

**ST NEWS**

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PROGRAMS  
HELP**

Page 59

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# Antic®

The **ATARI®** Resource

MARCH 1987 VOLUME 5, NUMBER 11

## **Inside Today's Atari Corp.**

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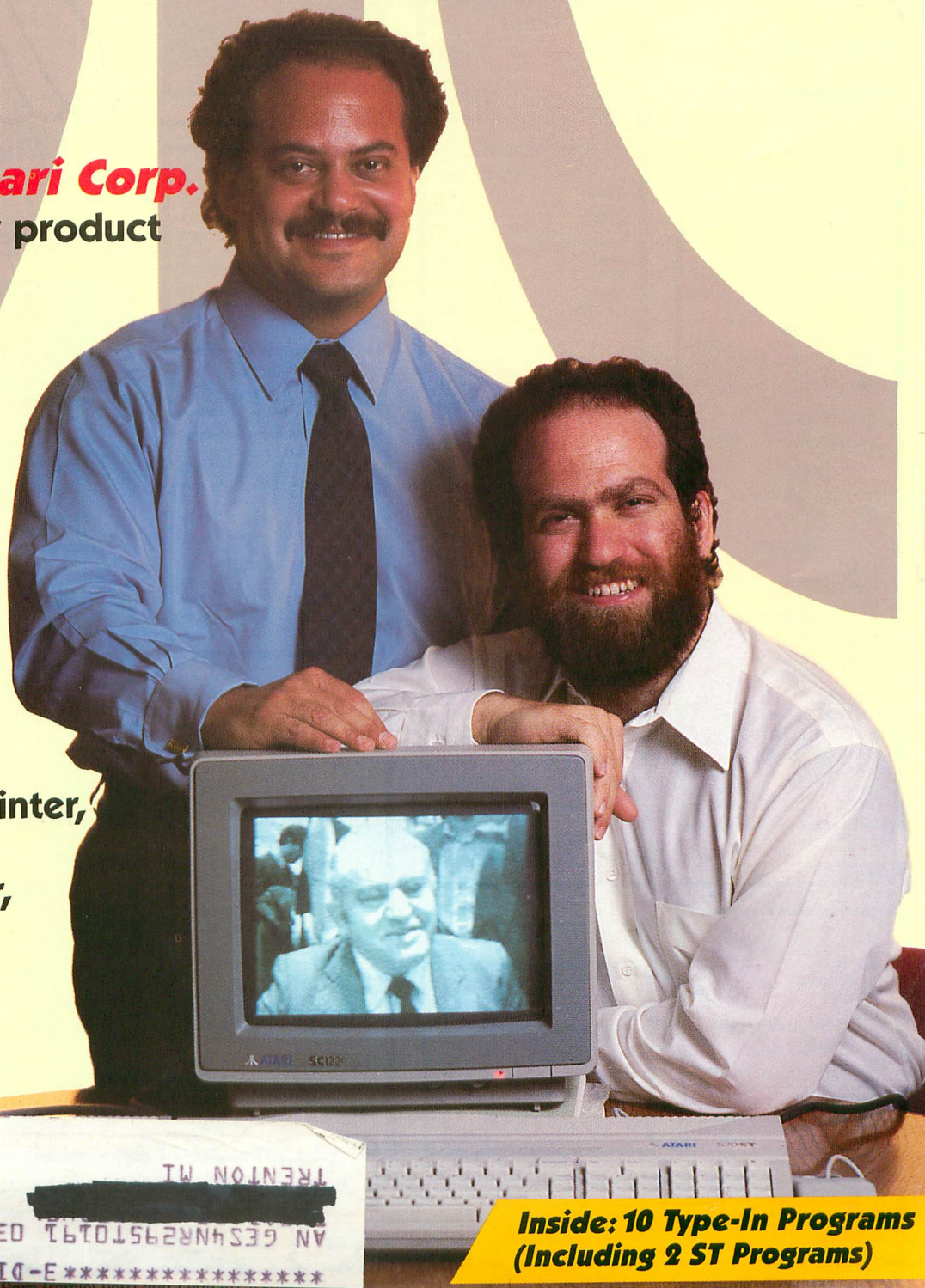
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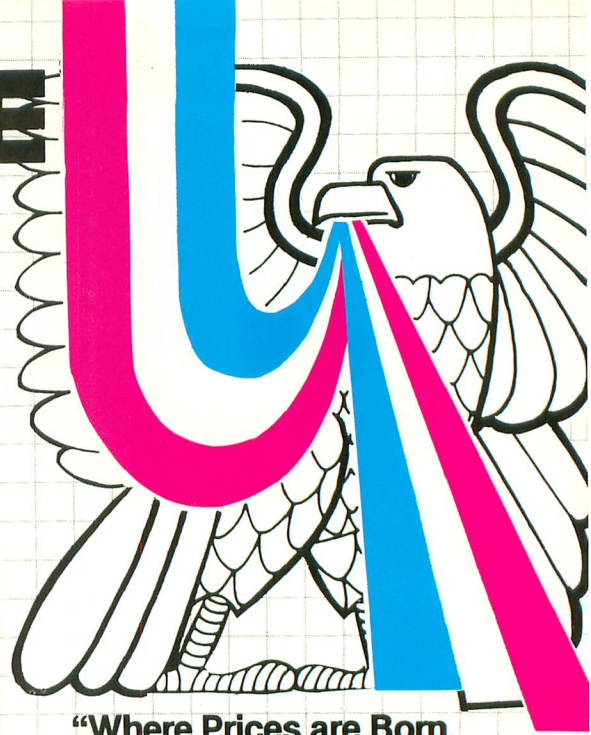


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Hippo Word ..... 26  
Almanac ..... 22  
Backgammon ..... 24

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Gun Ship ..... 24

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Atariwriter ..... 21  
Atariwriter + ..... 32  
Learning Phone ..... 26

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Ultima 4 ..... 38

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182 ..... 214  
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MPP 1200ST ..... 149  
Team Modem ..... 145  
Avatex 1200 ..... 95  
Avatex1200HC 100% Hayes. 143  
Packard/Bell 1200 ..... 199  
Compuserve ..... 21  
U-Call ..... 36

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U-Print/Port ..... 40  
U-Print 16K ..... 69  
U-Print 64K ..... 85  
PR Connection ..... 63  
PR Modem Cable ..... 11  
PR Printer Cable ..... 11  
Xetec ..... 39  
U-Print 1200XLP ..... 49  
520 ST/IBM Cables 6 ft. ..... 11  
Micro Stuffer ..... 69

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DS/DD ..... 24

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SF314 ..... 215  
SF354 ..... 149  
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US Doubler ..... 49

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Color 710 ..... 568

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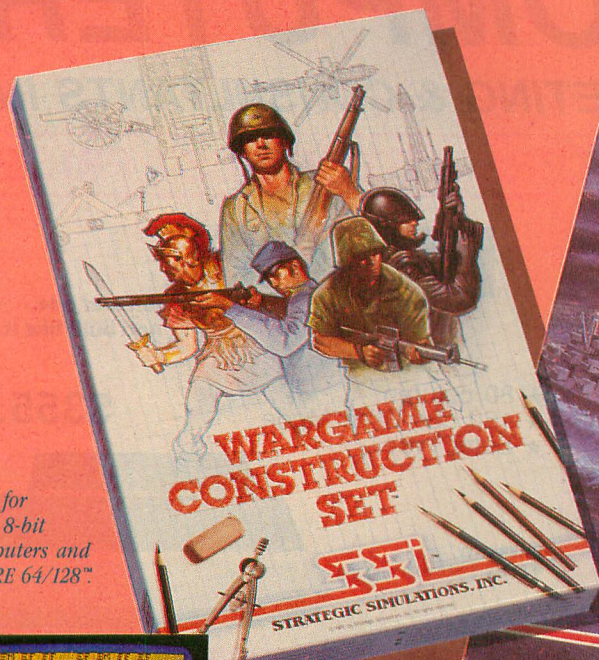
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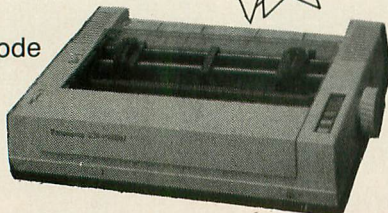
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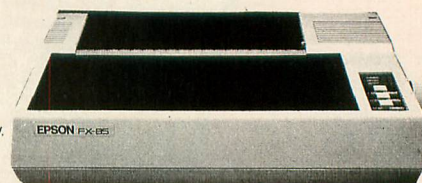
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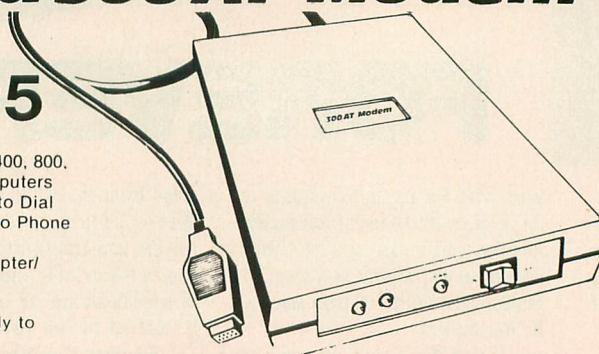
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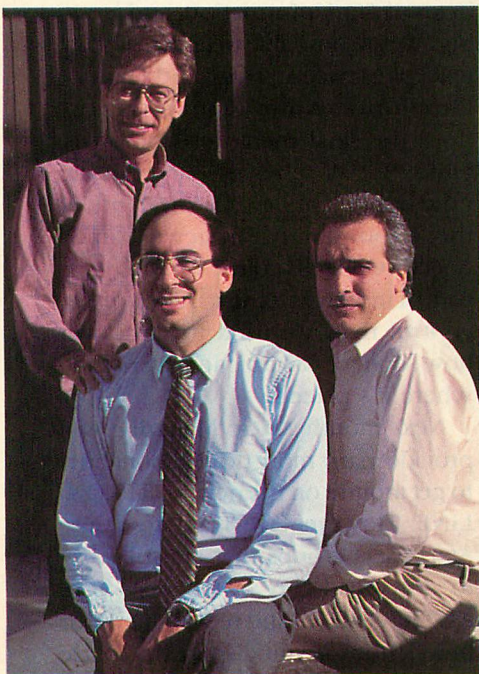
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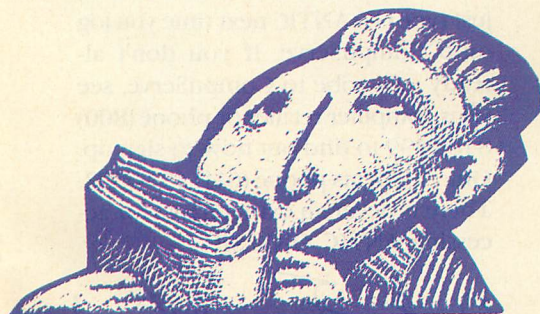
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Game of the Month . . . . . 16



Today's Atari Corp . . . . . 30



Word Searcher . . . . . 23

## FEATURES

<b>WORD SEARCHER</b> by Kevin Peck	23
Atari power finds the winners	
<b>RAINBOW SCREEN CUSTOMIZER</b> by James Hague	27
Flashy displays for your programs	<b>TYPE-IN SOFTWARE</b>
<b>TODAY'S VICTORIOUS ATARI CORP.</b> by Nat Friedland	30
A close-up look inside	
<b>DVORAK KEYBOARD</b> by David Yearke	36
Turbo typing for the Atari	<b>TYPE-IN SOFTWARE</b>
<b>PAGE 6 GRAB-BAG: PART I</b> by Matt Loveless and Mike Eggers	39
Add punch to your programs with useful routines	<b>TYPE-IN SOFTWARE</b>
<b>WAGE/HOUR PAYMASTER</b> by Hal Boyer	45
First fruits from the Practical Program Contest	<b>TYPE-IN SOFTWARE</b>
<b>MULTI-AUTORUN</b> by Bill Bodenstein	47
27 files at your fingertips	<b>TYPE-IN SOFTWARE</b>

## DEPARTMENTS

<b>GAME OF THE MONTH</b>	
<b>VECTRON</b> by Heath Lawrence	16
Atomic arrow strategy game	<b>TYPE-IN SOFTWARE</b>
<b>STARTING OUT</b>	
<b>NEW OWNERS COLUMN</b> by David Plotkin	42
Lesson 12: Graphics Modes	<b>TYPE-IN SOFTWARE</b>
<b>PRODUCT REVIEWS</b>	49
Seikosha SP-1000A, Kyan Pascal, Leader Board, Vestor	
<b>USERS GROUP OF THE MONTH</b>	
<b>TACE</b> by Gregg Pearlman	57
Serving 500 square miles of Texas	
<b>TECH TIPS</b> by Bill Marquardt	106
Pinout master charts	

## SOFTWARE LIBRARY

### TYPE-IN LISTINGS SECTION

## ST RESOURCE

<b>USING INP AND OUT</b> by Alex Golitis	61
From keyboard to screen or modem in ST BASIC	
<b>ST PUZZLER</b> by David Bohlke	63
Jigsaw puzzle generator	<b>TYPE-IN SOFTWARE</b>
<b>ST REVIEWS</b>	64
<b>BASIC ALERT</b> by Ron Shaefer	68
Create alert boxes in ST BASIC	<b>TYPE-IN SOFTWARE</b>
<b>STARGLIDER</b> reviewed by David Plotkin	71
Fantastic space warfare simulator	
<b>HIPPO SOUND DIGITIZER</b> by Patrick Bass	77
Easy-to-use sound tool	
<b>ST NEW PRODUCTS</b>	81

# Antic

The ATARI Resource

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## Editorial

Many of you sent us letters or electronic mail wondering why we haven't said much lately about ANTIC ONLINE—or added much to our CompuServe edition either.

Well, we missed you at least as much as you missed us. We enjoy providing the fastest and most in-depth Atari news to thousands of users each month on ANTIC ONLINE. But although we felt bad about the temporary slowdown, all of us here are happy that contract negotiations have been concluded to everyone's satisfaction.

More important, we're sure that *you* will also be happy with the vastly expanded but streamlined new ANTIC ONLINE, which now becomes the first online magazine to offer these important new features we *couldn't* bring you before:

- **SOFTWARE ONLINE**—Every month there will be new 8-bit and ST programs you can download, without any extra charge. These will showcase the best programs from Antic's five years of publication. And as we replace programs each month, the previous titles will be transferred to the SIG\*Atari data libraries and remain accessible online.

- **PICTURE GALLERY**—New RLE (Run Length Encoding) high resolution graphics will be available each month for downloading or online viewing. ANTIC ONLINE will even be able to display pictures accompanying news stories. You'll *read* about a product or convention and then *see* it onscreen. You can submit your own best ST or 8-bit RLE pictures too.

- **SUBSCRIPTIONS ONLINE**—Now you can place your subscription orders online for Antic Publishing magazines and later be billed directly.

## ALL-NEW MENUS

During our hiatus, Antic literally spent months of man-hours to create

a dramatically streamlined menu structure for ANTIC ONLINE. Now you can see what's new as soon as you enter ANTIC ONLINE. No more wading through pages of submenus and old files before finding out about the newest products and developments. Only the best of the old material will remain in our archives. So it won't get in your way, but it's still there if you need it.

ANTIC ONLINE is CompuServe's largest online magazine—1.5 megabytes of Atari information, and growing. We are now able to update it daily (except between Friday and Sunday) directly from Antic. CompuServe still does the final merge in Columbus, Ohio. But all other preparations are now done right here at Antic, under the responsibility of newly-named ANTIC ONLINE editor Charles Jackson. This gives Antic much more control than we used to have over how soon we can upload material and where it's placed.

Next month Antic Magazine will provide many more details about how to get around on the new ANTIC ONLINE. However, we want to assure Atari users groups that it's still okay to download *any text article* from ANTIC ONLINE and reprint it in your newsletter—if you display the Antic copyright and permission notice at the top of each article you reprint.

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*Nat Friedland*

Nat Friedland  
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- Stereo CAD-3D animation and stereo slide show by Tom Hudson.
- For programmers: Complete developer's instructions plus source code for adding stereo to your own programs.

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Glasses

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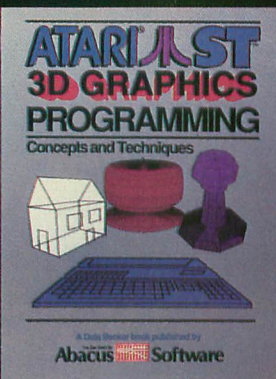
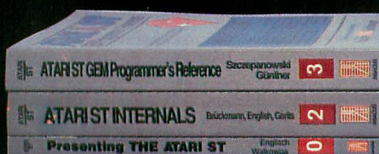
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**On ST Internals:**

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**On GEM programmer's Reference:**

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Enhance your programs with the examples found within this book. Explores using different languages BASIC, C, LOGO and machine language, using various interfaces, memory usage, explore the VDI using BASIC, more. 280pp \$16.95

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## ST BASIC to C

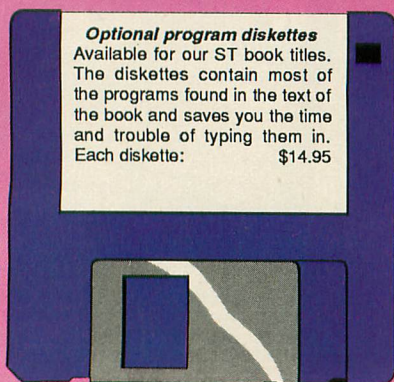
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## MDA ATARITHON

This summer I worked on my hometown Muscular Dystrophy Association Telethon. The dealer that had previously supplied computers went out of business, so donors' names, addresses and donations had to be listed by hand. But a friend and I brought our Ataris (800XL and 600XL) and I wrote a quick program to track all this information. We had a good time and I got to show off my computer to the whole community.

Oscar Fowler  
CompuServe ID  
72347,1655

## SHARED HARD DRIVE

Is it possible for an 8-bit Atari and an ST to share the same hard disk drive?

Lenny Tamburello  
East Hanover, NJ

*Theoretically it's possible to connect one hard disk to both computers if you have interfaces for each. But using data on the same hard disk in both 8-bit and ST file formats would be quite a programming challenge. In an upcoming issue, we will review the Lurie & Associates Hard Disk System (up to 128Mb) for Atari 8-bits. The company plans to offer an ST interface soon. Lurie & Associates, P.O. Box 7546, Van Nuys, CA 91409. (818) 780-1783.—ANTIC ED*

## HELP FOR DISABLED

On behalf of the severely physically handicapped who now (or wish to) enjoy the Atari, I appeal to programmers to try to include all starting controls, options and other controls in simple menus accessed by the joystick. It's very frustrating to require someone else to press keys when you're not in a position to do so. We have taken a great step forward in the past few years in recognizing that the handicapped can enjoy the things we take for granted if we just include them in our thinking and designing of things.

W.E. Barton  
Chatsworth, CA

## BUDGET DB UPGRADE

I have an enhancement to the excellent program, *Budget dB* (Antic, November 1986). When listing transactions to the screen, the prompt "C to cont" gets printed at the top of the screen after the second page is listed, overwriting part of a transaction. Typing "C" at that point ends the listing. To correct this, delete POSITION N0,22 in line 445.

Jim Barnett  
Gaithersburg, MD

## NEEDS DEVELOPERS KIT

I am unable to locate a Resource Construction Set anywhere. Can private individuals get the Atari Developers Package? If so, how? It appears the RCS and the Atari/DRI documentation are worth the price. If not, what now?

Joel Hart

*Yes, anyone may purchase the Atari Developers Kit directly from Atari by sending \$300 to Atari, Inc., 1196 Borregas Ave., Sunnyvale, CA. 94088. Write on the outside of the package you want the Developers Kit. In addition to 1500 pages of ST/GEM documentation, you'll receive six disks packed with Alcyon C, a linker, a debugger, a text processor, many tools, and example source code. Oh, you get Atari's RCS, too.*

*You'll also be admitted to CompuServe's Atari Developers SIG, where many people who make the ST tick (like SYSOP\*Tom Hudson 76703,4224) visit every day to answer questions. There are other RCS's available, however. The RCS which comes with MegaMax C (\$200) is a good one, and KUMA has just released an RCS of their own. RCS 2.1 was available for downloading from CompuServe for a while, but has disappeared as of this writing.—ANTIC ED*

## MICROLINE 1025

The Atari 1025 does have adjustable tractor feed capability. It's basically the same printer as Okidata's Microline 80. Cascade Electronics sells a tractor drive for this printer for \$35 and it fits the 1025 perfectly. Cascade Electronics Inc., Route 1, Box 8, Randolph, MN 55065. (507) 645-7997.

Gary Martin  
Dothan, AL

## ULTIMA RUNES

Most of the characters in the archaic alphabet of Lord British's Ultima IV (Origins Software) can be found under "rune" in the *American College Dictionary* (Random House). Translating the ancient language on the cloth map of Ultima IV into English is a great help when moving players between cities.

As a further clue, remember that mandrake root and nightshade can be found only when both moons are dark.

Marjorie Martin  
San Francisco, CA

## CHROMA BOOST

The "busy" appearance of the video display background described in Jon Krahmer's *XL Color Boost* (Antic, November 1986) is actually a video problem originating in the composite video signal output. The problem varies according to whether the unit was manufactured in Hong Kong or Taiwan, and it's less noticeable on high-quality monitors because their wide range of contrast control permits greater suppression of the background than can be achieved on a television set.

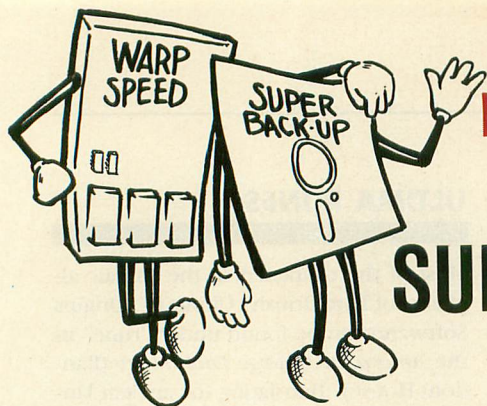
Benjamin Poehland  
Frazer, PA

## 1020 PENS: FOUND

*A number of readers replied to Russ Novotny's cry for Atari 1020 Plotter pens (December, 1986). Radio Shack carries a set of three black pens (26-1480) and another trio with red, green and blue (26-1481). Each of these 1020-compatible sets costs about \$2.95. If you're out of paper for your 1020, Radio Shack's roll paper for the CGP-115 plotter (26-1428) will do fine—but you'll have to transfer some paper to an empty spool, because the full CGP roll is too big to fit into the 1020.*

*Thanks to Pete Harker, Cory Laidlaw, David Brown, Raymond Aston, Gary Vimr and Paul Marquette for their help.—ANTIC ED.*

continued on page 11



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## I/O Board

### TURN C INTO PASCAL?

As a new C programmer wishing to learn the already hard subject of interfacing C into GEM, I do not appreciate your published C source code filled with **#defines** that turn it into "Pascal." Will you ensure that any future C source code is straight C and not **#defined** to the hilt into some "other" language?

Ralph E. Freshour

*Different programmers write programs in different ways. The person who programs for us in C feels the operator set in C can be (and is often) abused until the program becomes unreadable. Also, it seems the majority of people reading The ST Resource know some BASIC or PASCAL, and are encountering C for the first time. Since C allows its operators to be re-defined, they get changed from the curly brackets to "begin...end" or "for...next", or whatever is applicable. However, we have a simple solution for you. Type in the code as it appears in the magazine, then run your source code through CP68.PRG, and the file it puts out (yourfile.i) will contain pure, clean C source code without any **#defined** Pascal in it anywhere.—ANTIC ED*

## Help!

### MENU MAESTRO

If *Menu Maestro* (January 1987) is "freezing" your XL or XE keyboard, just add the following line for a quick thaw:

```
150 IF PEEK(65521)=2 OR  
PEEK(65521)=1 THEN
```

```
A$(100,100)="Q":A$(101,101)=  
CHR$(251)
```

The TYPO II Code for this line is SY.

*Antic welcomes your feedback, but we regret that the large volume of mail makes it impossible for the Editors to reply to everyone. Although we do respond to as much reader correspondence as time permits, our highest priority must be to publish I/O answers to questions that are meaningful to a substantial number of readers.*

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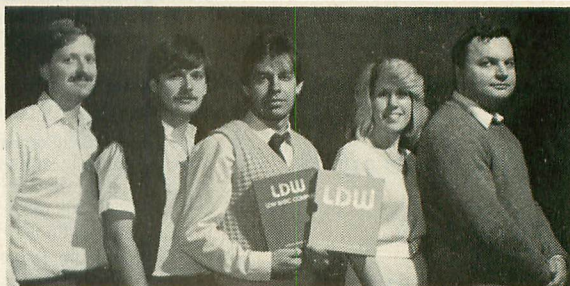
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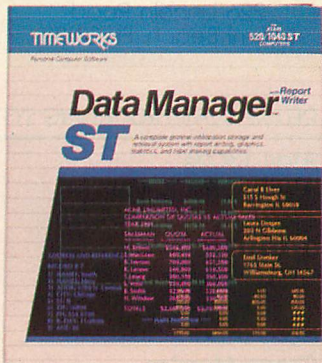
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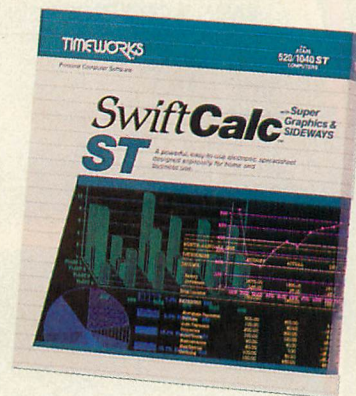
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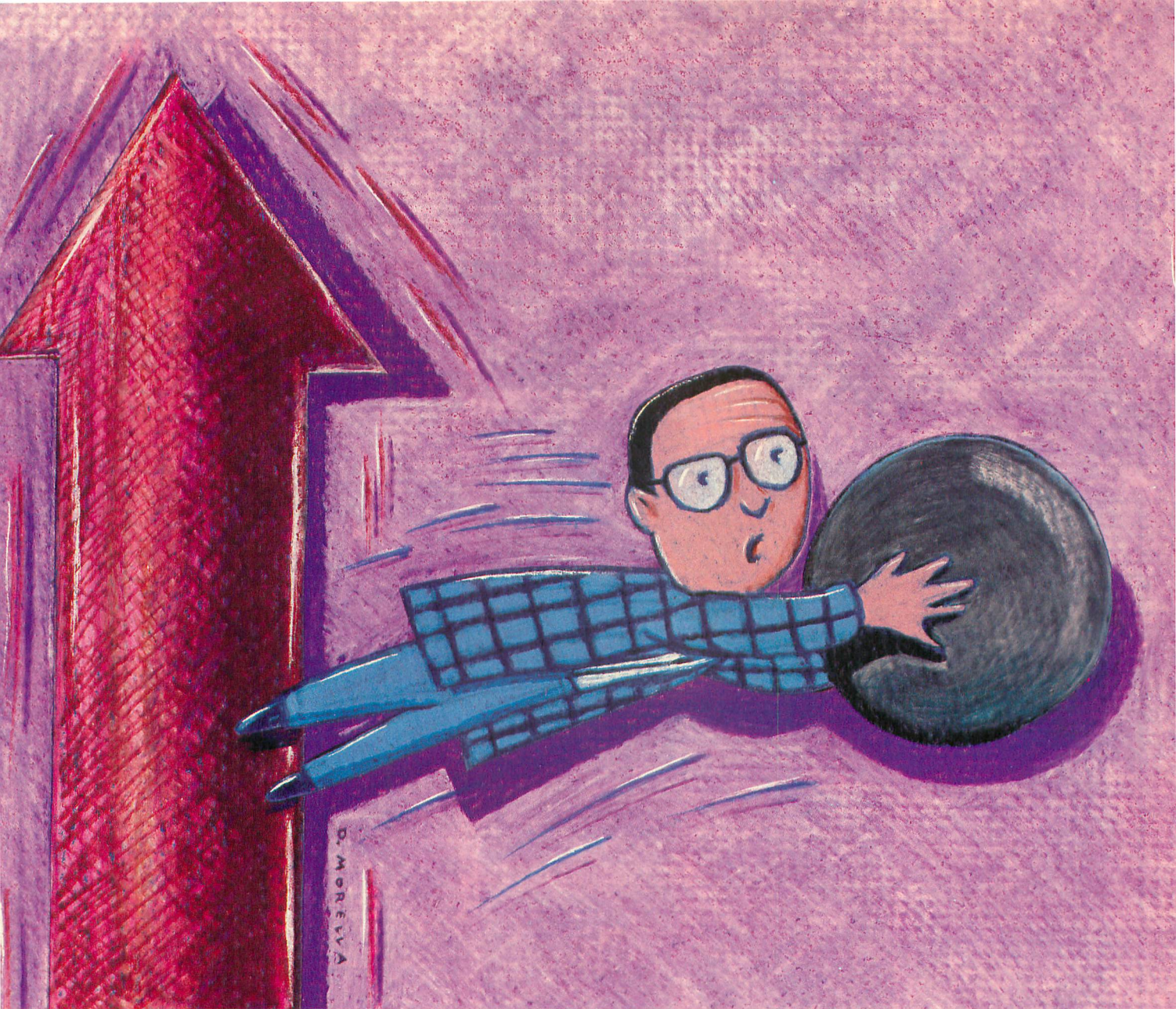
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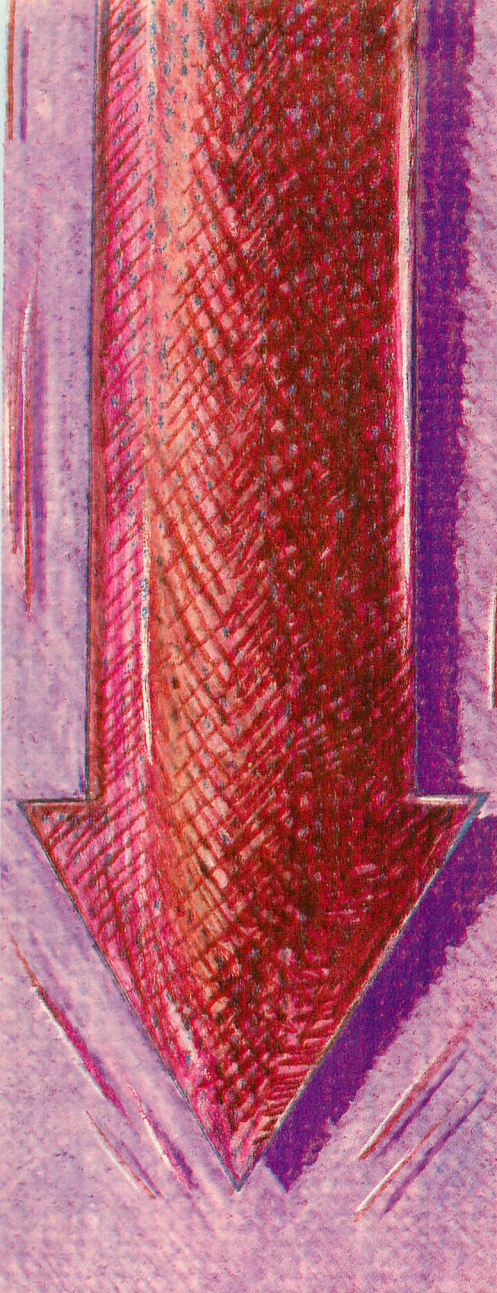
# Vectron

## *Atomic arrow strategy game*

*Manipulate atomic particle blasters and energy deflectors to destroy more targets than your opponent. This strategic marksmanship game is **Antic's** second offering from the author of *Cliffhanger* (**Antic**, November, 1986). The BASIC program works on all 8-bit Atari computers of any memory size, with disk or cassette.*

**Y**our Atari starts Vectron by randomly placing a playfield of 50 energy deflectors (arrow-shaped targets) within a border of atomic containment gutters. Opposing atomic particle launchers are at the left and right sides of the field. These two launchers can move up or down. The scores of each player and the number of deflectors remaining are displayed at the bottom of the screen.

Arrangement of the energy deflectors is crucial to the game. Movement of launched projectiles is controlled by the directions in which deflector arrows point. For example, if your projectile is hurtling horizontally across the field and strikes a deflec-



tor arrow pointing *up*, the projectile starts moving upward. At the same time, it blows up the deflector and increases your score by one point.

You win by destroying more deflectors than your opponent. Naturally you want to keep your projectiles in play as long as possible. You do this by finding lengthy "chains" of targets, which will usually make your projectile change direction constantly.

Spend time analyzing the field's target setup before you do anything else during your turn. See which deflector directions and positions will do you the most good. Always look for a new chain, because the playfield is constantly changing. Don't rule out isolated deflectors—they just might

get you into a chain that looked inaccessible.

## FOUR PHASES

Each player's turn is divided into four phases. During the first phase, the message DEFLECTOR TYPE appears at the top of the screen. Push your joystick in the direction of an arrow that you want to put into play. That arrow direction will be displayed at the top of the screen. Press the joystick button to move to the second part of your turn.

You are now ready to position the deflector. An *inverse* image of your deflector appears in the middle of the playfield. Use your joystick to move the cursor to the desired position and press the joystick button. But only a buzzer will sound if you try to lay one deflector over another.

You only get to add one deflector during your turn, so you must make sure to place it where it will do you the most good.

Next, move the atomic particle blaster up or down with the joystick. When it is lined up properly, press the joystick button to launch a projectile. The projectile keeps moving in one direction until it hits a deflector.

If the projectile strikes a blaster it will reverse direction—and the blaster disappears until the next turn. So don't hesitate to use your opponent's blaster (or even your own) to keep a chain going.

When the projectile hits a containment gutter, it will roll off the screen and your turn is over. Turns continue until there are no targets left. Whoever has the highest score gets a musical victory salute from Vectron.

## TYPING VECTRON

Type in Listing 1, VECTRON.BAS, check it with TYPO II and SAVE a copy. If you have trouble typing in the special characters in lines 575 and 581, leave those lines out. Instead, Listing 2 will make a disk or cassette file called LINES.LST that creates those lines for you. LIST a copy of Listing 2 after you check it with TYPO II. Now type NEW and LOAD Listing 1, then ENTER the file created

by Listing 2. Make sure you SAVE a copy of the merged program before you RUN it.

To change the number of targets at the start of the game, change the 50 in line 540 to the number you want. Having more than 99 targets will slightly affect the second player's score display.

To increase the speed of the projectile, remove the FOR/NEXT loop from line 60. To decrease the speed, *increase* the number in that loop.

## PROGRAM TAKE-APART

Lines 10-20—Jump to initialization routines.

40-100—Establish the initial position of projectile, add to the horizontal and vertical positions of projectile and check for collision with gutter or deflector.

120-140—Indicate player turn and adjust the variables accordingly.

160-180—Check trigger for projectile launch and joystick for launcher movement.

200-230—Check trigger for deflector type selection and display deflector options according to joystick input.

250-320—Check joystick for cursor movement and check trigger for selection of deflector location.

340-380—Display projectile rolling down gutter.

400—Display scores and targets left.

420-480—Display game over, scores and winner, play victory tune and display Play Again option.

500-540—Initialize the variables and create the playfield.

560-590—Display the title screen and redefine the characters.

610-630—DATA for shapes.

650—DATA for tune.

*Heath Lawrence lives in Port Elgin, Ontario, and has been programming on his Atari 800 for nearly five years. His game Cliffhanger appeared in the November, 1986 issue of Antic.*

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At the head of the Panzergruppe invading central Russia was General Heinz Guderian, the man who turned the potential of armor into the reality of Blitzkrieg warfare. Opposing him were masses of Soviet infantry and armor determined to defend their homeland, but untried in battle. With Guderian's armor and motorized infantry divisions approaching the ancient city, the stage was set for another encounter with the Nazi juggernaut.

**Guderian** simulates this critical campaign of WWII, using the acclaimed joystick-driven system from Gulf Strike. On the full-color scrolling map of central Russia, the German player must master Blitzkrieg tactics to encircle and overrun Soviet divisions and drive deep enough into Russia to make the capture of Moscow possible. At your command are infantry divisions, panzer regiments, motorized infantry, panzergrenadiers, even the 1st German Cavalry Division.

The Soviet player must work to counter the German threat, and make attacks capable of cutting off supply to the forward units. While your army is massive, it is also untrained. Soviet units begin play with a hidden strength revealed only at the moment of combat. Uncertainty is always present. The game becomes a tense contest as German units blunder into Soviet strongpoints, while Russian attacks can suddenly turn into a rout.

