

**GREEN
COMPUTING**
(SEE PAGE 82)

PICK THE BEST LAPTOP—A BASIC GUIDE

COMPUTE

JULY 1992

WORD POWER!

**WE TEST 5 FEATURE-PACKED
WINDOWS WORD PROCESSORS**

PLUS! TOP 10 MACROS FOR

- **WORDPERFECT FOR WINDOWS**
- **WORD FOR WINDOWS**
- **WORDPERFECT FOR DOS**

MULTIMEDIA!

- **CUTTING-EDGE ENTERTAINMENT**
- **SUPER PC SOUND**
- **INSTANT CD-ROM LIBRARY**

MORE HOT STUFF!

- **CHARLES GIVENS EXCLUSIVE**
- **LANS AT HOME**
- **ONLINE GETS EASIER**



CALLAHAN DISTRIBUTORS

2450 Broadway, Suite 600
 Santa Monica, CA 90404-3060
 Phone#: (310) 453-0614
 FAX#: (310) 453-2814

P.O.# 1331992-1

PURCHASE ORDER

VENDOR: Vendor#: CITIZEN
 Citizen America Corporation
 P.O. Box 4003
 Santa Monica, CA 90411-4003

SHIP TO: Vendor#: CALLAHAN
 Callahan Distributors
 2450 Broadway, Suite 600
 Santa Monica, CA 90404-3060

ORDER DATE: March 31, 1992	TERMS: 2% ¹⁰ Net 30	SALESMAN: Anthony	VENDOR PHONE#: (800)477-4683	VENDOR FAX#: (310)453-2814
F.O.B.: Santa Monica	SHIP VIA: Padded Van	REG. DATE: April 15, 1992	TAXABLE? No	BUYER: John
QTY	PART NUMBER	DESCRIPTION	UNIT PRICE	EXT. PRICE

Citizen's Notebook Printer. It also fits in your briefcase.

Callahan knows that a successful business often uses teamwork to make the sale. So he goes where the customers are, and he makes points. His teammate is the Citizen Notebook Printer. It's an exercise in good business: laser-quality output, 2.5 pounds, rechargeable power. Anytime. Anyplace. For more information call 1-800-4-PRINTERS.



© 1992 Citizen America Corporation, PN48, Thermal Fusion and the Citizen logo are trademarks of the Citizen Watch Co. LTD.

64/128 VIEW

Mad Man Software is a new company with a new adventure game for the 64. Its average playing time is between 200 and 400 hours.

Tom Netsel

The rat looked as big as a Volkswagen, and it was charging straight at our hero. Outrunning such a creature was impossible. His only chance was to stand and fight, a pitifully small sword his only weapon. He drew it and took a swing at the rampaging rodent. Would the rat engulf him, or would his puny blow strike home?

As we held our breaths awaiting the outcome, it took a minute before we realized that nothing had happened. The rat was still there, our hero was still there, but the screen had frozen. Our first encounter with the game's first monster, and the program locked up. This was one of those embarrassing moments that can occur when a software representative demonstrates his company's latest product.

Reboot. Try again. Same thing. Groan! I was feeling sorry for Gene Barker. He's a recent graduate from the Colorado School of Mines who'd flown to North Carolina from Colorado to show the Gazette staff Messiah III: Nemesis, an adventure game for the 64 that he's been developing for almost six years. Now, when the game's lead character aims his first blow at the very first monster, years of programming grind to a halt.

Wait a minute! This 128 has a defective SID chip, and the program relies on one of the computer's voices to generate random numbers to help decide a battle's outcome. The program's in a loop, waiting for a random number to appear, and that chip is as silent as Harpo Marx! We

could be here until Godzilla comes home. Let's go down the hall and try another machine.

As I said, when someone comes all this way to demonstrate a major new release for the 64, you want things to go well. After all, there's not exactly a flood of new titles sweeping that market these days. In fact, it would take a madman to start a new company aimed at developing software for that veteran market. And that's just what Barker and ten associates have done. Their company is called Mad Man Software (7610 West 5th Avenue, Suite 200, Lakewood, Colorado). For the past year, they've been polishing Barker's game, and Messiah III should be ready by this fall or Christmas.

Messiah III is no lightweight arcade adventure, as we saw when we ran it on another machine. We were treated to a richly detailed adventure game that's the first of a six-game saga. Messiah III, which should sell for around \$60, consists of more than one megabyte of code. That's six disk sides. Disk access times have been reduced, however, so that the longest load should take no more than 12 seconds.

While we await the final version for review, Barker estimates the average playing time will take between 200 and 400 hours. When many new games are measured in megabytes, Barker doesn't feel the 64's memory constraints have placed limits on his creativity. "It's the game's design which dictates its power," he says, "not the machine." □

GAZETTE

64/128 VIEW G-1

Anybody who'd start a new company based on a new adventure game for the 64 must be a madman, but that's just what Gene Barker and friends have done. By Tom Netsel.

FEEDBACK G-2

Questions and comments from our readers.

THE SMALLER, THE BETTER G-4

For large storage capacity in a small package, check out the 1581. It's the great big drive in the little beige box.

By George Gunn.

REVIEWS G-12

Chip's Challenge, Perfect Print, Predator 2.

BEGINNER BASIC G-18

Joystick ports usually handle input devices, but here's a way to reverse the data flow.

By Larry Cotton.

MACHINE LANGUAGE G-20

The stack works so well by itself that many programmers simply ignore it.

By Jim Butterfield.

GEOS G-22

Check out deskTop alternatives.

By Steve Vander Ark.

D'IVERSIONS G-24

Can multimedia be a springboard to immortality?

By Fred D'Ignazio.

PROGRAMS

Pop-Up	G-25
Mimic 128	G-28
SpeedPurge	G-29
Alphabetizer	G-30
Duplicate 1541	G-31
Railroad Solitaire	G-32
128 Graphic Dump	G-34
Quiz Wiz	G-35
MLX	G-38

Questions and answers about time, word processors, modems, programming languages, and MIDI

INPUT Time

Is there a way to change the value of TI\$ by using an INPUT statement from within a BASIC program?

KARL ROSEMAN
DENVER, CO

Try the following line in your program. It should do the trick nicely.

10 INPUT "NEW TIME"; TI\$

When the program runs and you see the INPUT prompt, enter your response with six digits in an HHMMSS format. HH equals hours, MM equals minutes, and SS equals seconds. For example, 123456 will set TI\$ to read 12:34:56. If you enter more or fewer digits, you'll get an ILLEGAL QUANTITY message. If the number is greater than 23:59:59, the clock resets to 00:00:00.

Bug-Swatter

The ending address of File Lord (May 1992) is incorrect. The correct address is 14C0. This affects MLX only and not the File Lord program. We prepared the listing after the documentation, and it was then that we noticed how long the program was. To make it easier to type in, we compressed the program with Mega-Squeeze but neglected to change the ending address.

The compression program may have affected the way the program starts. If you type RUN and get a READY message, simply type RUN again, and File Lord should start. The program on Gazette Disk wasn't affected.

80-Column Word Processor

Is there a word processor for the 64 that has a true 80-column screen? I am looking for one that's like the 128 or IBM, not a 40-column screen such as GEOS, which scrolls to reveal 80 columns. I am not look-

ing for one that simply has a preview screen either. Is there one that exists with this feature?

JON PERSINGER
INDIANAPOLIS, IN

You might try Script 64, published by Richvale Telecommunications of Canada. To the best of my knowledge, however, that company is no longer in business. You might locate a used copy of the program for about \$9 at Bare Bones Software, 940 4th Avenue, Suite 222, Huntington, West Virginia 25701, (800) 638-1123. Call or write for a free catalogue of used 64 and 128 software. They also carry Amiga products. Supplies are limited, so check with the company before ordering.

Modem Woes

I have a 64 with an Arotek 12C modem used as a Volks 6480. I would like to play modem games with a friend, but I need the originate and answer codes that will correspond with my friend's Commodore 1670 modem. I can't find this information in the manual. Can you supply me with these codes?

MARTIN BOUTIN
LONGUEUIL, PQ
CANADA

Your modem, which can be used as a Volks 6480, is no longer in production, but you should have no problem using it to connect with your friend. It requires no special originate or answer codes or settings. It's Hayes compatible in that it supports automatic answering (ATA) and automatic dialing (ATDT) commands, just as your friend's 1670 does. You should be able to contact each other just as easily as you can connect with a local BBS.

Check the terminal or game software you're using

for requirements specific to that program. It may require manual dialing or answering. Also check the echo or duplex modes to make sure you both can see what each of you is typing. If you still think the modem is at fault, call Arotek's service department at (503) 582-2118 from 8:00 a.m. to 4:30 p.m. Pacific time on weekdays.

Pascal Wanted

I am currently taking a course in Pascal at high school, using Turbo Pascal on a Macintosh. I have a 64 at home, and I would like to use Pascal with it. Is there such a compiler and where can I obtain it?

MIKE SMITH
CRYSTAL, MN

Contact Abacus, 5370 52nd Street SE, Grand Rapids, Michigan; (800) 451-4319, and ask about Super Pascal 64 (\$19.95). It implements the full Jensen & Wirth compiler plus extensions for graphics. It has a complete source file editor, a full assembler, and a utility package.

MIDI Info

I am interested in music and would like to get into MIDI. Is there a MIDI system available for the 64?

EDNA WILLIAMS
BRIDGEPORT, CT

Contact Dr. T's Music Software, 100 Crescent Road, Needham, Massachusetts 02194; (617) 455-1454, and ask for its free catalog of MIDI hardware and software. Dr. T offers a 64 MIDI starter pack that includes its Keyboard Controlled Sequencer, a MIDI interface, and two MIDI cables for \$180. A version for the 128 retails for \$275. You'll have to supply your own MIDI keyboard or other MIDI instrument. □

TENEX Introduces: WORLD'S LOWEST PRICE FOR AMIGA 500!

Amiga 500 Computer Basic Package

\$299⁹⁵



Commodore®
AMIGA®

Plus 3 Great Value Packages!

TENEX Bonus Pack

- Amiga 500 Basic Package
- Software Bundle #1
- TV Adapter

Total at Reg. Price \$364.85
Low TENEX Package Price **\$339.95**
You Save \$24.90 More!

TENEX Power Pack

- Amiga 500 Basic Package
- Software Bundle #1
- Software Bundle #2 & Joystick
- TV Adapter
- TENEX 500 Memory Expansion

Total at Reg. Price \$454.75
Low TENEX Package Price **\$399.95**
You Save \$70.75 More!

TENEX Super Graphics Pack

- Amiga 500 Basic Package
- Amiga 1084S Stereo Monitor
- Software Bundle #1
- Software Bundle #2 & Joystick
- TENEX 500 Memory Expansion

Total at Reg. Price \$739.75
Low TENEX Package Price **\$669.00**
You Save \$54.80 More!

Commodore-Ready Printer from Star At An Incredible Price!

\$119⁹⁵

star
THE COMPUTER PRINTER



NX-1000C.

Enjoy near-letter quality at 36 cps and high-speed draft at 144 cps. Features the new paper parking function and convenient front panel controls. Includes four built-in fonts and over 20 typestyles. This is the Commodore-ready version of the NX-1000. Just plug it in and start printing—no additional interfaces or cables required.

NX-1000C Printer	Sug. Retail \$299.00		
	75060	\$179.95	
		SPECIAL! \$119.95	
Ribbon (NX-1000C)	75471	\$5.95	
Dust cover	77789	\$8.95	

OTHER STAR PRINTERS

NX-1001 Multi-Font	90895	\$139.95
NX-2420 Rainbow	A51047	\$284.95
NX-1020 Rainbow	A51027	\$179.95
LaserPrinter 4	A57934	\$799.00

Commodore 64 Computer

Only
\$149⁹⁵



Commodore 1541 II Disk Drive

Only
\$169⁹⁵



Don't miss out on the lowest prices on the Amiga 500, plus a full line of Commodore and Amiga hardware, software, and accessories.

Call today to receive your FREE catalog with the greatest prices on the most popular hardware and software!



TENEX™

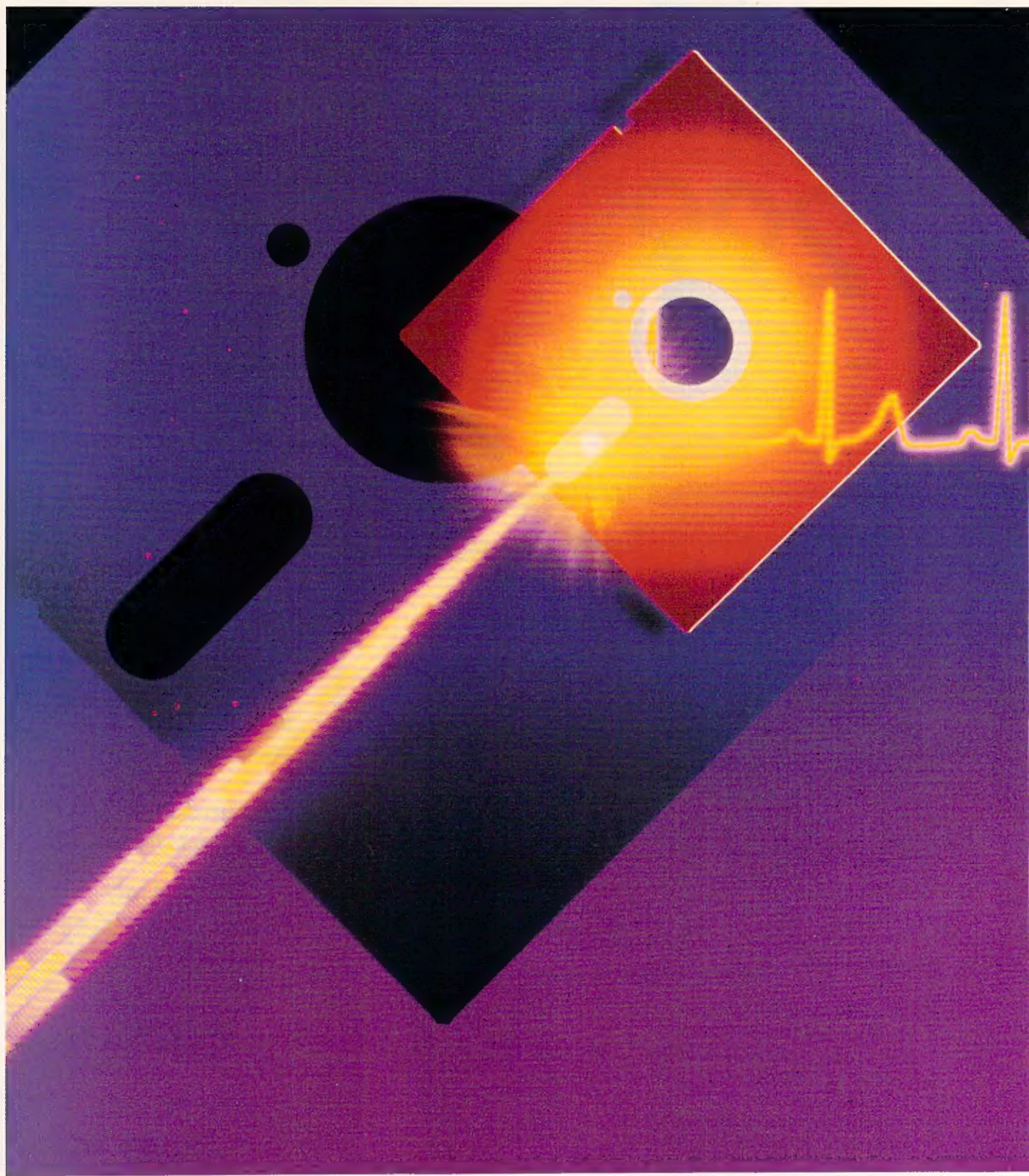
Computer Express
Order Today! Call 1-800-PROMPT-1

56800 Magnetic Drive
Mishawaka, IN 46545
(219)259-7051 FAX (219)259-0300
We gladly accept mail orders!
Circle Reader Service Number 170
(1-800-776-6781)

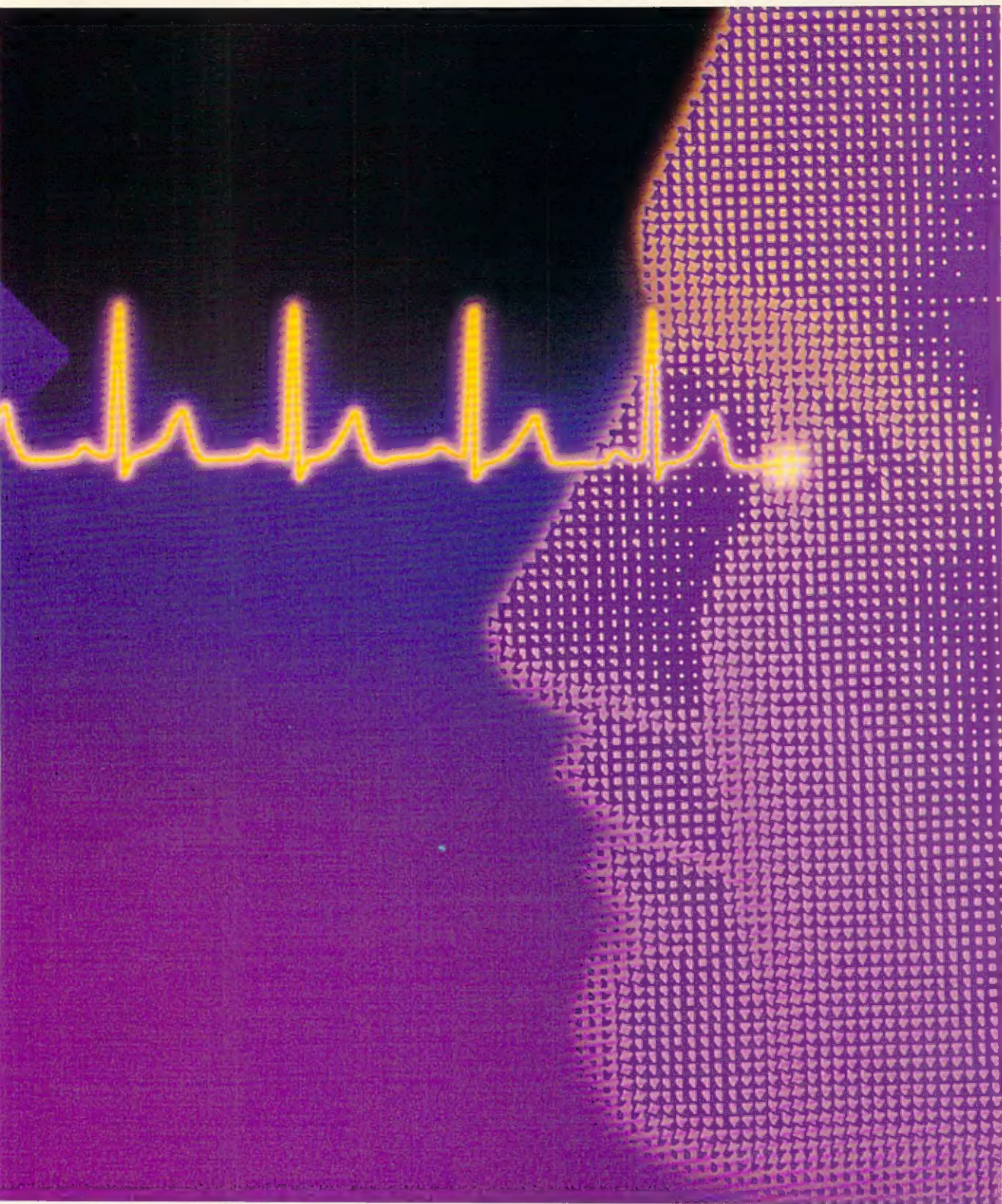


Shipping, Handling, Insurance

Order Amount	Charge
less than \$19.99	\$4.95
\$20.00-\$39.99	\$5.95
\$40.00-\$74.99	\$6.95
\$75.00-\$99.99	\$7.95
\$100.00-\$149.99	\$9.95
\$150.00-\$299.99	\$10.95
\$300.00-\$499.00	\$12.95
\$500.00-\$699.99	\$19.95
\$700.00-\$999.99	\$27.95
\$1000 & Over	2.8% of Order



THE SMALLER, THE



BETTER

FOR GREATER STORAGE CAPACITY IN A
SMALLER PACKAGE, THE 1581 IS
THE BIG DRIVE IN THE LITTLE BEIGE BOX.

BY GEORGE GUNN

The 1581 drive is a great piece of hardware for anyone who owns a 64 or 128, and it's also compatible with Plus/4, Commodore 16, and VIC 20. The 1581 is smaller than either the 1541 or 1571, yet it stores much more data on its disks. The 1581's 3½-inch disk holds nearly a megabyte of information (808,960 bytes). After formatting, 3,160 blocks are available to the user, with 40 blocks reserved for the disk's main directory. On a 1541, this would be equivalent to 4¾ floppies, each with 664 available blocks!

Having all this space makes it possible to store a huge number of files on one disk, but the directory scrolls off the screen if you have more than 22 files. This can make file management particularly difficult.

For this reason, the 1581 has a feature known as partitions. A partition is a space on a disk which the user sets aside for special use. For all intents and purposes, each partition is seen by the computer as a separate disk. Within the limits of certain parameters, you can create numerous partitions on each disk, with each partition containing whatever files you wish. Each partition can also have its own directory. You can even store files with the same filename on the same disk, because the computer thinks each partition is a separate disk drive.

Logical Disk Organization

When creating partitions, it's helpful to remember the 1581's logical disk organization. Although each 1581 disk is double-sided, the computer sees it as single-sided, with 80 tracks per disk (numbered 1-80) and 40 sectors (or blocks) per track (numbered 0-39).

It might be helpful to think of a formatted disk as consisting of a series of concentric circles. Each circle is a track, and each track is divided into several sectors.

Each partition must consist of one or more complete tracks; thus, a partition must be a multiple of 40 sectors in length and must begin on sector 0 of a given track. Remember that track 40 is reserved for the disk's main directory, so tracks 1-39 are available for partitioning, as are tracks 41-80. A partition may not include or pass over track 40.

Creating Partitions

The commands for creating partitions described in the 1581 user's guide are unwieldy and difficult to understand. Of greater help is the Partition Aid program on the demo disk that's supplied with the drive. Through a series of screens and prompts, this program asks for the partition name, beginning

track and sector, and total number of blocks you want in the partition. Suppose you want to create a partition called Arcade Games and set aside 600 blocks for it. After loading and running Partition Aid on the demo disk, you'd be presented with a screen that lists the following options.

