 160:OPEN #2,4,0,F1$:GOSUB 440
H$=SYTOM 10,10:? "FILE ALREADY EXISTS
!":POKE 752,0
ZU 130 POSITION 10,12:? "ERASE IT? ";:GOS
UB 500:POKE 752,1:? CHR$(A)
VH 140 IF CHR$(A)="N" OR CHR$(A)="n" THEN
CLOSE #2:GOTO 30
QG 150 IF CHR$(A)<>"Y" AND CHR$(A)<>"y" T
HEN 130
BH 160 CLOSE #2:OPEN #2,8,0,F1$
IE 170 GOSUB 450:POSITION 10,1:? "NO:ON
LINE":LINE:CHKSUM=0
GH 180 L1=3:FOR X=1 TO 16:POSITION 13*(X<
10)+12*(X>9),X+2:POKE 752,0:? "BYTE #":
X;":":GOSUB 310
KH 190 IF EDIT AND L=0 THEN BYTE=BF(X):GO
TO 210
FY 200 BYTE=VAL(M$)
OZ 201 MODS=M$
BU 210 POSITION 22,X+2:? BYTE:" "
YZ 220 BF(X)=BYTE:CHKSUM=CHKSUM+BYTE*X:IF
CHKSUM)9999 THEN CHKSUM=CHKSUM-10000
MS 230 NEXT X:CHKSUM=CHKSUM+LINE:IF CHK$
M$9999 THEN CHKSUM=CHKSUM-10000
IG 240 POSITION 12,X+2:POKE 752,0:? "CHEC
KSUM":L1=4:GOSUB 310
EM 250 IF EDIT AND L=0 THEN 270
QH 260 C=VAL(M$)
SY 270 POSITION 22,X+2:? C:" "
IL 280 IF C=CHKSUM THEN 300
DI 290 GOSUB 440:EDIT=1:CHKSUM=0:GOTO 180
LM 300 FOR X=1 TO 16:PUT #2,BF(X):NEXT X:
LINE=LINE+10:EDIT=0:GOTO 170
FU 310 L=0
LG 320 GOSUB 500:IF A=ASC("0") AND X=1 AN
D NOT EDIT THEN 420
PO 330 IF A<>RETRN AND A<>BACKSP AND (A<
8 OR A>57) THEN 320
DX 331 IF A=RETRN AND M$="" THEN M$=MOD$
TD 335 IF A=RETRN AND L=0 AND X>1 THEN 35
0
JR 340 IF ((A=RETRN AND NOT EDIT) OR A=B
ACKSP) AND L=0 THEN 320
DH 350 IF A=RETRN THEN POKE 752,1:? " ":R
ETURN
GG 360 IF A<>BACKSP THEN 400
SA 370 IF L>1 THEN M$=M$(1,L-1):GOTO 390
AS 380 M$=""
RE 390 ? CHR$(BACKSP):L=L-1:GOTO 320
BB 400 L=L+1:IF L>1 THEN A=RETRN:GOTO 35
0
HX 410 M$(L)=CHR$(A):? CHR$(A):GOTO 320
KN 420 GRAPHICS 0:END
YT 430 GOSUB 440:POSITION 10,10:? "NO SUC
H FILE!":FOR X=1 TO 1000:NEXT X:CLOSE
#2:GOTO 30
FD 440 POKE 710,48:5000,0,100,12,8:FOR X
=1 TO 50:NEXT X:5000,0,0,0,0:RETURN
MY 450 GRAPHICS 23:POKE 16,112:POKE 53774
,112:POKE 559,0:POKE 710,4
HR 460 DL=PEEK(560)+256*PEEK(561)+4:POKE
DL-1,70:POKE DL+2,6
HW 470 FOR X=3 TO 39 STEP 2:POKE DL+X,2:N
EXT X:FOR X=4 TO 40 STEP 2:POKE DL+X,0
:NEXT X
ZH 480 POKE DL+41,65:POKE DL+42,PEEK(560)
:POKE DL+43,PEEK(561):POKE 87,0
AC 490 POSITION 2,0:? "analog ml editor":
POKE 559,34:RETURN
MZ 500 OPEN #1,4,0,"K":GET #1,A:CLOSE #1
:RETURN

```

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Hot Poker

A machine language subroutine to move your data fast.

by S.M. Baugh

Everyone knows that machine language (we'll use *ML* for brevity) routines dramatically speed up a BASIC program. What you may not realize is that the same routines can also slow it down! How many times have you seen *PLEASE WAIT. . . INITIALIZING* after booting a BASIC program? Usually the delay occurs so that BASIC can read the ML routines from data statements and POKE them into memory.

This delay can be prolonged, and programmers have tried several ways to shorten it. Sometimes the ML is put into a string as ATASCII characters. This method initializes much faster, but is next to impossible to type out, or send to the printer. The **Hot Poker** utility is a fast and convenient solution.

The program below creates an ML subroutine which can be appended to any BASIC program. When called by a *USR* statement, this routine will transfer decimal numbers 0 - 255 from data statements into memory or a BASIC string. It will move ML or character set data, or characters in ATASCII form. And it's hot!

For example, I recently wrote a program with three ML routines: two were POKEd into strings and one into memory—335 data items in all. When test running each version, there was that screen again: *PLEASE WAIT. . . INITIALIZING*. I timed the delay with the Atari internal timers at locations 19 (\$13) and 20 (\$14). The initializing took 1299 jiffies (a jiffy is 1/60 second), or 21.65 seconds, just to let BASIC READ and POKE.

With **Hot Poker**, the same program initializes in 12 jiffies, or 0.20 seconds! That's more than 100 times faster, and includes string dimensioning and GOSUB time. That's a rate of 1675 numbers per second (versus BASIC's 15.47

numbers per second). You may have seen the last of those *PLEASE WAIT* screens!

Start by typing in the BASIC Listing 1, PKLOADR.UTL, and save it. Make sure that you type the data lines correctly. When you run PKLOADR.UTL, it will create the subroutine program POKER.SUB on disk, which can be retrieved with the ENTER command.

The ML routine in POKER.SUB takes up Lines 2-9 and is DIMensioned as PKR\$. Now, load a BASIC program to be speeded up and ENTER POKER.SUB. The REM statements in Lines 8-9 remind you to add a *USR* call to your program, specifying the line number of the first data statement to be moved, the number of data statements and the destination address. For example:

```
10 U=USR(ADR(PKR$),1000,2,1536)
1000 DATA 216,104,104,133,209
1010 DATA 104,133,208,104,104
```

will move the ten numbers in Lines 1000-1010 to locations 1536-1545. No more READ, FOR/NEXT and POKE delays!

Hot Poker will not be affected by the RESTORE command or other data lines in your program, but it will go into a genuine tiff if your *USR* statement is incorrect. (try telling it to move a nonexistent data line!)

POKER.SUB will also put data numbers into a string, but you must always fill the string with dummy characters first. For example:

```
30 DIM ML$(15):ML$="*":ML$(15)="*":ML$(2)=ML$
40 U=USR(ADR(PKR$),2000,3,ADR(ML$))
2000 DATA 104,104,133,204,104
2010 DATA 133,203,169,0,197
2020 DATA 205,240,20,162,0
```

will fill ML\$ first with dummy characters (*), and then the fifteen numbers in Lines 2000-2020. If you forget to load ML\$ first with filler, as we did in Line 30, ML\$ would

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Hot Poker *continued*

be empty afterwards. BASIC won't let you fill an empty string—but you can change a full string.

With imagination, you can use **Hot Poker** to fill strings with messages from ATASCII numbers in data lines, move character sets in mid-program, etc. The main restriction is that the numbers in the data statements must not be larger than 255.

On the technical side, Atari BASIC stores numbers in data statements as ATASCII characters. (This allows storage of numbers larger than 255, as well as characters.) For instance, DATA 22,1,213 would be represented in hexadecimal as: 1 (=BASIC token for DATA) 32 32 2C (=comma) 31 2C 32 31 33. You can see that the number 213 takes up 3 bytes and must be converted into a binary number before moving it. For those interested in the source code of **Hot Poker**, the listing is given on the magazine disk version, or on Delphi's Atari Users' Group.

The conversion is fairly simple. We use the BASIC pointer STMTAB, which points to the first BASIC tokenized line. After we find the first data line to be moved (FINDR and NEXTL[line]), we set the Y-register on the second ATASCII character to see if it's a comma or the end of line (EOL) marker, \$9B. If it is, then we have a one-digit number (ONEDG). If not, we check the next character to see if we have a two-digit number (TWOEDG).

From there, conversion is easy. If it's a three-digit number (e.g., 213=\$32 31 33), we take the first digit, \$32, which represents hundreds; subtract \$30, which tells us how many hundreds, 2, and use the X-register as an index. Then we load the destination address (which we've filled with a 0 in Lines 140-160 and 920-930) and add two 100s. We do the same with the next character, \$31, and add one 10; and the last character, \$33, and add 3, for a sum of 213 decimal. The rest of the routine fills the next destination address with a 0, checks for the end of a line, or to see if we're done.

This routine could be modified to handle numbers larger than 255 or even alphabetic data, but it would have to be larger than I wanted. This is my third program, so if you have improvements, I'd like to learn from them. 

S.M. Baugh has an M.Div. degree and formerly taught ancient Greek. Now he keeps busy writing computer programs. His first computer, an Atari 130XE, was a graduation gift. His computing interests include utilities and data processing, and he just taught his computer and printer Greek!

Listing 1.
BASIC listing.

```

WM 10 REM *** HOT POKER LOADER ***
RE 20 REM *** by S.M. Baugh ***
UK 30 DIM PK1$(72),PK2$(72),PK3$(72),A$(1
)
YI 40 ? "Creating file: D:POKER.SUB":PO
KE 710,180
WM 50 TRAP 220:CLOSE #1:OPEN #1,8,0,"D:PO
KER.SUB"
TS 100 FOR L=1 TO 72:READ D:PK1$(L,L)=CHR
$(D):NEXT L
UM 110 FOR L=1 TO 72:READ D:PK2$(L,L)=CHR
$(D):NEXT L

```

```

WA 120 FOR L=1 TO 72:READ D:PK3$(L,L)=CHR
$(D):NEXT L
OO 130 ? #1;"2 DIM PKR$(216):REM * Hot Po
ker Sub *"
PF 140 ? #1;"3 PKR$(1,72)=";CHR$(34);PK1$
;CHR$(34)
JP 150 ? #1;"4 PKR$(73,144)=";CHR$(34);PK
2$;CHR$(34)
HV 160 ? #1;"5 PKR$(145,216)=";CHR$(34);P
K3$;CHR$(34)
UM 170 ? #1;"6 FOR L=1 TO 3:READ P:READ D
:PKR$(P,P)=CHR$(D):NEXT L"
JQ 180 ? #1;"7 DATA 80,155,91,155,181,155
"
NT 190 ? #1;"8 REM MAKE LNBR=1ST DATA LIN
E TO MOVE, NBR=NBR OF DATA STATEMENTS
, DEST=DESTINATION"
WB 200 ? #1;"9 REM INCLUDE: U=USR(ADR(PKR
$),LNBR,NBRL,DEST)"
NY 210 CLOSE #1:?"All done.":POKE 710,14
8:END
AU 220 POKE 710,148:?" ? "I'm sorry, I've
discovered error #";PEEK(195):?" ? "P
ress RETURN to continue":INPUT A$
XQ 230 POKE 195,0:GOTO 40
HE 1000 DATA 216,104,104,133,209,104,133,
208,104,104,141,253,3,104,133,206,104,
133,205,165
OH 1010 DATA 136,133,203,165,137,133,204,
169,0,168,145,205,160,2,177,203,133,20
7,160,1
HT 1020 DATA 177,203,197,209,208,9,136,17
7,203,197,208,208,2,240,14,24,165,203,
101,207
HM 1030 DATA 133,203,144,224,230,204,24,1
44,219,160,5,200,177,203,201,44,240,69
,201,0
KT 1040 DATA 240,65,200,177,203,201,44,24
0,32,201,0,240,28,132,208,230,208,136,
136,56
RI 1050 DATA 177,203,233,48,240,13,170,16
0,0,24,177,205,105,100,145,205,202,208
,246,164
CZ 1060 DATA 208,132,208,136,136,56,177,2
03,233,48,240,13,170,160,0,24,177,205,
105,10
HL 1070 DATA 145,205,202,208,246,164,208,
132,208,136,56,177,203,233,48,240,7,16
0,0,24
OL 1080 DATA 113,205,145,205,230,205,208,
2,230,206,169,0,168,145,205,164,208,17
7,203,201
HM 1090 DATA 0,240,13,200,24,144,140,160,
2,177,203,133,207,24,144,129,206,253,3
,240
KF 1100 DATA 14,24,165,203,101,207,133,20
3,144,233,230,204,24,144,228,96
ZE 1110 REM * 216 BYTES

```

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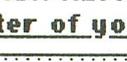
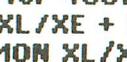
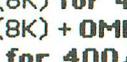
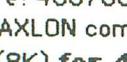
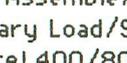
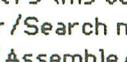
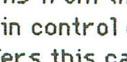
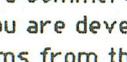
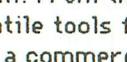
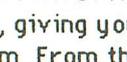
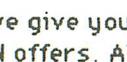
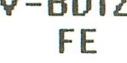
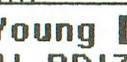
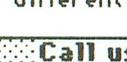
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Screen Scroller

Now you can put fine-scrolling text on just about any screen.

by Jeff Brenner

The "fine scrolling" capability of Atari computers has been effectively employed in everything from space adventures to word processors. This article presents another application of fine scrolling: scrolling programmed messages on the screen.

Originally designed for a cable TV program to "roll the credits," the **Screen Scroller** will prove equally practical for adding scrolling text to your home movies and video tapes, displaying sales messages, or even as an introduction for your own BASIC programs.

Fine and coarse scrolling.

Before we can learn about fine scrolling, we first need to understand coarse scrolling. You frequently encounter coarse scrolling when you list a BASIC program on-screen. When all the lines of the screen are filled with the program listing, the computer must scroll the screen. Each line of text is moved one line upward, to make room at the bottom for more of the listing. The lines don't move up the screen smoothly when the scroll occurs, but rather jump from one screen line to the next. Because of this jumpy movement, it was named "coarse scrolling."

Fine scrolling allows you to move characters a pixel or two at a time. Where a line of text undergoing a coarse scroll will move the whole height of a character, the fine scrolling line may only move up a quarter or an eighth of the character's height. The result is a much smoother transition from one line to the next and, consequently, a more visually appealing display.

Preparing the screen.

Before fine scrolling can occur, the screen must be set up for it. This is accomplished by setting bit 5 of each display instruction byte of the Atari's display list. This bit is

known as the "vertical scroll enable bit." Since bit 5 has a decimal value of 32, 32 is added to each instruction byte of the display list. This is performed at Lines 9300 and 9310 of Listing 1.

Once these bits are set, the vertical scroll register becomes active. This register is commonly called VSCROL and is located at 54277 (\$D405). Storing a value between 0 and 15 in this register will cause the screen to scroll upward by that number of scan lines. For example: if the vertical scroll enable bits are set, and a value of 1 is stored in VSCROL, the display will move one scan line upward. VSCROL only uses its first 4 bits and thus will not fine scroll more than fifteen scan lines.

A distinction should be made here between a line of text and a scan line. A line of text is the same height as the characters it contains. A graphics 0 screen contains 24 of these lines. Each of these lines is composed of 8 scan lines. The scan line is the unit of vertical resolution on the Atari. It is the same height as a graphics 8 pixel. The display screen normally consists of 192 scan lines.

Graphics 2 text.

The **Screen Scroller** uses graphics 2 text, because this is the biggest size available on the Atari. Graphics 2 characters are sixteen lines in height. Thus, to scroll upward the height of one character, the screen must be scrolled sixteen scan lines, one at a time. Scrolling from one through fifteen scan lines works fine, but recall that the screen will not scroll beyond fifteen. How, then can we scroll graphics 2 text if we have a fifteen-scan-line limit? The secret lies in coarse scrolling. When we reach fifteen scan lines, we set VSCROL back to 0, then perform a coarse scroll. Resetting VSCROL brings the text back down to where it started. However, the coarse scroll brings it up to the sixteenth scan line position. After the coarse scroll, any new text to be rolled up the screen is printed on the bottom

Screen Scroller *continued*

of the screen. Then the whole process is repeated, resulting in a continuously moving screen of text.

Vertical blank.

Lines 9020 through 9140 contain the machine language program that performs the fine and coarse scrolling. To achieve a smooth-scrolling, flicker-free display, the scrolling registers must not be changed while the screen is being drawn. Thus, this program is incorporated into the Atari's vertical blank interrupt routine (VBI).

Using the program.

Screen Scroller can be used as is to display scrolling lines of text, or it can be a subroutine for your own BASIC programs. If you wish to use it as a subroutine, change Line 9440 to:

```
9440 RETURN
```

Then your BASIC program can GOSUB 9000 to perform the scrolling.

The text to be scrolled is stored in data statements starting at Line 9500. Each line on the screen should have its own data line. To put blank lines on the screen, do not place anything after the data statement. For example:

```
9500 DATA FIRST
9510 DATA
9520 DATA THIRD
```

This will separate the words *FIRST* and *THIRD* by a blank line as they scroll up the screen. Up to twenty characters can be printed on one line.

To end the scrolling display, you might add several blank data lines, so the remaining text will scroll up the screen. The last data statement should contain the word *END*. When the program encounters this word, it will stop. If the program is being used as a subroutine, *END* will return control to your BASIC program.

If you want the scrolling display to restart once all the lines have been printed, use *REPEAT* instead of *END*. This will cause the scrolling text to cycle continuously. Pressing the *SPACE BAR* at any time will end the scrolling program.

To save the data that you add to the program, simply save the entire program. Then you can load it back in, to display the message without having to retype the data.

Scrolling speed.

The speed of scrolling text can be changed by specifying a greater or lesser value for the variable *DELAY* on Line 9250. The greater the value, the more slowly the text will move. This variable is normally set at 3. Thus, if you wanted to increase the speed, you could change Line 9250 to:

```
9250 CENTER=1:DELAY=2
```

A value of 0 yields the fastest speed. The maximum delay, or the slowest speed, is 255. You can experiment with different values to get the speed you want.

Automatic centering.

Another feature of the **Screen Scroller** program is its automatic centering capability. This will center each line of text on-screen, to create a neatly organized display.

To disable the centering feature, and thus display the data at the screen's left margin, set the variable *CENTER*

to 0 on Line 9250 as follows:

```
9250 CENTER=0:DELAY=3
```

To re-enable, set *CENTER* to 1.

Colors.

Since the graphics 2 screen offers four colors and one background color, each printed character may contain any one of four colors. Each of these four colors is controlled by the *SETCOLOR* statements.

Uppercase text takes its color from *SETCOLOR 0,HUE,LUM*. Lowercase text takes its color from *SETCOLOR 1,HUE,LUM*. And inverse lowercase text takes its color from *SETCOLOR 3,HUE,LUM*. All these text styles will appear on the graphics 2 screen as the normal uppercase characters; only the color will be different. The background color is controlled with *SETCOLOR 4,HUE,LUM*. Line 9290 contains the four *SETCOLOR* statements for the text. To change any of the colors, simply change the values in those statements. *HUE* can be any hue from 0 to 15. *LUM* can be any luminance from 0 to 14, even numbers. Line 9300 contains the background *SETCOLOR* statement.

Listing 3 is the assembly listing of the VBI routine. Listing 2 can be added to the main program for a demonstration of **Screen Scroller**. Simply add Lines 9500 through 9910 to Listing 1 and run the program. If you get a *THERE IS AN ERROR IN THE DATA* message, recheck Lines 9020 through 9140 and make sure all numbers have been typed correctly. **A**

Jeff Brenner is a free-lance writer, editor and programmer based in Long Island. He writes a column specifically for Atari users, "Applying The Atari," which is published monthly in *Computer Shopper* magazine. His most recent software creation, *FlipSketch*, is being distributed by *Dynacom, Inc.*

The two-letter checksum code preceding the line numbers here is *not* a part of the BASIC program. For further information, see the *BASIC Editor II*, in issue 47.

Listing 1.
BASIC listing.

```
JG 9000 REM ATARI SCREEN SCROLLER
MQ 9010 REM (c) 1984 Jeff Brenner
TM 9020 DATA 104,169,000,141,014,212,169
PM 9030 DATA 022,141,036,002,169,006,141
PI 9040 DATA 037,002,169,064,141,014,212
YI 9050 DATA 096,008,216,165,206,230,206
WH 9060 DATA 197,207,208,051,169,000,133
HE 9070 DATA 206,024,165,203,105,001,133
KW 9080 DATA 203,201,016,176,005,141,005
JK 9090 DATA 212,208,031,169,000,141,005
YW 9100 DATA 212,133,203,024,165,088,105
OP 9110 DATA 020,133,204,165,089,105,000
SF 9120 DATA 133,205,160,000,177,204,145
VW 9130 DATA 088,200,192,220,208,247,040
LU 9140 DATA 104,168,104,170,104,064
KO 9150 T1=PEEK(548):T2=PEEK(549)
MT 9160 IF FL=1 THEN GOTO 9250
UF 9170 FL=1
EJ 9180 DIM SP$(20):SP$(1)=CHR$(32):SP$(2)
      0)=CHR$(32):SP$(2)=SP$
```

```

TQ 9190 DIM SCROLL$(300),TXT$(20):TOT=0:F
OR I=1 TO 90
HY 9200 LOC=ADR(SCROLL$)+22:H=INT(LOC/256
):L=LOC-H*256
KT 9210 SCROLL$(8,8)=CHR$(L):SCROLL$(13,1
3)=CHR$(H)
MO 9220 READ NUM:SCROLL$(I,I)=CHR$(NUM)
EU 9230 TOT=TOT+NUM+I:NEXT I
PR 9240 IF TOT<15081 THEN PRINT "THERE I
5 AN ERROR IN THE DATA.":STOP
PM 9250 CENTER=1:DELAY=3
ZC 9260 IF DELAY=0 THEN DELAY=1:SCROLL$(4
1,41)=CHR$(2)
KE 9270 POKE 207,DELAY-1:POKE 203,0:POKE
206,0:RESTORE 9500
LM 9280 GRAPHICS 18:DL=PEEK(560)+256*PEEK
(561)
XM 9290 SETCOLOR 0,2,8:SETCOLOR 1,12,10:5
ETCOLOR 2,9,4:SETCOLOR 3,4,6
MK 9300 SETCOLOR 4,0,0:POKE DL+3,PEEK(DL+
3)+32
FU 9310 FOR I=DL+6 TO DL+15:POKE I,PEEK(I
)+32:NEXT I
XK 9320 A=USR(ADR(SCROLL$)):POKE 764,255
YA 9330 IF PEEK(764)=33 THEN GOTO 9430
SA 9340 IF PEEK(203)>0 THEN GOTO 9330
JF 9350 POSITION 0,11:PRINT #6;SP$;
KZ 9360 READ TXT$:IF TXT$="REPEAT" THEN R
ESTORE 9500:GOTO 9360
BB 9370 IF TXT$="END" THEN GOTO 9430
CI 9380 IF CENTER=0 THEN POSITION 0,11:PR
INT #6;TXT$;:GOTO 9410
YH 9390 POS=(20-LEN(TXT$))/2:IF POS<1 THE
N POSITION 0,11:PRINT #6;TXT$;:GOTO 94
10
LX 9400 POSITION 0,11:PRINT #6;SP$(1,POS)
;TXT$
PT 9410 IF PEEK(203)=0 THEN GOTO 9410
UE 9420 GOTO 9340
UD 9430 POKE 54286,0:POKE 548,T1:POKE 549
,T2:POKE 54286,64
FP 9440 END
HX 9450 REM Display data begins at line 9
500.

```

Listing 2.
BASIC listing.

```

EH 9500 DATA THIS IS A TEST
LP 9510 DATA OF THE ATARI
VT 9520 DATA SCREEN SCROLLER
WM 9530 DATA PROGRAM.
DJ 9540 DATA
E5 9550 DATA NOTE HOW THESE
UC 9560 DATA LINES OF TEXT
QQ 9570 DATA SMOOTHLY SCROLL
AG 9580 DATA UP THE SCREEN.
DY 9590 DATA
QQ 9600 DATA WE CAN GET
HA 9610 DATA OTHER COLORS
FS 9620 DATA ON THE SCREEN
BJ 9630 DATA BY USING
IT 9640 DATA INVERSE
MJ 9650 DATA lower case AND
FY 9660 DATA Inverse lower case
RN 9670 DATA CHARACTERS
SY 9680 DATA IN THE DATA
WQ 9690 DATA STATEMENTS.
DB 9700 DATA
VE 9710 DATA THE TEXT IS
KD 9720 DATA AUTOMATICALLY
BT 9730 DATA CENTERED SINCE
FL 9740 DATA WE SET THE
HW 9750 DATA VARIABLE center
ED 9760 DATA TO ONE.
DW 9770 DATA

```

```

YH 9780 DATA THE WORD
CK 9790 DATA REPEAT ON LINE
OS 9800 DATA 9910 OF THE DATA
TO 9810 DATA WILL CAUSE THIS
UX 9820 DATA MESSAGE TO
JT 9830 DATA START OVER FROM
LD 9840 DATA THE BEGINNING.
DS 9850 DATA
Y5 9860 DATA YOU CAN PRESS
UI 9870 DATA THE space bar
SH 9880 DATA TO STOP.
EE 9890 DATA
DF 9900 DATA
ON 9910 DATA REPEAT

```

Listing 3.
Assembly listing.