**Guderian** has a *solitaire option* allowing you to take command of either the German or Soviet armies, as well as overrun attacks, supply rules, Soviet leaders, rail movement and optional reinforcements. The rulebook introduces new players to historical gaming, explaining clearly concepts such as zones of control, supply, combat and movement. Planning map included.

The battle for Moscow was lost on the fields of Smolensk. Now is the time for you to re-create (and rewrite) history with **Guderian**.

**COMPLEXITY:** Intermediate

**SOLITAIRE SUITABILITY:** Very high

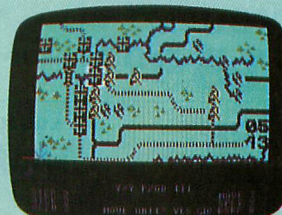
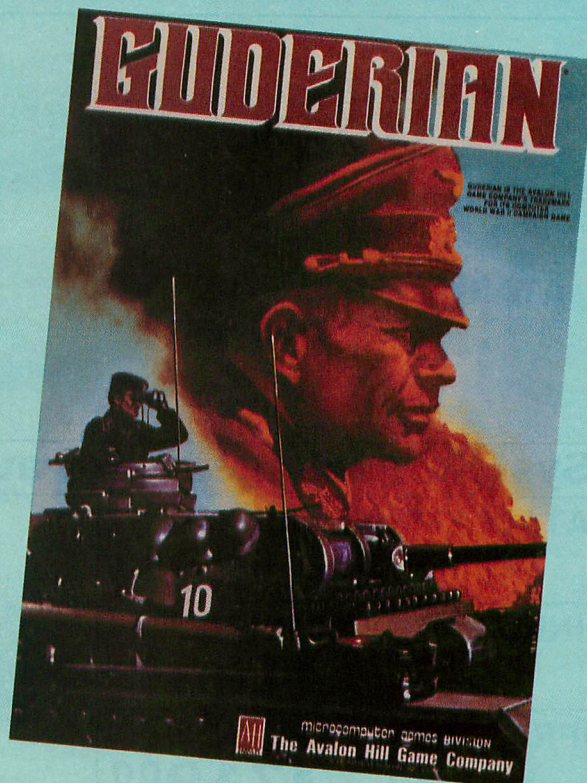
**TIME SCALE:** 2 days per turn

**MAP SCALE:** 10.5 km.

**UNIT SCALE:** Regiments and divisions

**PLAYERS:** One or two

**PLAYING TIME:** 1½ to 3 hrs.



**Guderian** has a full color joystick driven map display which easily allows commands to be executed

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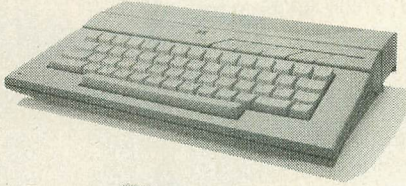
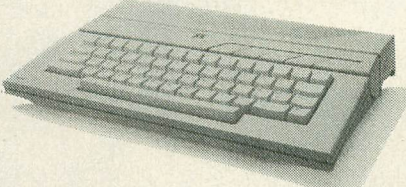
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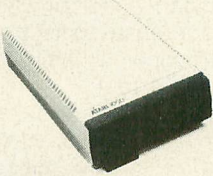
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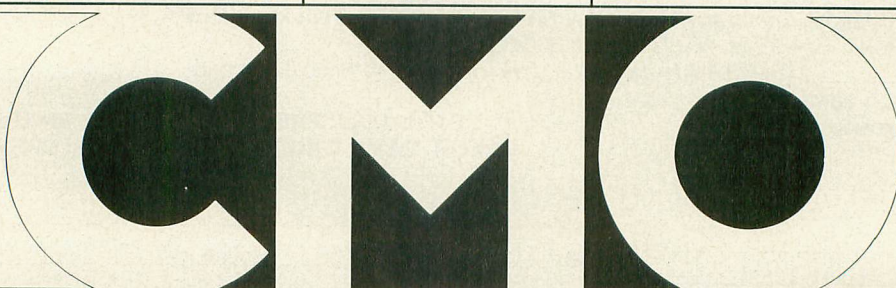
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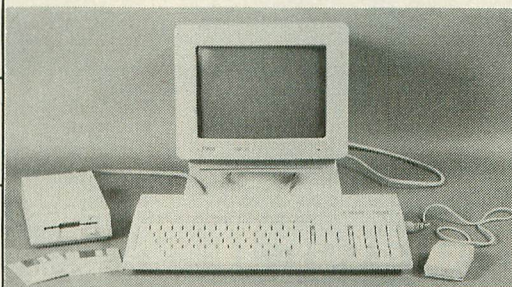
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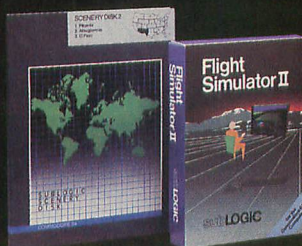
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# Word Searcher

## Atari power finds the winners

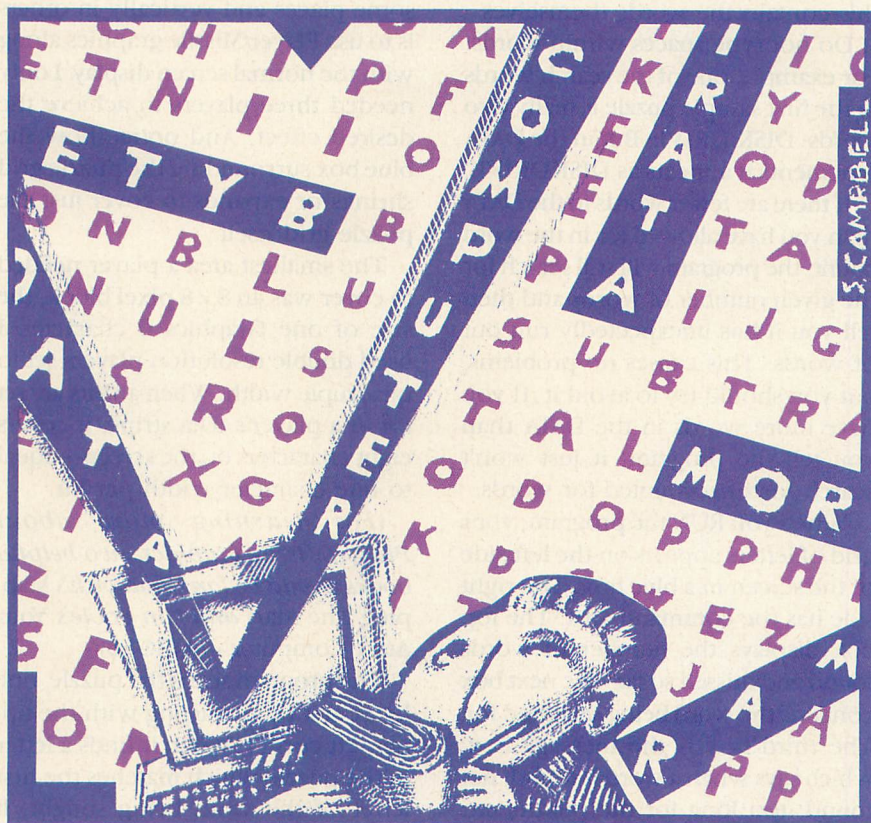
BY KEVIN PECK

A word search contest in my local newspaper inspired me to develop this program. Each week, a few of the names of the contest's 114 sponsors were hidden in a grid of letters. No clues were given about when any sponsor would appear, so it took a lot of trial and error to solve the puzzle. I decided that my Atari should do this dirty work for me.

Word search contests are fairly common newspaper promotions. So if you'd like your 8-bit Atari to put you ahead of the pack next time such a contest appears in your hometown paper, type in Listing 1, WORD-FIND.BAS. Check it with TYPO II and SAVE a copy before you RUN it.

I have also provided two puzzles for you to try with the Word Searcher program. Listing 2, PUZZLE2.DAT, contains various Atari computer terms. Listing 3, PUZZLE3.DAT, has a variety of words. These listings are both included on the monthly disk.

Type in Listing 2 or 3 and check it with TYPO II. Then LIST it to disk or cassette. Type NEW to clear memory, LOAD Listing 1 and ENTER Listing 2 (or 3). This creates a ready-to-RUN program. When you are through with the first sample puzzle, repeat this process with the listing for the second sample puzzle. Be sure to save a copy of Listing 1 *without* any puzzles merged in, so you can use it with any puzzle you want.



*With Word Searcher, just type in the letter grid from a word-finding contest grid, give your Atari the list of words to be searched, and the computer will find them in a flash. This BASIC program works on all 8-bit Atari computers of any memory size, with disk or cassette.*

You can use Word Searcher with any printed puzzles, or with ones that you create yourself. Deciding if the program can handle the puzzle is simple. A puzzle grid can be no larger than  $24 \times 24$  letters. (This is actually imposed by the screen size of the Atari, not memory space.) The word

list can be any size.

## PUZZLE DATA

The first DATA statement of your Puzzle Program *must* contain the width and height of the puzzle. In the first sample puzzle, the first DATA state-

continued on next page

ment reads DATA 24,24. The second sample puzzle is eight letters wide and 10 letters tall, so the first DATA statement reads DATA 8,10.

The next DATA statements contain the puzzle grid itself. Each statement must have the same number of letters as the width of the puzzle. And the total number of DATA statements must equal the height of the puzzle. Otherwise an error will be generated.

The following DATA statement will tell the program how many words to search for. The DATA statements after this contain the words themselves.

Do not type spaces within words. For example, one of the search words in the first sample puzzle is really two words: DISK DRIVE. But in the DATA statements it appears as DISKDRIVE.

If there are fewer words in the DATA than you have allowed for in the word count, the program will still search for the given number of words and then tell you it has unexpectedly run out of words. This causes no problems, but you should try to avoid it. If you have more words in the DATA than you tell the program, it just won't search for unaccounted-for words.

When you RUN the program, your grid of letters appears on the left side of the screen in a blue box. The right side has the command area. The top box displays the number of words found and missed so far. The next box contains the word being searched for. The third box is the message box, which says when a word is found, not found, too long for the puzzle, etc. The bottom box shows what keys to press when needed.

The cursor moves through the grid looking for the first word in the list, highlighting it in inverse video when found. You then can press either [START] to continue or [OPTION] to quit. You should now circle the word in the puzzle you're working on and then press [START] to continue with Word Searcher.

When the program finishes searching the entire word list, the background turns black and the word "Finished" appears in the command box.

If a word isn't found, either you've misspelled the word in the word list

or a letter in the puzzle grid DATA is incorrect—or the puzzle you're using has a typo. The program will tell you it can't find a word and the screen will turn red. Exit by pressing [OPTION].

## PROGRAM TAKE-APART

You might wonder how I got two colors on the screen in Graphics 0 and used them all over the screen. You've probably seen it done using display list interrupts, but that only works for splitting the screen horizontally. The only way to split it horizontally in some places and vertically in others is to use Player/Missile graphics along with the normal screen display. I only needed three players to achieve the desired effect. And notice how the blue box surrounding the puzzle grid shrinks or expands to cover just the puzzle grid itself.

The smallest area a player needed to cover was an 8×8 pixel block, the size of one Graphics 0 character. I used double resolution players set to quadruple width. When all bits are set on in a player's data stripe, it covers eight characters on the screen—equal to one character width per bit.

*(For learning more about Player/Missile graphics, two helpful books would be Ian Chadwick's Mapping The Atari and Lon Poole's Your Atari Computer.—ANTIC ED)*

The program scans the puzzle, one letter at a time, starting with the upper left corner. When it finds a letter in the puzzle which matches the first letter of the word being sought, it checks the surrounding letters in the puzzle for a complete match.

Let's look at how the loops within the program perform this task. The I loop starting at line 270 is the main outer loop. It READs a word from the list and makes sure the word isn't too long to fit in the puzzle. Over-long words are printed in the command box.

The X and Y loops move the cursor through the grid, highlighting each letter as it scanned. This is done by using the LOCATE command to get the screen RAM value of the letter, adding 128 to set bit 8 on for inverse video and finally PLOTting the letter back to the screen at the same spot.

You usually do not consider using the PLOT, LOCATE and other graphics commands in Mode 0, but they work here just as they do in any other graphics mode. For the commands to work properly, you must turn the cursor off beforehand by POKEing 752,1. Turn it back on with POKE 752,0 before exiting the program.

If the first letter of the search word doesn't match the letter at the current grid position then it skips the next set of loops and moves on to the next letter in the puzzle grid.

If the first letter *does* match the grid letter, the area around that grid position is searched to see if the rest of the word is there. Here's where the DX and DY loops come in. These loops give nine possible values, of which eight are valid. The ninth value occurs when DX and DY are both 0, which means we're not going anywhere—so we skip over the subroutine call to the NEXT line and try the next valid set of values.


For each pass of the DX/DY loop pair we enter the subroutine starting at line 80, which makes sure the word will fit in the puzzle going in the direction indicated by DX and DY. If a 10-letter word is being searched and we're in grid position 18, then the word won't fit going to the right. There's no need to check anything else with this set of directions. We also perform the same check for vertical words.

If the word fits, we must check, character by character, against the grid in the current direction. As we look we will set each character in the grid to inverse video. No match means resetting all matched letters to normal video and exiting the subroutine. We then continue searching in the next direction.

If the check is successful, the user is informed of the find by a message in the command box and the screen turning green.

*Kevin Peck is currently in college studying computer science. He has written various programs for business in Salina, Kansas.*

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Listing on page 87 

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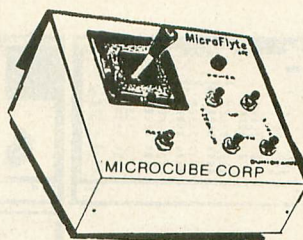
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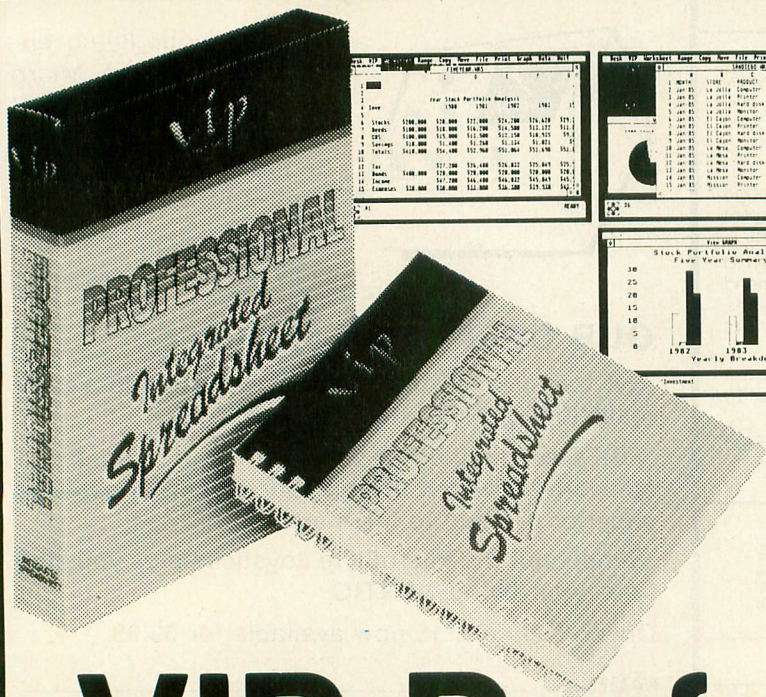
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# Rainbow Screen Customizer

*Flashy displays for your programs*

BY JAMES HAGUE

**A**tari 8-bit computers are equipped with a palette of 128 vivid colors (Or 256 with a bit of programming gimmickry. See *GTIA Rainbow* in the March, 1984 *Antic*.) This is far more colors than most computers boast. Why then do Atari programs usually use only one or two colors, ignoring all that power? Because, in BASIC, it's difficult to have more than four colors on screen at once. To make matters worse, Graphics Mode 0 seems to be the most popular mode, and it's usually limited to three colors.

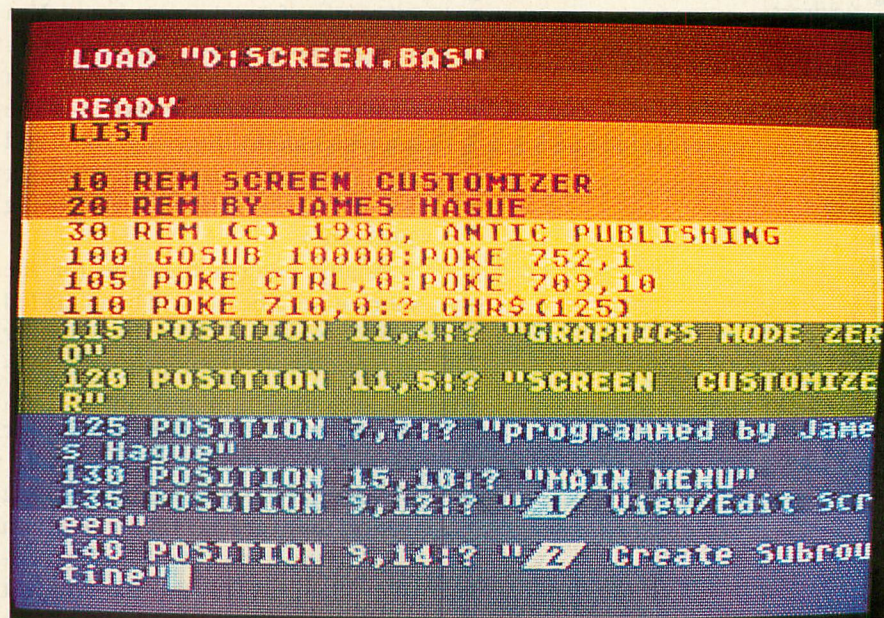
But now you can bypass these color barriers with user-friendly Rainbow Screen Customizer. This program lets you make each line of a Graphics 0 screen any of 128 distinct colors—allowing up to an amazing 24 colors in all, and that's not even counting the border. Rainbow Screen Customizer also generates a BASIC subroutine that will recreate your own 24-color screen in any BASIC program.

## HOW IT WORKS

Type in Listing 1, SCREEN.BAS, check it with TYPO II and SAVE a copy before you RUN it.

To edit the colors of a GR. 0 screen, choose option one, View/Edit Screen, from the main menu. Move the joystick until the arrow is on the line that you want to edit. (The text on the screen will not be saved with your finished product. It's only there to help you design your color pattern.)

Press [START] to select one color for that line from a possible 16, holding it down to cycle through the available colors. The [SELECT] key changes the luminance of the current



*Rainbow Screen Customizer expands the color palette of Graphics 0 screens in your own programs to 24, instead of just the three colors usually available in this popular graphics mode. This BASIC programming utility works on all 8-bit Atari computers of any memory size.*

line to one of eight brightness levels. [OPTION] selects the character luminance for the line, also allowing eight settings. When you are satisfied with your colorful creation, a quick press of the joystick button recalls the main menu.

There are a few things to be aware of about the color combinations available. First, setting both the character luminance and line luminance to the same value renders any text on the line—including the arrow—invisible. Another important point is that the color of the characters cannot be cho-

sen directly. Instead, the characters usually assume a shade relating to the line color. Except for these minor snags, you can mix and match colors to your heart's content.

## USING CUSTOM SCREENS

A colorful screen is nice to look at, but what good is it unless you can spice up your latest programs with it? Imagine being able to divide the screen into separate horizontal color-coded windows, each having its own special function. For example, to

continued on next page



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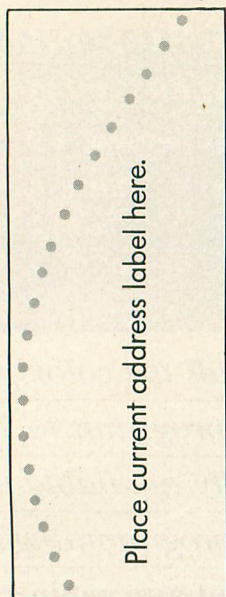
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bring attention to a message area at the bottom of the screen in a word processor, you could color it a vivid red. Applications like this are the purpose behind this program.

Programming a colorful screen from scratch is not a task for the faint of heart, but with Rainbow Screen Customizer it's a snap. You don't even have to understand how it works, just how to use it.

To create a BASIC subroutine that allows easy access to your customized screen, choose option two, Create Subroutine, from the main menu. You will be asked to enter the line number in your main program where you want your routine to start, and the line increment. (Entering 1000 and then 10 would start the subroutine at line 1000, with the next line being 1010, etc.)

Finally, enter a filename for the subroutine. The file will be in LISTed format, so use .LST as the extender to remind you. Then insert a formatted disk of any density, press a key, and sit back and relax while your subroutine is created automatically.

Now exit the program by choosing option three and LOAD the program to which you want to add the subroutine. Then ENTER the file you just created. You now have a subroutine to create a custom screen included as part of your program. If you want to LOAD the subroutine into memory by itself, type NEW and then ENTER it.

To access the custom screens within your own BASIC program, just GOSUB to the first line of the subroutine. This will take about two or three seconds to set up, after which a brand new GR. 0 screen will appear with the colors you have chosen.

The custom screen is disabled whenever a GRAPHICS command is executed, but another GOSUB brings it back. Fortunately, the subroutine is "intelligent"—if it's called more than once, it will "realize" this and set things up more quickly.

While the custom screen is enabled, the color registers will have no effect, except for the one that controls the border. A pre-defined variable, CTRL, lets you easily enable and disable the multi-colored screen at will.

POKE CTRL,1 turns the screen on and POKE CTRL,0 turns it off. When disabled, the entire screen takes on the characteristics of line 0, but the color registers are active again.

## WHOOOPS!

I have run into two minor glitches with this program. But if a colorful screen is what you need, these restrictions should be easy to work around.

First, the keyclick sound interferes with custom displays created by Rainbow Screen Customizer, making the screen shudder whenever a key is pressed, as well as making the click sound more like a quack. XL/XE owners can easily turn off the keyclick sound with POKE 731,255 and turn it back on with POKE 731,0. But 400/800 diehards don't have such an obvious solution. Probably the best way around it is to write a custom routine using memory location 764 to access the keyboard. But, on the other hand, the latest trend in programming is software that doesn't require the keyboard, so why not stick with your joystick?

The second problem is common to many programs involving machine language subroutines. The machine language used by this program, as well as data needed by it, is stored in a section of memory known as Page Six, which starts at location 1536. If you are using other pre-written machine language routines, make sure they don't occupy the same memory space.

With the Rainbow Screen Customizer you can create professional-looking BASIC programs that surpass the two-color displays found in many commercially available software packages. Of course, looks are just one part of a program, but they can make the difference between a mediocre piece of programming and one that is truly outstanding.

*James Hague's most recent Antic program was Uncle Henry's Nuclear Waste Dump, (December, 1986). He lives in Richardson, Texas and has been working in assembly language and BASIC for over four years.*

Listing on page 92



# Antic<sup>®</sup>

# 8-Bit

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**HOW TO WIN** We are looking for the most powerful, versatile, easy-to-operate programs that perform useful jobs in the real world. The more uses for your software, the better. For example, a stuffed-animal database for taxidermists would probably be considered too specialized by the magazine's judges—no matter how excellently it is programmed.

The winning software must be user-friendly, most likely menu-driven wherever possible. Users should not need programming knowledge in order to successfully operate the application programs.

Please note that some of the other popular Atari program categories—such as utility routines that add power when inserted into your own programs—cannot properly be considered applications. Practical application programs should be complete, stand-alone software that does an entire user-controlled job from start to finish. For example, a drawing or painting program would be a practical application—a colorful graphics demo would not!

**TECHNICAL RULES** Programs must run on the Atari 800, 800XL and 65XE models and require no

more than 48K memory. However, programs that *also* take advantage of the extra memory in the 130XE will be given preference.

Programs must be written in standard renumberable Atari BASIC or MAC/65 assembly language, under a disk operating system compatible with Atari DOS 2 or 2.5. Program listings cannot be larger than 150 sectors of a single-density disk.

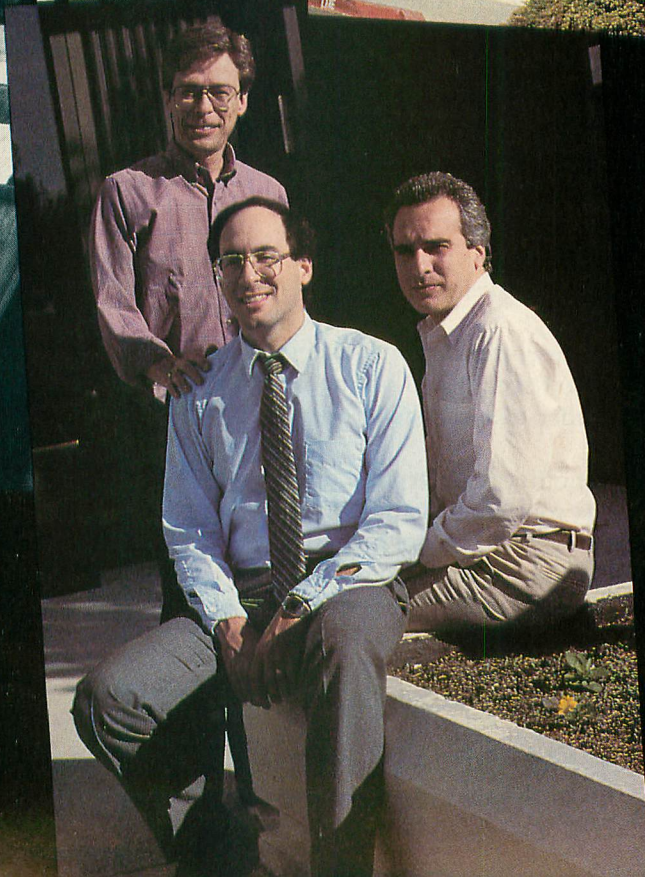
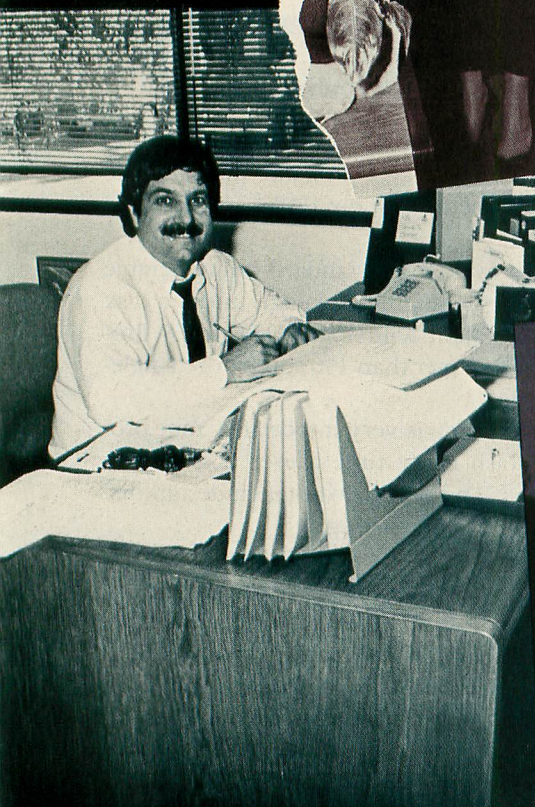
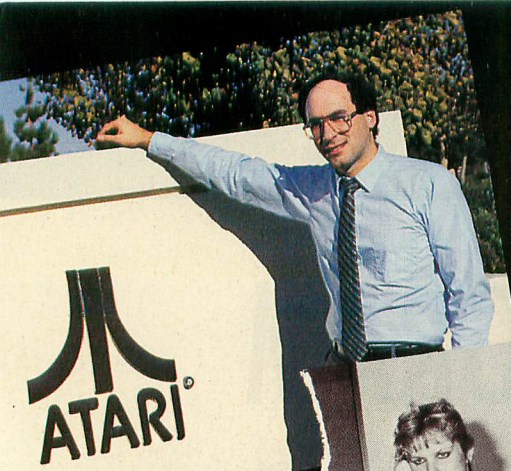
Thorough error-trapping is very important. Your program should not crash every time a user accidentally presses the wrong key. And please do not include authors' copyright statements in your listing.

**JUNE 15, 1987** All entries in the Antic 8-Bit Practical Applications Competition must be received by June 15, 1987. Winners will be announced in the November, 1987 issue of Antic. Judges' decisions are final.

Entries—programs and accompanying articles—should be submitted on disk *and* in printout. Entries will be returned only if the author provides a stamped, self-addressed envelope.

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All 8-bit practical application programs accepted for publication by Antic between November 1, 1986 and June 15, 1987 will also be automatically evaluated as potential prizewinners in the contest.



Atari Views—clockwise from top left. 1. Neil Harris, Marketing Communications Director. 2. Aline LeFranc, Senior Customer Relations Assistant. 3. Atari's main entrance. 4. (From left:) Mel Stevens, Creative Services Director; Neil Harris, Marketing Communications Director; Augie Liguori, Atari U.S. Vice President/General Manager. 5. Richard Frick, Director of Fortune 500 and OEM sales. 6. Carol Richter, Customer Relations Coordinator; Barbara Hamblen, Customer Relations Supervisor. Photography by Mary Rhomberg Lavery

# Today's Atari Corp.

## *A close-up look inside*

BY NAT FRIEDLAND, ANTIC EDITOR

**R**eaders of **Antic** have always been curious about what goes on inside the Atari company and how it develops new products. Now, for the first time, this valid curiosity can be satisfied. **Antic** editors were recently admitted into Atari headquarters and allowed to take photos anywhere in the building, and even to record conversations with engineers and programmers.

Strange as it may seem, this welcome for **Antic** to report on the entire Atari facility marked a historic first. The previous Atari management was quite secretive, to put it mildly.

For example, when **Antic** first began publishing in 1982, Atari Inc.—then a division of Warner Communications—was not immediately enthusiastic about this magazine printing the word “Atari” on the cover as an explanation of what computer we were publicizing.

Although **Antic** gradually developed accurate and detailed information “sources” inside the old Atari, we were never officially given any special consideration for advance information—even on technical topics which would only be of interest to hardcore Atari enthusiasts such as **Antic** readers.

During the heyday of the old Atari, around 1982, the company had approximately 10,000 employees worldwide and some 70 buildings all over Silicon Valley. The fastest-growing company in the history of American business, Atari dominated the international videogame market and grossed \$2 billion in one year.

Today, after surviving the most spectacular losses in the history of American business, The Silicon Valley presence of Atari Corp. consists of a single Silicon Valley building with about 200 employees. Worldwide, Atari now has 1,000 employees and an assembly factory in Taiwan.

However, the company is still setting records. Atari is clearly “the Chrysler of high-tech, the biggest comeback story in the history of the computer industry”—exactly as predicted in the September, 1984 **Antic** (page 7). At this writing, Atari just went public for the first time with a stock issue that sold \$51 million in one day.

### THE NEW ATARI

When Jack Tramiel took over Atari in June 1985, with a team including many of his former Commodore management associates and his three

sons, the flow of information steadily became freer. In mid-November 1985, the newly renamed Atari Corporation broke the ice with its first press conference—which included an exclusive **Antic** interview (February 1985, page 72)—announcing that the 130XE and the 520ST would be unveiled at the January 1985 Consumer Electronics Show.

**Antic** even got a private preview of the new computers the day before they were shipped from Silicon Valley to the CES (April 1985, page 17). But although the new Atari management team was a lot more accessible than the previous executives had ever been, they still left no doubt that developing the new Atari computer models and establishing them in the marketplace was a much more urgent priority than telling Atari's story via the press.

But now, with the success of the ST and XE computers an established fact, Atari has become more open than ever before. For the first time, **Antic** was permitted to use cameras and tape recorders throughout the entire Atari building—although we did agree in advance that we wouldn't photograph incomplete products if re-

continued on next page

quested by Atari. The following is a report of what we saw and heard at today's new Atari Corp.

## ON TO SUNNYVALE

Low, wide and modernistic, 1196 Borregas Avenue used to be one of the *two* Atari headquarters buildings on this street in Sunnyvale. It is surrounded by a vast tract of similar high-tech company buildings that are typical of Silicon Valley's corporate architecture.

Sunnyvale is just about at the center of Silicon Valley, which is generally considered to extend from San Jose to Palo Alto, roughly 40 miles south of San Francisco. This section of Borregas Avenue dead-ends into Highway 101, Silicon Valley's main expressway, just south of Moffett Air Force Base with its giant hangars and the "Blue Cube" center for electronic tracking of satellites.

Turning into the parking lot at the Atari sign, about one block from Highway 101, I pull into a visitor's space and meet **Antic** ST Program Editor Patrick Bass in the lobby. The front desk is manned by a receptionist and a security guard. We sign the login sheet and are issued visitor's badges.

Our guide arrives, Neil Harris, Atari's Marketing Communications Director (See the February 1987 **Antic** article, *Atari's Own BBS*). After Neil okays our entry with camera and recorder, we follow him through a double door into a sprawling, airy workspace full of employees at desks and modular workstations. "This is a typical Jack Tramiel open work area," comments Harris. "He doesn't like to have employees separated by a lot of little office cubicles."

Harris's office is at the far end of this wing. En route we pass a series of wall maps of the U.S. and the world, with color-coded pins marking the locations of Atari users groups, scheduled Atari Fairs, national and overseas distributors and sales offices.

Neil shows off his advance model of the Print Technik video digitizer. **Antic** has been receiving reports of this super-sharp digitizer from European trade shows for months, but this

is the first unit we have seen in the U.S. Harris has a videocamera set-up by his ST and he takes a headshot of me sitting in front of his desk. (When the disk of this portrait is brought back to **Antic**, Patrick and the technical staff use DEGAS Elite to convert it into a Monty Python cartoon. Very clever, indeed. Too bad the perpetrators are all fired!!)

Next door to Neil's office is the oversized closet that houses the Atari Base bulletin board with its five sets of 520STs, hard disks and modems. Across the way is the desk of Atari Users Group Coordinator Sandi Austin. "Most of the people in this part of the building are in Marketing or they work for Diana Goralczyk in Customer Relations," says Harris. Customer Relations phones are (408) 745-2367 or (408) 745-5759.

We walk through this wing and into the equally large work area on the opposite side of the lobby, where the Accounting Department is housed. Throughout this floor, it is striking how many STs are in use on people's desks.

"ST computers have pretty much replaced terminals, telexes and other micros throughout the company," says Harris. We use dbMan for our order processing database in customer service inventory. STs track the sales for our executives like Mike Katz, Sales-Marketing Vice President; Augie Ligouri, the U.S. General Manager; Ian Kennedy, our General Manager in Canada. Atari secretaries use ST Writer for word processing. Greg Pratt, the Finance Vice President, uses the VIP Professional spreadsheet. We're replacing all our mainframe terminals with STs—using either Atari's new DEC VT100 Terminal Emulator Cartridge or PC InterComm software from Mark of the Unicorn."

Another striking fact about Atari's in-house equipment is how many laser printers are in use. A variety of different brands are on desktops and the laser units almost seem to have replaced dot-matrix and daisywheel printers at Atari. "We've found that two of the best buys in laser printers right now are the Quadram Quadlaser and the Canon LBP-82," says Harris.

"We use them in Epson or Diablo emulation mode."

At a rear corner of the downstairs floor is the Creative Services Department, where the various Atari manuals and package designs are developed. We are enthusiastically shown a powerful, new, enhanced version of the NEOchrome paint program for the ST.

## R&D UPSTAIRS

Atari's upper floor is the tour stop that will be of most interest to the majority of **Antic** readers. This is where Atari's engineers and programmers work on forthcoming products.

Coming up the rear stairs, the first thing we see is a prototype 3-piece computer. The keyboard is simply a mockup with individual ST keys stuck into a big sponge pad. The computer is in a separate closed box with a detached video monitor—the standard IBM-type arrangement. On top of the computer box is what seems to be a schematic diagram showing open slots for add-on boards.

"You need to understand that we experiment with a lot of prototypes up here that never make it to market for a variety of reasons," says Harris. "We won't talk about anything you might see on this floor unless Atari is reasonably committed to a release date for it."

Nearby are units that underline Neil's warning. One example is a rare PS3000, an ST color monitor with a built-in disk drive. About 1,000 of these experimental monitors actually were manufactured and sold through specialty computer retailers. We also see a prototype 1040ST with a 10-megabyte hard disk built in. Called the 1040STH, this version is not going to be released.