1. SHOW PARTITIONS
2. CREATE PARTITIONS
3. DIRECTORY
4. CHANGE UNIT
5. QUIT

Since we don't have any partitions at this time, you'd skip the first choice. Choosing option 2 would take you to the next screen called Create a Partition. Here you'd see the following instructions on your screen.

MODIFYING SPEEDSCRIPT

Most people set their 1541 or 1571 as drive 8 and designate the 1581 as drive 9. If you use SpeedScript, which normally uses drive 8, there was formerly no easy way to save your files to drive 9 and use the 1581 as the data storage device.

Now there's a way to alter the program to access drive 9 instead. This will let you load SpeedScript from a 1541 or 1571 and save data to the 1581. Of course, since SpeedScript is fairly small, you can save this modified version to the 1581 and direct all of its disk commands to drive 9. To accomplish this, load a copy of SpeedScript into memory, but don't run it. Then enter the following two lines below in immediate mode.

**POKE 4843,9: POKE 4908,9: POKE 5274,9:
POKE 5873,9: POKE 5967,9
POKE 6367,9: POKE 6883,9: POKE 7003,9:
POKE 7073,9**

Then save the modified program to disk using a unique filename, such as SPEEDSCRIPT9. All disk commands will now access device number 9. You won't be able to switch at will between drive 8 and drive 9 from within SpeedScript, but you can choose to work from whichever version of SpeedScript you wish. If you try to alter such a program, however, be sure you don't alter your only copy of it. Make a backup copy first.

Of course, you must set the switches on the back of your 1581 to the proper combination. If both of your drives are set to the same device number, your system will lock up.

To set the drive number, turn off your 1581's power and look at the drive from the rear. To set it for drive 8, push both switches to the up position. To set it for drive 9, pull the left switch down and push the right switch up. To set the 1581 to drive 10, set the left switch up and the right one down. Pull both switches to the down position to set it for drive 11.

TO CREATE A SUBDIRECTORY YOUR PARTITION MUST

- (1) START ON SECTOR 0
- (2) BE AT LEAST 120 BLOCKS
- (3) BE A MULTIPLE OF 40 BLOCKS

At the prompt *Enter a partition name*, you would enter *Arcade games*.

Next, you're prompted for the beginning track. Since track 40 is reserved for the disk's directory, it may not be used. The partition may begin on any other track on the disk. This prompt appears onscreen as follows.

FIRST TRACK (1-39 or 41-80)
?

We'll begin this partition on the first track of the disk, so we should enter the number 1. Next, you're prompted for the first sector.

FIRST SECTOR (0-39)
?

For practically all purposes this would be 0, so enter 0 at the prompt.

Finally, you're prompted for the number of blocks you want in the partition. This must be a minimum of 120 and a multiple of 40.

NUMBER OF BLOCKS IN PARTITION
?

We're making a partition of 600 blocks (which, by the way, covers 15 tracks since $600/40=15$), so at this prompt we enter the number 600.

After this last prompt, all the necessary information has been gathered, and we're taken to a third screen, bearing the title *Create a Partition*. At the top of the screen we see the following message.

CREATING PARTITION: ARCADE
GAMES STATUS: 0 OK 0 0

Next, we're asked if we want to make a subdirectory for this partition. For most uses, you'll need a subdirectory, so at the prompt type *Yes*.

This brings up another prompt asking for a directory name. Here you should type the Partition Name *Arcade games*.

Finally we are prompted for the familiar two-character alphanumeric ID, well known to users of CBM BASIC. Let's number this partition 01.

From this prompt, the drive checks its status and tells us to press a key to continue.

We're then returned to the opening screen, where we may exit by pressing number 5. At this point we have placed a partition of 600 blocks on

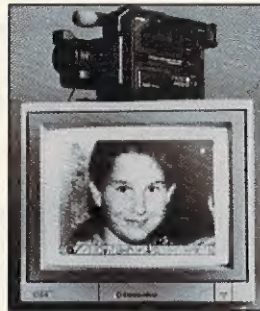
VIDEOFOX

The Tool For Creative Video Buffs

- Generate video titles, opening credits, window advertising, animation or other small trick movies
- All of these exciting effects are easy and fun for you to do with our new Videofox software
- Provides 18 special effects such as scrolling, combing, windshield wiper and spiral mixing
- Mix text, graphics and effects to produce hundreds of combinations
- Independent adjustment of foreground and background colors
- Page flipping in real time for perfect animation sequences

ONLY \$59.95

VIDEO DIGITIZER



- Digitize black and white or color pictures
- Digitize any video source including VCR
- Digitize either 4, 7 or 13 level grey levels
- Menu controled picture brightness
- Includes three independent software programs for total control and editing of digitized images: DIGISON ~ DIGIFOX ~ DIGIMULTI
- Free color filters included for digitizing color images from black and white cameras
- seperate adjustment of brightness levels for each of the red - green - blue primary colors
- Easy transfer of pictures into Pagefox

ONLY \$249.95



HANDYSCANNER 64

The Worlds First Handscanner for the 64!

- Professional quality super high 400 dots per inch resolution ~ Reads the graphics from any printed document
- Converts any material to digitized graphics in seconds ~ B/W setting for crisp reproduction of high contrast line art
- Elaborate grey-tone scale digitizes color or black & white photos using 3 built in dithering settings
- Enlarge or reduce 300% to 33% ~ Graphic memory of 640 X 400 standard (640 X 800 with Pagefox module)
- Included software has all the standard functions of a good drawing program

ONLY \$299.95

PAGEFOX

3 Easy To Use Editors For Perfect Home Desktop Publishing

GRAPHIC EDITOR ~ TEXT EDITOR ~ LAYOUT EDITOR

- Completely menu driven
- 100Kb storage enlargement module keeps entire page in memory
- Uses proportional mouse or joystick for total control over text, graphics or picture

ONLY \$139.95



ACTION REPLAY V 6.0

THE ULTIMATE UTILITY/BACKUP CARTRIDGE FOR THE C64/128

Allows You To Freeze The Action Of Any Memory Resident Program And Make A Complete Backup To Disk

- WARP 25** - The worlds fastest disk serial Turbo
 - Typical backup will reload in under 5 seconds
 - No special formats-save directly into Warp mode
 - Warp Save/Load available straight from BASIC
- RAMLOADER** - Loads most commercial originals 25 times faster than normal!
- UNIQUE CODE CRACKER MONITOR** -
 - Full monitor features
 - See the code in its Frozen state not Reset state

- MORE UNIQUE FEATURES** - Menu driven operation
 - Simple operation: Just press a button at any point
 - All backups reload WITHOUT cartridge at Warp speed
 - Sprite killer: Make yourself invincible-disable collisions
 - Freeze HiRez screen & save in Koala & Paddles format
 - Print out any screen in 16 grey scales
 - 100% compatible with ALL drives and computers
 - Disk utilities: fast format, directory, list and many other commands operated directly from function keys

MIDI 64 -Only \$49.99

- Full specification MIDI at a realistic price
 - MIDI In - MIDI Out - MIDI Thru
 - Works with Sampler and Adv. Music System
 - MIDI CABLES** (4 ft. prof. quality) -Only \$*8.99
- FREE cables when you buy MIDI & ADV. MUSIC at same time

DIGITAL SOUND SAMPLER

Only - \$89.99

THE ADVANCED OCP ART STUDIO

COMPREHENSIVE, USER FRIENDLY ART AND DESIGN SOFTWARE

Only - \$29.99

ADV. MUSIC SYSTEM

Powerful modular program for creating, editing, playing and printing out music

- Playback thru internal sound or external MIDI keyboard/synthesiser
- Print music in proper musical notation together with lyrics using **PRINTER** module
- Enter music a note at a time in written music format using the **EDITOR** or via on screen piano **KEYBOARD** emulator or via an externally connected MIDI keyboard
- Generate almost unlimited sounds with the flexible **SYNTHESIZER** module
- Linker joins files to form large compositions

Only - \$29.99

MAKE THE MOST OF YOUR ACTION REPLAY

GRAPHICS SUPPORT DISK

- View screens in a slide show sequence
 - Add scrolling messages to your saved screens
 - Contains full sprite editor
 - Explodes sections of saved screens to full size
- Only - \$19.99

SUPERCRUNCHER - ONLY \$9.99

Turn your Action Replay into a super powerful program compactor. Reduce programs by up to 50%! Further compact progs already crunched by Action Replays compactor

tracks 1 through 15 of the disk. The first track of this partition will be reserved for the partition's own directory. On the disk's main (root) directory, the partition will show up as the following.

600 "ARCADE GAMES" CBM

Partition from BASIC

The series of prompts in this program makes the process very easy. Of course, you can create partitions from BASIC if you can decipher the following code given in the user's manual.

```
PRINT#file#,"/0:partition name,"+
CHR$(starting track)+ CHR$(starting sector)+
CHR$( < # of sectors)+ CHR$( > # of sectors)+
",C"
```

Especially confusing are the expressions < # of sectors and > # of sectors. Evidently a misprint in the book has placed these two expressions in reverse order. After much experimentation, I've found that they essentially refer to the range of sectors contained in the partition. The expression < # of sectors should refer to the high number of this range (600 in our example above), and > # of sectors should refer to the bottom of this range (0 in our example). However, since a CHR\$ value may fall only within the range of 0-254, any partitions of more than 254 sectors have to use an adjusted value.

The > and < signs actually refer to the high byte and low byte for a given expression. There's a way to calculate values for partitions greater than 254 sectors. If N equals the number of sectors for a partition, the high byte would be represented by INT(N/256). The low byte would be represented by N-(low byte)*256. Thus, for our partition of 600, the high byte is INT(600/256) = 2. The low byte is 600-2*256 = 88. So, to create our partition of 600 blocks, we'd issue the following commands.

```
OPEN 15,8,15
PRINT#15,"/0:ARCADE GAMES,"+ CHR$(1)+
CHR$(0)+ CHR$(88)+ CHR$(2)+ ",C"
```

CHR\$(1) refers to the starting track of 1. CHR\$(0) refers to the partition's beginning sector in track 1. CHR\$(88) refers to the 600 block partition's low byte. CHR\$(2) refers to the 600 block partition's high byte.

Another Format

At this point the required blocks have been set aside as a partition, but the partition can't be used yet. It has to be formatted before you can store files in it even though the disk itself has already been formatted. This creates a partition directory (or subdirectory) on

the first track of the partition. So, with the disk still in the drive, the new partition is selected by the following line.

```
PRINT#15,"/0:ARCADE GAMES"
```

Then the NEW or HEADER commands are used to format this partition area. Enter the following line.

```
PRINT#15,"NO:ARCADE GAMES,01":
CLOSE15
```

CARTRIDGES

In addition to holding more information, the 1581 loads programs significantly faster than the 1541 or 1571. Because of a slightly different DOS than that used in a 1541, the 1581 isn't compatible with some fast load cartridges. I use the Epyx Fast Load Cartridge with my 1541, but it has to be disabled before I use the 1581. There are a couple of fast load programs for the 1581, and these work quite well.

Recently, I bought a Super Snapshot cartridge, after reading that it was compatible with the 1581 drive. After using it for a while, I'm very impressed with the performance of this cartridge. Most of its features work quite well with the 1581. The only shortcoming I've found is that its file utility isn't able to scratch a file from within a partition.

The partition is now ready to be used. We've done in BASIC what the Partition Aid program did for us through a series of easy-to-understand prompts. Files in the partition may now be written to, read from, scratched, renamed, and so on.

If you're interested in constructing your partitions from BASIC rather than using Partition Aid, the following table may prove useful. Consult it for a list of the high byte and low byte values of the given numbers of sectors.

No. of Sectors	High Byte	Low Byte
120	120	0
160	160	0
200	200	0
240	240	0
280	24	1
320	64	1
360	104	1
400	144	1
440	184	1
480	224	1
520	8	2
560	48	2
600	88	2
640	128	2
680	168	2
720	208	2
760	248	2

Partition Management

Now that you have partitions on your disk, how do you make practical use of them? One of the more useful purposes for partitions is grouping similar files. For example, on my SpeedScript word processing disk, I've set up one partition for the word processor itself. I have SpeedScript's accompanying programs and utilities (mail merge, 80-column preview, right margin justified, columns, and so on) in a partition located at tracks 1-8 (320 blocks). In addition, I have made three other partitions out of tracks 9-39 for holding document files. I call these DOCUMENTS1 (tracks 9-19), DOCUMENTS2 (tracks 20-29), and DOCUMENTS3 (tracks 30-39).

In each partition, the first track is reserved for a directory of that partition; the rest of the tracks are available for files. This partition directory doesn't show up when the disk's main (or root) directory is listed. After the partition has been selected, the computer treats that partition as if it were a disk in itself, and its own directory may be listed. On the disk's main directory, partition names are listed like other files, but the three-letter code (PRG, USR, SEQ) for a partition is CBM. Thus, on the word processor disk I described above, the disk's main directory looks like the following.

```
320 "SPEEDSCRIPT"      CBM
400 "DOCUMENTS1"      CBM
360 "DOCUMENTS2"      CBM
360 "DOCUMENTS3"      CBM
5  "CHANGE UNIT"      PRG
51 "1581 FAST LOADER" PRG
1  "1581 PATH"        PRG
12 "COPY 81"          PRG
1651 BLOCKS FREE
```

The first four items are my partitions, the next four items are utilities I commonly use with the 1581 drive that are stored on the unpartitioned part of the disk, and the last item lists the blocks still available.

Partition Selection

Once the disk is inserted in the drive, a partition can be selected from BASIC. The syntax for selecting a partition follows.

```
OPEN 15,8,15,"/0:partition name"
```

Of course, if you're using the 1581 as device 9, you should substitute the number 9 for the 8 in this statement. Once the partition has been selected, you simply work with it as if it were a separate disk of its own, loading, saving, verifying, validating, and so on. All of these commands affect only the selected par-

INTRODUCING

COMPUTE NET

COMPUTE  NET

- About COMPUTE/NET
- Product Ordering
- Feedback Board
- Coming Events
- Monthly Contest



Welcome to the grand opening of COMPUTE/NET. A wealth of information awaits you. Back issues of COMPUTE, hard-to-find computer books, super software, dazzling pictures, challenging games, prizes, a complete bulletin board, and much more are here. You can even talk to the editors and authors of the magazine. Lots of surprises are planned, so keep your eyes on us.

FIND US ON Q-LINK



FREE Q-LINK STARTER KIT. FREE TIME. ORDER TODAY!

Just call our toll-free number or return the coupon, and we'll send you the Q-Link Starter Kit and software free, waive your first month's membership fee, and credit you with one hour of "Plus" time to try the service. Your \$9.95 monthly fee gives you unlimited access to all of our "Basic" services online, including a searchable encyclopedia, AND one free*hour of "Plus" services. After your free hour, you'll pay only \$4.80/hour—just 8 cents per minute—for additional use of the service.

Q-Link is a registered service mark of Quantum Computer Services, Inc.

*Long-distance charges may apply. Surcharges apply if you are a resident of Alaska, Hawaii, or Canada. Allow four to six weeks for delivery.

YES! Send me my FREE Q-Link software, waive my first month's membership fee, and credit me with one FREE* hour of Plus time to explore the service and try COMPUTE/NET.

Name _____

Address _____

City _____ State _____ Zip _____

Home Phone _____



Use of Q-Link requires a VISA, MasterCard, or checking account.

MAIL TO

Q-Link

8619 Westwood Center Drive
Vienna, Virginia 22182-9897

Call 1-800-782-2278, Ext. 2414 today

tion, not the rest of the disk.

With the 64, all of the familiar BASIC 2 commands, NEW, COPY, RENAME, SCRATCH, INITIALIZE, and VALIDATE, which work with the 1541 drive, work with the 1581. If you have a 128, use the BASIC 7.0 commands as with the 1571. A partition's directory may also be listed from within the partition with the standard LOAD "\$",8: LIST.

Rather than using BASIC, I prefer using 1581 Path, a short machine language program that appeared in the June 1990 Gazette. This one-block program offers a simplified syntax for selecting partitions, loading programs, and moving between partitions.

From within your word processor, it's usually quite easy to move from partition to partition. Most word processors have a command for accessing the disk drive. In SpeedScript, the keypress sequence is Ctrl-Å. After pressing these keys you simply type /*partition name* and hit Return. If you need to go to the disk's main directory, enter Ctrl-Å, simply type /, and press Return. This should result in the message 02, *partition selected*.

Using Different Device Numbers

A potential software problem involves programs that routinely access drive 8. If you're using the 1581 as drive 9,

you'll encounter problems. If you're familiar with machine language monitors or disk sector editors, you may be able to modify such programs to work from drive 9. Most programs use the following six-byte combination to open a disk file.

A9 02 A2 08 A0 02

These bytes are the same as the BASIC command OPEN 2,8,2. To access other drives in BASIC, substitute the new drive number instead of using 8. The most recently accessed drive number is stored in memory location 186.

In machine language, therefore, you'd change the *A2 08* to *A2 BA* so the program would load its files from the drive from which you booted it.

Utilities for the 1581

In addition to 1581 Path, which I've already mentioned, the utilities that come on the demo disk supplied with the 1581 are very good. Also, I have found several Gazette programs worthwhile additions to my 1581 library.

Check out 1581 FastLoader (January 1990). This program provides high-speed data transfers that are up to nine times faster than the standard Kernel load routine. It works with both the 64 and 128 and allows you to relocate

the program to nearly any memory location and to create autoboot files.

Copy 81 (November 1989) allows you to copy any BASIC or machine language file from the root or a partition of one disk to the root or a partition of another disk. It also lets you copy files from the root or partition of one disk to another partition on the same disk.

Another helpful program is 1581 Directory Sorter (July 1989). It sorts your directory entries in both alphabetical and reverse alphabetical order. It also allows you to arrange files manually in any order you want. This utility has the ability to detect whether it's running on a 64 or 128 and whether the 128 is in 40- or 80-column mode. In 128 mode, the program uses fast mode whenever possible. Unfortunately, this program works only on the disk's main directory, not on a partition's directory.

All in all, I highly recommend the 1581 drive to all 64 and 128 users. Its speed and storage capacity are immense improvements over the 1541 drive and, to a lesser extent, over the 1571 drive. Rigid-shelled 3½-inch disks are easier to handle and store than vulnerable 5¼-inch floppies. □

George Gunn is a Commodore owner who lives in Redding, California.



PUMP UP YOUR PRODUCTIVITY!

Harness the potential of your 64 and 128 with these powerful programs.

Get more work out of your 64 and 128 with these two new disk products from COMPUTE's Gazette – the 1992 Best of Gazette Utilities, and the Gazette Graphics Grab Bag!

The 1992 Best of Gazette Utilities

Seize control of your operating system and your world!

Here's what's on it—MetaBASIC 64, MetaBASIC 128, Quick, Sprint II, Ultrafont+, RAMDisk 64, RAMDisk 128, BASSEM, SciCalc 64, List Formatter, MegaSqueeze.



The Gazette Graphics Grab Bag

Do it all with Commodore graphics!

Here's what's on it—Starburst Graphics, Screen Designer 128, 128 Graphics Compactor, 64 Animator, VDC Graphics, Dissolve 128, Super Slideshow, 128 Animator, 1526 Print Screen, Supratechnic, Medium-Resolution Graphics, Screen Maker, GAS!64—Special Edition, GAS!128—Special Edition.

**ORDER
THEM
TODAY!**

Extend Your Computer Power With This Powerful Software!

YES!

I want to pump up my productivity! Please send me the disks checked below at \$11.95 each.

The 1992 Best of Gazette Utilities

The Gazette Graphics Grab Bag

Subtotal

Sales Tax (Residents of NC and NY please add appropriate sales tax for your area. Canadian orders, add 7% goods and services tax.)

Shipping and Handling (\$2.00 U.S. and Canada, \$3.00 surface mail, \$5.00 airmail per disk.)

Total Enclosed

Check or Money Order MasterCard VISA

Credit Card No. _____ Exp. Date _____

Signature _____
(Required)

Daytime Telephone No. _____

Name _____

Address _____

City _____

State/Province _____ ZIP/Postal Code _____

MasterCard and VISA accepted on orders with subtotal over \$20.

Mail this coupon to COMPUTE's 1991 Utilities, 324 West Wendover Ave., Ste. 200, Greensboro, NC 27408.

CHIP'S CHALLENGE

If you love puzzles, then Chip's Challenge from Epyx is for you. As the game begins, Chip MacCallahan, a real nerd, finds out he may be able to join his beloved Melinda's computer club, the Bit Busters. However, there's a catch to this offer. He must first complete 144 levels of a maze-like puzzle before he can attain the highest membership privilege of this very exclusive club. (That privilege is to be near Melinda, of course!) Your job is to help Chip complete these levels so he can be close to the love of his life.

The first few levels of Chip's Challenge are easy. But don't be fooled; the game gets more challenging as you progress to the higher levels. Each level is slightly more difficult than the previous one, but you have more than one chance to pass a level. For example, if you get killed by a monster, then you get to try that level again.

Some levels provide hints on what to do; others don't. From time to time you'll encounter levels that seem impossible to pass. Don't lose sleep over this, though. After several tries, the game gives you the option of continuing at this level or going to the next. It's best to avoid both of these options, however. Since scores are based on what level you reach and how quickly you pass to the next level of play, restarting or not completing a level only lowers your score.

If you exit the game for any reason, you don't have to start at the first level. Just remember the code for the level you reached, and you can start again at that point.

Each level has different types of puzzles to solve. No matter what obstacles you encounter, you must pass through a blinking exit to go to the next level. You may have to find your way through a maze in a certain amount of time. At another level, you may have to col-

lected along the way.

There are many items to aid you at each level. Shields are important in that they allow you to walk through fire or even on water. Cleats prevent you from slipping on ice. Another very useful item is a magnet. If you manage to get

you progress to higher levels, you'll know more of what's expected of you and have a better idea of how to solve a particular puzzle. Thus, what you learn from early levels can help later in the game. For example, you may realize that certain creatures move in similar patterns or shoving a particular block on the water will help you build a bridge to cross a moat.