```

SCREEN SCROLLER ASSEMBLY LISTING
(C) 1984 JEFF BRENNER
$= 5000
PLA #0 SETUP
LDA #0
STA 54286
-----
;Lines 70-100 store the address of
;the scrolling routine in the
;deferred VB interrupt vector.
-----
LDA #START&255
STA #0224
LDA #START/256
STA #0225
LDA #64
STA 54286 ;Re-enable VB
;Return to BASIC
START
RTS
PHP
CLD
LDA #CE ;#CE=timing cntr
INC #CE
CMP #CF ;#CE=delay?
BNE RETURN ;if not, end.
LDA #0
STA #CE
CLC
LDA #CB ;# of scan lines
; scrolled.
ADC #1
STA #CB
CMP #16
BCB UP ;Before 16 scan
; lines, text must
; be moved up.
UP
STA 54277
BNE RETURN
LDA #0
STA 54277 ;Reset vertical
; scroll register
;Reset scroll cnt
STA #CB
-----
;Lines 330-450 move entire
; display upwards by one line
; of text (20 bytes).
-----
CLC
LDA #8
ADC #20
STA #CC
LDA #9
ADC #0
STA #CD
LDY #0
LDA (#CC),Y
STA (#8),Y
INY
CPY #220
BNE LOOP
RETURN
PLP
PLA
TAY
PLA
TAX
PLA
RTI ;Return from VBI
.END

```

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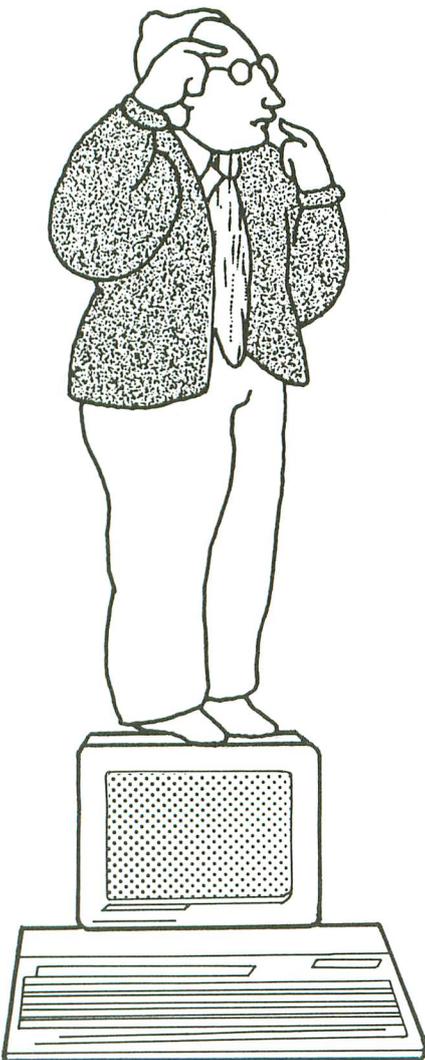
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CIRCLE #116 ON READER SERVICE CARD

Do you need 16 bits?



by Matthew J.W. Ratcliff

It seems that everyone wants an ST. And why not? It has 512 colors, high-resolution graphics and a new, powerful 16-bit microprocessor. Does that make your 8-bit Atari obsolete? Positively not! If your 8-bit machine can get the job done, there's no need to purchase a more powerful 16-bit computer. You must ask yourself these questions: do I want a 520ST?; can I afford an ST?; and do I really *need* an ST?

You can handle the first two. What I hope to do is give you enough information to answer the third one. And, for those of you with fears about obsolescence, I hope to quell them.

Bigger is better? Americans tend to think that way, but it isn't always true. For example, the more powerful the microprocessor, the more complicated it is. Professional software has the potential of processing much more information in less time on a 16-bit micro, but it also takes longer to write, debug and optimize a program. You can bet software will be more expensive. Unfortunately, it won't necessarily be more efficient. Since 16-bit micros can address much more memory, programmers tend to develop the attitude, "Why optimize the code? We have memory to burn." The end result may be a sloppy program, slow and wasteful of memory, that doesn't live up to the machine's full potential. On an 8-bit computer, most large programs must be optimized for memory efficiency. And tight memory miser programs are also fast!

ST BASIC has lots of bells and whistles. It fully supports the graphics and windowing capabilities of the system—to the point of frustration. Logically grouped functions, such as editing and listing, have been separated into different "windows"... a weird concept! It's also a slow BASIC. Everyone who's seen ST BASIC has been disappointed. It doesn't seem to run much faster than an 8-bit machine. Why? Again, bigger isn't always better. ST BASIC tries to support many new commands, and more commands mean the microcomputer must do more "table searching" as your program runs.

Developing software on the ST is tougher than on the 8-bit. True, C and 68000 assembly language for the ST are more powerful dialects than anything you can find for a 6502, but what a difference in the compilers. Everything for the ST is disk-based, with separate editor, compiler, linker and debugger utilities. You're constantly loading programs and creating files, until you finally get executable code. And if the final product doesn't work? Back to the editor, to begin the process again.

We 8-bit programmers have it nice. OSS brought us MAC/65, the *de facto* standard in software development for the Atari 8-bits, and the fastest 6502 compiler ever produced. This assembler can reduce 40K of source code into executable object code in a mere 10 seconds. MAC/65 provides editor, assembler and debugger in one package. Each is only a command away.

Of course, new software is being written all the time. Eventually, there'll be fast

Do you need 16 bits? *continued*

and versatile utilities and compilers for the ST, too. (I hear that Megamax C is really turbo-charged.) Remember, the old 8-bit Ataris were out for several years, before MAC/65 and BASIC XL hit the market.

If you're fed up with the 6502's limitations and lack of memory for "serious" applications software, then the 520ST is the logical step. Learning to program the 68000, after years of 6502 work, is like stepping out of a '65 Volkswagen Beetle and driving a Porsche 944 Turbo—"the ultimate driving experience!"

With this new "competition," 8-bit Atari software continues to fall in price. Are you worried that new software won't be produced for the 8-bit? Why? Do you need a word processor better than **PaperClip** or **AtariWriter**? I don't! More memory? When was the last time you got an out-of-memory error writing a BASIC program? I haven't, not since I've owned a 16K Atari 400. If you need more programming space, BASIC XE on the 130XE gives you 60K of program space, and 30K for array and variable storage. This package is certainly cheaper than buying an ST.

Do you need better graphics? If so, may-

be you haven't played **Ballblazer** or **Rescue on Fractalus**. If better graphics is a must, you'll be pleased to know that the 520ST has higher resolution in monochrome mode than the Apple Macintosh, and the *complete* 520ST color system plus a 1-megabyte RAM upgrade is cheaper than a 1-Meg RAM expansion for the Macintosh.

Do you need better database capabilities, faster file I/O and more standard interfacing capabilities? Then the ST can meet your needs. Do you need a MIDI interface for your Casio **CZ101** synthesizer? The ST has it. If you want to perform magic with assembly language, the 68000 of the ST is twenty times more powerful (in terms of total internal register space) than the 6502—and it hums at 8 megahertz, about eight times faster than the 8-bit Ataris.

Do you need an ST? Maybe not—although, for the price, you can't purchase more raw computing power. But if you retire your 8-bit machine to get an ST, it will be sorely missed!

Me? Of course I *wanted* one. Did I need one? Well, yes—not because my 130XE

didn't do everything I wanted it to, but because, as a writer and Atari advocate in the computing world, I must keep up with the times. I still prefer assembly language programming on the 130XE with MAC/65 . . . until maybe OSS comes out with a MAC/68K? 

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CIRCLE #117 ON READER SERVICE CARD



Database Delphi

News and updates about the *ANALOG* Computing Atari Users' Group on Delphi

by Matthew J.W. Ratcliff

This month, we'll take a look at the controversy over **Neo-Chrome** (is it public domain or not?) and some new ST products coming from England. Finally, we'll wrap up with a couple of tips on the use of Delphi database areas. The following messages are reprinted from Delphi's Atari forum.

New Neo-Chrome.

8357 11-SEP 00:24
From: ALBATROSS (Bruce Holloway)
To: DFSCOTT (D. F. Scott)

Where is the **Neo** 0.9? I can't find it in the ST database, or the Sound & Graphics, either.

8370 11-SEP 17:27
From: DFSCOTT
To: ALL

Apparently, we have some problems with version 0.9. It appears there is some doubt as to whether the program actually is public domain. My feeling is that the zero designation on the version number implies that it is public domain—PR at Atari must be confused about all these version numbers. . .

8383 11-SEP 23:08
From: THUD (Tom Hudson)
To: DFSCOTT

Atari says differently. **Neo** 0.9 is supposedly a copyrighted program, and was never supposed to go up anywhere. Darn confusing policy if you ask me—first it's a giveaway, next they say it's under copyright.

8594 16-SEP 21:35
From: NEILHARRIS (Neil Harris, Atari Corp.)
To: THUD

Yes, it has a copyright notice. Did that

stop the managers of Atari SIGs of CompuServe, Delphi, or GENie from making it available to the public? Did they even try to ask me or any other Atari representative?

We let people know that this was not intended to be available free for the public as soon as we discovered it on the networks. We have been damaged by the fact that this program is in circulation prematurely.

We have serious questions as to how the program made it out in the first place, but at least we expect the SIG managers to be more responsible.

9000 24-SEP 18:42
From: THUD
To: NEILHARRIS

I think the managers of the various systems were as confused as anyone by the fact that **Neo** was out long ago as a free-ware program. Suddenly, it wasn't anymore. I know CompuServe took it down as soon as they knew, and they spread the word that **Neo** 0.9 should be removed from public access on all systems.

Atari would have done better to rename **Neo-Chrome** before deciding to make it a retail product, in order to avoid confusion. (Yes, hindsight is 20-20 vision.)

Under the circumstances, I feel the various SIG managers did about everything they could to resolve the problem once it occurred.

New ST products.

8581 16-SEP 15:09
From: MATRAT (Matthew Ratcliff)
To: ALL

According to Ron Robinson in St Louis—Atari news from the PCWS London—Atari announced the 2080STF, an ST with

2 meg of RAM; 4160STF, with 4 meg of RAM; and the blitter hardware.

Kuma announced an expansion box to give the ST 15 MIPS (Million Instructions per Second!) parallel computing performance.

A VME (Virtual Memory Expansion) box was demonstrated, running several multiuser operating systems.

A storage oscilloscope adapter box, weather satellite receiver, several video digitizers, Pascal, LISP, BCPL and Fortran compilers were also shown.

8587 16-SEP 19:13
From: DLM (Daniel L. Moore)
To: DFSCOTT

Actually, all the announcements in England were made over a week ago, before Matt made his comments about new hardware. Last I heard, Sam was promising they would make it to the States before Christmas. (Of course, if that is true, they should already be shipping, in order for dealers to have them by November. The local dealers haven't received any official word yet.)

They are probably going to have them at the Atari Fest and, hopefully, they will have a little more info on shipping and features. (The reports I've seen are not clear on whether the blitter is built-in or if there is just a socket—or whatever—for it in them.)

Possible new products.

9005 24-SEP 19:38
From: DFSCOTT
To: MATRAT

I've already asked Neil. The 2080 and 4160 STFs were announced in London, but not in America yet, because of the FCC. No plans so far to put a specific blitter



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slot—or, for that matter, the chip itself—into the new STFs. Atari just can't resist holding fire until further notice.

In response to the new blitter, the topic of software compatibility came up. According to Atari, the LINE A calls should be virtually the same. Any software which uses LINE A should run unchanged—and much faster, at that.

Delphi tips.

We had some problems with file transfers recently, and some of the Current Issue files were bad. One user downloaded the same file a half-dozen times, with different terminal software and different network connections. This can get very expensive. Whenever you get an "apparently good" download, but the file is bad, do not keep downloading the file. You should leave a FORUM or EMAIL message for ANALOG2 (Charles Bachand) or for me (MATRAT). We will be glad to download the file and make sure it's a good program. Sometimes a file can get garbled in the transfer process from **ANALOG Computing** to the databases of Delphi.

Uploading is now **free**. We have a new function (although it may not appear in the menu yet) called REQUEST. It can be used to ask for free upload time. You will be prompted for a little information about the file(s) you're interested in sending, and what day and time period you wish to send the files. If the programs aren't already on the system, the SYSOP will set a temporary free access flag for you on the prescribed date and time. You can then go to your workspace (WO command) and upload (XU for xmodem upload) the files. From there, you may exit and then enter the database area. After selecting a topic, you must enter the submit (SUB) command. At this point, you can submit the files as a group (such as a program and associated documentation) or separate units (such as different programs). Just follow all of the prompts, read carefully and remember the filenames you assigned your files in the workspace. **■**

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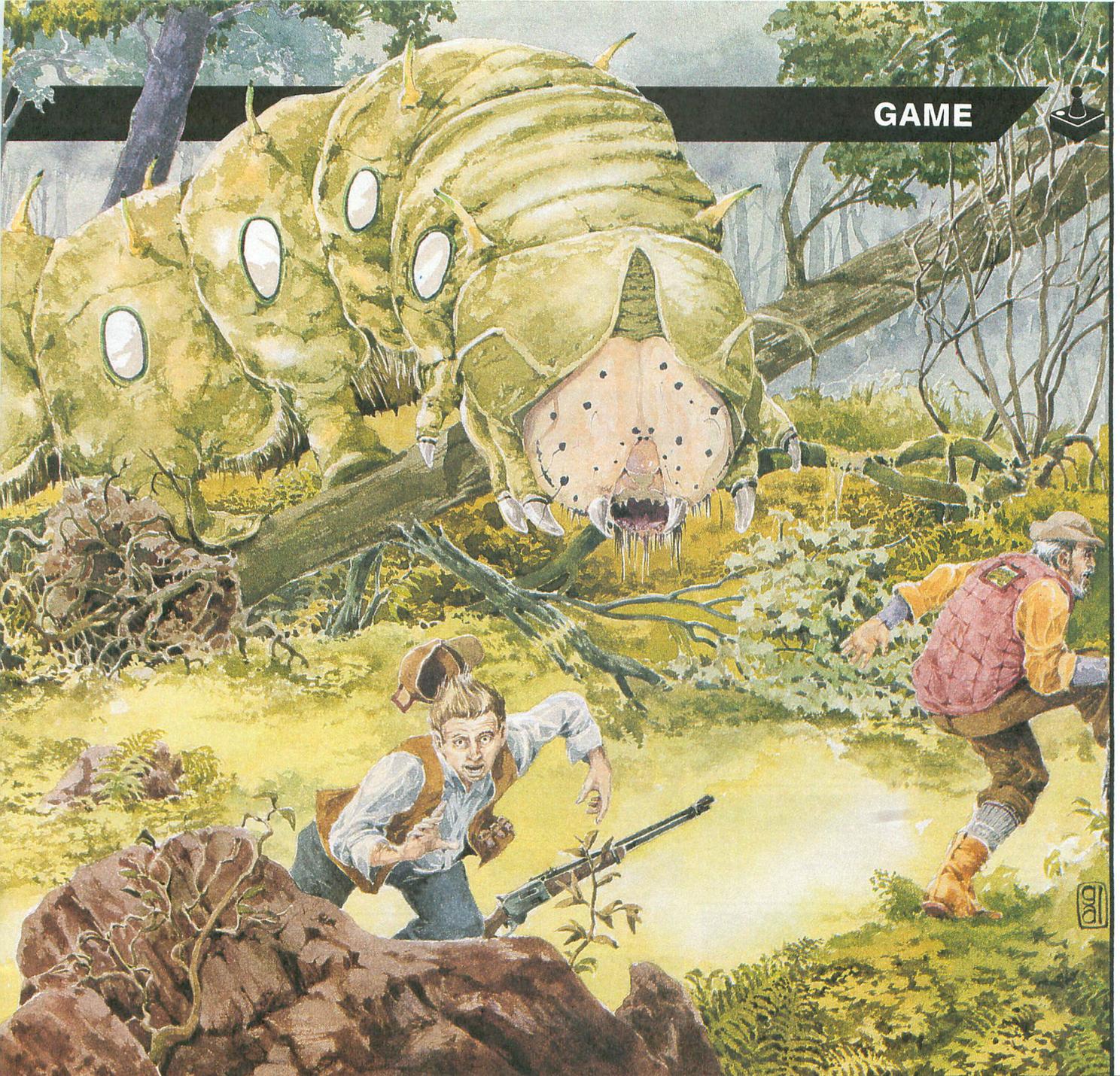


Larvicide won't be enough when you're up against these vermiform villains.

by David Huff

Krazy Katerpillars is a fast-action arcade-type game. Your job is to clear the screen of the swarming caterpillars before they do you in. Though you start out in the

screen center, in a zone clear of the bugs, you're surrounded—above and below. **Katerpillars** begin to move across the screen, advancing on you. Shoot as many as possible, while trying to outmaneuver the rest. Be careful. If you miss your target, your missile cycles to the



Krazy Katerpillars

screen bottom and forms a deadly spike that heads straight toward you.

Typing it in.

Listing 1 is the BASIC data used to create both cassette and disk versions of **Krazy Katerpillars**. Those readers who

are interested in how the game works may obtain the assembly listing on either the magazine disk version or the **ANALOG Computing** Atari Users' Group on Delphi.

Disk users should refer to the **M/L Editor** article on page 10 for typing instructions.

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Krazy Katerpillars *continued*

If you have a cassette system, type in Listing 1, then add the lines shown in Listing 2. Type *RUN* and press *RETURN*. The program will begin checking the data statements, printing the line numbers as it goes. It will alert you to any problems. Fix any incorrect lines and rerun the program until all errors are eliminated.

When all your data lines are correct, the computer will beep twice and prompt you to *READY CASSETTE AND PRESS RETURN*. Now, insert a blank cassette in your recorder, press the *RECORD* and *PLAY* buttons simultaneously, and hit *RETURN*. The message *WRITING FILE* will appear, and the program will create a machine language boot tape version of **Krazy Katerpillars**, printing each data line number as it goes. When the *READY* prompt appears, the game is recorded and ready to play. *CSAVE* the *BASIC* program onto a separate tape before continuing.

To play the game, rewind the tape created with the *BASIC* program to the beginning. Turn your computer off and remove all cartridges. Press the *PLAY* button on your recorder and turn on your computer, while holding down the *START* key. If you have an *XL* or *XE* series computer, you must hold the *START* and *OPTION* keys when you turn on the power. The computer will beep once. Hit the *RETURN* key, and **Krazy Katerpillars** will load and run automatically.

Rules.

When the title screen appears, use the *SELECT* key to choose a starting level, 1-9, then press *START* to begin playing.

In **Krazy Katerpillars**, you have four lives. The number remaining is shown in the upper right corner, under your level. Contact with any creature or a spike will take one life. A level is completed when all the **Katerpillars** have been destroyed. The larvae going off the screen's bottom will cycle back to the top and reappear.

Any of your missiles that reach the top of the screen are reset to the bottom and become spikes. Remember, contact with a spike is deadly. Spikes can be useful, though, for killing **Katerpillars**—the tip is deadly to them.

When over, the game may be restarted at the original starting level by pressing the fire button. To pick a new level, press *START*. The title screen will appear, with the level selector.

Hints.

Go with the flow of bugs from left to right. Try to shoot and maneuver your way up above the top layer. Then destroy the **Katerpillars**, using the spikes. On higher levels, you have to do this; it's impossible to shoot them all on the first run-through.

The two-letter checksum code preceding the line numbers here is *not* a part of the *BASIC* program. For further information, see the *BASIC Editor II* in issue 47.

The code is simply a double check for Listing 1; it's of more use with Listing 2.

Listing 1.

```
KV 1000 DATA 255,255,0,32,181,39,76,181,3
2,112,112,112,112,112,71,33,3613
RA 1010 DATA 32,112,7,112,112,112,6,112,1
12,6,112,112,112,112,112,112,4045
WT 1020 DATA 112,6,48,6,65,3,32,0,0,0,0
,0,0,43,114,4348
XL 1030 DATA 161,58,121,0,0,0,0,0,0,0,0
,0,0,43,2358
QY 1040 DATA 97,180,37,114,176,41,108,172
,33,114,179,0,0,0,0,0,8728
DB 1050 DATA 0,0,0,0,0,0,0,0,226,249,0,0
,0,0,0,0,5574
BP 1060 DATA 0,0,0,0,0,0,0,0,228,225,246,
233,228,0,232,245,1228
WO 1070 DATA 230,230,0,0,0,0,0,0,0,0,24
3,229,236,229,227,8024
YU 1080 DATA 244,0,236,229,246,229,236,0,
0,0,0,0,0,240,1044
QZ 1090 DATA 242,229,243,0,243,244,22
5,242,244,0,0,0,0,0,3075
UT 1100 DATA 0,0,0,0,112,112,112,70,0,48,
134,197,40,48,133,133,3309
SW 1110 DATA 133,133,133,133,133,133,133,
133,65,158,32,216,169,72,141,196,9463
RH 1120 DATA 2,169,40,141,197,2,169,120,1
41,198,2,169,104,141,199,2,6926
UD 1130 DATA 169,0,141,200,2,169,3,141,48
,2,169,32,141,49,2,162,2531
GY 1140 DATA 31,169,0,149,176,202,16,251,
162,0,138,157,0,6,202,208,7619
CC 1150 DATA 250,169,40,133,194,169,48,13
3,195,32,230,37,162,8,169,0,5576
FJ 1160 DATA 157,0,210,202,16,250,32,101,
228,160,115,162,38,169,7,32,5705
CN 1170 DATA 92,228,162,1,142,11,6,173,19
8,2,72,162,1,189,196,2,4579
ME 1180 DATA 157,197,2,202,16,247,104,141
,196,2,169,15,141,24,6,173,4813
SJ 1190 DATA 31,208,41,1,240,52,173,24,6,
208,244,173,31,208,41,2,5535
CQ 1200 DATA 208,18,238,11,6,169,170,141,
7,210,169,121,141,6,210,169,8809
CG 1210 DATA 10,141,8,6,173,11,6,201,10,1
44,5,169,1,141,11,6,9992
PU 1220 DATA 9,208,162,97,157,33,32,76,17
,33,206,11,6,174,11,6,9990
ZH 1230 DATA 142,10,6,142,12,6,169,224,13
3,198,169,40,133,200,169,0,7629
DD 1240 DATA 133,197,133,199,162,1,160,0,
177,197,145,199,136,208,249,230,4539
MZ 1250 DATA 198,230,200,202,16,240,162,3
9,189,101,39,157,0,40,202,16,5152
TD 1260 DATA 247,169,28,141,196,2,169,136
,141,197,2,169,204,141,198,2,8673
JJ 1270 DATA 169,42,141,199,2,169,0,141,2
00,2,169,158,141,48,2,169,5708
OX 1280 DATA 32,141,49,2,169,103,141,0,2,
169,37,141,1,2,169,192,3654
EE 1290 DATA 141,14,212,169,40,141,244,2,
169,3,141,29,208,169,62,141,7247
PP 1300 DATA 47,2,169,40,141,7,212,169,16
,141,111,2,162,0,142,8,2764
JQ 1310 DATA 208,142,12,208,169,44,133,17
7,169,43,133,191,32,163,37,162,7677
GY 1320 DATA 39,189,141,39,157,0,48,202,1
6,247,162,0,142,16,6,142,3881
CL 1330 DATA 17,6,142,18,6,32,217,36,162,
4,142,23,6,32,0,36,8324
VZ 1340 DATA 162,1,142,0,6,142,30,208,32,
117,36,32,225,34,32,217,4277
IM 1350 DATA 36,32,105,36,32,225,34,32,82
,38,173,9,6,240,3,32,1037
XU 1360 DATA 0,36,173,13,6,240,3,76,71,34
,76,34,34,169,0,141,1389
OI 1370 DATA 0,6,141,13,6,160,17,185,46,3
9,145,176,136,16,248,169,7373
LU 1380 DATA 32,141,4,210,169,34,141,7,6,
173,7,6,208,251,32,163,5877
```



Krazy Katerpillars *continued*

HQ 1390 DATA 37,206,23,6,173,23,6,240,23,32,37,37,32,230,37,32,978
 HL 1400 DATA 250,37,32,203,37,169,1,141,3,0,208,141,0,6,76,34,34,1063
 KA 1410 DATA 162,8,189,92,39,157,25,48,20,2,16,247,32,230,37,169,10,5501
 UH 1420 DATA 141,15,6,32,44,38,169,10,141,15,6,230,195,32,44,38,1944
 TN 1430 DATA 198,195,173,31,208,41,1,208,10,173,31,208,41,1,240,249,8406
 BN 1440 DATA 76,181,32,173,132,2,240,16,1,73,24,6,208,229,32,117,36,5261
 YX 1450 DATA 169,10,141,24,6,76,172,34,17,4,12,6,142,10,6,142,11,96
 FT 1460 DATA 6,32,230,37,76,249,33,162,3,189,8,208,240,6,238,13,7252
 YQ 1470 DATA 6,76,251,35,202,16,242,162,3,189,0,208,240,3,32,208,8000
 IP 1480 DATA 35,202,16,245,162,1,142,30,2,08,162,3,173,27,6,61,252,5980
 HL 1490 DATA 35,240,3,32,110,35,202,16,24,2,173,4,6,240,6,206,4,4826
 NH 1500 DATA 6,76,251,35,169,4,141,4,6,17,3,132,2,240,3,76,251,6017
 QA 1510 DATA 35,162,3,173,27,6,61,252,35,208,15,189,252,35,13,27,4405
 DL 1520 DATA 6,141,27,6,32,74,35,76,251,3,5,202,16,230,76,251,35,6772
 WS 1530 DATA 169,166,141,1,210,169,15,141,5,6,165,178,24,105,3,157,4150
 LL 1540 DATA 4,208,149,181,56,165,176,233,5,149,185,169,65,157,28,6,6654
 PZ 1550 DATA 32,110,35,96,181,185,133,190,222,28,6,240,53,189,32,6,5892
 DV 1560 DATA 208,14,160,2,189,252,35,73,2,55,49,190,145,190,136,16,244,703
 JL 1570 DATA 56,165,190,233,3,133,190,149,185,201,50,144,13,160,2,177,8017
 QE 1580 DATA 190,29,252,35,145,190,136,16,246,96,169,255,149,185,157,32,1156
 JC 1590 DATA 6,96,160,0,169,0,133,190,189,252,35,73,255,49,190,145,217
 UP 1600 DATA 190,136,208,244,169,0,157,28,6,157,32,6,189,252,35,77,5620
 UL 1610 DATA 27,6,141,27,6,96,32,172,35,1,81,185,133,190,181,181,133,9989
 NC 1620 DATA 189,142,3,6,32,159,36,169,0,145,192,200,145,192,169,32,8426
 YF 1630 DATA 141,21,6,169,168,141,3,210,1,69,11,141,6,6,174,3,6,1803
 TY 1640 DATA 96,96,3,12,48,192,248,24,173,10,6,105,1,141,10,6,521
 UC 1650 DATA 216,169,0,141,0,6,141,9,6,23,8,11,6,173,11,6,201,2199
 KJ 1660 DATA 16,144,5,169,14,141,11,6,174,11,6,189,89,36,141,14,1706
 IT 1670 DATA 6,169,168,141,7,210,169,200,141,6,210,169,80,141,8,6,6057
 FJ 1680 DATA 32,163,37,32,37,32,217,36,32,250,37,32,203,37,169,4999
 CX 1690 DATA 150,141,24,6,173,24,6,208,25,1,169,1,141,0,6,96,0,2109
 EM 1700 DATA 30,25,20,25,17,10,15,12,10,1,0,7,6,5,5,4,174,5604
 QZ 1710 DATA 14,6,160,255,136,208,253,202,208,248,96,162,2,142,25,6,8388
 UQ 1720 DATA 160,255,230,195,177,194,170,198,195,160,0,142,26,6,177,194,9923
 AM 1730 DATA 170,173,26,6,145,194,200,208,242,230,195,206,25,6,208,233,3653
 YF 1740 DATA 198,195,198,195,96,56,165,18,9,233,48,74,74,170,169,0,141,8296
 RA 1750 DATA 1,6,56,165,190,233,48,41,240,74,141,2,6,10,10,46,1182
 AN 1760 DATA 1,6,24,109,2,6,133,192,173,1,6,105,0,133,193,24,2828
 DG 1770 DATA 169,40,101,192,133,192,169,4,8,101,193,133,193,138,168,96,248,2646

EO 1780 DATA 24,162,2,189,16,6,125,19,6,1,57,16,6,202,16,244,216,5871
 PG 1790 DATA 162,2,169,0,157,19,6,202,16,250,162,6,160,0,185,16,4629
 IY 1800 DATA 6,32,14,37,232,232,200,192,3,208,243,162,17,173,10,6,7161
 TD 1810 DATA 32,14,37,96,141,22,6,41,15,9,16,157,1,48,173,22,9489
 CD 1820 DATA 6,74,74,74,74,9,16,157,0,48,96,169,45,133,180,169,5699
 WP 1830 DATA 38,133,179,162,3,169,0,157,0,208,202,208,250,169,26,141,664
 HT 1840 DATA 193,2,141,194,2,141,195,2,16,2,2,160,13,185,32,39,145,4625
 SY 1850 DATA 179,136,16,248,230,180,202,1,6,241,174,23,6,202,240,9,189,492
 DB 1860 DATA 99,37,157,0,208,202,208,247,96,0,176,183,190,72,138,72,9884
 VH 1870 DATA 152,72,156,196,189,141,37,18,8,152,37,141,10,212,141,22,208,8799
 VE 1880 DATA 140,23,208,230,196,224,11,20,8,4,162,0,134,196,104,168,104,9127
 UO 1890 DATA 170,104,64,134,198,24,86,126,182,70,42,6,102,14,14,26,760
 BL 1900 DATA 60,28,136,202,122,70,28,60,1,68,169,0,133,190,162,5,169,7253
 MC 1910 DATA 0,168,145,190,136,208,251,23,0,191,202,208,246,169,43,133,191,5795
 IX 1920 DATA 162,3,169,0,157,32,6,157,28,6,141,27,6,202,16,244,4107
 KN 1930 DATA 96,169,128,133,176,169,100,1,41,0,208,133,178,169,14,141,192,261
 FL 1940 DATA 2,160,13,185,32,39,145,176,1,36,16,248,96,162,1,169,0,5777
 CK 1950 DATA 168,145,194,136,208,251,230,195,202,16,246,169,48,133,195,96,2909
 DL 1960 DATA 32,35,38,230,195,32,35,38,19,8,195,24,165,194,105,160,133,9308
 LG 1970 DATA 194,165,195,105,0,133,195,16,0,160,169,0,145,194,136,208,251,3374
 GH 1980 DATA 169,40,133,194,169,48,133,19,5,96,174,11,6,189,66,38,141,6032
 WD 1990 DATA 15,6,172,10,210,32,56,38,206,15,6,16,245,96,162,4,3796
 ZG 2000 DATA 138,145,194,136,202,208,249,96,0,6,10,15,25,16,10,20,9692
 JJ 2010 DATA 22,25,25,27,30,30,35,35,162,1,160,0,177,194,208,15,4725
 TA 2020 DATA 136,208,249,230,195,202,16,2,44,162,1,142,9,6,208,5,162,7285
 GF 2030 DATA 0,142,9,6,169,48,133,195,96,216,174,24,6,240,3,206,7994
 WY 2040 DATA 24,6,174,5,6,240,11,189,64,3,9,141,0,210,206,5,6,3979
 OI 2050 DATA 208,5,169,0,141,1,210,174,6,6,240,11,189,80,39,141,5652
 PZ 2060 DATA 2,210,206,6,6,208,5,169,0,14,1,3,210,173,7,6,240,6029
 VH 2070 DATA 9,74,141,5,210,206,7,6,208,5,169,0,141,5,210,174,6671
 IO 2080 DATA 8,6,240,5,206,8,6,208,5,169,0,141,7,210,173,0,4677
 LF 2090 DATA 6,208,3,76,98,228,173,4,208,240,6,238,13,6,76,205,7793
 YG 2100 DATA 38,166,178,164,176,173,120,2,74,176,2,136,136,74,176,2,5990
 PE 2110 DATA 200,200,74,176,2,202,202,74,176,2,232,232,224,50,144,11,9752
 PP 2120 DATA 224,208,144,2,162,50,134,178,142,0,208,192,90,144,6,192,8890
 AF 2130 DATA 185,176,2,132,176,160,13,185,32,39,145,176,136,16,248,169,9413
 RY 2140 DATA 0,133,77,76,205,38,0,0,8,8,8,28,28,62,62,7924
 TW 2150 DATA 62,62,0,0,8,16,74,34,72,68,1,6,133,16,4,162,20,9376
 QU 2160 DATA 69,18,72,18,8,16,230,240,250,255,230,200,180,170,150,130,4999

(continued on page 74)



Atari Picture Storage Techniques

The workings of *Micro Painter*, *MicroIllustrator* and *Fun with Art*— and how to convert pictures from one format to another.

by Charles F. Johnson

Atari computers are justly famed for their graphics. There are quite a few painting programs for the Atari 8-bit line, and the would-be artist has a comprehensive set of tools available. This article will deal with three of the most popular drawing programs: **Micro Painter**, **MicroIllustrator**, and **Fun with Art**. **Micro Painter** and **Fun with Art** are designed to be used with a joystick, **MicroIllustrator** is used with the **KoalaPad** touch tablet. (The **MicroIllustrator** program is also sold as **Atari Artist**, with the **Atari Touch Tablet**.)

These three programs all use the ANTIC graphics mode \$0E, which allows four colors and a resolution of 160x192. To take advantage of each program's special features, it sure would be nice to be able create a picture with one program and load it into another. Unfortunately, the files made by saving a picture to disk with these programs are mutually incompatible. In other words, **Micro Painter** can't load **Fun with Art** pictures, **MicroIllustrator** can't load **Micro Painter** pictures, etc. But don't worry. At the end of this article is **Picture Converter**, a program that will nicely solve this little problem.

ANTIC mode \$0E.

The XL/XE computers allow you to set up an ANTIC mode \$0E screen simply by doing a GRAPHICS 15 command. However, in the older 400/800 operating system there's no direct provision for this graphics mode—even though the ANTIC chip is capable of displaying it. To use this mode on a 400/800 requires the construction of a custom display list. Display lists have been fully explained before now, but, essentially, a display list is a series of bytes that tell the ANTIC chip how to display the screen data, much like a machine language program. (See *De Re Atari* for one of the best explanations of display lists.)

Modes 15, 8, 9, 10 and 11 all use the same amount of memory for their display list and screen area. The display list usually requires 202 bytes, the screen memory 7680 bytes.

Micro Painter.

The simplest method of saving a picture created in ANTIC mode \$0E is to copy the screen memory into a disk file. To save all the necessary data, you must also put the picture colors into the file, as well. This is the method that **Micro Painter** uses. First the screen memory is saved, then the color register data is saved. The color registers are located at 708 through 712. Location 712 holds the background color, and this is the first byte that **Micro Painter** saves. Then **Micro Painter** saves the contents of 708, 709, and 710 (711 is not used in ANTIC mode \$0E). Thus, the format of a **Micro Painter** picture file is:

- 7680 bytes — Picture data (screen memory).
- 4 bytes — Color registers (712, 708, 709, 710).

The **Micro Painter** storage format results in a disk file that's always 62 single-density sectors long. You can see why, since 7684/125 (125 is the number of bytes in a SD DOS sector) equals 61.472.

Micro Painter was perhaps the first serious drawing program for the Atari 400/800 line, back in the Paleolithic Era. This may explain why many people still use it, even though it's somewhat lacking in features, when compared to the other two programs in this article.

Fun with Art.

Fun with Art is unique among these three drawing programs, in that it supports the Atari's powerful "display list interrupt" (DLI) feature, allowing the artist to change colors on every other horizontal screen line. In fact, **Fun with Art** would probably be my favorite of the three, if only it supported a touch tablet. When **Fun with Art** saves a picture, it also saves the display list and interrupt routines.

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Picture Storage *continued*

The format of a **Fun With Art** picture is:

2 bytes — Header bytes, indicating that this is a **Fun with Art** file. Both bytes are 254 or (\$FE).

4 bytes — Color data, in the same order as **Micro Painter** (712, 708, 709, 710).

256 bytes — Display list and interrupt data tables. This block of data will be loaded into page 6.

4080 bytes — Picture data (screen memory). **Fun with Art's** screen memory is laid out so it crosses a 4K boundary, which would confuse the ANTIC chip. The program compensates for this by having 16 "extra" bytes in the middle of the screen memory.

16 bytes — Zeroes. See above.

3600 bytes — The rest of the screen data.

2+ bytes — This is the data for the DLIs, and can be up to 2304 bytes. If there are no DLIs set, this will be two 0 bytes.

Since **Fun with Art** is the only program covered here that supports DLIs, my conversion program simply ignores the interrupt routines when it loads a **Fun with Art** picture.

Microillustrator.

MicroIllustrator is the program that comes with both **KoalaPad** and **Atari Touch Tablet**, although the Atari version is somewhat more polished. (This software is also supplied with some other drawing packages, such as the **Koala Light Pen** and the **Powerpad** touch tablet).

MicroIllustrator was the first graphics program to save pictures in a special, compressed format. Its files also have a header containing information about the picture. When the program was designed, they left space in this header for future enhancements, and several of the header bytes refer to features not used by the current versions of the program. The format for a **MicroIllustrator** header is:

4 bytes — Identification bytes, indicating that this is a **Microillustrator** file. These bytes are 255, 128, 201 and 199 (\$FF, \$80, \$C9, \$C7).

2 bytes — Length of the header, in 6502 LSB/MSB format. This is the number of bytes in the header minus 1. These bytes will usually be 26 and 0 (\$1A and \$00).

1 byte — The program's revision number. This is set to 1.

1 byte — Type of compression used to save the picture. 0= uncompressed, 1= vertical compression, 2= horizontal compression.

1 byte — The picture's graphics mode. This will normally be 14 (\$0E). Apparently, the designers planned to have the **Microillustrator** work in other graphics modes, too. I wish they'd followed through!

4 bytes — Active screen area configurations. These bytes are 0, 40, 0 and 192 (\$00, \$28, \$00, \$C0). They were probably intended to be used in conjunction with the graphics mode byte, to allow drawing in other modes.

5 bytes — Color data. These are the values in memory locations 708 through 712.

2 bytes — Total length of picture file, in LSB/MSB format.

2 bytes — For future use. Currently set to 0, 0.

1 byte — Set to a RETURN (end-of line) character, 155 (\$9B). This is intended for a picture title, with a maximum of forty characters; currently unused.

1 byte — 155 (\$9B). Forty-character space reserved for author name; currently unused.

2 bytes — Both 155 (\$9B). Two more text lines, currently unused.

1 byte — Spare byte, set to 162 (\$A2).

MicroIllustrator's compression technique allows its picture files to be much smaller than the ones generated by **Micro Painter** or **Fun with Art**. The length of the picture file will depend on the amount of unique detail in the picture. **MicroIllustrator** can compress a picture either vertically or horizontally, by scanning the bytes in the screen memory area for repeating data. Figure 1 shows the organization of a **MicroIllustrator** file's compressed screen data.

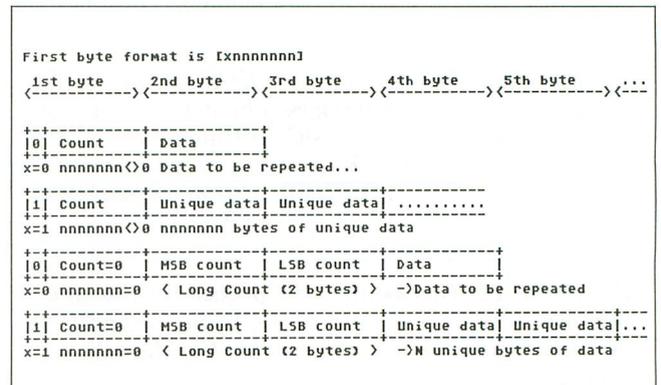


Figure 1.

The first byte in each block of picture data is used for several purposes. The most significant bit (bit 7) is used as a flag to indicate whether the data following is unique or repeating; 0 indicates repeating data, 1 indicates unique data. The other 7 bits of this byte represent the count value (n). If this is repeating data, the next byte will be repeated n times. If unique, this is the number of bytes of unique data that follow. A special case occurs when these 7 bits equal 0; then the next 2 bytes are interpreted as the count value in 6502 LSB/MSB form.

The advantage of this scheme is that the resulting disk file is usually much smaller, so you can save many more pictures on a disk. The size of a picture file saved with **MicroIllustrator** is directly related to the amount of fine, unique detail in the picture. See the article accompanying my **Koala Slideshow** program in **ANALOG Computing** issue 40 for a discussion of a bug in the **MicroIllustrator** program that prohibits saving files with a very large amount of detail.

Picture-swapping.

Let's say you create a picture with your **Atari Touch Tablet** and **Atari Artist** (same as **MicroIllustrator**, see above). You decide you'd like to label the picture in some way, but the program has no text feature. Sure would be nice to load that picture into **Fun with Art**, which lets you put

Picture Storage *continued*

text on the screen just by typing. But wait, the picture is saved in the compressed format, and **Fun with Art** has all that weird interrupt stuff in the file. . .What to do?

Or, say you've been working on the Great American Program, and you'd like to make a title screen for it. How do you load this work of art once you've created it?

Relax! I've done all the nasty programming work for you. Picture Converter (Listing 1) is a BASIC program that will allow you to convert pictures back and forth between the three programs discussed in this article. Picture Converter contains routines to load all three types of files, and you should be able to adapt them to your own programs by studying the listing.

Picture Converter writes **MicroIllustrator** files in the uncompressed format (see the discussion of a **MicroIllustrator** header, above). Therefore, the converted file will always be 62 sectors long. To get it into compressed format, just load the picture into **MicroIllustrator** and resave it. The picture colors are always preserved when you use Picture Converter. **A**

Charles F. Johnson is a musician by trade, drawn into Atari computers by Star Raiders, about five years ago. When he latched onto the BASIC cartridge, he was seriously hooked. He's currently living in Los Angeles with his wife and the most intelligent cat in the world.

The two-letter checksum code preceding the line numbers here is *not* a part of the BASIC program. For further information, see the *BASIC Editor II*, in issue 47.

Listing 1.
BASIC listing.