We move on to meet Atari's three-person final testing group. They use video recorders to keep track of exactly where new software crashes. The team is currently working on the Microsoft Write word processor. As we see it on the ST monochrome screen, the program looks fast and detailed, with a true WYSIWYG (what you see is what you get) graphic display. We are told that Write is a port

of Microsoft Word, in current Macintosh version 1.05, and it will support most popular laser and dot-matrix printers.

We see some of the new 8-bit products that are due in 1987. There's the SX212 Hayes-compatible 1200 baud modem which is to sell for \$99.95. We also see the sharp, clear text display of the XEP80 plug-in 80-column card (\$79.95).

As we walk by the equipment-crowded worktables, we see a lot of large, strange circuit boards featuring chips marked 68020. The Motorola 68020 chip is widely rumored to be the microprocessor for an upcoming Atari 32-bit computer which would support the Unix operating system.

Harris is more willing to talk about some of the other offbeat boards we see. Here is the original hand-assembled circuit board for the first prototype ST. "Unfortunately, a lot of the chips have been taken out for other projects," says Neil. "This board really should be left the way it was, as a piece of history."

Another curiosity is a cumbersome board that shows what ST circuitry would look like if it was designed on the same logic principles as the Macintosh. Atari engineers put it together as a joke. Patrick gets Harris to pose with the clumsy item. "Hurry up and take the picture," Neil says. "The whole bottom of this board is like a pincushion, you can't hold onto it without getting stuck."

Shiraz Shivji, Atari's Vice President of Research and Development, is having an impromptu hallway meeting. There's Landon Dyer, one of the programmers of TOS, and John Feagans, who is working on a new GEM version of the ST Writer word processor. We hear that the arcade hits Crystal Castle and Battle Zone are coming soon in ST versions.

When we ask about the hallway posters claiming that the Intel 820386 is a "stupid" chip, the technical staffers insist that the Motorola 68020 chip being worked with by Atari is faster and more powerful than the 386 which is going into the next generation of IBM-compatible computers.

It's a surprise to run into Dennis Friedman, who visited **Antic** several times while working for Atari in France. Dennis tells us he is based in Sunnyvale now and his current project is the second edition of the International ST Software Catalog. "It will be twice as big as the first edition," he says.

In a rear office we meet Jim Tittler, who is putting the finishing touches on the ST's IBM emulator box. As he discusses the complexities of IBM vs. ST disk formats, we learn that the box is to be an add-on to the DMA port. It will support the IBM 5 1/4 and 3 1/2 inch disks as well as the Atari 3 1/2 inch format. The estimate is that the emulator will run most MS-DOS software as fast as an IBM, in some cases faster.

Jack Tramiel's office is in a front corner. It's about the only office in the whole building that can be considered comparatively large. The room is currently empty, as the Chairman is looking after Atari business elsewhere in the world.

Down at the other end of the hall, Atari President Sam Tramiel has a full crew meeting in his office, including Richard Frick, Director of Fortune 500 and OEM sales; John Skruch, Associate Director for Computer Software; and Claude Nahum, General Manager of Atari in Spain. Tramiel is just passing through town during a short hiatus in a series of investor meetings preparing for the Atari stock offering. He mentions that Atari is recruiting programmers for the revived videocartridge machines, particularly the 2600.

## SOFTWARE VP

We learn that Leonard Tramiel, Vice President for Software, is now in charge of third-party as well as in-house software development. He has taken over from Executive Vice President Sig Hartmann, whose new assignment is to establish the ST with Fortune 1,000 companies and add-on value manufacturers as an affordable combination of high-powered workstation and mainframe terminal (with the VT100 emulator cartridge).

Leonard agrees to join us and an-

swer some questions. As we pass a fast-moving animated display utilizing the upcoming blitter chip, he explains that current ST owners will be able to obtain the blitter chip upgrade for about \$120. The upgrade will include a new set of TOS ROM chips.

Also coming soon is a new revision of ST BASIC from MetaComCo. The revised BASIC will feature additional commands and faster processing, along with direct control of AES, VDI, BIOS, XBIOS and GEMDOS. The same program will be able to run with or without the blitter chip.

We bring up an idea **Antic** had for a photo-essay showing every step in the manufacture and marketing of a single Atari computer. "Sorry, we couldn't allow any photographing inside the Taiwan assembly plant," Leonard responds. "Atari's facility is highly automated and our competitors would love to have a look at the robotics."

Patrick Bass asks about TOS error messages and gets a confirmation from Tramiel that error number 35 is a general error message which is given when the ST can't figure out anything more specific that's wrong.

## GDOS ARRIVES

Probably the most exciting new information Leonard tells us is that GDOS (Graphics Device Operating System) is now shipping to independent developers for use in new software. GDOS is already incorporated into DEGAS Elite. Software using the GDOS Normalized Device Coordinates will map its displays on an ultra-high-resolution grid of 32,767×32,767 pixels. This output will then automatically display or print out at the highest resolution available to whatever device the ST is connected to.

This makes GDOS a crucial tool for keeping the ST at the forefront of fields such as graphics and desktop publishing. As new video screens and laser printers with finer detail come to market, the ST's output will automatically adapt to the best quality that can be produced by these new devices.

IF YOU'D ENJOY SEEING MORE ARTICLES LIKE THIS ONE, CIRCLE 249 ON THE READER SERVICE CARD.



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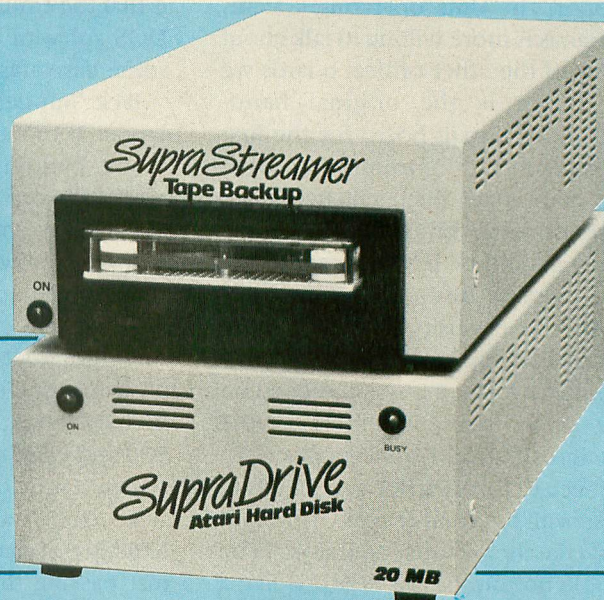
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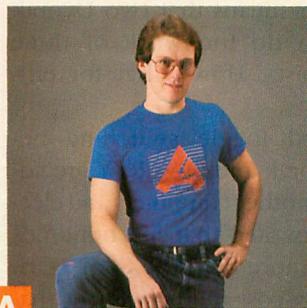


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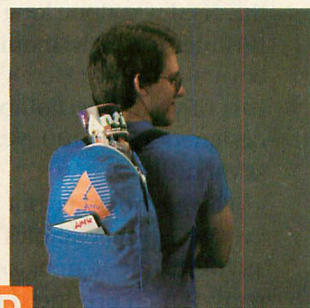
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# Dvorak Keyboard

## *Turbo typing for Atari*

BY DAVID YEARKE

*Try out a version of the speed-typing Dvorak keyboard on any 8-bit Atari computer of any memory size, with disk or cassette. This BASIC program offers an alternative to the standard QWERTY keyboard—which was actually designed to slow down the pioneering generation of touch typists.*

**B**elieve it or not, part of your computer was designed to be as slow and inefficient as possible. No, don't blame Atari—the deed was done long before Nolan Bushnell or Jack Tramiel were even born. Confused? Here's a clue: it's the part of your Atari computer that was designed over 100 years ago—the keyboard!

The keyboard layout was invented by Christopher Sholes in the early 1870s for the Remington Arms Company, which produced the first typewriter. On the early mechanical typewriters, keys tended to jam when struck too rapidly. To overcome this, Sholes designed the QWERTY layout which is commonly used today throughout the world.

Sholes slowed down typists by making sure that the most commonly used letters were spread all over the keyboard, and that frequent combinations of letters, such as "ed," had to be struck with the same finger.

It may have been all right to slow down typists in Sholes' time, but today's electronic typewriters don't jam. So the reason behind the QWERTY system no longer applies. Fortunately, we have an alternative.

### DVORAK'S IDEA

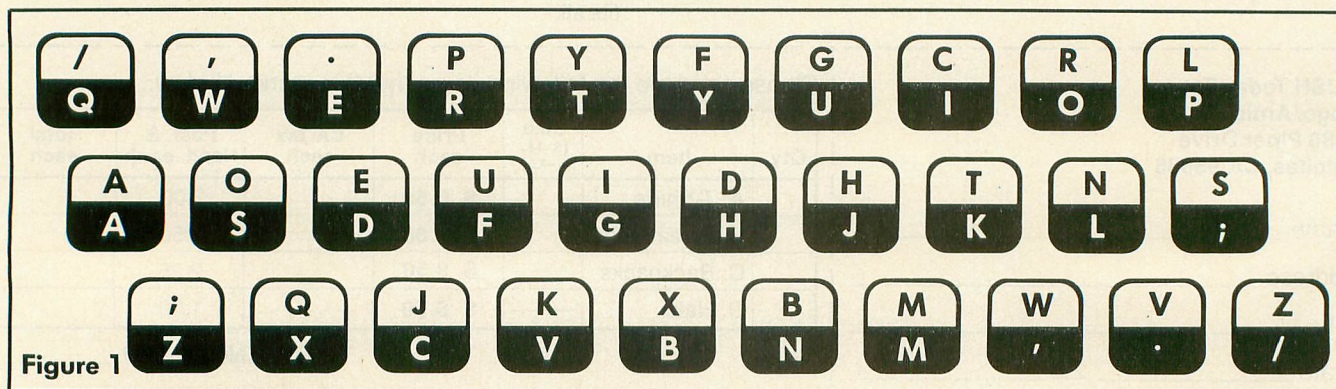
In the 1930s, Professor August Dvorak studied the typewriter and concluded the Sholes layout was not only cumbersome, but that even a random arrangement of keys would be more efficient. He studied the keyboard and

people's typing habits, and devised a keyboard arrangement that gave what he felt was the best possible speed and efficiency.

Why is the Dvorak layout better? First of all, it involves less physical movement. He computed that a Sholes typist's fingers move an average of 16 miles a day, compared with a single mile for a typist using Dvorak. This improvement makes Dvorak not only less fatiguing, but faster as well. The average speed of a Sholes typist is about 40 words per minute (wpm), compared with 60 wpm for a Dvorak typist. This means that two Dvorak typists can do the work of three Sholes typists. How's that for efficiency?

Keyboard toggle switching between Dvorak and QWERTY are advertised for other computers and electronic typewriters that cost hundreds of dollars more than the 8-bit Atari. Here's a low-cost alternative, one that you can examine to see if you like this typing system. The Dvorak layout finally seems to be catching on, and your new-found skills as a Dvorak typist could come in handy.

NOTE: The Dvorak Keyboard pro-



gram has been used successfully with cartridge software such as AtariWriter, MAC/65 and BASIC (built-in BASIC too). It does *not* work with PaperClip or most other disk-based software. (Please send the I/O Board your own discoveries about software compatibility with this program.—ANTIC ED)

## DVORAK FOR ATARI

Figure 1 shows this modified Dvorak layout as implemented on the Atari. The top characters (black letters on white background) are the Dvorak Keyboard. The bottom characters (white letters on black background) are the standard QWERTY arrangement.

I didn't change the existing positions for the cursor keys and Atari special symbols. But I changed the position of some punctuation marks. For example, the slant bar [/] which Dvorak placed on the equal key [=] I've moved to the [Q] key. And I moved the quote character ["'] from the [Q] key back to the [2] key, as on the Atari's QWERTY layout.

I also opted for the "modified" Dvorak keyboard, in which the numbers are kept in sequence, as opposed to Dvorak's order of "7-5-3-1-9-0-2-4-6-8." I saw little advantage—and *lots* of confusion—in using his arrangement.

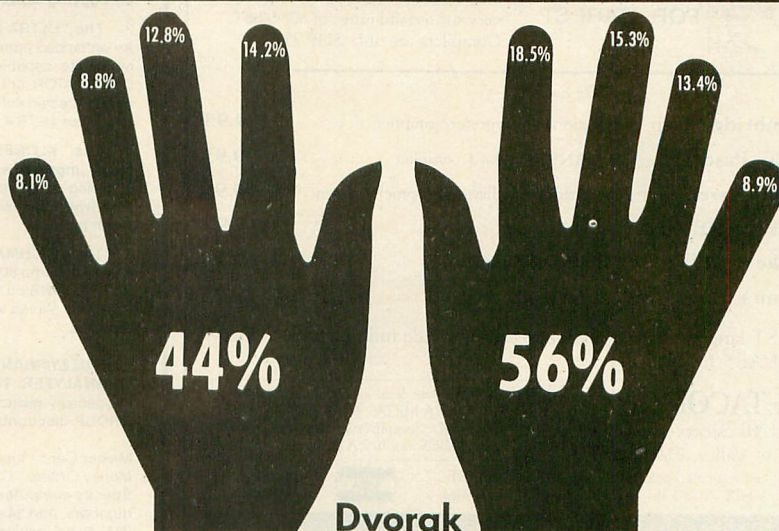
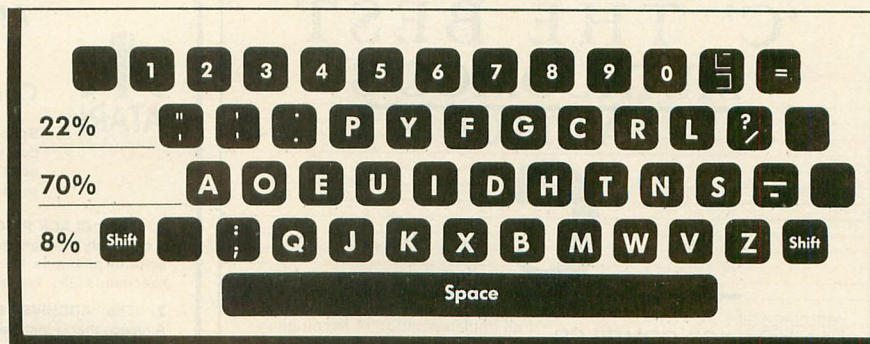
Notice that all the vowels and the most common consonants are located on the middle, or "home" row, where a typist's fingers are at rest. This is the key to Dvorak's speed. With the Sholes layout, only about 100 common English words can be formed using the home row, compared to over 4,000 words with Dvorak. Eliminating that half-inch that a finger must travel to hit a common letter really adds up.

Dvorak also made the workload of each hand more even. With the Sholes arrangement, the left hand works harder than the right, and left-handed typists are often faster than right-handed ones.

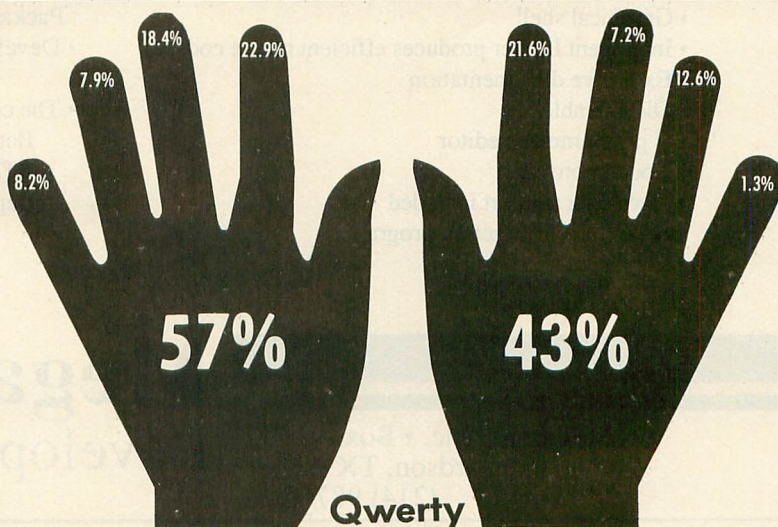
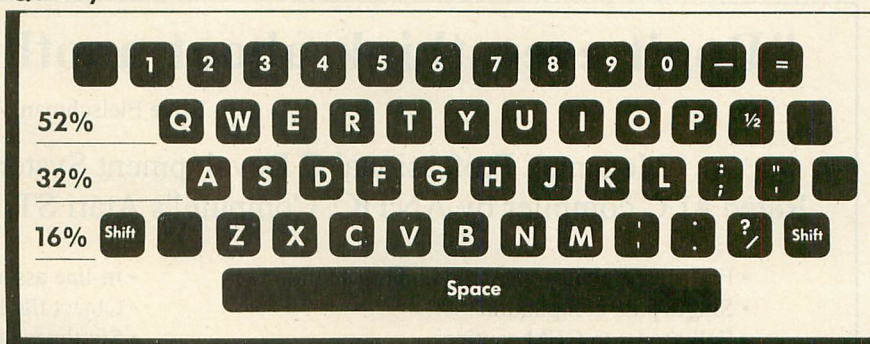
Finally, by putting the common letters on the home row, he has eliminated the phenomenon known as a "hurdle," where the same finger must

continued on page 40

### Dvorak



### Qwerty



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- Mike Fleischman, ANTIC: The Atari Resource, Sept. 1986

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CIRCLE 031 ON READER SERVICE CARD

# Page 6 Grab-Bag

*Punch up your program  
with these useful routines*

*Plug one of these short but powerful USR routines into your own BASIC programs to create a Joystick Enhancer or a Console Key Expander that operate at assembly language speed. You do not need to know assembly language to use the routines. The BASIC programs work on all 8-bit Atari computers of any memory size, with disk or cassette.*

**A**fter you are familiar with Atari BASIC, what next? Assembly language is the next logical step. Fortunately your Atari offers a bridge between these two languages—the USR (USer) function. This function lets the programmer call fast, powerful machine language routines from a BASIC program.

To smooth the transition between BASIC and assembly language even more, Atari also has a “protected” area of memory known as Page 6. Page 6 occupies 256 bytes of memory from location 1536 to 1791 (0600 to 06FF in hexadecimal). And it is left untouched by the operating system and BASIC.

During the coming months, **Antic** will be presenting a number of short but effective Page 6 utility routines which were originally released in 1982 by Synapse Software. You do *not*

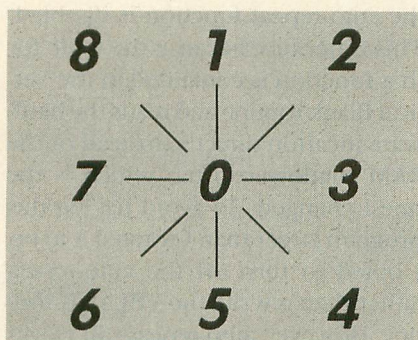


Figure 1

need to know assembly language. Just type in these useful tools and make your programming sessions more productive.

## JOYSTICK EXPANDER

Our first routine, Joystick Expander, greatly reduces programming effort. It lets you use a simple ON . . . GOTO instruction to handle the different joystick directions.

When Joystick Expander is used in

your program, the values returned from a STICK(X) function will not be the standard ones. A centered joystick will return 0, forward returns a 1. (See *Figure 1*.) The values increase by one in a clockwise direction, with the forward/left combination returning 8.

To use Joystick Expander in your own program, type in Listing 1, JSTICK.LST, checking it with TYPO II. You do *not* need to type in Listing 2, JSTICK.M65, which is the assembly language source code (for MAC/65 or Atari Assembler/Editor) provided for the information of assembly language programmers. After you have an error-free copy of Listing 1, remove the TYPO II program and LIST JSTICK.LST to disk or cassette. Now, LOAD (or type in) your own program and then type ENTER

"D:JSTICK.LST". (Cassette owners substitute "C:" for "D:"). This will merge JSTICK.LST with your program.

Make sure that your own program does not have any lines numbered higher than 30000, or they will be replaced by the Joystick Expander. Somewhere near the beginning of your program include the line below. (Change the sample line number, if needed)

```
101 GOSUB 30000:JUNK=USR(1536)
```

The USR call only needs to be made once. Thereafter, any joystick readings will produce the new values.

## CONSOLE ENHANCER

This month's second routine is a useful Console Key Enhancer. With this routine in place, you will double the number of possible values that can be returned from your console keys—[OPTION], [SELECT] or [START]. Normally, a statement such as Y=PEEK (53279) would indicate which key was pressed.

Using the Console Key Enhancer, you can also detect the [SHIFT] key used in combination with the console keys. You can even “latch” these key values, so they are remembered after the keys are released.

Type in Listing 3, CONSOLE.LST, checking it with TYPO II. Follow the instructions about LISTing and EN-

continued on next page

## DVORAK KEYBOARD

continued from page 37

travel from the top row to the bottom (or vice-versa)—“hurdling” over the home row. There are over 1,200 common English words with multiple hurdles, such as the word “number,” where the first three characters are struck with the right index finger. Hurdles are a common cause of spelling errors, because fingers tend to get “lost” while hurdling.

## DVORAK DISCLAIMER

Despite the improved efficiency of the Dvorak Keyboard, it is not easy to switch to Dvorak typing if you are already accustomed to touch-typing with the QWERTY layout.

In fact, the difficulty of retraining typists who use the vast installed base of QWERTY keyboards is the main obstacle to widespread acceptance of the Dvorak layout. When your QWERTY-trained subconscious mind tells you to press an [F] key and you get a Dvorak [U], this can be a very disorienting experience—not unlike pressing the Coke button on a vending machine and receiving a handful of bubblegum.

To help preserve your sanity as you experiment with an Atari Dvorak Keyboard, you should photocopy *Figure 1*, cut apart the individual key guides and *lightly* glue them on top of your three rows of letter keys. (Or at least keep the diagram very close to your computer.)

Press [CONTROL] [4] to toggle back and forth between Dvorak and QWERTY typing. [CONTROL] [5] toggles one-key cursor movement on and off—in either Dvorak or QWERTY mode—allowing you to move the cursor without having to hold down [CONTROL]. To get the characters [-], [=], [+], and [\*] hold down the [CONTROL] key when pressing the appropriate key.

## HOW IT WORKS

The Dvorak Keyboard program replaces the built-in keyboard handler of any 8-bit Atari computer. In normal Atari keyboard use, whenever you press a key an interrupt is generated by the POKEY chip. The operating system looks to location \$0208 for the

location of the keyboard handler routine. This program replaces the handler in your computer, taking the code for the key you pressed and looking it up in a table to find the Dvorak equivalent.


Type in Listing 1, DVORAK.BAS, check it with TYPO II and SAVE a copy before you RUN it. Listing 1 will create a file called DVORAK.EXE on your disk. Antic Disk owners will find DVORAK.EXE on the Main Menu. Copy this file to another disk (which contains DOS 2.0 or 2.5) and rename it AUTORUN.SYS.

To start typing Dvorak-style, turn off your computer and reboot with the new disk. You won't notice anything different except that you have about 500 fewer bytes of available memory than before. Dvorak Keyboard continues working even after you press [RESET], so you'll need to turn off your computer to remove Dvorak from memory.

I removed the routine that processes function keys 1-4 on the 1200XL, which saved 105 bytes. Listing 2, the source code created with MAC/65, is included to show how the program works.

You will probably notice that in Dvorak or one-touch cursor modes the auto-repeat function is disabled. This is because the logic for that function is contained in the Vertical Blank routine and reads the hardware location directly, instead of the RAM shadow register, which is the one I changed. To avoid having this program larger than I wanted it to be, I opted to turn off the auto-repeat rather than rewrite the VBLANK routine. However, auto-repeat still works in normal mode.

*Dvorak typing implementations have long been a staple of Atari public domain software, but Antic liked David Yearke's clean programming and informative article when we saw it in POKEY, the newsletter of the Western New York Atari Users Group. So we asked Yearke, a resident of Cheektowaga, New York to expand his piece for this issue.*—ANTIC ED

Listing on page 89 

## PAGE 6 GRAB BAG

continued from page 39

TERing programs, which were explained above for the Joystick Expander routine. You do *not* need to type in Listing 4, CONSOLE.M65, the assembly language source code.

Add the following line to your own program, changing the line number if necessary. This routine only needs to be called once, unless you switch in or out of latch mode:

```
101 GOSUB 31000:
```

```
    BUTTON=USR(1536,CMD)
```

Note that we are passing a second parameter to the routine. The variable CMD can have one of three values—0 to turn OFF the enhancer, 1 to turn it ON, or 128 to turn on the enhancer and latch the last key pressed. Now, whenever you wish to read the console keys, do a PEEK(BUTTON) instead of a PEEK(53279).

Refer to the following table to see the values you may expect:


Normal	Enhanced
No press = 7	No press = 0
[START] = 6	[START] = 1
[SELECT] = 5	[SELECT] = 2
[OPTION] = 3	[OPTION] = 4
n/a	[SHIFT][START] = 9
n/a	[SHIFT][SELECT] = 10
n/a	[SHIFT][OPTION] = 12

## TECHNICAL NOTES

This article does not provide extensive technical explanations of the two routines, but the assembly source code is well documented and should provide interested readers sufficient information to understand how they work. These source programs can be assembled on either the Atari Assembler/Editor cartridge, or MAC/65 from Optimized Systems Software.

**IMPORTANT:** Because the Joystick Expander and the Console Key Enhancer run from the same part of Page 6, you should only use *one* of them in any program. For example, if you're using the joystick routine and decide to add any other routine which uses Page 6, the Joystick Expander will be over-written.

*Cousins Matt Loveless and Mike Eggers were both in their mid-teens when Page 6 was originally released on disk by Synapse Software in 1982.*

Listing on page 93 

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# New Owners Column

PROGRAM BY CHARLES JACKSON

## Lesson 12: Graphic Modes

*This series teaches beginners how to program in BASIC on all Atari 8-bit computers such as the 800XL and 130XE. The lessons began in the March, 1986 issue.*

Computer graphics are great fun, and also an area where your Atari is really outstanding—even in comparison to more expensive machines. In this lesson, we will introduce the Atari's **graphics modes**, an essential subject for understanding how to create colorful visual displays.

Your Atari can display visual information onscreen in various different modes (ways). You get at least 12 different ways to show information in a simple **GRAPHICS** command, such as:

10 GRAPHICS X(where X is any whole number between 0 and 11)

### MEET THE MODES

Graphics Mode 0 (GR. 0) is the familiar blue screen seen when you turn on the computer. It displays 24 lines of 40 characters each. Two colors are normally displayed, the background color and the text color.

Graphics 1 (GR. 1) displays 24 lines of 20 characters that are twice as wide as those in GR. 0. This mode displays only capital letters, but it can display them in four different colors. Including the background color, you can normally put five colors on the screen at once in GR. 1. For a sample of text in GRAPHICS 1, type:

10 GRAPHICS 1:POSITION 1,1: PRINT #6; "HeLlO AnD weLcOmE"

Type GRAPHICS 0 and press [RETURN] to get back to the regular screen.

Graphics 2 is similar to GR. 1, but with 12 lines of 20 characters. Thus characters in GR. 2 are both twice as high and twice as wide as those in graphics mode 0. This mode is also capable of five colors. Try this:

10 GRAPHICS 2:POSITION 0,1:PRINT #6; "WeLcOmE To #11"

### TEXT MODES

Graphics Modes 0, 1 and 2 are the text modes, where information is put on the screen as text. In Graphics Modes 3 through 11, information is entered as colored dots. The difference between these modes is the number of colors available and the **resolution**—how many dots will fit on the screen.

In general, as the graphics mode number increases, the resolution and/or number of available colors also increases. However, the memory requirement also increases. This table gives the requirements of the various GRAPHICS modes:

GR. Modes	No. of colors	Resolution (width × height)	Memory (Bytes)
Text			
0	2	40 × 24	992
1	5	20 × 24(-4)	672
2	5	20 × 12(-2)	420
Graphics			
3	4	40 × 24(-4)	432
4	2	80 × 48(-8)	696
5	4	80 × 48(-8)	1176
6	2	160 × 96(-16)	2184
7	4	160 × 96(-16)	4200
8	2	320 × 192(-32)	8138
9	16	80 × 192	8138
10	9	80 × 192	8138
11	16	80 × 192	8138

You can see the trade-offs among resolution, number

of colors and memory requirements. For example, GR. 4 has the same resolution as GR. 5 but needs only half the memory and can produce only half the colors. Modes 9 and 11 can produce 16 colors at once, yet they need the same amount of memory as GR. 8, which has only two colors. The trade-off is resolution. mode 8 can display 320 tiny dots across the screen, whereas GR. 9, 10 and 11 can only display 80 larger dots.

Graphics Modes 3, 5 and 7 each are capable of four colors—one background color and three “dot” colors. GR. 4 and 6 are capable of only two colors: the background color and one dot color.

In GR. 8, although two colors are possible, you have much less control over what they are. The dot color is the same as the background color, but with a different luminance (brightness). For example, if the background is black, the dot color could then be anything from white through shades of gray to black. Of course, if you make the dot color black, you’d be unable to see the dots against the black background.

Graphics 0 shares this limitation regarding to color selection. GR. 9 and 11 can display 16 colors at once, but again there are certain constraints on the colors you can select. GR. 9 lets you choose one color, and the others will be 16 shades of the color selected. GR. 11 lets you choose one luminance and can display all 16 colors in that selected shade. Finally, GR. 10 allows nine colors, which can be anything you like.

## VARIATIONS

When you ran the examples for GR. 1 and 2, you noticed that the top part of the screen was black, while the last few lines (equal to four lines of GR. 0 text) were still blue. This arrangement, with a large graphics section at the top of the screen and a small “text window” at the bottom is typical for GR. 1-8. To get rid of the text window and have an all-graphics screen, add 16 to the number you call in the GRAPHICS command. GRAPHICS 7+16 or GRAPHICS 23 produces GR. 7 with no text window:

```
10 GRAPHICS (7+16)
```

The screen heights listed in the table above are for the “no text window” case. If you want a text window, the available height of the screen is reduced by the number in parentheses. For example, in GR. 7 a text window reduces the available height of the screen from 96 to 80.

You’ll also notice that the screen is cleared when you use the GRAPHICS command. Normally this is what you want. I don’t think I’ve ever used the GRAPHICS command without wanting the screen cleared. But if you ever want the data left on the screen, just add 32 to the number in the GRAPHICS command. The following line delivers GR. 1 without the screen clear. GRAPHICS 33 also works:

```
10 GRAPHICS (1+32)
```

You may add *both* 16 and 32, so that you have no text window *and* the screen is not cleared. As long as there is a text window, the word READY will appear at the bottom of the window when a program finishes running. An advantage to this is that you can look at whatever you have

put in the upper part of the screen for as long as you like. If you do a GRAPHICS command without the text window, the screen automatically returns to the blue GR. 0 screen when the program is completed. To prevent this, you can add a line such as:

```
20 GOTO 20:REM endless loop, press [BREAK] to end the program and return to GR. 0.
```

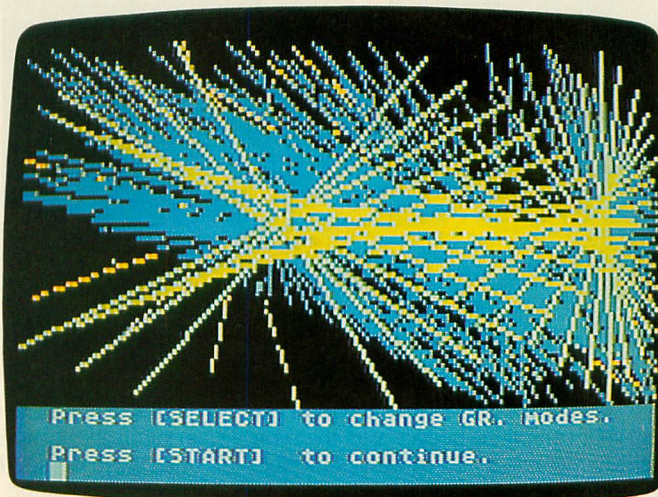
## SCREEN POSITION

Since the *text* Graphics modes and the *graphics* Graphics modes are quite different, we will look at them separately. First we’ll cover the text modes.

Below, the PRINT #6; tells the Atari to put the text in the upper (normally black) part of the screen. If you just use PRINT, the text will be displayed in the text window. Try this:

```
10 GRAPHICS 1:PRINT #6;"THIS IS THE GRAPHICS PART";
```

```
20 PRINT "THIS IS THE TEXT WINDOW";
```



To specify where in the *upper part* of the screen you want the text, use the **POSITION** statement in the form: POSITION X-coordinate, Y-coordinate. Because computers count funny, the upper left corner of the screen is 0,0—not 1,1. So if the resolution of GR. 1 is given as 40×24, you can use any number between 0 and 39 for the X-coordinate and any number between 0 and 23 for the Y-coordinate. Going outside these ranges generates, naturally, a “cursor out of range” error.

The POSITION statement will not work to specify the position of the text in the *text window*. Instead you must POKE the X-coordinate into memory location 657 and the Y-coordinate into 656. The Y-coordinate is measured from the top of the *text window*, so the range of values for the Y-coordinate is 0 to 3:

```
10 GRAPHICS 1:POKE 657,3:POKE 656,1: PRINT "MOVE OVER IN THE TEXT WINDOW"
```

## FOUR-COLOR TEXT

Getting four colors for letters is easy, if not straightforward. Normally, only capital letters will print on the screen. If you use a PRINT #6 statement containing capitalized

continued on page 48

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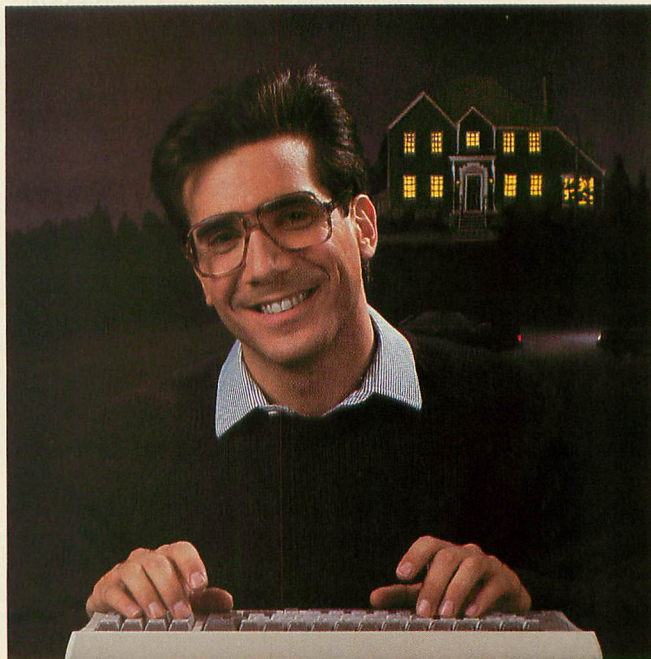
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# First fruits from the Practical Program Contest

BY HAL BOYER

## Wage/Hour Paymaster

*Here is our first published entry from the Antic 8-Bit Practical Program Contest—which is still open until June 15. Wage/Hour Paymaster is a short but useful program that keeps track of your hourly wage totals by week or by year. The BASIC program works on all 8-bit Atari computers of any memory size, with disk or cassette.*

For the millions of wage-earners out there who are paid by the hour and put in overtime, Wage/Hour Paymaster calculates the weekly and yearly earnings from your total working hours. Short and simple as the program is, it has many convenient uses. For example, you could project how much cash that next overtime call will put into your pocket—and decide if the extra money is worth giving up your plans to attend the big ballgame.

To use Wage/Hour Paymaster, type in Listing 1, WAGES.BAS, check it with TYPO II and SAVE a copy before you RUN it.

When you RUN the program and see the first prompt, type in your hourly base pay. A pay rate of more than \$20

or less than zero is not accepted. Type in your name at the next prompt and then choose whether to send the program's output to the screen or to a printer.

Wage/Hour Paymaster then creates a five-column table showing your base pay, overtime pay, weekly wages and yearly wages—in half-hour steps ranging from 40 to 65 hours per week.

### PROGRAM TAKE-APART

Wage/Hour Paymaster is straightforward and well-remarked. The subroutines are near the beginning of the program to shorten access times. Each time a program tells your Atari to GOSUB a line, it searches for that line starting with the first line of your program. Placing often-used subroutines at the beginning of your program minimizes this search time.

The subroutine at lines 110-220 converts the program's output to dollars and cents format. Line 190 inserts the decimal point. If two trailing zeros are needed, the routine adds them at line 210. The resulting number is right-justified, so that the number column lines up on the decimal points.