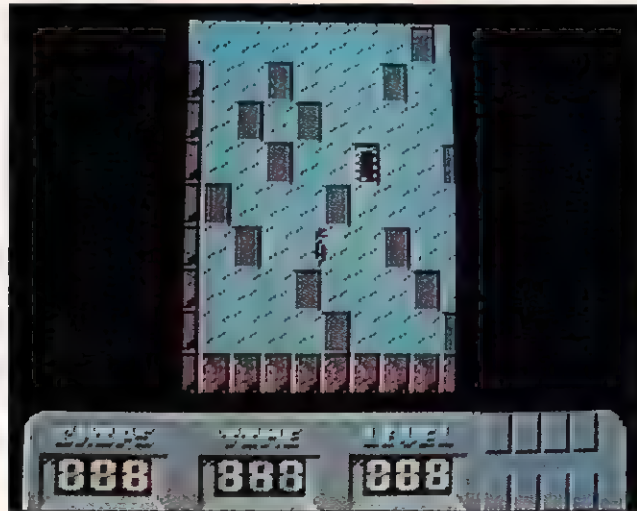
The documentation is brief but effective in getting you on your way to solving the 144 levels of puzzles. After a quick reading, you'll know what to expect and pick up some useful hints. It also provides a list of items and obstacles that you'll encounter while playing the game.

The graphics and sound for Chip's Challenge were average for the 64. Sometimes I found it was hard to tell what an onscreen item was supposed to be. If you have the manual nearby, most of the items in question can be matched to appropriate items from the list. The game's music gets boring after the first ten levels, so I did turn down the volume.

Overall, I rate Chip's Challenge highly. This delightful and interesting one-player game is a lot of fun to play. It'll keep you amused for hours and test your problem-solving skills as well.

Chip really wants to join the Bit Busters to be with Melinda, but he needs your help. Are you up for a real challenge? Chip is anxiously waiting for you at level 1!

CHRIS SAUCIER



You'll find plenty to keep you busy as you try to complete 144 levels of maze-like puzzles in Chip's Challenge.

lect a required number of microchips or other items while avoiding creatures that chase you. Some chips and items may be hidden or placed where they aren't easy to find. You'll have to solve a problem or two to get to these items. For example, walls can appear that were once invisible, or you may have to find a way to cross a castle moat.

Sometimes the order of how you try to accomplish a task is vital. At some of the more difficult levels, more than one type of puzzle must be solved at the same time. An information window always displays your level, the amount of time you have remaining to complete that level, the number of chips still to be collected, and the tools or keys you've

one of these, then you have control on force floors. If you can't get through a colored door, you may need a key of the same color. Colored buttons can also unlock doors for you and sometimes either control the movements of creatures you may encounter or deactivate bombs. Sometimes these creatures are guarding these keys or items you need. Blocks of dirt help you get across water. Numerous teleports jump you to other areas of the puzzle within that same level.

Chip's Challenge is very easy to learn and play. You use your joystick to control Chip's movements. The manual tells you what types of obstacles you'll face, but the experience you gain along the way is important, too. As

Commodore 64 or 128—\$34.95

EPYX
500 Allerton St
Redwood City, CA 94063
(415) 368-3200

Circle Reader Service Number 341

GAZETTE DISK LIBRARY

VALUE-PACKED SOFTWARE AT AFFORDABLE PRICES

All *Gazette* disks are menu-driven for ease of use—and they feature complete documentation. Just load and you're ready to go!

SpeedScript

\$11.95

COMPUTE Publications' most popular program ever. Powerful word processing package includes *SpeedScript* for the 64, *SpeedScript 128*, spelling checkers for both 64 and 128 versions, plus an additional dozen support programs, including mail-merge and word-count utilities.

Gazette Index

\$7.95

Every article and department from *Gazette*—July 1983 through December 1989 issues—is indexed: features, games, reviews, programming, "Bug-Swatter," "Feedback," and the other columns. Disk features pull-down menus, help screens, superfast searching/sorting capabilities, and much more.

Best Gazette Games

\$9.95

Best dozen arcade and strategy games ever published in *Gazette* all on one disk. All games for Commodore 64. Titles: *Crossroads II*; *Pandemonium*, *Basketball Sam & Ed*, *Delta War*, *Heat Seeker*, *Omicron*, *Powerball*, *Q-Bird*, *Trap*, *Arcade Volleyball*, *Mosaic*, *Power Poker*, and *Scorpion II*.

Gazette's Power Tools

\$9.95

Fourteen of the most important utilities for the 64 ever published in *Gazette*. For serious users. Titles: *MetaBASIC*, *Disk Rapid Transit*, *Mob Maker*, *Ultrafont+*, *Quick!*, *Disk Editor*, *Basically Music*, *PrintScreen*, *1526 PrintScreen*, *Fast Assembler*, *Smart Disassembler*, *Comparator*, *Sprint II*, and *Turbo Format*.

The GEOS Collection

\$11.95

Gazette's best 13 programs for GEOS and GEOS 128 users. Selection includes utilities, applications, and games. Titles: *Super Printer Driver*, *Skeet*, *File Saver*, *Help Pad*, *Word Count*, *Directory Printer*, *Quick Clock*, *SlideShow*, *File Retriever*, *Screen Dumper*, *Font Grabber*, *GeoPuzzle*, and *GeoConverter*.

128 Classics

\$11.95

Thirteen of *Gazette's* best 128 programs, including utilities, games, and applications. Titles: *MetaBASIC 128*, *RAMDisk 128*, *80-Column Disk Sector Editor*, *MultiSort*, *Block Out*, *Miami Ice*, *The Animals' Show*, *Cribbage*, *XPressCard*, *Sound Designer*, *Video Slide Show*, *Math Graphics*, and *3-D BarGrapher*.

SPECIAL OFFER!

All 6 DISKS FOR ONLY \$49.95!

A \$13.00 SAVINGS!

All prices include shipping & handling.

- | | | |
|-----------------------|--------------------------|---------|
| SpeedScript | <input type="checkbox"/> | \$11.95 |
| Gazette Index | <input type="checkbox"/> | \$ 7.95 |
| Best Gazette Games | <input type="checkbox"/> | \$ 9.95 |
| Gazette's Power Tools | <input type="checkbox"/> | \$ 9.95 |
| The GEOS Collection | <input type="checkbox"/> | \$11.95 |
| 128 Classics | <input type="checkbox"/> | \$11.95 |
| Special 6-Disk Offer | <input type="checkbox"/> | \$49.95 |

Subtotal _____

Tax* _____

Outside U.S. or Canada** _____

Total _____

Name _____

Address _____

City _____ State _____ ZIP _____

Amount enclosed \$ _____ Method of payment Check or Money Order

VISA or MasterCard

Mail to Gazette Disks (for orders over \$20)
324 W. Wendover Ave., Ste. 200
Greensboro, NC 27408

Credit card no. _____ Exp. date _____

Signature (required) _____

Daytime phone number _____

* Residents of North Carolina and New York add appropriate sales tax. Canadian orders, add 7% goods and services tax.

** For delivery outside the U.S. or Canada, add \$1 for surface mail or \$3 for airmail. All orders must be in U.S. funds drawn on a U.S. bank.

PERFECT PRINT

I love GEOS. I use it all the time, but there's practically no way around the weak link in its system. GEOS dot-matrix printouts look like they've been, well, printed on a dot-matrix printer. Professional Page on Amiga or geoWrite on the IBM use beautiful scalable fonts that make dot-matrix printouts rival laser printouts for quality. With GEOS, unless you have a laser printer, you're stuck with blocky, jaggy, amateurish-looking fonts.

That's all changed now, because Creative Micro Designs, a company that seems determined single-handedly to carry the Commodore computers through the 1990s, has released Perfect Print, a new print package for geoWrite. Its printouts, using the GEOS LQ application, are incredible!

Let's get a few details straight. For one thing, Perfect Print works only with geoWrite. It won't work with geoPublish, no matter how hard we might wish. GEOS LQ, which produces the incredible geoWrite printouts, is only one part of the Perfect Print package.

Also included are a set of HQ (for High Quality) printer drivers and fonts designed to work especially well with each other. These drivers are standard GEOS printer drivers that work with any application, enhancing the printouts by using advanced interpolation techniques. They offer better results than the drivers that come with the GEOS system, even better than double-strike drivers. They aren't the stars of the Perfect Print show, though. You can find printer drivers on QuantumLink that will outperform the ones in the Perfect Print package.

The star of the Perfect Print package is GEOS LQ. Nothing anywhere can beat it. You won't believe it the first time one of these printouts comes slowly (and I do mean slowly) out of your lowly 9-pin workhorse.

I'm not talking about some pattern that's been

der the printhead.

To be fair, there are a few niggling inconveniences. Speed is the primary trade-off, as I mentioned above. A full page from geoWrite can take ten or fifteen minutes to print. Also, larger point sizes don't have the exquisite quality of the smaller ones. As a

This text is formatted in California 10-point. I'm going to print it out using an Epson 24-pin printer and the LQ-1500 printer driver. I'll switch to 14 point, **bold face**, *italics*, and **outline** modes and even print a graphic:



This text is formatted in CaliforniaLQ 10-point. I'm going to print it out using an Epson 24-pin printer and Perfect Print's "GEOS LQ" system. I'll switch to 14 point, **bold face**, *italics*, and **outline** modes, use a fancy-styled font, and even print a graphic:



Here are examples of the way GEOS prints text and graphics (above). Beneath them are similar examples from Perfect Print.

overprinted so many times that all the jaggies have been mashed into the weave of the paper and struck so repeatedly that a small font looks like a smudge. No, this is print with absolutely perfect details, with precise curves and angles—even on a six-point font in italics. I'm talking printouts to die for!

Oh, come on, you say; there must be a catch. The manual is probably sketchy and obscure. The setup procedure probably requires a degree in advanced systems analysis to implement. The thing probably overheats the printer. But, no, the manual is clear and concise. It contains more information than most users will ever need. The setup procedure is straightforward, and your printer won't get hot un-

der the printhead. matter of fact, the larger sizes are basically printed using the same kind of interpolation routine used in the HQ drivers, which is good but not perfect. And while you can use most of the features of geoWrite, you can't use the page, date, or time functions in the header or footer to let the system print those for you automatically.

The only fonts that will print out in such high quality are the specially designated LQ fonts. Of course, there are more than 40 such fonts available with plenty of great designs to choose from. If you're so inclined, you can always convert or create more using the font-creation utilities included on the disk. On top of this, CMD has been actively soliciting some of the leading font designers to con-

vert their fonts to LQ format.

GEOS LQ is one of the more user-friendly programs around. You can start it from within geoWrite, using an included desk accessory. The control panel screen includes features you've probably never considered. The system fully supports both 9- and 24-pin printers, and everything is well explained in the documentation. You need know virtually nothing about control codes or your printer's inner workings to use GEOS LQ.

If you have any technical expertise, though, you'll find it possible to affect the GEOS LQ system at a basic level by changing the configuration files. These files are actually geoWrite documents, containing the various information your system needs to properly use GEOS LQ. Since they're standard geoWrite documents, they can be examined and altered quite easily. Some variations are already included on the disk, such as a file to set page length to label height and another to tell GEOS LQ to look for the fonts on a different drive from the one geoWrite is on.

These nifty touches are just icing on the cake, however. Unless you use GEOS for geoPublish or geoPaint only, you won't want to be without the Perfect Print package. Once again, CMD takes the Commodore and GEOS to unexpected and incredible heights.

STEVE VANDER ARK

Commodore 64 or 128—\$34.95 for all drivers, utilities, and seven fonts; \$29.95 for package with 45 LQ fonts; \$49.95 for all drivers, utilities, and 45 LQ fonts

CREATIVE MICRO DESIGNS
P.O. Box 646
East Longmeadow, MA 01028
(800) 638-3263

Circle Reader Service Number 342

8 BIT
PO BOX 542
LINDENHURST NY 11757-0542

NOW BRINGING YOU GREAT PRICES ON COMMERCIAL SOFTWARE TOO!

DIE HARD \$5.00

BLOCK OUT \$5.00

THESE ARE DEDICATED PROGRAMS, AND COME COMPLETE IN THEIR ORIGINAL PACKAGING.

6 PAC SETS EACH SET \$ 5.00

1: ASST. (StarTrek+)
 2: ADULT IMAGES
 3: EDUCATIONAL
 4: GAMES (Tetris +)
 5: DEMOS/MOVIES
 6: PRODUCTIVITY
 7: GEOS CLIP ART
 8: RECIPES SET
 9: UTILITIES SET
 A: CHRISTMAS
 B: ASST. (Mario +)
 C: MUSIC SET
 D: ART GALLERY
 E: GEOS FILES

CLUB HOUSE SPORTS \$5.00

SEGA 5 PACK \$15.00

MINDSCAPE HANDGRIP JOYSTICK ONLY \$5.00

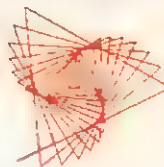
PARADROID \$5.00

INCLUDES THE SEGA HITS OUT RUN, AFTERBURNER, THUNDERBLADE, SHINOBI, AND ALIEN SYNDROME
A \$190 VALUE!

MANY ITEMS ARE CLOSEOUTS, AMOUNT OF STOCK IS LIMITED!
 Add \$1.00 shipping per item ordered*U.S. Funds Only!
SORRY NO C.O.D.'s OR CREDIT CARD ORDERS FOR A FREE COPY OF OUR CATALOG, CALL:
(516)-957-1110 MONDAY - FRIDAY 10 am to 5 pm EST

Circle Reader Service Number 162

Commodore Logo



Just \$19.95!

Why buy Logo? Because it is the best way for you to learn programming and for your kids to explore math and problem solving. Logo is used in schools and colleges across the U.S.

Famous for turtle graphics, Logo lets you draw complex designs with a few simple commands. Easier and more powerful than BASIC, Logo is the perfect language for both beginners and experienced programmers. You'll love Logo's sprites and music, list processing, global and local variables, recursion, and screen editor.

Now, you can buy the complete Commodore Logo for just \$19.95! Two disks plus 380 page Tutorial & Reference Manual. Send your check for just \$19.95 plus \$4.25 s&h, or call with your Visa/MC number. **Call toll-free today!**

1-800-354-2744

Terrapin Software
 400 Riverside St.

(207) 878-8200
 Portland, ME 04103

Circle Reader Service Number 148

SAVE TIME AND MONEY

Yes, save time and money! Subscribe to the *Gazette Disk* and get all the exciting, fun-filled *Gazette* programs for your Commodore 64 or 128—already on disk!

Subscribe today, and month after month you'll get all the latest, most challenging, and fascinating programs published in the corresponding issue of *COMPUTE*.

New on the *Gazette Disk*! In addition to the programs that appear in the magazine, you'll also get outstanding bonus programs. These programs, which are often too large to offer as type-ins, are available only on disk—they appear nowhere else.

As another *Gazette Disk* extra, check out

"Gazette Gallery," where each month we present the very best in original 64 and 128 artwork.

So don't waste another moment. Subscribe today to *COMPUTE's Gazette Disk* and get 12 issues for only \$49.95. You save almost 60% off the single-issue price. Clip or photocopy and mail completed coupon today.

Individual issues of the disk are available for \$9.95 (plus \$2.00 shipping and handling) by writing to *COMPUTE*, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

YES! Start my one-year subscription to *COMPUTE's Gazette Disk* right away for only \$49.95.*

Payment enclosed (check or money order)

Charge MasterCard Visa

Acct. No. _____ Exp. Date _____

Signature _____ (Required)

Name _____

Address _____

City _____

State/Province _____ ZIP/Postal Code _____

Mail to *COMPUTE's Gazette Disk*, P.O. Box 3250, Harlan, IA 51593-2430

*Residents of NC and NY, please add appropriate sales tax for your area. Canadian orders, add 7% goods and services tax.



1991 Gazette Index

Everything's included! Features, games, reviews, education/home applications, programming, bugswatter, feedback, and columns!

A superb interface includes pull-down menus, help screens, and keyboard, joystick, or mouse control. Features include super-fast searching and sorting capabilities. An options screen allows you to choose text colors, drive number, and input device. And there's full documentation on disk.

Choose from three modes of operation—*browse* for quick scanning, *view* for detailed information and descriptions, and *edit* for adding items from upcoming issues—and print to any printer. There's even a turbo-load option for maximum disk-access speed.



To order, send \$7.95 per disk, the quantity of disks ordered, check or money order,* your name and complete street address:

**1991 Gazette Index
324 West Wendover Avenue
Suite 200
Greensboro, NC 27408**

* Please add \$2 shipping & handling (\$5 foreign) for each disk (residents of NC, NJ, NY please add applicable sales tax; Canadian orders, add 7% goods and services tax).

All payments must be in U.S. funds. Please allow 4 weeks for delivery.

REVIEWS

PREDATOR 2

So many computer games based on movies are nothing more than poor games wrapped in catchy visuals and logos from the film they represent. That's why you should be especially careful when buying games of this type. You should look beyond the references to and scenes from the film and search for some indication of what the game's all about.

Predator 2 has a strong basic game element that was adapted to fit the movie's plot. This is the way it's supposed to work. Predator 2 is a four-level shoot-'em-up that puts the player in the heat of battle in 1997 Los Angeles. You play the part of Danny Glover's character in the movie, Detective Lieutenant Mike Harrigan. Your ultimate goal is to beat the Predator creature that is stalking Los Angeles. You must survive four levels of action before the climactic battle. Each level is tougher than its predecessor and gives you less time to breathe. Although Predator 2 isn't difficult to play, only the best of the best will make it through the game. Most of your efforts will be spent trying to surpass your previous score in an attempt to make to the end.

Game mechanics are simple. Move the cross hairs around the sideways-scrolling screen with a joystick (recommended) or keyboard and press the fire button or space bar to fire your current weapon. Take out all the criminals who show signs of resistance and do it quickly. Power items make your stay on the current level more manageable. These include better and faster-firing weapons, body armor, and ammo clips that appear occasionally on the screen. Fire at them to collect them. A wave of criminals at the end of each level usually depletes your reserve lives and eliminates your chance for success. During this last volley, all of your shots must be well placed or the enemy will overwhelm you.

It'll take a few games before you get anywhere with Predator 2. More than any other computer game, good aim and conservation of ammo are extremely important. If you hold down the fire button, your weapon will continue to fire at its maximum rate. The Mark I Assault Shotgun shoots as fast as a machine gun, and it's very tempting to spread your fire. It's important to shoot the enemy in short bursts rather than laying down a constant bombardment because you'll need the firepower later in the level. Therein lies the key to Predator 2. Successful players will

learn to anticipate the enemies' appearances and eliminate the enemies before they get a chance to shoot. The longer you avoid return fire, the longer your current life lasts, and the better your chance at finishing the game.

The four levels are varied, with numerous challenges and unique features. You see the Predator's outline in all of the levels as he stalks his prey, but don't fire at him! If you do, he turns one of his weapons on you instead of the criminals. The first level takes place on the Los Angeles streets, with drug criminals against the police. It's a practice level compared to what's coming next.

The second level thrusts you into the penthouse apartment of the drug lord Ramon Vega. There are more criminals, and they come from all directions. The third level takes place in the subway tunnels. Just as in the real world, the subway's lights affect gameplay, especially when they shut off and you can't see the enemy. If you can survive, you'll soon confront the Predator. The last level opens the doors of a slaughterhouse for your infiltration. This abandoned warehouse is the perfect lair for the Predator. An exciting battle concludes the game—if you can make it this far.

Graphics are standard for Predator 2. This late in the life cycle of the 64, developers are more concerned with providing a good game with good graphics than they are with providing a poor game with great graphics. Predator 2 is the former. You can distinguish the guns before you collect them, but to help the less experienced, the name of each gun appears below it on the screen. An addictive theme tune makes Predator 2 a bit more exciting. Sound effects are fairly common. From a bells-and-whistles point of view, Predator 2 doesn't have much to offer. What shines through is strong gameplay.

Predator 2 is the latest product from the Konami/Image Works partnership for the 64 and 128. It makes good use of the machine's sprite and animation capabilities and packs a lot of fun in a simple game framework.

The constant challenge and addiction most players will find in Predator 2 is especially attractive to diehard shoot-'em-up fans. See if you can take out one of the more intelligent and deadly hunters in the universe!

RUSS CECCOLA

Commodore 64 or 128—\$14.95

KONAMI/IMAGE WORKS
900 Deerfield Pkwy.
Buffalo Grove, IL 60089
(708) 215-5100

Circle Reader Service Number 343



Calc II

The Fastest Spreadsheet for the Commodore 64

Calc II makes your math work a breeze - whether it's a mortgage calculation, budgeting, or keeping sports statistics. Or use it for your non-math chores like organizing phone numbers or making a shopping list!

- Uses Commodore math routines for power and speed • gets results twice as fast as competitor's • Ideal for databases - sort by row or column • View lots of information fast with up to four configurable windows, row and column locking • Quick, responsive cursoring • Independently adjustable decimal places, width and positioning

- of data • Uppercase, lowercase and Commodore graphics all available • Bar graphs on-screen with text • Over two dozen functions, including LOOKUP, AVG, IF, FIND, SIN & FX • 240 rows by 240 columns • Easy to remember commands • Uses disk or tape • Simple worksheet setup • Easy text entry

The Package includes a Detailed User's Guide with quick start info and spreadsheet tips. Also on disk with Calc II, two utility programs and over 40 ready to use worksheets. Only \$29.95 (plus \$4.95 shipping and handling). Please allow 4-7 weeks for delivery.

PANKHURST PROGRAMMING P.O.Box 49135 • Montreal • Quebec • Canada • H1N 3T6

Circle Reader Service Number 152

New for the C128! KeyDOS ROM!

The KeyDOS ROM is a chip for the empty socket inside your C128 and adds more than 40 new instantly available features only a keypress or two away!

20 KeyDOS F keys for simple "point & click" multiple drive access. All major DOS functions: Fast-load C64 programs in 128 mode, view SEQ files, execute batch files. Print, copy, view, scratch or rename multiple files. ASCII/CBM converter. Full 1581 subdirectory support! RAMDOS supports REUs up to 2MB. GEOS RBoot. Disk editor, ML debugger, alarm clock, screen dump editor.

LOTS MORE! Satisfaction Guaranteed! Write for more information. Only \$32.50. See why C128 users say that KeyDOS ROM is a MUST!

Antigrav Toolkit, PO Box 1074, Cambridge, MA 02142

Shipping outside of US, Canada and Mexico add \$3

Circle Reader Service Number 155

LOTS A DISKS! THE BEST in 64/128 PD.
GEOS, Graphics, Clipart, Demos, Games, Bible,
SID/MIDI, Educational, Basic 8
NEW! Graphics Scanning Service

Send stamp for FREE catalog or \$2 for sample disk.

Diskoveries
 The Best
 in PD Software

Diskoveries
 PO Box 9153, Waukegan, IL 60079

Circle Reader Service Number 190

C64/128 PUBLIC DOMAIN SOFTWARE

REQUEST FREE CATALOG or send \$2 for sample disk and catalog (REFUNDABLE). Categories include education, utilities, games, business, PRINT SHOP graphics, pre-tested programs and more. Rent for 75¢ or buy as low as \$1.00 per disk side or for 80¢ for 70 or more. \$20 order gets 4 free disks of your choice.