```
PJ 10 GOSUB 1070
JX 20 POSITION 2,4:?"1-Micro Illustrat
or":?"2-Micro Painter":?"3-Fun w
ith Art"
J5 30 ? :?"Convert from? "":GOSUB 570:FR
OM=K-48:TOP$(47)=FMT$
FU 40 ? :?"Convert to? "":GOSUB 570:DEST
=K-48:TOP$(87)=FMT$
N5 50 ? :?"Which drive has the 'FROM' fi
le?":GOSUB 530
CN 60 IN$="D":IN$(2)=CHR$(K):IN$(3)="
WF 70 ? :?"Want a directory listing? (Y/N)
">";
YZ 80 GET #2,K:IF CHR$(K)<"Y" AND CHR$(K)
><"N" THEN 80
OF 90 ? CHR$(K):IF CHR$(K)="Y" THEN GOSUB
440
BX 100 ? :?"'FROM' file name? ">:IN$:GO
SUB 500
VV 110 IN$(4)=TEMP$:TEMP$=IN$:Q=USR(CNV,A
DR(TEMP$),LEN(TEMP$)):TOP$(65)=TEMP$
OC 120 ? :?"Which drive for the 'TO' fil
e?":GOSUB 530
OU 130 OUT$="D":OUT$(2)=CHR$(K):OUT$(3)="
MK 140 ? :?"'TO' file name? ">:OUT$:GOS
UB 500
UE 150 OUT$(4)=TEMP$:TEMP$=OUT$:Q=USR(CNV
,ADR(TEMP$),LEN(TEMP$)):TOP$(105)=TEMP
$
```

```
YN 160 POKE 752,1:?"K":POSITION 2,6:IF I
N$(2,2)<>OUT$(2,2) THEN ? "Insert both
disks "":GOTO 190
DC 170 IF IN$=OUT$ THEN ? "Insert source
disk in drive "":IN$(2,2):GOTO 190
NJ 180 IF IN$(2,2)=OUT$(2,2) THEN ? "Inse
rt disk in drive "":IN$(2,2)
FU 190 ? "and press any key.":POKE 764,2
55:GET #2,K
DY 200 TRAP 380:OPEN #1,4,0,IN$:TRAP 4000
0
KQ 210 GRAPHICS 24:Q=USR(GR7PLUS):SCREEN=
PEEK(88)+256*PEEK(89)
OG 220 ON FROM GOSUB 640,750,790:CLOSE #1
OI 230 IF IN$<>OUT$ THEN 270
LP 240 GRAPHICS 40:Q=USR(GR7PLUS):Q=USR(P
OKE,752,1,710,0):?"K:Insert destinati
on disk in drive "":OUT$(2,2)
WH 250 ? "and press any key...":POKE 764
,255:GET #2,K
YV 260 GRAPHICS 56:Q=USR(GR7PLUS):FOR I=0
TO 4:POKE 708+I,COL(I):NEXT I
HU 270 TRAP 380:OPEN #1,8,0,OUT$:TRAP 400
00
DW 280 ON DEST GOSUB 880,960,1000:CLOSE #
1
UF 290 GRAPHICS 0:SETCOLOR 4,11,4:SETCOLO
R 2,11,0:SETCOLOR 1,0,12:POKE 752,1:?"
Conversion complete."
DJ 300 ? "Filename .... "":OUT$:?"
EM 310 ? "COLOR REG COLOR LUMINAN
CE":?"
HV 320 FOR I=0 TO 4:COL=INT(COL(I)/16):LU
M=COL(I)-COL*16
EM 330 POSITION 6,I+7:?"I:POSITION 18-(C
OL>9),I+7:?"COL:POSITION 30-(LUM>9),I
+7:?"LUM
UE 340 POSITION 2,I+13:?"POKE "":708+I:?"
":COL(I):NEXT I:POKE 752,0:?"
AX 350 ? "Convert more pictures? (Y/N) ">
":GET #2,K:IF CHR$(K)<"Y" THEN ? CHR$(
K):?" :END
KZ 360 ? CHR$(K):CLOSE #2:CLOSE #3:TOP$=T
OP2$:GOSUB 1240:GOTO 20
AQ 370 REM ERRORS
TE 380 CLOSE #1:E=PEEK(195)
GV 390 GRAPHICS 0:?"Error #":E
XS 400 ? :?"Want to re-try? (Y/N)":?">
";
RQ 410 GET #2,K:IF CHR$(K)="Y" THEN RUN
VV 420 ? :END
AC 430 REM DISK DIRECTORY
LX 440 IN$(4)="*.*":OPEN #5,6,0,IN$:TRAP
470
LH 450 ? "K":POSITION 2,4
GF 460 INPUT #5:DIR$:?"DIR$:GOTO 460
NK 470 CLOSE #5
JW 480 IN$=IN$(1,3):RETURN
CE 490 REM INPUT FILENAME
YR 500 C=PEEK(85):R=PEEK(84)-(PEEK(84)=23
):INPUT #3:TEMP$:IF TEMP$="" THEN POSI
TION C,R:?">":GOTO 500
ZD 510 RETURN
QS 520 REM GET DRIVE NUMBER
GO 530 ? "(1 - 4) ">";
UG 540 GET #2,K:IF CHR$(K)<"1" OR CHR$(K)
>"4" THEN 540
ZG 550 ? CHR$(K):RETURN
CW 560 REM GET TYPE OF FILE
HM 570 ? "(1, 2, or 3) ">";
ZV 580 GET #2,K:K$=CHR$(K):IF K$<"1" OR K
$>"3" THEN 570
DQ 590 IF K$="1" THEN FMT$="--icro*)illustr
ator"
EK 600 IF K$="2" THEN FMT$="--icro*0ainter
"
RU 610 IF K$="3" THEN FMT$="--&un*with*rt"
```

```

GK 620 ? K$:RETURN
FH 630 REM LOAD MICRO ILLUSTRATOR FILE
SA 640 FOR I=1 TO 7:GET #1,BYTE:H2$(I)=CHR$(BYTE):NEXT I
HN 650 IF H2$(I)HEADER$ THEN GRAPHICS 0:?:? "ERROR! - ";IN$;" is not a":? "Micro Illustrator file.":? :POP :GOTO 400
IW 660 GET #1,TYPE:FOR I=1 TO 5:GET #1,BYTE:NEXT I
BB 670 FOR I=0 TO 4:GET #1,BYTE:COL(I)=BYTE:POKE 708+I,BYTE:NEXT I
QI 680 FOR I=1 TO 9:GET #1,BYTE:NEXT I
AQ 690 POKE 850,7:IF TYPE THEN Q=USR(POKE,852,ADR(INBUF$)):GOTO 710
OL 700 Q=USR(POKE,852,SCREEN)
WC 710 Q=USR(POKE,856,7680):Q=USR(IO,16)
YA 720 IF TYPE THEN Q=USR(ADR(INIT$),ADR(INBUF$),TYPE)
ZJ 730 RETURN
QT 740 REM LOAD MICRO PAINTER FILE
MF 750 Q=USR(POKE,850,7,852,SCREEN,856,7680):Q=USR(IO,16)
ME 760 GET #1,BYTE:COL(4)=BYTE:POKE 712,BYTE:FOR I=0 TO 2:GET #1,BYTE:COL(I)=BYTE:POKE 708+I,BYTE:NEXT I
ZR 770 RETURN
DE 780 REM LOAD FUN WITH ART FILE
UD 790 GET #1,BYTE:GET #1,B2
FF 800 IF BYTE<>254 OR B2<>254 THEN GRAPHICS 0:?:? "ERROR -";IN$;" is not a":? "Fun with Art file":? :POP :GOTO 400
LV 810 GET #1,BYTE:COL(4)=BYTE:POKE 712,BYTE:FOR I=0 TO 2:GET #1,BYTE:COL(I)=BYTE:POKE 708+I,BYTE:NEXT I

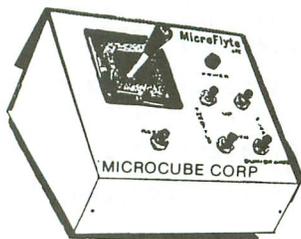
```

```

NL 820 FOR I=1 TO 256:GET #1,BYTE:NEXT I
ZB 830 Q=USR(POKE,850,7,852,SCREEN,856,4080):Q=USR(IO,16)
PW 840 FOR I=1 TO 16:GET #1,BYTE:NEXT I
DQ 850 Q=USR(POKE,852,SCREEN+4080,856,3600):Q=USR(IO,16)
ZQ 860 RETURN
FS 870 REM SAVE UNCOMPRESSED MICRO ILLUSTRATOR FILE
LZ 880 RESTORE 930:FOR I=1 TO 13:READ BYTE:PUT #1,BYTE:NEXT I
SD 890 FOR I=0 TO 4:PUT #1,COL(I):NEXT I
SQ 900 FOR I=1 TO 9:READ BYTE:PUT #1,BYTE:NEXT I
VA 910 Q=USR(POKE,850,11,852,SCREEN,856,7680):Q=USR(IO,16)
ZJ 920 RETURN
KW 930 DATA 255,128,201,199,26,0,1,0,14,0,40,0,192
QF 940 DATA 27,30,0,0,155,155,155,155,162
XW 950 REM SAVE MICRO PAINTER FILE
VK 960 Q=USR(POKE,850,11,852,SCREEN,856,7680):Q=USR(IO,16)
NL 970 PUT #1,COL(4):FOR I=0 TO 2:PUT #1,COL(I):NEXT I
ZV 980 RETURN
KH 990 REM SAVE FUN WITH ART FILE
VI 1000 PUT #1,254:PUT #1,254:PUT #1,COL(4):FOR I=0 TO 2:PUT #1,COL(I):NEXT I
OX 1010 Q=USR(POKE,850,11,852,ADR(PG6$),856,256):Q=USR(IO,16)
QT 1020 Q=USR(POKE,852,PEEK(88)+256*PEEK(89),856,4080):Q=USR(IO,16)
LW 1030 FOR I=1 TO 16:PUT #1,0:NEXT I

```

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Picture Storage *continued*

```

ID 1040 Q=USR(POKE,852,PEEK(88))+256*PEEK(
89)+4080,856,3600):Q=USR(IO,16)
DD 1050 PUT #1,0:PUT #1,0:RETURN
BK 1060 REM INITIALIZATION
WF 1070 DIM K$(1),IN$(15),OUT$(15),TEMP$(
18),TEMP2$(12),HEADERS$(7),H2$(7),FMT$(
17),DIR$(17)
YF 1080 DIM INBUF$(7680),PG6$(256),INIT$(
36),DL$(37),TOP$(120),TOP2$(120),POK$(
25),GR$(77),CNV$(48),COL(4)
IY 1082 GRAPHICS 0:?:?"Please wait for
initialization...":FOR I=0 TO 200:NEXT
I:POKE 559,0
PQ 1084 IO=ADR("hhhLUV"):HEADERS$="X2T6Lw
t"
HV 1090 RESTORE 5000:FOR I=1 TO 25:READ X
:POK$(I)=CHR$(X):NEXT I:LET POKE=ADR(P
OK$)
OO 1100 FOR I=1 TO 238:READ X:POKE 1535+I
,X:NEXT I
DA 1140 FOR I=1 TO 36:READ X:INIT$(I)=CHR
$(X):NEXT I
CT 1150 FOR I=1 TO 256:READ X:PG6$(I)=CHR
$(X):NEXT I
LJ 1190 FOR I=1 TO 77:READ X:GR$(I)=CHR$(
X):NEXT I:GR7PLUS=ADR(GR$)
PG 1200 FOR I=1 TO 48:READ X:CNV$(I)=CHR$
(X):NEXT I:CNV=ADR(CNV$)
RP 1210 FOR I=1 TO 37:READ X:DL$(I)=CHR$(
X):NEXT I:DL=ADR(DL$)
IR 1220 FOR I=1 TO 120:READ X:TOP$(I)=CHR
$(X):NEXT I:TOP=ADR(TOP$):TOP2$=TOP$
AT 1240 OPEN #2,4,0,"K":OPEN #3,12,0,"E":
:SETCOLOR 4,11,4:SETCOLOR 2,11,0:SETC
OLOR 1,0,12
IS 1250 SCREEN=PEEK(88)+256*PEEK(89)+120:
Q=USR(POKE,DL+4,TOP,DL+12,SCREEN,DL+35
,DL,560,DL)
AV 1260 RETURN
KO 5000 DATA 104,74,170,160,0,104,133,255
,104,133,254,104,240,4,200,145,254,136
RZ 5010 DATA 104,145,254,202,208,237,96
IA 5020 REM * 25 BYTES
WT 5100 DATA 132,213,132,207,177,203,8,32
,110,6,40,24,42,38,207,74,133,212
HY 5110 DATA 208,14,177,203,133,213,32,11
0,6,177,203,133,212,32,110,6,165,207
TA 5120 DATA 240,34,177,203,32,110,6,145,
205,166,214,224,2,208,6,32,215,6
FU 5130 DATA 76,60,6,32,117,6,198,212,208
,230,165,213,240,188,198,213,16,222
KQ 5140 DATA 177,203,133,209,32,110,6,165
,209,145,205,166,214,224,2,208,6,32
KN 5150 DATA 215,6,76,98,6,32,117,6,198,2
12,208,233,165,213,240,150,198,213
GI 5160 DATA 16,225,230,203,208,2,230,204
,96,24,165,205,105,80,133,205,144,2
DZ 5170 DATA 230,206,165,205,197,217,208,
42,165,206,197,218,208,36,165,208,208,
33
ZG 5180 DATA 230,208,24,165,215,105,40,13
3,205,165,216,105,0,133,206,24,165,217
GR 5190 DATA 105,40,133,217,144,2,230,218
,230,215,208,2,230,216,96,198,208,165
NU 5200 DATA 215,133,205,133,217,165,216,
133,206,24,105,30,133,218,24,165,88,10
5
TN 5210 DATA 40,170,165,89,105,0,228,205,
208,224,197,206,208,220,104,104,96,230
KM 5220 DATA 205,208,2,230,206,165,88,197
,205,208,205,165,89,24,105,30,197,206
JH 5230 DATA 208,196,240,230
BV 5240 REM * 238 BYTES
CD 5400 DATA 104,104,133,204,104,133,203,
104,168,104,133,214,165,88,133,205,133
,215
MY 5410 DATA 133,217,165,89,133,206,133,2
16,24,105,30,133,218,132,208,76,0,6
JH 5420 REM * 36 BYTES
MN 5500 DATA 112,112,112,78,0,80,14,14,14
,14,14,14,14,14,14,14,14,14
BV 5510 DATA 14,14,14,14,14,14,14,14,14,1
4,14,14,14,14,14,14,14
BY 5520 DATA 14,14,14,14,14,14,14,14,14,1
4,14,14,14,14,14,14,14
CB 5530 DATA 14,14,14,14,14,14,14,14,14,1
4,14,14,14,14,14,14,14
CE 5540 DATA 14,14,14,14,14,14,14,14,14,1
4,14,14,14,14,14,14,14
AH 5550 DATA 14,14,14,14,14,14,14,14,14,1
4,14,14,14,14,14,14,78
SG 5560 DATA 0,96,14,14,14,14,14,14,14,14
,14,14,14,14,14,14,14,14
CN 5570 DATA 14,14,14,14,14,14,14,14,14,1
4,14,14,14,14,14,14,14
CQ 5580 DATA 14,14,14,14,14,14,14,14,14,1
4,14,14,14,14,14,14,14
CT 5590 DATA 14,14,14,14,14,14,14,14,14,1
4,14,14,14,14,14,14,14
BU 5600 DATA 14,14,14,14,14,14,14,14,14,1
4,14,14,14,14,14,14,14
YP 5610 DATA 14,65,0,6,104,170,104,141,1,
2,232,208,3,238,1,2,142,0
OP 5620 DATA 2,104,170,104,64,169,0,141,0
,2,169,0,141,1,2,169,192,141
OJ 5630 DATA 14,212,76,95,228,0,0,0,0,0,0
,0,0,0,0,0,0
IB 5640 DATA 0,0,0,0
CE 5650 REM * 256 BYTES
GN 5800 DATA 104,173,48,2,24,105,3,133,20
3,173,49,2,105,0,133,204,160,0
XO 5810 DATA 177,203,201,79,208,21,169,78
,145,203,165,203,24,105,2,133,203,165
JI 5820 DATA 204,105,0,133,204,169,0,240,
15,201,15,208,6,169,14,145,203,208
TZ 5830 DATA 5,201,65,208,1,96,165,203,24
,105,1,133,203,165,204,105,0,133
LP 5840 DATA 204,169,0,240,197
MH 5850 REM * 77 BYTES
AZ 6200 DATA 104,104,133,204,104,133,203,
104,168,133,253,104,133,205,6,253,177,
203
AD 6210 DATA 10,102,253,74,201,32,176,5,2
4,105,64,144,7,201,96,176,3,56
HK 6220 DATA 233,32,5,253,145,203,200,196
,205,208,223,96
KT 6230 REM * 48 BYTES
OA 7000 DATA 112,112,80,66,0,0,32,2,0,2,1
6,66,0,0,2,2,2,2
OA 7010 DATA 2,2,2,2,2,2,2,2,2,2,2,2,2,2,
2,2,65,0
JH 7020 DATA 0
JR 7030 REM * 37 BYTES
OS 8000 DATA 128,128,176,169,163,180,181,
178,165,128,163,175,174,182,165,178,18
0,165
RE 8010 DATA 178,128,226,249,128,163,232,
225,242,236,229,243,128,170,239,232,23
8,243
WE 8020 DATA 239,238,128,128,128,166,242,
239,237,154,0,0,0,0,0,0,0,0
EO 8030 DATA 0,0,0,0,0,0,0,0,0,0,124,0,0,0,
0,0,0,0
NY 8040 DATA 0,0,0,0,0,0,0,0,128,128,128,
180,239,154,0,0,0,0
IE 8050 DATA 0,0,0,0,0,0,0,0,0,0,0,0,12
4,0,0,0,0
CK 8060 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0
MW 8070 REM * 120 BYTES

```



Textually graphic

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Some advice to help the beginning programmer create attractive displays.

by Clayton Walnum

If you're a beginning programmer, you've got your hands full. No question about that. You've been tussling with weird commands like PEEK and POKE, banging your head against the computer desk, trying to get that nonsense about variables and arrays and strings and other computer esoterica forced between your ears. Let's face it: though the rewards are plentiful, learning to program is not an unpainful experience. To newcomers in the world of bits and bytes, the technical side of programming can be overwhelming. You may thrust other issues (including sleep, food and drink) into a dark place, where they'll lay inert and unnoticed until you snap from your obsession and drag them back to the fore. There lies the danger.

Though you'll be forced—eventually—to eat and sleep, some of those programming distractions you tossed aside will reawaken only once you've realized they're no longer in attendance. What am I getting at? The fact is, a program is written in two levels: the technical and the human level. A lack of attention to either will affect the success of your final effort. Since the human level is something that comes under the heading of "polishing it up," it's frequently overlooked by the novice—who's more concerned with "getting the darn thing to run at all." Simple oversights grow to bad habits.

The first sign of an amateur programming effort is the way text screens look. So, in this article, we'll explore some simple methods for displaying information attractively and logically. We won't be doing anything too fancy; most of these techniques are embarrassingly simple—but you'd be surprised how often programmers (even experienced ones) take the lazy way out.

From the beginning.

The first step toward making your text displays more pleasing and easier to read is to preface PRINT commands with a POSITION statement. POSITION lets you place the cursor anywhere on the screen, using X,Y-coordinates. The X-coordinate is the number of characters to the right you want the cursor to appear, and the Y-coordinate is the number of characters down from the top of the screen. Using the POSITION statement before PRINT lets you place text anywhere on the screen (in graphics 0, the text screen is 40x24 characters).

It may take some character counting and experimenting to get the final result just right, but nothing worthwhile is free. Your extra effort will be apparent in the final product. For instance, text—especially in graphics 0—is easier to read when it's double spaced, and centering the text on the screen gives it a little extra pizzazz.

Type in the following sample and run it. To end the program, press SYSTEM RESET.

```
10 GRAPHICS 0:?"WHAT IS MORE APPEALING TO YOU? SEEING THE TEXT PRINTED TO THE SCREEN WITH NOFORMATTING EFFORT?"
20 ? :?"OR...":FOR X=1 TO 3000:NEXT X
30 GRAPHICS 0:POKE 752,1:POSITION 7,8:?"A NICELY FORMATTED SCREEN,"
40 POSITION 7,10:?"WHERE CARE HAS BEEN TAKEN":POSITION 4,12:?"IN THE POSITIONING OF THE TEXT?"
50 GOTO 50
```

See what I mean?

A rainbow at your fingertips.

The Atari 8-bit computers are capable of displaying 256 colors (though not all at the same time, unless you use some advanced programming techniques). They're there for a reason: for you to use. Every time you turn on your

Textually graphic *continued*

computer, it sets up the default colors and presents you with that boring blue-and-white screen. It doesn't take too long for even the casual user to get sick of that combination. When they run a piece of software, they want to see something *different*.

As a programmer, don't resort to the lazy way out—don't stick with our old friend "blue and white." Unfortunately, this isn't quite as simple as it sounds. Oh, sure, changing the background color is easy; just a simple SET-COLOR or POKE will do the trick. But what about the text? If you've ever experimented with changing text color, you've discovered a slight problem. The following short program will cycle through all possible text colors.

```
10 GRAPHICS 0:POSITION 12,10:? "THIS I
5 A TEST"
20 FOR X=0 TO 255:POKE 709,X
30 FOR Y=1 TO 50:NEXT Y:NEXT X
```

How does it look? Don't see many colors, do you? The text just seems to step through the shades of gray, from almost black to white. What's going on here? Where are all those colors I promised you? Was I making all that up?

Nope. We cycled through all the possible text colors. But the lines that make up the text, being only one or two screen dots (pixels) wide, tend to take on the color of the background. If you examine a normal graphics 0 screen, you'll see that text is not really white, but has a faint blue tinge.

Well, that's just great, huh? Now what the devil do we do? The solution is to take advantage of that "background bleed." Set the text color to white, and it'll take on the shade of the background. Want to make your Atari look more like those terminals with the black background and green text? Run this:

```
10 GRAPHICS 0:POKE 752,1:POKE 709,12:P
OKE 710,160
20 POSITION 7,8:? "JUST A SIMPLE COLOR
CHANGE":POSITION 9,10:? "CAN IMPROVE
THE LOOKS"
30 POSITION 12,12:? "OF YOUR SCREEN."
40 GOTO 40
```

The background color here is changed to dark green, giving the "white" text a greenish tint.

You've probably noticed by now that I tend to avoid the SETCOLOR command and, instead, change the color registers with a POKE. Either method works fine; I got used to the latter, since it's easier to type and makes more sense to me (in a warped sort of way). Color register 709 is the text, and color register 710 is the background color (in graphics 0). The value to POKE is the color times 16, plus the luminance. Here's a modification of an earlier example, which will let you see the effect the sixteen background colors (at the lowest luminance) have on white text.

```
10 GRAPHICS 0:POKE 709,12:POSITION 12,
10:? "THIS IS A TEST"
20 FOR X=0 TO 255 STEP 16:POKE 710,X
30 FOR Y=1 TO 300:NEXT Y:NEXT X
```

More colors, bigger text.

I remember how, in the early days of my programming career, I used to wonder where other programmers were getting those text screens with the oversized characters. After a few hours of pawing through manuals, I discov-

ered graphics 1 and 2. These special text modes not only allow you to use two larger character types, but they let you do it in four colors (five, if you count the background). In a graphics 1 display, the character height is the same as in graphics 0, but twice as wide. In graphics 2, the characters are twice as wide and twice as high.

However, these text modes require special handling (you already guessed that, right?) First of all, you can't just PRINT to the screen. If you try, the screen will automatically return to graphics 0 before printing your text. You must use a special form of the PRINT command that looks like this: PRINT #6; "TEXT". By adding the #6;, you're telling your computer you want the text printed via I/O channel 6, which is specially set up to handle the large text.

Another thing you have to be aware of: the graphics 1 and 2 text displays *do not* scroll. If you try to print more text than the screen will hold, you'll get an error.

To access these two special text modes: you must first perform a GRAPHICS 1 or GRAPHICS 2 command (if you add 16 to the graphics number, you'll get rid of the graphics 0 window at the bottom of the screen; see the listing below). Now, use the POSITION and PRINT #6; commands to place the text on the screen. Different text colors can be obtained by using uppercase, lowercase, normal or inverse video characters. Only uppercase letters will appear, but they will be in different colors. To see how these text modes work, type the following program and run it.

```
10 MODE=17
20 GRAPHICS MODE:POSITION 3,0:? #6;"wa
nt your text":POSITION 3,2:? #6;"to st
and out?"
30 POSITION 0,4:? #6;"the graphics 1 o
r 2":POSITION 2,6:? #6;"MultiColor tex
t"
40 POSITION 4,8:? #6;"modes may be":PO
SITION 4,10:? #6;"just right."
50 IF MODE=18 THEN 70
60 MODE=18:FOR X=1 TO 2500:NEXT X:GOTO
20
70 GOTO 70
```

On the border.

If you own a 130XE, you've no doubt noticed those funny symbols on the front edge of each key. These are special graphics characters that can be printed to the screen just like text, enabling you to construct designs and borders. Those of you with 400, 800, or XL computers can use these characters, too; they're just not printed on the keys.

These graphics characters are also called "control" characters, because you must hold down the CONTROL key to access them. Go ahead and try it. Hold down the control key (located to the keyboard's left) and press the letter S. You get a cross, right? All the other graphics characters are accessed the same way.

Screen borders are another way of making your text screens more attractive. You can use any combination of graphics characters, to create as fancy a border as you wish. Here's a simple example:

```
10 DIM B$(36):B$="|
|"
20 GRAPHICS 0:POKE 752,1:POKE 709,12:P
OKE 710,160
```

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Textually graphic *continued*

```

30 POSITION 2,1:? " _____
   "
40 FOR Y=2 TO 20:POSITION 2,Y:? B$:NEX
T Y
50 POSITION 2,21:? " _____
   "
60 POSITION 9,8:? "A SIMPLE SCREEN BOR
DER":POSITION 12,10:? "PLEASES THE EYE
"
70 POSITION 8,12:? "AND UNIFIES THE DI
SPLAY."
80 GOTO 80

```

Using the graphic characters to construct a chart helps you organize data on the screen, making it easier for the user to read and interpret the information. Run this program to see how a chart of this type may look on your screen:

```

10 GRAPHICS 0:POKE 752,1:POKE 709,12:P
OKE 710,160
15 ? " _____ "
20 ? " | "
25 ? " | If you have a lot of data | "
30 ? " | to display, you can take | "
35 ? " | the border idea one step | "
40 ? " | further, and set up a well | "
45 ? " | organized chart. | "
50 ? " | _____ | "
55 ? " | TITLE | "
60 ? " | ITEM 1 COMMENT | "
65 ? " | ITEM 2 COMMENT | "
70 ? " | ITEM 3 COMMENT | "
75 ? " | ITEM 4 COMMENT | "
80 ? " | _____ | "
90 GOTO 90

```

You can easily change the information displayed on-screen, without having to redraw the chart, by using the POSITION command to print new information on top of the old. In my text adventures, *Nightshade* (issue 36) and *Mr. Scratch* (ST-Log 1, April 1986), I used the chart method to organize information the player needs to know.

You can generate sophisticated displays with a little planning and practice. Use a sheet of graph paper to design the chart; this will avoid a lot of trial-and-error programming.

Getting fancy.

Some of you may be aware of the method used for getting more than one graphics mode on the screen at one time. For those of you who haven't had any experience with this technique, bear with me. There's no room here to go through this method fully, but I'll give you a quick explanation.

There's a special program in your computer's memory, called a "display list." This program is written in a form of machine language that the ANTIC chip uses, and is responsible for the way information is displayed on your screen. Essentially, it's a list of graphics modes, one mode for each line on the screen. If we know how to handle the display list, we can mix different graphics modes on the same screen.

What does this do for us? Well, first of all, we can access all three text modes, graphics 0, 1 and 2, at the same time, and place them anywhere we want on the screen. Second, we can get two different background colors on the screen, without having to bother with fancy stuff like display list interrupts (DLIs), because graphics 1 and 2 use a different background color register than does graphics 0. With all those text sizes and different colors available

to us, we can create some very special displays. Run the following program as an example.