Line 340 does a quick partial screen clear. The inverse up-arrow in the program is treated the same way as pressing [SHIFT] [DELETE]. This is one of the fastest and easiest ways to erase selected parts of your screen display.

Wage/Hour Paymaster is set up for Epson or Star (Gemini) printers. The printing routines automatically insert top and bottom margins, so you don't need to worry about printing your report on top of a page perforation.

continued on page 48

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# Multi-AUTORUN

*27 files at your fingertips*

BY BILL BODENSTEIN

*With Multi-AUTORUN you can automatically load as many as 27 binary AUTORUN files under DOS 2 or DOS 2.5. This BASIC program works on all 8-bit Atari computers of any memory size, with disk drive.*

I love writing utility programs, especially those requiring little time and effort to construct. Such was the case with this short BASIC program. But after I write a program, I tend to have a hard time explaining what it is good for.

It seems as if most machine language programs you find in the pages of *Antic* work only as AUTORUN.SYS files. But unfortunately, the commonly used Atari DOS 2.0 and 2.5 can only binary-load one AUTORUN file at start-up. Wouldn't it be nifty if you could make DOS load a *chain* of binary files when booting? If your answer is "yes," type in Listing 1, MULTIAUT.BAS, check it with TYPO II and SAVE a copy before you RUN it.

When you RUN the program, Multi-AUTORUN will ask you if you are sure you wish to modify your DOS. Type Y to continue, or N to abort. Next, insert your disk into drive 1 and press [RETURN]. This program writes information to your disk, so you should remove any write-protect tabs from your disk.

## IMPORTANT NOTES

Don't use Multi-AUTORUN directly on the Antic Monthly Disk. Instead, copy the DOS.SYS file (version 2.0 or 2.5) from any source to a new work disk.

Be Careful: Multi-AUTORUN will not work for *all* batches of AUTORUN files. For example, if one AUTORUN file is written to work with BASIC installed and a second file isn't, you will obviously run into trouble. Also make sure that you are not loading several AUTORUNs that want to occupy the same part of memory at the same time.

## HOW IT WORKS

Multi-AUTORUN inserts a machine language patch into the DOS routine that loads AUTORUN.SYS. Once modified, your new Atari DOS will binary-load AUTORUN.SYS, AUTORUN1.SYS, AUTORUN2.SYS, etc., *in succession*, up to AUTORUN9.SYS or until it receives a "file not found" error. That is, if no file named AUTORUN.SYS is found, DOS won't even check for AUTORUN1.SYS. Therefore, always name your start-up files in correct sequence to ensure proper loading.

The patch is only about 50 bytes long, so you won't lose much memory or much compatibility with machine language programs stored in low memory. In fact, you'll lose perhaps one sector on your disk with this modification.

By the way, once you've modified DOS, you can use the WRITE DOS FILES option from the DOS menu to modify other disks—you only need to run the BASIC program once.

## GET 27 AUTORUNS

You could also use the letters of the alphabet instead of numbers to get even more AUTORUN files.

Just start with an A in place of the 1 in AUTORUN1.SYS and you could have as many as 27 AUTORUN files on one disk. The program will load AUTORUN.SYS, AUTORUNA.SYS, AUTORUNB.SYS, and so on.

To try this version of the program, simply replace the 48 in lines 520 and 530 with a 64. Make sure to RUN this version of the program with an *unmodified* Atari DOS in memory.

I hope I've clearly explained what Multi-AUTORUN is good for, because I've just now thought of an idea for another short utility program...

*Bill Bodenstein, a computer science major at the University of Cincinnati, is a prolific machine language programmer, churning out utilities left and right.*

IF YOU'D ENJOY SEEING MORE ARTICLES LIKE THIS ONE, CIRCLE 265 ON THE READER SERVICE CARD.

Listing on page 86



## NEW OWNERS COLUMN

continued from page 43

characters, they will appear in one color. Lower-case letters will appear in upper case, but in a *different* color. Two more colors can be obtained by using inverse-capital letters and inverse lower case letters:

```
10 GRAPHICS 1
20 PRINT "THE FIRST COLOR";
30 PRINT "the second color"
40 PRINT "THE THIRD COLOR":REM in inverse
50 PRINT "the fourth color":REM in inverse
```

You can get lower-case letters and certain symbols in GR. 1 and 2 by POKEing 756,226, which gives you four colors of the lower-case letters, but you can't have both capital letter and lower-case letters on the screen at the same time.

What about numbers and other characters? You can print an inverse number, but there's no such thing as a lower-case number. To get the other two colors for numbers, you need to print out different characters altogether. Like lower-case letters, certain characters don't appear on the GR. 1 and 2 screens the way you'd expect them to appear.

A full reference table showing these character substitutions would be too large to print here. In many cases, however, you can determine the proper ASCII value to use by taking the ASCII value of your original character and subtracting 32 (for color register 1), adding 96 (for color register 3) or adding 128 (for color register 2). Next month's New Owners Column will explain the Atari color commands in detail.

## THE LISTING

This month's listing, by **Antic** Technical Editor Charles Jackson, is a flashy visual demonstration showing what all the different Atari graphics modes look like. Type in Listing 1, NEWOWN12.BAS, check it with TYPO II and SAVE a copy to disk before you RUN it.

When RUN, the program begins its tour through the graphics modes with a simple Graphics 1 text screen. Press any key when you want to move along to a Graphics 2 text screen. Notice the flashing text window at the bottom of the screen.

Now you can press any key to switch over to the "dot" or "bit-mapped" graphics modes. Here, the program plots the course of a bouncing, rotating line. After each bouncing line is drawn, you may press the [START] key to draw another bouncing line, or press the [SELECT] key to move to the next graphics mode.

While the line is being plotted, the text window displays the number of the graphics mode you're seeing, the number of available columns and rows, the number of available colors and the number of the color currently being used. Since most of these demo screens include a text window, the number of available rows is decreased.

Graphics 9, 10 and 11 do not allow text windows, so you'll need to remember to press the [START] or [SELECT]

## WAGE/HOUR PAYMASTER

continued from page 45

Line 350 sends the printer a control code to print one line of expanded text. Line 370 calls for condensed print and line 650 lets you adjust the linefeed. If you own a printer that is not compatible with Epson or Star, check your printer manual for the substitute control codes, and insert them into these lines.

All calculation is performed in lines 760 to 830. If you wish to change your overtime pay rate from the straight time-and-a-half specified by the program, replace the 1.5 at line 800 with any other pay rate.

This short program can easily be modified to your own needs, if you know the essentials of BASIC programming. For example, a plumber—or other wage-earner who makes more than \$20 an hour—can increase the program's maximum base pay rate. (Hint: Don't forget to change the 20 in line 490.)

If you are a part-time worker who normally puts in less than 40 hours weekly, or a workaholic who toils more than 65 hours a week, you might want to change the program's minimum and maximum hours (Hint: One modification is the HRS=39.5 in line 1110.)

*Hal Boyer lives in Indianola, Mississippi. This is his first publication in Antic.*

IF YOU'D ENJOY SEEING MORE ARTICLES LIKE THIS ONE, CIRCLE 268 ON THE READER SERVICE CARD.

Listing on page 90



keys after each "bounce." I've included a short beeping sound to let you know when a drawing is complete.

## PROGRAM TAKE-APART

Line 35: Defines four color values for graphics mode 10. Graphics 10 allows nine different colors, but only five of them may be defined with the SETCOLOR statement (which you'll learn about in the next lesson). The four remaining color values must be POKEd into memory.

Lines 70-90: These lines alternate the colors on our Graphics 1 screen, giving the effect of motion. This technique is often called "color rotation." Since we don't want to rotate our colors *too* fast, we slow down the process with a statement such as X=SIN(4). This statement uses your Atari's trigonometric functions, which take a (relatively) long time to compute.

Lines 120-140: This routine displays and removes the flashing text window in the Graphics 2 demo.

Lines 150-230: These lines tell the computer which graphics mode you want to use, along with the screen width, screen height and the number of available colors.

Lines 800-920: This is the subroutine which draws the bouncing line. Actually, the routine randomly creates two sine waves, one point at a time. Each time a pair of points is plotted, the program draws a line between them. The effect is a bouncing, rotating line capable of creating colorful patterns.

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Listing on page 96



## Product Reviews

### SEIKOSHA SP-1000A

Hattori Seiko  
1111 MacArthur Blvd.  
Mahwah, NJ 07430  
(800) 422-7768—National  
(201) 529-4655—New Jersey  
\$299

CIRCLE 255 ON READER SERVICE CARD

*Reviewed by Gregg Pearlman*

**Antic** has not been overly impressed with the Seikosha printers we reviewed in the past. But then the new U.S. management team from Hattori Seiko Computer Peripherals showed up at our offices as part of their nationwide tour spreading the message that the Seikosha product line had been thoroughly revamped.

We're glad we tried out the **Seikosha SP-1000A**. This is a full-featured, affordable, well-documented, Epson-compatible printer that delivers near letter quality and is probably the quietest dot-matrix we use around here.

It's still pretty slow—44 characters per second, as opposed to 51 for the Atari XMM801. (Reviewed in **Antic**, December 1986.) Near letter quality speed was only 13 characters per second. A 20,000-character text file printed with a simple 8-bit BASIC program was used for the speed tests.

On the up side, the trim and compact SP-1000A is easy to load, offering adjustable-width tractor feed as well as single-sheet paper feed. It can produce condensed and double-wide print.

The SP-1000A's Epson FX-80 emulation handles graphics with no problem. On the Atari 8-bits, the Seikosha did a fine job with Picture Plus and Broderbund's Print Shop. On the ST, there were no problems printing out DEGAS Elite pictures, although one of the printer's DIP switches had to be changed.

The SP-1000A's near letter quality printing can be accessed either from one of the panel buttons on the front

of the printer or via your software. (We tended to get better results using the panel button.) Other than that, the Seikosha's NLQ printing is comparable to what we got from the more expensive Star NL-10. (Reviewed in **Antic**, January 1987.) The SP-1000A will even give you near letter quality with elite type, which the NL-10 can't.

Graphics printouts on the SP-1000A are sharp and well-detailed—but not as dark as pictures we have obtained from other printers. Text printing was also on the light side. And it didn't help much to use brand-new ribbons or to move the print head closer to the paper (per instructions in the manual). Incidentally, our favorite replacement ribbon cartridge for the SP-1000A is presently the Radio Shack DMP-130 (\$10.95).

The printer's manual runs 103 pages and provides several illustrations and examples. The DIP switches on the back of the SP1000A are easily accessed and their functions are described thoroughly. Eleven international character sets can be called up via the DIP switches.

The Seikosha SP-1000A is a good all-around printer. For a low list price of \$299 (which will probably be widely discounted), you can sacrifice a little speed for good NLQ text and graphics printouts that are nice and sharp (although a bit light). If you're seeking a versatile, affordable dot-matrix printer, you can't go wrong with the SP-1000A.

(See the ST Resource cover on page 59 for an example of SP-1000A graphics printing.)

### KYAN PASCAL

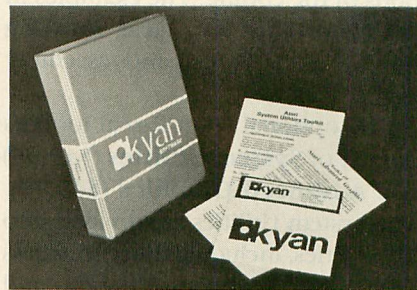
Kyan Software  
1850 Union Street  
San Francisco, CA 94123  
(415) 626-2080  
\$69.95, 48K disk

CIRCLE 253 ON READER SERVICE CARD

*Reviewed by Sol Guber*

The new **Kyan Pascal** upgrade is up there with such top-notch programming environments as BASIC XL, ACTION!, Forth and MAC/65. This strong software development tool conforms to the ISO Pascal standard (level 0), so it's portable to mainframe computers. An enclosed series of toolkits makes it even more powerful.

The non-protected Pascal disk comes with both a compiler and an assembler. Assembly language code is produced in the final pass, allowing forward references to be resolved and



code to be generated very quickly. The assembler also lets the programmer insert assembly code into the source code.

Kyan Pascal uses 13-digit precision for numbers and is not slowed down by doing so. It also allows for the linking of source code modules at compile time for separate writing and debugging of programs.

This package comes with KIX, a new command-line file-management system. To write a program, you must enter the editor—which is good and fast. Once the program is written, it must be compiled.

Compiler options include debugging, generating source code, even watching the compilation progress. The compiler examines the whole program. Errors, while normally shown on the screen, can be sent either to disk or the printer.

The documentation is very good and has an excellent 150-page tutorial on Pascal. The disk contains sample reference programs. The tutorial begins by showing how a program is written, including the syntax and

continued on next page

## Product Reviews

structure of the commands needed to write a program. It then progresses to decision-making, looping, variables and procedures, and it includes information on records, sets, files and pointers.

Instead of P-code, Kyan Pascal produces native 6502 code. It changes the Pascal to assembly source code and then runs it through an assembler, which is available to the programmer as well as the compiler. The assembler has macros and allows for included files, and it's useful in time-critical applications to speed up portions of the coding. The examples in the manual are very clear, showing how to mix Pascal and assembly procedures.

The optional Kyan Pascal toolkits consist of **System Utilities** (\$49.95) and **Advanced Graphics** (\$49.95). The System Utilities are divided into I/O utilities, including those to access disk drives, keyboard, joysticks and paddles; system functions, which allow for changes in character sets, key clicks, [BREAK] keys and rebooting; screen management, which lets you place information anywhere on the screen and access all editor commands. Other routines include a random number generator, string-to-number conversion, and sort and merge routines.

The Advanced Graphics package provides routines for Player/Missile graphics, displaying high-resolution 3-D objects and using the Atari 1020 plotter. The 18 P/M procedures include setting up, generating shapes, movement and collision information. The seven plotter routines allow for the output of the 3-D graphics in color.

One limitation of the program is that Kyan has placed a licensing fee on use of the runtime library—which must be present on disk if you want someone to be able to run your Pascal application without having the Kyan package.

Kyan Pascal is a good, solid implementation that will help anyone learn to program in this useful lan-

guage. It will suit anyone needing the structure of a sophisticated, multi-featured Pascal.

## LEADER BOARD (8-BIT)

Access Software Inc.

2561 South 1560 West, Suite A

Woods Cross, UT 84087

(801) 298-9077

\$39.95

CIRCLE 251 ON READER SERVICE CARD

*Reviewed by Gregg Pearlman*

Our 8-bit **Leader Board** golf game arrived a bit later than the fascinating ST version. But when **Antic** checked out the 8-bit package we discovered that it was good enough to almost make you forget about the ST game.

The main difference from the ST version is that the joystick-controlled 8-bit **Leader Board** doesn't present roughs, sand traps or trees. But its hazards are dangerous enough—everywhere you look, there's water.



In real golf, you'd be penalized one stroke and a replayed shot for each ball you put into the water, not to mention the added expense of more golf balls. And you must drop a ball on dry land no nearer the hole than the point at which the ball went into the water. **Leader Board** only adds a stroke to your score and lets you replay the shot. But because of all the water, those replays can add up fast.

A 15-page manual tells you all you need to know, and you'll get along fine, even if you don't golf. The manual explains which club to use when. You'll need this information whether

or not you actually play golf, because while your heart might tell you, for instance, to use your pitching wedge 100 yards from the hole, the manual says not to use it beyond 83 yards.

**Leader Board's** three ability levels, Novice, Amateur and Professional, are progressively tougher *and* more realistic. Novice players will hit the ball in the direction they aim—they don't have to worry about hooking or slicing. But Amateur players must rely on their reflexes in order not to hook or slice. So do Professionals, but they have the added concern of wind factors affecting their play.

It only took a short while to get the hang of **Leader Board**. I prudently played my first few rounds at the Novice level, topping out at an 18-hole score of 64 (on a par 72 course). I thought that was a fairly awesome round of golf, so I tried the Professional level. I shot an 80 (including five tee shots into the water—on one hole), which still isn't bad, but 80 won't win the big tournaments.

Your golf bag contains three woods, nine irons, a pitching wedge and a putter. Each club is given a minimum and maximum strike distance as a guide. The game doesn't acknowledge the possibility of hitting a ball farther with some irons than with some woods. Nor does it take into account the fact that *in theory* you're far more likely to hit the ball straight with an iron than with a wood.

**Leader Board's** ST graphics feature outstanding detail and quick updating. But the graphics are top-class on the 8-bit also. The detail isn't as sharp, of course, but the screen quickly updates its first-person picture of the course. In this game, however (and indeed in most 3-D games, it seems), the player's perspective is a bit odd. You can't really tell how far away the hole is. Luckily Access has provided diagrams of the four built-in courses, so at least you'll know where to hit the ball in order to avoid the water.

Like real golf, success with **Leader Board** is a matter of timing. You must know exactly when to press the joy-

## Product Reviews

stick button for maximum distance and straight shooting. It takes practice. That's why *Leader Board* provides a driving range, which lets you see on-screen how far each club can hit the ball.

One nice thing about *Leader Board* is that you can copy a backup disk without any trouble. However, you'll need the supplied hardware key in joystick port 2 for the game to work.

*Leader Board* is a fun game whether or not you actually play golf. Its graphics are a wonder to see, and play is, for the most part, realistic. The only thing wrong with *Leader Board* is that it might keep you indoors, playing golf from your armchair, instead of outside in the fresh air.

## VESTOR

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Edison, NJ 08837

(800) 524-0831—National

(201) 494-1200—New Jersey

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CIRCLE 258 ON READER SERVICE CARD

*Reviewed by Edward Beddow*

**Vestor** is a 24-hour online investment database offering over 30 "technical trading" programs for buy/sell signals, screens, fundamental and technical rankings, etc. According to Investment Technologies, a model portfolio using the buy/sell signals generated from this system from 1964 to 1984 beat the market averages by over 20 percent per year. Of course, as with any investment service, future results cannot be guaranteed.

Your **Vestor** package comes with only a manual and a password. To access this mainframe-based service, your computer needs a modem and communications software. The one-time fee of \$295 and a minimum \$24 monthly fee are automatically billed to your credit card. Monthly charges are based on actual usage and also depend on the types of reports requested. In addition, local access via

Telenet carries charges for connect time. However, brokerage clients of Charles Schwab & Co. can get a \$100 rebate on the up-front fee.

The **Vestor** main menu choices are stocks, options, futures, averages and information/retrieval. Each of these gives you several reporting or screening selections accessed by a two-character code, with output format either in standard tabular report or bar-chart. The stocks section has technical statistics on about 4,500 securities as well as a graphic presentation of share price and the ability to screen the database for numerous technical factors.

The options section is much like the stocks area. The program does not access or chart option prices, but instead gives the share prices of optionable stocks and a "what if?" analysis for various price movements. The futures and averages modules provide similar data on selected commodities and the major market indexes.

The heart of the **Vestor** system is its buy/sell signals generated by proprietary equations. The stock evaluation section is the most commonly used module, providing technical indicators that show the comparative attractiveness of a security. The relative strength of a buy or sell signal is indicated. And at the bottom of the chart, the estimated profit is calculated as a self-test of the buy/sell algorithm.

The handy information/retrieval module provides not only historical price information but also lets you track securities, holdings and profit/loss in several individual portfolios. You can request ticker symbols for unfamiliar securities. Online help is available and you can send messages directly to the sysop.

The manual is easy to understand and has sound information on developing an investment strategy based on personal goals. Risk, leverage, diversification and discipline in making decisions is stressed in several parts of the manual. **Vestor** is easy to use because all selections are made from menus. I liked being able to save

several lists of common stocks for evaluation and charting, eliminating the tedium of typing in ticker symbols each time the program is used. The portfolio management system, though really just a simple spreadsheet, is a nice, useful extra.

Reports and charts both take too long to receive; they don't scroll across the screen like the text sent from the originating system. Also, the charts are not high-resolution graphics, but rather are made up of = and x symbols to create a sort of bar chart which can be difficult to read.

This is definitely a technical trading program. In other words, it will appeal to investors who make decisions based on arcane statistical trends. **Vestor's** buy/sell advice is generated by proprietary formulas, the makeup of which are not disclosed to users. While the publisher often mentions **Vestor's** inclusion of fundamental analysis, I found very little fundamental research information on which investment decisions could be based.

I question the program's statistical information. For example, some earnings-per-share numbers were out of date. Users may be making decisions based on non-current data. I also found that **Vestor's** industry codes for many companies didn't accurately describe the business of the company being evaluated.

What this package provides is access to a proprietary trend line and buy/sell signals which seem to change with great frequency. Adhering to all the buy/sell signals would require a great deal of trading and the payment of associated brokerage commissions. In any case, you must establish personal trading rules by which to employ the signals provided by the program.

The publisher does not provide a reference booklet listing the securities included in the database, but almost all common stocks on the New York and American exchanges and 1,500 of the more active OTC issues are included.



# New Products

*New Products notices are compiled by the Antic staff from information provided by the products' manufacturers. Antic welcomes such submissions, but assumes no responsibility for the accuracy of these notices or the performance of the products listed.*

## EASYFIND SYSTEM

(magazine index)

Sierra Services

P.O. Box 40454

Bellevue, WA 98004

(206) 881-2868

\$9.95, 48K disk

This specialized information retrieval software works with indexes compiled from articles in **Antic** and other computer magazines. Each one-year index contains a summary of every program, article, review, correction and tip—all cross-referenced. The **EasyFind System** uses multiple search phrases or keywords to quickly retrieve these references, outputting them to screen, disk or printer. Each full year of information costs \$4.95 per magazine.

CIRCLE 256 ON READER SERVICE CARD

## VIDEO VEGAS

(entertainment software)

Baudville

1001 Medical Park Drive S.E.

Grand Rapids, MI 49506

(616) 957-3036

\$29.95, 48K disk



Turn your Atari into a casino with **Video Vegas**. Play the slots, blackjack, draw poker and keno. The **Lucky 7** slot machine is a classic three-reel slot which pays back about \$98 for each

\$100 you put in. **Blackjack** features a sort of card-counting tutorial to sharpen your skill. **Draw Poker** mimics video poker machines, paying off on a pair of jacks or better. **Keno** is just like real Keno—except there's no real money to lose.

CIRCLE 257 ON READER SERVICE CARD

## MATH BLASTER!, WORD ATTACK!, SPELL IT!

(education software)

Davidson & Associates Inc.

3135 Kashiwa Street

Torrance, CA 90505

(800) 556-6141—National

(213) 534-4070—California

\$49.95 each, 48K disk

These three programs help students master math, vocabulary and spelling in a new, exciting way. **Math Blaster!**, for grades 1 through 6, contains more than 600 problems grouped into 25 "families of facts" in ascending difficulty levels covering addition, subtraction, multiplication, division, fractions, decimals and percents. **Word Attack!** gives 4th-graders through 12th-graders 675 new words in 27 lists and various tests. Additional data disks are available for \$19.95. **Spell It!** has 50 word lists covering 1,000 commonly misspelled words in five difficulty levels featuring games and an editor.

CIRCLE 258 ON READER SERVICE CARD

## GUDERIAN, STOCKS AND BONDS

(entertainment software)

Avalon Hill

4517 Harford Road

Baltimore, MD 21214

(301) 254-9200

48K disk

**Guderian** (\$30) uses the popular joystick-driven system from the **Gulf Strike** game to simulate this World War II campaign. The player must master Blitzkrieg tactics to encircle and overrun Soviet divisions and drive deep enough into Russia to capture Moscow. **Stocks and Bonds** (\$25) puts you into a different kind of battle. In a fast-

paced format, you invest in securities and get a graphic understanding of the Bull and Bear markets along with the importance of performance histories in planning an investment strategy.

CIRCLE 260 ON READER SERVICE CARD

## KEYPUNCH SOFTWARE

(various programs)

Keypunch Software

1221 Pioneer Building

St. Paul, MN 55101

(612) 292-1490

\$6.99 to \$9.99, 48K disk

The extremely low prices are the kicker in this new family of 8-bit software. Entertainment software includes **Gambler**, **Space Games**, **Arcade Games**, **Strategy Simulations** and **Mind Mazes**. Others include **Money Tools**, **Fun in Learning** and **Fun in Numbers**.

CIRCLE 264 ON READER SERVICE CARD

## WARSHIP

(entertainment software)

Strategic Simulations Inc.

1046 N. Rengstorff Avenue

Mountain View, CA 94043

(415) 964-1353

\$59.95, 48K disk

Almost every warship that fought in the Pacific from 1941-45 is included in **Warship**. Choose from 79 classes of ships from the Allied or Japanese fleets, or modify ship data to create new warships. The game has four scenarios—including one non-historical situation. Players can also devise original maps to create any possible ship-to-ship tactical surface engagement.

CIRCLE 261 ON READER SERVICE CARD

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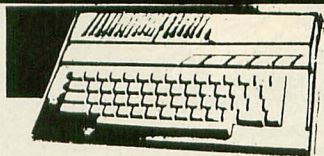
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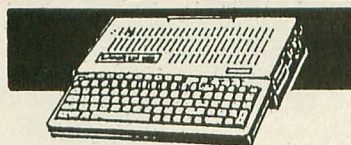
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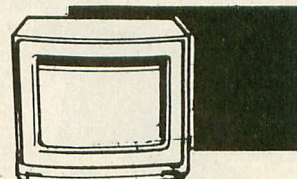
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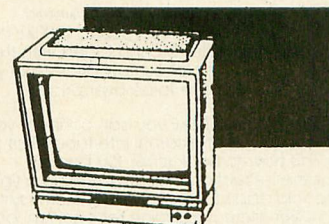
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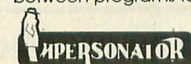
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BY GREGG PEARLMAN, ANTIC JUNIOR EDITOR

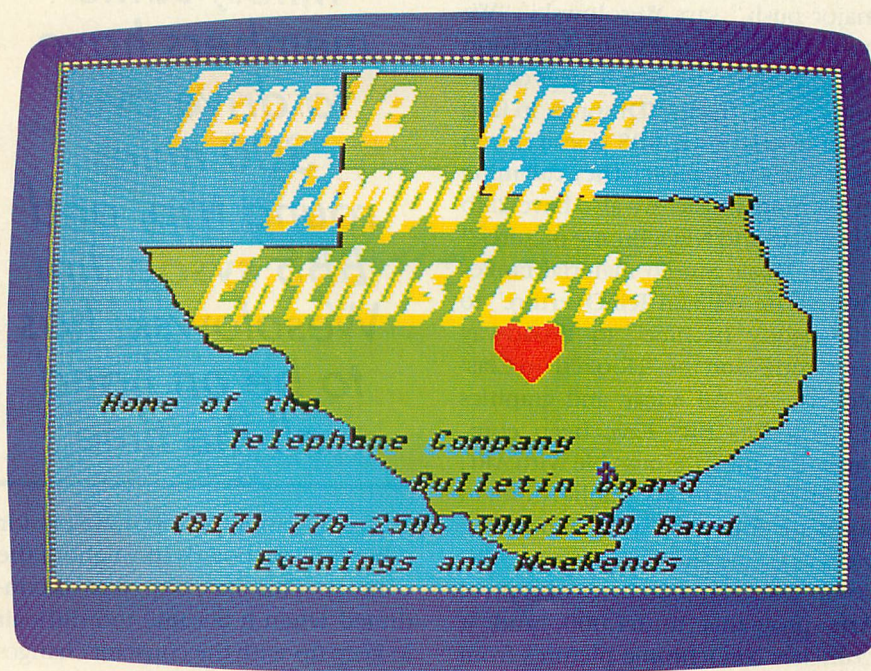
# TACE

*Serving 500 square miles of Texas*

**T**ACE, the Temple Area Computer Enthusiasts, is located right in the middle of Texas. "I'd say we cover about 500 square miles," says TACE founder Jim Wesolowski, "but we also have members in other states and even in Germany. There's a lot of military around here, 285,000 troops in the area. Fort Hood itself is 323 square miles. Temple, on the other hand, has 42 people and is six miles from one end to the other." Temple residents used to go about 65 miles for the nearest Atari equipment, but a new full-fledged dealer has cropped up less than 40 miles away.

Wesolowski, confined to a wheelchair as a result of a tunnel explosion while serving in Vietnam, is now TACE librarian and system operator of the users group bulletin board, the Telephone Company. "I also belong to SAM, the Sysops' Association of the Metroplex," Wesolowski says. The Metroplex is the triangle between Waco, Temple and Killeen, including Fort Hood and Harbor Heights. "To give you an idea of how big the area is, one sysop drives 163 miles each way for our monthly meeting."

TACE officially meets at Wesolowski's home three times a month—some people drive over 100 miles round trip. But members stop



by all the time. "It's an oddball arrangement," says Wesolowski. "I'm stuck at home all the time. So when people come for disk swaps or to learn something on the computer, 10 might show up on Saturday, 15 on Sunday—or whenever they can make it. They'll come any day of the week to learn whatever was taught at the last meeting."

Most TACE members are in the military, so the largest age group is be-

tween 18 and 34. However, TACE memberships cover an entire family, not just an individual. Including children, the total membership is about 400—of which some 103 families are primarily Atari users.

"I have non-Atari users over also," says Wesolowski, "though my only computer now is an ST. For instance, I worked with a couple of IBM users on C compilers." The A in TACE used

continued on next page

to stand for Atari, but the group now includes users of other personal computer brands. Previously there had been no groups for non-Atari users in the area.

TACE holds a major meeting every three months at Kwik-Fix Electronics, the only full-service Atari dealer in the area. Average attendance is around 160. TACE membership has grown about 22 percent a year since it began in 1983.

## TACE BBS

The Telephone Company bulletin board runs on Wesolowski's one-megabyte 520ST, with a 20Mb Atari hard disk and Michtron BBS software (rev. 2.0). The BBS is online from 5 p.m. to 10 a.m. on weekdays, 24 hours on weekends and holidays.

"We have about 8Mb of MIDI music and graphics online—they're the major push," says Wesolowski. "We have 1Mb—108 titles—of Activision Music Studio files and 3.5 megs of Hybrid Arts EZ Track MIDI songs. In fact, Hybrid Arts' own BBS doesn't even have half a megabyte—they call mine to get more music. We also have 2Mb of DEGAS and NEOchrome pictures."

The Music Studio material ranges from "The William Tell Overture" to "Rhapsody in Blue" to Broadway showtunes and the "Hooked on Classics" series. All music and graphics files on this BBS have been compressed as much as possible with ARC (short for Archiver) public domain software found in such online services as GENie and CompuServe. ARC compresses 330,000 bytes of Hybrid Arts programs to 64,000, and it crunches NEOchrome pictures from 32,000 bytes to 5,000.

"Forty-five percent of our callers are long distance—I even have callers from Ohio and California," says Wesolowski. The Telephone Company BBS is open to everyone. First-time callers have upload and download capability. Online time is limited to 35 minutes until users are validated and get boosted to 75 minutes.

TACE actually has five bulletin boards covering topics from computers to country-western music. Wesolowski's system just handles the

Atari information—8-bit and ST. All the TACE systems run at 300 and 1200 baud. "Because the of the range of topics," says Wesolowski, "people usually call one BBS, then another and another. They don't usually hook up to just one."

Wesolowski updates TACE's online newsletter monthly. "We've channeled our energy into software reviews," he says, "and I've got online reviews of Haba, Michtron and Activision products. I'm limited to how much I can do at a time, though, because I have only one ST."

Antic first heard about the Telephone Company when it used to spe-

---

*Because TACE  
covers 500  
miles, some  
members have  
to drive over  
300 miles  
round trip, and  
BBS sysop Jim  
Wesolowski has  
to be on hand  
all the time*

---

cialize in listing phone numbers for other bulletin boards throughout the country. This specialty was discontinued when it became too difficult to keep up with the constant changes in a list of 1,400 numbers.

## TACE ACTIVITIES

TACE's president, Paul Fische, is the Chief of Recreation and Rehabilitation at a nearby Temple Veteran's Administration Medical Center and TACE is one of the few Atari users groups in the United States with the VA as a member.

"We help the VA hospital with 8-bit computers," says Wesolowski, "which they use in a nursing home for recreation and rehabilitation in

terms of such things as hand-eye coordination after strokes. We also work with the Muscular Dystrophy Association and have a hotline modem pledge system for the Jerry Lewis Telethon."

Another group member is Temple Junior College, which holds an annual continuing education class that covers various computers and modem operation. TACE is also a charter member of the Worldwide User Network and has started a bulletin board association against piracy.

## TACE SURVEY

TACE supplied the following survey information. Of the 103 Atari-owner family memberships in TACE, 9.8 percent use STs and the remainder use 8-bit computers in this order: 800XL, 800, 130XE, 65XE and 1200XL. Atari 1050 and Indus GT disk drives are the most popular.

The most widely-used modems are the Avatex, Volksmodem, Atari, Supra (MPP) and Hayes. Twelve percent of the members use online services, primarily GENie, CompuServe and Dow Jones.

About 6 percent of the TACE Atari-ans are active programmers, while another 12 percent program occasionally. Rankings for the favorite 8-bit languages are Atari BASIC, Microsoft BASIC and ACTION!. ST programmers favor C, ST BASIC and assembler, in that order.

The software types used most by members are ranked here in order of importance:

1. Business/Financial
2. Word Processing
3. Programming
4. Help for Handicapped
5. Education
6. Communications
7. Games
8. Robotics
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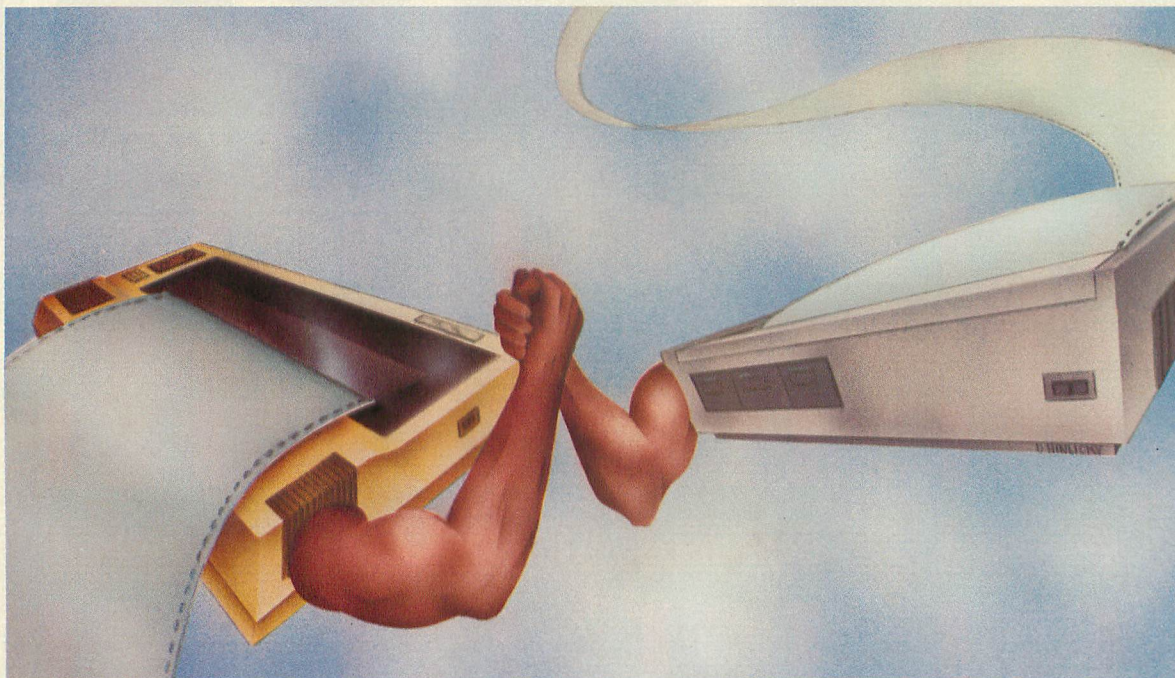
MARCH 1987

## CONTENTS

USING INP AND OUT	61
ST PUZZLER	63
ST REVIEWS	64
BASIC ALERT	68
STARGLIDER	71
HIPPO SOUND DIGITIZER	77
ST NEW PRODUCTS	81

ST Disk Subscribers: For instructions on how to transfer **Antic** ST programs to 3 1/2-inch disk, see ST Help File on Side B of monthly disk. ST programs from previous issues are available in 3 1/2-inch format from the Antic Catalog.