NEXT DAY SHIPPING!

SINCE 1986



CALOKE INDUSTRIES (Dept. GK)
 PO BOX 18477, RAYTOWN, MO 64133



Circle Reader Service Number 255

KODEKRAKR LTD.

Proudly presents a new innovation in software security check DE-protection! **PASSCODE KRAKR!** removes time consuming and often annoying documentation security checks in many of your games software programs. Lists are continually updated with the latest and greatest software releases available on disk! System also uses parameters which are easily updated with our "newest releases" list. Also available—**THE PARAMETER HOTLINE**—call on us to customize your favorite (registered owners only)! Don't let lost documents ruin another expensive program. TO ORDER CUSTOMIZATION PACKAGE, send \$21.95+\$4.00 S/H to

KODEKRAKR LTD.
 761 Meade Lane • Virginia Beach, VA 23455

Circle Reader Service Number 223

DISKS O'PLENTY INC

7958 PINES BLVD. SUITE 270A
 PEMBROKE PINES FL 33024
 (305) 963-7750

Call or write for free descriptive catalog of
C64/128 Public Domain & Shareware
 Choose from over 900 Disks
 Adult list of over 50 Disks available
 to those 18 or over.

Choose 6 for \$5.00
 LIMITED OFFER

- 021MU SID MUSIC UTILITIES
- 019GR PRINTSHOP UTILITIES
- 019ED JR HIGH EDUCATION
- 062ED HIGH SCHOOL EDUC.
- 033ED TYPING / SPANISH
- 031ED COMPUTER SCIENCE
- 010UT PIRATES TOOLBOX
- 119GA FOREIGN ARCADE
- 022GA CASINO-BOARD GAMES
- 021GE GEOS FONTS
- 002MS LOTTERY PROGRAMS
- 003MS COLLECTORS CORNER

Circle Reader Service Number 253

THE STRATEGY/CAMPAIGN GAMES of JACK O'ROSES ©1992

for play on Commodore 64/128 and Plus 4
 (5 1/4" disc. Specify if for Plus 4)

\$19.00 Each or \$55.00 for all 3!

THE RECENT UNPLEASANTNESS

Individual control of 43 Confederate Divisions/149 Bridges. Could you have turned back the Federal onslaught? Don't re-fight the Civil War, declare your own!

COMSOPAC: The Guadalcanal Campaign

Engage the Imperial Japanese Navy in Ironbottom Sound. Lead air attacks on the "Tokyo Express" in "The Slot". Be with the 1st Marines and American Division along the Tenaru.

MALADAN THE INVADER

You alone, Krysgia, have the political and military savvy to form the Alliance and lead into battle the legions of the nine feudal Lords. Slam-bang medieval combat. Never play the same game twice. Packed with Historical fact.

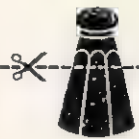
Send check or money order to

JACK O'ROSES

P.O. BOX 144, MIDDLETOWN, PA 17057
 (717)944-5843

(Commodore is a reg. TM of Commodore Business Machines, Inc. who are not responsible for nor affiliated with the application of this software.)

**Go against the grain.
 Cut down on salt.**



Adding salt to your food could subtract years from your life. Because in some people salt contributes to high blood pressure, a condition that increases your risk of heart disease.



American Heart Association

BEGINNER BASIC

Larry Cotton

JOYSTICK OUTPUT

As we all know, the ubiquitous joystick has been around almost as long as the computer. When plugged into one of the 64's two joystick ports, it becomes an input device, translating hand movement to input the computer can use.

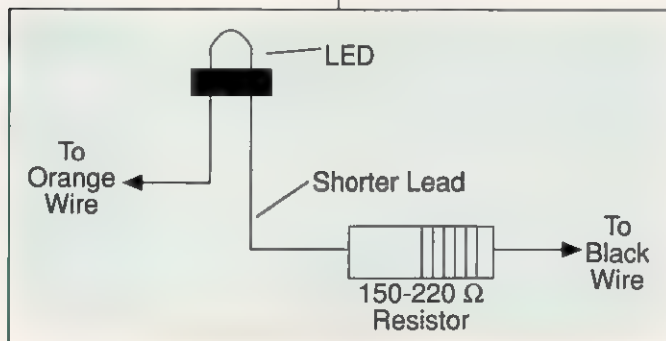
Few people know that joystick ports can also be used for output. Perusing the *Programmer's Reference Guide*, I noticed two little-mentioned memory registers—56322 and 56323—known as Data Direction Registers (DDR) for ports

a 17, bits 0 and 4 will be set for output. (All the rest will be at 0, for input.) Thus, one can independently control each of a particular joystick port's lines. It happens that bit 4 of 56323 controls port 1's fire button line.

How can we put this knowledge to use? Let's do a little work with some hardware. Locate a discarded joystick and remove its cable. If you don't have one, Radio Shack sells a connector (catalogue number 276-1538), but you'll have to wire it yourself.

Most joysticks use six wires

Joystick ports are usually input devices that receive data. Here's an easy way to reverse that flow.



A and B. These are ports 2 and 1, respectively, as labeled on the computer.

These two registers, when properly programmed, have the ability to change a joystick ports' direction of data flow from input to output! Address 56322 controls joystick port 2's memory register 56320; 56323 controls port 1's register at 56321. They behave similarly to the DDR at 56579, which determines whether the user port lines are set for input or output.

Each memory register in the 64 contains one byte, or eight bits. Those bits (numbered 0 through 7) can be controlled independently from BASIC with the Poke command.

If you poke memory register 56323 with a 1, for instance, bit 0 will contain 1; it will be set for output. If you poke it with

within the cable: the ground, the four direction lines (up, down, right, left), and the fire button. The fire button wire is usually orange, and the ground wire is usually black.

Select these two wires and join them with an LED and a resistor, as shown above. Connect the shorter lead of an LED to either end of a 150-220-ohm resistor and the longer lead to the orange fire button wire. Complete the circuit by attaching the free end of the resistor to the black ground wire.

If you don't happen to have LEDs at home, try Radio Shack's super-bright LED, catalogue number 276-087.

Now enter the following.

```
10 NT=900:FT=300:B=3: REM ON  
TIME, OFF TIME, AND NUMBER  
OF BLINKS
```

```
20 POKE56323,17: REM FIRE  
BUTTON OUTPUT, DISABLES  
KEYBOARD, TURNS LED OFF  
30 FORT=1TOFT:NEXT  
40 FORI=1TOB  
50 POKE56321,16  
60 FORT=1TONT:NEXT  
70 POKE56321,0  
80 FORT=1TOFT:NEXT  
90 NEXT  
100 POKE56323,0: REM  
RESTORE TO NORMAL
```

Save the program to disk before going any further!

Memory register 56323 normally contains a 0. Because of the way the 64's keyboard is wired, poking values to that register will interfere with the keyboard's normal operation. To try this, poke a 1 to 56323.

Turn your computer off and on again to restore keyboard operation. Plug the joystick cable into port 1. (That's the port closest to you.) Load and run the above program. The LED should blink three times and possibly will glow softly afterwards. The LED turns off completely when the line is changed to output.

Line 10 defines the constants NT, FT, and B for LED on-time, off-time, and number of blinks. Try changing these values. Line 20 pokes the DDR with a 17, which disables the keyboard and changes the fire button line to output. Poking a 16 works also but leaves the cursor in a strange place.

Lines 30, 60, and 80 control the times the LED is on or off. Line 40 begins a FOR-NEXT loop for the number of blinks; line 90 ends it. Lines 50 and 70 turn the fire button wire on (positive DC voltage) and off (ground potential), respectively. Line 100 restores port 1 to normal operation.

We'll look at more useful applications next month and learn how to control small electrical appliances. □

The GRAPEVINE GROUP Inc.

COMMODORE UPGRADES

NEW POWER SUPPLIES

- A super-heavy, repairable C-64 power supply with an output of 4.3 amps (that's over 3x as powerful as the original). Featuring 1 year warranty ext. fuse schematics. JLT approved. Cost is **\$37.95** and includes as a bonus the Commodore Diagnostic II (valued at **\$6.95**)
- 4.3 amp supply for C-128. Same features as above—**\$39.95** (includes bonus package)
- Our **Biggest Seller** • 1.8 amp repairable heavy duty supply for C-64 (Over 120,000 sold) ... **\$24.95**

EMERGENCY STARTUP KITS

Repair your own Commodore/Amiga and save lots of money. Kits contain all major chips, schematics, diagnostics, etc. No soldering. Send for full details. Five different kits available.

512K RAM EXPANDERS

Super 1750 REU Clone (512K). Does not require a larger power supply. ... **\$142.50**
Original REU-1750 512K Expander Unit ... **\$131.00**

COMMODORE DIAGNOSTICIAN II

Originally developed as a software package, then converted to a readable format, the Diagnostician has become a fantastic seller. With over 38,000 sold worldwide, Diagnostician II utilizes sophisticated cross-reference grids to locate faulty components (ICs) on all C-64 and C1541 computers (C-128/64 mode). Save money and downtime by promptly locating what chip(s) have failed. (No equipment of any kind needed.) Success rate from diagnosis-to-repair is 98%. Includes basic schematic. **\$8.95** (Avail. for Amiga computers with 3^{1/2"} disk at **\$14.95**)

Send For Free 36 Page Catalog

3 CHESTNUT ST. SUFFERN NY 10901
Order Line 1-800-292-7445 Fax 914-357-6243

Hours 9-6 EST M-F 914-357-2424 Prices subject to change

Tell a friend you've heard it through the Grapevine.

Circle Reader Service Number 145

Big Blue Reader 128/64 - 4.0

Transfers word processing, text, ASCII, and binary files between C64/128 and IBM PC compatible 360K 5.25" and 720K 3.5" disks.
NEW Version 4.0 features: Transfers ASCII, PET ASCII and Screen Code files including: WordWriter, PocketWriter, SpeedScript, PaperClip, WriteStuff, GEOS, EasyScript, Fleet System and most others. Supports drives # 8-30. New Backup (C128) and Format (1571/1581) programs. Reads MS-DOS sub-directories, uses joystick, and more.

Includes C64 & C128 programs. Requires 1571 or 1581 Disk Drive.

Big Blue Reader 128/64 - 4.0 only \$44.95

Version 4.0 upgrade, send original BBR disk plus \$18.

Bible Search 3.2

1. Entire Old and New Testament text on 4-1541/71 or 2-1581 disks.
2. Exhaustive English Concordance on 2-1541/71 or 1-1581 disks; includes more than 700,000+ references.
3. Incredible five (5) second look-up time per/word, per/disk.
4. Instant, automatic spell checking of more than 12,800 words.
5. Boolean search options, including AND, OR & NOT logic.
6. Search the entire Bible in 5 seconds with 1581 or HD (v3.52).
7. Money Back Guaranteed!

Includes: C64 & C128 programs; printer and disk output; users guide, disk case. Available on (7) 1541/71, or (4) 1581 disks.

KJV \$49.95 ☆☆☆☆ **NIV \$59.95**

Any questions? Call or write for more information.

Also available! Amiga, Bible Search

Order by check, money order, or COD. US funds only.

FREE shipping in US. No Credit Card orders.

Canada & Mexico add \$4 S/H, Overseas add \$10 S/H (\$5 BBR)
SOGWAP Software (219)724-3900

115 Belmont Road; Decatur, Indiana 46733

Upgrade your Commodore system

Refurbished Hardware

MONITORS	DRIVES	OTHER
1701 - \$235	1541 - \$100	1660 - \$30
1702 - \$255	1541-II - \$120	1670 - \$50
1801 - \$265	1571 - \$165	C64 - \$100
1802 - \$285	1571-II - \$185	64C - \$120
1901 - \$295	1581 - \$180	C128 - \$175
1902 - \$305	1001SFD - \$150	C128D - \$225
1084+ - \$325	1530 DATASETTE - \$35	
MANY BOOKS - \$10	SOFTWARE - \$10-20	

ASK FOR ANYTHING I MIGHT HAVE!!!
J.P. PBM PRODUCTS BY MAIL
P.O. BOX # 1233, STATION B
WESTON, ONTARIO, M9L2R9

New APROTEK modems

64/128/AMIGA-2400 BAUD - \$119
64/128/AMIGA-1200 BAUD - \$89
APROSAND-4 SLOT CARTRIDGE EXPANDER FOR THE 64/128 - \$40
New CMD accessories
JIFFYDOS 64/128 & ANYDRIVE "SYSTEM" - \$85
128D/ANY DRIVE "SYSTEM" - \$95
ADDITIONAL DRIVE ROMS - \$45
RAMLINK/RAMCARD C/M BATTERY (0mb) - \$345
1Mb RAM SIMM - \$75
4Mb RAM SIMM - \$250

SHIPPING INCLUDED FOR CANADA, USA +15%
15 DAY WARRANTY ON REFURBISHED GOODS
TAX - Canada + 7% GST, Ontario Res. + 8% PST

COMMODORE 64 PUBLIC DOMAIN

Highest Quality Since 1987*

Games, Education, Business, Utilities, GEOS, Music, Graphics & More. As low as 90¢ per collection. 1 stamp for complete catalog or \$2.00 for catalog AND 30 sample programs (refundable). 24 hour shipping.

64 DISK CONNECTION

4291 Holland Rd., Suite 562 - Virginia Beach, VA 23452
(* Formerly RVH Publications)

Circle Reader Service Number 254

NUCLEAR SUB COMMAND

Realistic Nuclear Attack Sub Simulation

C64 or 128 In 64 Mode
Command Missions Order The Arctic Sea
Hunt Russian Espyships in The North Sea
Requires C64 GEOS 1.3 or 2.0
\$19.95 Check or Money Order
VMC Software PO Box 326
Cambria Hts. NY 11411



Circle Reader Service Number 171



Can Your
Computer Make
YOU

\$1,000,000?

WITH LOTTERY PC YOUR NEXT TICKET
COULD BE WORTH MILLIONS!

LOTTERY uses the raw power and storage of your computer to determine and refine the number selection methods that will win the various lottery games you play. Don't be limited to the one or two methods that other programs use, they might not work in your state. There is no better system available!

Join the growing list of winners using our system.

SPECIFY:

Lottery 64(C64/128)

Lottery PC

IBM PC/XT/AT and compatibles

Commodore 64/128 & Plus/4 are registered trademarks of Commodore Int
IBM PC/XT/AT are registered trademarks of International Business Machines Inc

To order, send \$29.95 for each plus \$3.00 postage & handling per order to
(Illinois residents add 6% sales tax)
(Orders outside North America add \$3.00)



C.O.D. orders call:
(708) 566-4647



Superior Micro Systems, Inc.

26151 N. Oak Ave.
Mundelein, IL 60050



Circle Reader Service Number 221

MACHINE LANGUAGE

Jim Butterfield

SIMPLE STACK USAGE

The stack is used automatically by many activities. When your program calls a subroutine with JSR, the stack stores the return address. Later, the subroutine returns with RTS, and the stack delivers the stored address. Similar actions take place with RTI and interrupts. In every case, the stack is returned to its former condition automatically when the job is done.

The stack takes care of itself so well that it often remains a mystery to programmers. Since they don't often use the four stack-manipulation commands, programmers feel ill at ease with them. Here are those commands

PHA Push (copy) the contents of A to the stack.

PLA Pull the contents of the stack into A.

PHP Push (copy) the PSW (program status word) to the stack.

PLP Pull the contents of the stack into the PSW.

Using these commands is simple. Do you have something in the A register that you know you will need soon but not right now? Push it to the stack with PHA. You can store it there for a while then bring it back later with PLA. Perhaps you have a condition flag that you'll want to test later in the program but not immediately? Push all the flags with PHP, and bring them back with PLP when you want to test them.

There's only one vital rule that you must follow: If you put it on the stack, you *must* take it off. Leave a messy stack, and your program will crack. The last thing that you pushed

onto the stack is the first thing you must pull. After you push something to the stack, be very careful that your code never branches away, leaving a bad stack in place.

Let's write a small but useful program that uses the stack commands. It's a program to print the contents of a sequential file to the screen or to a printer.

The program will connect to the input file, take a byte, and disconnect. It will then connect to the output file, send that byte, and again disconnect. Then it will test to see if the input has signaled end-of-file (EOF). If not, back we go to do it all again.

The EOF condition is signaled in variable ST (status), address \$90 on current Commodore 8-bit machines. But here's the catch: It's signaled immediately following the input operation. If you examine the logic flow described above, you'll see that we test for EOF after we've performed an output operation. That's the right program point to do the test, but by that time, variable ST will have lost the vital EOF signal that was present after the program performed the input operation.

That means we should test the value of ST immediately after the input but we shouldn't branch based upon that test until a later program point. How may we preserve the condition flags? We do it with the PHP and PLP instructions.

A second problem arises. We read a byte from our input file by means of a call to the Kernal subroutine at \$FFE4. The value is placed into register A, which is just where we'll want it for output. Our next call, however, is to \$FFCC in order to disconnect from the input stream, and that will destroy the contents of the A register. The easiest solution is to preserve A with

the PHA and PLA instructions. Gosh, this is easy. Let's go to the code.

Logical file 1 will have been opened as our input; logical file 2 as our output. First, let's connect to the input stream.

```
2000 A2 01    LDX #$01 ;
           logical file 1
2002 20 C6 FF JSR $FFC6 ;
           connect input
2005 20 E4 FF JSR $FFE4 ;
           input a byte
```

Now we test ST, address 90. A value of 0 means that we aren't at EOF and there are no other problems. Loading ST into the Y register will automatically set the Z flag if the value is 0; otherwise, the Z flag will be cleared. Either way, we'll push the flag to the stack and test it later.

```
2008 A4 90    LDY $90 ;
           read ST (Z flag)
200A 08      PHP ;
           save conditions to stack
```

The byte we received from the input stream is still in the A register. But we're about to make a couple of calls that will wipe it out. So let's put that on the stack, too. Remember that since it's the most recent thing we've put on the stack, it must be the first thing we pull.

```
200B 48      PHA ;
           save input byte
```

Now that the byte is safely stacked, we can disconnect our input.

```
200C 20 CC FF JSR $FFCC ;
           restore default I/O
```

Then we connect to our output stream, logical file 2.

```
200F A2 02    LDX #$02 ;
           logical file 2
2011 20 C9 FF JSR $FFC9 ;
           connect output stream
```

The stack takes care of itself so well that it often remains a mystery to programmers.

SOFTWARE CLOSEOUTS

For Commodore 64 & 128

STRATEGIC SIMULATIONS INC. (SSI) \$19.00 EACH
 Typhoon of Steel, War of the Lance, Curse of Azure Bonds, Pool of Radiance, Countdown to Doomsday, Battles of Napoleon, Tony LaRussa Baseball, B-24, Roadwar 2000, Hillsfar, First over Germany, Heroes of Lance, Pro-Tour Golf Battle for Normandy, Dragons of Flame or Dragonstrike.

MICROPROSE & MICROPLAY \$14.50 EACH
 Acrojet, Destroyer Escort, Netherworld, Rick Dangerous, Top Gunner, Xenophobe, Crusade in Europe, Decision in the Desert, Spitfire Ace Hellicat Ace, Solo Flight, Silent Service, Conflict in Vietnam, Stunt Track Racer, 3D Pool, F-15 Strike Eagle, Airborne Ranger, or Pirates!

ACCOLADE BARGAINS \$5.00 EACH
 PSI 5 Trading Co., Law of the West, Comics, Killed Until Dead, Hardball, Dambusters, Ace of Aces, Fight Night, or Jet Boys

TAITO PREMIUM TITLES \$14.50 EACH
 Alcon, Arkanoed, Arkanoed II, Bubbie Bobbe, Qix Operation Wolf, Rambo III, Rastan or Renegade

ACTIVISION BARGAINS \$5.00 EACH
 Toy Bizarre, Mindshadow, H.E.R.O., Crossbow Championship Baseball Zenji or Powderdrift

ACTIVISION PREMIUM TITLES \$14.50 EACH
 Gee Bee Air Rally, Aliens, Ghostbusters II, Maniac Mansion, Beyond Dark Castle Titanic Space Shuttle, Christmas Model Kit, Mandu's Fight Palace, or Die Hard

MINDSCAPE FOUNDATION \$9.95 EACH
 Mastertype/Writer Bundle, Perfect Score SAT, Shinobi, Gauntlet 2, Bop 'n Rumble, Color Me, Combat Course, Into the Eagle's Nest, Indoor Sports, Boston Computer Diet, Songwriter, Thunderblade, Golden Oldies

COMPSULT
 P.O. BOX 5160
 SAN LUIS OBISPO
 CA 93404-5160

AVOLON HILL GAME COMPANY \$16.00 EACH
 Under Fire, MacBeth, Wooden Ships & Iron Men, Ripper!, Tsushima, Stocks & Bonds, Dr. Ruth, Partisan Kings, Jupiter Mission 1999, T.A.C., Legionnaire, Tournament Golf, Maxwell Manor, Status-Pro Baseball, Gulf Strike, Darkhorn Gudenan Mission on Thunderhead, Panzers East, Super Sunday, or Panzer Jagd

INFOCOM BARGAINS \$5.00 EACH
 Starcross, Suspended, Zork 2 or 3 or Deadline

MORE GREAT DEALS!!!!
 Printed Word or The Tool, by ValueWare \$2.75
 Partner 128 (cartidge for C/128 only), by Timeworks \$17.50
 Ghostwriter 128, by Heavens (C/128 only) \$14.50
 Super Expander 64 (cartidge) by Commodore \$5.00
 Assembler, by Commodore \$5.00
 Pet Emulator, by Commodore \$9.50
 Entertainer or Educator, by ValueWare \$3.75
 Tri-Malaga Turtle Toyland, by HesWare \$4.50
 Attack of the Mutant Camels, cartidge by HES \$3.50

Electronic Zap \$16.50 EACH
 Iron Lord, Puffy's Saga, Skale Wars, B.A.T., Pick N' Pick Chessmaster 2100, by Software Toolworks \$14.50
 Dragon Wars or Neuromancer, Interplay... \$19.50
 Heatwave or Steel Thunder, Accolade... \$16.50

TONS OF ADDITIONAL ITEMS FOR COMMODORE 64/128... IN STOCK NOW!
 CALL (805) 544-6616 TO CHECK TITLES

VISA/MC ORDERS CALL TOLL-FREE
1-800-676-6616
 Credit Card Orders Only!!!! (\$25 minimum)

TO ORDER: Send check or money order including shipping charges of \$5 for U.S.A. \$8 for Canada \$12 all others. California addresses must include 7.25% sales tax. To receive our complete catalog of over 2,000 titles for all computer types, send \$2 in cash or postage stamps. The catalog is FREE with any order. To check for an item not listed here, call (805) 544-6616

WE ALSO CARRY LOTS OF SOFTWARE FOR IBM, APPLE, MAC, AMIGA, ATARI & MORE!