```

10 GRAPHICS 0:POKE 752,1:POKE 709,12:P
OKE 710,98:DL=PEEK(560)+256*PEEK(561)+
4
20 POKE DL-1,71:POKE DL+2,7:POKE DL+20
,6:POKE DL+21,6:POKE DL+22,6
30 POKE DL+23,65:POKE DL+24,PEEK(560):
POKE DL+25,PEEK(561)
40 POSITION 23,0:? "display title":POS
ITION 24,18:? "USER PROMPT"
50 POSITION 5,4:? "A SIMPLE MODIFICATI
ON TO THE":POSITION 5,6:? "DISPLAY LIS
T CAN GIVE YOU"
60 POSITION 5,8:? "SEVERAL TEXT SIZES,
AS WELL":POSITION 5,10:? "AS DIFFEREN
T BACKGROUND COLORS"
70 POSITION 5,12:? "(WITHOUT RESORTING
TO TRICKY":POSITION 5,14:? "DISPLAY L
IST INTERRUPTS)."
80 GOTO 80

```

If you don't understand modified display lists, you can still use the above program to design your own screens. The code in Lines 10 through 30 must remain exactly as it is (except you may renumber the lines), but any of the other lines can be changed to print whatever text you'd like. You'll have to experiment a little with the POSITION statement, though, since the changes to the display list affect text positioning on the screen.

On your way.

Now you can get back to your keyboard and manuals. I wish you the best of luck in your programming future. Study hard, practice constantly, and become as fluent in BASIC as you are in English. Just don't forget who you're programming *for*, don't let bad habits creep in, and don't be sloppy. Your programs will be judged as much by their appearance as their usability. Give them the chance they deserve. 

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Bits & Pieces

by Lee S. Brilliant, M.D.

Mouse \ˈmaʊs\ noun (Latin mus): a small beige creature that crawls around desktops and has a long tail which plugs into computers.

For years, computer designers have been looking for the ultimate way to control the computer. Before the mouse, they used keyboards, joysticks, light pens, touch screens, touch tablets, trak balls, etc. Why would anyone want to recover old ground and make a new input device?

Well, in this case, for two reasons: first is the educational value inherent in building something unique, and second, because there's always a better mousetrap! All devices have shortcomings—including mice (or is that mouses as in houses?) But the primary purpose of building Rodent is to learn about the analog, or so-called paddle, inputs to the joystick ports.

Plumbing.

In describing electrical systems, textbooks often compare circuits to plumbing. A house has pipes through which water flows at various pressures and rates. The rate of flow is determined by the size of the pipe (or how much resistance to flow) and the pressure behind the water. Similarly, electrical flow, or current, is dependent on how much resistance to flow there is, and how much voltage, or electrical pressure, is available.

Along a similar line, the time it takes to fill up a bucket of water depends on the flow of water and how big the bucket is. In electronics, the bucket is called a *capacitor*, which is measured in *farads*. However, a 1-farad capacitor would likely fill a clos-

et, so most capacitors are rated in microfarads or smaller. Resistance is produced by a resistor and is measured in *ohms*. The time it takes to fill our electronic bucket thus depends on the size of the capacitor and resistor (see Figure 1).

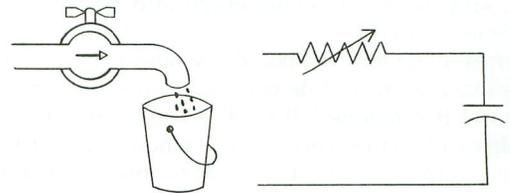


Figure 1. — Buckets.

Atari capacitors are .047 microfarads, and voltage is 5 volts. The time to fill up the capacitor is proportional only to the number of ohms in the resistor. Using a variable resistor, or volume control, you can vary the time it takes to fill the capacitor, proportional to the setting of the volume control.

You're familiar with the old paddle controller, which is nothing more than a volume control with a value of 150,000 ohms in a box attached to the joystick port. The computer can work backwards to measure the resistance, by counting how long it takes to fill the capacitor. This is accomplished by dumping the charge in the capacitor at the start of each screen and counting how many TV scan lines it takes to refill it. The timing and counting is done by POKEY, and the values for each paddle are found in locations 53760 to 53767. They are then copied down by the operating system to locations 624 to 631 during the vertical blank period.

Note: only the first half of these registers will function on XL/XE computers. So when the paddle is ful-

ly counter-clockwise, the resistance is 0, and it takes 0 scan lines to charge up the capacitor. Conversely, at maximum resistance the capacitor takes more than 228 scan lines to charge, so the maximum value of 228 is read. In between, settings of the paddle will give intermediate values in the registers. The maximum of 228 was chosen to match player/missile graphics.

Doing some good.

Almost any electronic device which varies resistance *can be attached here*. You could attach a photocell (Radio Shack 276-116), a device that changes resistance with light. Attaching one of these allows your computer to measure light levels (see Figure 2).

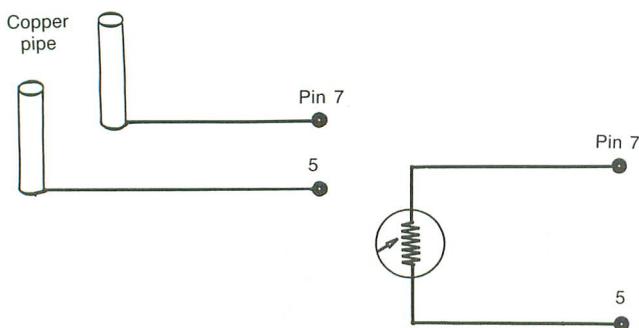


Figure 2. — Photocell light detector.

There are also devices called *thermistors*, which vary resistance according to temperature. One of these would allow you to measure the temperature of air, water, ice cream, and so on. These are essentially the same as the Atari Science Labs released a couple of years ago. Two bare wires, mounted on a board just above your swimming pool water line, would detect wave motion in the swimming pool if someone fell in. I've even seen an application where a two-piece arm was attached to a board, using volume controls for the joints. The position of the arm could be known by the computer, so its motions could be plotted onto a screen—forming a crude type of graphics tablet. Similarly, the position of a door, the level of a float in a water tank and many other things can be measured, using a little imagination and some carpentry. Volume controls come in linear or logarithmic gradations (also called *audio taper*). Use the linear variety for most applications.

Another idea is to put two pieces of copper pipe into the ground and connect them to the paddle input. Now the ground's water content is reflected in the values read from the paddle inputs. The more moist the ground, the lower the number. This could be part of a "smart" sprinkler controller. Or hold the pipes in your hands and measure your body resistance. The sweeter your palms, the lower your resistance. Use it with the following program:

```
10 GRAPHICS 2:POSITION 3,5: ? #6;"LOVE
QUOTIENT"
20 P=PADDLE(0):IF P=228 THEN SOUND 0,0
,0,0:POKE 712,80:GOTO 20
30 SOUND 0,P,10,10:POKE 712,95-(P/15):
GOTO 20
```

Meanwhile, back in the mousehole. . .

Have you ever noticed: all ads for mouse-controlled

computers show them on endless work surfaces—with no peripherals in the way? If your computer's like mine, you have wires all over, two disk drives, a printer, a TV, a monitor, a few disks, an old bowl of ice cream—all occupying space on the same small desk! How is one supposed to use a mouse without space? I've seen cursor controllers using touch tablets, but they too are bulky and often require two hands for the stylus and pushbuttons.

Rodent is a little different (and I think better), because it: occupies little space and doesn't move around; requires only one hand to operate; is inexpensive (under \$20.00); is transparent to normal keyboard operation, but allows "instant" cursor placement on-screen; can be used for text and graphics; and *I invented it!* So what is this \$20.00 technical marvel?

Rodent is a modified Radio Shack joystick that differs from the Atari model in a major way. The Atari contains four switches indicating only the direction of movement, while the Rodent contains two volume controls showing the actual position of the joystick handle (the resistances of the two volume controls being proportional to the handle positions in x- and y-coordinates. The position of the cursor can be moved as fast as you can accurately move the handle. In fact, it's possible to move the cursor from one margin to the other in $\frac{1}{60}$ second. The joysticks are \$20.00 a pair and require about \$6.00 in additional parts, each. Find a friend; you each have one for less than \$20.00. With the programs listed, you'll have a truly useful editor/controller and graphics gadget.

Building Rodent.

There are two modifications to be made to the joystick before it can be used with the Atari. First, cut off the existing 5-pin DIN plug and save it for a later project. Carefully strip back the cable sheath about 1", then strip and solder the ends of each wire to the 9-pin "D" plug, according to Figure 3. Modify the hood by breaking off the tabs that wrap over the plug. Now, assemble the hood over the plug and attach to the plug with small screws, hot melt or epoxy glue, and tighten the strain relief screw.

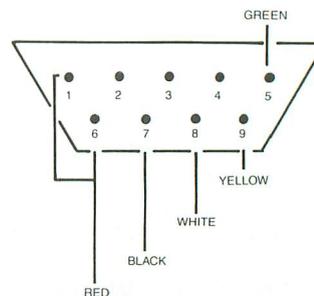


Figure 3. — Pin assignments.

Second, open the joystick by removing the two screws on the back. Remove the red wire which joins the two volume controls, then cut the white wire off the volume control. There are two green wires; the one we want goes to the fire button. Cut it at the volume control. Solder one wire from C1 to the center lead of one volume control, and one wire from C2 to the other control's center lead. Finally, sol-

der the free wires from C1, C2, and the free green and white wires together. When done, it should look like Figure 4.

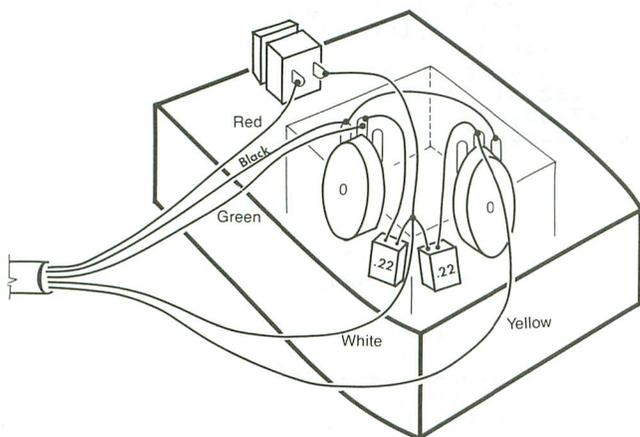


Figure 4. — Wiring diagram.

Now, close up the joystick and insert it into plug 1. PEEK(624) and PEEK(625) should yield 0s when the joystick is in the left upper corner, and 228s when in the right lower. Intermediate positions should yield intermediate results. PADDLE(0) and PADDLE(1) will do the same.

The variable resistors in the joysticks are only 50,000 ohms. When used with the Atari analog inputs, they only yield values between 0 and 44. In order to get full values, we either need to replace the resistors with larger ones, or we need larger capacitors to increase the size of our electronic bucket and the time it takes to charge it up. This is why we add the .22 microfarad capacitors—to produce full-scale readings with resistors which are too small.

Rodentsoft.

Type in Listing 1 and save it to disk (I used AUTORUN.BAS), then run. It reads the data and builds a string containing the machine code. After all the data has been read, the string is written to disk as AUTORUN.SYS. Be sure you have no other AUTORUN.SYS files on that disk. Now, turn your computer off and on again. Your disk will boot up as before, but the cursor will wind up in the lower right corner of the screen. Occasionally, you may get an ERROR 141 on booting, but it isn't significant.

Without Rodent plugged into port 1, the screen editor will behave no differently than before. But, plug in Rodent and move the joystick around. You'll see the cursor move around on the screen and see that it moves as fast as you can reposition the joystick. Now, try typing in lines in BASIC, and you'll find that not only does the cursor move, but the editor also knows where your cursor is. So, you can LIST a portion of your BASIC program, then position the cursor and make corrections, then press RETURN or the fire button, and the new line will be entered (or executed in immediate mode). The effect is exactly like using the cursor control keys on the keyboard to move the cursor—only much faster. It's also just like using the mouse on the 520ST—even down to the noise!

Rodent works by checking the paddle shadow registers every vertical blank cycle and, if different from the previ-

ous blank cycle, it will update the screen's cursor position registers, then enter a cursor-up character to the editor to force an update of the editor's working location of the cursor. Without this step, the cursor will move and your typing might show up on Line 5, but the editor will still be working on Line 21! The printing of the cursor-up character causes a keyclick, which can be turned off on the XL/XE by POKEing 255 into location 731(\$02DB). The carriage return generated by pressing the trigger button is followed by a 1-second delay. Using the keyboard will lock out Rodent, preventing competition for the editor. If the cursor is not moved by Rodent, or if Rodent is not connected, then nothing will happen. Rodent functions only in immediate mode, or when the screen editor is working, as in INPUT A\$, GET #1,L, or similar commands.

Rodent works with DOS, but I can't imagine a good use. You can defeat Rodent by calling $A = USR(1552)$ and re-establish it with $A = USR(1536)$. The program barely resides in page 6, but can be assembled anywhere in RAM if you type in Listing 2 and assemble it to disk as AUTORUN.SYS.

Now, type in and run Listing 3. This simple BASIC program demonstrates how to use Rodent in graphics programs. In fact, Rodent is compatible with some programs that use touch tablets. To work as a tablet, pin 1 is used instead of pin 6. Connecting both pin 1 and the trigger together allows Rodent to work for text/games or as a touch tablet. I use mine with **Rambrandt**, a graphics program from APX, and with **Music Construction Set**, where it emulates a **KoalaPad**.

Final notes.

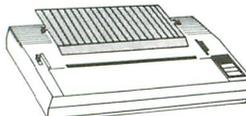
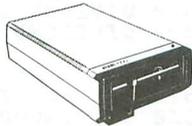
In addition to the many ideas above, there are many other possible uses. For example, for fast arcade games, Rodent could control cross hairs for your laser cannons. Also, using Rodent, you could replace the real cursor with a player cursor that could be any shape you define: an arrow, a pointing finger, or you could even make it blink! Tom Hudson produced this cursor in **ANALOG Computing's** issue 23. Such a cursor would move more smoothly than the normal cursor and could mimic the action of a real mouse. C'mon, all you programmers out there, fire up your assemblers and let's see some action!

Now you know about the analog inputs to the joystick ports. Even though computers are digital devices, we basically live in an analog world. Clocks are still round and have sweep hands, your car's gas gauge and speedometer are round; and the volume controls on most radios still don't request binary input. It seems natural that we should use analog inputs to computers, but lately they seem to be ignored. Well, no longer. Here comes Rodent!

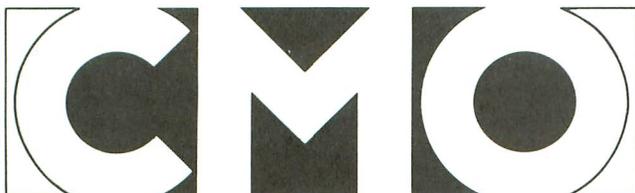
This article concludes the part of this series which deals with the joysticks. Next month we'll see what you can do with the plug you cut off your joystick. ■

An Obstetrician-Gynecologist by day, Lee Brilliant, M.D. turns into a bug-eyed computer monster by night. He started in 1983 with a TI 99/4A and rapidly moved to Atari. He's programmed on Apple, TI, Commodore and IBM, but

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Bits & Pieces *continued*

```

0590 CLD
0600 LDA PADDLEY ;CHECK STICK POS
0610 STA DIVIDEND ;FACTOR FOR
0615 ; 40 COLUMNS
0620 LDA #9 ;DIVIDE BY 9
0630 STA DIVISOR
0640 JSR DIVIDE
0650 LDA DIVIDEND ;AVERAGE 3 TIMES
0660 CLC
0670 ADC YTEMP ;SUM ALL 3
0680 STA YTEMP
0690 LDA PADDLEX ;DO SAME FOR X
0700 STA DIVIDEND
0710 LDA #5 ;FACTOR BY 5
0720 STA DIVISOR
0730 JSR DIVIDE
0740 LDA DIVIDEND ;AVERAGE 3 TIMES
0750 CLC
0760 ADC XTEMP ;SUM ALL 3
0770 STA XTEMP
0780 INC COUNT ;THREE TIMES?
0790 LDA COUNT
0800 CMP #3
0810 BNE EXIT2 ;NO, EXIT
0820 ;FIND AVERAGES
0830 LDA #3
0840 STA DIVISOR
0850 LDA YTEMP
0860 STA DIVIDEND
0870 JSR DIVIDE
0880 LDY DIVIDEND
0890 LDA XTEMP
0900 STA DIVIDEND
0910 JSR DIVIDE
0920 LDX DIVIDEND
0930 LDA #0 ;CLEAR REGISTERS
0935 ; AND COUNTERS
0940 STA XTEMP
0950 STA YTEMP
0960 STA COUNT
0970 CPX KOLD ;CHECK AGAINST
0975 ; OLD SETTINGS
0980 BNE NEWPOS
0990 CPY YOLD
1000 BNE NEWPOS
1010 EXIT LDA TRIG0 ;IF SAME CHECK
1015 ; TRIGGER FOR RETURN
1020 BNE EXIT2 ;NO THEN EXIT
1030 LDA #RETURN ;YES, CREATE CARR
1035 ; IAGE RETURN
1040 STA CH ;FOOL EDITOR
1050 LDA #60 ;SET DEBOUNCE
1055 ; FOR 1 SECOND
1060 STA KEYDEL
1070 EXIT2 JMP HITVBU ;LEAVE VBI
1080 NEWPOS STX KOLD ;SAVE NEW X COORD
1090 CPX RMARGIN ;CHECK RT MARGIN
1100 BMI XLOTST ;CHECK L MARGIN
1110 LDX RMARGIN ;X>RMARGIN,
1115 ; USE R MARGIN
1120 JMP STOREX
1130 XLOTST CPX LMARGIN ; CHECK LEFT
1135 ; MARGIN
1140 BPL STOREX
1150 LDX LMARGIN ;X<LEFT,
1155 ; USE L MARGIN
1160 STOREX STX COLCRS ;SET CURSOR COL
1170 STY YOLD ;SAVE NEW ROW
1180 CPY BOTSCR ;CHECK AGAINST
1185 ; BOTSCR
1190 BMI STOREY ;TOO BIG USE 23
1200 LDY BOTSCR
1210 DEY
1220 STOREY INY ;INCREMENT ROW
1225 ; BEFORE SETTING CURSOR
1230 STY ROWCRS ;TO OFFSET THE
1235 ; UP CURSOR
1240 LDA #CRSRUP ;IN THIS COMMAND

```

```

1250 STA CH ;FOOL SCRIN EDITOR
1260 JMP HITVBU ;DONE
1270 DIVIDE LDA #0 ;DIV SUBROUTINES
1280 LDX #8
1290 NXTBT ASL DIVIDEND
1300 ROL A
1310 CMP DIVISOR
1320 BCC CNTDN
1330 SBC DIVISOR
1340 INC DIVIDEND
1350 CNTDN DEX
1360 BNE NXTBT
1370 RTS
1380 ;
1390 ;*****
1400 ;*WORKSPACES*
1410 ;*****
1420 ;
1430 KOLD .BYTE 0
1440 YOLD .BYTE 0
1450 XTEMP .BYTE 0
1460 YTEMP .BYTE 0
1470 COUNT .BYTE 0
1480 DIVISOR .BYTE 0
1490 DIVIDEND .BYTE 0
1500 ;
1510 ;
1520 *= INITAD ;SELF BOOT ADDR
1530 .WORD INIT+1

```

Listing 3.
BASIC listing.