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# USING INP AND OUT

## Create a terminal program in ST BASIC

by ALEX GOLITSIS

**T**here are two mysterious commands in ST BASIC that are perhaps the most powerful, but least known. They allow you to print text to your printer, or even communicate with other computers. The commands are INP(x) and OUT x,y.

For communicating with the outside world, nothing beats this pair. INP is short for INPut, and OUT, of course, is short for OUTput. These are the two basic, primary functions that a computer performs. It inputs to gain information, and it outputs to send information.

Chart 1 shows the values that x can be in INP(x) or OUT x,y. You would probably guess from the chart that 4 takes input from your ST's keyboard, right? Wrong. The console (2) takes care of both screen output and keyboard input. The "keyboard" refers to the virtual keyboard, not the physical one that you type on.

Have you ever wanted a screen to wait for the user to hit a key before continuing? Well, INP is one way to accomplish this. Since you want the user to hit a key on the keyboard, we use assignment number 2 (console). To check the status of the character buffer for any of the devices, use its negative. It will return zero if there is no character, or -1 if there is a character waiting in the buffer.

So to check if someone has hit a key, you would say:  
1000 IF INP(-2)<>-1 THEN 1000

This should keep BASIC busy until someone hits a key. Unfortunately, though, there is a hitch. GEM's "Desktop" interaction, consisting of the mouse pointer and key buffering, steals almost all of the characters before line 1000 can get to them. All is not lost, though. It is as easy as turning GEM's "Desktop" interaction OFF with the following command:

```
POKE SYSTAB+24,1
```

And to turn it back on,

```
POKE SYSTAB+24,0
```

So, we can now use our original line in a subroutine at the end of your program. We can label it "KEYIN". Here's how it looks:

```
KEYIN:
```

```
POKE SYSTAB+24,1
```

```
A=0
WHILE A<>-1
A=INP(-2)
WEND
POKE SYSTAB+24,0
RETURN
```

This subroutine can now be called with a GOSUB KEYIN any time you would like the user to hit a key to continue in your program.

Now that you have the basics of INP, I can introduce you to its sister, OUT. OUT does the opposite of what INP just did. Instead of taking in a character, OUT sends out a character to any of the devices in Chart 1. The format is identical, but you cannot check the status through OUT because it is up to the program to supply the characters this time. Let's send the characters "HI" to your printer.

```
OUT 0,72
OUT 0,73
OUT 0,13
```

For those of you who haven't memorized the ASCII values for every character, 72 is decimal for "H" and 73 for "I". 13 is a carriage return, inserted because many printers with buffers won't print until they receive one.

At this point, you may be asking, "Hmm . . . What would happen if I sent a character to the screen through OUT? Will it show up in the OUTPUT window?" Hmm indeed. Let's try it.

```
OUT 2,72
OUT 2,73
```

(Notice we don't need the carriage return this time.)

What happened? Instead of looking through all of the windows for "HI", focus your attention to the top left corner. After Debug on the menu bar, the letters HI have appeared!

By now, some of the implications of these commands might be running through your head. "If I can get two characters on the screen, I must be able to fill the whole screen with my own text". You can, if you do it carefully.

continued on next page

One of the assignments we haven't used yet is number one, the RS-232 port. This is where your modem plugs in. If a little lightbulb just lit up above your head, you're not alone. Now that we can control incoming and outgoing text to the modem, who is going to stop us from writing an ST BASIC terminal program? Or even a Bulletin Board System (BBS)? The answer is no one.

Before we go on, first realize that the all-text part of the ST's operating system uses the VT52 standard terminal. If you have studied the table of escape sequences for the VT52 that have been published in some books, you might have noticed some very exciting features. But if you recall, the screen isn't cleared by an ASCII 12 like most terminals, but rather an [ESCAPE] (ASCII 27) followed by the capital letter E (ASCII 69). Since OUT 2 utilizes VT52 codes, sending these characters through OUT 2 should clear the whole ST BASIC screen. If you try it, you will definitely agree that it does. Windows, drop-down menus and even the grey background have all disappeared. But if you have just entered these lines in COMMAND mode, you will notice that moving the mouse, hitting keys, and dropping menus seems to have a rebuilding effect. You cannot, unfortunately, have the ST BASIC Desktop back in perfect condition without re-booting. You will also notice that the characters you now type are not appearing at the top of the screen with our "HI", but rather back in the COMMAND window.

With this knowledge, we should be able to make a short program that echoes every character you type to the blanked-out screen (and not the OUTPUT or COMMAND windows). The following program will do just that:

```
1000 ON ERROR GOTO 5000
1010 POKE SYSTAB+24,1
1020 OUT 2,27:OUT 2,69
1030 CHAR.IN=0
1040 WHILE CHAR.IN<>13
1050 A=0
1060 WHILE A<>1
1070 A=INP(-2)
1080 WEND
1090 CHAR.IN=INP(2)
1100 OUT 2,CHAR.IN
1110 WEND
5000 POKE SYSTAB+24,0
5010 END
```

What you type will be shown on the first line of the screen (normally the menu bar) and will continue along until you hit [RETURN].

The ON ERROR GOTO 5000 is included just in case you make a typing error. All errors are fatal unless you trap them because with GEM's interaction turned off, you have no way of talking to ST BASIC, which is a GEM application. If we hadn't included the ON ERROR GOTO and we had made a mistake typing, we would have had to reset the ST.

With this small program, we can send a line of text to the screen, the printer, or even the MIDI port. Or we could

have sent it to the modem.

The modem works just like the keyboard. If a character has come through, a -1 will be returned from INP(-1). If no characters are available, a zero will be returned. OUT also works the same with the modem. If you would like to send a character to the modem, OUT 1,(ASCII VALUE) will do it. With this information, we could go about writing a very short terminal program in ST BASIC that, for starters, will be very similar to the VT52 Desk Accessory. But there is one major difference: you cannot customize the VT52 desk accessory.

The main escape codes are listed in Table 2. Most of them we will not need for our terminal, but some will be very important. We definitely need to see the cursor, and word wrap will come in handy (this allows text to flow onto another line if it exceeds 80 columns). We must organize our program into a smooth-flowing, well-structured application if we want it to keep up with the demands of high-speed telecommunication.

Table 2.

#### VT-52 Escape Codes

ESC A	CURSOR UP
ESC B	CURSOR DOWN
ESC C	CURSOR RIGHT
ESC D	CURSOR LEFT
ESC E	CLEAR HOME
ESC H	CURSOR HOME
ESC p	REVERSE ON
ESC q	REVERSE OFF

The "main" loop will consist of two IF's: one to check for an incoming character, and the other to check for an outgoing character. With some thought, trial, and error, I found out that giving priority to an incoming character (checking INP(1) first) was the best method. Otherwise, every time you enter text before a prompt has been reached (storing it in the buffer of the host computer), the incoming text being printed to the screen pauses.

These two IF's must then call two other subroutines. These subroutines should handle special characters, and finally process the information.

Special characters to watch out for would be keys that you hit on the keyboard that will serve a function on your side of the terminal. What leaps to mind is the [UNDO] key, which is well-suited for handling the QUIT function. When you hit [UNDO], you don't want its value sent over to the host, so you must trap it before you send it.

Let's trace a character as it goes through the system. If I hit a key, INP(2) will pick it up. If it is not a reserved key, it should be sent to the modem with OUT 1,(value). Likewise, if a character is coming in, INP(1) will receive it, and it should be printed to screen with OUT 2,(value). These two operations are reciprocals.

Good luck, and happy telecomputing!



# ST PUZZLER

## A jigsaw puzzle generator for your ST

by David J. Bohlke

**S**T **Puzzler** is a simulation which will generate a random jigsaw puzzle for you to solve. A scoring routine will allow you to compete against your own best score on each new puzzle. You also have the option of changing the puzzle pattern so that you can adjust the difficulty level of the game.

To begin you will need to type in the ST BASIC listing. Be sure to save a copy or two to disk before you run the program. It is also necessary to set the display to low resolution from the control panel. If you have a monochrome-only display, you can try placing random patterns in the puzzle, as described later.

When you run the game, the random puzzle to be solved will be displayed in the bottom-right corner of the screen. The left two-thirds of the screen will show an 8×6 grid in which you will place the pieces in the puzzle. The piece you will need to place in the puzzle each turn will be randomly selected; and shown in actual size in the upper-right corner of the display. Each of these pieces and the completed puzzle grid are nine times as large as the original puzzle that you will be completing.

There are four types of prompts which will be printed in the OUTPUT bar on the top of the screen. When the computer is selecting a piece for you to place in the grid, and plotting the piece in the upper right of the screen, the message "Selecting piece" will be displayed. Then it will be time for you to place the piece in the puzzle,

and the prompt "Click to Grid" will be shown. To place the piece, use the mouse to move the pointer to the location in the grid you think the piece belongs, relative to the original puzzle from the lower right of the screen, then click the left mouse button.

If you are accurate in your selection, the message "CORRECT" will be shown; and if you miss the appropriate

---

The  
maximum  
score  
is a  
perfect 4800,  
with any  
score  
over 4000  
exceptional.

---

grid square the message "INCORRECT" will be printed. Each of the four prompts will also indicate your current score. The "CORRECT" signal also displays the number of right and wrong pieces you have attempted. When your placement is accurate, the piece will be put in the large grid that you pointed to with the mouse. When you are wrong, the

piece to place will be erased, and a new random piece will be chosen.

The scoring routine considers the number of right and wrong placements, and a timing factor. The timing counter begins when the piece to place in the upper right corner is completed, and ends when you click the mouse to pick your square. You can only click the mouse when the prompt "Click to Grid" is displayed. The maximum score is a perfect 4800, with any effort over 4000 exceptional.

Each puzzle is made up of random ellipse segments. Currently, the pieces are filled with the pattern labeled (2,7) on page C-21 of the ST BASIC Sourcebook. These numbers are engaged using the color statement in program line number 240. Notice the order used in the statement is 7,2. Using other patterns here is one way that you can increase or decrease the difficulty level of the jigsaw puzzle. If you do not have a color display, you might try using a `rnd*24` to pick a random pattern for each different ellipse drawn in the puzzle.

I really enjoyed writing Puzzler and experimenting with the different color combinations and patterns. After you are accustomed to play, you might try altering the elliptical shapes to boxes, circles, lines, or triangles. If jigsaw puzzles are one of your hobbies, you now have billions of options to enjoy.

IF YOU'D ENJOY SEEING MORE ARTICLES LIKE THIS ONE, CIRCLE 285 ON THE READER SERVICE CARD.

Listing on page 97



# ST PRODUCT NEWS

## ST Reviews

### ST POOL

Shelbourne Software Systems  
7221 Rising Sun Ave. Suite #191  
Philadelphia, PA 19111  
215-725-5644  
\$39.95

### 8-BALL

MichTron Inc.  
576 S. Telegraph  
Pontiac, MI 48053  
313-334-5700  
\$34.95

CIRCLE 277 ON READER SERVICE CARD

Reviewed by Rick Teverbaugh

The game of pool is likely to experience a comeback, especially with the Fast Eddie Felson character Paul Newman created in "The Hustler" returning in Martin Scorsese's hit movie "The Color of Money." However, for those who prefer keyboard and mouse in the comfort of home to wooden cue and green felt table in a smokey pool hall, you have two choices of pool programs for your ST.

**8-Ball** and **ST Pool** are distinctively different programs, in that the scope of each game is drastically different. 8-Ball is limited to just that game of pool, while ST Pool gives you the table, cues and balls, inviting you to play whatever game that strikes your fancy. With ST Pool, you can create your own rack of balls, making it easy to play 8-Ball, 9-Ball, Rotation or whatever. 8-Ball keeps track of which player is up, and lines the balls sunk

behind that player's name. ST Pool presents beads at the top of the table to keep score manually; otherwise the program doesn't care which player is up.

There are advantages and disadvantages to each program. For example, 8-Ball limits the options of games available. True pool aficionados will likely favor this plan because they will be used to keeping score manually, so that chore won't seem unusual. But to the veteran computer gamer, it will seem too much trouble. Computer users are accustomed to the machine doing the dirty work, leaving them to have fun. 8-Ball tells which player is up, keeps track of scratches and much more.

At the beginning of the program, 8-Ball asks what will constitute a scratch. The choices are: hitting the ball off the table (yes, it's possible), not hitting a ball, hitting opponent's ball first, shooting backward after a scratch, and failing to cushion a ball. At game's end, the program will then deliver some specific information about each player's game. That data includes the number of shots, the number of turns, the number of scratches and the longest run of balls in one turn.

There are also other differences in the way each program executes the game of pool. The most unusual of these is in ST Pool. First, you have to position the pool cue with the tip over the white ball, using the mouse. Then, you use the mouse or the Con-

trol and Tab keys to aim the stick. In the most difficult mode, it is necessary to use line-of-sight vision to gauge where the ball will go. There is another option which projects a dotted line down the table, making it easier to judge when the shot is lined up properly.

After that, just executing the shot is no picnic. You have to hold the left mouse button down while drawing the mouse towards you to prevent changing your aim. This movement also pulls the cue stick away from the ball. Also, controlling how hard the ball is hit is accomplished in a novel manner. It doesn't matter how far the stick is away from the ball, the strength of the shot depends on the speed of the mouse movement back towards the ball. To develop a nice touch on the table will take hours of practice.

However, ST Pool will enable you to make some shots that would be impossible with 8-Ball. A box at the lower right-hand side of the screen shows the cue ball. A crosshair on that ball will help control the action of the cue ball when it hits the object ball. That makes it easier to position the cue ball on the table to set up a second shot.

The entire process is simplified in 8-Ball. The mouse moves the cue and controls the aim around the cue ball. A dotted line projects forward to aid your aim. The farther the stick is drawn back from the ball, the more force will be applied to the shot. You

can get a normal strength shot by using the left mouse button. The right mouse button will give a force about four times greater than the left, and is designed to be used mostly on the opening break shot.

8-Ball also avoids a problem that plagues ST Pool. Since 8-Ball only involves shooting at solid-colored balls or stripes and then the eight ball, all that is necessary for the table display is that you be able to tell the solids from the stripes and identify the eight ball. On the other hand, when you play Rotation, you have to be able to tell the number of the ball. That type of definition just isn't possible on a table cluttered with up to 16 balls at one time. ST Pool assumes you'll know which color the number one ball is, number two and so on. (Later versions of the game have a rules addendum on the disk you can print out and keep by the keyboard to aid in ball identification.)

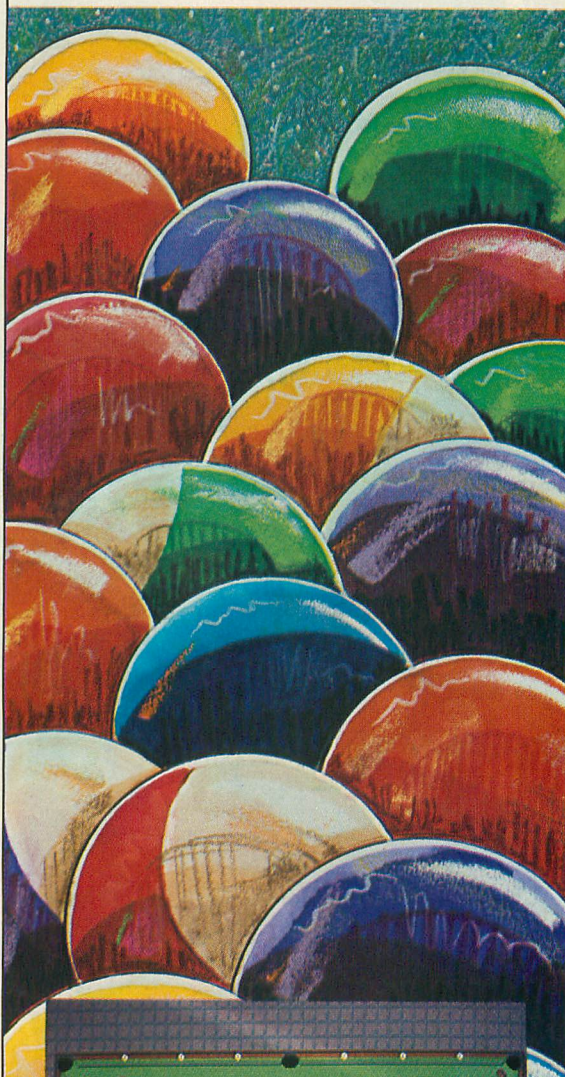
There are some added touches on ST Pool that aren't really necessary, but are fun to toy with. You can change the table color, for instance. (Fortunately, it never gets dirty or worn.) Also, you can alter the size of the boxes containing the table and other options can be changed to suit your tastes.

That only leaves the action of the balls on the table as a means for comparison. Overall, 8-Ball has the most realistic action, although even it falters a bit when the cue ball goes crashing into a pack of closely-clustered balls. 8-Ball evidently handles each contact individually or in pairs, so it is almost a stop-action sequence until all the contact ends. However, the roll of the balls is smooth and realistic. Since there are many angle options for shots, it is less difficult to line up a shot.

ST Pool makes much more exacting demands for making shots. In the practice, one-player mode, it will take almost twice as long to clear the table in ST Pool as it will in 8-Ball. Also, the ball movement isn't quite as life-like. On one shot, I had two object balls bounce off each other, go to opposite bumpers and then back to hit each other again. That process

continued on page 70

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CIRCLE 059 ON READER SERVICE CARD

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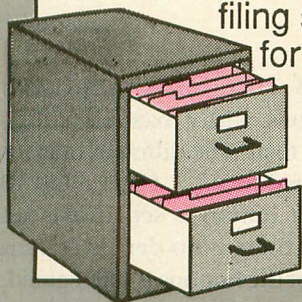




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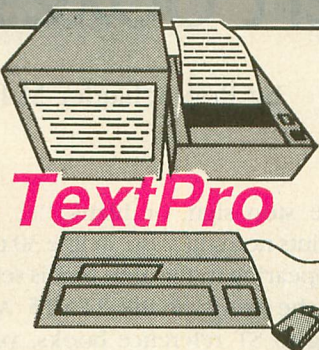
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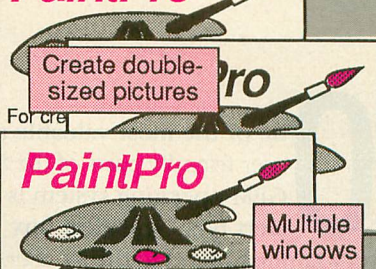


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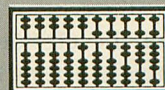
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# BASIC ALERT

## Creating alert boxes in ST BASIC

by Ron Schaefer M.D.

One of the most valuable and user friendly parts of the ST's GEM operating system is the alert box. The alert box is a very familiar object to the ST user. It's that rectangle that pops up in the middle of your screen, usually before you are about to make a change to your file. It can ask you to make decisions (such as EXIT, CANCEL, etc.) simply by clicking your mouse button on another "button," actually, a smaller rectangle at the bottom of the alert box.

To create an alert box using ST BASIC is a relatively simple matter. For instance, you can pass some parameters to a subroutine which will then do all the dirty work (PEEKing and POKEing). The alert box or the GEMSYS(52) call, is part of the Application Environment Service, or AES for short. Before using any AES application you must first initialize a few variables, as demonstrated in the subroutine called INITAES. These variables are set equal to constants and need to be defined only once in a program, but this must be done before you attempt to make any GEMSYS calls. Not all of these variables are used by every AES application, but I have found it easiest to initiate them all at once, then forget about them.

Let's walk through the program. Line 10 is a comment. Line 20 calls the subroutine INITAES, and opens and clears the output window. Line 30 sets the type of icon that will appear on the left side of the Alert box. I did this by setting the string variable TYPE\$ equal "1", the exclamation mark, "2", the question mark, "3",

the stop sign, or blank "", which prints nothing. Also, in line 30 the text appearing in the alert box is set equal to the string variable TEXT\$. According to ST reference books, you can have up to five lines of text, each line up to 40 characters long. However, whenever my text got over 4 lines long or over 30 characters per line my system started crashing, so I kept within these constraints.

---

To create  
an alert  
box  
using  
ST BASIC  
is a  
relatively  
simple  
matter.

---

The string TEXT\$ can be more than one line long, each line separated by a "|", a character you get by pressing [SHIFT]\ This "|" serves the function of a carriage return, telling the alert box to start a new line. Text should not contain square brackets "[", or "]" since these have special meaning to the GEMSYS(52) routine.

In line 40 the text appearing in the buttons is set equal to the string

BUTTON\$. There can be from one to three buttons, with a maximum of 20 characters total. The different buttons are separated by a "|". Also in line 40 the default button is set. If it is set equal to 0 there is no default, otherwise one of the buttons is highlighted, and when a carriage return is pressed it has the same function as clicking on that particular button. Line 50 calls the subroutine DOALERT. Lines 60 through 80 print out a message, depending on which button you click.

The subroutine DOALERT starts on line 120. Line 130 sets a double precision variable "N#" equal to the memory location where the parameters must be POKed in order to create an Alert box. Line 140 sets the default button as explained above. Line 150 generates the string ALERT\$, which is a concatenation of the variables TYPE\$, TEXT\$, and BUTTON\$, separated by square brackets. In line 160 the command VARPTR pokes the address of the string variable ALERT\$ into the spot where the GEMSYS(52) routine will look for it. Line 170 calls the routine to generate an alert box. Finally, line 180 looks for which button you clicked and sets it equal to the variable CHOICE. A word of caution: When using GEMSYS commands it is very helpful if you frequently save your program. These commands are very finicky, and if they are not executed perfectly, they have a tendency to lock up or crash the system.

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Listing on page 98



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## ACCESS

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Action	49
Action Tool Kit	19
Basic XL	38
Basic XL Tool Kit	19
DOS XL	19
Basic XE	49
Mac 65	49
Mac 65 Tool Kit	19

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Syn-File	33
Syn-Calc	33
Syn-Trend	28

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## ST PRODUCT REVIEWS

continued from page 65

repeated itself twice before the balls finally lost momentum and came to a stop.

Though each program has individual strengths and weaknesses, if you don't mind being limited to just 8-ball, I think that either program is a satisfactory choice for ease of use, and sophisticated pool playing. Rack 'em up!

### TIMEKEEPER

Navarone Industries  
21109 Longeway Road, Suite C  
Sonoma, CA 95370  
(209) 533-8349  
\$39.95

CIRCLE 262 ON READER SERVICE CARD

Reviewed by Patrick Bass

Looking for a battery-backed ST clock but don't want to lose the use of your cartridge port? The **Timekeeper** by Navarone Industries is just what you had in mind. The Atari-silver Timekeeper plugs into the Atari ST cartridge port, but provides a "feed-through" cartridge slot to allow the Timekeeper to remain installed when using other cartridges.

The Timekeeper comes with the correct time and date already programmed in. Along with the cartridge, Navarone provides software on disk which includes a desk accessory clock and a standard .PRG time-setting program.

On powerup, the software automatically gets the time and date from the Timekeeper and sets the ST internal clock. Then it disengages itself. Your files will always be properly time- and date-stamped. No more guessing when the last update was. The desk accessory clock includes an "Alarm Clock" function, which you set to the time you desire the alarm to sound. When the alarm trips, the desk accessory pops up on the screen and a warbling two-tone alarm comes ringing out of the video speaker.

The built-in battery should last upwards of ten years. I've had

Timekeeper plugged in for over a week now, and haven't lost a second. If you need a battery clock, but also need to keep your cartridge port, look long and hard at this \$39.95 wonder.

### MEAN 18

Accolade Software  
20833 Stevens Creek Blvd.  
Cupertino, CA 95014  
(408) 446-5757  
\$44.95

CIRCLE 254 ON READER SERVICE CARD

Reviewed by DeWitt Robbeloth



Armchair golfers will enjoy playing **Mean 18** if they can ever get beyond the practice tee. The instructions confused me so much I almost gave it up. But once on the course, I found challenging amusement where physical coordination, concentration, judgment and an attractive environment all translated nicely from real golf to the computer.

Three careful clicks of the mouse button simulate a golf swing. The timing of the clicks, cued by a visible "power gauge," determines the extent of your backswing and the moment of impact with the ball. Perfect timing results in a shot down the middle with maximum distance for the chosen club. Slight timing variations cause hooks and slices and loss of distance, so you can rarely play a shot the same way twice. Even short putts are tricky, requiring rapid clicking to avoid overpowering the ball.

You also control your shots in two other realistic ways—choice of 14 clubs and direction of shot. Scrolling lets you shoot to the side, for example, to escape a tree, or to play a deliberate hook.

Mean 18's four courses are Augusta, Pebble Beach, St. Andrews, and Bush Hill Country Club. Each realistic hole begins with a tee facing down the fairway. Trees, bunkers, streams and rough are all strategically placed to intercept the errant shot. In the distance you see the green and flag, if they're not hidden by the terrain.

Your onscreen golfer, toggled in color-coded shirt, addresses the ball. As you click your mouse, the golfer swings and sends a white dot arcing towards the pin. The ball drops, bounces and comes to a stop according to the computer formula. When you click again, the scene changes to represent the vista from the ball's new position.

When your ball finally lands on the green, you first see an overhead view of the whole green and its contours, the hole and the positions of all balls on the green. Then the scene narrows to the distance between your ball and the hole. The computer displays an aiming line for your putt, which you adjust with the mouse. When the line seems right, the clicker putts the ball.

On my first round I shot an 85 against a par of 72. Not bad. If you need more challenge, choose the pro tees to increase the distance, or play in expert mode where the computer does not suggest the proper club nor line up the shot. Stroke play (lowest total) or medal play (most holes won) are available.

Of course the computer keeps score, and tells whose shot it is (which can get confusing when you're pretending to be a foursome all by yourself). You see the scorecard after each hole, and you can post outstanding scores to the Hall of Fame. If your game is interrupted, save it to disk and return to it later.

The graphics of **Mean 18** deserve praise. With great simplicity, computer-artist George Karalias paints a pleasant and convincing golf setting. If you ever tire of the initial four courses, design your own with the Course Architect—essentially a golf-course construction set included on the disk.

My beef with this game is the instructions. Originally written for the

continued on page 73

# STARGLIDER

## A fantastic space warfare simulator for your ST

Reviewed by DAVID PLOTKIN

**Starglider** is an extraordinary combat simulator. Its combination of strategy and outstanding graphics demands hair-trigger reflexes, providing a thoroughly enjoyable gaming experience.

Starglider is the classic "one vessel against overwhelming odds" scenario. When your home planet of Novenia was overrun by the Egrons, only the outpost on Novenia's moon was left intact. There, you discover a museum piece—an AGAV, or Airborne Ground Attack Vehicle. After fitting it with advanced weaponry and rocket boosters, you fly it from the moon to Novenia, there to do battle with the hordes of enemy invaders. At stake is not only the fate of Novenia, but of your friends left behind at the moon base, who will perish unless additional supplies reach them soon from Novenia.

When you reach Novenia, the hordes of enemies will give you pause. There are numerous types: The (apparently) invincible walker (shades of "Empire Strikes Back") is the most imposing, but there are also fighter aircraft, tanks, missile launchers, floating mines and other nasties, all rendered in gorgeous color. Most of these will fire furiously at you, and it will take all your skill to avoid them and return fire. You will also have to deal with the flagship of the enemy fleet, StarGlider 1.

Your AGAV is equipped with twin

lasers and computer-aided targeting, as well as guided missiles—if you can find any. There is nothing so satisfying as blowing an enemy tank to bits with multiple hits from your laser! Your AGAV also has a force field which will give limited protection from enemy fire. From the moment you descend to Novenia, you will have your hands full. Besides flying your ship, monitoring forward speed



and altitude (hitting the ground is very hard on your shields), you must keep an eye on your laser energy, shield energy, and flight energy. As you duke it out with enemy forces, you will also have to figure out how to recharge your various energy sources. Not all of them can be recharged in the same place. It's actually not too hard to figure where and how to get energy—read the documentation carefully.

Your AGAV is controlled by the mouse. The control systems uses both mouse buttons for altitude, speed, and fire control. It is a little confus-

ing at first, but you soon get the hang of it. Once you do, Starglider becomes a lot of fun. You can also control the AGAV from the keyboard, although I think the mouse is much easier. The default keys are strange choices, but you have the option of defining your own control keys before starting the games. Thus, you can control your AGAV using the cursor arrow keys if you wish.

Your view is out the cockpit, and the graphics and animation are simply amazing. You appear to be moving over the surface of a darkened planet, with structures and enemies depicted in vector graphics. The documentation, consisting of a novella, flight manual and quick reference sheet, gives quite plausible reasons why the planet is dark and why you can see through buildings and vehicles. Moving your mouse left and right alters your flight direction, allowing you to line up your sights on targets and blast away with your lasers. Enemies explode convincingly, scattering pieces. Digitized sound and voice complete the realistic simulation of combat.

The strategy required for Starglider is pretty intuitive. For example, if you are "waxing" an enemy fighter's tail, blasting away (it may take quite a few hits before it explodes), you may need to adjust your speed so as not to let him get away or get too close. A burst

continued on next page

of speed may also be needed to shake a missile from your tail, and it is often wiser to run than take on a missile launcher that never seems to run out of missiles!

The ultimate aim of Starglider is the destruction of the enemy flagship. After destroying a variety of enemy forces, Starglider 1 will make an appearance. No sense in wasting laser fire: The flagship is impervious. The only weapon that has any effect on Starglider 1 is a missile. These can be obtained at the supply silos, but only one at a time. When you launch a missile, your cockpit screen switches to show the view from the missile, and you use your mouse to guide it towards the madly evading flagship. Only one place on Starglider is vulnerable, and it is difficult to hit. Successfully hitting that spot (under the tail) advances you to the next level. Three hits will destroy the flagship, causing Egron forces to surrender.

As you would expect, each successive level is harder. But not just be-

cause things occur faster, as would be true of an ordinary arcade game. What happens is that the enemy gets smarter and adjusts his strategy to make your life miserable. Heavy concentrations of tanks begin appearing around the supply silos and energy recharge towers, and it gets ever more hazardous to refuel. Further, there seems to be no end to the missiles the Egrons throw at you, and the missiles can track you more accurately at the higher levels.

The documentation which comes with Starglider is delightful. Not only is the novella informative, but funny as well, with historic references (if you are a history buff) to the likes of Hermann Goering (in charge of the Luftwaffe—airforce—of Nazi Germany during World War II). In fact, the commander of the Egron forces is a character named Hermann Kruud, who swaggers and has delusions of grandeur very much like Goering. The novella is also full of references to the designers and programmers of

Starglider, with backwards names abounding.

The bright colors, smooth animation and digitized sound of Starglider make for an impressive gaming experience, full of challenges and fun. I would have preferred slightly less overwhelming odds to fight against, and the inability to save high scores to disk (they are lost when you turn off the computer) is sorely missed, but I think that this game is destined to become a classic. It really shows off what the ST can do. If you are hungering for a high-resolution challenge, this game is for you.

Now excuse me, I have a date with some Egrons. . .

### Starglider

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#### PROGRAM PARAMETERS

LANGUAGE.....MACHINE  
NUMBER OF PLAYERS.....1  
AVERAGE COMPLETION.....90 MIN  
AGE GROUP.....10 TO ADULT  
CLASS.....STRATEGY ACTION  
SOUND.....YES  
ANIMATED GRAPHICS.....YES  
EQUIPMENT.....MOUSE JOYSTICK

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## ST PRODUCT REVIEWS

continued from page 70

IBM, the slim instruction pamphlet failed completely to orient me to the ST version. A 3x5-inch insert attempts to explain changes for the ST, but essentially it only says to substitute "mouse click" for "space bar." There's no explanation of the practice tee or practice green, where every novice player naturally proceeds—and where almost nothing works as the instructions say they do, although the instructions are correct for the main course. It's a shame that such a colorful and interesting game is almost torpedoed by shortsighted documentation.

### MIDI MAGIC

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Reviewed by Jim Pierson-Perry

As I write this review, the ghost of Ge-

orge Gershwin is rolling into high gear playing "Rhapsody In Blue" on my Casio synthesizer. And when he finishes, some of his friends will take over to play "The Old Piano Roll Blues," "Do You Think I'm Sexy?" and others.

MIDI Magic allows the ST to read music disks and send the data, via the ST MIDI ports, to any MIDI-compatible instrument. It comes with a connecting cable for the ST to the instrument, a demo disk with six songs and a catalogue of available music disks (currently 103 at \$19.95 apiece). As the music plays, the screen shows a player piano with the corresponding piano roll winding through it.

The programmer of the ST version of MIDI Magic is Tom Jefferies, who also gave us the MIDI sequencer in the premiere issue of START magazine. Both programs use a basic MIDI protocol with all notes sent on one channel in polyphonic mode. For best results, the receiving instrument should be capable of sounding at least eight notes at once (e.g. Casio CZ-101,

Yamaha DX-7) or there might be a noticeable loss of music quality.

A standard approach would be to use a synthesizer set to sound like a piano as the receiving instrument to give the full effect of a simulated player piano. While this works well, I've had fun with more unusual synthesizer sounds, such as Madonna's "Material Girl" played by eight invisible whistlers, or the Beach Boys' "California Girls" on bagpipes. Of course with MIDI just about anything goes, so if you want to send the music data to a sampling keyboard set to respond as harmonic barking dogs—go for it.

Be aware that MIDI Magic is a "playback only" program—you can't use it to record your own playing. It does what it claims—acts as a computer-age player piano—and does it well. I recommend this as a good example of what the marriage of the Atari ST and MIDI can do—not to mention the great fun. Now if you will excuse me, George is done and I think I'll let Eubie Blake try playing some ragtime on a trumpet section.



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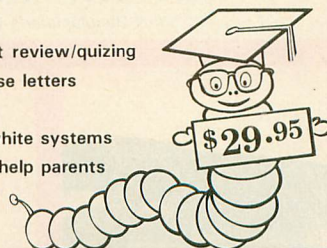
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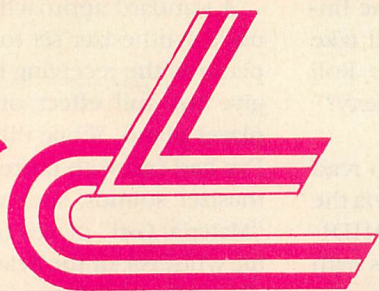
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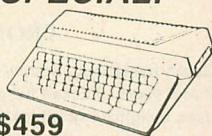
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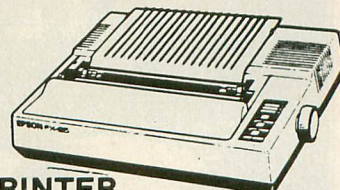
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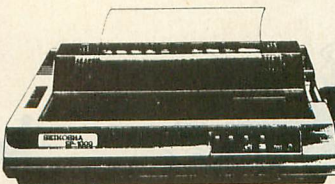
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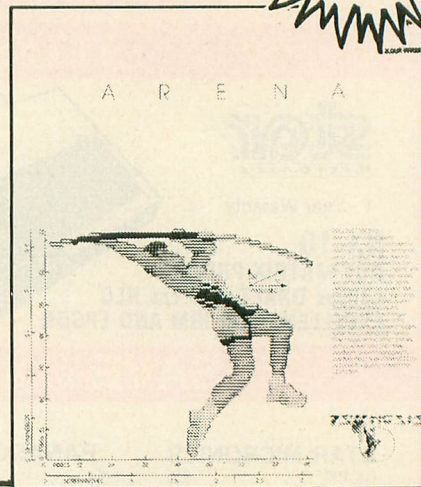
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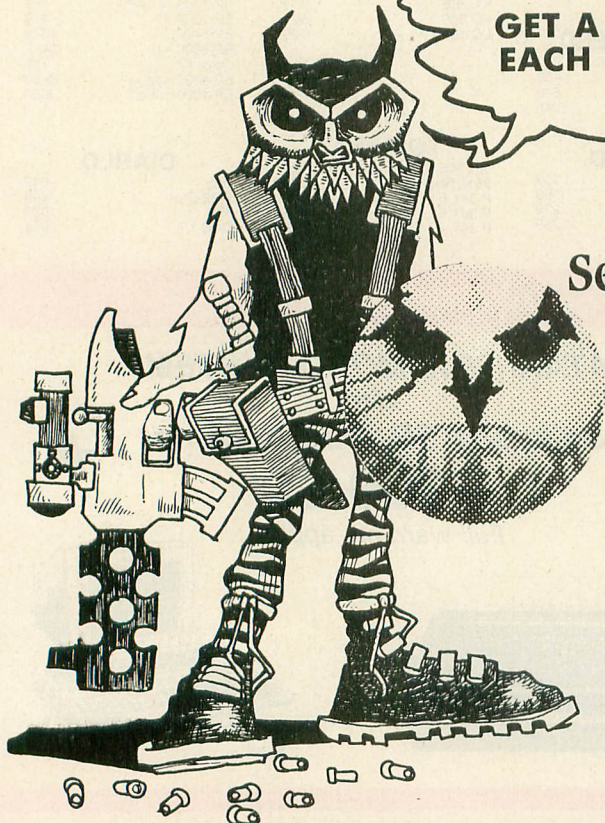
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# HIPPO SOUND DIGITIZER

An easy-to-use sound digitizer for your ST

Reviewed by Patrick Bass

I want this product.