Fun Graphics Machine

FUN GRAPHICS MACHINE (FGM) IS AN "ALL-IN-ONE" GRAPHICS PROGRAM FOR THE C-64, WHAT CAN BE CREATED WITH FGM IS ONLY LIMITED BY YOUR IMAGINATION. JUST A FEW EXAMPLES:



BUSINESS CARDS
 CUSTOM LABELS
 VIDEO TITLING
 NEWSLETTERS
 CALENDARS
 DIAGRAMS
 FORMS

SIGNS
 CHECKS
 OVERLAYS
 BROCHURES
 LETTERHEADS
 CERTIFICATES
 GREETING CARDS
 DISK ENVELOPES



FUN GRAPHICS MACHINE SUPPORTS IMPORTING GRAPHICS AND HI-RES SCREENS FROM MANY POPULAR PROGRAMS INCLUDING:



KOALA
 GEOPRINT
 RUNPRINT
 PRINT SHOP
 ADV OCP ART
 VIDEO BYTE II

HANDYSCANNER 64
 COMPUTER EYES
 PRINTMASTER
 NEWSROOM
 GEOWRITE
 OODLE



GEOS SCREENS CAN BE CAPTURED SIMPLY BY RESETTING COMPUTER THEN LOADING THE FUN GRAPHICS MACHINE.

FGM CLIP ART VOL.1 OVER 200 EXCELLENT GRAPHICS - \$8.00
 FGM FONT DISK OVER 30 FONTS IN FGM FORMAT - \$5.00
 C-64 KEYBOARD TEMPLATE MAKE YOUR OWN OVERLAYS - \$5.00
 C-128 KEYBOARD TEMPLATE MAKE YOUR OWN OVERLAYS - \$5.00
 FGM CALENDAR TEMPLATES DAILY, WEEKLY, MONTHLY - \$5.00

FULL KEYBOARD OVERLAYS FOR THE FOLLOWING PROGRAMS
 CMD'S HARD DRIVE, RAMLINK, RAMDRIVE JIFFY DOS COMMANDS
 SHAP SHOT 5 ACTION REPLAY 4 & 5 EPYX FAST LOAD
 BUSINESS FORM SHOP CALC STAR BASIC ROCK'S ASSEMBLER THE FUN GRAPHICS MACHINE \$3.50 EA
 PLEASE STATE COMPUTER (C64, C128, SX-64) OR C64 IS SHIPPED

The FGM Connection
P.O. Box 2206
Roseburg, OR. 97470

(503)-673-2234

ADD \$3.50 FOR S/H PER ORDER

IF ONLY ORDERING OVERLAYS THEN S/H IS \$2.00 PER ORDER

Now that we've connected, we're ready to output. All we have to do is pull the data byte back and send it.

```
2014 68 PLA
; restore input byte
2015 20 D2 FF JSR $FFD2
; output it
```

We've used the Kernal subroutine at \$FFCC before, to disconnect the input stream. Now we use it to disconnect the output stream.

```
2018 20 CC FF JSR $FFCC
; restore default I/O
```

Now the program is ready to test for EOF. Let's bring back the Z flag that we stashed quite a while ago.

```
201B 28 PLP
; restore condition flags
201C F0 E2 BEQ $2000
; if not EOF, do it again
201E 60 RTS
; else back to BASIC
```

The BASIC code pokes the machine language code in

place, opens the input and output files, and then calls the machine language with a SYS command. When the ML program returns control, BASIC closes the two files.

This example of stack usage runs on all recent Commodore 8-bit computers. To run this program on the older CBM and PET computers, change the value 144 to 150 in line 100 and the value 4388 to 4396 in line 250.

```
100 DATA 162,1,32,198,255,
32,228,255,164,144,8,
72,32,204,255
110 DATA 162,2,32,201,255,
104,32,210,255,
32,204,255,40,240,
226,96
200 FOR J=8192 TO 8222
210 READ X
220 POKE J,X
230 T=T+X
240 NEXT J
250 IF T<>4388 THEN STOP
300 INPUT "NAME OF INPUT FILE";F$
310 OPEN 15,8,15
320 OPEN 1,8,3,F$
330 INPUT# 15,E,$,E1,E2
```

```
340 IF E<>0 THEN PRINT
E;$;E1;E2:STOP
350 INPUT "OUTPUT TO
SCREEN OR PRINTER";D$
360 D$=LEFT$(D$,1)
370 IF D$="S" THEN
A=3:GOTO 400
```

```
380 IF D$="P" THEN A=4:GOTO
400
390 GOTO 350
400 OPEN 2,A
410 SYS 8192
420 CLOSE 2
430 CLOSE 1
```

TYPING AIDS

MLX, our machine language entry program for the 64 and 128, and *The Automatic Proofreader* are utilities that help you type in Gazette programs without making mistakes. To make room for more programs, we no longer include these labor-saving utilities in every issue, but they can be found on each *Gazette Disk* and are printed in all issues of *Gazette* through June 1990.

If you don't have access to a back issue or to one of our disks, write to us, and we'll send you free printed copies of both of these handy programs for you to type in. We'll also include instructions on how to type in Gazette programs. Please enclose a self-addressed, stamped envelope. Send a self-addressed disk mailer with appropriate postage to receive these programs on disk.

Write to Typing Aids, COMPUTE's Gazette, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

GEOS

Steve Vander Ark

IN SEARCH OF A BETTER DESKTOP

Which GEOS application do you use the most? You might think it's geoWrite, but it's the deskTop. The deskTop lets you erase and copy files, page through disk directories, and load and run applications. The deskTop is like home base—where you go when you click on Quit.

Whenever you hit a quit button, GEOS looks for and runs the file called DESKTOP. Obviously, it wouldn't do to have an unsuspecting user rename his or her deskTop. That's why it's invisible to the system and why it isn't called an application in its info box. It's a GEOS system file 4, which is a file type you can't rename.

The deskTop, especially the 2.0 version, is very efficient, but it has some faults. Moving from page to page on the notepad, for example, is a fairly slow process, since the system must load each page and its icons separately. Also, the deskTop provides only marginal support for a third disk drive and until recently provided none at all for devices such as CMD's RAMLink.

Over the years, programmers have created several different file-handling applications to supplement the deskTop. These programs buy speed by using text instead of icons to list files. Most of them patch the GEOS system with a different filename so that a Quit command returns you to them instead of the deskTop. Here's a list of such programs.

DualTop. DualTop, as its name implies, does the deskTop one better by displaying the directories of two disks side by side. Standard file functions are accomplished by highlighting the filename and then clicking on one of the buttons on the screen. DualTop

supports three drives, including RAM drives.

On Q-Link, the 128 version is called 128DTV27.SFX, uploaded by RedSonia. DUALTOP is the 64 version, uploaded by JBUS.

WormDesk. This program provides all normal file functions, as well as an elaborate view system. The directory displayed can consist of only one type of file at a time. This usually is fine, but once in a while it's nice to be able to peruse an entire directory, an option not available on WormDesk.

The Q-Link filename is WORMDESK5.0, uploaded by geoWorm. It's for the 64 only.

QwikTop. The QwikTop screen is divided into eight boxes, each of which displays the files from a single page of the deskTop's notepad. The result is that you get to see seven pages at once, plus the border, with filenames shown in text. QwikTop saves space by including only the most often-used file functions, but the fact that you can view most of a disk's files at once and move them around from page to page almost instantly makes this one a joy for those of us who like to organize our disks. This one's a winner!

Q-Link filenames are QWIKTOP, uploaded by IL-LINI70, and QWIKTOP128.2, uploaded by GEOREP JIM.

Mini-Desk. This Jim Collette masterpiece is a desk accessory which provides access to a few essential file-handling options while you're within another application. I find this nifty program especially helpful when I'm working on a project where the application and the document are both in RAM. Mini-Desk lets me copy the file I'm working on to another drive, assuring me of a current copy even if the power fails.

Released as part of CommPlex Software's GeoWizard disk, the entire package is

\$16.95 from CommPlex Software, 6782 Junction Road, Pavilion, New York 14525.

Switcher. To avoid the delay while one application quits to the deskTop and another one loads, Switcher avoids the deskTop and provides a dialog box from which to open the next application. This isn't really a full-fledged deskTop replacement, but if your work requires moving from program to program, Switcher will certainly keep you jumping. Its very small size makes it a boon for single-drive geoPublish users. Its Q-Link filename is SWITCHER 1.3, uploaded by Student t.

gateWay. GateWay is more than a deskTop alternate. It's a full-blooded replacement with lots of great features. Until recently, gateWay was the only file-handling system which supported CMD's RAM-Link and RAMDrive. For more information, see the Gazette review (November 1991).

GateWay (\$29.95) is available in 64 and 128 versions from Creative Micro Designs, P.O. Box 646, East Longmeadow, Massachusetts 01028.

geoShell. GeoShell takes the GEOS environment full circle, replacing the graphics interface of the deskTop with text commands. While this might seem to you like a step backwards, the many hot-key commands and the speed of this program might instead lead you to decide that it's the most efficient file-handling routine around. For example, by typing the filename of a file on the current disk and pressing Return, geoShell quickly scans the directory and then loads and runs the file. There's no need to page through a slew of icons or scroll through a directory.

For more information about geoShell, contact Maurice Randall, 215 East Harris, Charlotte, Michigan 48813. □

The GEOS deskTop is a very efficient program, but it has its faults. Here's a look at some deskTop alternatives.

The Gazette Productivity Manager

(Formerly PowerPak)

Harness the productivity power of your 64 or 128!

Turn your Commodore into a powerful workhorse, keep track of finances, generate reports in a snap, manage your money in minutes—all with the new 1991 *Gazette Productivity Manager!* Look at all your 64/128 *Productivity Manager* disk contains.

GemCalc 64 & 128—

A complete, powerful, user-friendly spreadsheet with all the features you'd expect in an expensive commercial package (separate 64 and 128 versions are included). Most commands can be performed with a *single* keypress!

Memo Card—Unleashes the power of a full-blown database without the fuss! **Nothing's easier**—it's a truly simple computerized address file. Just type in your data on any one of the index cards. Need to edit? Just use the standard Commodore editing keys. Finished? Just save the data to floppy. What could be easier?

Financial Planner—Answers all of those questions concerning interest, investments, and money management that financial analysts charge big bucks for! You can plan for your children's education and know exactly how much it will cost and how much you need to save every month to reach your goal. Or, decide whether to buy or lease a new car. Use the compound interest and savings function to arrive at accurate estimates of how your money will work for you. **Compute the answer at the click of a key!**

DON'T MISS OUT ON THIS POWERFUL WORKHORSE!



**ORDER YOUR
1991 GAZETTE
PRODUCTIVITY
MANAGER
TODAY!**

(MasterCard and Visa accepted on orders with subtotal over \$20).

YES! Please send me ___ *Productivity Manager* disk(s)
(\$14.95 each).

___ Subtotal

___ Sales Tax (Residents of NC and NY please add appropriate sales tax for your area. Canadian orders, add 7% goods and services tax.)

___ Shipping and Handling (\$2.00 U.S. and Canada, \$3.00 surface mail, \$5.00 airmail per disk.)

___ Total Enclosed

___ Check or Money Order ___ MasterCard ___ VISA

Credit Card No. _____

Signature _____ (Required)

Daytime Telephone No. _____

Name _____

Address _____

City _____

State/Province _____ ZIP/Postal Code _____

Send your order to Gazette 1991 Productivity Manager,
324 W. Wendover Ave., Ste. 200, Greensboro, NC 27408.

D'IVERSIONS

Fred D'Ignazio

DIGITAL IMMORTALITY

When I was a child, I used to think I was immortal. I couldn't die. This type of attitude naturally led to several life-threatening experiences, such as jumping off roofs, almost getting hit by cars, and climbing on cliffs. I concluded that my surviving these activities demonstrated my invulnerability.

When I grew older and had experienced the deaths of my uncle, a favorite grandmother, and a few assorted movie stars and pets, I grew wiser. I realized that maybe I wasn't immortal. Maybe I could die. But, heck, I was young. Death was probably 50, 60, maybe 80 years away. I was hopeful. Someone was bound to discover a cure for old age way before I got close to dying.

I clung to this notion of a fountain of youth for quite a few years, but now it's starting to dry up. It's getting harder to believe in medical miracles. I'm 43, and there doesn't seem to be a miracle drug on the horizon. In fact, things seem to be getting worse. With the upsurge in crime, violence, AIDS, and so on, I feel far more at risk now than I did when I was younger.

The other night I was watching television, feeling kind of blue, and I spotted a commercial that features Elton John playing alongside Louis Armstrong, Humphrey Bogart, and James Cagney. Through special digital techniques, movie images of these long-dead superstars have been added to a new ad that features a very much alive Elton John.

The next night I tuned into the Grammy Awards and saw Natalie Cole win a Grammy for her song "Unforgettable." To create this version, she used digital techniques to weave her father's original song into

a new recording in which the two of them sing a duet. Nat King Cole is dead, but that didn't stop his daughter from resurrecting his unforgettable solo and changing it into a hauntingly beautiful father-daughter masterpiece.

Both of these instances qualify as digital immortality. I know that Cagney, Bogart, Cole, and Armstrong are dead, but I did see and hear them on television the other night in new productions.

The Elton John commercial and the Natalie Cole song have been so successful that they're sure to spawn a host of imitations. Television companies, movie houses, and ad agencies will search their archives to resurrect film stars, political figures, authors, athletes, heroes, villains, and saints to mix their images with contemporary media figures. We'll soon be flooded with songs and commercials digitally combining the dead and the undead: Marilyn Monroe with Madonna, W. C. Fields with Danny DeVito, Lou Gehrig with Jose Canseco, Teddy Roosevelt with George Bush, Steve Martin with the Three Stooges.

In fact, virtual immortality is nothing new. We've been getting accustomed to it for years. What's the effect of media stars dying? If they're popular, it doesn't mean that we no longer see them. All it means is that we don't get any new material. We still see reruns of their best work.

Are Bing Crosby and Danny Kaye gone? It doesn't seem like it after I've watched *White Christmas*. What about Judy Garland? Not after seeing *Wizard of Oz* with my three-year-old. How about Spencer Tracy, John F. Kennedy, or Jim Morrison? It's hard to imagine Lucille Ball gone after watching one of her wonderful "I Love Lucy" episodes.

The truth is that my memory of a star's death pales in comparison to the vivid, poignant evidence of his or her survival on the television or movie screen. The stars seem still alive when I see them in the midst of news programs, sitcoms, and commercials that feature the products and celebrities of the here and now.

This brings me to my own death, or, hopefully, my own virtual immortality. I may give up on cryogenics, miracle drugs, and fountains of youth, but I might still achieve immortality through multimedia.

I can see a whole new industry springing up as funeral homes retrofit middle-aged and older Americans with digital re-creations of their lives. They can interview us to capture our voices and images. They can scan in photographs and digitize home movies and audio tapes to capture us during our youth and our adulthood. They can embed us in the era in which we lived and put a spin on the whole presentation. How do we want to be remembered? Nostalgically? Romantically? Dashingly? Respectfully? Producers at multimedia funeral homes will be able to remaster our lives digitally and dramatize them according to our wishes.

"This is Your Life, Fred D'Ignazio." That's what I'll get. I'll pay about a thousand dollars. It'll take only a couple of days to create at the local funeral home equivalent of a one-hour Insty-Prints or Moto-Photo. I'll be packaged on CD-ROM. I'll get a dozen copies to distribute to my wife, children, and close friends. Whenever they miss me or want to remember how I was, they'll boot up my disc in their computer, and I'll spring to life, just like Bogart, Armstrong, Cagney, and Cole.

I'll be immortal. I won't notice, but others will. □

Don't let death act as an obstacle to your future. Use multimedia as a springboard to immortality.

PROGRAMS

POP-UP

By Richard Penn

While entering data for an applications program, you suddenly need to make a calculation. You press a key, call up a calculator screen, determine the answer that you need, and then continue with your main program.

The telephone rings while you're working on a report, and you need to check a date while discussing an appointment. You press a key, call up a calendar, and then return to your report.

Afterward, prior to printing your report, you call up a smart help screen—one that knows you're ready to print and displays only a summary of printer commands, not the ten previous pages of instructions that you don't need.

If you think this sounds like something only an expert programmer could do in machine language, you're wrong. Pop-Up allows you to add pop-up desk tools to BASIC programs as easily as writing a GOSUB subroutine, and it lets you call them with a single command!

Typing It In

Pop-Up consists of three programs. The first is the actual machine language routine, so you'll need to use MLX, our machine language entry program to enter it. See "Typing Aids" elsewhere in this section. When MLX prompts you, respond with the values given below.

Starting address: C000

Ending address: C607

Before exiting MLX, save a copy of this program with the name POP-UP. The enclosed demonstration program looks for that name when it runs.

A second machine language program contains sprite data for an on-screen calculator that's used in the demonstration program. Again, you'll need MLX to type it in. When MLX prompts you, respond with the following values.

Starting address: 3E00

Ending address: 3FFF

When you've finished typing, be sure to save a copy of the program as CALCULATOR.SPR.

Finally, Demo is a BASIC program

that shows how to use Pop-Up. To prevent typing errors, enter it with The Automatic Proofreader; see "Typing Aids" again elsewhere in this section.

Put It to Work

To use Pop-Up in your own applications, add lines 30-40 of Demo to the beginning of your BASIC programs. Now let's take a look at how it works.

Two Commands

Pop-Up works by setting up a branch key. Whenever f1 is pressed, the running BASIC program is suspended, and execution branches to a selected line. This subroutine, which runs independently with its own variables, contains the code for the pop-up tool. Pressing f1 again returns you to the main program without a hint that anything ever happened. Think of it as a powerful GOSUB key that jumps to a subroutine with its own screen, VIC-II chip, and variables.

There are only two commands to learn. The first, SYS 49752, *line*, enables Pop-Up and selects the line to branch to. This command should be used at the beginning of your program. The second command, SYS 49877, disables Pop-Up.

Programming Desk Tools

A BASIC routine for an accessory such as a calculator is practically no different from any other subroutine, except that you must write it as a stand-alone program that loops endlessly. Think of an accessory as a new program that runs from the main program whenever you press f1. This new program continues until you press f1 again to exit. You'll see a programming example of this by using a calculator in Demo.

When you press f1, the machine language routines save all important information about the main program, such as BASIC pointers, screen and color memory, the VIC-II chip, and variables. Then BASIC jumps to the subroutine selected by the SYS 49752, *line* command and executes it, just as if RUN were typed. This subroutine has its own variables (2559 bytes stored at memory locations 50689-53247) that are cleared each time you press f1. The display, however, isn't cleared, so

your pop-up tools can be printed over the current screen for a window effect. The only quirk is that the cursor is positioned one column to the right of the home location whenever f1 is pressed the second time.

No changes made to the screen or sprites by the subroutine called by Pop-Up are permanent. Pressing f1 again restores the original program and screen. The only exception is the SID chip, which cannot be peeked and therefore cannot be saved.

More Than One

What if you want several accessories? Include a menu at the beginning of the Pop-Up subroutine for the user to select. You might include a calculator, calendar, and notepad.

When programming Pop-Up tools, it's best to write them separately and then merge them with your main program once they're debugged. This is because only the main set of variables is available to the BASIC editor. If you press Run/Stop while a Pop-Up subroutine is running and then type PRINT A, the value of A in the main program, not the subroutine, will be returned.

Also, note that a renumbering utility won't recognize the new SYS 49752, *line* command. You'll have to change its line number yourself.

Smart Help Screens

Suppose you have a two-part program in which you first enter data and then print a report. Some programs offer a help key, and dumb help screens are always displayed in the same sequence. That means users who need information about printing but don't need help for entering data have to see the data-entry help screen anyway because it comes first. Smart help screens eliminate flipping through unwanted screens because they know where you are in a program and only display relevant information.

Programming them with Pop-Up is easy. In our example program, you might insert the command POKE 679,1 at the beginning of the data-entry routine, and POKE 679,2 at the start of the report-printing routine.

The help screen subroutine (called with f1) would check location 679 with a line such as IF PEEK(679)=1 THEN

PROGRAMS

2000 : REM PRINT DATA ENTRY HELP SCREEN. If it contained a 1, the data-entry help screen would be printed. If location 679 held a 2, the program would jump to 3000 where a report help screen would be displayed. For a longer program, just include more flags and IF/THEN statements.

New Look and Feel

Pop-Up gives BASIC a new look and feel. Never before could software written in BASIC be so user-friendly, nor did the BASIC programmer have so much power at his fingertips. The possible click-on accessories are limited only by your programming ability.

Even if you don't want to program your own accessories, you can use the demonstration's Pop-Up calculator in your own programs by including lines 20-60 and 1000-1390.