```

LD 10 REM *****
YE 15 REM *MOUSER GRAPHICS TABLET*
YL 20 REM * by Lee Brilliant *
LZ 25 REM *****
BA 30 REM
BY 35 REM USE '1', '2', OR '3' TO CHOOSE
A COLOR
BB 40 REM
ED 50 REM PRESS BUTTON TO DRAW
BM 55 REM
HY 100 GRAPHICS 7:KEYPRESS=764:N=1:OPEN #
1,4,0,"K":POKE 752,1:?" " ***** MOU
SER GRAPHICS TABLET ****":GOTO 160
PO 110 X=PADDLE(0):Y=PADDLE(1):IF X>159 T
HEN X=159
BY 120 IF Y>79 THEN Y=79
XL 130 IF X<>KOLD OR Y<>YOLD THEN 160
VF 140 IF PEEK(KEYPRESS)<>255 THEN 200
MO 145 GOTO 110
MB 150 GOTO 110
UB 160 IF STRIG(0)=0 THEN DRAWTO X,Y:KOLD
=X:YOLD=Y
TA 170 COLOR 0:PLOT KOLD,YOLD:KOLD=X:YOLD
=Y
HE 180 COLOR N:PLOT X,Y:GOTO 110
RU 200 GET #1,N:N=N-48:IF N<1 OR N>3 THEN
110
OT 210 GOTO 180

```



Panak strikes!

Reviews of the latest software

by Steve Panak

We've all made it to another year, so I thought it might be a good time to take a look back. In 1986, the ST breathed some life back into the sagging home computer market. The excitement even spilled over to the 8-bits, resulting in strong sales for two new models. And let's not forget the software.

Arcade wrist-busters like **Super Boulder-Dash** flooded the market. Adventures, like **Trinity**, **Ultima IV**, and the **Wizard's Crown** took us to new worlds. Of course, there were failures. . . many failures. And though a majority of the games were mediocre, the gems in the bunch more than made up for it.

Yes, 1986 had some great games. I only hope that 1987 continues this trend. The way my current workload looks, it will.

So, without further ado, here they are, the first games of the new year. Enjoy.

Fight Night

by The Sydney Development Corp.

ACCOLADE

20833 Stevens Creek Blvd.

Cupertino, CA 95014

48K Disk \$29.95

Accolade has exploded onto the software scene this year, with no less than three sporting simulations. The one I'm looking at this month, **Fight Night**, breaks little new ground. Yet it's still a well developed and packaged product, which will disappoint few sports fans.

Fight Night is a boxing simulation quite similar to the arcade version popular a cou-

ple years ago. In this game, you square off against a succession of six fighters, slugging your way up through the ranks. From the scrawny Dipstick (weakness: light in the head) to the mighty Bronx Bomber (weakness: none), these fighters have enough differences to keep it interesting. And if, after a while, these bruisers become boring, you can build your own.

The program contains a boxer construction set. Using this option, you fill your stable with up to twenty-four customized combatants. You can combine a number of body parts and statistics to build these bullies, then save them on disk for use in future thrillers. While this was a nice feature, the variables available are rather limited. For instance, you choose a head, arms, trunk and legs from pools of six each. This constraint is probably a function of the computer's graphics limitations. But, while this program makes good use of graphics, the images are still nondescript. You also assign power and resistance factors, and intelligence if the fighter is to be computer controlled.

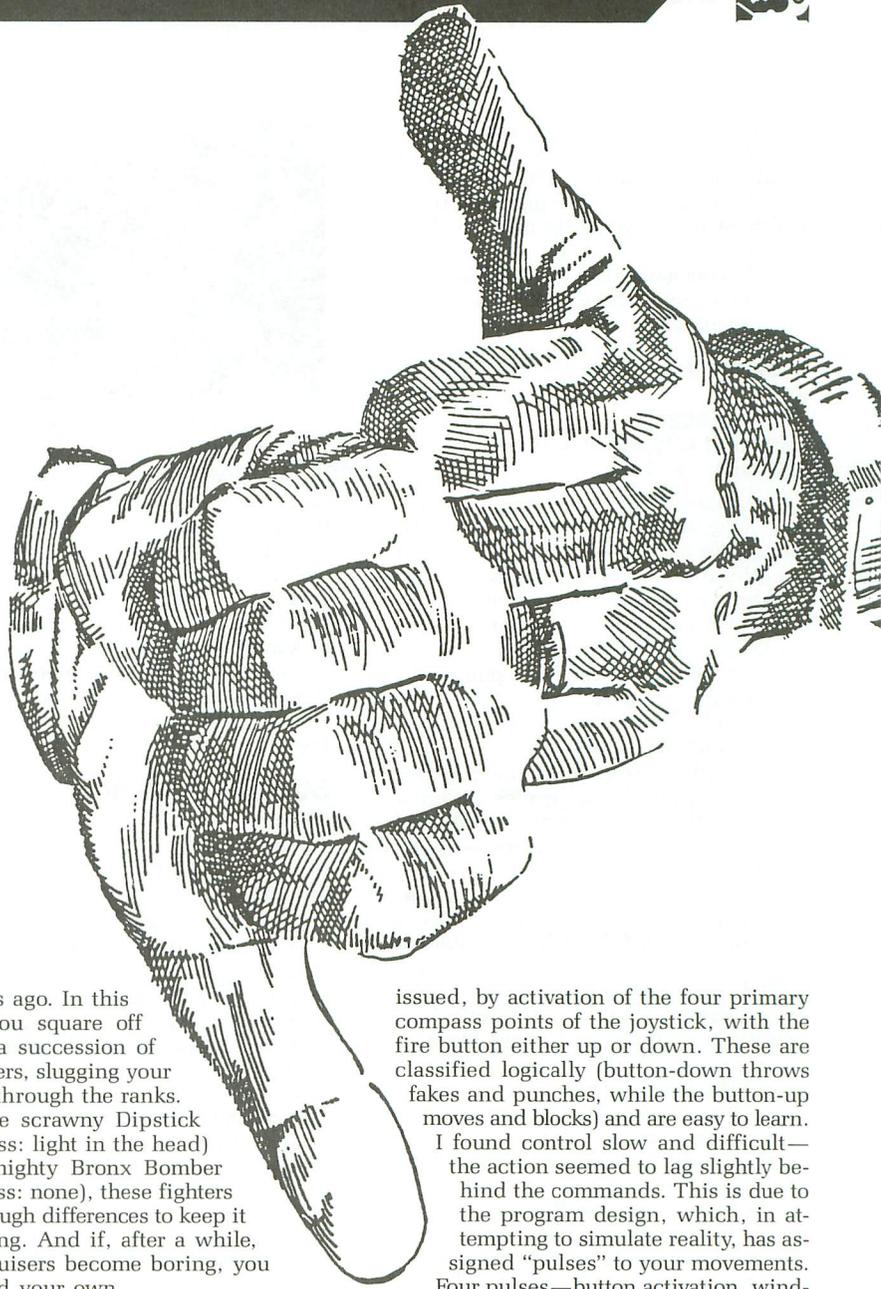
Your machine can play for one or both of the on-screen fighters, or two humans can slug it out. Eight commands may be

issued, by activation of the four primary compass points of the joystick, with the fire button either up or down. These are classified logically (button-down throws fakes and punches, while the button-up moves and blocks) and are easy to learn.

I found control slow and difficult—the action seemed to lag slightly behind the commands. This is due to the program design, which, in attempting to simulate reality, has assigned "pulses" to your movements. Four pulses—button activation, wind-up, swing and follow-through—make up any punch.

There are five play options: boxing, where you work yourself up past six challengers of increasing difficulty; construction; training, which lets you practice on joystick control against a constructed fighter; sparring, for two boxers to practice against each other; and tournament play, where two players set up a tournament, negotiating the best fight schedule to make one the champ.

As for packaging, Accolade has adopted what I call the record-album format of software containers. The tri-folded covers are similar to small albums and are infinitely superior to the bulky boxes many manufacturers still use. The manual for the game was complete. Diagrams allow you to learn the moves easily and also serve





Panak strikes! *continued*

as handy references, while the short history of boxing given was a nice extra.

All things considered, **Fight Night** was not a knockout. It had a number of flaws which might disappoint the most avid boxing fan. On the other hand, there aren't a lot of boxing games out there—this is the first I've tested. I'll have to give it a standing three count.

World Championship Karate EPYX

**P.O. Box 8020
Redwood City, CA 94089
48K Disk \$34.95**

From boxing we move to karate, a somewhat more venerable sport in my book. Although I've felt lately that Epyx has given me a little less than my money's worth, their new game is an unqualified success.

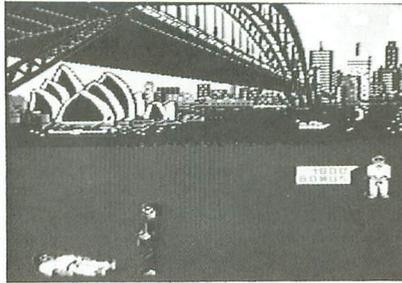
World Championship Karate is, quite simply, a karate fight. Fighting a human or computer opponent, you kick, punch and jump your way to a black belt. What makes this game so good is its perfect blend of sight, sound and action.

The graphics are good. Nothing spectacular, just good, strong images. Before a backdrop of eight international settings, the fighters twirl about gloriously. Although the 8-bits' limitations reduce resolution somewhat, the figures move smoothly, and the stars above the prone loser's head are a beautiful touch. Indicators at the top of the screen clearly display points scored as the karate master awards them. Enhancing the action are sound effects so realistic you almost hear bones break.

As for control, the thing is a bear to learn. All eight joystick positions, button up or down, provide you with sixteen movements. Kick high, punch low, jump over your opponent, then backspin-kick him into unconsciousness. Once the myriad of moves are mastered, they're executed quickly and cleanly by the program—but boy, what a job it is to get them down! I must also add that, due to my defective packaging (which I'll explain later), I could find no pause key. It isn't ESC or the SPACE BAR.

You score points for each successful maneuver, based on the difficulty and impact of the move. Match points are also awarded. A combination of these scoring methods is used, the exact mix depending on whether you're playing against the computer or not. Once you've won, you get to try the test of skill, breaking bricks with your head, and dodging spears and knives. The best players will advance through the ranks to black belt status.

The manual is rather spartan, though its diagrams (which speed up the learning process) are worth an honorable mention. Images depict both the moves your figure can make and the joystick positions necessary. What wasn't honorable was the fact



World Championship Karate — artful moves from Epyx.

that the manual covered only the Commodore—and a separate reference card for the Atari was inadvertently omitted from my copy. The object, as stated in the manual, is simple enough—defeat your opponent.

So, whether it be the nature of the art of karate, or the better control I felt the game had, **World Championship Karate** scored a clear victory over **Fight Night**. Its simple quality would make the masters proud.

500 XJ Joystick

**EPYX
P.O. Box 8020
Redwood City, CA 94089
\$19.95**

In addition to **Karate**, Epyx has recently manufactured a truly radical joystick design. When one thinks of a joystick, the first image in the mind's eye is that of the Atari stick. Its classic, simple design, though often painful on the hands, is the model for many imitators. But its sturdiness was unique.

Now we have the **500 XJ** high-performance joystick. Whether the world is ready for it is too philosophical a question to address here. Thus, I'll merely check out the claim that higher scores will be obtained with the **500 XJ**. This will be dependent on its single most impressive characteristic—the design.

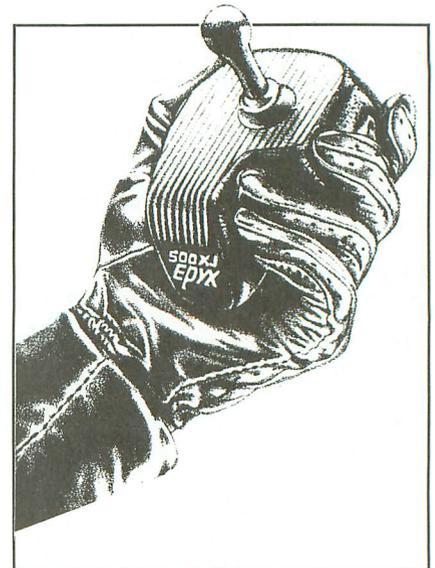
If the Atari stick's base is described as a box, then this one's a ball. Perhaps about the size of a cue ball, its black plastic base is easily encircled by your left hand. But, if you want to hold the base in your right, you're out of luck: only through unnatural contortions will you grip the thing. This base design cuts down pressure exerted on the palm of the hand, avoiding the dreaded, game-ending blister.

The stick itself is short and red. There's very little travel, and the thing is rigid, with no play. Underneath the plastic stick is an eighth-inch steel rod. This ends in a ball imbedded in the inside bottom of the base. Movements are registered when the metal rod activates one of four microswitches arranged around it. A fifth switch is activated by the button located on the side of the base, under your forefinger.

This interior design is quite different from that used in the Atari model. In case you've somehow resisted the primal urge to dissect your stick, the Atari has a flat plastic base attached to its stick. When the stick is yanked, this base moves inside the housing, depressing one of four dimple switches (similar to the 400's keys or the cash registers at McDonalds). Two problems arose from this design. First, the base, after extended use, could break free of the stick. This was an early vexation, new Atari sticks rarely break with normal use. The second problem is found in activating a diagonal move, or depressing two dimples at once. There's little tactile or audio response.

On the **500 XJ**, though, hitting the two diagonal switches is verified by feel and sound. There's also a definite position at which both switches are on. But the limiting factor is now the switches. How long will they last? You got me. The stick isn't going to break in normal use—the steel rod is very strong—but switches have a finite life span. For those who need a more precise response than this, just rely on the 5-year/10-million-shot warranty.

The **500 XJ** has no documentation, but none is necessary. It *does* come with a price tag approximately twice that of the standard Atari stick we've learned to love. As for the performance claims, it seems that, once you've used the Atari stick, you stick with it. The new design is too alien in the hands. So, while I don't think I'd throw out my old sticks for this new one, as a first stick (or a replacement), it would be a decent buy. Just test drive it through your favorite wristbuster first.



**Radical joystick design from Epyx.
Test drive it before you buy.**

Mercenary

by Paul Woakes
DATASOFT

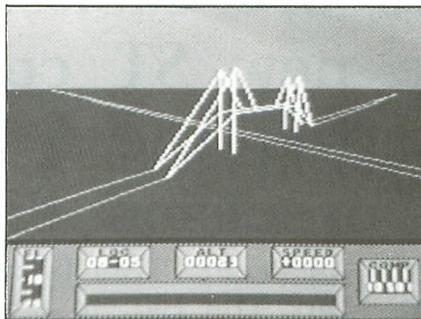
19808 Nordhoff Place
Chatsworth, CA 91311
48K Disk \$29.95

It's been quite a while since I've played a really good spaceship shoot-em-up. And it looks as though I still have a wait on my hands.

Mercenary: Escape from Targ is a disappointing mess, which allowed my expectations to soar, only to dash them to the ground. I'd hoped for an exciting adventure; all I got was a bore. This game combines two familiar themes: flight simulation and adventure.

The scenario is stirring. You're a 21st-century soldier of fortune, crash-landed on the war-torn planet Targ. You find the planet populated by two factions, the Palyars and the Mechanoids. You can join either, or stay independent—but, regardless of your choice, you must get off the planet. So, in the company of Benson, your 9th-generation PC, you search the planet for an escape craft and, of course, riches.

The flight simulation portion of the game is good. The 3-D, vector-like graphics move smoothly as you soar over alien terrain. Similarly, control during this portion of the game is good. Your craft dives and climbs immediately after your command is issued with the stick or keyboard. Easily read gauges display elevation, speed, direction and location.



The adventure turns scavenger hunt in *Mercenary*.

However, all this is for naught, considering the shoddy graphics. The planet is a flat wasteland of small, featureless things (yes, *things*—because it's very hard to tell exactly what is out there). The destruction animation is equally unimpressive. It's dull, in fact, when contrasted with the documentation's promise of "an awesome collapse" of any building you hit. Apparently, this is some new usage of the word awesome, one I was unaware of until now. And this game has the gall to promise more than simple flight.

The adventure turns out to be a scavenger hunt. To escape from Targ, you must collect a number of articles, which you use or sell. You move through a vast number of buildings and rooms, all similar. You can also shoot at things, if you so desire. The endless series of identical rooms became a monotonous maze, whose grip on me

(I'm happy to report) was released by a well-placed index finger on the RESET button.

The documentation in this game is vast. In addition to the manual, there are maps and hint sheets. The manual itself contains full loading instructions, although a lot of the game's play is a mystery until you get into it. Even with the clue sheet I received, it was difficult to move through the maze-like complexes.

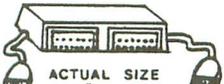
The result of these flaws is a thumbs-down for **Mercenary**. It was boring, unattractive and—worst of all—not fun to play. Avoid the unpleasantness of having to **Escape from Targ** by never getting stuck there in the first place.

That's a wrap for this month, gang. If you like arcade thrillers, Epyx's **Karate** is the one for you. It's entertaining, alone or head-to-head, though difficult to learn. I give it the decision over **Fight Night**, the boxing simulation that was too simplistic. Don't even bother with the **Mercenary** unless you're a masochist. Next month, look for a new chess simulation with the best board and pieces I've seen yet. Until then, good gaming. ♣

The author wishes to express his appreciation to the Magic One Computer Shop of Barberton, Ohio, for their constant support.

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by Roland Gustafsson
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by Jay Pierstorff

The **Print Shop** from Broderbund Software is one of the most useful and popular programs ever published. Thousands of people have fallen in love with its friendly menus, slick cards, flashy banners and nifty signs. Who could resist all those graphics libraries?

The **Print Shop Companion** adds new life and versatility to **The Print Shop**. The **Companion** is menu driven by the same type of command design (ESC to go back, RETURN to continue). The **Companion** modifies your **Print Shop** disk to allow font and border selections, and its disk contains three full-featured editors for fonts, borders and graphics. It can also generate full-page monthly or weekly calendars. And, as a bonus, side B contains twenty graphics of some famous and infamous Broderbund characters.

You must, of course, own **The Print Shop** before you can use the **Companion**.

Perhaps the best improvement the **Companion** brings is its Graphic Editor+. This resembles the **Print Shop** Editor, but with the addition of every drawing feature you could imagine. It contains many of the features of classic drawing programs. If you draw your graphic a little off-center, you can scroll it in any direction. An "Undo" command erases the last thing you did. Seventeen patterns are available to "flood fill" any areas you choose, including "all white" or "all black." It's a cinch to make interesting tiles, using four-way, horizontal and vertical "mirror" modes. Insert and

delete columns and rows with a keystroke. You can even flip or reverse any graphic, or invert the luminance to make a "negative" of a graphic. Connected lines, rays, boxes, circles and ovals are easily drawn with "rubber band" lines. You can even pick a section from a screen magic file to convert to a graphic!

The Border Editor lets you create custom borders. All those flashy new Graphics Editor+ commands are available, as well as with all of the new editor's. You can design separate corners, sides, and top and bottom sections. The **Companion** disk comes with fifty (count 'em) new border styles.

The **Companion** comes with twelve new fonts, but the Font Editor lets you create your own. This editor resembles the other new editors, but it adds movable spacing guides to help in your designs. After you've created your new characters, you can save them to a data disk, storing fifteen complete fonts on one disk side.

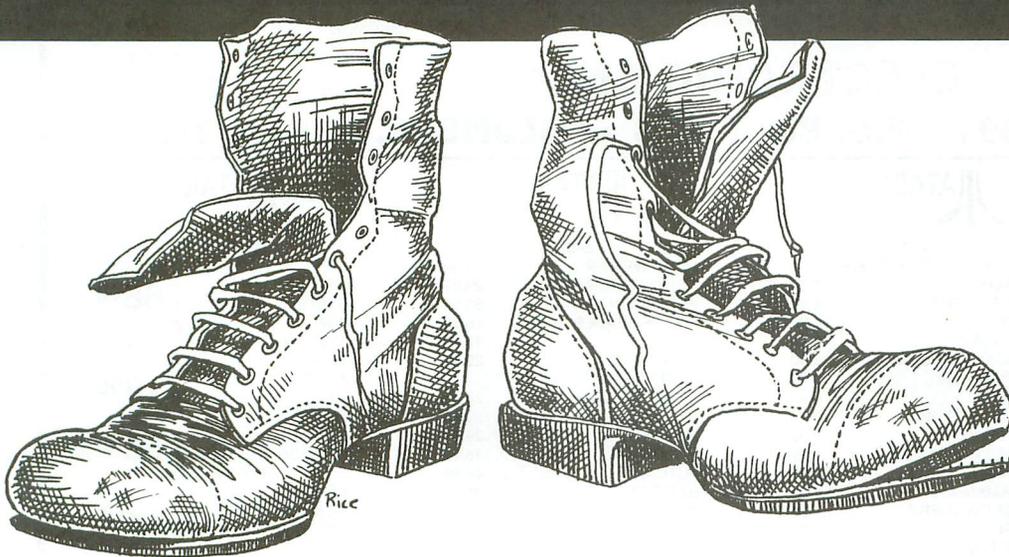
Tile Magic is a kaleidoscope generator, to produce patterned tile graphics. It works in much the same way as Screen Magic, but produces graphics instead of half-page screens. Just watch the kaleidoscope patterns change and hit ESC when you find one you like.

Creature Maker allows you to exchange the top, middle and bottom of ten different creatures. The resulting creatures can be saved to a separate disk. This feature seems childish, when compared to the **Companion's** other, sophisticated features. But it's fun—so I just close the door when using it.

The Calendar Maker can generate a calendar from 1753 to 9999. You can make a calendar for a week at a time, or for a whole month. You get to choose the font style, and the month or title. You can also decorate your calendar with a medium or small graphic. The calendar's best feature is its ability to insert a six-line message for every day of the month. This is ideal for cafeteria menus, employee schedules, and so on.

Broderbund has yet another best-seller on their hands with **The Print Shop Companion**. Everyone who's enjoyed **The Print Shop** will find **The Print Shop Companion** a must have. ☐

*Jay Pierstorff is a professional musician who plays guitar and sings with the fifties group, **Rocky and the Revellettes**. He's been an Atari enthusiast since 1983. His primary interests are music and graphics programs, but he does enjoy a shoot'em-up now and then.*



Boot Camp

by Karl E. Wieggers

Over the past two months, we've learned something about how to create and animate shapes in assembly language, using the Atari's player/missile graphics (PMG) capability. This was all in the context of my silly game concept, "Attack of the Suicidal Road-Racing Aliens." I warned you this would never evolve into a complete (and worthwhile) game, but I hope you discovered how to apply some of these ideas to your own projects.

This month, I conclude the PMG trilogy. I'll spice up the vertical blank interrupt (VBI) routine we wrote last time, so the alien (dubbed Bonzo in the last installment) is facing the direction he's moving. Also, the featureless graphics 3 playfield will be embellished with a few blue lines, from whence we'll see how to handle collisions between Bonzo and the terrain. Finally, I'll show you how to process a collision between Bonzo and the car he so desperately wishes would run him over (nobody ever claimed Bonzo was very bright).

A few notes on programming tactics wrap up this month's adventure. As before, begin by booting your assembler and loading the source code you built from last month's column (which itself included many lines from the previous month). Then enter the lines in the assembly listing in these pages, and save the whole thing. Assemble the result, and Bonzo responds to the whim of your joystick. The starting address to execute the composite program is, as usual, \$5000.

The many faces of Bonzo.

Let's look first at the VBI enhancements. We already have a complete routine for moving Bonzo every sixtieth of a second, based on which direction the joystick is pressed.

Now I'd like to have a different incarnation of Bonzo appear, depending on the direction he's moving. I designed left- and right-facing Bonzos to supplement our standard forward-facing fellow. Bonzo's chameleonlike character will result in his assuming a different color in each direction, too.

The player byte patterns for the left and right versions of Bonzo are found in Lines 4990-5090 of this month's listing. As with the original alien shape, these are stored in the unused portion of RAM set aside for player/missile graphics, beginning at address \$3000. Now, we just need to modify the VBI routine, to copy the desired player shape into the RAM block for player 0 (Bonzo) and set the player color each time the VBI is executed. The default shape (if he isn't moving at all) will be the standard, forward-facing form.

Lines 770-900 commence each pass through the VBI routine, by loading the default shape for Bonzo and making him yellow (color 28). This way, the forward form is there—unless an appropriate joystick deflection is detected.

Lines 1040-1160 are inserted into the VBI code, for the routine to move Bonzo 1 pixel to the right. These lines copy the shape labeled *ALIENR* (R is for "right") into the RAM block for player 0, and also set the player color to blue. Lines 1290-1410 perform the same function with the *ALIENL* (guess what the L stands for) shape, although he comes out green in this incarnation. All three player-copying routines use a couple of page 0 addresses (*SHAPE* and *PLYSTRT*) to copy the byte pattern into PMG RAM, using the very versatile indirect indexed addressing mode.

When certain conditions are met, this simple technique of copying player byte shapes into the correct RAM region is very useful. You can have many different player shapes

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stored, since they only require a few bytes each. You can perform some pretty elaborate animation by sequentially replacing the present player with a new, slightly different one. The VBI is a nice way to do this, thanks to both the regular timing it provides and the elimination of flicker from the animation.

Handling collisions.

In player/missile parlance, "collision" refers to the overlap of a pixel from a player (or missile) with a pixel from another player or missile, or with some nonbackground pixel on the playfield. Simply being adjacent doesn't constitute a collision; the objects must actually overlap.

Let's see. . . there are four players, four missiles and four foreground color registers. This gives us a lot of possible kinds of collisions. The Atari operating system has but 16 bytes set aside to keep track of collisions. The collisions monitored with these registers include player/player, player/playfield, player/missile and missile/playfield interactions. No registers are provided for the missile/missile or playfield/playfield collisions.

Tables 1 and 2 identify the sixteen collision registers and their contents following a collision. The four least significant bits of each byte are the interesting ones. Look at the first half of Table 1 for an example. The four registers shown handle missile/playfield collisions. If missile 0 overlaps with a playfield object drawn using color register 0, then bit 0 of register \$D000, MOPF, is set, resulting in a decimal value of 1. Subsequent collisions of the same variety have no additional effect. A collision between missile 0 and a playfield object using color register 1 sets bit 1, for a decimal value of 2.

Table 1.

| Missile/Playfield and Player/Playfield Collision Registers | | | | |
|--|--------------|--------------|--------------|--------------|
| Address | Color Reg. 0 | Color Reg. 1 | Color Reg. 2 | Color Reg. 3 |
| Missiles | | | | |
| \$D000, MOPF | 1 | 2 | 4 | 8 |
| \$D001, M1PF | 1 | 2 | 4 | 8 |
| \$D002, M2PF | 1 | 2 | 4 | 8 |
| \$D003, M3PF | 1 | 2 | 4 | 8 |
| Players | | | | |
| \$D004, P0PF | 1 | 2 | 4 | 8 |
| \$D005, P1PF | 1 | 2 | 4 | 8 |
| \$D006, P2PF | 1 | 2 | 4 | 8 |
| \$D007, P3PF | 1 | 2 | 4 | 8 |

More than 1 bit can be set if the missile collided with objects drawn using different playfield color registers. The decimal content of the byte in such a case is the sum of all such hits. Clearly, testing for the various collisions is best handled using our old friends, the AND and CMP assembly instructions, as we discussed last month when reading the joystick.

The other entries in the tables show similar behavior for the other collision registers. An anomaly is seen in Table 2, where the logical impossibility of, for example, player 0 colliding with itself means that address POPL will never have a decimal value of 1.

Table 2.

| Player/Playfield and Player/Missile Collision Registers. | | | | |
|--|----------|----------|----------|----------|
| Address | Player 0 | Player 1 | Player 2 | Player 3 |
| Missiles | | | | |
| \$D008, M0PL | 1 | 2 | 4 | 8 |
| \$D009, M1PL | 1 | 2 | 4 | |
| \$D00A, M2PL | 1 | 2 | 4 | 8 |
| \$D00B, M3PL | 1 | 2 | 4 | 8 |
| Players | | | | |
| \$D00C, P0PL | 0 | 2 | 4 | 8 |
| \$D00D, P1PL | 1 | 0 | 4 | 8 |
| \$D00E, P2PL | 1 | 2 | 0 | 8 |
| \$D00F, P3PL | 1 | 2 | 4 | 0 |

One minor problem arises: the collision registers are not automatically zeroed from time to time, so you can end up with junk left over from earlier hits. The solution is to store any number into a register called HITCLR (\$D01E), after doing all your testing of the collision registers. This process resets all collision registers to 0.

One collision we're obviously interested in is the intersection of Bonzo and the car. After all, that's the entire point of this ridiculous game. To make things more interesting, let's draw some lines on the playfield, so that collisions between players and playfield objects become possible.

Lines 2720-2940 draw some lines on the screen, using color register 0. This code gets some help from a subroutine called PLOTPOINT in Lines 3540-3710, and another subroutine called DRAWLINE in Lines 3770-3850. These are slight modifications of the drawing routines introduced in issue 42's **Boot Camp**.

The basic approach is to plot a point, draw a series of line segments connecting several additional points, then start the process again to draw a separate figure elsewhere on the screen. I built tables of the X- and Y-coordinates of the points to be plotted. These tables are labeled XVALUE and YVALUE, and occupy Lines 4700-4820 of the listing. Each table has a series of coordinates, ending with a -1. The plotting routine plots the first point (Lines 2740-2810), fetches the next one (Lines 2820-2840) and checks to see if it is negative (Line 2850). If not, a line is drawn from the last point to the present one and the next point is acquired (Lines 2860-2910).

If the current point is indeed -1, then the counter (Y-register value) is compared to a preset number of data values to be processed (Line 4660). This LIMIT value is one less than the total number of coordinate pairs, including all the -1 entries. If the contents of the Y-register equals LIMIT, then the plotting is complete. Otherwise, the next group of points is begun (Line 2940).

Now that the scene is set, let's start checking for some action. The routine in Lines 3060-3120 examines the contents of register POPL to see if player 0 (Bonzo) has run into anything lately. A value in POPL of 2 means that bit 1 is set, telling us Bonzo and the car have had a close encounter of the worst kind. Subroutine P0P1COL (player 0/player 1 collision) is called to take some action.

In the event that Bonzo and the car are not sharing the same space, Lines 3170-3220 perform an analogous check

of register POPF. This looks to see if Bonzo has stumbled into a blue wall. A value of 1 means that Bonzo is sitting on a playfield object drawn with color 1, a 2 means color 2, and a 4 means color 3. In this program, I don't really care what color register was used for the playfield object, so I just test for a nonzero value in POPF. You could certainly use the different values in POPF and its analogous registers for the other players to perform different actions, based on what kind of object (color register) the player encountered.

The collision processing itself takes place in subroutines POPICOL and POPFCOL (Lines 4200-4330). All I do in this example is copy a new shape for Bonzo to indicate that he's now deceased, and change the player color to show which kind of collision took place.

These subroutines call yet another subroutine, KILLED (Lines 4400-4570). KILLED copies the squashed alien shape into PMG RAM, using the familiar player-copying routine. The shape in question is called DEADALIEN (Lines 5130-5170). Also, KILLED clears the collision registers (Line 4520) and turns off the VBI routine (Lines 4530-4560). The subroutine that called KILLED sets the color of Bonzo's remains to white for a car collision (Lines 4220-4230), or orange for a playfield collision (Lines 4310-4320).

The result of all this collision jazz is that, whenever Bonzo encounters any other nonblack item on the screen, the squashed Bonzo shape appears in a new color, and the car movement and joystick control of Bonzo's position halt. To rerun the program, start over at address \$5000. Obviously, in a real game, you'd want to take some other action when Bonzo dies—like change the score, subtract 1 from his remaining lives, play a sad song and pick up the action after a suitable delay. I'll let you work out those details.

PMG wrap-up.

This completes our introductory venture into the world of player/missile graphics. We have seen how to design and use player shape byte patterns, and how to allocate a block of memory for the players to live in. The various registers in the operating system controlling PMG features like size and color were explained. We used a VBI to read the joystick and move Bonzo around his two-dimensional world. (The VBI will return in future issues, since lots of other neat things can be stuffed into a VBI.) Finally, we saw how to use the collision registers to figure out if Bonzo had gotten into any trouble.

One of the PMG topics we didn't cover is use of the priority register, to control what happens when a player overlaps with another player or a playfield display. You can specify which object will appear to be in front of the other. You can also obtain a different color where two players overlap, permitting multicolored players. We've also neglected the entire topic of missiles, including the technique for combining all four missiles to form a fifth player. Perhaps another time. . .

I now turn you loose, to apply all these ideas to the program plans brewing in your brain. But first, a little advice.

Some programming pointers.

You may have noticed that I use quite a few subroutines in my programs. Many of these aren't really "subroutines" in the classic sense. Traditionally, the subroutine is a block of code that could be written once and called repeatedly, thereby reducing the total amount of program code. Another view of a subroutine is to regard it as a little module of code which performs a specific task, even if it's only used once during program execution. The advantage is that the code needed for the function is a nice, tidy package, kept separate from the rest of the program.

Professional programmers practice a method known as "structured programming." One facet of structured programming is called "top-down design." This refers to the practice of designing a program as a relatively short and quite abstract main program, which calls a number of less abstract subroutines to perform a series of functions—which, themselves, may call still other subroutines, until finally the work gets done at a very detailed level.

There are great advantages to using a top-down design. You can decide what functions your program needs to perform, without having to define every single itty-bitty detail at the outset. You don't even need to know what language you'll be using. Programs are vastly easier to read, debug and modify (not that any of us ever have to make changes) when the different functions are separated in a logical way. And, the clearer a picture you have of what you're trying to accomplish, even at a fairly abstract level, the more efficient your time spent at the keyboard will be.

I started using a top-down design approach after reading an excellent series of articles on structured programming in BASIC, published in the now-defunct *Creative Computing* in June-September 1984. I estimate that it has shortened the time I need to complete a program to about one-third what it would be otherwise. And the resulting program is much cleaner and easier to understand than my old ones.

Modern languages are designed to be highly structured, with this modular approach built right in. BASIC is usually less structured, and Atari BASIC is particularly weak. It lacks even a simple IF-THEN-ELSE type of control structure. The result is the ubiquitous "spaghetti code" of indecipherable GOTOs.

Assembly language is no better. However, with a little thought you can clean up your assembly programming quite a bit, by using a top-down approach. The trick is to write many short, task-oriented subroutines instead of one huge linear block of code. The first FORTRAN program I wrote using top-down design involved a very short main menu and about forty-five subroutines at four different levels of detail (main program calls A, which calls B, which calls C, which calls D). And I knew just what each subroutine was to accomplish before I wrote a single line of code! (I wound up with over 2500 lines of code.)

"Attack of the Suicidal Road-Racing Aliens" evolved over several months, preventing a complete structured approach—mainly because three months ago I didn't know where we would end up. However, you can see some illustrations

of what I'm talking about in this month's example. Consider the routine in Lines 3060-3220 that loops forever, looking for collisions. If one takes place, an appropriate subroutine is called, either POPICOL or POPFCOL. Each of those routines in turn calls the subroutine KILLED. You can also envision them calling a sound-effects subroutine, then a scoring subroutine, then... I think you get the picture.

I cannot recommend the top-down approach strongly enough. It's been a tremendous asset in my own programming, both professional and recreational. I think you'll be pleased with the results. 

Listing 1.
Assembly listing.

```

0100 ;multiple players & collisions
0110 ;
0120 ;by Karl E. Wieggers
0130 ;
0170 PUTREC = $09
0180 DRAW = $11
0200 ROWCR5 = $54
0210 COLCR5 = $55
0230 ATACHR = $02FB
0380 POPF = $D004
0400 P0PL = $D00C
0420 HITCLR = $D01E
0690 ;
0770 FORWARD
0780 LDA #ALIEN&255 ;make alien
0790 STA SHAPE ;face forward
0800 LDA #ALIEN/256 ;initially
0810 STA SHAPE+1
0820 CLC
0830 LDA #$04
0840 ADC #PMG/256
0850 STA PLYRSTRT+1
0860 LDA YPOSP0
0870 STA PLYRSTRT
0880 JSR COPYPLAYER
0890 LDA #28 ;make alien
0900 STA PCOLR0 ;yellow
0910 ;
0920 ;joystick checking begins here
0930 ;
1040 LDA #ALIENR&255 ;load alien
1050 STA SHAPE ;shape going
1060 LDA #ALIENR/256 ;to the
1070 STA SHAPE+1 ;right
1080 CLC
1090 LDA #$04
1100 ADC #PMG/256
1110 STA PLYRSTRT+1
1120 LDA YPOSP0
1130 STA PLYRSTRT
1140 JSR COPYPLAYER
1150 LDA #138 ;color him
1160 STA PCOLR0 ;blue
1290 LDA #ALIENL&255 ;load alien
1300 STA SHAPE ;shape for
1310 LDA #ALIENL/256 ;going left
1320 STA SHAPE+1
1330 CLC
1340 LDA #$04
1350 ADC #PMG/256
1360 STA PLYRSTRT+1
1370 LDA YPOSP0
1380 STA PLYRSTRT
1390 JSR COPYPLAYER
1400 LDA #200 ;color him
1410 STA PCOLR0 ;green
2690 ;

2700 ;draw some lines on the playfield
2710 ;
2720 LDA #1 ;color register 0
2730 STA ATACHR
2740 LDY #255
2750 FIRSTPOINT ; plot the first
2760 INY ;point in the
2770 LDA XVALUE,Y ;data table
2780 STA COLCR5
2790 LDA YVALUE,Y
2800 STA ROWCR5
2810 JSR PLOTPOINT
2820 NEXTPOINT
2830 INY ;aim at the
2840 LDA XVALUE,Y ;next point
2850 BMI CHKDOME ;if -1,then quit,
2860 STA COLCR5 ;else draw
2870 LDA YVALUE,Y ;from last
2880 STA ROWCR5 ;point to
2890 JSR DRAWLINE ;this one and
2900 CLC ;get next
2910 BCC NEXTPOINT ;point
2920 CHKDOME
2930 CPY LIMIT ;all points done?
2940 BNE FIRSTPOINT ;no, continue
3020 ;
3030 ;check for collisions between
3040 ;players 0 and 1
3050 ;
3060 CHECKCOL
3070 LDA P0PL ;if collision,
3080 CMP #2 ;then call
3090 BNE CHECKPF ;subroutine
3100 JSR POPICOL ;to handle it
3110 CLC
3120 BCC CHECKCOL
3130 ;
3140 ;check for collisions between
3150 ;player 0 and playfield
3160 ;
3170 CHECKPF
3180 LDA POPF ;if collision,
3190 BEQ CHECKCOL ;call another
3200 JSR POPFCOL ;subroutine to
3210 CLC ;process it
3220 BCC CHECKCOL
3230 ;
3500 ;plot a point at current cursor
3510 ;position; save Y-register on
3520 ;the stack
3530 ;
3540 PLOTPOINT
3550 TYA
3560 PHA
3570 LDX #$60
3580 LDA #PUTREC
3590 STA ICCOM,X
3600 LDA #REG2&255
3610 STA ICBAL,X
3620 LDA #REG2/256
3630 STA ICBAL+1,X
3640 LDA #1
3650 STA ICBLL,X
3660 LDA #0
3670 STA ICBLL+1,X
3680 JSR CIOV
3690 PLA
3700 TAY
3710 RTS
3720 ;
3730 ;draw a line from last point to
3740 ;current cursor position - save
3750 ;Y-register on the stack
3760 ;
3770 DRAWLINE
3780 TYA
3790 PHA
3800 LDA #DRAW

```

```

3810 STA ICCOM,X
3820 JSR CIOV
3830 PLA
3840 TAY
3850 RTS
3860 ;
4170 ;subroutine to handle collisions
4180 ;between alien and car
4190 ;
4200 P0PICOL
4210 JSR KILLED ;change to dead,
4220 LDA #14 ;white alien
4230 STA PCOLR0
4240 RTS
4250 ;
4260 ;subroutine to handle collisions
4270 ;between alien and walls
4280 ;
4290 P0PFCOL
4300 JSR KILLED ;change to dead,
4310 LDA #40 ;orange alien
4320 STA PCOLR0
4330 RTS
4340 ;
4350 ;subroutine to copy dead alien
4360 ;shape when he hits something,
4370 ;clear collision registers, and
4380 ;turn off VBI routine
4390 ;
4400 KILLED
4410 LDA #DEADALIEN&255
4420 STA SHAPE
4430 LDA #DEADALIEN/256
4440 STA SHAPE+1
4450 CLC
4460 LDA #$04
4470 ADC #PMG/256
4480 STA PLYRSTRT+1
4490 LDA YPOSP0
4500 STA PLYRSTRT
4510 JSR COPYPLAYER
4520 STA HITCLR ;clear coll.
4530 LDY #HITVBV&255 ;turn off
4540 LDX #HITVBV/256 ;VBI routine
4550 LDA #7
4560 JSR SETVBV
4570 RTS

```