I can't use this product.

No, the above is not a textbook example of dichotomy, it's how I feel about the **Hippo Sound Digitizer**. First, however, let's explore it and then get back to my petty wants and desires.

The Hippo Sound Digitizer (hereinafter known as HSD) is a eight-bit resolution hardware/software combination which allows you to digitize sound with your Atari ST computer. The HSD hardware consists of a dove-grey box about half the size of an ST disk drive, which plugs into the cartridge slot of the computer. The box has two external control knobs for adjusting input and output level. On the back you'll find 1/4 inch standard phone jacks for sound input and output.

Notice that word output. You'll need an external amplifier to hear the sounds you've digitized, since there seems to be no way to play the sounds back through the TV speaker. I spent about 15 frustrating minutes before I found a reference to "adjusting the level of your amplifier" buried in the HSD manual. They should have made this apparent in the "Setting Up The Unit" section. Incidentally, patch cords are not provided.

The HSD software comes on a 3.5 inch disk, and contains both the digitizer software and sample sounds. HSD works on either color or monochrome Atari ST systems. To actually operate the digitizer, from the desktop, double-click on SOUND.PRG, and in a few seconds you'll see the HSD title screen pop up. There are four choices presented along the bottom of the screen.

On the left is "Command", which will present the main control panel for interacting with HSD. Next comes "O-scope", which presents a digital oscilloscope onscreen so you may watch the waveform of the incoming sound. To the right of that is "Rack," which presents a screen from which you may add reverb or echo to incoming or existing sounds, and finally, on the right is "Exit", which drops you back to the GEM desktop.

## COMMAND

The command screen is where you'll spend most of your time. Let's examine it closely. Most of the upper half of the screen contains an editing window, where the sound waveform is displayed and edited from. The upper right of the screen contains a "gas gauge" display of memory used for the sound and memory left in the cut/

paste buffer. The lower half of the screen contains buttons for 24 different functions.

First, you may LOAD or SAVE a sound file. The STATS button updates the display concerning playing time, number of samples, sample rate, and percentage of modulation concerning the average amplitude of the signal. The MIDI button sends sampling out through the MIDI port in the back. You may ADJUST RATE, either for the entire sound or just for a selected section of the sound, and vary the VOLUME, again either for the entire sound or just for a selected section.

HSD allows you to define your own wave shape and ADSR envelope, for completely unique sounds created from your own imagination. Also, at any time during editing of a sound, you may UNDO your last action.

You may MIX, or overlay, (sound with sound) one voice or instrument on top of another one. For example, select one sentence of a person talking, cut out a copy and save it in the cut buffer. Then, MIX the sound in the buffer back in with the original sound many times, each one starting a fraction of a second sooner or later than the last. The result? A "crowd" of people saying the original sentence

continued on next page

(more or less) in unison.

You may select a section of sound and SQUEEZE it to raise the pitch up one note, or you may STRETCH it out to lower the pitch. For multiple SQUEEZES and STRETCHES, you may double-click on the buttons, then type the number of times to repeat into the resolution dialog box.

Ever play Beatles' records backwards? With the REVERSE button, you could record and select the voice saying "Number Nine. . . Number Nine. . ." from the White Album and play it in reverse, confirming for yourself what the Beatles were really saying. (I have, and no, I'm not saying.)

The next four buttons all work together. CUT will remove the selected section of sound and place it into the cut buffer. COPY just makes a copy of the sound and places it into the cut buffer, without removing it from your original sound. INSERT copies the sound in the cut buffer to wherever the cursor is in the current sound being edited. REPLACE will remove the selected section of sound on the edit screen and replace it with the sound stored in the cut buffer.

When you click on SHOW ALL, the entire sound is displayed in the edit window along the top. The left side of the edit display shows the time the selected sound starts, and the right side of the display shows what time the sound ends. SHOW ALL is needed, because using the ZOOM IN and ZOOM OUT buttons, you may zoom in on a selected section of sound until the individual peaks and valleys of the sound waveform itself are visible.

This can have a very important function. For example, record a selection of music off an old record. Now play the section of music back, and if the record was old enough, you'll hear clicks and pops in the sound where the record has deteriorated. On the edit screen, you can see the clicks and pops, as they are louder than the music around them. Now ZOOM IN on a single click or pop, and cut it out of the music. The two ends of the song will seal together automatically, leaving just music, no clicks or pops.

Finally, you may PLAY the entire recorded sound, or just a selected



The complete Hippo Sound Digitizer kit.

piece of it. To select a section of sound, point the cursor at the left edge of the sound you wish to select, then click-drag the mouse to the right. The selected section of sound will be highlighted.

Above the PLAY button is DIGITIZE, which starts the HSD sampling the input sound and stores it in memory. Last is the SET TIME button, which allows you to determine how long the digitization lasts.

## O-SCOPE

Click on O-SCOPE, and the screen becomes a digital oscilloscope displaying the incoming sound as a waveform on your TV screen. This screen is used for setting the level of the incoming sound for use with the digitizer.

## RACK

RACK is a screen containing controls for inserting echo or reverb information into a previously digitized and stored sound, or for adding reverb or echo to the sound currently being digitized.

## STORAGE CAPACITY

Just how much sound can be stored at one time? Basically, it depends on how fast you sample the sound when you digitize it. There are rules in digital sound recording which state that in order to *properly* digitize the incoming sound, you must take *twice* as many samples (per second) as the highest expected incoming frequency. The HSD will sample sound up to 200 kilohertz (Khz) and signals up to five volts.

This, for example, means that to record a high-fidelity sound whose highest note is around 20 Khz, we must take 40 thousand samples per second. For voice, where the highest note is more like 5 Khz, a sampling rate of 10 Khz should work fine.

Each "sample" of sound is stored in one byte of memory. This means 20 thousand samples would take up 20 thousand bytes of memory. In an Atari ST with one megabyte of memory, there are roughly 800,000 bytes free for sound storage.

So, with a little math we can see that high-fidelity music sampled at 40

Khz should give us (800,000 / 40,000) 20 seconds of recording capability. A slower sampling rate, for instance, gives a correspondingly longer recording time. For example, voice sampled at 10 Khz should result in (800,000 / 10,000) 80 seconds, or nearly a full minute and a half, of digitized, editable sound.

Now this may be a case of not seeing the Emperor's new clothes, but I can tell very little difference (if at all) between music sampled at 40 Khz and music sampled at 20 Khz. If you can't tell the difference either, then you've just found a way to double your recording time.

## NITPICKING

Overall, the product is solid and usable. . . to an extent. For me, I was disappointed to find there was no *apparent* easy way to include my digitized sounds into my own programs. Like in Jez Sans' StarGlider, I'd like my panel to say "Systems alert!" instead of beeping at me. (With that English accent, of course. Who is she?) On the other hand, Hippo does reveal the file structure of the sound files created and they do include programming examples of how to capture digitized sound and how to drive the digitizer with your own sound data.

But. . . If I were running a radio or TV station, or worked in a recording studio, this one package would allow me to compose and edit complete commercials without ever putting sound on tape. I could cut, paste, and distort any sound I could hear, and even some I couldn't. I would want this package greatly, even to the point of buying an ST just to drive it.

Think of this. . . a complete package of HSD and the Atari 1040ST costs less than one-tenth the cost of a studio digital tape recorder. And the digital tape recorder won't play Time Bandits or Flight Simulator II. . .

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# ST New Products

By GREGG PEARLMAN, ANTIC JUNIOR EDITOR

## ANIMATOR ST

**Animator ST** from Aegis uses a concept called "tweening" to control the movement of objects during an animation, breaking it up into manageable units. You can create objects within the program and, for instance, change a pyramid into a star by dragging the points of the pyramid to the proper positions. When that tween is replayed, Animator ST creates all the in-between positions of the shape. The program also features color-cycling, in which repetitive movements can be animated, and cels created in NEOchrome can be page-flipped.

\$79.95. Aegis Development, 2210 Wilshire Blvd., Suite 277, Santa Monica, CA 90403. (213) 392-6445. PRESS.

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## THUNDER! FOR HEARING-IMPAIRED

Batteries Included's **Thunder!** now lets people with impaired hearing use the program's real-time spelling checker. Instead of beeping, the new version of Thunder! alerts you by blinking the screen. Now you can see when a spelling error has been detected. This special version is available free with the return of the original disk.

Batteries Included, 30 Mural Street, Richmond Hill, Ontario L4B 1B5, Canada. (416) 881-9941. PRESS.

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## NEC CP6 AND CP7

The 24-pin NEC **CP6** (80 columns, \$860) and **CP7** (136 columns, \$1,160) Color Pin-writers give you eight colors and 360×360 dots-per-inch resolution for graphics, and high speed (180 cps in draft mode) and letter quality for text. These quiet printers are compatible with the Epson LQ Series and JX80. COMDEX saw the announcement of option kits including buffer expansion and extra font capability for the CP6 and CP7. NEC's new P9XL (\$1795) prints text at 400 cps in draft mode.

NEC Information Systems Inc., 1414 Massachusetts Avenue, Boxborough, MA 01719. (617) 264-8000. PRESS.

CIRCLE 237 ON READER SERVICE CARD

## DR. T'S MUSIC SOFTWARE

The **Keyboard Controlled Sequencer** (KCS, \$195) operates in track mode, a 48-track computerized tape recorder; song mode, for convenient chaining of se-

quences into songs; and open mode, for flexible structuring. Memory capacity is 16 songs, 126 sequences and about 50,000 notes on the 520ST (130,000 on the 1040ST). Beginners might fancy the **MIDI Recording Studio** (\$39), a bare-bones version of the KCS track mode providing six-track recording. **The Copyist** (\$195) is a publication-quality score editing and printing program loadable from the KCS and having access to its data and play functions.

Dr. T's Music Software, 66 Louise Road, Chestnut Hill, MA (617) 244-6954. PRESS.

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## FLEET STREET EDITOR

This desktop publishing package (about \$150 in English pounds) has a complete disk of library graphics and is ideal for newsletters, sales bulletins, restaurant menus and circulars. The two Fleet Street Publisher packages for the ST let you produce multi-page documents with editable page layouts and more, in addition to those features offered at the Editor level. Features include kerning (changing the spacing between characters to make words more attractive), picture sizing, cropping and output to dot-matrix or laser printers.

Mirrorsoft, Maxwell House, 74 Worship Street, London EC2A 2EN. 01-377 4645. PRESS.

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Mouse- and menu-driven **TypeSetter Elite** has 23 built-in fonts and the ability to load custom fonts. Underline and outline text, change intensity, copy and move text, grab entire screens and print a full page, screen dump, free form, index cards, labels or Rolodex cards. TypeSetter Elite supports both color and monochrome systems with equal resolution, and you can preview your output before printing. A text formatter is provided to move ASCII files into the program.

\$49.95. XLEnt Software, P.O. Box 5228, Springfield, VA 22150. (703) 569-8881. PRESS.

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*A correction for those who have tried to call Mountain Magic Software about the programs under Wizard Wares (ST New Products, Antic, January, 1987): The actual phone number is (704) 264-3021.*

## LASERIMAGE 2000

The **LaserImage 2000** also gives you near-typeset quality, and a pop-in cartridge lets it emulate an HP LaserJet+. A second cartridge slot lets you change fonts instantly. The LaserImage 2000 prints full-page, 300×300 dpi graphics at eight pages per minute. Both serial and parallel interfaces are included.

\$3,495. Personal Computer Products Inc., 11590 W. Bernardo Court, San Diego, CA 92127. (619) 485-8411. PRESS.

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## LDW BASIC COMPILER, VERSION 1.1

Along with improved packaging and an updated manual, the **LDW BASIC Compiler** now has faster screen output, an enhanced GEM environment, multiline statements and improved runtime error-handling. Arithmetic functions are four times faster and compilation is up to 70% faster than version 1.0.

\$69.95 (\$25 for registered users of version 1.0). Logical Design Works Inc., 780 Montague Expressway, Suite 205, San Jose, CA 95131. (408) 435-1445. PRESS.

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## AES/VDI/LINE A WITH MARK WILLIAMS C

**Mark Williams C** now has AES/VDI/Line A documentation—the manual uses dozens of examples to explain how to use GEM while retaining the quality of the original manual. Line A deals with the system graphics procedures used by GEM.

Mark Williams Company, 1430 W. Wrightwood Avenue, Chicago, IL 60614. (312) 472-6659. FINAL.

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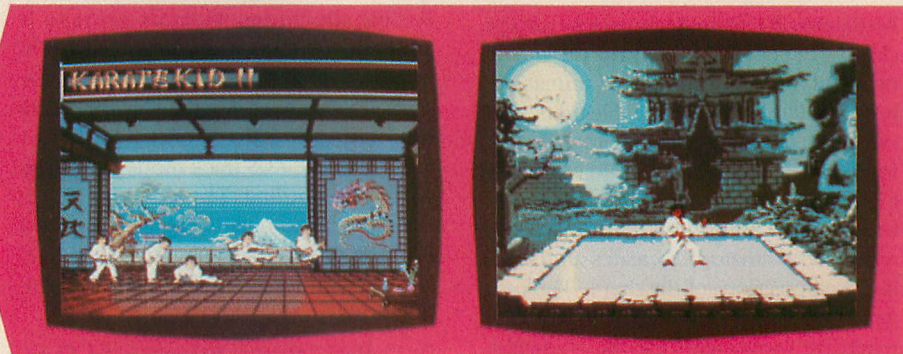
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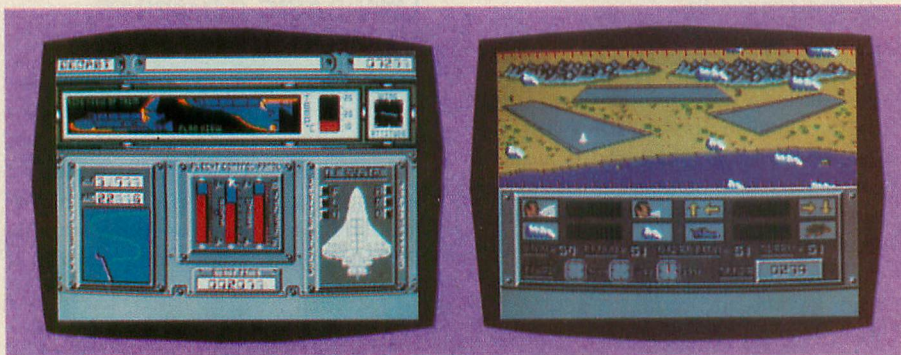


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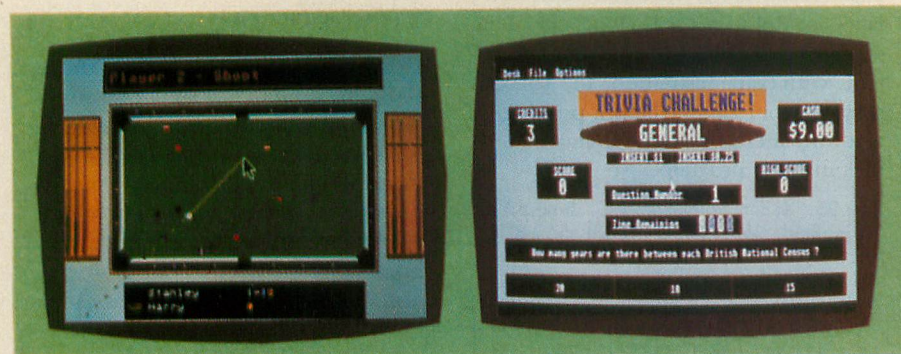
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TYPING SPECIAL ATARI CHARACTERS .....84

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**DISK SUBSCRIBERS:** Programs for 8-bit Atari computers can be used immediately. Just follow instructions in the accompanying magazine articles. ST Owners: See monthly disk's ST Help File for instructions on how to transfer programs to 3-1/2 inch disk.

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Antic program listings are typeset on the Star's SB-10 printer—from Star Micronics, Inc., 200 Park Avenue, New York, NY 10166.

# TYPING SPECIAL ATARI CHARACTERS

**Antic** printed program listings leave a small space between each Atari Special Character for easier reading. Immediately below you will see the way **Antic** prints all the standard Atari letters and numbers, in upper and lower case, in normal and inverse video.

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abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789          0123456789
  
```

The Atari Special Characters and the keys you must type in order to get them are shown in the two boxes below.

NORMAL VIDEO				INVERSE VIDEO			
FOR THIS	TYPE THIS	FOR THIS	TYPE THIS	FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
CTRL ,		CTRL S		CTRL ,		CTRL X	
CTRL A		CTRL T		CTRL A		CTRL Y	
CTRL B		CTRL U		CTRL B		CTRL Z	
CTRL C		CTRL V		CTRL C		ESC	
CTRL D		CTRL W		CTRL D		SHIFT	
CTRL E		CTRL X		CTRL E		CLEAR	
CTRL F		CTRL Y		CTRL F		ESC	
CTRL G		CTRL Z		CTRL G		SHIFT	
CTRL H		ESC ESC		CTRL H		INSERT	
CTRL I		ESC CTRL -		CTRL I		ESC	
CTRL J		ESC CTRL =		CTRL J		CTRL	
CTRL K		ESC CTRL		CTRL K		TAB	
CTRL L		ESC CTRL *		CTRL L		ESC	
CTRL M		CTRL .		CTRL M		SHIFT	
CTRL N		CTRL ;		CTRL N		TAB	
CTRL O		CTRL =		CTRL O		CTRL .	
CTRL P		ESC SHIFT		CTRL P		CTRL ;	
CTRL Q		CLEAR		CTRL Q		SHIFT -	
CTRL R		ESC DELETE		CTRL R		ESC CTRL 2	
		ESC TAB		CTRL S		ESC	
				CTRL T		CTRL	
				CTRL U		DELETE	
				CTRL V		ESC	
				CTRL W		CTRL	
						INSERT	

Whenever the CONTROL key (CTRL on the 400/800) or SHIFT key is used, *hold it down* while you press the next key. Whenever the ESC key is pressed, *release* it before you type the next key.

Turn on inverse video by pressing the Reverse Video Mode Key . Turn it off by pressing it a second time. (On the 400/800, use the Atari Logo Key instead.)

Among the most common program typing mistakes are switching certain capital letters with their lower-case counterparts—you need to look especially carefully at P, X, O and 0 (zero).

Some of Atari Special Characters are not easy to tell apart from standard alpha-numeric characters. Usually the Special Characters will be boxed. Compare the two sets of characters below:

SPECIAL		STANDARD	
	CTRL F		/
	CTRL G		SHIFT +
	CTRL N		SHIFT -
	CTRL R		-
	CTRL S		+

# HOW TO USE TYPO ST

TYPO ST is the automatic proofreading program for checking **Antic's** ST BASIC type-in listings. It finds any program line where you made a typing mistake.

Type in TYPO ST and SAVE a copy to disk before you RUN it. Now type RUN in the command window and press the [RETURN] key, or click on RUN from the RUN menu.

TYPO ST first asks for the name of the file to check. Type the desired filename and press [RETURN]. (TYPO ST will proofread itself if you type TYPOST.BAS as the filename.) Next, TYPO ST asks where you want the TYPO table printed. Type [S] [RETURN] for Screen, or [P] [RETURN] for Printer.

TYPO ST now reads your ST BASIC program and prints out a table of four-number codes—and the line number for each code. Compare your printed TYPO ST table with the **Antic** TYPO ST table published at the end of the program you are checking. If any of your four-number codes don't match the magazine's codes, you have made a typing mistake somewhere in that line. Carefully recheck your line against the published version.

**Antic** uses a word processor to format ST BASIC listings for publication, so we can indent lines and make the program structure more understandable. ST BASIC doesn't allow indentation and will strip off any spaces between the line number and the first BASIC instruction. Therefore, TYPO ST ignores space characters and does not care how far instructions are spaced apart.

TYPO ST cannot determine if two different characters have been switched within a line. For example, PRINT and PRNIT will look the same to TYPO ST. However, ST BASIC itself catches this error and points it out to you.

```

1000 ' TYPO/ST, (c) 1986 Antic Publishing, by Bill Marquardt
1010 DISK=1: OUTPUT=2: TRUE=(-1): FALSE=0: CHECKSUMMING=TRUE
1020 TV=FALSE: PRINTER=FALSE
1030 print "File to Check:": input FILENAME$: print "Output on:"
1040 print "(S)creen or ": print "(P)rinter ": input DEVICES$
1050 if( DEVICES="P" )or( DEVICES="P" )then PRINTER=TRUE else TV=TRUE
1060 if TV then print "Checksum for file: ": print FILENAME$: print
1070 if PRINTER then lprint "Checksum for file: ";FILENAME$: lprint
1080 open "I", #DISK, FILENAME$
1090 while CHECKSUMMING
1100     LINENUMBER=0: CHECKSUM=0: gosub GETALINE
1110     DECIMAL=CHECKSUM: gosub DECTOHEX
1120     OUTPUT$=str$( LINENUMBER )+" :"+HI$+LO$
1130     if PRINTER then lprint OUTPUT$ else print OUTPUT$
1140     wend
1150 close DISK
1160 end
1170 GETALINE:
1180 BLINES$="": on error goto 1150
1190 GOTALINE=FALSE
1200 while not GOTALINE
1210     line input#DISK, BLINES$: if len( BLINES$ )>1 then GOTALINE=TRUE
1220 wend
1230 LINENUMBER=val( BLINES$ )
1240 for CHAR=1 to len( BLINES$ )
1250     OK=TRUE: CHARACTER$=mid$( BLINES$, CHAR, 1 )
1260     if CHARACTER$=" " then OK=FALSE
1270     if OK then CHECKSUM=CHECKSUM+asc( CHARACTER$+chr$( 0 ))
1280 next CHAR
1290 return
1300 DECTOHEX:
1310 DECIMAL=abs( DECIMAL )
1320 HI=int( DECIMAL/256 ): LO=( DECIMAL-( HI*256 ))
1330 HH=int( HI/16 ): HL=( HI-( HH*16 ))
1340 LH=int( LO/16 ): LL=( LO-( LH*16 ))
1350 HI$=chr$( 48+HH-( 7*( HH>9 )))+chr$( 48+HL-( 7*( HL>9 )))
1360 LO$=chr$( 48+LH-( 7*( LH>9 )))+chr$( 48+LL-( 7*( LL>9 )))
1370 return

```

1000 :110B	1060 :13E7	1120 :0A48	1180 :089A	1240 :079B	1300 :0352	1360 :0C29
1010 :0EA2	1070 :140E	1130 :1000	1190 :04C6	1250 :0AEB	1310 :0667	1370 :036B
1020 :071B	1080 :0713	1140 :0274	1200 :0680	1260 :08BB	1320 :0B13	
1030 :12D2	1090 :0661	1150 :0408	1210 :11B9	1270 :0F36	1330 :07E3	
1040 :10E6	1100 :0BBD	1160 :01FF	1220 :0273	1280 :03A8	1340 :0804	
1050 :11A2	1110 :09F0	1170 :034C	1230 :0716	1290 :036C	1350 :0C0E	

# HOW TO USE TYPO II (8-BIT)

TYPO II automatically proofreads **Antic's** type-in BASIC listings for 8-bit Atari computers. It finds the exact line where you made a program typing mistake.

Type in TYPO II and SAVE a copy to disk or cassette. Now type GOTO 32000. When you see the instruction on the screen, type in a single program line **without the two-letter TYPO II code** at the left of the line number. Press the [RETURN] key.

Your line will reappear at the bottom of the screen with a two-letter TYPO II code on the left. If this code is not exactly the same as the line code printed in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [\*] followed (without in-between spaces) by the line number, then press [RETURN]. When the complete line appears at the top of the screen, press [RETURN] again. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 [RETURN] (Cassette owners LIST "C:"). Type NEW, then ENTER "D:FILENAME"[RETURN](Cassette—ENTER "C:"). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.



Don't type the  
TYPO II Codes!

```
WB 32000 REM TYPO II BY ANDY BARTON
UM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
H5 32020 CLR :DIM LINE$(120):CLOSE #2:CLO
SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "K":POSITION 11,1:? "TYPE II CODES"

EM 32050 TRAP 32040:POSITION 2,3:? "Type
in a program line"
H5 32060 POSITION 1,4:? " ":INPUT #2:LINE
$:IF LINE$="" THEN POSITION 2,4:LIST B
:GOTO 32060
XH 32070 IF LINE$(1,1)="*" THEN B=VAL(LIN
E$(2,LEN(LINE$)):POSITION 2,4:LIST B:
GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$:POSITION 1,3:? " ";
```

```
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
ET 32120 ? "K":POSITION 11,1:? "TYPE II CODES"
":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3:LINE$:IF
LINE$="" THEN ? "LINE ";B;" DELETED":G
OTO 32050
UV 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
ANS+C*ASC(LINE$(D,D)):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$
(LCODE)
UG 32220 POSITION 2,13:? "If CODE does no
t match press [RETURN] and edit line a
bove.":GOTO 32050
```

27 files at your fingertips

## MULTI-AUTORUN

Article on page 47

### LISTING 1


Don't type the  
TYPO II Codes!

```
JM 10 REM MULTI-AUTORUNS WITH ATARI DOS
RI 20 REM BY BILL BODENSTEIN
HA 30 REM (c) 1987, ANTIC PUBLISHING
RU 40 DIM A$(1)
GN 50 IF PEEK(5498)=76 AND PEEK(5496)=166
THEN 70
GV 60 ? "Please boot an Atari DOS 2.0 or
2.5":? "disk before running this progr
am.":GOTO 430
CX 70 GRAPHICS 0:POKE 712,66
QE 80 ? :? " This program permanently m
odifies your DOS.SYS file, ";
YJ 85 ? "permitting you to run several A
UTORUN.SYS files at boot-time."
XK 86 ? :? :? "Continue Y (Y/N)";
:INPUT A$:POKE 712,0
VZ 88 IF A$<>"Y" THEN ? :? "Aborted!":GOT
O 430
EE 90 ? :? "Make sure your DOS disk is in
drive 1.":? "Press [RETURN]":INPUT #1
6,A$:? "
HW 100 SASALO=PEEK(1804):SASAH1=PEEK(1805
):CLSELO=PEEK(5499):CLSEHI=PEEK(5500)
JS 110 SASA=SASALO+SASAH1*256:L0MEM=PEEK(
743)+PEEK(744)*256
MU 150 ? "Modifying DOS..."
CF 160 RESTORE :TRAP 300
XU 170 READ N
CC 180 SASA=SASA+1:L0MEM=L0MEM+1
ZJ 190 IF N<0 THEN POKE SASA-1,CLSELO:REA
D N:IF N<0 THEN N=CLSEHI:GOTO 180
WM 200 IF N>512 THEN N=SASAH1+N-512
PU 210 IF N>256 THEN N=SASALO+N-256
TC 220 POKE SASA-1,N:GOTO 170
UJ 300 POKE 5499,SASALO:POKE 5500,SASAH1
XD 310 SASAH1=INT(SASA/256):SASALO=SASA-S
ASAH1*256
SW 320 POKE 1804,SASALO:POKE 1805,SASAH1
KH 330 POKE 744,INT(L0MEM/256):POKE 743,L
0MEM-PEEK(744)*256:TRAP 40000
ZH 400 ? "Writing modified DOS..."
ZL 410 CLOSE #1:OPEN #1,8,0,"D1:DOS.SYS":
CLOSE #1
HW 420 ? "DOS modified!":
NZ 430 END
EG 500 DATA 152,72,32,-1,-1,104,16,4,201,
136,208,16
OL 510 DATA 238,302,512,169,292,141,84,3,
169,512,141,85,3,76,114,21
KU 520 DATA 169,48,141,302,512,76,-1,-1
UN 530 DATA 68,49,58,65,85,84,79,82,85,78
,48,46,83,89,83,155
```

## WORD SEARCHER

Article on page 23

## LISTING 1

Don't type the  
TYPO !! Codes! 

```

SP 2 REM WORD FINDER
ZF 4 REM BY KEVIN PECK
GI 6 REM (c) 1987, ANTIC PUBLISHING
JZ 8 BRK=1:IF PEEK(53279)=5 THEN BRK=0
OH 10 GRAPHICS 0:POKE 710,96:DIM WORD$(25
),GRID$(576),L$(14),CL$(14),BYTE(8)
VA 20 TRAP 25:READ WIDTH:RESTORE :GOSUB 1
510:GOTO 30:REM DO INITIALIZATION
UT 25 ? :? :? :? :? " I can't find any
puzzle data!":? :? :? :END
RI 30 GOTO 270:REM LOOK FOR 1ST. LETTER
DO 40 REM FIND REST OF WORD
HN 80 IF X+(DX*L)<0 OR X+(DX*L)>WIDTH+1 T
HEN 235
KG 90 IF Y+(DY*L)<0 OR Y+(DY*L)>HEIGHT+1
THEN 235
IM 100 EX=SX+DX:EY=SY+DY:P=2:GX=X+DX:GY=Y
+DY
NA 105 EX1=EX:EY1=EY
FP 110 LOCATE EX,EY,Z:Z=Z+128:COLOR Z:PLO
T EX,EY
AJ 120 IF WORD$(P,P)<>GRID$(GY-1)*WIDTH+
GX,(GY-1)*WIDTH+GX THEN 210
QT 130 P=P+1:IF P>L THEN POP :GOTO 1370
AB 140 EX=EX+DX:EY=EY+DY:GX=GX+DX:GY=GY+D
Y:GOTO 110
QW 150 REM
DO 160 POSITION 17,7:? "WORDSEARCHER":GOTO
235
HK 210 LOCATE EX,EY,Z:Z=Z-128:COLOR Z:PLO
T EX,EY
XC 220 P=P-1:IF P=1 THEN 235
UG 230 EX=EX-DX:EY=EY-DY:GOTO 210
ZT 235 RETURN
AI 240 REM -----
FY 270 I=1
YQ 280 READ WORD$:L=LEN(WORD$)
EP 290 IF L<13 THEN POSITION 26+INT((12-L
)/2),10:? WORD$:GOTO 320
JF 300 POSITION 26,10:? WORD$(1,12):POSIT
ION 26,11:IF L<25 THEN ? WORD$(13,L):G
OTO 320
EE 310 ? WORD$(13,24)
DH 320 IF L<=WIDTH OR L<=HEIGHT THEN 490
HB 330 POSITION 26,14:? "This word is"
OJ 340 POSITION 26,15:? " too LONG"
GX 350 POSITION 26,16:? "for puzzle!!"
PI 360 GOTO 820
RC 370 REM
XQ 420 POKE 106,PEEK(740):POKE 53277,0:PO
KE 559,34:FOR I=0 TO 2:POKE 53248+I,0:
NEXT I:GRAPHICS 0:END
QV 430 REM
JG 490 Y=1
WC 495 SY=Y+STARTROW-1
IK 500 X=1
FB 505 SX=X+STARTCOL-1
OB 510 LOCATE SX,SY,Z:Z=Z+128:COLOR Z:PLO
T SX,SY
JI 520 IF WORD$(1,1)<>GRID$(GY-1)*WIDTH+X
,(GY-1)*WIDTH+X THEN 700
QW 530 REM
AC 590 DX=-1:POKE 77,0:IF BRK THEN POKE 1
6,112:POKE 53774,112
UI 595 DY=-1
ST 600 IF DX=0 AND DY=0 THEN 620
VS 610 GOSUB 80
KG 620 IF DY<1 THEN DY=DY+1:GOTO 600
ZD 625 IF DX<1 THEN DX=DX+1:GOTO 595
GU 630 FOUND=1
PV 700 LOCATE SX,SY,Z:Z=Z-128:COLOR Z:PLO
T SX,SY
ST 710 IF X<WIDTH THEN X=X+1:GOTO 505
ML 711 IF Y<HEIGHT THEN Y=Y+1:GOTO 495

```

```

GI 720 FOUND=0
HX 790 POSITION 27,14:? "Word could"
FU 800 POSITION 26,15:? "NOT be found"
GZ 810 POSITION 27,16:? "in puzzle!"
PW 820 POKE 710,48:POKE 712,48:GOSUB 1050
WY 830 MISS=MISS+1
ER 840 POSITION 35,5:IF MISS<10 THEN POSI
TION 36,5
KB 850 ? MISS
XH 860 IF CFLAG=3 THEN 420
VI 870 IF I<COUNT THEN I=I+1:GOTO 280
RJ 880 REM
OR 930 POSITION 26,10:? CL$:POSITION 26,1
1:? CL$:POKE 710,0:POKE 712,0
KW 940 POSITION 28,15:? "FINISHED":FLASH=
0:GOSUB 1060
DT 950 IF CFLAG=6 THEN 930
OA 960 GOTO 420
RI 970 REM
WV 1050 POSITION 27,19:? "START##Cont"
YY 1060 POSITION 27,21:? "OPTION##End":SF
LG=0
GD 1070 NY=EY1-DY:NX=EX1-DX
IS 1072 IF (FOUND) THEN LOCATE NX,NY,Z:CO
LOR (Z+FLASH):PLOT NX,NY
WS 1073 STMP=PEEK(53279):IF STMP<7 THEN 5
FLG=STMP
GY 1074 IF NX<>EX OR NY<>EY THEN NY=NY+DY
:NX=NX+DX:GOTO 1072
HO 1075 IF (SFLG=0 OR Z>128) THEN 1070
MX 1080 CFLAG=3:IF SFLG=6 THEN CFLAG=6
IX 1090 REM
JU 1130 POSITION 26,10:? CL$:POSITION 26,
11:? CL$:POKE 710,96:POKE 712,96
NE 1140 POSITION 26,14:? CL$:POSITION 26,
15:? CL$:POSITION 26,16:? CL$
GH 1150 POSITION 26,19:? CL$:POSITION 26,
21:? CL$:SFLG=0:RETURN
IQ 1160 REM
UJ 1210 IF PEEK(195)<>6 THEN 1270
EZ 1220 POSITION 26,14:? "Unexpectedly"
CA 1230 POSITION 26,15:? "out of words"
QK 1240 POSITION 28,16:? "in DATA!":POKE
710,48:POKE 712,48
TA 1250 GOSUB 1060:IF CFLAG=6 THEN 1220
PT 1260 GOTO 420
LL 1270 POSITION 27,14:? "Unexpected"
VS 1280 POSITION 26,15:? "ERROR # ":PEEK(
195):POKE 710,48:POKE 712,48
NM 1290 POSITION 26,16:? "in LINE ":PEEK(
186)+256*PEEK(187)
ZG 1300 GOSUB 1060:IF CFLAG=6 THEN 1270
PG 1310 GOTO 420
II 1320 REM
QW 1370 POSITION 27,14:? "Word FOUND"
EC 1380 POSITION 26,15:? "at indicated"
FT 1390 POSITION 28,16:? "location"
ZW 1400 POKE 710,192:POKE 712,192
JM 1410 FND=FND+1
SA 1420 POSITION 35,4:IF FND<10 THEN POSI
TION 36,4
TE 1430 ? FND
CE 1440 GOSUB 1050:IF CFLAG=3 THEN 420
KB 1450 GOSUB 210:GOTO 870
IW 1460 REM
HD 1510 POKE 752,1:GOSUB 160:TRAP 1520:RE
AD WIDTH,HEIGHT:GOTO 1570
CX 1520 POSITION 2,10
YM 1530 IF PEEK(195)<>8 THEN 1560
UJ 1540 ? "First DATA statement must cont
ain WIDTH and HEIGHT of grid. One

```

continued on next page