POP-UP

```
C000:A2 02 B5 00 9D FD A2 E8 1D
C008:E0 FB D0 F6 A9 FF 85 FB D6
C010:A9 00 85 FC A9 F6 85 FD 19
C018:A9 A3 85 FE A0 00 B1 FB 5C
C020:91 FD E6 FD D0 02 E6 FE 02
C028:E6 FB D0 02 E6 FC A5 FB C8
C030:C9 10 D0 EA A5 FC C9 03 1B
C038:D0 E4 A9 00 85 FB A9 04 04
C040:85 FC A9 07 85 FD A9 A6 87
C048:85 FE B1 FB 91 FD E6 FD 92
C050:D0 02 E6 FE E6 FB D0 02 52
C058:E6 FC A5 FB C9 E8 D0 EA 7F
C060:A5 FC C9 07 D0 E4 A9 00 0B
C068:85 FB A9 D8 85 FC A9 EF D1
C070:85 FD A9 A9 85 FE B1 FB 8B
C078:91 FD E6 FD D0 02 E6 FE 5A
C080:E6 FB D0 02 E6 FC A5 FB 21
C088:C9 E8 D0 EA A5 FC C9 DB 82
C090:D0 E4 A2 00 BD D0 9D 35
C098:D7 AD E8 E0 2F D0 F5 BA FF
C0A0:8E 06 AE A9 36 85 01 A2 C7
C0A8:02 BD 00 A0 95 00 E8 E0 04
C0B0:D9 D0 F6 A2 F3 BD 00 A0 93
C0B8:95 00 E8 E0 FB D0 F6 A9 EA
C0C0:EB 85 FB A9 A0 85 FC A9 72
C0C8:FF 85 FD A9 00 85 FE B1 CB
C0D0:FB 91 FD E6 FD D0 02 E6 01
C0D8:FE E6 FB D0 02 E6 FC A5 6B
C0E0:FB C9 6D D0 EA A5 FC C9 3F
C0E8:A2 D0 E4 AE FC A2 A9 37 74
C0F0:85 01 9A A9 F6 8D 24 03 9C
C0F8:A9 C1 8D 25 03 A9 13 8D 36
C100:77 02 A9 0D 8D 78 02 A9 C1
C108:02 85 C6 A9 1A 8D 02 03 6F
C110:A9 C2 8D 03 03 A2 1A B5 87
C118:D8 09 80 95 D8 CA D0 F7 3F
C120:A2 08 BD F7 07 9D EA C5 78
C128:CA D0 F7 4C 31 EA A9 36 C7
C130:85 01 A2 02 BD FD A2 95 EB
C138:00 E8 E0 FB D0 F6 A9 FF 87
C140:85 FB A9 00 85 FC A9 F6 25
```

```
C148:85 FD A9 A3 85 FE A0 00 E6
C150:B1 FD 91 FB E6 FD D0 02 F0
C158:E6 FE E6 FB D0 02 E6 FC 05
C160:A5 FB C9 10 D0 EA A5 FC 6A
C168:C9 03 D0 E4 A9 00 85 FB 4E
C170:A9 04 85 FC A9 07 85 FD BC
C178:A9 A6 85 FE B1 FD 91 FB BF
C180:E6 FD D0 02 E6 FE E6 FB 2E
C188:D0 02 E6 FC A5 FB C9 E8 3B
C190:D0 EA A5 FC C9 07 D0 E4 AC
C198:A9 00 85 FB A9 D8 85 FC 1A
C1A0:A9 EF 85 FD A9 A9 85 FE 83
C1A8:B1 FD 91 FB E6 FD D0 02 49
C1B0:E6 FE E6 FB D0 02 E6 FC 5D
C1B8:A5 FB C9 E8 D0 EA A5 FC 50
C1C0:C9 DB D0 E4 A2 00 BD D7 F0
C1C8:AD 9D 00 D0 E8 E0 2F D0 91
C1D0:F5 AE 06 AE A9 37 85 01 DC
C1D8:9A 4C F3 C5 EA EA A9 1A
C1E0:83 8D 02 03 A9 A4 8D 03 F7
C1E8:03 A9 57 8D 24 03 A9 F1 8E
C1F0:8D 25 03 4C 31 EA A9 57 89
C1F8:8D 24 03 A9 F1 8D 25 03 5A
C200:08 A9 00 20 90 FF 28 20 EA
C208:60 A6 AD EB C2 85 15 AD DF
C210:EC C2 85 14 20 A6 A8 4C E7
C218:AE A7 78 8D E9 C2 8E EA 29
C220:C2 A9 83 8D 02 03 A9 A4 CE
C228:8D 03 03 A9 57 8D 24 03 6C
C230:A9 F1 8D 25 03 A9 00 8D 57
C238:E7 C2 A9 36 85 01 A2 2D 9D
C240:BD FD A2 95 00 E8 E0 39 70
C248:D0 F6 A9 37 85 01 AD E9 12
C250:C2 AE EA C2 58 4C 83 A4 0C
C258:A9 EE 85 FB A9 C2 85 FC 3F
C260:A9 00 85 FD A9 A0 85 FE 25
C268:A0 00 B1 FB 91 FD E6 FD 84
C270:D0 02 E6 FE E6 FB D0 02 76
C278:E6 FC A5 FD C9 FD D0 EA 18
C280:A5 FE C9 A2 D0 E4 20 FD 54
C288:AE 20 8A AD 20 F7 B7 A5 8F
C290:14 8D EC C2 A5 15 8D EB D5
C298:C2 A9 00 8D E7 C2 78 A9 A7
C2A0:AB 8D 14 03 A9 C2 8D 15 9A
C2A8:03 58 60 A5 C5 CD E8 C2 26
C2B0:F0 20 8D E8 C2 C9 40 F0 A5
C2B8:19 C9 04 D0 15 AD 8D 02 47
C2C0:D0 10 AD E7 C2 49 02 8D B3
C2C8:E7 C2 FD 03 4C 00 C0 4C 71
C2D0:2E C1 4C 31 EA 78 A9 31 38
C2D8:8D 14 03 A9 EA 8D 15 03 DF
C2E0:A9 00 8D E7 C2 58 60 00 A3
C2E8:04 40 00 03 EA FF 94 FF 31
C2F0:00 AA B1 91 B3 22 22 00 DA
C2F8:00 4C 00 FF 00 04 00 00 A1
C300:02 00 7F CB 19 16 00 0A 60
C308:76 A3 04 EA 0B 00 00 00 3B
C310:76 A3 B3 BD 51 00 00 00 98
C318:00 01 08 01 C6 01 C6 01 B9
C320:C6 FF CF 00 00 FF CF FA 9F
C328:FF FA 00 4F 0C 5C 4E D3 A5
C330:17 03 02 53 41 24 18 1E 62
C338:18 FF 0B 00 00 00 1E 18 81
C340:00 03 4C B7 00 00 69 17 77
C348:62 17 00 00 00 00 00 0A D0
C350:76 A3 19 00 00 00 00 90 AF
C358:CB 7A 00 00 00 76 00 80 BE
C360:A3 E6 7A D0 02 E6 7B AD 20
C368:06 02 C9 3A B0 0A C9 20 B1
C370:F0 EF 38 E9 30 38 E9 D0 19
```

```
C378:60 80 4F C7 52 58 40 FF 2B
C380:00 00 55 FF 00 00 00 00 B2
C388:03 00 00 80 00 00 00 24 BD
C390:6C 55 00 00 00 00 00 00 A3
C398:00 00 00 00 D6 17 00 00 33
C3A0:3C 03 00 00 00 06 00 60 7F
C3A8:08 FA 9F 00 00 00 00 E6
C3B0:A0 01 08 04 00 00 00 0C 26
C3B8:00 04 00 02 20 00 00 00 62
C3C0:04 00 00 27 00 85 00 FF D2
C3C8:00 00 FF FF 00 00 FF FF 50
C3D0:00 00 FF FF 00 00 FF FF 58
C3D8:00 20 20 34 39 37 35 35 F5
C3E0:00 30 30 30 30 FF 00 00 FE
C3E8:FF FF 00 00 FF FF 00 00 70
C3F0:FF FF 00 00 FF FF 00 00 78
C3F8:FF FF 00 00 FF FF 00 00 80
C400:FF FF 00 00 FF FF 00 00 89
C408:FF FF 00 00 FF FF 00 00 91
C410:FF FF 00 00 FF FF 00 00 99
C418:FF FF 00 00 FF FF 00 00 A1
C420:FF FF 00 00 FF FF 00 00 A9
C428:FF FF 00 00 FF FF 00 00 B1
C430:FF FF 00 00 FF FF 00 00 B9
C438:FF FF 00 00 FF FF 00 00 C1
C440:FF FF 00 00 FF FF 00 00 C9
C448:FF FF 00 00 FF FF 00 00 D1
C450:FF FF 00 00 FF FF 00 00 D9
C458:FF FF 00 00 FF FF 00 00 E1
C460:FF FF 00 00 FF FF 00 00 E9
C468:FF FF 00 00 FF FF 00 00 F1
C470:FF FF 00 00 FF FF 00 00 F9
C478:FF FF 00 00 FF FF 00 00 02
C480:FF FF 00 00 FF FF 00 00 0A
C488:FF FF 00 00 FF 7D EA 00 DD
C490:FF 00 22 0E BC 81 7D EA 11
C498:7D EA 00 17 C8 0E BC 81 86
C4A0:85 BD 0C BD BA 0E 0F FF E5
C4A8:7D EA 02 07 20 21 DA E4 7C
C4B0:0D 07 FF 7D 78 85 01 00 36
C4B8:22 CF E5 00 0A 14 E1 64 CC
C4C0:A5 85 A4 81 F4 17 81 80 B2
C4C8:00 00 00 01 86 60 00 00 18
C4D0:00 00 01 0C 74 A7 79 A6 9A
C4D8:9C 2C 9E 35 32 30 39 35 DC
C4E0:00 35 00 00 00 00 00 00 B7
C4E8:2E 4F 42 4A 22 2C 38 2C A8
C4F0:31 00 00 00 00 00 00 00 13
C4F8:00 00 00 00 00 00 00 00 82
C500:00 00 00 00 00 00 00 00 8B
C508:00 00 00 00 00 00 00 00 93
C510:00 00 00 00 00 00 00 00 9B
C518:00 00 00 00 00 00 00 00 A3
C520:00 00 00 00 00 00 00 00 AB
C528:00 00 00 00 00 00 00 00 B3
C530:00 00 00 00 00 00 00 00 BB
C538:00 00 00 00 00 00 00 00 C3
C540:00 00 00 00 00 00 00 00 CB
C548:00 00 00 00 00 00 00 00 D3
C550:00 00 00 00 00 00 00 00 DB
C558:00 00 00 00 00 00 A0 00 65
C560:0E F6 04 0A 00 02 10 00 F9
C568:00 48 EB 00 00 00 00 00 83
C570:00 00 00 00 00 00 00 00 FB
C578:00 00 00 00 00 00 00 00 04
C580:00 A9 57 8D 24 03 A9 F1 AC
C588:8D 25 03 A9 00 85 15 A9 09
C590:64 85 14 20 A6 A8 4C AE 53
C598:A7 00 00 00 00 00 00 00 F7
C5A0:00 00 00 00 00 00 00 00 2C
```

```

C5A8:00 00 00 00 00 00 00 00 34
C5B0:00 00 00 00 00 00 00 00 3C
C5B8:00 00 00 00 00 00 00 00 44
C5C0:00 00 00 00 00 00 00 00 4C
C5C8:00 00 00 00 00 00 00 00 54
C5D0:00 00 00 00 00 00 00 00 5C
C5D8:00 00 0B E3 83 A4 7C A5 61
C5E0:1A A7 E4 A7 86 AE CB 00 01
C5E8:00 B0 DA 56 00 9F 04 74 5C
C5F0:6B 8E 53 A2 08 BD EA C5 3D
C5F8:9D F7 07 CA D0 F7 4C DF BD
C600:C1 00 00 00 00 00 00 00 6E

```

```

3FB8:AA AA AA AA 5A 5A 5A C0 E8
3FC0:55 55 55 6A AA AA 6A AA 10
3FC8:AA 6A AA AA 65 55 55 65 C7
3FD0:55 55 65 55 55 65 55 91
3FD8:6B FF FF 6A AA AA 6A AA 33
3FE0:AA 6A AA AA 6A A5 5A 6A 58
3FE8:A5 5E 6A A5 5E 6A A5 5E BF
3FF0:6A AB FE 6A AA AA 6A AA 95
3FF8:AA 6A AA AA 6A A5 5A A5 AB

```

DEMO

```

FF 20 POKE53280,0:POKE53265,11
      :POKE53281,0:PRINT"(CLR)
      ":POKE53265,27
BA 30 POKE147,0:SYS57812"POP-U
      P",8,1:SYS62631
FX 40 POKE147,0:SYS57812"CALCU
      LATOR.SPR",8,1:SYS62631
EH 50 :
EB 60 SYS49752,1020:REM ENABLE
      POP-UP AND SET LINE TO
      {SPACE}BRANCH TO
MJ 70 :
KC 80 AS="{RED}{13 SPACES}COPY
      RIGHT 1992"+CHR$(13)
GE 90 AS=AS+"{4 SPACES}COMPUTE
      PUBLICATIONS, INTL, LTD
      "+CHR$(13)
EC 100 AS=AS+"{10 SPACES}ALL R
      IGHTS RESERVED":FORT=1T
      06:AS=AS+CHR$(13):NEXT
MI 110 BS="{YEL}{9 SPACES}POP-
      UP DEMO PRESS <F1>":FOR
      T=1TO6:BS=BS+CHR$(13):N
      EXT
AX 120 FORT=1TOLEN(AS):PRINTMI
      D$(AS,T,1);:FORDL=1TO40
      :NEXT:NEXT
GP 130 FORT=1TOLEN(B$):PRINTMI
      D$(B$,T,1);:FORDL=1TO40
      :NEXT:NEXT
MM 140 GOTOL20
PM 150 :
PP 1000 REM POP-UP CALCULATOR
SX 1010 :
DQ 1020 V=53248:POKEV+21,0:S=2
      55:FORT=2040TO2047:POK
      ET,S:S=S-1:NEXT
AX 1030 FORT=39TO46:POKEV+T,12
      :NEXT:POKEV+37,15:POKE
      V+38,11:POKEV+28,255
DQ 1040 S=0:FORT=0TO6STEP2:POK
      EV+T,32+S:S=S+48:NEXT
HK 1050 S=0:FORT=8TO14STEP2:PO
      KEV+T,32+S:S=S+48:NEXT
RM 1060 FORT=1TO7STEP2:POKEV+T
      ,98:NEXT:FORT=9TO15STE
      P2:POKEV+T,140:NEXT
ES 1070 POKEV+29,255:POKEV+23,
      255:POKEV+21,255
GJ 1080 PRINT"{HOME}{5 DOWN}":
      FORT=1TO7:PRINT"
      {RIGHT}{23 SPACES}":NE
      XT
QA 1090 POKEV+27,255:PRINT"
      {HOME}{7 DOWN}"TAB(15)
      "{2}C 7 8 9":PRINT
KK 1100 PRINTTAB(4)"{RED}M+ *
      {SPACE}+ *(3 SPACES)

```

CALCULATOR.SPR

```

3E00:5E 5E B0 5E 5E B0 5E 5E 10
3E08:B0 BE BE B0 AA AA B0 AA 7B
3E10:AA 00 FF FF F0 00 00 00 95
3E18:00 00 00 00 00 00 00 00 94
3E20:00 00 00 00 00 00 00 00 9C
3E28:00 00 00 00 00 00 00 00 A4
3E30:00 00 00 00 00 00 00 00 AC
3E38:00 00 00 00 00 00 00 3F F3
3E40:AA 5E 5E AA 5E 5E AA 5E 40
3E48:5E AA BE BE AA AA AA AA 62
3E50:AA AA FF FF FF 00 00 00 CC
3E58:00 00 00 00 00 00 00 D4
3E60:00 00 00 00 00 00 00 DC
3E68:00 00 00 00 00 00 00 E4
3E70:00 00 00 00 00 00 00 EC
3E78:00 00 00 00 00 00 5A 4F
3E80:5E 5E 5E 5E 5E 5E 5E 5E FC
3E88:5E BE BE AA AA AA AA A7
3E90:AA AA FF FF FF 00 00 00 0D
3E98:00 00 00 00 00 00 00 15
3EA0:00 00 00 00 00 00 00 1D
3EA8:00 00 00 00 00 00 00 25
3EB0:00 00 00 00 00 00 00 2D
3EB8:00 00 00 00 00 00 5A 8F
3EC0:6A A5 5E 6A A5 5E 6A A5 6F
3EC8:5E 6A AB FE 6A AA AA 6A 32
3ED0:AA AA 7F FF FF 00 00 00 3D
3ED8:00 00 00 00 00 00 00 55
3EE0:00 00 00 00 00 00 00 5D
3EE8:00 00 00 00 00 00 00 65
3EF0:00 00 00 00 00 00 00 6D
3EF8:00 00 00 00 00 00 00 75
3F00:55 55 50 AA AA B0 AA AA 4B
3F08:B0 AA AA B0 5A 5A B0 5E E5
3F10:5E B0 5E 5E B0 5E 5E B0 08
3F18:BE BE 00 AA AA B0 AA AA 7E
3F20:B0 AA AA B0 5A 5A B0 5E FD
3F28:5E B0 5E 5E B0 5E 5E B0 20
3F30:BE BE 00 AA AA B0 AA AA 96
3F38:B0 AA AA B0 5A 5A B0 A5 5D
3F40:55 55 55 AA AA AA AA 14
3F48:AA AA AA AA 5A 5A EA 25
3F50:5E 5E EA 5E 5E EA 5E 92
3F58:EA BE BE AA AA AA AA 7E
3F60:AA AA AA AA 5A 5A AA FC
3F68:5E 5E AA 5E 5E AA 5E A1
3F70:AA BE BE AA AA AA AA 76
3F78:AA AA AA AA 5A 5A C0 2B
3F80:55 55 55 AA AA AA AA 54
3F88:AA AA AA AA 55 55 55 07
3F90:55 55 55 55 55 55 55 0F
3F98:FF FF FF AA AA AA AA C1
3FA0:AA AA AA AA 5A 5A 5A 6E
3FA8:5E 5E 5E 5E 5E 5E 5E 27
3FB0:BE BE BE AA AA AA AA C0

```

```

DH 1110 {2}. 4 5 6":PRINT
      PRINTTAB(4)"{RED}MR /
      {SPACE}- *(3 SPACES)
      {2}0 1 2 3"
QX 1120 GOSUB1280
QM 1130 RT=V:O1$=OP$
JC 1140 GOSUB1290:V1=V:O2$=OP$
BK 1150 IFO1$="+THENRT=RT+V1
BE 1160 IFO1$="-THENRT=RT-V1
MS 1170 IFO1$="*THENRT=RT*V1
CH 1180 IFO1$="/ANDV1=0THEN12
      10
SR 1190 IFO1$="/THENRT=RT/V1
SP 1200 IFLEN(STR$(RT))<12THEN
      1230
HG 1210 PRINT"{HOME}{7 DOWN}
      {2 RIGHT}{6 SPACES}ERR
      OR":GETAS:IFAS<>"
      {HOME}"ANDAS<>"(CLR)"T
      HEN1210
XM 1220 GOTOL120
GA 1230 PRINT"{HOME}{7 DOWN}
      {2 RIGHT}{11 SPACES}":
      PRINT"{HOME}{7 DOWN}"T
      AB(13-LEN(STR$(RT)))RT
AK 1240 IFO2$<>"=THENO1$=O2$:
      GOTOL140
RB 1250 POKE198,0:WAIT198,1:GE
      TA$:IFA$="=THEN1250
GP 1260 IFA$="+ORA$="-ORA$="
      *ORA$="/THENO1$=A$:G
      OTOL140
HF 1270 D$="":C=0:DP=0:Z=0:GOS
      UB1310:GOTOL130
XD 1280 PRINT"{HOME}{7 DOWN}
      {2 RIGHT}{BLU}
      {10 SPACES}0"
GE 1290 D$="":B$="{11 SPACES}":
      C=0:DP=0:Z=0
MP 1300 POKE198,0:WAIT198,1:GE
      TA$
BM 1310 IFA$="{HOME}"ORA$="
      {CLR}"THENCLR:GOTOL120
QC 1320 IFZAND(A$="+ORA$="-O
      RA$="*ORA$="/ORA$="=
      ")THENOP$=A$:V=VAL(D$)
      :RETURN
ME 1330 IFA$="."ANDDP=0THENDP=
      1:GOSUB1370:GOTOL360
PK 1340 IFASC(A$)<48ORASC(A$)>
      57ORC>9THEN1300
DG 1350 IFA$="0"ANDDP=0ANDVAL(
      D$)=0THENGOSUB1390:GOT
      OL300
DE 1360 D$=D$+A$:PRINT"{HOME}
      {7 DOWN}"TAB(2)LEFT$(B
      $,11-LEN(D$))D$:C=C+1:
      Z=1:GOTOL300
SD 1370 IFVAL(D$)=0THEND$="0":
      C=1:Z=1
JG 1380 RETURN
RA 1390 PRINT"{HOME}{7 DOWN}
      {2 RIGHT}{10 SPACES}0"
      :Z=1:RETURN

```

Richard Penn is a prolific Commodore programmer who lives in Montreal, Quebec, Canada.

MIMIC 128

By Joseph Sheppard

I set out to design this diversion just to show my parents that all my hours in front a computer weren't a waste of time. Mimic 128 does a good job of showing off how easy it is to use the 128's sound and graphic commands in BASIC.

Mimic 128 is a simple but entertaining game that's similar to the hand-held electronic game Simon Says. The computer lights one of four colored panels at random and plays a corresponding musical tone. You're to press the joystick up, down, left, or right to light the same panel in response. If you're successful, the computer will repeat the sequence, adding an additional panel each time to the series. The object is to mimic the computer, lighting the same sequence of panels.

Entering the Program

Mimic 128 is written entirely in BASIC 7. To help avoid typing errors, enter the program with The Automatic Proofreader; see "Typing Aids" elsewhere in this section. Be sure to save a copy of the program to tape or disk before you exit Proofreader.

High Scores

For those with a competitive nature, Mimic 128 has a high-score sequential file named MM.HS that keeps track of the best player's name, date, and the number of panels he or she has properly responded to. The first time the program is run, MIMIC searches for this file. Since no such file exists, the first player will beat a high score of 0. The first player is guaranteed a spot on the disk for at least one session, no matter how badly he or she plays.

Tape Support

Players using tape drives should modify the OPEN statements in lines 35 and 30120 to ,1 instead of ,8. Also, tape users should immediately play a game to establish the high-score file directly behind the section of tape where the game file has been saved.

After you finish a game, the computer will check to see if you made the high score. If so, you'll be asked for the appropriate information. After a game, you'll be presented with a menu whose choices consist of Try again,

Continue, and End. Select Continue if you wish to continue with the current game. The computer won't accept a high score based on the continuation of an old game, however. Try again starts a new game, and End returns you to BASIC.

One last note: Be sure to explore the sound capabilities of your machine. Feel free to alter the sound envelopes, producing different tones and sounds for each panel. You can also make the final sound of the game (the one generated when you mess up) a little less dramatic and frightening.