```

4580 ;
4620 REG2 .BYTE "C"
4630 ;
4640 ;counter for drawing on playfield
4650 ;
4660 LIMIT .BYTE 16
4670 ;
4680 ;tables of X-coordinates
4690 ;
4700 XVALUE
4710 .BYTE 3,9,9,13,-1
4720 .BYTE 10,21,-1
4730 .BYTE 24,24,35,-1
4740 .BYTE 25,34,34,22,-1
4750 ;
4760 ;tables of Y-coordinates
4770 ;
4780 YVALUE
4790 .BYTE 2,2,9,9,-1
4800 .BYTE 14,14,-1
4810 .BYTE 8,3,3,-1
4820 .BYTE 14,14,19,19,-1
4830 ;
4960 ;
4970 ;alien facing to left
4980 ;
4990 ALIENL
5000 .BYTE 14,60,24,62,61,61
5010 .BYTE 61,61,60,60,36
5020 .BYTE 36,36,108,0
5030 ;
5040 ;alien facing to right
5050 ;
5060 ALIENR
5070 .BYTE 14,60,24,124,188,188
5080 .BYTE 188,188,60,60,36
5090 .BYTE 36,36,54,0
5100 ;
5110 ;poor, squashed alien
5120 ;
5130 DEADALIEN
5140 .BYTE 17,33,34,150,84,57
5150 .BYTE 30,60,123,159,30
5160 .BYTE 52,86,151,36
5170 .BYTE 194,193,0

```



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Trails in Action!

Mesmerizing graphic fun with your *KoalaPad* or joystick.

by Kevin R. Garlow

After receiving an Action! cartridge and a *KoalaPad* for Christmas, I set out to learn the language and make use of the *KoalaPad* at the same time. I began by typing in the kaleidoscope program by Clinton Parker in *ANALOG Computing's* issue 17. First, I developed this into a sketching program that used the *KoalaPad*. A day later, I remembered a demo program I'd once seen run on the Macintosh. I set out to duplicate that program based on my recollection of it, using the *KoalaPad* in place of the mouse. The result is *Trails*.

Trails is an interactive graphics demo written in Optimized Systems Software's Action! language. To use it, you need the Action! cartridge (for those without Action!, a runtime version of this program may be found on this month's disk, or on the Delphi Atari Users' Group.) A *KoalaPad* is highly recommended, but alternate procedures are provided to let you use a joystick.

Typing it in.

Type in Listing 1, then verify your work with **D:CHECK in Action!** from issue 44. If you'll be using a joystick with the program, you must also type in Listings 2 and 3, then replace the Instructions() procedure and the Draw() procedure in Listing 1 with Listings 2 and 3, as appropriate.

Directions.

Trails allows you to draw on the graphics 8 screen, via *KoalaPad* or joystick. After approximately five seconds, the points you drew will begin to be erased, in the order you drew them (meanwhile, you can continue to draw). The effect can be hypnotic, especially when the mirror function is on.

Your drawing is made symmetrical by the mirroring effect. Drawing in the center produces a pleasing lace effect, while drawing on the edges and in the corners gives you interestingly symmetrical loops and lines. Fascinating patterns emerge as you race to the center, out to the edges, then back to the center again, while the computer sequentially "undraws" what you've done.

The left button of the *KoalaPad* clears the screen. The right button both clears the screen and toggles the mirror effect on and off. With the mirror off, you can experiment with "chasing your tail," or write your name in cursive and watch it be unwritten.

While the program runs, an additional option is open to you. By hitting any key on the keyboard (except BREAK, which stops the program), you're shown the instructions and told the current value of persistence. You may then enter a new value from 1 to 10. The persistence controls the "lag time" between when a dot is drawn and when it's erased. As the program stands, the number you enter is approximately the lag time in seconds. If you don't wish to change the persistence, you can simply hit RETURN. Entering 0 or a letter will return you to the Action! monitor.

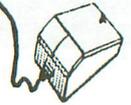
Alternate procedures are given, for joystick use. They replace the Draw() and Instructions() procedures in the original. The joystick button has the same action as the right button of the *KoalaPad*—it clears the screen and turns the mirror mode on or off. You can still change the persistence value by hitting a key.

I didn't make the joystick an option within the program, because I believe the *KoalaPad* works better as an input device in this program. You should use the original procedures if you have a *KoalaPad*.

• GEM Based

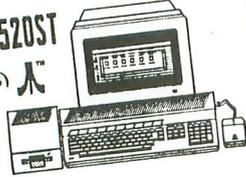
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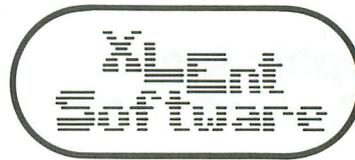


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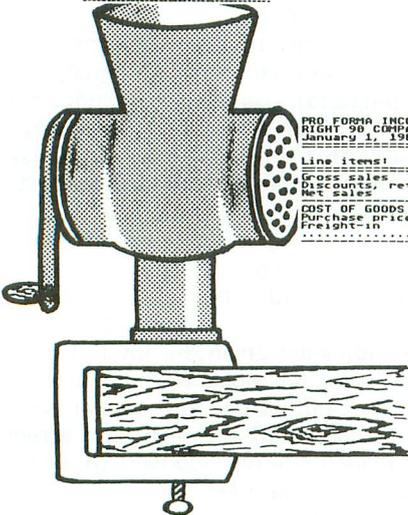


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PRO FORMA INCOME STATEMENT - FIRST YEAR
RIGHT 90 COMPANY
January 1, 1985 to December 31, 1985

| Line Items | Months | Jan-85 |
|-----------------------------|--------|---------|
| Gross sales | | 130,000 |
| Discounts, returns & allow. | | 500 |
| Net sales | | 37500 |

| COST OF GOODS SOLD | |
|--------------------|-------|
| Purchase price | 22000 |
| Freight-in | 500 |



PRO FORMA INCOME STATEMENT - FIRST YEAR
RIGHT 90 COMPANY
January 1, 1985 to December 31, 1985

| Line items | Month: | Jan-85 | Feb-85 | Mar-85 | Apr-85 | May-85 | Jun-85 |
|-----------------------------|--------|---------|---------|---------|---------|---------|---------|
| Gross sales | | 230,000 | 230,000 | 230,000 | 230,000 | 230,000 | 230,000 |
| Discounts, returns & allow. | | 500 | 500 | 500 | 500 | 500 | 500 |
| Net sales | | 37500 | 37500 | 37500 | 37500 | 37500 | 37500 |
| COST OF GOODS SOLD | | | | | | | |
| Purchase price | | 22000 | 22000 | 22000 | 22000 | 22000 | 22000 |
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WRITE

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Explanation.

The Main() procedure first calls the procedure Instructions(), which explains how to use the program. Then it enters a loop which first calls Setup(mode). This clears the screen, zeroes the x and y arrays, and draws a box on the screen. Main() then calls Draw(), the heart of the program. Draw() reads the **KoalaPad** (or joystick) and modifies x0 and y0 accordingly. The first call to Octplot() erases the point that occurred maxpts before the present point. Then the current point is saved in the x and y arrays, for erasure later on.

Finally, the present point is plotted. The variable n keeps track of the current position in the arrays. If a button is pushed, the Draw() routine calls Setup(mode) again to clear the screen. Hitting a key will return to Main(), which will call Get_pers(). Get_pers() calls Instructions() then displays the current value of persistence (maxpts). This is where you can enter a new value. If a 0 is entered, you are returned to Main() and then to the Action! monitor.

Modifications.

There are a number of modifications to this program that come to mind. One of the easiest potential changes occurs at the beginning of the program listing. The constant pers_ratio could be DEFINED to be a lesser or greater integer than 35 (as it is in the listing). A larger number would extend the lag time across the entire range of persistence values of 1 to 10, while a smaller number would decrease the lag time. Please note that, if you change pers_ratio to a number greater than 50, you need to dimension the x and y arrays to accommodate the additional points. For example, if you DEFINE pers_ratio to be 65, you should dimension x and y to 650 (i.e., CARD ARRAY x(650), y(650)).

Another modification might be to add more color. For example, change the program to run in graphics 7.5, the high-resolution four-color graphics mode. Or how about plotting four points in a square each time you plot a position? This would be fairly easy to do, by having Draw() call a new routine, say Quadplot(), that would in turn call Octplot() four times. And to speed things up, you could use the quick plotting routines from Clinton Parker's article in **ANALOG Computing's** issue 18. Let your imagination run free and match the program to your own idea of how it should be.

Summary.

Trails is an intriguing demo, because it's both kinetic and interactive. It must be seen in action (so to speak) to be appreciated. A still picture couldn't do it justice. At the same time, it requires someone to do the drawing. By itself, it sits and repeatedly plots and unplots the same points. With someone using the program, it draws mesmerizing patterns on the screen. Enjoy! 

Kevin R. Garlow is majoring in Astronomy and Astrophysics at Villanova University. He's owned an Atari 800 for two and a half years, and uses it for word processing, programming in BASIC (and some assembly) and, of course, playing games. His favorite **ANALOG Computing** games are *Bacterion!* and *Planetary Defense*.

Listing 1. Action! listing.

```

;TRAILS.ACT
; Copyright 1986 by Kevin Garlow
; Last modified 1-3-86

;      CHECKSUM DATA
; IE7 5F 32 D9 1B 77 3D 89
; 74 05 6C C4 EB C2 6B 1

DEFINE pers_ratio = "35"

BYTE col1=709,col2=710,border=712,
     cur=752,key=764,attract=77,
     clock=20,mirror=11,mode
CARD ARRAY x(500),y(500)
CARD x0,y0,n=[0],i,maxpts=[175]

PROC Setup(BYTE mode)
FOR i=0 TO maxpts DO
  x(i)=0:y(i)=0
OD
Graphics(mode) : col2=0 : col1=14
cur=0 : color=1 : border=16*Rand(16)+2
IF mode<>0 THEN
  Plot(64,0)
  DrawTo(192+64,0)
  DrawTo(192+64,191)
  DrawTo(64,191)
  DrawTo(64,0)
FI
RETURN

PROC Instructions()
; =====
; =                for KoalaPad                =
; = (see listing 2 for joystick)                 =
; =====

Setup(0)
Print("      ""Trails!""")
Pute()
Print("      Draw with KoalaPad...")
Pute()
Print("LEFT  \ CLEAR          TOGGLE ")
Print("/_ RIGHT")
Print("button / screen        MIRROR ")
Print("\ button")
Pute()
Print("      ANY KEY:")
Print("      see INSTRUCTIONS ")
Print("      or ")
Print("Change PERSISTENCE")
Pute()
Pute()
Pute()
Print("-----")
Print("-----")
IF key=255 THEN
  Print("      Hit any button ")
  Print("to start:")
  DO UNTIL (PTrig(0)=0 OR PTrig(1)=0
           OR key<>255 OR STrig(0)=0) OD
  key=255
FI
RETURN

PROC Get_pers()
Instructions()      key=255
Pute()
maxpts==/pers_ratio
Print("Persistence is now ")

```

```
PrintE(maxpts)
PutE()
Print("Enter new ")
Print("persistence (1-10): ")
PrintC(maxpts) Print("<")
IF maxpts=10 THEN Print("<") FI
maxpts=InputB()
RETURN
```

```
PROC Octplot(CARD x0,y0)
CARD x1,y1
```

```
x1=191-x0
y1=191-y0
IF Locate(x0+64,y0)=1 THEN
  color=0
ELSE color=1
FI
```

```
Plot (x0+64,y0)
```

```
IF mirror=1 THEN
  Plot (x0+64,y1)
  Plot (y0+64,x0): Plot (y0+64,x1)
  Plot (x1+64,y0): Plot (x1+64,y1)
  Plot (y1+64,x0): Plot (y1+64,x1)
FI
```

```
attract=0
clock=0
IF mirror=0 THEN
  DO UNTIL ((clock&1)=1) OD
```

```
FI
RETURN
```

```
PROC Draw()
```

```
=====
;=          for KoalaPad          =
;= (see listing 2 for joystick) =
=====
```

```
DO
```

```
x0=(Paddle(0)*95/114)-1
y0=(Paddle(1)*95/114)-1
IF PTrig(1)=0 THEN
  Setup(24)
  IF mirror=1 THEN mirror=0
  ELSE mirror=1
  FI
  DO UNTIL PTrig(1)<>0 OD
```

```
FI
IF PTrig(0)=0 THEN
  Setup(24)
```

```
FI
Octplot(x(n),y(n))
x(n)=x0 y(n)=y0
Octplot(x(n),y(n))
n==+1
IF n>=maxpts THEN n=0 FI
UNTIL (key<>255)
```

```
OD
RETURN
```

```
PROC Main()
```

```
Instructions()
```

```
DO
  IF (key<>255) THEN
    Get_pers()
    IF maxpts >10 THEN maxpts=10
    ELSEIF maxpts<1 THEN
      Graphics(0)
      RETURN
    FI
    maxpts=maxpts*pers_ratio
  FI
  key=255: Setup(24)
  Draw()
OD
```

```
OD
```

•

Listing 2.
Action! listing.

```
; CHECKSUM DATA
; [2A 9D 20 72 ]
```

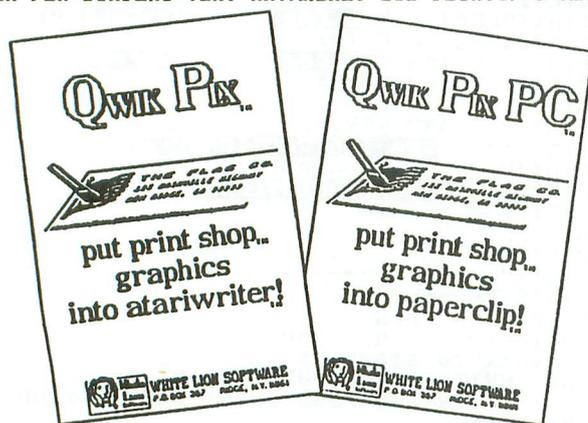
```
PROC Instructions()
```

```
=====
;=          for joystick          =
;= (substitute into listing 1) =
=====
```

```
Setup(0)
PrintE("          ""Trails!""")
PutE()
Print("          Draw with ")
Print("< joystick...")
PutE()
PrintE(" button: CLEAR and TOGGLE")
PrintE(" screen  screen  Mirror")
PutE()
Print(" ANY KEY:")
PrintE(" see INSTRUCTIONS ")
```

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```

Print("          or ")
PrintE("change PERSISTENCE")
PutE()
PutE()
Print("-----")
PrintE("-----")
IF key=255 THEN
  Print("      Hit any button")
  Print(" to start!")
DO UNTIL (PTrig(0)=0 OR PTrig(1)=0
OR key<>255 OR STrig(0)=0) OD
  key=255
FI
RETURN

```

Listing 3.
Action! listing.

```

; CHECKSUM DATA
; IBA 99 3B 1

```

```

PROC Draw()

```

```

; =====
; = for joystick =
; = (substitute into listing 1) =
; =====

```

```

INT delx=[0],dely=[0],st
x0=95 y0=95
DO
  st=Stick(0)
  delx=(st&4) R5H 2 - ((st&8) R5H 3)
  dely=((st&1)) -((st&2) R5H 1)
  x0=(x0+2*delx )
  y0=(y0+2*dely )
  IF x0<1 OR x0>190 THEN x0=95 FI
  IF y0<1 OR y0>190 THEN y0=95 FI
  IF STrig(0)=0 THEN
    Setup(24)
    IF mirror=1 THEN mirror=0
    ELSE mirror=1
  FI
  DO UNTIL STrig(1)<>0 OD
  FI
  Octplot(x(n),y(n))
  x(n)=x0 y(n)=y0
  Octplot(x(n),y(n))
  n==+1
  IF n>maxpts THEN n=0 FI
  UNTIL (key<>255)

```

```

OD
RETURN

```

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The End User

**THIS MONTH:
Truth in advertising,
consumer reporting,
noteworthy news
and propositions
for Atari.**

by Arthur Leyenberger

Recently, I was sitting around the house worrying about waxy yellow build-up, when my postal carrier dropped off the daily junk mail. Upon retrieving the soon-to-be landfill material, I discovered a new mail-order catalog from Computer Direct. This Barrington, Illinois outfit sells Atari and Apple hardware and software. I don't have a vested interest in this or any other business; I don't know these guys from Adam. However, what I saw on the first page of their catalog infuriates me.

Pictured at the top of the page is an Atari 130XE, with a reasonably low price. In headline lettering is the phrase "New — Atari 152K computer." I thought this type of advertising went out of style during the McCarthy era. Obviously, they're taking the 128K RAM memory and combining it with 24K of ROM memory. To the unwary, this seems to be a new computer, when the 130XE's been available for over a year. The fine print does mention that it's a 130XE with 128K RAM, but I *object* to this kind of advertising.

On the bottom of the same page is a picture of a 1050 disk drive, with the headline "127K Fast Disk Drive." Gimme a break! That amount of storage is available with Atari DOS 3.0, which nobody uses. The fine print says the drive comes with DOS 2.5, which can also store in "dual density" (Atari's name)—but why would you want to? The copy mentions that the drive is five times faster than the Commodore 1541 disk drive. Who cares?

This kind of misleading/inaccurate advertising doesn't help anybody. It doesn't

educate the consumer—and may even hurt the dealer, once the customer finds out the copy wasn't *exactly* true. We should all work to eliminate this type of thing. And Computer Direct—which advertises, "We love our customers"—clean up your ad copy.

Fair Is Fair Dept.

I've criticized *Consumer Reports* several times in the past, for their lack of computer "street smarts." Before Jack T. bought Atari in 1984, when the big debate was Commodore 64 vs. Atari 800, that magazine recommended the C-64, based mainly on price and misinformation. They didn't seem to care if the C-64 was more difficult to use (since PEEKs and POKEs were required for graphics and sound).

About a year later, the washing-machine and toaster people realized **AtariWriter** was the best (easy to use, powerful enough for home applications) word processor around, for any machine. Of course, they missed the mark, failing to recommend a disk drive for storage. . .

Earlier this year, the same folks said both the Amiga and Atari ST were only good enough to be used as doorstops. The apparent lack of software suggested a full review should appear later. At the time, there was actually about three times the software available for the ST as for the Amiga, but who's counting?

Well, I now have the September issue of *Consumer Reports*, with the long-awaited Commodore Amiga vs. Atari ST comparison. Is this stuff hot? Should it be kept from minors? Hardly.

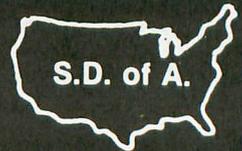
Consumers says, and I agree, that "from a technical standpoint, the Amiga out-

Arthur Leyenberger is a human factors psychologist and free-lance writer living in New Jersey. He's been writing about computers for four years and continues to be an Atari enthusiast. When not computing, he enjoys playing with robotic toys.

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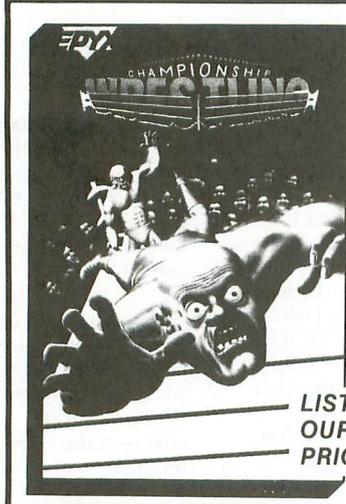
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The End User *continued*

points the ST because it has more of what makes both computers special—more colors, better animation, more and better sound, . . . etc.” Yet the report “leans slightly” toward the ST, because it’s cheaper and has a better color display. No mention of the excellent quality of the ST’s monochrome monitor, and little on the amount of memory that comes with the ST compared to the Amiga!

The article correctly states that a decision to buy either computer boils down to how each performs the user’s normal, everyday tasks. Word processing, small databases, spreadsheets and, perhaps, graphics are the main categories of programs. Unfortunately, the article lamented the availability of “major-league productivity programs.” I can’t speak for the Amiga, but ST programs of that nature have been available for almost a year.

I’m not arguing the merits of the ST vs. the Amiga. I strongly feel that either machine is an excellent choice for someone upgrading to a modern, 68000-based computer. Neither is perfect; in fact, both are quite buggy, even now.

The point is, once again, *Consumer Reports* has not done their homework. That their article was written three months in advance of the cover date is no excuse, since decent software (at least, for the ST) was available before then. It’s about time for *Consumer Reports* to get some writers as familiar with the computer scene as they are with other consumer goods.

Credit where credit is due.

There’s no question in my mind: the best user group newsletter is by the Washington Area Atari Computer Enthusiasts (WAACE). *Current Notes* amazes me every month, in size and content. An ex-newsletter editor myself, I can appreciate the work that goes into it.

Take the September 1986 issue, for example. Sixty-eight pages of columns, features, advertising, and a bunch of other stuff. It has a glossy cover and is as professional (in looks and writing) as was the first *ANALOG Computing*. I don’t know how they do it. Managing Editor Joe Waters, ST Editor Frank Sommers and 8-bit Editor Jack Holtzhauer all deserve a round of applause for their fine efforts.

If you’re interested in subscribing, send a \$15.00 check (payable to Editor, *Current Notes*) to them at 122 N. Johnson Road, Sterling, VA 22170. You’ll get ten issues a year. If you’re an officer of another Atari user group with a newsletter, you can exchange newsletters with them. Send your newsletter and request to Jack Holtzhauer, 15017 Vista Drive, Dumfries, VA 22026. Enjoy!

Old (and new) business.

When cleaning my desk, I ran across some notes about . . . well, Atari, software, End Users, and things in general. This

seems as good a time as any to ponder some of these. Here goes.

There’s been some controversy about Jack Tramiel’s announcing products that either never get past the prototype room door, or are delayed indefinitely. Some of these I’ve written about, in my best Jimmy Olsen prose. You remember. . . the portable 8-bit computer, the XEP, the 8-bit with the AMY chip, the XEM, the 260ST, the CD-ROM player and software, the hard disk drive (finally available in very small quantities), and all that great GEM software for the ST—GEM Write, GEM Draw, GEM This and GEM That. I could go on, but you get the point.

Atari does a pretty good job of making you notice this month’s hot stuff—while, at the same time, *not* talking about last month’s. And some of the excuses for non-delivery seem really whacky, don’t they? “The blankety-blank was being shipped to the U.S., when the boat stopped in the Philippines for refreshments. They happened to have a *coup d’etat* at the time, and it delayed the arrival of the Atari products by weeks.” I made up better excuses when I forgot my second grade homework.

This should all change, very soon. You see, Atari has announced that it will be going public, by the time you read this. I believe the action will both add legitimacy to the Atari name and put them on their toes—so products aren’t announced until they have a real chance at being made (and becoming available sooner than the next appearance of Halley’s Comet).

The company’s plan to sell shares is a good sign. Atari’s been profitable since the end of 1985, and needs some capital. Good for you, Atari. I sincerely wish you the best as a public company. Now, we Atari users can go out and buy some stock—assuming that the plane carrying the certificates doesn’t have to refuel at the North Pole and, because of magnetic distortion, gets lost forever. Just kidding.

The question is: when will Atari start acting like a real computer company? Things like advertising in noncomputer magazines need to be done, on a major scale. There’s the perception that Jack Tramiel and company have little regard for existing Atari users, because there’s no upgrade path. If you bought one of the early 520STs, you can’t add an RF modulator to it. If you bought a “second-generation” ST with a modulator, Atari has no official memory upgrade to give you 1 megabyte of RAM. Atari continues to come out with new computers, which, by inference, say “The heck with existing owners. If they want the new features, let them buy a new machine.”

As for user groups, a single reliable source of information should be made available to them. Accurate information is the key. Further, there’s the “problem” of selling a computer like the ST in ‘Toys ‘R

Us—and expecting corporate America to rally ‘round Atari, as they do for IBM.

I realize user groups can’t expect Atari to dole out free equipment to every group in the country. However, making equipment available at cost to bona fide groups, does not seem unreasonable. The user-group deal Atari gave when the STs first came out was a rip-off. The groups could buy the machines cheaper—and get them faster—from local dealers.

User groups exist to support Atari users and, thereby, Atari. The company should make it easier for them to do so. Brochures on Atari products should be available to user groups. They need freebies and trinkets, to keep the spirit up and the name visible. This would pay for itself over and over.

I think Atari ought to treat the groups better, period. For example, any club that has purchased an ST through the original “deal” should be allowed to upgrade, in order to take advantage of the RF modulator output. User groups need that feature, in order to demo software. Atari, there is a lot you could be doing. Are you listening?

Late-breaking news.

At the recent Atarifest in San Jose California, David Small (through his company, Data Pacific) officially announced the Macintosh emulator cartridge for the ST computer. Called the **Magic Sac** or **Magic Cartridge** (previously, **MacCartridge**), this device gives you Mac software compatibility. Yes, you heard me.

The product sells for \$129.00 without the 64K Macintosh ROMs. The two Mac ROMs must be acquired elsewhere (Data Pacific is *not* selling them) and plugged into the cartridge sockets. Two disks are supplied, to let you transfer, format, back up and otherwise use the cartridge.

The catch is that your ST drive can’t read Mac disks directly. Software must be transferred from Mac to ST via serial cable and stored on ST-readable disks. This takes 10 minutes per disk, and can only be done on non-copy-protected disks.

For slightly more, you can buy **Magic Sac Plus**, with the transfer cable to move the software, and an on-board clock calendar to use with TOS or in Mac mode. Buying **Magic Sac** gets you 20 percent faster operation, much of it using the 640 by 400 monochrome Atari screen. If the original Mac software was written to conform to developers’ guidelines, it will run on your MacJackintosh (my word). Data Pacific has tested many Mac programs and found only a few that don’t run.

If you want more information, contact: Data Pacific, 609 East Speer Blvd., Denver, CO 80203, or call (303) 733-8158. That’s it for this month. 

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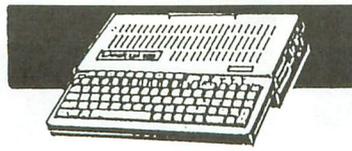
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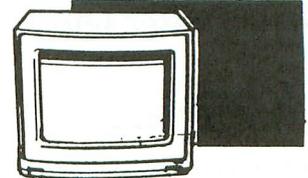
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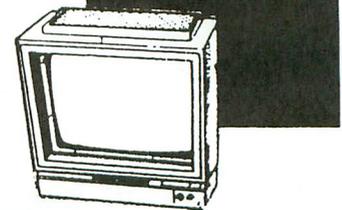
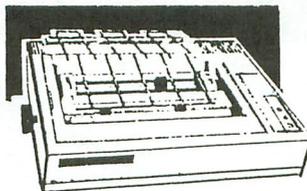
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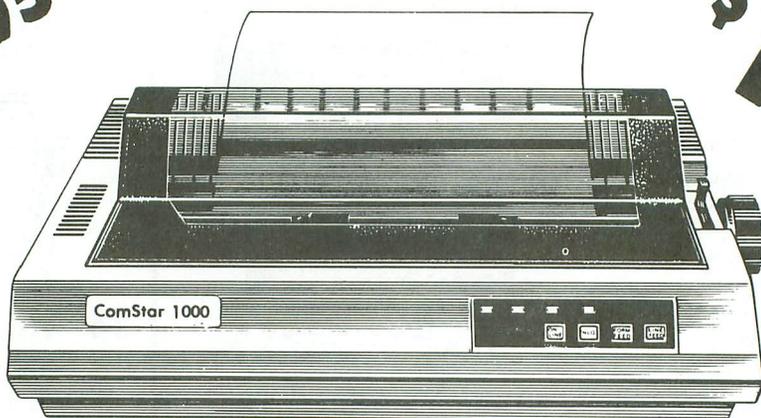
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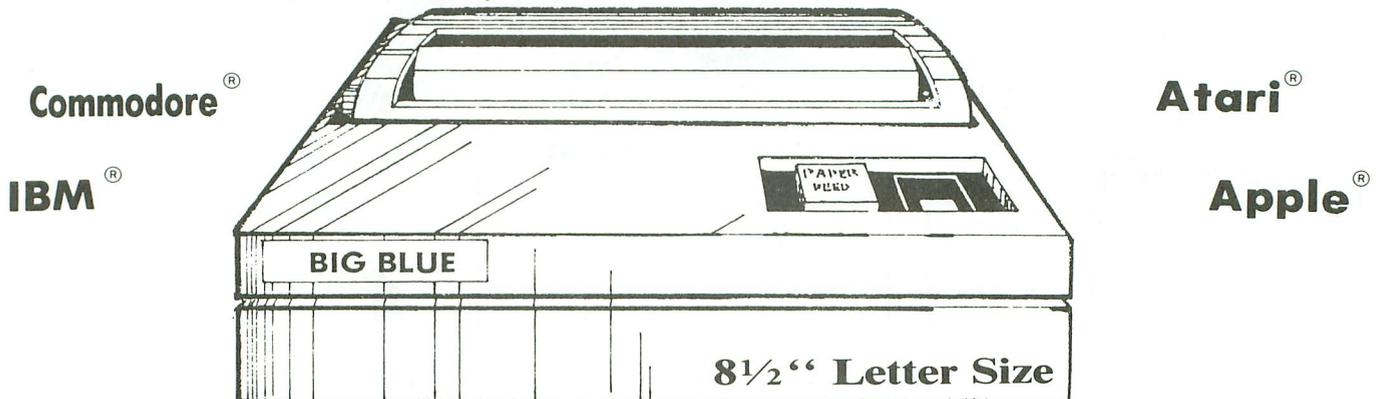
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Index to ANALOG Computing ISSUES 37-49

Back by popular demand is our index to back issues of **ANALOG Computing**, this time covering issues 37 through 49, December 1985 to last month, December 1986. You'll need issues 15 and 37 to complete the full index set thus far. Rather than run the articles in chronological order, we have chosen to begin listing them alphabetically. Columns, reader comment and other regular sections of **ANALOG Computing** are not included here.

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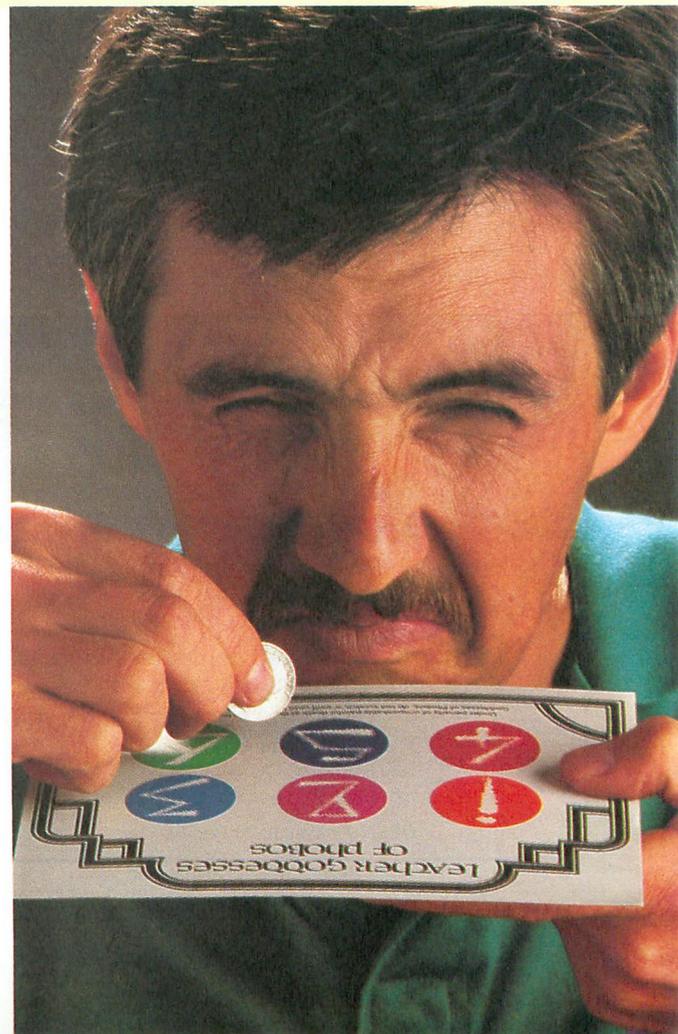
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| KISS (Eastern House) | Palmer, Bernard W. | 38 | 110 | ST-Talk (Quantum Microsystems) | ST Leyenberger, Arthur | 38 | 88 |
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| Lode Runner's Rescue (Broderbund) | Panak, Steve | 38 | 100 | Temple of Apsahai Trilogy (Epyx) | Kelley, Patrick J. | 40 | 41 |
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| Major Motion (MichTron) | ST Plotkin, David | 48 | 79ST | Time Bandit (MichTron) | ST Plotkin, David | 48 | 81ST |
| Mark Williams C (Mark Williams Co.) | ST Weir, Douglas | 48 | 76ST | Track and Field (Atari Corp.) | Panak, Steve | 42 | 96 |
| Mask of the Sun, The (Broderbund) | Panak, Steve | 44 | 90 | Transylvania (Polarware) | Panak, Steve | 49 | 97 |
| Master of the Lamps (Activision) | Panak, Steve | 38 | 99 | Trinity (Infocom, Inc.) | ST Panak, Steve | 48 | 131 |
| Megamax C (Megamax, Inc.) | ST Weir, Douglas | 48 | 75ST | Typing Tutor (Academy Software) | ST Walnum, Clayton | 44 | 76ST |
| Micro League Baseball (Micro League) | Curtin, Bob | 46 | 95 | Typesetter (XLent Software) | Buckheit, Jonathan | 40 | 33 |
| Mind Forever Voyaging, A (Infocom) | Panak, Steve | 40 | 95 | Typesetter ST (XLent Software) | ST Ratcliff, Matthew J.W. | 46 | 71ST |
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Scroll-It

Now, you can create scrolling messages — with ease.

by Mark Sloatman

Hey Atarians! This is what you've been waiting for: a program that will allow you to display a fine-scrolling message (up to 190 characters) across the bottom of the screen in graphics mode 0, 1 or 2, or ANTIC modes 4 or 5. The scrolling message can be in a different graphics mode than that of the rest of the screen. If used in graphics 2, it displays messages just like those in the game **M.U.L.E.**

A scrolling message has many uses. In a game, it can add pizzazz. Because your message can be longer than a standard line would allow, the player can't read the message all at once, and you can create an air of mystery. In an application program, you could give instructions without having to alter the screen display. Just imagine how it could spice up an adventure!