```

or"
QA 1550 ? "both of these numbers are miss
ing!":END
BF 1560 ? "ERROR #";PEEK(195);" in LINE "
;PEEK(186)+256*PEEK(187):END
GI 1570 IF WIDTH>24 OR WIDTH<0 THEN POSIT
ION 2,10:? "Improper WIDTH value in DA
TA!":END
SI 1580 IF HEIGHT>24 OR HEIGHT<0 THEN POS
ITION 2,10:? "Improper HEIGHT value in
DATA!":END
BL 1590 LINE=0:FOR I=1 TO WIDTH*HEIGHT ST
EP WIDTH:LINE=LINE+1
BM 1600 READ WORD$:L=LEN(WORD$):IF L=WIDT
H THEN 1640
QZ 1610 POSITION 2,10:? "Width of GRID DA
TA element #";LINE
EW 1620 IF L<WIDTH THEN ? "is too short!":
END
UH 1630 ? "is too long!":END
DW 1640 GRID$(I,I+WIDTH-1)=WORD$:NEXT I
SU 1650 TRAP 1660:READ COUNT:GOTO 1750
QZ 1660 POSITION 2,10:? "DATA statement f
ollowing GRID DATA!":? "statements does
not contain the"
XT 1670 ? "number of WORDS to search for.
Please check number of GRID DATA and"

GY 1680 ? "check for possible missing WOR
D COUNT DATA statement.":END
JJ 1690 REM
ZE 1750 H=PEEK(106)-8:POKE 106,H:GRAPHICS
0:POKE 752,1:POKE 710,96:GOSUB 160:PO
SITION 14,10:? "FINDER"
KK 1755 GOSUB 160:POSITION 14,10:? "FINDE
R":POSITION 12,13:? "BY KEVIN":POSITIO
N 16,12:? "P####C####"
ME 1760 BYTE(0)=0:BYTE(1)=128:BYTE(2)=192
:BYTE(3)=224:BYTE(4)=240:BYTE(5)=248:B
YTE(6)=252:BYTE(7)=254:BYTE(8)=255
TM 1770 STARTCOL=INT((24-WIDTH)/2+0.5):FL
ASH=128
EC 1780 STARTROW=INT((24-HEIGHT)/2+0.5)
LD 1790 P0=WIDTH:IF P0>8 THEN P0=8
MX 1800 P1=WIDTH-8:IF P1>8 THEN P1=8
XL 1810 IF P1<0 THEN P1=0
ZC 1820 P2=WIDTH-16:IF P2<0 THEN P2=0
ID 1830 POKE 54279,H:POKE 559,46:POKE 532
77,3
SA 1840 POKE 53256,3:POKE 53257,3:POKE 53
258,3
ID 1850 POKE 704,145:POKE 705,145:POKE 70
6,145:POKE 712,96
XM 1860 PMB=H*256+512:POKE 623,1
GM 1870 FOR I=PMB TO PMB+15+(STARTROW*4):
POKE I,0:POKE I+128,0:POKE I+256,0:NEX
T I
CV 1880 FOR X=1 TO I+(HEIGHT*4)-1:POKE X,
BYTE(P0):POKE X+128,BYTE(P1):POKE X+25
6,BYTE(P2):NEXT X
EJ 1890 FOR I=X TO PMB+127:POKE I,0:POKE
I+128,0:POKE I+256,0:NEXT I
KH 1900 X=48+(STARTCOL*4)
BW 1910 POKE 53248,X:POKE 53249,X+32:POKE
53250,X+64
IU 1920 REM
JC 1970 ? "M":POKE 82,STARTCOL:POSITION S
TARTCOL,STARTROW
IL 1980 LINE=1:FOR I=1 TO LEN(GRID$) STEP
WIDTH
UN 1990 ? GRID$(I,I+WIDTH-1);:IF LINE<24
THEN ?
XT 2000 LINE=LINE+1:NEXT I
IA 2010 REM
RO 2060 POSITION 25,0:POKE 82,25
CF 2070 L$="0"
NE 2080 CL$="00000000000000000000"
WQ 2090 ? "00000000000000000000"
GF 2100 ? "0 COMPUTER 0"
PO 2110 ? "0 WORD FIND 0":? CL$
EK 2120 ? "0 # FOUND 0 0"
IW 2130 ? "0 # MISS 0 0":? CL$
RS 2140 ? "0SEARCH WORD0"
PJ 2150 ? CL$:? L$:? L$:? L$:? L$:? CL$
JQ 2160 ? L$:? L$:? L$:? CL$:? L$:? L$
NU 2170 ? L$:? L$:? L$
AM 2180 ? "00000000000000000000";
RJ 2190 POKE 82,2:FND=0:MISS=0:TRAP 1210
IR 2200 CL$="":REM 12 SPACES
AH 2210 RETURN

```

## LISTING 2

```

SP 2 REM WORD FINDER
ZF 4 REM BY KEVIN PECK
GI 6 REM (c) 1987, ANTIC PUBLISHING
FH 2220 DATA 8,10
RC 2230 DATA AKNFEAKC
JC 2240 DATA DDRKRDVA
XA 2250 DATA NOWIECST
VJ 2260 DATA GQGD5MNT
PS 2270 DATA EUZKAASL
BX 2280 DATA DFSMHCLC
ND 2290 DATA TNAPPBOH
MV 2300 DATA MIETDKWE
PU 2310 DATA NLLUBDMR
VQ 2320 DATA EWJUOZDD
LZ 2330 DATA 6
EL 2340 DATA FROG
JX 2350 DATA ELEPHANT
ML 2360 DATA CATTLEHERD
MI 2370 DATA DOG
QG 2380 DATA PHASER
FX 2390 DATA BULL

```

## LISTING 3

```


SP 2 REM WORD FINDER
ZF 4 REM BY KEVIN PECK
GI 6 REM (c) 1987, ANTIC PUBLISHING
JA 2220 DATA 24,24
FP 2230 DATA PKAENGNIITSILMARGORPPAIED
BH 2240 DATA WEQBGAOWCSIFALDECMDDDN5C
BP 2250 DATA DDJACKTRAMIELEORRUVKCCAM
FG 2260 DATA NIODZKIKCVDLNCPNEGASIZNN
CQ 2270 DATA B5SMRSMNEIEFXOMATARHLALA
FU 2280 DATA WKNPAIDTSDNDNYRXENMPTLCEO
JW 2290 DATA ADDOPWKKVHEIJISIAZGAOXK
WI 2300 DATA ERAWMEEMRAPMDZJDRWAEBJCN
DX 2310 DATA KIJXNTNSICHUMNAGPQHKKPAD
DV 2320 DATA DVOTTKXFWHOGBENGNCISAUSZ
WN 2330 DATA NEYEXYTRIHTENONHASTPRC50
RK 2340 DATA ASSACPNVGUKOIPGSOMOYTLEN
MN 2350 DATA TNTHWGMWIPTSNHAZSCOAUTD
LR 2360 DATA SOIEEACVNUWOSTSDENIDSTA
MC 2370 DATA RKCQMOMNULZYAMPECNRMTEEX
CG 2380 DATA OSKKXKLAOCUTIRISRTSDLNID
ZE 2390 DATA TISAPCZSTEHNASJPYFABWKAM
XS 2400 DATA IEWTSBEKSADTXAIGPNANUABI
SS 2410 DATA NCOLORINDIRECTIONTOCQUPF
AQ 2420 DATA OXNYHWBYZTSHFNXHCQENF5
XR 2430 DATA MZXGMTMRCABMOUICKBNULOMB
PQ 2440 DATA SUI5LCEYONDZSCUJLWXXKJOK
BT 2450 DATA LHRCZITISKTEHOSENSYDIBMT
CY 2460 DATA RNVHDDERDNUHTHGIEWNECRCG
GZ 2470 DATA 20
SV 2480 DATA ATARI
FT 2490 DATA ONETHIRTYXE
IM 2500 DATA EIGHTHUNDRED
QU 2510 DATA DISKDRIVE
PX 2520 DATA CASSETTE
PU 2530 DATA DISKETTE
TD 2540 DATA JACKTRAMIEL
DZ 2550 DATA TOUCHTABLET
XS 2560 DATA JOYSTICK
RV 2570 DATA HIGHRESOLUTIONGRAPHICS
SA 2580 DATA COLORINDIRECTION
YS 2590 DATA PRINTER
AT 2600 DATA INTERFACE
QJ 2610 DATA ANTICMAGAZINE
ER 2620 DATA MONITORSTAND
DX 2630 DATA FIVETWENTYST
LW 2640 DATA GEM
EG 2650 DATA TRAKBALL
FU 2660 DATA CABLE
IW 2670 DATA PROGRAMLISTING

```

# DVORAK KEYBOARD

Article on page 36

## LISTING 1

 Don't type the  
 TYPO II Codes! 

```

HE 10 REM DVORAK KEYBOARD
KN 20 REM BY DAVID YEARKE
FW 30 REM (c) 1985, ANTIC PUBLISHING
CQ 40 REM (LINES 10-220 MAY BE USED WITH
    OTHER BASIC LOADERS IN THIS ISSUE.)
IS 45 REM CHANGE LINE 70 AS NECESSARY.)
MG 50 DIM FN$(20),TEMP$(20),AR$(93)
HQ 60 DPL=PEEK(10592):POKE 10592,255
QG 70 FN$="D:\DVORAK.EXE":REM THIS IS THE
    NAME OF THE DISK FILE TO BE CREATED
YS 80 GRAPHICS 0:? "    ANTIC'S GENERIC
    BASIC LOADER"
CD 90 ?,"BY CHARLES JACKSON"
PW 100 POKE 10592,DPL:TRAP 170
PO 110 ? :? :? "Creating ";FN$:? "...plea
    se stand by."
LQ 120 RESTORE :READ LN:LM=LN:DIM A$(LN):
    C=1
BK 130 AR$="":READ AR$
XW 140 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
    2,255
DG 150 LM=LM-1:POSITION 10,10:? "(Countdo
    wn...T-";INT(LM/10);") "
UY 160 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
    1:NEXT X:GOTO 130
MZ 170 IF PEEK(195)=5 THEN ? :? :? "TOO
    MANY DATA LINES!":? "CANNOT CREATE FIL
    E!":END
CZ 180 IF C<LN+1 THEN ? :? "TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
AL 200 OPEN #1,8,0,FN$
PP 210 POKE 766,1:? #1;A$;:POKE 766,0
AF 220 CLOSE #1:GRAPHICS 0:? "COMPLETED"
    "
IQ 1000 DATA 417
QC 1010 DATA 2552550000291480300320830301
    69000133012169029133013169048133010169
    029133011169083141231002169
EL 1020 DATA 0301412320021691001410080021
    69029141009002169255141081030141082030
    096169048141043002173001029
TV 1030 DATA 1330121730020291330131730980
    29133010173099029133011173079030141231
    002173080030141232002173077
YE 1040 DATA 0301410080021730780301410090
    02076083030138072173009210205242002208
    005174241002208123170201159
HN 1050 DATA 2080101732550020732551412550
    02176099201152208010173082030073255141
    082030176085201157208010173
IY 1060 DATA 0810300732551410810301760710
    41063201017208005142220002240060134124
    142242002173081030208022138
FW 1070 DATA 0410642080171381331240410631
    62004202221073030240060224000208246173
    082030208018166124138041192
AU 1080 DATA 1331241380410631701890090300
    05124133124165124141252002169003141241
    002169000133077173082030240
DY 1090 DATA 0071730810302400021690481410
    43002104170104064165124073128133124208
    215035057062003004045006007
LE 1100 DATA 0400900000610120180140150050
    17001019020022047002024025026027028029
    030031046033016021036037023
RK 1110 DATA 0390100410340560440430320380
    48049050051052053054055011058042059060
    013008063006007014015000000
MA 1120 DATA 00000000000000001650121410010
    29165013141002029165010141098029165011
    141099029173231002141079030
YQ 1130 DATA 17323200214108800301730080021
    41077030173009002141078030076003029000
    00000000000000000000000000000000
  
```

```

CH 1140 DATA 00000000000000000000000002260
    02227002084030
  
```

## LISTING 2

```

0100 ;PARTIAL DVORAK KEYBOARD
0110 ;BY DAVE YEARKE
0120 ;(c) 1986, ANTIC PUBLISHING
0130 ATRACT = $4D
0140 CH = $02FC
0150 CH1 = $02F2
0160 DOSINI = $0C
0170 DOSVEC = $0A
0180 HELPGF = $02DC ;XL/XE ONLY
0190 HOLDCH = $7C
0200 INITAD = $02E2
0210 KBCODE = $D209
0220 KEYDEF = $79
0230 KEYDEL = $02F1
0240 KRPDEL = $02D9 ;XL/XE ONLY
0250 MEMLO = $02E7
0260 SRTIMR = $022B
0270 S5FLAG = $02FF
0280 START = $1D00
0290 UKEYBD = $0208
0300 ;SYSTEM RESET TRAP
0310 *= START
0320 RSTTRAP JSR DUMMY
0330 LDA # <RSTTRAP ;RESET TRAP
0340 STA DOSINI ;ADDRESS IN DOSIN
    I
0350 LDA # >RSTTRAP ;LO BYTES
0360 STA DOSINI+1 ;HI BYTES
0370 LDA # <DOSTRAP ;TRAP DOS CALL
    STA DOSVEC
0390 LDA # >DOSTRAP
0400 STA DOSVEC+1
0410 LDA # <BOTTOM ;END OF TABLE
0420 STA MEMLO ;RESET MEMLO
0430 LDA # >BOTTOM
0440 STA MEMLO+1
0450 LDA # <HANDLER ;ADDRESS OF
0460 STA UKEYBD ;POKEY HANDLER
0470 LDA # >HANDLER ;INTO UKEYBD
0480 STA UKEYBD+1
0490 LDA #$FF
0500 STA ARFLAG
0510 STA KBFLAG
0520 RTS
0530 DOSTRAP LDA #$30
0540 STA SRTIMR ;AUTO-REPEAT ON.
0550 LDA RSTTRAP+1
0560 STA DOSINI
0570 LDA RSTTRAP+2
0580 STA DOSINI+1
0590 LDA BYEBYE+1
0600 STA DOSVEC
0610 LDA BYEBYE+2
0620 STA DOSVEC+1
0630 LDA MEMHOLD
0640 STA MEMLO
0650 LDA MEMHOLD+1
0660 STA MEMLO+1
0670 LDA KEYHOLD ;REPLACE ORIGINAL
    STA UKEYBD ;HANDLER
0680 LDA KEYHOLD+1
  
```

continued on next page

```

0700      STA VKEYBD+1
0710 BYEBYE JMP DUMMY
0720 ;POKEY INTERRUPT ROUTINE
0730 HANDLER TXA
0740 PHA
0750 LDA KBCODE
0760 CMP CH1
0770 BNE NEWKEY
0780 LDX KEYDEL
0790 BNE SETTIMES
0800 NEWKEY TAX ;KEY VALUE INTO X
.
0810 CMP #$9F ;IS IT CTL-1?
0820 BNE CTL4 ;IF NOT, BRANCH.
0830 LDA SSFLAG ;SCREEN FREEZE FL
AG.
0840 EOR $FFF
0850 STA SSFLAG
0860 BCS SETDELAY ;SET TIMERS.
0870 CTL4 CMP #$98
0880 BNE CTL5
0890 LDA KBFLAG
0900 EOR $FFF ;TOGGLE FLAG.
0910 STA KBFLAG
0920 BCS SETDELAY
0930 CTL5 CMP #$9D
0940 BNE HELP
0950 LDA ARFLAG
0960 EOR $FFF
0970 STA ARFLAG
0980 BCS SETDELAY
0990 HELP AND #$3F ;MASK HIGH BITS.
1000 CMP #$11
1010 BNE CONVERT
1020 STX HELPG
1030 BEQ SETDELAY
1040 CONVERT STX HOLDCH
1050 STX CH1
1060 ARROWS LDA ARFLAG
1070 BNE DVORAK
1080 TXA
1090 AND #$40 ;TEST SHIFT BIT.
1100 BNE DVORAK
1110 TXA
1120 STA HOLDCH
1130 AND #$3F
1140 LDX #$04
1150 ARLOOP DEX
1160 CMP ARRTAB,X ;CHECK TABLE
1170 BEQ NEWARR ;ARROW
1180 CPX #$00 ;DONE?
1190 BNE ARLOOP
1200 DVORAK LDA KBFLAG ;CHECK TYPE
1210 BNE PUTCH
1220 LDX HOLDCH
1230 TXA
1240 AND #$C0
1250 STA HOLDCH
1260 TXA
1270 AND #$3F
1280 TAX
1290 LDA TABLE,X
1300 ORA HOLDCH
1310 STA HOLDCH
1320 PUTCH LDA HOLDCH

```

```

1330      STA CH
1340 SETDELAY LDA #$03 ;DEBOUNCE
1350 STA KEYDEL
1360 LDA #$00
1370 STA ATTRACT
1380 SETTIMES LDA KBFLAG
1390 BEQ STIME
1400 LDA ARFLAG
1410 BEQ STIME
1420 LDA #$30
1430 STIME STA SRTIMR
1440 PLA
1450 TAX
1460 PLA
1470 RTI
1480 NEWARR LDA HOLDCH
1490 EOR #$80
1500 STA HOLDCH
1510 BNE PUTCH
1520 ;DVORAK OFFSET TABLE
1530 TABLE .BYTE $23,$39,$3E,$03,$04,$
2D,$06,$07
1540 .BYTE $28,$09,$00,$3D,$0C,$12
,$0E,$0F
1550 .BYTE $05,$11,$01,$13,$14,$16
,$2F,$02
1560 .BYTE $18,$19,$1A,$1B,$1C,$1D
,$1E,$1F
1570 .BYTE $2E,$21,$10,$15,$24,$25
,$17,$27
1580 .BYTE $0A,$29,$22,$38,$2C,$2B
,$20,$26
1590 .BYTE $30,$31,$32,$33,$34,$35
,$36,$37
1600 .BYTE $0B,$3A,$2A,$3B,$3C,$0D
,$08,$3F
1610 ;ARROW KEY TABLE
1620 ARRTAB .BYTE $06,$07,$0E,$0F
1630 KEYHOLD .DS 2
1640 MEMHOLD .DS 2
1650 ARFLAG .DS 1
1660 KBFLAG .DS 1
1670 DUMMY
1680 BOTTOM .DS 1
1690 ;INSTALLATION ROUTINE
1700 INIT LDA DOSINI
1710 STA RSTTRAP+1
1720 LDA DOSINI+1
1730 STA RSTTRAP+2
1740 LDA DOSVEC
1750 STA BYEBYE+1
1760 LDA DOSVEC+1
1770 STA BYEBYE+2
1780 LDA MEMLO
1790 STA MEMHOLD
1800 LDA MEMLO+1
1810 STA MEMHOLD+1
1820 LDA VKEYBD
1830 STA KEYHOLD
1840 LDA VKEYBD+1
1850 STA KEYHOLD+1
1860 JMP RSTTRAP+3
1870 *= INITAD
1880 .WORD INIT
1890 .END


```

first fruits from the practical program contest

# WAGE/HOUR PAYMASTER

Article on page 45

## LISTING 1

Don't type the  
TYPO II Codes! 

XU 10 REM WAGES AND HOURS  
ZH 20 REM BY HAL BOYER  
HJ 25 REM (c) 1987, ANTIC PUBLISHING

OI 26 REM IMPORTANT: SEE PRINTER CODES IN  
LINES 350 & 370 IF YOU DON'T OWN  
SL 27 REM AN EPSON-COMPATIBLE PRINTER!

```

PP 30 CLR :GOSUB 1040:GOTO 455
ZW 50 REM GOSUB ROUTINES
IA 70 NBRDGT=6:DECPL5=2:N=BP:GOSUB 110:BP
$=NUMBER$(1,NBRDGT):RETURN
CJ 80 NBRDGT=6:DECPL5=2:N=OTP:GOSUB 110:O
TP$=NUMBER$(1,NBRDGT):RETURN
YT 90 NBRDGT=7:DECPL5=2:N=TP:GOSUB 110:TP
$=NUMBER$(1,NBRDGT):RETURN
ZR 100 NBRDGT=8:DECPL5=2:N=YR:GOSUB 110:Y
R$=NUMBER$(1,NBRDGT):RETURN
AI 110 WORK$=STR$(N)
IB 120 NUMBER$=BLANK$
PA 130 DECPNT=LEN(WORK$)+1
BU 140 FOR J=1 TO LEN(WORK$)
XC 150 IF WORK$(J,J)="" THEN DECPNT=J:J=
NBRDGT
GN 160 NEXT J
SC 170 NBRLTH=DECPNT+DECPL5
DF 180 NUMBER$(NBRDGT-NBRLTH+1,NBRDGT)=WO
RK$
HC 190 NUMBER$(NBRDGT-DECPL5,NBRDGT-DECPL
5)="."
TZ 200 FOR J=NBRDGT-DECPL5+1 TO NBRDGT
ES 210 IF NUMBER$(J,J)="" THEN NUMBER$(J
,J)="0"
GG 220 NEXT J
ZE 230 RETURN
JY 240 POSITION 4,22:? "RETURN=CONTINUE
RETURN"
KG 245 CLOSE #1:OPEN #1,4,0,"K":GET #1,K
:CLOSE #1:IF K<>155 AND K<>27 THEN 245

DY 250 POSITION 0,22:? CHR$(156):RETURN
MG 260 L$(1,1)="":L$(6)=STR$(HRS):L$(11)
="":L$(16)="":L$(17)=BP$
GI 270 L$(28)="":L$(33)="":L$(34)=OTPS:
L$(49)="":
BU 280 L$(54)="":L$(55)=TP$:L$(67)="":L
$(70)="":L$(71)=YR$:L$(80)="":
ZQ 290 RETURN
ZU 300 L$(1,1)="":L$(2)=STR$(HRS):L$(6)=
"":L$(8)=BP$:L$(14)="":L$(16)=OTPS:L
$(22)="":
GT 310 L$(23)=TP$:L$(30)="":L$(31)=YR$:L
$(39)="":
ZD 320 RETURN
FB 330 FOR LOUD=14 TO 0 STEP -1:SOUND 0,5
0,10,LOUD:SOUND 1,60,10,LOUD:NEXT LOUD
:RETURN
UJ 340 POSITION 0,5:FOR E=1 TO 20:? "E":
NEXT E:RETURN
NZ 350 LPRINT "E":REM PRINTER CODE FOR O
NE LINE OF EXPANDED PRINT
HC 360 LPRINT " *WAGES & HOURS
*"
XE 370 LPRINT :LPRINT :LPRINT "E":REM PR
INTER CODE FOR CONDENSED PRINT
ZU 390 LPRINT "NAME: ";EMPS:LPRINT
ZN 400 LPRINT "BASE RATE= $";BASE;"

52 WKS"
SU 410 LPRINT "HRS BASE PAY
OVERTIME PAY WEEKLY PAY
YEARLY PAY"
ZE 420 RETURN
WK 440 REM MAIN PROGRAM INPUT
GO 455 GRAPHICS 0:POKE 709,0:POKE 710,8:P
OKE 712,118
SU 460 POKE 752,0:? "A":POSITION 11,1:? "
WAGES & HOURS"
UY 470 POSITION 11,2:? "=====
"
DU 480 TRAP 480:POSITION 5,4:? "Enter Bas
e Rate.":INPUT BASE
LB 490 IF BASE<=0 OR BASE>20 THEN GOSUB 3
30:POSITION 5,4:? "ENTER ONE OF
THESE" :GOTO 460
SZ 500 TRAP 500:POSITION 5,6:? "Enter Nam
e.":INPUT EMPS
TG 510 IF EMPS="" THEN 10
RC 520 IF LEN(EMPS)>12 THEN GOSUB 330:POS
ITION 5,6:? "NAME TOO LONG" :GOTO 460

```

```

PR 530 TRAP 530:POSITION 3,8:? "Send Outp
ut to Printer or Screen":INPUT R$
JC 540 TRAP 40000
UT 550 IF R$="" THEN 10
YG 560 IF R$(1,1)<>"P" AND R$(1,1)<>"S" T
HEN GOSUB 330:GOTO 530
CQ 570 IF R$="S" THEN 890
TG 590 REM PRINT ROUTINE
VX 610 POKE 752,1:POSITION 8,10:? "PRIN
TING IN PROGRESS"
NZ 620 TRAP 740
UB 630 GOSUB 350
XE 640 FOR R=1 TO 51
TY 650 IF R=24 OR R=48 THEN FOR LINEFEED=
1 TO 8:LPRINT :NEXT LINEFEED:GOSUB 350


LT 660 HRS=HRS+0.5:POKE 77,0
FJ 670 L$=BLANK$
XN 680 GOSUB 780
CQ 690 LPRINT PLINE$
LV 700 LPRINT L$
JL 710 NEXT R
AC 720 LPRINT "-----
-----"
UN 730 POKE 752,0:GOSUB 330:GOTO 10
AK 740 POSITION 12,21:? "BACK PRINTER"
:GOSUB 240:TRAP 40000:GOTO 10
VR 760 REM FORMULAS AND JUSTIFY
QN 780 BP=BASE*40:BP=INT(BP*100+0.5)/100:
GOSUB 70
JI 790 OT=HRS-40:IF OT<=0 THEN OT=0
IQ 800 OTP=OT*BASE*1.5:OTP=INT(OTP*100+0.
5)/100:GOSUB 80
EA 810 TP=BP+OTP:TP=INT(TP*100+0.5)/100:G
OSUB 90
BX 820 YR=TP*52:YR=INT(YR*100+0.5)/100:G
OSUB 100
KS 830 IF R$(1,1)="P" THEN GOSUB 260:GOTO
850
RX 840 GOSUB 300
ZO 850 RETURN
KI 870 REM SCREEN DISPLAY ROUTINE
CK 890 ROW=5:COL=0:POKE 752,1:? "R"
ET 900 POSITION 11,1:? "WAGES & HOURS"
GX 910 POSITION 2,2:? "Name.":EMPS
XD 920 POSITION 22,2:? "Base Rate.":$";
BASE
PK 930 POSITION 0,4:? "HRS BASE PAY OT
PAY WEEKLY YEARLY"
VF 940 FOR L=1 TO 51
VK 950 HRS=HRS+0.5
MP 960 L$=BLANK$(1,40):GOSUB 780
DF 970 POSITION COL,ROW:? L$:ROW=ROW+1
GG 975 IF ROW>20 THEN GOSUB 330:GOSUB 240
:IF K=27 THEN POP :GOTO 10
MA 978 IF ROW>20 THEN GOSUB 340:ROW=5
HT 980 NEXT L
BJ 990 POSITION COL,ROW:? "-----
-----"
MY 1000 GOSUB 330:GOSUB 240:POKE 752,0:GO
TO 10
YZ 1020 REM SETUP ROUTINE
DI 1040 DIM L$(80),BP$(20),OTPS(20),TP$(2
0),YR$(20),NUMBER$(80),PLINE$(80),EMPS
(20),SLINE$(40),R$(10),GO$(10)
IE 1050 DIM BLANK$(80),WORK$(20)
EY 1060 PLINE$="":PLINE$(80)="":PLINE$(
2)=PLINE$
FU 1070 PLINE$(1,1)="":PLINE$(11,11)="":
PLINE$(28,28)="":PLINE$(49,49)="":P
LINE$(67,67)="":PLINE$(80,80)="":
UK 1080 SLINE$="":SLINE$(39)="":SLINE$(
2)=SLINE$
UT 1090 SLINE$(1,1)="":SLINE$(7,7)="":S
LINE$(15,15)="":SLINE$(23,23)="":SLI
NE$(31,31)="":SLINE$(39,39)="":
CJ 1100 BLANK$="":BLANK$(80)="":BLANK$(
2)=BLANK$
TR 1110 HRS=39.5
KP 1120 POKE 82,0
AK 1130 RETURN

```

# RAINBOW SCREEN CUSTOMIZER

Article on page 27

## LISTING 1

Don't type the  
TYPO II Codes! 

```

TH 10 REM SCREEN CUSTOMIZER
WQ 20 REM BY JAMES HAGUE
GL 30 REM (c) 1986, ANTIC PUBLISHING
FI 100 GOSUB 10000:POKE 752,1
SM 105 POKE CTRL,0:POKE 709,10
LT 110 POKE 710,0:? CHR$(125)
EV 115 POSITION 11,4:? "GRAPHICS MODE ZERO"
DG 120 POSITION 11,5:? "SCREEN CUSTOMIZE R"
FG 125 POSITION 7,7:? "Programmed by James Hague"
MR 130 POSITION 15,10:? "MAIN MENU"
OO 135 POSITION 9,12:? "View/Edit Screen"
XW 140 POSITION 9,14:? "Create Subroutine"
IA 145 POSITION 9,16:? "Exit Program"

IC 150 POSITION 3,19:? "Press the number of your selection"
TD 155 GOSUB 500
BY 160 IF CHR$(A)="1" THEN GOSUB 1000:GOTO 105
EJ 165 IF CHR$(A)="2" THEN GOSUB 2000:GOTO 105
LK 170 IF CHR$(A)="3" THEN GRAPHICS 0:? "Your computer is":END
AN 175 FOR A=15 TO 0 STEP -1:SOUND 0,240,10,A:NEXT A:GOTO 155
OZ 499 REM RETURN KEYPRESS IN (A)
SV 500 POKE 764,255:OPEN #1,4,0,"K:"
OC 505 GET #1,A:CLOSE #1:RETURN
XI 999 REM EDIT/VIEW SCREEN
FU 1000 ? CHR$(125)
KI 1005 POSITION 7,5:? "THE FOLLOWING CONTROLS ARE"
AD 1010 POSITION 8,6:? "AVAILABLE DURING EDITING"
HH 1015 POSITION 7,9:? "select line with JOYSTICK"
DF 1020 POSITION 6,11:? "OPTION - character luminance"
MB 1025 POSITION 6,12:? "SELECT - line luminance"
YH 1030 POSITION 6,13:? "START - line color"
HD 1035 POSITION 5,15:? "press TRIGGER to stop editing"
GV 1040 POSITION 6,18:? "press any key to continue..."
DJ 1045 GOSUB 500:? CHR$(125)
FA 1050 POKE CTRL,1:LINE=11:GOSUB 3000
QC 1055 FOR A=6 TO 23:POSITION 25,A
JM 1060 IF INT(A/2)=A/2 THEN ? "ABCabc";:GOTO 1070
PN 1065 ? "ABCabc";
FZ 1070 IF A<>23 THEN PRINT
CU 1075 NEXT A
GR 1080 POSITION 2,LINE:? "->"
MY 1085 A=STICK(0)
SY 1090 IF A=14 AND LINE THEN A=LINE-1:GOTO 1105
DP 1095 IF A=13 AND LINE<>23 THEN A=LINE+1:GOTO 1105
NP 1100 GOTO 1110
OP 1105 POSITION 2,LINE:? " ";:POSITION 2,A:? "->";:LINE=A
AL 1110 A=PEEK(53279):IF A<>7 THEN 1125
HU 1115 POKE 20,0
KI 1117 IF PEEK(20)>=5 THEN 1085
SL 1120 IF NOT STRIG(0) THEN RETURN
RX 1122 GOTO 1117
ZJ 1125 IF A<>3 THEN 1145

OK 1130 B=PEEK(1560+LINE)+2
VR 1135 IF B=16 THEN B=0
UC 1140 POKE 1560+LINE,B:GOTO 1115
SK 1145 B=INT(PEEK(1536+LINE)/16)
YD 1150 C=PEEK(1536+LINE)-16*B
ZH 1155 IF A<>6 THEN 1170
LY 1160 B=B+1:IF B>15 THEN B=0
SO 1165 GOTO 1180
XR 1170 IF A<>5 THEN 1115
PH 1175 C=C+2:IF C>15 THEN C=0
SK 1180 POKE 1536+LINE,B*16+C
RZ 1185 GOTO 1115
NL 1999 REM CREATE SUBROUTINE
FW 2000 ? CHR$(125)
VU 2005 POSITION 11,0:? "SUBROUTINE CREATE OR":POKE 752,0
SR 2010 ? "Enter the line number that you would like the routine to start at."