MIMIC 128

```
MM 5 REM COPYRIGHT 1992 - COMP
UTE PUBLICATIONS INTL LTD
- ALL RIGHTS RESERVED
CG 10 DIM MD$(60),MC(60),MC$(6
0)
QR 20 COLOR0,1:COLOR4,1
EE 30 PRINT"{CLR}":PRINT"DIFFI
CULTY LEVEL (1-EASIER TO
5-BORING)":GETKEYDL
RE 32 IFDL<LORDL>5 THEN30
FG 35 OPEN2,8,2,"MM.HS,S,R"
RB 36 INPUT#2, ZN$(1),ZZ$(1),Z
D$(1)
PG 37 DCLOSE
MB 38 ZZ(1)=VAL(ZZ$(1))
SJ 60 PRINT"{CLR}":FORZ=1TO12:
PRINT:NEXTZ:PRINT"
{12 SPACES}SETTING UP BO
ARD":PRINT"{10 SPACES}TE
N SECONDS, PLEASE.":SLEE
P2
QE 70 FAST
RR 80 GOSUB10000
HP 90 SLOW
QS 100 NT=RND(TI):NT=INT(RND(1
)*4+1)
XA 110 NT$=STR$(NT)
RQ 120 IFNT=1THENNN$="C":X=17:
Y=9:C=6
QX 130 IFNT=2THENNN$="D":X=26:
Y=12:C=7
JK 140 IFNT=3THENNN$="E":X=17:
Y=15:C=8
PX 150 IFNT=4THENNN$="F":X=9:Y
=12:C=3
EF 160 MS$=MS$+NN$
FK 170 COLOR2,2:FORZ=1TO600:NE
XTZ:GOSUB20000
SA 180 A$=""
KS 190 FORT=1TO(LEN(MS$))
MM 200 MC(T)=JOY(2)
MX 202 IFMC(T)=1THENMC$(T)="C"
:X=17:Y=9:C=6:GOTO210
GD 203 IFMC(T)=3THENMC$(T)="D"
:X=26:Y=12:C=7:GOTO210
QS 204 IFMC(T)=5THENMC$(T)="E"
:X=17:Y=15:C=8:GOTO210
JA 205 IFMC(T)=7THENMC$(T)="F"
:X=9:Y=12:C=3:GOTO210
```

```
HS 206 GOTO200
SS 210 IFMC$(T)<>MD$(T)THEN240
SD 220 CHAR2,X-1,Y,"CORRECT"
KJ 221 PLAYMC$(T)
GA 222 FORZ=1TODL+75:NEXTZ
XK 224 COLOR3,C
KR 226 CHAR3,X-1,Y,"{7 SPACES}
",1
CF 234 A$=A$+MC$(T)
JP 236 NEXTT
DA 238 IFAS$=MS$THEN100
XQ 240 SOUND2,2500,60,2,2470,2
,1,3048
SH 243 SOUND3,2000,50,2,,3,3
QF 990 PRINT"YOU GOT";LEN(MS$)
-1,"CORRECT!":SLEEP3
XK 994 IFQQ=0THENGOSUB30000
GK 995 FORZ=1TO24:PRINT:NEXTZ:
INPUT"{BLU}DO YOU WISH
{SPACE}TO (T)RY AGAIN,(
C)ONTINUE{3 SPACES}OR (
E)ND";MS
KJ 996 IFM$="T"THENQQ=0:PRINT:
PRINT:PRINT:A$="" :MS$=""
":PRINT:PRINT:PRINT:GOT
O100
SQ 997 IFM$="C"THENQQ=1:PRINT:
PRINT:PRINT:GOTO170
GG 998 GRAPHIC0,1:END
QJ 10000 REM ***{2 SPACES}GRAP
HIC SETUP{2 SPACES}**
*
MH 10001 REM ***{2 SPACES}PLAY
ING BOARD{2 SPACES}**
#
HQ 10005 GRAPHIC4,1,23:COLOR1,
2
SH 10100 WIDTH2:DRAW1,28,46TO7
3,46TO78,53TO83,46TO1
27,46TO142,75TO142,12
3TO127,152TO83,152TO7
8,145TO73,152TO28,152
TO14,125TO14,74TO28,4
6:WIDTH1
FW 10110 DRAW1,51,66TO105,66TO
85,90TO71,90TO51,66
AR 10120 DRAW1,72,109TO84,109T
O104,132TO51,132TO72,
109
EH 10130 DRAW1,95,93TO115,75TO
129,75TO129,123TO115,
123TO95,105TO95,93
GC 10140 DRAW1,61,105TO61,93TO
41,75TO29,75TO29,123T
O41,123TO61,105
AQ 10200 COLOR1,16:COLOR2,3:CO
LOR3,7
GR 10210 PAINT2,50,100,1
ED 10220 PAINT3,101,100,1
DG 10230 COLOR2,6:COLOR3,8
ES 10240 PAINT2,60,75,1
SB 10250 PAINT3,75,120,1
GD 10300 CHAR1,17,12,"MIMIC"
AB 10999 RETURN
FR 20000 REM{2 SPACES}***
{2 SPACES}LIGHT UP PA
NEL{2 SPACES}***
RB 20100 FORT=1TOLEN(MS$)
KK 20110 MD$(T)=MID$(MS$,T,1)
```

```

GH 20120 NEXTT
HD 20130 FORT=1TOLN(MSS)
JD 20140 PLAYMDS(T)
BD 20142 IFMDS(T)="C"THENX=17:
Y=9:C=6
DD 20144 IFMDS(T)="D"THENX=25:
Y=12:C=7
QH 20146 IFMDS(T)="E"THENX=17:
Y=15:C=8
XC 20148 IFMDS(T)="F"THENX=9:Y
=12:C=3
RQ 20150 CHAR2,X,Y,"PRESS"
KM 20160 FORZ=1TODL*100:NEXTZ
QB 20170 COLOR3,C
AS 20180 CHAR3,X,Y,"{5 SPACES}
",1
ER 20190 NEXTT
FG 20199 RETURN
JP 30000 MS=LEN(MSS)-1
EM 30010 IFMS<ZZ(1) THENRETURN
QD 30020 GRAPHIC0,1
DK 30030 PRINT"{RED}CONGRADULA
TIONS! YOU HAVE JUST
{SPACE}BEAT THE
{2 SPACES}PREVIOUS RE
CORD OF"
BF 30040 PRINT"{GRN} ";ZZ(1);"
{RED} SET BY {GRN}";Z
NS(1);" {RED}ON {GRN}
";ZDS(1);"{RED}"
CX 30050 GETKEYAS
RA 30060 PRINT:INPUT"WHAT IS Y
OUR NAME";ZNS(1)
ER 30070 INPUT"WHAT IS TODAY'S
DATE";ZDS(1)
PA 30080 ZZ(1)=MS:GS=CHRS(13)
JB 30100 PRINT:PRINT"{BLU}ONE
{SPACE}MOMENT; SAVING
SCORES..."
RP 30110 SCRATCH"MM.HS"
RJ 30120 OPEN2,8,2,"MM.HS,S,W"
EE 30130 PRINT#2,ZNS(1)GS ZZ
(1)GS ZDS(1)
QS 30140 DCLOSE
HK 30150 GRAPHIC4,0,23
AD 30160 RETURN

```

Joseph Sheppard lives in West Fork, Arkansas.

SPEEDPURGE

By Daniel Lightner

SpeedCheck is a popular utility program that checks for misspelled words in any SpeedScript word processing document. It examines text word by word, comparing words in the document with entries in its dictionary. If the program comes across a word it doesn't recognize, it highlights the word on your screen so that you can correct any misspellings immediately. If SpeedCheck comes across a correctly spelled word that isn't in its dictionary, it will also highlight that word. These new words can then be added to

SpeedCheck's dictionary. As you work with SpeedCheck, you can create your own personalized dictionary disks, which may contain thousands of words.

Words on the SpeedCheck dictionary disk are kept in sequential files, with one file for each of the 26 letters of the alphabet. As new words are added, they are tacked onto the end of the appropriate file. This makes adding words to the dictionary fast and simple, but it makes looking up words slower because words are added in random—rather than alphabetical—order. Within the file for Z, for example, *zebra* might be found between *zymurgy* and *zipper*.

The only way to find a particular item in randomly ordered data is to search sequentially from the first item until the desired item is found. Thus, when SpeedCheck looks up a word, it must hunt through all the words with the same initial letter before it can determine whether or not that word is present.

People who use SpeedCheck know how easy it is to have dictionary files containing duplicate words. SpeedCheck's Disk Manager program can help, but it's difficult to find duplicates if there are many words between them. Sometimes there may be three or four duplicate words hogging space on the disk, slowing down SpeedCheck.

Purging files manually for duplicate words can be a tedious task for a human, but it's an ideal chore for a computer. SpeedPurge is just such a utility. It searches SpeedCheck dictionary files for duplicate words and deletes them.

Entering the Program

SpeedPurge is a fairly short BASIC program. To help avoid typing errors, however, enter the program with The Automatic Proofreader. See "Typing Aids" elsewhere in this section. When you've finished typing, be sure to save the program to disk.

Purging Your Files

SpeedPurge is easy to use; just load and run it. When you're ready to start, place the disk containing the SpeedCheck dictionary files in drive 8. SpeedPurge prompts for a filename, and you enter the letter of the alphabet that represents the file that you wish to check. For example, press A to check the A file and B to check the B file

SpeedPurge reads the file into an array and converts it to ASCII format. Then it checks the entire file for duplicate words. When SpeedPurge finds a match, it displays the word and the locations in the file where the match was found. Then it deletes one of the pair. It then continues searching until another match is found or until the entire file has been checked. When it has finished checking the file, SpeedPurge asks whether or not you wish to save the corrected file. Obviously, if no matches were found, there would be no need to save the file. Press N if you don't want to save it; press Y if you do.

After it has finished saving the file, SpeedPurge asks if you wish to check another file. Type Y to continue checking files or N to exit SpeedPurge.

SPEEDPURGE

```

SH 5 REM COPYRIGHT 1992
HK 10 REM COMPUTE PUBLICATIONS
INTL LTD
MP 15 REM ALL RIGHTS RESERVED
RG 20 CLR:DIMA$(500):OPEN15,8,
15
PK 25 PRINT"{CLR}{DOWN}
{12 RIGHT}{7}SPEEDPURGE
[2 DOWN]"
EG 30 POKE53280,0:POKE53281,0
EC 35 INPUT"{BLU}FILE {RED}(A-
Z) {BLU}";FS
XR 40 IPLEN(FS)>1THEN25
PD 45 IFASC(FS)<65ORASC(FS)>90
THEN25
PS 50 OPEN2,8,2,"0:"+FS+"",S,R"
:GOSUB225:BS=FS:X=1:POKE
781,2:SYS65478:SYS65487
BG 55 SYS65487:A=PEEK(780)
KA 60 IFA>127THENA=A-64:BS=B$+
CHR$(A):AS(X)=BS:B$=FS:X
=X+1:GOTO80
CR 65 IFA=39THEN75
DH 70 IFA<64THENA=A+64
JM 75 BS=B$+CHR$(A)
QJ 80 IFST=0THEN55
QE 85 CLOSE2:POKE781,0:SYS6547
8:X=X-1
KS 90 Z=1
PQ 95 IT=0:PRINT"{DOWN}{7}":FO
RT=ZTOX:AS=AS(T):PRINT"
{UP}{8 SPACES}{8 LEFT}";
T;"-";X:FORR=1TOX
EQ 100 IFA$=AS(R)THENIFR<>TTHE
NGOSUB220
FS 105 NEXTR,T
KA 110 IFIT=0THEN125
AG 115 IFIT=XTHENX=X-1:GOTO95
RP 120 FORT=ITOX-1:AS(T)=AS(T
+1):NEXTT:X=X-1:GOTO95
FA 125 PRINT"{BLU}":FORT=1TOX:
PRINT;AS(T):AS(T)=RIGH
T$(AS(T),LEN(AS(T))-1)

```

PROGRAMS

```

EP 130 B$="":FORR=1TOLEN(A$(T)
)~1:A=ASC(MIDS(A$(T),R,
1)):IFA>63THENA=A-64
MB 135 B$=B$+CHR$(A):NEXTR:A=A
SC(RIGHT$(A$(T),1)):A=A
+64:B$=B$+CHR$(A)
SJ 140 A$(T)=B$:NEXTT
SR 145 PRINT"{DOWN}{7}SAVE THI
S FILE {RED}Y/N"
RE 150 GETA$:IFA$=""THEN150
GP 155 IFA$="N"THEN190
FG 160 IFA$<"Y"THEN150
AR 165 PRINT#15,"S0:"+F$:GOSUB
230
QS 170 OPEN2,8,2,"0:"+F$+"S,W
":POKE781,2:SYS65481:PO
KE780,13:SYS65490
PK 175 FORT=1TOX:FORR=1TOLEN(A
$(T)):A$=MIDS(A$(T),R,1
):A=ASC(A$):POKE780,A
AD 180 SYS65490
JS 185 NEXTR,T:CLOSE2:POKE781,
3:SYS65481:GOSUB230
KG 190 PRINT"{DOWN}{3}FINISHED
1"
RK 195 PRINT"{DOWN}{7}DO ANOTH
ER FILE {RED}Y/N"
CS 200 GETA$:IFA$=""THEN200
KG 205 IFA$="Y"THEN20
XX 210 IFA$="N"THENCLOSE15:END
XX 215 GOTO200
JD 220 PRINT"{DOWN}{BLU}FOUND
{SPACE}A MATCH! {RED}";
CHR$(34);A$(R);CHR$(34)
;"{BLU}";T;"{RED}&
{BLU}";R
GA 225 Z=T:IT=R:T=X:R=X:RETURN
SS 230 INPUT#15,EN,EM$,ET,ES
MF 235 PRINT"{DOWN}{RED}"EN;EM
$;ET;ES:IFEN>1THENCLOSE
15:STOP
MF 240 RETURN

```

Daniel Lightner programs and raises Himalayan cats in Sidney, Montana.

ALPHABETIZER

By Todd Piltingsrud

As many 64 and 128 programmers know from experience, original and public domain programs can quickly fill up your disk library. Finding a desired file is no problem when there are only a few programs on a disk, but when file after file scrolls by during a directory listing, it can be a hassle. Wouldn't it be easier if all files were in alphabetical order?

Alphabetizer was written as a solution to that problem. It reads a disk directory, reorganizes it, and then saves it back to disk in alphabetical order. The directory stays in alphabetical order until you add additional files or programs.

Alphabetizer consists of two pro-

grams. The main program is in BASIC. To help avoid typing errors, enter it with The Automatic Proofreader. See "Typing Aids" elsewhere in this section. Be sure to save a copy of the program before you exit Proofreader.

This program loads a short machine language program. You'll have to use MLX, our machine language program, to enter it. Save it with the name ALPHA.ML, as this is the name used by the BASIC program. When MLX prompts, respond with the following values.

Starting address: C000
Ending address: C147

Putting Disks in Order

Using Alphabetizer is simple. After running it, select a disk you want to alphabetize and place it in the drive. Press A to alphabetize it or press D to see its directory. When you have finished, press Q to quit.

ALPHABETIZER

```

CP 1 REM COPYRIGHT 1992 - COMP
UTE PUBLICATIONS INTL LTD
- ALL RIGHTS RESERVED
CG 5 IFPEEK(49152)<>160THENLOA
D"ALPHA.ML",8,1
QB 10 PRINT"{CLR}"TAB(11)"
{DOWN}{A}*****
{S}"
HQ 20 PRINTTAB(11)"-A - ALPHAB
ETIZE-" :PRINTTAB(11)"-D
{SPACE}- DIRECTORY
{2 SPACES}-"
HS 25 PRINTTAB(11)"-Q - QUIT
{7 SPACES}-" :PRINTTAB(11)
"{Z}*****{X}"
RM 27 POKE56,142:CLR:DIMFP$(14
4),SP$(144),SS$(144)
EX 30 GETA$:IFA$="A"THEN80
EA 40 IFA$="D"THENSYS49411:GOT
0680
QP 60 IFA$<"Q"THEN30
CB 70 PRINT"{CLR}";:END
DK 80 PRINT"{DOWN}READING DIRE
CTORY";:OPEN1,8,15,"I":G
OSUB660:CLOSE1
PS 90 SYS49152:IL=PEEK(7):PRIN
T"FILES"
KR 230 PRINT"{DOWN}ALPHABETIZI
NG":FORT=1TO11:SP$(T)=S
P$(T)+FP$(T):NEXT
KP 240 N=11:LI=1:B(LI)=N+1:M=1
DD 250 J=B(LI):I=M-1:IFJ-M<3TH
EN360
JD 260 MI=INT((I+J)/2)
KM 270 I=I+1:IFI=JTHEN320
MB 280 IFSP$(I)<=SP$(MI)THEN27
0
KX 290 J=J-1:IFI=JTHEN320

```

```

RX 300 IFSP$(J)>=SP$(MI)THEN29
0
PX 310 SP$=SP$(I):SP$(I)=SP$(J
):SP$(J)=SP$:GOTO270
EH 320 IFI>MITHENI=I-1
XS 330 IFJ=MITHEN350
QC 340 SP$=SP$(I):SP$(I)=SP$(M
I):SP$(MI)=SP$
KR 350 LI=LI+1:B(LI)=I:GOTO250
BC 360 IFJ-M<2THEN390
EM 370 IFSP$(M)<SP$(M+1)THEN39
0
BC 380 SP$=SP$(M):SP$(M)=SP$(M
+1):SP$(M+1)=SP$
GR 390 M=B(LI)+1:LI=LI-1:IFLI>
0THEN250
QM 400 FORT=1TO11:FP$(T)=RIGHT
$(SP$(T),5):SP$(T)=LEFT
$(SP$(T),27):NEXT
PS 410 OPEN1,8,15,"I":GOSUB660
:OPEN8,8,8,"#":I2=1:PRI
NT"{DOWN}WRITING DIRECT
ORY"
EH 420 PRINT#1,"B-P";8;0
PP 430 C=0:READS:IFI1-I2<8THEN
PRINT#8,CHR$(0)CHR$(255
);:GOTO450
JB 440 PRINT#8,CHR$(18)CHR$(S)
;
DJ 450 PRINT#8,RIGHT$(FP$(I2),
3);:GOTO470
GE 460 PRINT#8,FP$(I2);
XD 470 PRINT#8,SP$(I2);
SA 480 IFI2=I1THEN510
PX 490 I2=I2+1:C=C+1:IFC<8THEN
460
HD 500 READS:PRINT#1,"U2";8;0;
18;S:GOTO420
CG 510 A$="":FORT=1TO32:A$=A$+
CHR$(0):NEXT
SG 520 C=C+1:IFC=8THEN540
XA 530 PRINT#8,A$;:GOTO520
MR 540 READS:PRINT#1,"U2";8;0;
18;S:CLOSE8:SYS49411:GO
TO680
JH 550 DATA 4,1,7,4,10,7,13,10
,16,13,2,16,5,2,8,5,11,
8,14,11,17,14,3,17,6,3,
9,6
HQ 560 DATA 12,9,15,12,18,15,0
,18
RE 660 INPUT#1,A,B$,C,D:IFA=0T
HENRETURN
PP 670 PRINTA;B$;C;D
GQ 680 CLOSE1:PRINT"{DOWN}PRES
S RETURN"
CQ 690 GETA$:IFA$<>CHR$(13)THE
N690
AM 700 RUN

```

ALPHA.ML

```

C000:A0 08 20 EC C0 A9 00 85 D8
C008:02 A9 8E 85 03 A0 02 20 DD
C010:CF FF C8 D0 FA A9 00 F0 0F
C018:0E 20 CF FF 91 02 A5 90 13
C020:D0 0E C8 D0 F4 E6 03 91 8E
C028:02 C8 91 02 C8 4C 19 C0 99
C030:20 3B C1 38 A5 03 E9 8D E6
C038:85 03 A2 04 46 03 66 02 DE

```

```

C040:CA 10 F9 4C 9B C0 24 30 87
C048:A5 2F 85 03 A5 30 85 04 46
C050:A0 00 B1 03 DD 97 C0 F0 48
C058:15 A0 02 18 B1 03 65 03 B5
C060:48 C8 B1 03 65 04 85 04 E8
C068:68 85 03 4C 50 C0 C8 B1 6D
C070:03 DD 98 C0 D0 E3 18 A5 F5
C078:03 69 0A 95 03 A5 04 69 90
C080:00 95 04 60 A2 02 2C A2 06
C088:00 A9 03 18 75 03 95 03 3C
C090:A9 00 75 04 95 04 60 46 99
C098:D0 53 D0 A2 02 20 48 C0 7D
C0A0:A2 00 86 07 20 48 C0 A9 02
C0A8:00 85 FB A9 8E 85 FC A0 CA
C0B0:02 B1 FB F0 2B A0 00 A9 B3
C0B8:05 91 03 C8 A5 FB 91 03 51
C0C0:C8 A5 FC 91 03 20 87 C0 31
C0C8:A0 00 A9 1B 91 05 C8 18 CB
C0D0:A5 F0 69 05 91 05 C8 A5 79
C0D8:FC 91 05 20 84 C0 E6 07 DB
C0E0:A2 F8 A9 20 20 8B C0 C6 A0
C0E8:02 D0 C4 60 A9 08 AA 20 21
C0F0:BA FF A9 02 A2 46 A0 C0 55
C0F8:20 BD FF 20 C0 FF A2 08 4F
C100:4C C6 FF A0 00 20 EC C0 00
C108:20 D7 AA A0 04 20 A5 FF DC
C110:88 10 FA 48 20 A5 FF A8 FF
C118:68 AA 98 A4 90 D0 1C A0 78
C120:06 84 D3 20 CD BD E6 D3 4B
C128:20 A5 FF 20 16 E7 D0 F8 12
C130:20 D7 AA A5 C6 D0 04 A0 00
C138:02 D0 D2 A9 08 20 C3 FF 2E
C140:4C CC FF 00 00 00 00 00 1D

```

Todd Piltingsrud has subscribed to Gazette for three years and has never seen a utility that alphabetizes a directory. So he wrote one. He lives in New Richland, Minnesota.

DUPLICATE 1541

By Daniel Lightner

When you want to copy files from one disk to another with Commodore BASIC, you must first load a file, swap disks, and then use the SAVE command. This process can become tedious when you copy a disk that contains numerous programs and files.

Unlike some computers, the 64/128 doesn't come with a built-in DISKCOPY command. Using a utility program to do the job for you is one way around this problem. Duplicate 1541 is just such a utility. With it and a 1541 disk drive, you can make exact copies of any floppy disk that isn't copy-protected.

Typing It In

Duplicate 1541 is written entirely in machine language, but it loads and runs like a BASIC program. To enter it, use MLX, our machine language entry pro-

gram; see "Typing Aids" elsewhere in this section. When MLX asks for starting and ending addresses, respond with the following values.

Starting address: 0801

Ending address: 0DA8

When you've finished typing in Duplicate 1541, be sure that you save a copy of the program to disk.

Making Copies

Before attempting to copy a disk, it's a good idea to place a tab over its write-protect notch. This is just a precaution in case an accident occurs during the copy process.

When you run Duplicate, it'll prompt you to place the source disk in drive 8. This is the disk that you wish to copy. After you press the space bar, Duplicate 1541 reads the disk name and ID and starts reading sectors into memory starting at track 1. When the computer's memory is filled, the program will prompt you to place a target disk in the drive. Remove the source disk, place a blank disk in the drive, and press the space bar.