Type in the program in Listing 1. Be sure to save it before you run it. Though there are only a few, the data statements *must* be typed in correctly. After running the program, there will be a slight pause. Answer the three prompts (speed, graphics mode and message) and *voila!* Your message will be scrolling across the screen. Since all of the "work" is done in a vertical blank interrupt (VBI) routine, the scrolling is independent of your program. Once set up, simple POKEs will stop the message, take it off the screen, or change speed.

A full explanation of horizontal scrolling is beyond the scope of this article, but Kyle Peacock did a great job in **ANALOG Computing** issues 13-16. However, I will fully explain my routine, so that you can easily modify it for your own uses. (How many times have you seen a nice program, and not been able to make heads or tails of it?) The BASIC program (Listing 1) has plenty of REMarks.

All of the code for the VBI routine and the display list is relocatable, so you may use page 6 (or any other mem-

ory) for your own purposes. Just remember that, if you put the VBI in a string (by deleting the REM in Line 130), you use SYSTEM RESET to end the program. If you try to BREAK it and change something, the program will certainly crash.

Lines 100-110 — Display lists can't cross a 1K boundary without a JMP instruction. These lines check to see if the DL will cross a 1K boundary, and, if so, add enough offset for the DL to be "bumped" over the 1K boundary.

Line 210 — This line puts INITVB into memory. INITVB tells the computer where the VBI routine is in memory, then starts it.

Lines 230, 240 — Get low and high bytes of the VBI, and POKE them into INITVB.

Lines 370-450 — Get graphics mode desired, and, if applicable, convert it to the ANTIC mode. Line 450 tells the display list what mode will be scrolled and turns on the display list.

Lines 490-570 — Convert the string of ATASCII characters to Atari internal code, then POKE them into the memory for the scrolling window.

Lines 590-610 — POKE the proper value in the VBI routine, so it knows how many fine scrolls are needed before a coarse scroll.

Lines 680 and 700 — Increase or decrease speed of scrolling, depending on position of the joystick.

Lines 730-790 — Put the VBI routine into memory. Line 750 POKEs into the VBI the high and low bytes of where in the display list the location for the coarse scroll is (see Variable Table, below).

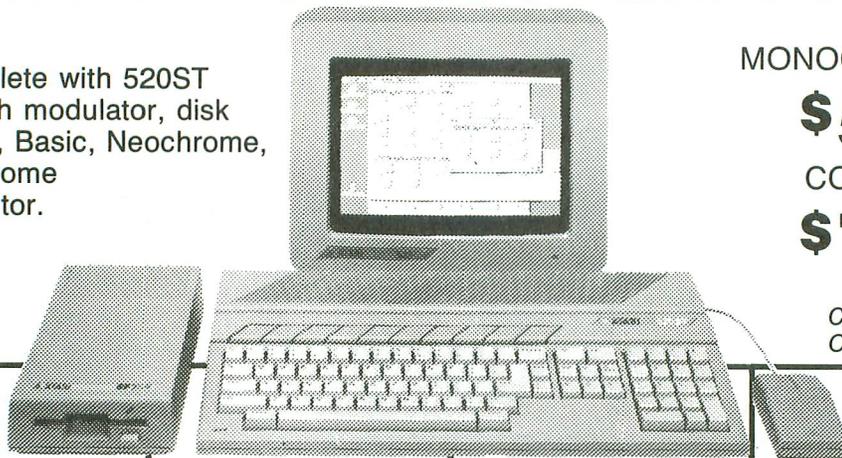
Variable Table. (in order of line numbers).

VBORG — Address of VBI routine. Note that by deleting the REM in Line 130, the VBI routine will

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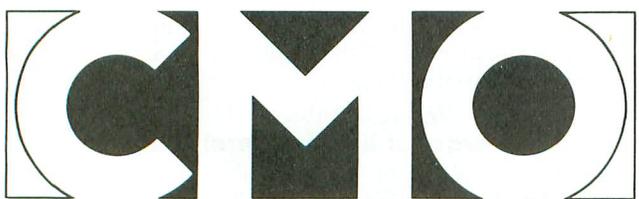
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```

=224 AND CHAR<=255 THEN 560
DH 520 IF CHAR<=31 THEN CHAR=CHAR+64:GOTO
560
FB 530 IF CHAR<=95 THEN CHAR=CHAR-32:GOTO
560
BK 540 IF CHAR<=159 THEN CHAR=CHAR+64:GOT
0 560
VD 550 IF CHAR<=223 THEN CHAR=CHAR-32
IQ 560 POKE (MEM)*256+M+OFF5ET,CHAR
HX 570 NEXT M
HB 580 REM POKE VBORG+37 with 7 for GRAPH
IC5 modes 1 and 2
BJ 590 IF ANTIC=6 OR ANTIC=7 THEN POKE VB
ORG+37,7:GOTO 630
AT 600 REM POKE VBORG+37 with 3 for GRAPH
IC5 mode 0 and ANTIC modes 3,4 and 5 (
also map modes 7,7+ AND 8)
KA 610 POKE VBORG+37,3
TA 620 REM VBORG+37 contains the number o
f times a finescroll needs to be done
before a coursescroll.
TN 630 X=USR(INITVB):REM Start the VB!
NS 640 ? CHR$(125):? :? " All done."
OT 650 POKE 752,1:? " hit RETURN for anot
her message":POKE 764,255
SZ 660 REM if message scrolls off screen
then scroll it again.
US 670 IF PEEK(CSCROLL)>LEN(MESSAGE$)+OFF
SET THEN POKE CSCROLL,0

```

```

VM 680 S=5+(STICK(0)=11)-(STICK(0)=7):IF
5<0 THEN S=0
ER 690 IF S>10 THEN S=10
MC 700 POKE SPEED,S:IF PEEK(764)=255 THEN
FOR T=1 TO 50:NEXT T:GOTO 670
TG 710 POKE 764,255:GOTO 330
UG 720 REM *VERTICAL BLANK SCROLL ROUTINE
*
MK 730 RESTORE 770:FOR T=VBORG TO VBORG+7
0:READ A:POKE T,A:NEXT T
EX 740 REM Need to tell VB routine where
pointer is in Display List for memory
shown.(50 we can do the course scroll)
JN 750 SCROLLBYTES=DLIST+29:HIGH=INT(SCRO
LLBYTES/256):LOW=SCROLLBYTES-HIGH*256:
POKE VBORG+60,LOW:POKE VBORG+61,HIGH
ZP 760 RETURN
AJ 770 DATA 216,173,3,1,201,255,240,60,17
3,2,1,208,52,173,3,1,141,2,1,206,0,1,1
73,0,1,48,9,141,4,212,141,0,1,76,98
UF 780 DATA 228,169,3,141,4,212,141,0,1,2
38,1,1,173,1,1,201,216,208,5,169,0,141
,1,1,141,29,6,76,98,228
OK 790 DATA 206,2,1,76,98,228

```

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by Andy Eddy

A few years ago, a 1200-baud modem was a luxury item. To the tune of about \$400.00, only the most serious telecommunications users could resort to this speedy option. This was also reflected in the on-line cost for services of that time (Compu-Serve, Dow Jones and the Source).

They charged (and *still* do) a higher rate for access to the mainframes at 1200 baud, than for the "normal" 300 baud. Still, the surcharge was reasoned away, as the four-fold increase in data transfer usually made up for it.

Mass production occurs when there's a great enough demand. That usually leads to a lowering in production costs, which, in turn, is passed on to the consumer in lower shelf prices. The fact that so many of us have reasonably low-cost computers in our homes demonstrates this.

It has happened in the telecommunications field. Because of the drastic decline in modem prices, the demand for services has increased. Multitudes of the second-generation on-line networks—like Delphi and GENie—have broken the former trend of discrimination against high-speed users, by not surcharging for 1200-baud usage. They're offering many attractive features, such as file libraries, conference and bulletin board areas and electronic mail services. Telecommunications has become very affordable.

We're going to look at two companies currently selling telecommunications hardware and software that, because of these recent trends, can follow along with Atari's "Power without the Price" credo. The **QMI**

1200ST and **Supra 1200ST** modems, at prices under \$200.00 (including versatile terminal software, besides) cheaply enable the information age to enter *any* home in the country. We'll also explore why the companies' approaches are changing.

At the time of this writing, both modems were based on the same model: the **Avatex 1200**. This design, though predominantly plastic, is sturdy, well made, lightweight—and attractive, to boot. Unfortunately, the **1200** is no longer made by Avatex. Once the supply is depleted, both QMI and Supra are planning to employ different routes to satisfy customers.

QMI plans to discontinue selling 1200-baud modems under their name, but have agreed to license their **ST-Talk** terminal software to Anchor, for packaging with the popular **Volksmodem** in a system specifically for ST users. Supra, though, is in the process of finding a distributor, so that they can continue to market a 1200-baud modem under their brand—while maintaining their \$199.95 price.

It's apparent that the companies involved have had a chance to review bad points of their present hardware (lack of full Hayes compatibility, for example) taking into account the needs—and complaints—of the customer, they'll be able to upgrade, to permit optimum telecommunications performance.

In fact, with technology moving at this rapid rate, both the principals I spoke to (Mark White, head of Technical Support for Supra and programmer of **Omega**, and John DeMar, QMI President and programmer of **ST-Talk**) noted that they're currently testing prototypes of 2400-baud modems to be marketed under the companies' re-

spective names, at prices comparable to those of most Atari-specific products.

Both QMI and Supra have included with their modems—and intend to continue the practice—their own terminal software, which a few years ago would have cost a fortune. The programs give both beginner and expert the ability to handle all telecommunications needs with easy-to-use, easy-to-remember command sets. While the software packages may offer many of the same features, the programs take quite different approaches, from both visual and operational standpoints.

Among the functions common to both programs are: file manipulation without the loss of connection or need to log off; ASCII and Xmodem (error correction) transfer, for sending and receiving of files; routing of text to a printer and/or disk file; on-screen display of a real-time clock; and setting of various parameters (parity, baud rate and word length, for example) necessary for access of BBSs and data retrieval networks.

Both programs offer disk-based dialing directories, to contain your most frequently used phone numbers. After these similarities end, the differences are more substantial.

Supra has upgraded their previous release (version 1.12) of **Omega**, to bring a great deal of power to your telecomputing. Dubbed version 1.2, it retains its predecessor's full use of the GEM environment. The main addition will provide for auto-log-ons through macros, which can either be typed in by the user or "learned" by the program—while you do a log-in or some other function. Instructing the computer to watch your log-in, the program will take

note of your keystrokes, enabling you to use them in future sessions. This takes a lot of the tedium out of telecommunications.

Along with those particulars, **Omega** offers the ability to take screen "snapshots," to be saved in a disk file. Should you require successive snapshots, they will be added to the original file for later viewing. This takes care of the problem of forgetting to activate the capture buffer—and makes it easy to get a record of text that's already passed by.

STTalk (version 1.1) is less feature filled. It relies on function keys and typed-in commands for operation. By Christmas, it will be phased out for version 1.2 (also named **STTalk Professional**), which QMI feels will take the world by storm. The program will feature full use of an unfettered 80x24 text window, a full-featured editor for processing of the capture buffer and manipulation of files before saving or transmission, translation tables (to change incoming and outgoing characters to match the system accessed), emulation of popular systems such as VT52, VT100 and Atari

XL, as well as the addition of eight desktop icons for some of your more intricate functions (like printing, directories, etc.) As before, the inclusion of public domain RAMdisk and Squeezer/Unsqueezer programs (to allow for shorter—and, therefore cheaper—file transfers and more economical disk storage) makes it even more attractive to the consumer.

Another unique feature of the new **STTalk** is custom font control and creation. This lets you make alternate character sets. DeMar claims this will permit the ST user to build a character set that mimics the Atari 8-bit set, among others. Also of note: the auto-answer macros give the freedom to create your own "personal" BBS. By handing these tools to the SYSOP, it allows boards unique looks, to set them apart from "pre-fab" BBS programs, which all start from the same shell.

As a sidenote: both **Omega** and **STTalk** can be purchased separately, should you already own a modem. Each retails for \$29.95 and can probably be found on dealer's shelves at prices lower than that. Additionally, Supra supports the 8-bit crowd

with a 1200-baud modem package for \$199.95. It includes an interface for the 400/800/XL/XE series. The interface can be purchased separately, for \$49.95.

Supra and QMI are both riding with firm grips on the ST bandwagon. Their products are top-notch, and neither company is likely to dry up and disappear. That's a relief, should the need for technical support or service arise. Though their modems of choice will be changing, they'll undoubtedly hand the telecommunications user the maximum. I expect them to stay at the forefront of what's technologically available—at a price that will continue to make owners of other brands of personal computers uncomfortable. **■**

*Andy Eddy works as a cable TV technician in Connecticut having been interested in computers since high school. While his family's Atari 800 is three years old, he's been an avid arcade gamer since **Space Invaders**, and is a former record holder on **Battlezone**.*



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Picture Show

A picture loader for your ST BASIC programs.

by Mathew Spolin

One of the ST's most powerful features is its easily accessed graphics. Programs such as **Neo-Chrome** and **DEGAS** take full advantage of such graphics to create excellent picture files. But most people use the pictures they create only to impress friends and neighbors. Few actually use the pictures they draw within their own ST BASIC programs, because it's so difficult to load pictures from BASIC.

Not any more. With the use of **Picture Show's** self-contained subroutine, **SHOWPIC**, loading **NEO-Chrome** or **DEGAS** pictures is as simple as defining a filename and calling the subroutine with a simple **GOSUB**.

Using **Picture Show**.

To use the program, first type in Listing 1 from ST BASIC, then check your typing with **ST-Check** (see page 49). If you're using the RAM version of TOS, you may need to disable buffered graphics in order to utilize the program. Lines 10-140 are part of the demo program driver and are not needed in order to use the subroutine. The actual **Showpic** subroutine begins at Line 64000.

To use **Picture Show** within your own programs, combine the subroutine with your main program by using the **MERGE** command. Then, whenever you wish to display a picture, define **FILE\$** with the name of the picture you wish to display. The picture may be either **NEO-Chrome** or **DEGAS**, but don't forget to include the extension. Also, be sure the screen is in the same resolution mode as the picture you're attempting to load. If not, the picture won't appear clearly on the screen.

Once the filename is defined, call the subroutine with a **GOSUB SHOWPIC** statement. The screen will clear, the mouse pointer will disappear, and your picture will be loaded into screen memory. The subroutine will then wait for the left mouse button to be pressed. When this happens, **Picture Show** will clear the screen, restore the mouse pointer and return control to the main program.

How it works.

Picture Show is a series of GEM and VDI calls, combined with a **BLOAD** command and some color palette handling code. In a nutshell, variables are defined and redimensioned in Lines 64010 and 64020. The color palette is then saved in the variable **PAL%** in Lines 64030 and 64040. Then, in Lines 64050 through 64070, the picture type is determined and variables are set as to the header lengths of the two types of pictures.

The VDI routine **Hide__Pointer**, called at Line 64080, hides the mouse pointer so it won't spoil the picture. Then, at Lines 64090 through 64110, the new color palette is loaded in and changed. Line 64110 also calls a VDI routine called **Clear__Workstation**, which clears the entire screen, including the menu bar.

This done, the actual picture is loaded into screen RAM at Line 64120. The AES routine, known as **Mouse__Event**, called at Line 64130, waits for the left mouse button to be pressed. The **POKE** statement at Line 64140 resets the palette to its original colors. At Line 64150, the screen is again cleared and, through Line 64160, the VDI routine **Show __Mouse** is called, which restores the pointer to the screen. Finally, Line 64170 sends control back to the main program.

You may notice that, even though ST BASIC will redraw the windows, the menu bar remains blank and the menu still functions as usual. This is because, although AES routine **Create__Menu** (used to make all ST menu bars) draws and maintains a new menu, it never updates the menu bar. However, this has no effect on the menu functions.

So, next time you need a really elaborate title page, or need to load a game background, utilize those stunning graphics available to your ST. . . from BASIC! 

Mathew Spolin has been writing computer programs for six years and works in BASIC, Action!, C and 6502 assembly language. He currently enjoys writing programs on his 520ST, while his 130XE runs his bulletin board system, the Towers of Darkness BBS, at (301) 656-3401.



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Listing 1. ST BASIC listing.

```

10 REM *****
20 REM ** SHOWPIC DEMO **
30 REM ** -- **
40 REM ** By Mathew Spolin **
50 REM *****
60 REM
70 REM This is the demo driver.
80 REM The actual program starts at li
ne 6400.
90 REM
100 FULLW 2: CLEARW 2
110 COLOR 2: ?"VALID EXTENDERS:" : COLOR
3: ?" .NEO - Neochrome Image"
120 ?" .PI? - Degas Image" : COLOR 1
130 ? : INPUT "File to load --> ", FILE$:
IF FILE$="QUIT" THEN END
140 GOSUB SHOWPIC: GOTO 100
59997 '
59998 ' The SHOWPIC Subroutine Follows
.
59999 '
64000 SHOWPIC:
64010 COLOR$=SPACE$(32): ERASE PALX: DIM
PALX(15): IGNORE=0: A#=GB
64020 SCREENREG#=&H44E: SCREENRAM# = PEEK
(SCREENREG#): PALREG#=&H45A
64030 GINTIN=PEEK(A#+8): SAVEP=16745024
: COUNT=0: FOR REGISTER=0 TO 15
64040 PALX(REGISTER)=PEEK(SAVEP+COUNT)
: COUNT=COUNT+2: NEXT REGISTER
64050 IF RIGHT$(FILE$,3)="NEO" THEN IG
MORE=128: FORGET=4
64060 IF LEFT$(RIGHT$(FILE$,3),2)="PI"
THEN IGNORE=34: FORGET=2
64070 IF IGNORE=0 THEN RETURN
64080 POKE CONTRL,123: POKE CONTRL+2,0:
POKE CONTRL+6,0: VDISYS(0)
64090 CLOSE #1: OPEN "I", #1, FILE$: A$=IN
PUT$(FORGET,1)
64100 COLOR$=INPUT$(32,1): CLOSE #1: NEW
CH=VARPTR(COLOR$)
64110 POKE PALREG#, NEWCH: GOSUB 64180
64120 BLOAD FILE$, SCREENRAM#-IGNORE
64130 POKE GINTIN,1: POKE GINTIN+2,1: PO
KE GINTIN+4,1: GEMSYS(21)
64140 POKE PALREG#, VARPTR(PALX(0))
64150 GOSUB 64180: POKE CONTRL,122: POKE
CONTRL+2,0: POKE CONTRL+6,1
64160 POKE INTIN,0: VDISYS(0)
64170 RETURN
64180 POKE CONTRL,3: POKE CONTRL+2,0: PO
KE CONTRL+6,0: VDISYS(0): RETURN

```

ST CHECKSUM DATA. (see page 49)