GH 2015 TRAP 2015:INPUT LINE:IF LINE<0 OR LINE>32700 THEN 2015
DT 2020 ? :? "Enter the line number increment."
UD 2025 TRAP 2025:INPUT INC:IF INC<1 OR INC>INT(100) THEN 2025
PN 2030 ? :? "Enter the filename to save the subroutine as. The 'D:' is optional."
CC 2035 INPUT A$:IF A$="" THEN 2035
FG 2040 IF A$(2,2)="" AND A$(1,1)<>"D" THEN 2035
ZU 2045 IF A$(2,2)<>"":AND A$(3,3)<>"":THEN B$=A$:A$="D":A$(3)=B$
TI 2050 POKE 752,1:? CHR$(125)
DD 2055 POSITION 6,10:? "Insert a FORMATTED diskette":POSITION 6,12:? "press any key to write file"
NA 2060 GOSUB 500:TRAP 2500:? CHR$(125)
QO 2065 CLOSE #1:OPEN #1,8,0,A$:? CHR$(125)
BK 2070 POSITION 14,10:? "writing file"
UO 2075 ? #1;LINE;"IF PEEK(1584)=104 AND PEEK(1585)=173 THEN";LINE+3*INC:LINE=LINE+INC
VO 2080 ? #1;LINE;"RESTORE";LINE+3*INC;"FOR A=0 TO 47:READ B:POKE 1536+A,B:NEXT A":LINE=LINE+INC
VK 2085 ? #1;LINE;"FOR A=0 TO 106:READ B:POKE 1584+A,B:NEXT A":LINE=LINE+INC
YI 2090 ? #1;LINE;"A=USR(1584):CTRL=205:RETURN":LINE=LINE+INC
FC 2095 ? #1;LINE;"DATA";PEEK(1536);
RQ 2100 FOR A=1 TO 23:? #1;"",PEEK(1536+A);:NEXT A:? #1;LINE=LINE+INC
AL 2105 ? #1;LINE;"DATA";PEEK(1560);
NJ 2110 FOR A=1 TO 23:? #1;"",PEEK(1560+A);:NEXT A:? #1;LINE=LINE+INC
CX 2115 FOR A=0 TO 14
BN 2120 ? #1;LINE;"DATA";PEEK(1584+7*A);
EV 2125 FOR B=1 TO 6:? #1;"",PEEK(1584+7*A+B);:NEXT B:? #1;LINE=LINE+INC:NEXT A
JF 2130 ? #1;LINE;"DATA 104.64"
EH 2135 CLOSE #1:RETURN
YZ 2499 REM ERROR HANDLER
SI 2500 TRAP 2505:CLOSE #1
HA 2505 ? CHR$(125)
AT 2510 POSITION 13,10:? "I/O ERROR ";PEEK(195)
IR 2515 POSITION 6,12:? "press any key for main menu"
IO 2520 GOSUB 500:RETURN
FG 3000 POSITION 6,0:? "*****"

```

```

OA 3010 POSITION 6,1:? "OPTION=Character
   Luminence"
SY 3020 POSITION 6,2:? "SELECT=Line Lumi
   nence"
FY 3030 POSITION 6,3:? "START= Line Colo
   r"
NH 3040 POSITION 6,4:? "TRIGGER= Main Me
   nu"
MY 3050 POSITION 6,5:? "XXXXXXXXXXXXXXXXXX
   XXXXXXXXXXXXXXX"
AT 3060 RETURN
XR 9999 REM INITIALIZATION
GG 10000 FOR A=0 TO 23:POKE 1536+A,0:POKE
   1560+A,10:NEXT A
FP 10005 RESTORE 10100
MW 10010 FOR A=0 TO 106:READ B:POKE 1584+
   A,B:NEXT A
TT 10015 CTRL=205:A=USR(1584):DIM A$(20),

```

```

B$(20)
DF 10020 RETURN
NK 10100 DATA 104,173,48,2,133,203,173
QG 10105 DATA 49,2,133,204,160,3,177
ZE 10110 DATA 203,9,128,145,203,160,6
AE 10115 DATA 169,130,145,203,200,192,29
BA 10120 DATA 208,249,169,129,141,0,2
B5 10125 DATA 169,6,141,1,2,160,99
ZZ 10130 DATA 162,6,169,7,133,205,76
MK 10135 DATA 92,228,162,64,165,205,240
IL 10140 DATA 18,173,24,6,141,197,2
PJ 10145 DATA 173,0,6,141,198,2,169
MC 10150 DATA 1,133,206,162,192,142,14
XD 10155 DATA 212,76,98,228,72,138,72
ZT 10160 DATA 166,206,189,24,6,141,10
PX 10165 DATA 212,141,23,208,189,0,6
PI 10170 DATA 141,24,208,230,206,104,170
YL 10175 DATA 104,64

```

punch up your programs with these useful routines

## PAGE 6 GRAB-BAG

Article on page 39

### LISTING 1

```

HC 10 REM JOYSTICK EXPANDER SUBROUTINE
SJ 20 REM BY MATT LOVELESS AND MIKE EGGER
S
HA 30 REM (c) 1987, ANTIC PUBLISHING
FL 30000 RESTORE 30100:FOR QQZ=1536 TO 15
   94:READ QQX:POKE QQZ,QQX:RETURN
NA 30100 DATA 173,36,2,141,57,6,173,37,2,
   141,58,6,162,6,160,23
XX 30110 DATA 169,7,32,92,228,104,96,162,
   3,189,120,2,168,185,41,6
DS 30120 DATA 157,120,2,202,16,243,108,57
   ,6,0,0,0,0,4,2
IG 30130 DATA 3,0,6,0,7,0,5,1,0,0,0,0,0,
   0,0,0

```

### LISTING 2

```

0100 ; JOYSTICK EXPANDER
0110 ; BY MATT LOVELESS AND MIKE EGGER
S
0120 ; (c) 1987, ANTIC PUBLISHING
0130 ;
0140 * = $0600 ;Page 6
0150 SETUBV = $E45C ;Routine to set V
   BI vectors
0160 XITUBV = $E462 ;EXIT VBI VECTOR
0170 STICK = $0278 ;beginning of OS'
   s joystick values
0180 DUBULK = $0224 ;Address of defer
   red VBI vector
0190 ;
0200 SETUP
0210 LDA DUBULK ;Save old vector
0220 STA RETADD
0230 LDA DUBULK+1
0240 STA RETADD+1
0250 LDX #UPDATE/256 ;High byte of
   VBI vector
0260 LDY #UPDATE&255 ;Low byte
0270 LDA #7 ;Use deferred vec
   tor
0280 JSR SETUBV ;Set VBLANK
0290 PLA ;* BASIC ONLY *
0300 RTS
0310 ;
0320 UPDATE
0330 LDX #503 ;4 sticks (0-3)
0340 ;
0350 LOOP
0360 LDA STICK,X ;Get this joystick

```

```

k reading...
0370 TAY ; -- AND --
0380 LDA TABLE,Y ;use it to index
   into the table
0390 STA STICK,X ;Store new value
0400 DEX
0410 BPL LOOP ;If not finished
   then branch back
0420 ;
0430 JMP (RETADD)
0440 TABLE
0450 .BYTE 0,0,0,0,0 ;Bad values r
   eturn a zero
0460 .BYTE 4 ;RIGHT/BACK
0470 .BYTE 2 ;RIGHT/FORWARD
0480 .BYTE 3 ;RIGHT
0490 .BYTE 0
0500 .BYTE 6 ;LEFT/BACK
0510 .BYTE 8 ;LEFT/FORWARD
0520 .BYTE 7 ;LEFT
0530 .BYTE 0
0540 .BYTE 5 ;BACK
0550 .BYTE 1 ;FORWARD
0560 .BYTE 0 ;CENTERED
0570 ;
0580 RETADD
0590 * = **2 ;Return address
0600 .END

```

### LISTING 3

```

UH 10 REM CONSOLE KEY SUBROUTINE
SJ 20 REM BY MATT LOVELESS AND MIKE EGGER
S
HA 30 REM (c) 1987, ANTIC PUBLISHING
WU 31000 RESTORE 31100:FOR XX=1536 TO 153
   6+111:READ XXX:POKE XX,XXX:NEXT XX:RET
   URN
CF 31100 DATA 169,0,141,111,6,104,208,1,9
   6,170,104,104,141,112,6,202
SD 31110 DATA 240,5,104,104,202,208,251,4
   4,112,6,240,30,48,5,169,1
GB 31120 DATA 141,111,6,169,6,133,213,169
   ,112,133,212,162,6,160,75,169

```

continued on next page

```

CU 31140 DATA 133,212,162,228,160,98,169,
7,76,92,228,173,15,210,41,8
EN 31150 DATA 13,31,208,73,15,174,111,6,2
08,9,170,41,247,240,13,138
HU 31160 DATA 76,105,6,170,41,247,240,1,1
38,141,112,6,76,98,228,0

```

## LISTING 4

```

0100 ; CONSOLE KEY EXPANDER
0110 ; BY MATT LOVELESS AND MIKE EGGER
0120 ; (c) 1987, ANTIC PUBLISHING
0130 ; EQUATES
0140 CONSOL = $D01F ;CONSOLE BUTTONS
0150 SKSTAT = $D20F ;SERIAL PORT/KEYB
0160 VALTRN = 212 ;LOCATION TO STOR
0170 SETUBV = $E45C ;SET VBI VECTOR
0180 SYSUBV = $E45F ;SYSTEM VBI
0190 XITUBV = $E462 ;EXIT VBI
0200 ;
0210 *= $0600
0220 LDA #$00
0230 STA FLAG ;ZERO THE FLAG
0240 PLA
0250 BNE INIT
0260 ;
0270 RTS
0280 INIT
0290 TAX
0300 PLA ;DISCARD HIGH BYT
0310 PLA ;GET LOW BYTE
0320 STA BUTTON ;SAVE IT
0330 DEX ;COMPENSATE FOR R
0340 BEQ GETUBI ;IF ALL PARAMETER
0350 ARE OFF THEN BRANCH
0360 PLA ;REMOVE BAD
0370 PLA ;VALUES WHICH
0380 DEX ;MIGHT OCCUR
0390 BNE LOOP1 ;IN THE USR CALL
0400 ;
0410 GETUBI
0420 BIT BUTTON
0430 BEQ VBIOFF ;OPTION #0
0440 ;
0450 BMI VBION ;OPTION #128
0460 ;
0470 ;OPTION #1
0480 ;
0490 LDA #$01
0500 STA FLAG
0510 ;
0520 VBION
0530 LDA #BUTTON/256 ;HIGH BYTE FO
0540 STA VALTRN+1
0550 LDA #BUTTON&255 ;LOW BYTE
0560 STA VALTRN

```

```

0570 ; GRAB VBI
0580 LDX #VBI/256 ;HIGH BYTE
0590 LDY #VBI&255 ;LOW BYTE
0600 LDA #$07 ;DEFERRED VBI
0610 JSR SETUBV
0620 LDA #$00
0630 STA BUTTON
0640 RTS
0650 ;
0660 VBIOFF
0670 LDA #CONSOL/256 ;HIGH BYTE FO
0680 STA VALTRN+1
0690 LDA #CONSOL&255 ;LOW BYTE
0700 STA VALTRN
0710 LDX #XITUBV/256 ;HIGH BYTE
0720 LDY #XITUBV&255 ;LOW BYTE
0730 LDA #$07 ;DEFERRED VBI
0740 JMP SETUBV ;ITS RTS WILL RET
URN TO CARTRIDGE
0750 ;
0760 ; THE DEFERRED VBI VECTOR POINTS
0770 ; HERE.
0780 ;
0790 VBI
0800 LDA SKSTAT
0810 AND #$08 ;"AND-OUT" ALL BU
T BIT-3 (SHIFT KEY)
0820 ORA CONSOL ;OR, IN CONSOLE K
EYS
0830 EOR #$0F ;SWITCH THE LOWER
NIBBLE.
0840 LDX FLAG
0850 BNE ZERO ;ARE WE IN LATCHE
D MODE?
0860 ;---YES
0870 TAX ;COPY A-REG INTO
X-REG
0880 AND #$F7 ;AND OUT SHIFT VA
LUE
0890 BEQ EXIT ;IF NO CONSOLE KE
YS THEN EXIT
0900 ;
0910 TXA ;ELSE RETURN ORIG
INAL VALUE
0920 JMP STORE
0930 ZERO
0940 TAX
0950 AND #$F7 ;"AND-OUT" SHIFT
VALUE
0960 BEQ STORE ;IF NO CONSOLE KE
YS THEN STORE A ZERO
0970 ;
0980 TXA ;OTHERWISE STORE
THE ORIGINAL VALUE
0990 ;
1000 STORE
1010 STA BUTTON
1020 EXIT
1030 JMP XITUBV
1040 ;
1050 FLAG
1060 .BYTE 0
1070 BUTTON
1080 .BYTE 0
1090 ;
1100 .END

```

## game of the month

# VECTRON

Article on page 16

## LISTING 1

Don't type the  
TYPO II Codes!

```

WU 5 REM VECTRON
EK 6 REM BY HEATH LAWRENCE
GJ 7 REM (c) 1987, ANTIC PUBLISHING
JZ 8 BRK=1:IF PEEK(53279)=5 THEN BRK=0
SF 10 GOSUB 500
DB 20 GOSUB 500:GOTO 120

```

```

RU 30 REM MOVE PROJECTILE
TR 40 POKE 77,0:PY=LY:PX=2+34*(PT=2):V=2+
2*(PT=2):POKE SC+PX+40*PY,10
SP 50 POKE SC+PX+40*PY,0:PY=PY+(V=3)-(V=1
):PX=PX+(V=2)-(V=4):PP=PEEK(SC+PX+40*P
Y):POKE SC+PX+40*PY,10

```

MARCH 1987

## LISTING 2

continued on next page

```

MANY DATA LINES!":? "CANNOT CREATE FILE!":END
CZ 180 IF C<LN+1 THEN ? :? "TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
AL 200 OPEN #1,8,0,FN$
PP 210 POKE 766,1:? #1;A$;POKE 766,0
AF 220 CLOSE #1:GRAPHICS 0:? "CONTINUED"
IR 1000 DATA 165
JY 1010 DATA 0530550530320770790860690610
    65068082040034104104133241104133240104
    133213104133212104133239104
PK 1020 DATA 1332381600001772401452122302

```

```

12208002230213230240208002230241198238
208234198239016230096034041
KI 1030 DATA 1550530560490320810610650680
    82040034024012006255255006012024024048
    096255255096048024024060126
N5 1040 DATA 2191530240240240240240241532
    19126060024159255131251251131255159249
    255193223223193255249000024
SU 1050 DATA 0601261260600240002550240601
    261260600242552550000000000000000255
    129129129129129129129129129129
ZV 1060 DATA 1531892552551891531290340411
    55


```

## lesson 12: graphics modes

# NEW OWNERS COLUMN

Article on page 42

## LISTING 1

Don't type the  
TYPO II Codes! 

```

FP 10 REM THE NEW OWNERS COLUMN #12
EB 20 REM BY DAVE PLOTKIN
XW 25 REM (DEMO PROGRAM BY CHARLES JACKSON)
GL 30 REM (C) 1986, ANTIC PUBLISHING
CE 35 POKE 704,50:POKE 705,180:POKE 706,3
    0:POKE 707,146
SW 40 GRAPHICS 1+16
JS 50 POSITION 5,4:? #6;"THIS IS"
RI 60 POSITION 3,8:? #6;"GRAPHICS ONE"
SO 65 POSITION 2,15:? #6;"PRESS ANY KEY";
    CHR$(129):POKE 764,255
ND 70 TEMP=PEEK(711):POKE 711,PEEK(710):X
    =SIN(4)
OY 80 POKE (710),PEEK(709):X=SIN(4):POKE
    709,PEEK(708):X=SIN(4)
QF 90 POKE 708,TEMP:X=SIN(4):IF PEEK(764)
    =255 THEN 70
SG 100 POKE 764,255:GRAPHICS 2+16
YB 110 POSITION 4,4:? #6;"GRAPHICS 2"
FE 120 GOSUB 1000:GRAPHICS 2+32:? CHR$(12
    5);"HERE'S THE TEXT WINDOW"
OY 130 ? :? " -> Press any key <- "
CB 140 GOSUB 1000:GRAPHICS 2+16+32:IF PEE
    K(764)=255 THEN 120
WC 145 REM NOW LET'S SEE GR. 3-11
YI 150 GMODE=3:WIDTH=39:HEIGHT=19:MAXKL
    R=4:GOSUB 800
AZ 160 GMODE=4:WIDTH=79:HEIGHT=39:MAXKL
    R=2:GOSUB 800
EM 170 GMODE=5:WIDTH=79:HEIGHT=39:MAXKL
    R=4:GOSUB 800
PG 180 GMODE=6:WIDTH=159:HEIGHT=79:MAXKL
    R=2:GOSUB 800
SV 190 GMODE=7:WIDTH=159:HEIGHT=79:MAXKL
    R=4:GOSUB 800
QT 200 GMODE=8:WIDTH=319:HEIGHT=159:MAXKL
    R=2:GOSUB 800
HA 210 GMODE=9:WIDTH=79:HEIGHT=191:MAXKL
    R=16:GOSUB 800

```

```

CT 220 GMODE=10:WIDTH=79:HEIGHT=191:MAXKL
    R=9:GOSUB 800
XZ 230 GMODE=11:WIDTH=79:HEIGHT=191:MAXKL
    R=16:GOSUB 800
NZ 240 END
IA 799 REM RANDOMLY SELECT TWO SINE WAVES
    AND DRAW A LINE BETWEEN CORRESPONDING
    POINTS
CJ 800 GRAPHICS GMODE:K=1:DEG :IF GMODE>8
    THEN K=8
AA 810 COLOR K:IF GMODE>8 THEN 820
XM 812 ? "GRAPHICS ";GMODE;" (" ;WIDTH+
    1;" x ";HEIGHT+1;" , ";MAXKL;
DC 815 ? " colors":? :? " Drawing i
    n COLOR ";K
ZW 820 FACT=INT(RND(0)*180):POKE 764,255
AV 830 FACT2=INT(RND(0)*180)
UF 840 FOR X=(HEIGHT*-1) TO HEIGHT STEP 2
    +INT(RND(0)*GMODE)
ZM 850 Y1=ABS(SIN(FACT+X)*WIDTH)
KV 860 Y2=ABS(SIN(FACT2+X)*WIDTH)
QH 870 PLOT Y1,ABS(X):DRAWTO Y2,HEIGHT-AB
    S(X)
FG 880 NEXT X:SOUND 0,75,14,14:GOSUB 1000
    :SOUND 0,0,0,0:POKE 77,0
ZO 890 IF GMODE<9 THEN ? "Press (SELECT)
    to change GR. Modes.":? :? "Press (ST
    ART) to continue."
YD 900 ON (PEEK(53279)) GOTO 900,900,900,
    900,920,910,900
TV 910 K=INT(RND(0)*MAXKL):IF MAXKL=16
    AND K/2<>INT(K/2) THEN 910
PI 915 GOTO 810
ZJ 920 RETURN
PR 999 END
LG 1000 POKE 20,0:REM GENERIC TIMER ROUTI
    NE
LO 1010 IF PEEK(20)<50 THEN 1010
AF 1020 RETURN

```

## ST PUZZLER

Article on page 63

## LISTING 1

```

1000 '
1010 ' ST PUZZLER
1020 ' (C) 1987 Antic Publishing
1030 ' Ver 120286
1040 ' Written by David Bohike
1050 '
1060 '-----
1070 MAIN:
1080 randomize 0
1090 gosub SETCOLOR
1100 TRUE=1: FALSE=0
1110 WRONG=0
1120 TIMER=0
1130 RIGHT=0
1140 fullw 2
1150 clearw 2
1160 for J=1 to 60
1170   X=rnd*84+210
1180   Y=rnd*70+90
1190   while abs( XA-YA )<300
1200     XA=rnd*3600
1210     YA=rnd*3600
1220   wend
1230   XR=rnd*9+7
1240   YR=rnd*9+7
1250   color 1, rnd*15+1, 1, 7, 2
1260   ellipse X, Y, XR, YR, XA, YA
1270 next J
1280 color 1, 1, 1
1290 linef 220, 100, 283, 100
1300 linef 283, 100, 283, 147
1310 linef 283, 147, 220, 147
1320 linef 220, 147, 220, 100
1330 color 1, 0, 0
1340 for X=180 to 219
1350   linef X, 60, X, 180
1360   linef X+104, 60, X+104, 180
1370 next X
1380 for Y=70 to 99
1390   linef 160, Y, 310, Y
1400   linef 160, Y+78, 310, Y+78
1410 next Y
1420 gosub GRID
1430 color 12
1440 gotoxy 23, 7
1450 print " ST PUZZLER"
1460 for I=1 to 8
1470   for J=1 to 6
1480     B( I, J )=0
1490   next J
1500 next I
1510 '
1520 '-----
1530 PUZZLE:
1540 gosub MAKE.SCOR
1550 MS=" Selecting piece      SCORE "
1560 MS=MS+str$( SCORE )+" "
1570 gosub TITLE
1580 R=int( rnd*8 )+1
1590 C=int( rnd*6 )+1
1600 if B( R, C )=1 then goto PUZZLE
1610 NX=240
1620 NY=20
1630 gosub PLOTBIG
1640 gosub MAKE.SCOR
1650 MS=" Click to grid      SCORE "
1660 MS=MS+str$( SCORE )+" "
1670 gosub TITLE
1680 '
1690 MLOOP:
1700 gosub MOUSE
1710 if B<>1 then TIMER=TIMER+1: goto MLOOP
1720 A=int(( X-10 )/24)+1
1730 B=int(( Y-30 )/24)+1
1740 if A<1 or A>8 or B<1 or B>8 then goto MLOOP
1750 if A=R and B=C then goto GOT.ONE
1760 WRONG=WRONG+1
1770 gosub MAKE.SCOR
1780 MS=" Incorrect      SCORE "
1790 MS=MS+str$( SCORE )+" "
1800 gosub TITLE
1810 sound 1, 8, 4, 2, 99
1820 sound 1, 0, 0, 0, 0
1830 goto PUZZLE
1840 '
1850 '-----
1860 GOT.ONE:
1870 RIGHT=RIGHT+1
1880 B( R, C )=1
1890 gosub MAKE.SCOR
1900 MS=" CORRECT "+str$( RIGHT )
1910 MS=MS+" -"+str$( WRONG )
1920 MS=MS+"      SCORE "+str$( SCORE )
1930 MS=MS+" "
1940 gosub TITLE
1950 NX=R*24-14
1960 NY=C*24-14
1970 gosub PLOTBIG
1980 if RIGHT<48 then goto PUZZLE
1990 '
2000 gotoxy 2, 0
2010 color 15
2020 B.LOOP:
2030 gosub MOUSE
2040 if b<>1 then goto B.LOOP
2050 goto MAIN
2060 '
2070 '-----
2080 GRID:
2090 color 1, 1, 1
2100 for X=10 to 202 step 24
2110   linef X, 10, X, 154
2120   linef 10, X, 202, X
2130 next X
2140 return
2150 '
2160 '-----
2170 PLOTBIG:
2180 A=R*8+212
2190 B=C*8+92
2200 for I=0 to 7
2210   for J=0 to 7
2220     X=I+A
2230     Y=B+J
2240     gosub LOCATE
2250     color 1, LC, LC
2260     X1=I*3+NX
2270     Y1=J*3+NY
2280     X2=I*3+NX+2
2290     linef X1, Y1, X2, Y1
2300     linef X1, Y1+1, X2, Y1+1
2310     linef X1, Y1+2, X2, Y1+2
2320   next J
2330   if NX<210 then sound 1, 8, I+4, 5, 0
2340   if NX>=210 then sound 1, 6, 10-I, 3, 0
2350 next I
2360 sound 1, 0, 0, 0, 0
2370 return
2380 '
2390 '-----
2400 MAKE.SCOR:
2410 SCORE=( RIGHT-WRONG )*100
2420 SCORE=SCORE-int( TIMER/10 )
2430 return
2440 '
2450 '-----
2460 TITLE:
2470 MS=MS+chr$( 0 )
2480 AH=68
2490 GINTIN=peek( AH+8 )
2500 poke GINTIN, peek( SYSTAB+8 )
2510 poke GINTIN+2, 2
2520 V#=GINTIN+4
2530 poke V#, varptr( MS )
2540 gemsys( 105 )
2550 return
2560 '
2570 '-----
2580 MOUSE:
2590 poke CTRL, 124
2600 poke CTRL+2, 0

```

continued on next page

```

2610 poke CONTRL+6,0
2620 vdisys( 0 )
2630 X=peek( PT5OUT )
2640 Y=peek( PT5OUT+2 )
2650 B=peek( INTOUT )
2660 return
2670
2680
2690 SETCOLOR:
2700 restore COLOR.DATUM
2710 for I=0 to 1
2720 read A
2730 R=int( A/100 )
2740 G=int( ( A-R*100 )/10 )
2750 B=A-R*100-G*10
2760 poke CONTRL,14
2770 poke CONTRL+2,0
2780 poke CONTRL+6,4
2790 poke INTIN,I
2800 poke INTIN+2,R*140
2810 poke INTIN+4,G*140
2820 poke INTIN+6,B*140

2830 vdisys( 0 )
2840 next I
2850 AM=GB
2860 GINTIN=peek( AM+8 )
2870 poke GINTIN,3
2880 gemsys( 78 )
2890 return
2900
2910 COLOR.DATUM:
2920 data 030,777
2930
2940
2950 LOCATE:
2960 poke CONTRL,105
2970 poke CONTRL+2,1
2980 poke CONTRL+6,0
2990 poke PT5IN,X+1
3000 poke PT5IN+2,Y+22
3010 vdisys( 0 )
3020 LC=peek( INTOUT+2 )
3030 return

```

#### TYPO ST codes for ST PUZZLER! Don't type these.

1000 :00F2	1210 :03D2	1420 :040D	1630 :04FB	1840 :00F4	2050 :03A5	2260 :0307	2470 :03F9	2680 :0421	2890 :0373
1010 :030C	1220 :0273	1430 :034A	1640 :05B3	1850 :04D3	2060 :00EF	2270 :030B	2480 :01F8	2690 :0376	2900 :00F2
1020 :087B	1230 :03B6	1440 :043B	1650 :07A9	1860 :0303	2070 :0582	2280 :0367	2490 :0592	2700 :06F5	2910 :042E
1030 :034B	1240 :03B8	1450 :06DE	1660 :05D0	1870 :0465	2080 :022A	2290 :0586	2500 :089A	2710 :03DB	2920 :03CB
1040 :08F1	1250 :0692	1460 :03E4	1670 :0470	1880 :0293	2090 :03D5	2300 :0636	2510 :04FB	2720 :02A8	2930 :00F5
1050 :00ED	1260 :083C	1470 :03E4	1680 :00F6	1890 :05BA	2100 :0699	2310 :0639	2520 :03A7	2730 :03F8	2940 :0501
1060 :05DA	1270 :02D3	1480 :02BC	1690 :0291	1900 :0745	2110 :0501	2320 :02D0	2530 :067F	2740 :0549	2950 :02C2
1070 :0227	1280 :03D5	1490 :02D7	1700 :0471	1910 :060C	2120 :04FC	2330 :090A	2540 :044A	2750 :03C7	2960 :0514
1080 :04C2	1290 :05B1	1500 :02CE	1710 :0B49	1920 :074B	2130 :02DD	2340 :0975	2550 :036C	2760 :04E1	2970 :050D
1090 :0555	1300 :05BD	1510 :00EE	1720 :050C	1930 :025B	2140 :0367	2350 :02D2	2560 :00F4	2770 :050A	2980 :0511
1100 :0482	1310 :05C0	1520 :0554	1730 :0511	1940 :0470	2150 :00EF	2360 :0495	2570 :041F	2780 :0513	2990 :04F1
1110 :02BD	1320 :05AD	1530 :02ED	1740 :08F9	1950 :0326	2160 :0582	2370 :036C	2580 :0292	2790 :0478	3000 :0591
1120 :02B2	1330 :03CF	1540 :05B2	1750 :09C3	1960 :0319	2170 :0315	2380 :00F4	2590 :0514	2800 :0595	3010 :03E7
1130 :02B0	1340 :04BC	1550 :08DD	1760 :0481	1970 :0502	2180 :02BD	2390 :03F2	2600 :0502	2810 :058D	3020 :05C7
1140 :0322	1350 :050A	1560 :05CF	1770 :05B7	1980 :0919	2190 :0286	2400 :03C8	2610 :0507	2820 :058B	3030 :0366
1150 :0377	1360 :068B	1570 :046F	1780 :06E7	1990 :00FA	2200 :03DD	2410 :06C4	2620 :03ED	2830 :03F0	
1160 :0410	1370 :02E2	1580 :04FB	1790 :05D4	2000 :03FA	2210 :03DD	2420 :07D7	2630 :0545	2840 :02D6	
1170 :03F6	1380 :0465	1590 :04EB	1800 :046B	2010 :0348	2220 :0210	2430 :0369	2640 :05A4	2850 :01F9	
1180 :03C9	1390 :053C	1600 :08AA	1810 :04E4	2020 :02A8	2230 :0214	2440 :00F1	2650 :0525	2860 :0593	
1190 :069A	1400 :0668	1610 :0241	1820 :0495	2030 :050E	2240 :04A0	2450 :03EF	2660 :036E	2870 :04A8	
1200 :03D0	1410 :02DE	1620 :020F	1830 :046F	2040 :07B4	2250 :048F	2460 :0288	2670 :00F6	2880 :042A	

## ST RESOURCE

# BASIC ALERT

Article on page 68

### LISTING 1

```

1000 > ST ALERT BOXES
1010 > (C) 1987 Antic Publishing
1020 > Ver 120286
1030 > Written by Dr. Ron Schaefer
1040 >
1050 > -----
1060 gosub INITAES
1070 fullw 2
1080 clearw 2
1090 >
1100 > -----
1110 while CHOICE<3
1120 TYPES="3"
1130 TEXTS="Choose a box and click the mouse."
1140 BUTTONS="One|Two|Quit"
1150 DEFAULT.BUTTON=1
1160 gosub FORM.ALERT
1170 if CHOICE=1 then ?"You chose number 1"
1180 if CHOICE=2 then ?"You chose number 2"
1190 if CHOICE=3 then ?"Good bye"
1200 wend
1210 end
1220 >

1230 > -----
1240 FORM.ALERT:
1250 NM=ADDRIN
1260 poke GINTIN, DEFAULT.BUTTON
1270 ALERTS="["+TYPES+"]"
1280 ALERTS=ALERTS+"["+TEXTS+"]"
1290 ALERTS=ALERTS+"["+BUTTONS+"]"
1300 ALERTS=ALERTS+chr$(0)+chr$(0)
1310 poke NM, varptr( ALERTS )
1320 gemsys( 52 )
1330 CHOICE=peek( GINTOUT )
1340 return
1350 >
1360 > -----
1370 INITAES:
1380 AM=GB
1390 CONTROL=peek( AM )
1400 GLOBAL=peek( AM+4 )
1410 GINTIN=peek( AM+8 )
1420 GINTOUT=peek( AM+12 )
1430 ADDRIN=peek( AM+16 )
1440 ADDROUT=peek( AM+20 )
1450 return

```

#### TYPO ST codes for BASIC ALERT! Don't type these.

1000 :0492	1040 :00EC	1080 :0379	1120 :02DE	1160 :05C2	1200 :0271	1240 :03DB	1280 :076A	1320 :0416	1360 :06EB	1400 :056C	1440 :0616
1010 :087A	1050 :0552	1090 :00F1	1130 :0E07	1170 :0BEC	1210 :01FB	1250 :0328	1290 :0802	1330 :06CF	1370 :0312	1410 :0589	1450 :05A3
1020 :034A	1060 :04F4	1100 :054E	1140 :083E	1180 :0BEF	1220 :00EC	1260 :087C	1300 :07F3	1340 :0368	1380 :01F6	1420 :0600	1460 :0600
1030 :09E7	1070 :0324	1110 :04F6	1150 :0544	1190 :08B0	1230 :0633	1270 :059F	1310 :079D	1350 :00F0	1390 :0585	1430 :036A	1470 :036A

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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
- Programs may be broken up into Modules for separate compilation
- Machine level interface
  - Bit-wise operators
  - Direct port and Memory access
  - Absolute addressing
  - Interrupt structure
- Dynamic strings that may be any size
- Multi-tasking is supported
- Procedure variables
- Module version control
- Programmer definable scope of objects
- Open array parameters (VAR r: ARRAY OF REALS;)
- Elegant type transfer functions

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];
VAR
  FlagSet = SET OF FlagRange;
  i: FlagSet;
  Prime: k, Count, Iter: CARDINAL;
BEGIN
  ("SS-SR-$A+");
  FOR Iter:= 1 TO 10 DO
    Count:= 0;
    Flags:= FlagSet(); (* empty set *)
    FOR i:= 0 TO Size DO
      IF (i IN Flags) THEN
        Prime:= (i * 2) + 3; k:= i + Prime;
        WHILE k <= Size DO
          INCL (Flags, k);
          k:= k + Prime;
        END;
        Count:= Count + 1;
      END;
    END;
  END;
END Sieve.

```

```

MODULE Float;
FROM MathLib0 IMPORT sin, ln, exp,
  sqrt, arctan;
VAR x,y: REAL; i: CARDINAL;
BEGIN ("ST-$A-$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 ("ST-$A-$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**

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### Other Modula-2 Products

- Kermit - Contains full source plus \$15 connect time to Compuserve. \$29.95
- Examples - Many Modula-2 example programs to show advanced programming techniques \$24.95
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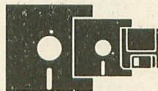
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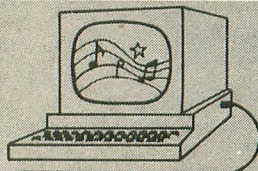
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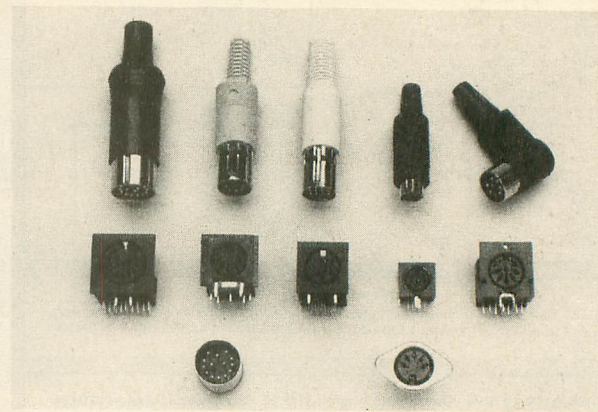
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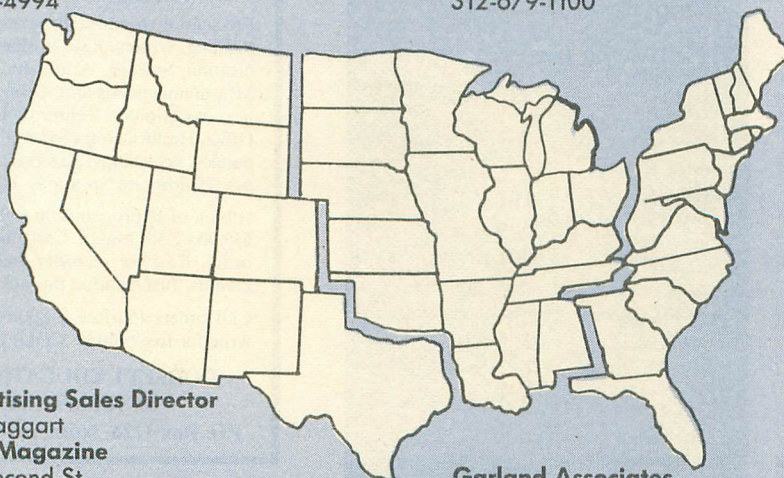
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**T**his month's Tech Tips column brings together pinout diagrams for all connector sockets on 8-bit Atari computers. (ST owners have a full set of pinout diagrams in the manuals provided with their computers, particularly the ST BASIC manual.)

If you've ever built a hardware project or needed to troubleshoot your computer, you know the value of correct pinout diagrams. But it is often hard to find these diagrams for the 8-bit Atari. And even if you do find a diagram, it is not always clear whether the pinout is facing forward or backward.

Here you have all the 8-bit connector diagrams collected in one place. And they are all displayed in the same

point of view—as if you are looking directly into the socket from the outside of the computer.

Which connectors you'll find socketed on your Atari depends on the model. Connector name labels may also vary slightly from model to model.

A	B	C	D	E	F	H
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1	2	3	4	5	6	7

1	EXSEL	A	Reserved
2	RST	B	IRQ
3	DTXX	C	HALT
4	MPD	D	A13
5	Audio	E	A14
6	REF	F	A15
7	+5V	H	Ground

A	B	C	D	E	F	H	J	K	L	M	N	P	R	S
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

2	4	6	8	10	12
○	○	○	○	○	○
○	○	○	○	○	○
1	3	5	7	9	11
					13

1 Clock input	8 Motor control
2 Clock output	9 Proceed
3 Data input	10 +5V / Ready
4 Ground	11 Audio input
5 Data output	12 +12V
6 Ground	13 Interrupt
7 Command	

1	S4	A	RD4
2	A3	B	Ground
3	A2	C	A4
4	A1	D	A5
5	A0	E	A6
6	D4	F	A7
7	D5	H	A8
8	D2	J	A9
9	D1	K	A12
10	D0	L	D3
11	D6	M	D7
12	S5	N	A11
13	+5V	P	A10
14	RD5	R	R/W
15	CSCTL	S	B02

A diagram of a book's page layout. It shows a horizontal bar representing the book. On the left side, the numbers 1 and 2 are written vertically. On the right side, the numbers 49 and 50 are written vertically. The bar is divided into segments by small vertical lines, representing the pages of the book.


[illegible]

- 1 Composite luminance
- 2 Ground
- 3 Audio out
- 4 Composite video
- 5 Composite chroma  
(not on XL/XE)

A circular diagram with seven small circles inside, numbered 1 through 7, representing the seven colors of the rainbow. The numbers are placed around the perimeter of the large circle: 1 at the top right, 2 at the bottom, 3 at the top left, 4 at the bottom right, 5 at the bottom left, 6 at the top right (above 1), and 7 at the top left (above 3).

- |          |          |
|----------|----------|
| 1 +5V    | 5 Ground |
| 2 Shield | 6 +5V    |
| 3 Ground | 7 Ground |
| 4 +5V    |          |

1 2 3 4 5  
○ ○ ○ ○ ○  
○ ○ ○ ○  
6 7 8 9

- |            |   |
|------------|---|
| 1 Forward  | 6 Trigger   |
| 2 Back     | 7 +5V   |
| 3 Left     | 8 Ground  |
| 4 Right    | 9 Paddle A  |
| 5 Paddle B |  |

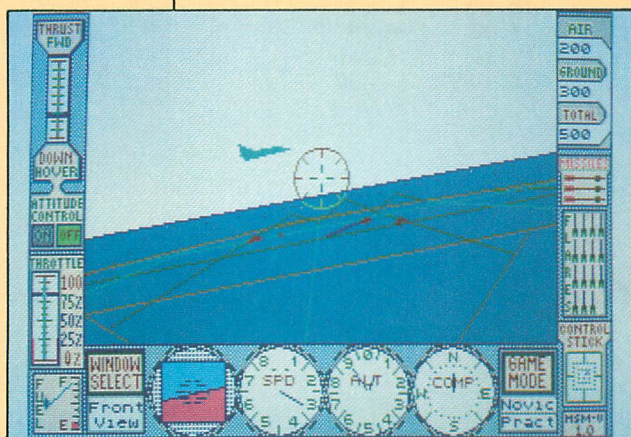
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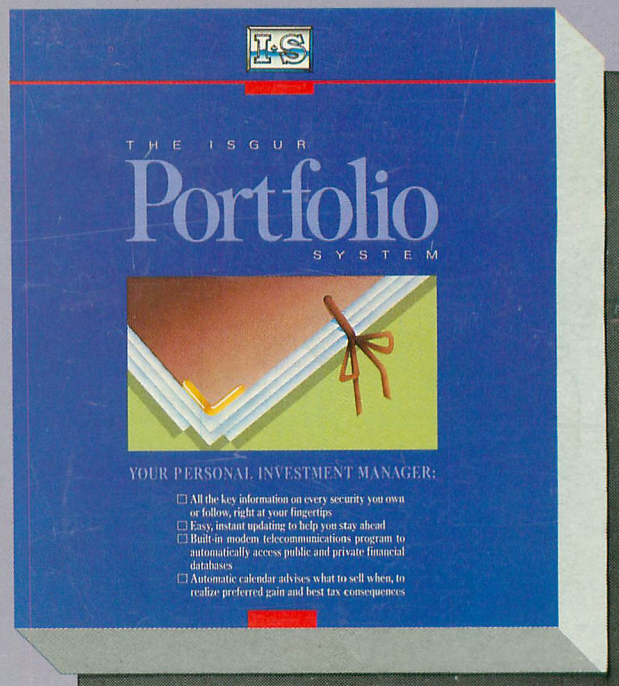
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