```

10 data 676, 19, 434, 572, 684, 796,
197, 988, 738, 496, 5600
110 data 112, 507, 344, 440, 723, 22
7, 729, 840, 689, 285, 4896
64030 data 477, 950, 26, 663, 854, 1
18, 231, 12, 487, 531, 4349
64130 data 915, 210, 316, 535, 548,
992, 3516

```

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Pascal and Modula-2 source code are nearly identical. Modula-2 should be thought of as an enhanced superset of Pascal. Professor Niklaus Wirth (the creator of Pascal) designed Modula-2 to replace Pascal.

Added features of Modula-2 not found in Pascal

- CASE has an ELSE and may contain subranges
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 - Interrupt structure
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- Module version control
- Programmer definable scope of objects
- Open array parameters (VAR r: ARRAY OF REALS;)
- Elegant type transfer functions

| Benchmark | Ramdisk Benchmarks (secs) | Compile | Link | Execute | Optimized Size |
|------------------------|------------------------------|---------|------|------------|-------------------|
| Sieve of Eratosthenes: | 6.2 | 4.3 | 3.5 | 2600 bytes | |
| Float | 6.4 | 4.8 | 8.3 | 4844 bytes | |
| Calc | 5.5 | 4.2 | 3.3 | 2878 bytes | |
| Null program | 5.1 | 3.2 | — | 2370 bytes | |

| | | |
|--|--|---|
| MODULE Sieve; CONST Size = 8190; TYPE FlagRange = [0..Size]; FlagSet = SET OF FlagRange; VAR Flgs: FlagSet; i: FlagRange; Prime, k, Count, Iter: CARDINAL; BEGIN ('\$\$-\$\$R-\$\$A+') FOR Iter:= 1 TO 10 DO Count:= 0; Flgs:= FlagSet(); (* empty set *) FOR i:= 0 TO Size DO IF (i IN Flgs) THEN Prime:= (i * 2) + 3; k:= i + Prime; WHILE k <= Size DO INCL (Flgs, k); k:= k + Prime; END; Count:= Count + 1; END; END; END Sieve. | MODULE Float; FROM MathLib0 IMPORT sin, ln, exp, sqrt, arctan; VAR x,y: REAL; i: CARDINAL; BEGIN ('\$\$-\$\$A-\$\$S-') x:= 1.0; FOR i:= 1 TO 1000 DO y:= sin (x); y:= ln (x); y:= exp (x); y:= sqrt (x); y:= arctan (x); x:= x + 0.01; END; END float. | MODULE calc; VAR a,b,c: REAL; n, i: CARDINAL; BEGIN ('\$\$-\$\$A-\$\$S-') n:= 5000; a:= 2.71828; b:= 3.14159; c:= 1.0; FOR i:= 1 TO n DO c:= c*a; c:= c*b; c:= c/a; c:= c/b; END; END calc. |
|--|--|---|

Product History

The TDI Modula-2 compiler has been running on the Pinnacle supermicro (Aug. '84), Amiga (Jan. '86) and will soon appear on the Macintosh and UNIX in the 4th Qtr. '86.

Regular Version \$79.95 Developer's Version \$149.95 Commercial Version \$299.95
The regular version contains all the features listed above. The developer's version supplies an extra diskette containing a symbol file decoder - link and load file disassemblers - a source file cross referencer - symbolic debugger - high level Windows library Module - Ramdisk and Print Spooler source files - Resource Compiler. The commercial version contains all of the Atari module source files.

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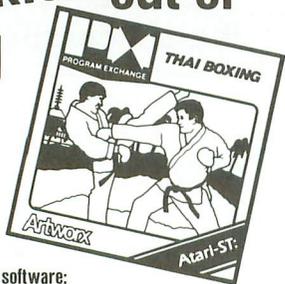
| | | |
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| Kermit | - Contains full source plus \$15 connect time to Compuserve. | \$29.95 |
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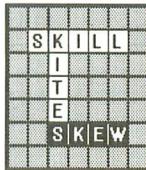
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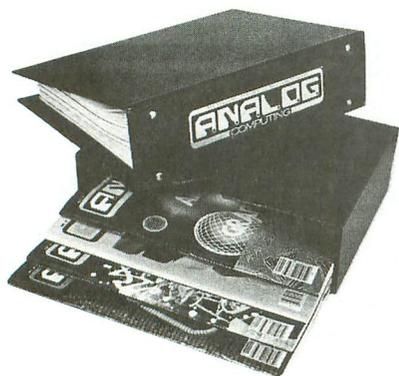
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by Steve Panak

This is the first business-related program I've tested for the Atari. For a couple of years, I've been a "power user" of business personal computers... a legend in my own mind. This field has, up to now, been the exclusive province of the IBM PC and compatibles (affectionately known as clones). The reason is not so much for the machines, whose technology has lapsed into obsolescence, but because of the huge software library available.

Then along came the ST, with the inverse problem; state-of-the-art hardware and few software titles. Now the gates are opening; I've finally gotten the chance to examine a couple of the best yet created in business and personal productivity software. The first is **Time Link** from Batteries Included, and if this program's any indication of future offerings for this machine, the ST may be able to wrench me back from the clutches of Big Blue.

Have you ever lost track of what you were doing? Has where you're going become inextricably mixed up with where you've been, with the result that you're never where you're supposed to be when you're supposed to be there? Or would you simply like to move your diary into the 21st century?

If you find yourself in either of these situations, **Time Link** may be your answer. **Time Link** can best be described as an electronic diary. It contains entries of a time, a date, a keyword, a duration and text. While the time, date and text are self-explanatory, the others are not. The keyword is simply seven characters attached

to your entry to classify it. The duration is a timespan during which **Time Link** questions the insertion of another entry. Say you want to plan an hour meeting. Set the meeting at one o'clock with a one-hour duration, and you'll be alerted if you attempt to insert another entry with the same keyword in that time span.

I was impressed by the simplicity of the program, which I could use efficiently after about an hour. Unfortunately, in that hour I also lost my first file—more about that horror in a moment.

Using the mouse, you effortlessly travel through time, to the exact date you want. Start by displaying the year, then tap the mouse on the day you wish, or search through months (or weeks) for the day you want. Your first entry might just as well be today. Select "add" an entry, then type in your text—up to 511 characters. This isn't a lot of text, but **Time Link** is a diary, not a word processor. If more than 511 characters worth of stuff happens to you in one day, then open an entry for each minute of the day. That gives you 735840 characters per day. By contrast, this review contains about 7000 characters.

As your diary fills, finding a particular entry becomes more difficult. First, as outlined above, you can scan the days and weeks for your entry. A quicker way is to either "filter" or "search." In filtering, you ask **Time Link** to display only those entries with the keyword you wish. For an even more specific search, ask **Time Link** to find a given character string. As long as you know what you're looking for, it's pretty hard to lose anything.

There are a number of "extras" in **Time Link**, too. You can vary the date format,

as well as perform date and time arithmetic. If you've ever wanted to know how many minutes are left till Christmas, you'll really appreciate this last feature. Finally, the program will permit numeric fields and will sum a given variable for a given time span. If you used the program to track customer billings, this could give you weekly, monthly and yearly receipts.

Although not primarily a word processor, the program includes basic editing commands you'll need to whip your entries into shape. You can move about the text window effortlessly, deleting characters and defining blocks of text to copy, move, or delete. Toss BI's **Thunder!** into the background as a desk accessory, and you'll never have to worry about misspelling misspelled again.

Like all jewels, **Time Link** was not without a couple of flaws. One problem was the "quit" option. If you quit without saving your file, it's very likely to be damaged beyond repair. This is what happened to my first database. I don't see why the option to cause such a disaster is even given. I also would have liked to see the program as a desktop accessory, floating behind my word processor the way **Thunder!** does. The convenience and utility of this terrific program would have been greatly increased.

Another problem was in the help screens... or the lack of them. This is a feature which, while still alien to most Atari users, is near and dear to me. The equivalent to having a manual (open to the correct page) at any given time, the help facility is a necessary component of any piece of productivity software I'd consider buying. Anyone with **1st Word** has tasted this gem,

and that was only an appetizer. More complete help facilities are not only possible, but are standard on most of the best business software. Fortunately, this isn't fatal to **Time Link**, since its simplicity of operation more than compensates for the missing option.

The manual has its strengths and weaknesses. First, it's spiral bound. This makes it easy to read when working on the computer. Unlike a bound booklet, it doesn't snap shut at an inopportune moment. Further, the text is clear, and nicely handles presentation of instructions for two different machines (the Macintosh and the ST).

The problem is the lack of an index—and the cryptically sparse table of contents. I like to use a manual as a reference work, like a dictionary. I want to go to it and have it answer my questions quickly. I don't want to have to read it like a novel. So, while the program was very user-friendly, the manual was not.

But I'm picking on a fine program, exposing flaws which don't destroy its incredible utility. **Time Link** is your link to the past (your past) and is a valuable addition to anyone's ST library. **A**

The author thanks *The Magic One Computer Shop of Barberton, Ohio.*

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by George R. Stepanenko

The Music Studio is the first commercially available sound-and-song-editing program for the ST, and it's a nice one. Activision released it for the XL/XE computers at the same time; except for the MIDI features, the two versions are very similar. For some unfathomable reason, the XL/XE also lacks the capacity for printing out the score—a significant exclusion, one which might discourage users from replacing their **Music Construction Set**, a very similar (but not identical) program.

The Music Studio is laid out a lot like **N-Vision**, with pull-down menus above and below the work area, and everything accessible via the mouse. The graphics are crisp, and the symbols logical, if not intuitive. It's almost too good, considering the limitations of the ST sound chip, so it's fitting that the program does support MIDI output. This also makes **The Music Studio** the first generally available MIDI program. Although it won't begin to satisfy the needs of professional musicians, since it's neither a sequencer nor a patch-editing program, it's quite good enough as a tool for basic composition and entertainment. A growing number of ST owners are picking up small synthesizers; for the non-professional, **Music Studio** is a workable compromise.

Whether one is using the internal chip or external devices, the process for laying down music is the same. An instrument palette (in sixteen colors) offers a choice of sounds, and similar menu boxes are used to pick durations, rests, key signa-

tures, ties, triplets, keys, accents, dots, time signatures and the other elements which make up a piece of written music. It's all there, very easy to get at and almost easy to use. At the bottom, there's a song slider—a sort of gas gauge indicating the number of columns in a song and the current column number. Moving from any portion of the song to another is a simple matter of scrolling the song window. The bottom menu bar also sports an ear—for listening, of course—an eraser, a trash can, plus speed and volume controls.

For editing, a special menu in the upper right corner of the screen works with a section marker, to facilitate copying, moving and deleting blocks. This menu is also used to make large-scale changes through a specific range of columns, supporting transposition, changing the length of durations, adding repeats and replacing instruments. Marking off a section is as simple as pointing and clicking at either end of the range desired; this system offers to a musician all the flexibility a decent word processor gives to a writer.

While the mechanics of laying down sound elements are simple (point and click, click a second time to remove the element), conceptually it's a bit trickier, and the program betrays some shortcomings. It's impossible to put down a dot, accent, sharp or flat after having put down the note. Added to the fact that each voice is different—and that most music contains notes of a variety of durations—this becomes a bit of a problem in strategy. There is a way around it: by putting down the notes, then going back and replacing them with appropriate flatted, dotted, etc. equiv-

alents, but this method significantly interferes with the flow. Also, two notes can be tied only if they are of the same key and duration; “sliding” is impossible. Combined with **The Music Studio's** use of the concept of columns—as opposed to true measures—this can yield strange results, and it limits the program's potential as a true compositional tool.

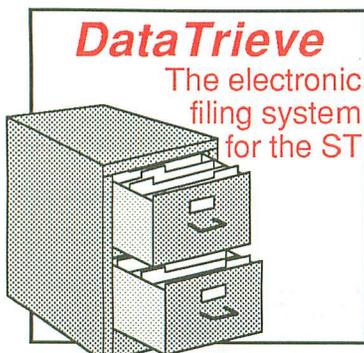
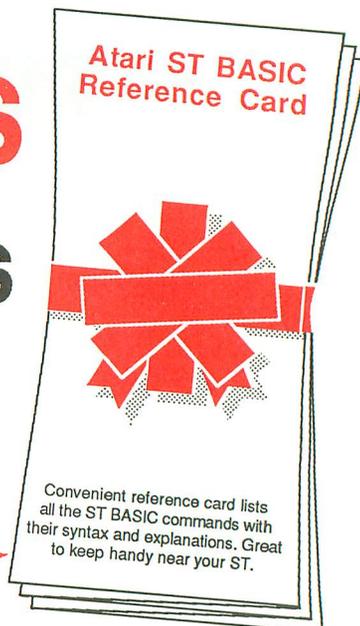
Measure bars are optional. The user can plop them in for the sake of organization, or they can be left out—they make no difference at all. Nor do the time signatures appear to have any purpose, and the accent marks are strictly cosmetic. Again, because the program perceives each column as a complete event determined by the note of longest duration, keeping track of beats per measure becomes more of an exercise in fractions. This is not to say that the program doesn't work; it's simply that **The Music Studio** makes enough compromises with traditional concepts to frustrate anyone hoping to use standard compositional rules. Thus, the judgement that it's not for “professionals.”

There are a few other problems in using **The Music Studio** for serious composition, arrangement and printing of a score. The low resolution mode supports sixteen colors. This is well in keeping with the sixteen channels available for MIDI information, but it does tend to clutter up the screen. Complex pieces become very hard to read; notes pile up on each other, and, in the mess of flags, a note of one duration can easily be mistaken for another. The key symbols appear to belong to notes one step above them, though they print in the right position. The print function is

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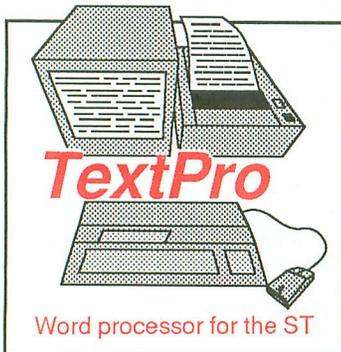
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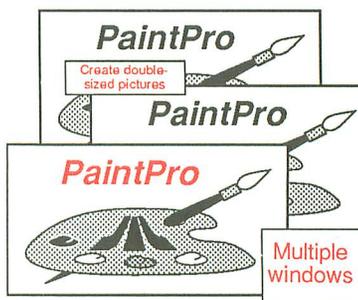


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single-purpose; there's no option to modify the driver or obtain selective printing. Also, the program prints the repeat bar, rather than actually repeating the measures, and treats the end of a printed line as the end of a measure.

Whenever a formal system like that of musical notation and scoring is adapted to the computer environment, problems are bound to arise. Taken as a flexible creative environment, **The Music Studio** is a very decent piece of work. Professional musicians, composers and arrangers hoping to "computerize" their work will have to look to programs far larger, more expensive and complex. Anyone who's adapted to computer graphics processes, or even to word processing, is familiar with the relearning which comes before increased productivity. Activision claims too much for the program, but, at the price, it can't be everything to everyone.

The Music Studio offers some interesting innovations, like the "Paintbox." Click the right button, and a completely different screen appears. The voices are lined up like a color palette in a painting program, and the durations are represented by little boxes of different sizes—we can literally paint with music. There seems to be potential in this approach—the idea that music is not static, the insight that notes can and do flow like paint or words. Except for generating potential patterns, this option has no usefulness for the composer, but it is fun.

The "Design Instrument" screen is another welcome feature. **The Music Studio** comes with sixteen preprogrammed internal sounds, but any or all can be modified to suit the user, and saved as a sound file. Modifying a sound is as simple as pulling sliders around on-screen. We're given one set of controls for the volume of the ADSR, another to set the length. While we have only two waveforms, tone and noise, there's a lot of flexibility in this method of changing the envelope. Another slider sets the octave in which the voice will play, and, as the sound is modified, we can hear the changes, as well as watch a graph representing the envelope. Again, this is a secondary feature which could almost stand alone.

For those with MIDI-compatible keyboards, there is an equivalent submenu. While the sixteen channels are defaulted to a specific set of Casio **CZ-101** preset sounds, the user has the option of resetting any of those channels to activate any sixteen (of up to eighty) presets on whatever keyboard might be attached. The user can also specify the range of that sound, effectively determining where Middle C will be represented on the keyboard. Since a lot of keyboards offer only one voice at a time, some have four (as do the Casios) and very few have as many as six, setting the MIDI parameters screen becomes a

matter of choosing sixteen favorite instruments and saving them as a sort of orchestra, which would be used over and over—like a favorite color palette.

An alternative method for music entry also exists for those with a MIDI keyboard. It wouldn't be correct to call this function a sequencer, but it does allow for direct entry and recording of notes from the keyboard. A color (voice) is chosen, along with a note duration; MIDI input is turned on from the menu; and the computer is prepared to accept data. This function pays no attention to "system" data. Fast or slow, the music appears in one duration; play softly or with a hammer, punch in violins or guitars—there's no effect on what's being recorded.

The strength of this function is that it does let you compose on a tool of composition—the MIDI keyboard. The recorded results can all be edited and the output determined by other functions of the program. It's a workable and acceptable compromise between full-blown MIDI packages and the limitations of the internal sound system. For many, **The Music Studio** might very well be the only music-and-MIDI program necessary. **A**

*Thanks to Alan Isley for his comments and suggestions on **The Music Studio**.*

George G. Stepanenko has been an Atari enthusiast since 1981. Having sold computers in a department store, he's been with an Atari-only store for over two years now. He's an original member of Calgary Atari ST user's group and a contributor to their newsletter.

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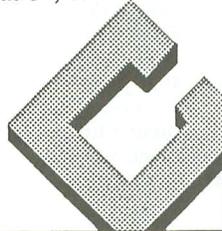
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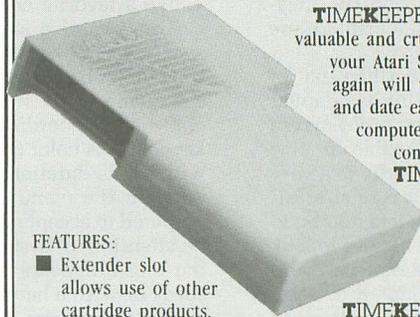


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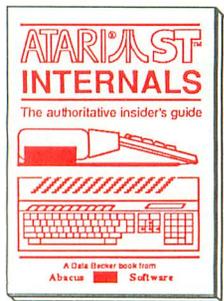
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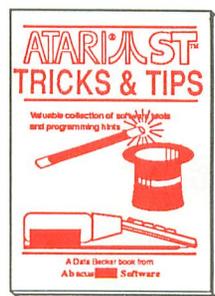
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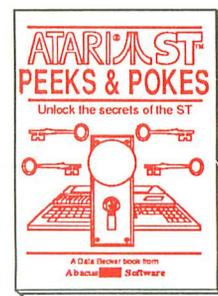
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DOS Shell

Atari ST Command Line Interpreter
 by Timothy Purves
 MICHTRON
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 ST \$39.95

by David Plotkin

There's no doubt in my mind that the Atari ST's icon-based GEM system is much easier for novices to learn than the hard-to-remember, typed-in commands used to accomplish the same purpose. In fact, this difference in ease of use is one of the major things which separates the ST from the likes of the IBM PC. Nevertheless, there are times when it would be advantageous to have the ability to type commands, rather than using GEM.

DOS Shell from Tim Purves at MichTron, gives ST users the ability to control their computers with typed-in commands, instead of the GEM icons. This "Command Line Interpreter" is quite powerful, and provides options—such as batch files—not available from GEM.

DOS Shell can be run from the GEM desktop. You are presented with a blank screen and a prompt. From here, you can use a multitude of commands to accomplish your tasks. You can set the time and date, call up directories, copy files from one disk to another and between subdirectories, set search paths, delete files, rename files, print remarks on the screen—and quite a few other things, as well.

DOS Shell handles subdirectories (folders on the GEM desktop) with ease. You can create new subdirectories and erase empty ones. The PATH command even allows you to set up a search pattern for a particular file. Normally, when you type in a filename to access, it must be present on the current drive and directory. With PATH, the computer will search all other listed drives and directories for the file if

it isn't in the current one. You can change directories at any time.

One of the ways in which **DOS Shell** is quite similar to MS-DOS is that you can run any program with a .COM extender simply by typing in its name. Thus, if you're familiar with machine language, you can program your own extensions (new commands) to **DOS Shell**.

DOS Shell supports the standard "wild card" characters, so you can specify multiple files. It also allows redirection of input and output, so you may list a file to the printer, or turn a disk directory into a file. Esoteric features such as pipes and filters are also provided, which make it possible for the output of one program to serve as the input to another.

My favorite **DOS Shell** feature has to be batch files. A batch file is nothing more than a text file, containing a series of commands to **DOS Shell**. The file is created with a text processor and given a .BAT extension. When you type the name of the file, **DOS SHELL** will perform all the commands in the file. Because your batch file can print on the screen, use logical IF, branch to labeled lines, and use replaceable parameters, it can give you considerable power.

For example, my batch file quizzes me for the time and date, sets up a 150K RAM-disk by calling one of the public domain RAMdisk programs, copies my compile and link files to the RAMdisk, and loads and runs OSS **Personal Pascal**. There's even one version called AUTOEXEC.BAT, which will run automatically when **DOS Shell** is run. If you put **DOS Shell** in your auto folder, it will load and run AUTOEXEC.BAT when you turn on your ST, giv-

ing the same effect that AUTORUN.SYS files do on 8-bit Ataris.

DOS Shell's weak point is its documentation. Not only is it strangely organized, but it's repetitious and often inaccurate. Tips on powerful uses of the commands and a long dissertation on batch files are given *before* you're introduced to the commands themselves—tough reading when you don't know the commands.

Also, the manual repeatedly states that the AUTOEXEC.BAT file will run automatically on booting up. This is simply not true, and the *only* way to get this to happen is outlined above. The manual would have you believe that **DOS Shell** isn't even necessary to execute AUTOEXEC.BAT. Finally, the instructions for using some functions (notably pipes and filters) are pretty sketchy. An explanation of why the samples work would go a long way toward clearing this up.

Despite some shortcomings in the documentation, **DOS Shell** is an excellent program. MichTron's phone support is fast and friendly. **DOS Shell** is easy to learn and use, especially if you're familiar with CPM or MS-DOS. But even if you aren't, you'll soon be efficiently manipulating commands and files like an old pro. **A**

David Plotkin, with his Master's degree in Chemical Engineering, is a Project Engineer for Chevron U.S.A. He purchased his Atari in 1980 and is interested in programming and game design, as well as word processing.

ST notes

by Lee H. Pappas and D.F. Scott

Newsworthy happenings and tidbits from the ST world.

MichTron.

This company's policy of publishing software from free-lancers has been paying off recently. For instance, Kay McFadden has come up with **Pinball Factory**—a game-construction set, which borrows a bit from Tom "Degas" Hudson and is about three steps ahead of Bill Budge. The familiar picking-up-and-stamping-down of objects from **Pinball Construction Set** can be found here; though painting the pinball machine itself is the real selling point of this program—reminiscent of **Neo-Chrome** and **Paint-works**. Game play also includes a touchy tilt (you can make it not so touchy) and multiball capabilities. Color only, this retails for \$49.95.

If you're interested in other methods of saving those mysteriously vanishing quarters, the very same MichTron is offering **Financial Future**. The premise behind this is for the program to act as a structural guide, to aid in the shaping of a personal financial plan. It takes into account personal savings, investments and their prospective yields, and loans and their respective interest rates. Feed it some suppositional amounts, and the program forecasts your net worth at various intervals. My own forecast:

make money and don't go into debt. I've known some who'll set off the tilt there, too. Color or monochrome, it retails for \$39.95. MichTron, 576 S. Telegraph, Pontiac, MI 48053 — (313) 334-5700. //

Batteries Included/ Integral Solutions.

The powerhouse has released the **Isgur Portfolio System**, to keep track of stock investments (including that 33 percent share of Atari you've been meaning to purchase). The program's concept is by Lee Isgur, First Vice President of PaineWebber—who, by the way, handled Atari's prospectus. **IPS** shows the current status of every item in your portfolio—including profit and loss totals, net value after commissions, and total percentage and compound annual percentage variation. It also keeps consolidated portfolios containing securities and foreign investments, in the currency of their respective countries. Naturally, the program has graphing and charting capacity. Also "bridges" with **I*S Talk**, for access to financial databases. Color or monochrome. Contact Batteries Included, 30 Mural Street, Richmond Hill, Ontario L4B 1B5, Canada — (416) 881-9941. //

Monogram Software.

This company's fame and fortune was earned from **Dollars & Sense**, another financial record-keeping program made popular for IBM and Apple products. The porting over to the ST represents a substantial endorsement of a product which deserves some substantial endorsements. Company executive Derick McLeish claims that, "for the first time, the 200,000-plus Atari users will have access to a full-featured program to help bring their personal finances into focus." As we've seen, it's really the third time, but why quibble? The record-keeping procedure is divided into five categories: assets, liabilities, income, checking and expenses. **Dollars & Sense** specializes in graphing and charting also, and can access your hard disk drive (IBM veterans recognize the need for hard drives). Retail for \$99.95, which is lower for the ST than for other systems. Monogram Software, Inc., 8295 S. Cienega Blvd., Inglewood, CA 90301 — (213) 215-0355. //

Quickview Systems.

The name that's known for **Zoomracks** releases its newest ST product, appropriately entitled **Zoomracks II**.



The sequel to this most unique of databases—shall we call it a “card file” program?—has added, according to Quickview Product Manager Paul Heckel, new output formats, with cutting, copying and replacement within each format. Macro replacement phrases may now be stored in an unlimited number of “racks.” The mail merge and report formatting functions have been updated, and it’s now possible to include a **DEGAS** drawing within a card (call that “dGas II?”) Until Christmas, the program will retail for \$119.95—after then, the price goes up to \$149.95. Current **Zoomracks** owners may upgrade to **Zoomracks II**, by sending the company the original disk and a check for \$79.95. Demo disks are available for \$9.95. Quickview Systems, 146 Main Street, Los Altos, CA 94022 — (415) 965-0327. //

Hybrid Arts.

The company that gave us **EZ-Track ST** is offering **CZ-Android**, a waveform and envelope generator for use with Casio’s **CZ-101** digital synthesizer. The program allows the ST to maintain the data necessary for two banks, or “workbenches,” of sixteen sound functions. One can set

the values by manipulating the number fields, or can *have the computer come up with a sound-form itself*. These randomly generated sound waveforms don’t end up with mindless noise; some very unique tones can be transferred to the **CZ-101** via MIDI cable. Any random sounds can be fine-tuned later. Color or monochrome, retailing for \$79.95. Hybrid Arts, 11920 W. Olympic Blvd., Los Angeles, CA 90064. //

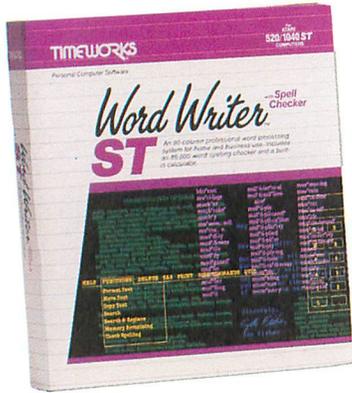
Cygnus.

There isn’t a microcomputer yet built that hasn’t been “benchmarked” in some way on how well it played “Star Trek.” The accepted first of this genre, called “Dartmouth Trek” by those who believe the game originated at that university, sets the *Starship Enterprise* (recently converted to dust in the movies) on a course through a chessboard of sorts, each square divided into another chessboard of sorts. Armed with the proverbial phasers and photon torpedos, your object in the game was to blast away as many enemy ships as possible. It’s taken a while, but now the acclaimed “expert version” of the text-driven “Dartmouth Trek” has finally been ported over to the ST. **Star Fleet I** by

Cygnus maintains much of the old flavor of the game, without forsaking all the technological advances the ST offers. People (like me) who used to drool at new “Trek” features announced in the computer mags will exude sweat and other like fluids when reading these features: *thirteen* different types of ships besides yours, and you have your choice of *thirty-six different configurations* for your ship, some of which put the *Excelsior* to shame (others make a scout look like a starbase). Over twenty command categories, which relate to, among other things, tractor beams, damage control and internal security. “Star Trek” nomenclatures aren’t used here; Cygnus would need permission to use them, anyway. You start out life as a cadet (your rank and status are kept on disk). By the time you’ve worked halfway up in the ranks and can effectively deploy a probe or lay out a space minefield, you will have been put through tests that make the Kobayashi Maru scenario look like a Sunday of miniature golf. Retailing for \$55.00. Released through Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404 — (415) 571-7991. //

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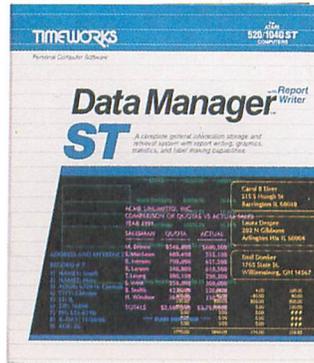
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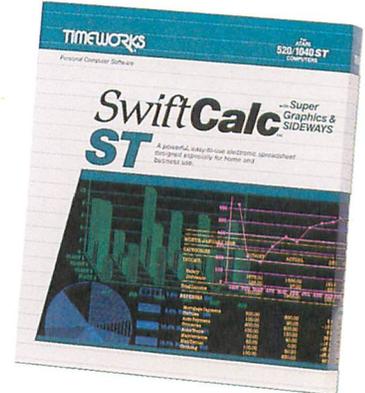
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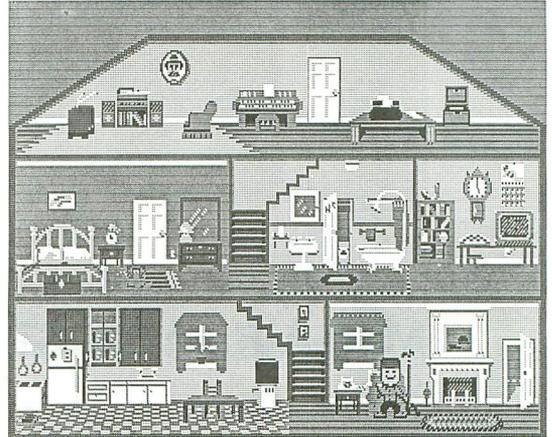
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The Little Computer People Discovery Kit



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by Victor T. Albino

The Little Computer People Discovery Kit represents a new and unique concept in entertainment software. So original, in fact, it's impossible to categorize. It isn't really a game—although there are indeed games to be played within the program—but rather an experience, to be shared with others and enjoyed.

According to the full-sized color magazine packaged with the documentation, it seems that Little Computer People (or LCPs, as they're nicknamed) have been found living inside the micro-interiors of home computers. With the sharp circuit boards, hot resistors and humming capacitors, it's no wonder that these little people are attracted to a more hospitable abode if one's available.

The LCP Discovery Kit generates such an environment, providing a three-level dollhouse guaranteed to lure a little person from the recesses of your computer.

When you load the program for the first time, the house is empty. After all, LCPs are quite shy and don't like to be rushed into a new situation. Eventually, however, an LCP will open the front door and give the proffered living quarters a thorough inspection. If he finds this new home to his liking, he'll leave to retrieve his belongings. When he returns, he'll have a suitcase (and possibly his dog) with him.

Only one LCP will occupy a house at a time, and this person will have a unique name and personality. He'll differ from the LCP who would emerge from a different Little Computer People Discovery Kit disk.

Once your LCP has moved in, he quickly makes himself right at home. He may fix a meal, light a few logs in the fireplace,

or play with his computer. If he's in an active mood, he may do some aerobics, or turn on the stereo and dance to the music.

Although the LCP is quite friendly and willing to talk to you, his language (called LPS for Little People Speak) is difficult for most humans to decipher. You can still communicate extensively with him, by typing sentences on your computer keyboard. You may ask questions, give suggestions, or make requests. Since the LCP has a mind of his own, you can expect a wide range of responses. If you ask his name, he'll usually introduce himself.

In general, LCPs seem to be fairly good natured. They'll try to comply with your requests—when they get around to it. Don't be surprised if they feed the dog or watch a favorite TV program before accepting your invitation to play. Also, remember your manners when communicating with the LCP. Words like *please* and *thank you* go a long way toward maintaining a good relationship.

You can, and should, interact with the LCP in other ways—such as leaving a food basket at his front door, or filling his water tank when it gets low. You can also give him gifts or pat him on the head with a special extension hand. Such psychological "mood boosters" are helpful if your LCP is ill, or if his expression indicates that he's unhappy. In fact, failure to provide for his needs may draw sharp criticism—in the form of a typewritten letter.

Most LCPs are happy to entertain themselves. They're good pianists, who can play compositions ranging from the classics to modern jazz. They love their record collections and will respond favorably if you leave a new album at the front door.

Almost all LCPs will play games with you. If in the mood, the LCP will step up

to the monitor screen, knock on the glass (from the inside of course) and invite you to play. Although each LCP has his own favorite game, the types most often enjoyed are word games, puzzles, blackjack and draw poker. LCPs are good game players, but they insist on dealing—and they hate to lose.

After playing poker late into the evening, the LCP may make a midnight snack or take a long, relaxing shower before going to bed. Of course, you could wake him prematurely, by turning on his alarm clock or causing his phone to ring. But if he doesn't get enough sleep, he may be irritable. On the other hand, some LCPs would rather play than sleep, so you just have to get to know your own little guest's personality.

From the above description, it's easy to see why The Little Computer People Discovery Kit defies routine classification. It's difficult even to determine what age group enjoys the program most. Adults, teenagers and young children—all seem equally fascinated by the personality and activities of these little individuals. Perhaps it's simply best to say that, if you want to interact with your computer in a totally original way and you like meeting new "people," you'll definitely enjoy this truly exceptional program. ☐

Victor T. Albino is a hospital administrator, self-taught computer enthusiast and vice-president of his local Atari user group. A number of his programs and articles have appeared in computer magazines, and he has received awards in educational programming and computer graphics.



Meg-A-Ram 520ST upgrade

CAL COM INC.
6820-A Orangethorpe Avenue
Buena Park, CA 90620
(714) 523-5353
\$149.95

by Anthony M. Falcetano

Do it yourself? Some time ago, I wrote to several companies inquiring about memory upgrades for the 520ST. More specifically, I was asking for a "do-it-yourself" kit. Several companies responded, but only one offered an upgrade in a kit form. The company not only sent product information, but the installation instructions as well, giving me a chance to see what I was getting into before shelling out \$149.95. I bought it—and recommend that anyone desiring a 1-megabyte Atari 520ST give serious thought to Cal Com's **Meg-A-Ram** kit.

The kit itself is very simple. It consists of one small printed circuit board with the RAM chips installed, a sixteen-DIP header pin and a small bundle of wires on the bottom. The wires (nineteen in all) are cut to the proper length, and the ends have been stripped of insulation. A sixteen-pin IC socket is also included, as are instructions and diagrams.

The installation process is also simple. Basically, one has to disassemble the computer, removing the RF shields and the mother board from the housing.

Remove the 68-ohm resistor (if present) that's located over the first RAM chip, and reposition it to the underside of the mother board. Then, piggyback the empty IC socket over RAM chip 1 and solder. Afterward, cover the top of the MMU chip (U15) with electrical tape or other insulating material, to keep the **Meg-A-Ram** board from shorting on the exposed connections on top of the U15.

Next, plug the **Meg-A-Ram** board into the socket you just installed, routing the wires down through two holes marked A and B in the mother board. There are sixteen wires that must be soldered to the shifter chip, U10. The eight yellow wires go to pins 3-10 and the eight blue wires go to pins 12-19.

There are three other wires, which must be soldered to pins 18, 21 and 22 on U15. That's about all there is to it. Although there are several items not mentioned, the instructions are well written. They provide good tips on installing the upgrade, soldering, using a grounding strap, and other hints to calm your nerves. Here are the missing items.

It would be a good idea to keep the conductive foam on the circuit board header pins until actually needed. This will help keep down static electricity. Care must be used when repositioning the 68-ohm resistor from the top of the board to the bottom. If it isn't installed close to the circuit board, the bottom half of the metal RF shield will not fit properly.

There are two adhesive patches on top of the **Meg-A-Ram** circuit board; no mention of these is made in the instructions. I cut a small piece of foam rubber the size of one of the patches. One of these adhesive patches is directly over the socket that was added; I placed the foam rubber on this patch. When the top RF shield is reinstalled, the foam compresses against it, helping hold everything in place. It didn't look as if the adhesive patches would contact the shield by themselves.

Otherwise, the instructions supplied are more than adequate. There's a paper tem-

plate included with the kit. And, while not exactly to scale, it's pretty close. Finding the right pins to connect the wires is easy—and almost foolproof. Simply lay the template at the joystick end of the mother board, and everything lines up.

The software supplied is Cal Com's **J-Disk**, a RAMdisk utility. What makes this RAMdisk special is that, upon initialization, the program asks you to enter the date and time, along with the amount of memory (up to 789K) you want set aside for the RAMdisk. It also has a copy program to automatically copy files from the boot disk to the RAMdisk. It includes **Neo-Chrome**, as a demonstration transfer program.

The only problem I came across was when I found the format for entering the date and time—it wasn't given in the instructions. By trial and error, I discovered that the date format is the same one as in the control panel, *mo/dy/yr*. The format for the time was another story! The only one I could get to work correctly was the 24-hour clock (20:00 for 8:00 p.m.)

The program was apparently written in Europe (most likely, England). This isn't really a problem, though. After the date's been entered into the RAMdisk program, it's converted to a 12-hour format—before being placed in the control panel.

For those of you who like statistics, I've included the following data: MichTron's **Softspool** has 727K bytes available for use after installation of **Meg-A-Ram**; **M-Disk** has 709K bytes; ST BASIC has about 187K bytes before and 700K bytes after its installation (with desk accessories in). RAM amounts are with TOS in ROM. Atari's **1st Word** takes about 15 seconds to load and

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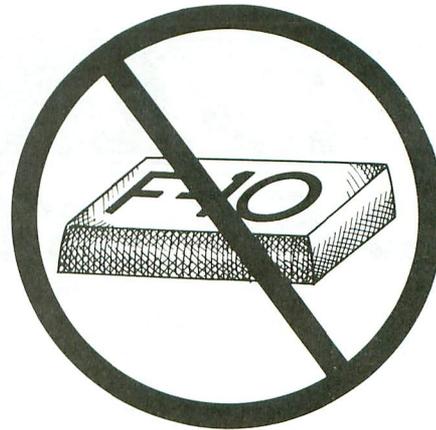
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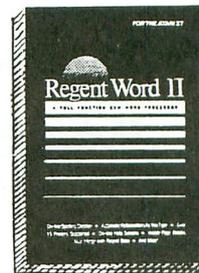
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Don't confuse our upgrade with others you may have heard about. Ours supports Antic CPU control, so you don't have to worry about overwriting the screen when doing bank selecting. Some programs will not run properly if this is not controlled. Our upgrade also protects the main memory. During banked operations, you cannot accidentally access the main memory bank and wipe it out.

Installation available. Check with your dealer or contact Newell Industries for more details.

RAMDISK XL/XE

Allows the use of three different operating systems. Comes with OSNXL OS that includes the FASTCHIP floating point routines, and OMNIMON XL machine language monitor. The OSNXL OS is compatible with the 400/800 OS.

The OMNIMON XL is a resident monitor with all the debugging tools needed for any application. Interrupt and examine any program (including cartridges) easily. Includes read/write to disk, binary load, directory, assembler, disassembler, single step execution, drive control, change registers, hex conversion/arithmetic, search/ display/ alter/ move/ relocate/ verify memory, hex or character format and more.

FASTCHIP

The FASTCHIP floating point routines can give you up to four times the speed of the original floating point routines. Atari basic uses these routines for almost every operation. Spreadsheets and other languages also use these routines. You can see the difference.

SCXH COPIER

This program was designed for use with Atari 130XE, and 256K 800XLs with the Newell Industries 256KXL ram upgrade. It should not be used with other computers unless they support this bank switching method. This program supports both single and double density disk drives up to 2880 sectors per disk. Copies a full disk in just one pass. Make multiple copies while reading the source disk once.

SBM ST

This system was designed to operate in a wholesale or retail environment. SBM ST is an inventory control, point of sale program that produces invoices, purchase orders, statements, mailing labels, quotes, sales and account reports, plus much more.

Inventory control:

Each inventory record consists of item number, part number, description, vendor number, quantity on hand, location, reorder point, quantity on order, cost, sale price, quantity sold, dollar amount sold, and product group.

Accounts control:

Account records consist of account number, name and address, terms, total purchased, total paid, last invoice date, and balance due.

General information:

Mailing labels may be printed for all or selected accounts and vendors. Purchase orders may be printed with automatic update of inventory records. Sales reports consist of daily, periodic, and annual. Tracking of up to 30 salespersons for figuring commissions, etc. Ten programmable tax rates, separated and recorded.

Capacities:

Parts (items) - 32,767 per inventory file, unlimited number of files.

Accounts - 32,767 per account file, unlimited number of files.

Vendors - 32,767 per vendor file, unlimited number of files.

Estimated capacity per media:

Single sided drive - 2000 records. Double sided drive - 4000 records. 20MB hard disk - 110,000 records.

MYDOS DOS

Compatible with 2.0S, but has the serious user in mind. Supports all 5 $\frac{1}{4}$ and 8 inch drives. Single and double sided and density. Also support for hard disk. Ramdisk support up to one megabyte.

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run from one of the disk drives. It takes approximately 3 seconds from the RAM-disk —quite an improvement.

All in all, the **Meg-A-Ram** upgrade kit performs very well. It's easy to install—even with a coffee break, installation time was under an hour. I have yet to find any programs that are incompatible; I doubt if I ever will. I've left the computer on for approximately twelve hours straight, running a **Neo-Chrome** graphics animation, and it showed no signs of overheating—or other ill effects.

The only thing missing from the RAM-disk software was an option to set aside a predetermined amount of memory to be used each time it was booted. With this, it would be easier to set up a dedicated RAMdisk, to work with special-purpose programs like **DEGAS**, **1st Word**, compilers, and other programs which have a lot of disk access time.

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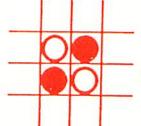
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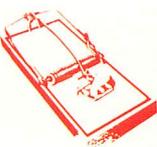
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