Your blank disk doesn't have to be formatted; Duplicate 1541 automatically formats it for you. To copy an entire disk, this process must be repeated three more times. You'll be prompted when to swap disks.

Duplicate 1541 isn't exactly a speedster, but it'll get the job done. To boost the copying speed a bit, the program blanks the screen and sets the 1541 to 1540 mode. If your disk has only a few files on it, copying them manually may be faster.

Duplicate 1541 will inform you when the copying process is complete. You'll then be asked if you wish to make more copies. If you do, tap the Y key. Press the N key, and Duplicate 1541 will return your computer to BASIC. When it has finished all of its tasks, Duplicate 1541 restores the screen and returns the drive to 1541 mode.

DUPLICATE 1541

```

0801:0B 08 C8 07 9E 32 30 36 76
0809:31 00 00 00 A9 00 8D 20 3A
0811:D0 8D 21 D0 78 A5 01 29 A3
0819:FE 85 01 58 20 91 0B 20 2D
0821:CC FF A9 20 8D B2 02 20 2A

```

```

0829:EC 0A A9 08 20 B1 FF A9 59
0831:6F 85 B9 20 93 FF A0 00 71
0839:B9 93 0C 20 A8 FF C8 C0 26
0841:0B D0 F5 20 AE FF A9 08 9C
0849:20 B1 FF A9 6F 85 B9 20 95
0851:93 FF A0 00 B9 9E 0C 20 BF
0859:A8 FF C8 C0 09 D0 F5 20 7A
0861:AE FF A2 02 20 C6 FF A0 F9
0869:00 A2 00 20 CF FF C9 A0 D6
0871:F0 04 9D 38 03 E8 C8 C0 40
0879:12 D0 F0 A9 2C 9D 38 03 CA
0881:E8 A0 00 20 CF FF 9D 38 22
0889:03 E8 C8 C0 02 D0 F4 8E 46
0891:34 03 A2 00 20 C6 FF 20 0D
0899:E3 0A A2 00 20 EB 0B 20 59
08A1:43 09 20 06 0B A9 02 20 1D
08A9:C3 FF 20 B4 0B 20 9F 0B 0E
08B1:20 E3 0A A2 00 20 EB 0B 99
08B9:20 A2 09 20 EC 0A 20 E3 59
08C1:0A A2 01 20 EB 0B 20 43 B0
08C9:09 20 06 0B 20 E3 0A A2 1F
08D1:01 20 EB 0B 20 A2 09 20 56
08D9:EC 0A 20 E3 0A A2 02 20 24
08E1:EB 0B 20 43 09 A2 03 20 DB
08E9:EB 0B 20 43 09 A2 04 20 E5
08F1:EB 0B 20 43 09 20 06 0B D2
08F9:20 E3 0A A2 02 20 EB 0B F1
0901:20 A2 09 A2 03 20 EB 0B 92
0909:20 A2 09 A2 04 20 EB 0B A2
0911:20 A2 09 20 EC 0A 20 E3 B2
0919:0A A2 05 20 EB 0B 20 43 8A
0921:09 A2 06 20 EB 0B 20 43 32
0929:09 20 06 0B 20 E3 0A A2 00
0931:05 20 EB 0B 20 A2 09 A2 3C
0939:06 20 EB 0B 20 A2 09 4C 6E
0941:69 0B A9 08 20 B1 FF A9 F1
0949:6F 85 B9 20 93 FF A0 00 8B
0951:B9 A7 0C 20 A8 FF C8 C0 45
0959:07 D0 F5 20 A3 0A 20 AE 18
0961:FF 20 B7 FF C9 00 D0 F9 5C
0969:A2 02 20 C6 FF A0 00 20 60
0971:CF FF 91 FB C8 C0 00 D0 77
0979:F6 A2 00 20 C6 FF 20 3C 64
0981:0A 20 D5 0A AD CF 02 CD 7A
0989:CB 02 D0 0F AD CD 02 CD 83
0991:C7 02 D0 01 60 20 2C 0A 18
0999:4C 43 09 20 22 0A 4C 43 DA
09A1:09 A2 02 20 C6 FF A9 08 B4
09A9:20 B1 FF A9 6F 85 B9 20 F7
09B1:93 FF A0 00 B9 B5 0C 20 7E
09B9:A8 FF C8 C0 07 D0 F5 20 CC
09C1:AE FF A2 02 20 C9 FF 0B 68
09C9:00 B1 FB 20 D2 FF C8 C0 B2
09D1:00 D0 F6 A2 03 20 C9 FF 4D
09D9:20 3C 0A A9 08 20 B1 FF 0B
09E1:A9 6F 85 B9 20 93 FF A0 E0
09E9:00 B9 AE 0C 20 A8 FF C8 6D
09F1:C0 07 D0 F5 20 A3 0A 20 63
09F9:AE FF 20 B7 FF C9 00 D0 DA
0A01:F9 20 D5 0A AD CF 02 CD F3
0A09:CB 02 D0 0F AD CD 02 CD 05
0A11:C7 02 D0 01 60 20 2C 0A 99
0A19:4C A2 09 20 22 0A 4C A2 93
0A21:09 18 AD CF 02 69 01 8D B7
0A29:CF 02 60 18 AD CD 02 69 45
0A31:01 8D CD 02 18 A9 00 BD F7
0A39:CF 02 60 A9 08 20 B4 FF 86
0A41:A9 6F 85 B9 20 96 FF 20 CD
0A49:A5 FF 8D E0 02 C9 30 D0 58
0A51:0D 20 A5 FF 8D E1 02 C9 6A

```

PROGRAMS

```

0A59:30 D0 09 4C AB FF 20 A5 E2
0A61:FF 8D E1 02 A0 02 20 A5 28
0A69:FF 99 E0 02 C8 C9 0D D0 78
0A71:F5 20 AB FF A9 08 20 C3 6F
0A79:FF 20 40 0B 20 CC FF A9 2C
0A81:0D 20 D2 FF A9 1D 20 D2 53
0A89:FF 20 D2 FF A0 00 B9 E0 59
0A91:02 20 D2 FF C8 C9 0D D0 61
0A99:F5 68 68 68 68 A0 17 4C 96
0AA1:6E 0B AE CD 02 A9 00 20 39
0AA9:0A 0C A0 00 B9 FB 02 20 BB
0AB1:A8 FF C8 CC B0 02 D0 F4 24
0AB9:A9 20 20 A8 FF AE CF 02 95
0AC1:A9 00 20 0A 0C A0 00 B9 EB
0AC9:FB 02 20 A8 FF C8 CC B0 58
0AD1:02 D0 F4 60 18 A5 FB 69 78
0AD9:00 85 FB A5 FC 69 01 85 3E
0AE1:FC 60 A9 A8 85 FB A9 0D C8
0AE9:85 FC 60 20 40 0B A0 00 7D
0AF1:B9 C2 0C 20 D2 FF C8 C0 FF
0AF9:2C D0 F5 20 E4 FF C9 20 F3
0B01:D0 F9 4C 19 0B 20 40 0B 7D
0B09:A0 00 B9 ED 0C 20 D2 FF 0C
0B11:C8 C0 2C D0 F5 4C FC A0 33
0B19:20 9F 0B AD 11 D0 29 EF 71
0B21:8D 11 D0 A9 00 20 B1 FF 1B
0B29:A9 6F 85 B9 20 93 FF A0 2C
0B31:00 B9 BC 0C 20 A8 FF C8 7A
0B39:C0 03 D0 F5 4C AE FF A9 B0
0B41:02 20 C3 FF AD 11 D0 09 35
0B49:10 8D 11 D0 A9 08 20 B1 59
0B51:FF A9 6F 85 B9 20 93 FF 8D
0B59:A0 00 B9 BF 0C 20 A8 FF 25
0B61:C8 C0 03 D0 F5 4C AE FF B7
0B69:20 40 0B A0 00 B9 18 0D 2F
0B71:20 D2 FF C8 C0 33 D0 F5 43
0B79:20 E4 FF C9 00 F0 F9 C9 F6
0B81:4E F0 07 C9 59 F0 06 4C 5F
0B89:79 0B 4C E2 FC 4C 20 08 38
0B91:A0 00 B9 4B 0D 20 D2 FF 72
0B99:C8 C0 5D D0 F5 60 A9 01 82
0BA1:A2 92 A0 0C 20 BD FF A9 24
0BA9:02 A2 08 A0 02 20 BA FF 7A
0BB1:4C C0 FF A9 4E 8D 35 03 CE
0BB9:A9 30 8D 36 03 A9 3A 8D 86
0BC1:37 03 18 AD 34 03 69 03 95
0BC9:8D 34 03 AD 34 03 A2 35 17
0BD1:A0 03 20 BD FF A9 0F A2 40
0BD9:08 A0 0F 20 BA FF 20 C0 D6
0BE1:FF A9 0F 20 C3 FF 20 3C E0
0BE9:0A 60 BD 76 0C 8D C5 02 60
0BF1:8D CD 02 BD 7D 0C 8D 07 5D
0BF9:02 BD 84 0C 8D C9 02 8D F6
0C01:CF 02 BD 8B 0C 8D CB 02 22
0C09:60 8D B4 02 8E B3 02 A2 55
0C11:00 8E B0 02 A2 09 8E B5 0F
0C19:02 A0 B0 AD B3 02 DD 56 03
0C21:0C AD B4 02 FD 57 0C 90 57
0C29:0F 8D B4 02 AD B3 02 FD 21
0C31:56 0C 8D B3 02 C8 D0 E3 1D
0C39:98 CA F0 11 C9 B0 F0 03 75
0C41:8D B5 02 2C B5 02 30 05 AB
0C49:AD B2 02 F0 05 29 7F 20 20
0C51:61 0C CA 10 C4 60 01 00 21
0C59:0A 00 64 00 E8 03 10 27 9D
0C61:8C B1 02 AC 8W 02 99 FB F3
0C69:02 C9 20 F0 04 C8 8C B0 15
0C71:02 AC B1 02 60 01 09 11 36
0C79:12 19 1A 1F 08 10 11 18 D0
0C81:19 1E 23 00 00 00 00 12

```

```

0C89:00 00 14 14 14 12 11 11 81
0C91:10 23 55 31 20 32 20 30 72
0C99:20 31 38 20 30 42 2D 50 4C
0CA1:20 32 20 31 34 34 55 31 BB
0CA9:20 32 20 30 20 55 32 20 40
0CB1:32 00 30 20 42 2D 50 00 7A
0CB9:32 20 30 55 49 2D 55 49 41
0CC1:2B 0D 9A 20 20 50 55 54 49
0CC9:20 1C 53 4F 55 52 43 45 18
0CD1:20 9A 44 49 53 4B 20 49 0F
0CD9:4E 20 44 52 49 56 45 20 1D
0CE1:1C 50 52 45 53 53 20 53 36
0CE9:50 41 43 45 0D 9A 20 20 6A
0CF1:50 55 54 20 1C 54 41 52 1B
0CF9:47 45 54 20 9A 44 49 53 5F
0D01:4B 00 49 4E 20 44 52 49 D6
0D09:56 45 20 1C 50 52 45 53 0F
0D11:53 20 53 50 41 43 45 0D FA
0D19:96 20 20 43 4F 00 59 20 4D
0D21:43 4F 4D 50 4C 45 54 45 C4
0D29:44 20 21 21 21 0D 0D 9A 95
0D31:20 00 4D 41 4B 45 20 41 12
0D39:4E 4F 54 48 45 52 20 43 54
0D41:4F 50 59 3F 20 1C 59 2F 89
0D49:4E 00 96 93 0D 20 20 44 47
0D51:55 50 4C 49 43 41 54 45 55
0D59:20 31 35 34 31 00 9A 20 CC
0D61:20 43 4F 50 59 52 49 47 39
0D69:48 54 00 31 39 39 32 0D F3
0D71:20 00 43 4F 4D 50 55 54 AB
0D79:45 20 50 55 42 4C 49 43 B6
0D81:41 54 49 4F 4E 53 20 49 B8
0D89:4E 54 4C 20 4C 54 44 0D B4
0D91:20 20 41 4C 4C 20 52 49 81
0D99:47 48 54 53 20 52 45 53 51
0DA1:45 52 56 45 44 0D 0D EA 6D

```

Daniel Lightner is a regular contributor who lives in Sidney, Montana.

RAILROAD SOLITAIRE

By Donald G. Klich

Have you ever been caught up in a simple game that's so challenging that you have a hard time turning it off? Railroad Solitaire for the 128 is just such a game.

This card game for one person was originally created to be used as a pastime while traveling by train, since little space was available for conventional games of solitaire. The object of the game is ultimately to discard the entire deck while working with only the four currently dealt cards.

Typing It In

Railroad Solitaire is written entirely in BASIC 7.0 and works with a 40-column screen. To help avoid typing errors, enter it with The Automatic Proofreader; see "Typing Aids" elsewhere in this section. Be sure to save a copy of the program before you exit Proofreader.

Playing a Hand

You may discard the middle two cards of the set of four that appear onscreen if the bracketing cards are of the same suit or value. If all four cards match in suit or value, then all four can be discarded. If you can't play, you must request another card. This card is placed at the right-hand side of the screen, and the card on the left is moved offscreen and temporarily "lost." When discards occur, lost cards from the left move back to fill the spaces. If you're lucky enough to have insufficient lost cards to fill in from the left, new cards will be dealt to fill in from the right.

Onscreen prompts will tell you which keys to press to discard or request cards. Unlike solitaire played with actual cards, this computerized version won't let you cheat or make an improper move.

When you've gone through the deck, discarding all that you can, the game will end, and you'll be informed of any remaining cards. You'll then have the opportunity to play again and better your score.

Be prepared for long hours of play to beat the odds. It took the author an hour to win, just so he could test all the logic involved.

RAILROAD SOLITAIRE

```

EQ 10 REM COPYRIGHT 1992 - COM
      REM PUBLICATIONS INTL L
      REM TD - ALL RIGHTS RESERVED
PR 20 REM $$ CONTAINS SUIT CHA
      REM RACTERS
MJ 30 REM $$$ CONTAINS SUIT PI
      REM XELS
KH 40 REM C CONTAINS SUIT COLO
      REM RS
CX 50 REM V$ CONTAINS CARD LAY
      REM OUT DATA
SB 60 REM DN CONTAINS DECK CAR
      REM D VALUES
FJ 70 REM DS CONTAINS DECK CAR
      REM D SUITS
BF 80 REM WN CONTAINS WORK CAR
      REM D VALUES
KB 90 REM WS CONTAINS WORK CAR
      REM D SUITS
GH 100 REM DP/WP ARE THE DECK/
      REM WORK POINTERS
CJ 110 DIMS$(4),V$(13),DN(52),
      REM DS(52),WN(52),WS(52):TS
      REM =52:Q=0
QH 120 C(0)=11:C(1)=1:C(2)=11:
      REM C(3)=1:C(4)=2

```

```

GQ 130 SS(0)=CHR$(154):SS(1)=C
HR$(152):SS(2)=CHR$(147
):SS(3)=CHR$(129):SS(4)
=CHR$(64)
GB 140 FORI=0TO51STEP13:FORJ=0
TO12:DN(I+J)=J:DS(I+J)=
I/13:NEXTJ:NEXTI
QG 150 VS(0)="A 03081656563236
"
HE 160 VS(1)="2 04081656563216
3256"
MH 170 VS(2)="3 05081656563216
32563236"
EP 180 VS(3)="4 06081656562416
401624564056"
FQ 190 VS(4)="5 07081656562416
4016245640563236"
AD 200 VS(5)="6 08081656562416
40162456405624364036"
HS 210 VS(6)="7 09081656562416
40162456405624364036324
6"
JG 220 VS(7)="8 10081656562416
40162456405624364036324
63227"
SA 230 VS(8)="9 11081656562416
40162456405624294029244
340433237"
BF 240 VS(9)="1012081656562416
40162456405624294029244
340433223250"
FA 250 VS(10)="J 0208165656"
RK 260 VS(11)="Q 0208165656"
KE 270 VS(12)="K 0208165656"
MJ 280 VS(13)=" {2 SHIFT-SPACE}
00"
BE 290 COLOR0,2:COLOR1,1:COLOR
4,2:GOSUB840:WIDTH2:GRA
PHIC2,1,21
SH 300 FORI=0TO3:CHAR1,0,10,SS
(I):DRAW1,3,82TO4,82TO4
,83TO3,83:SSHAPES$(I),
0,80,7,87:NEXTI:CHAR1,0
,10," "
PH 310 REM ****SHUFFLE DECK
CH 320 PRINT"{BLK}{7 SPACES}I'
M SHUFFLING THE DECK":F
ORI=1TO100:F=INT(RND(1)
*51):T=INT(RND(1)*51):B
N=DN(F):BS=DS(F):DN(F)=
DN(T):DS(F)=DS(T):DN(T)
=BN:DS(T)=BS:NEXTI
HA 330 REM ****INITIAL SETUP
CS 340 FORDP=0TO3:WN(DP)=DN(DP
):WS(DP)=DS(DP):NEXT:WP
=DP:GOSUB770
KK 350 PRINT"{BLK}ENTER {CYN}C
{BLK}TO RECEIVE A CARD
":PRINT"ENTER {CYN}2
{BLK}TO DISCARD THE MID
DLE CARDS":PRINT"ENTER
{SPACE}{CYN}4 {BLK}TO D
ISCARD ALL CARDS":IFDP>
52THEN570
MQ 360 GETKEYZ$:IFZ$<>"C"THEN4
20
QG 370 IFDP=52THEN570:ELSE:GOS
UB400:GRAPHIC2,1,21:GOS
UB770:GOTO350
RB 380 REM ****ROUTINE TO READ
A CARD
EP 390 IFDP>=52THENWN(WP)=13:W
S(WP)=4:WP=WP+1:RETURN
KB 400 WN(WP)=DN(DP):WS(WP)=DS
(DP):DP=DP+1:WP=WP+1:RE
TURN
MD 410 REM ****ROUTINE TO REMO
VE MIDDLE CARDS
MM 420 IFZ$<>"2"THEN470
GE 430 IFWN(WP-4)=WN(WP-1)THEN
450
DA 440 IFWS(WP-4)<>WS(WP-1)THE
NSOUND1,4000,5:GOTO350
PE 450 WN(WP-3)=WN(WP-1):WS(WP
-3)=WS(WP-1):WP=WP-2
DQ 460 IFWP>3THENGGRAPHIC2,1,21
:GOSUB770:GOTO350:ELSEG
OSUB390:GOTO460
JR 470 IFZ$<>"4"THENSOUND1,400
0,5:GOTO350
RQ 480 REM ****ROUTINE TO REMO
VE ALL FOUR CARDS
KQ 490 IFWN(WP-4)<>WN(WP-3)THE
N520
CS 500 IFWN(WP-3)<>WN(WP-2)THE
N520
DQ 510 IFWN(WP-2)=WN(WP-1)THEN
WP=WP-4:GOTO460
SS 520 IFWS(WP-4)<>WS(WP-3)THE
N550
AX 530 IFWS(WP-3)<>WS(WP-2)THE
N550
JF 540 IFWS(WP-2)=WS(WP-1)THEN
WP=WP-4:GOTO460
MX 550 SOUND1,4000,5:GOTO350
FE 560 REM *****SAVE SCORE RO
UTINE
RB 570 SOUND1,8000,5:PRINT"
{BLK}GAME OVER. YOU HAD
";WP-Q;" CARDS REMAINI
NG":IFWP-Q<TSTHENTS=WP-
Q
MX 580 PRINT"YOUR BEST SCORE I
S ";TS
CE 590 Q=0:PRINT"PLAY AGAIN? Y
/N":GETKEYZ$:IFZ$="Y"TH
ENGRAPHIC2,1,21:GOTO320
XD 600 IFZ$="N"THENEND:ELSE570
QF 610 REM ****DISPLAY A CARD
HH 620 COLOR1,C(S):CHAR1,X+1,Y
+1,MID$(VS(V),1,2):IFV=
9THENCHAR1,X+6,Y+8,MID$
(V$(V),1,2):ELSECHAR1,X
+7,Y+8,MID$(VS(V),1,2)
GP 630 X=X*8:Y=Y*8
KA 640 FORI=0TO{(VAL(MID$(VS(V)
),3,2))-1}*4STEP4
KX 650 GSHAPES$(S),X+VAL(MID$
(V$(V),5+I,2)),Y+VAL(MI
D$(VS(V),7+I,2)):NEXTI
DR 660 COLOR1,1:BOX1,4+X,4+Y,6
7+X,75+Y:COLOR1,8:IFV<>
10THEN690
BH 670 CIRCLE1,36+X,40+Y,12,16
,90,270:CIRCLE1,36+X,40
+Y,4,8,90,270
GQ 680 DRAW1,40+X,40+YTO40+X,2
4+YTO48+X,24+YTO48+X,40
+Y:DRAW1,24+X,40+YTO32+
X,40+Y:PAINT1,28+X,44+Y
:GOTO750
GR 690 IFV<>11THEN720
HM 700 CIRCLE1,36+X,40+Y,12,16
:CIRCLE1,36+X,40+Y,4,8:
PAINT1,28+X,40+Y
HH 710 DRAW1,36+X,54+YTO40+X,6
0+YTO47+X,60+YTO39+X,51
+Y:PAINT1,44+X,58+Y:GOT
O750
CG 720 IFV<>12THENRETURN
BP 730 DRAW1,24+X,56+YTO24+X,2
4+YTO32+X,24+YTO32+X,56
+YTO24+X,56+Y:PAINT1,28
+X,28+Y:DRAW1,32+X,36+Y
TO40+X,24+YTO48+X,24+YTO
O32+X,44+Y:PAINT1,44+X,
26+Y
DE 740 DRAW1,32+X,36+YTO40+X,5
6+YTO48+X,56+YTO36+X,32
+Y:PAINT1,40+X,48+Y
SX 750 WIDTH1:BOX1,19+X,16+Y,5
2+X,63+Y:WIDTH2:RETURN
BS 760 REM ****DISPLAY THE WIN
DOW
MM 770 FORZ=0TO3:V=WN(WP-4+Z):
S=WS(WP-4+Z):X=10*Z:Y=5
:IFV=13THENQ=Q+1
SG 780 GOSUB620:NEXTZ:IFQ=4THE
N820
DM 790 IFQ<>2THENRETURN
BP 800 IFWN(WP-4)=WN(WP-3)THEN
820
FD 810 IFWS(WP-4)=WS(WP-3)THEN
820
XM 820 PRINT"{5 SPACES}YOU WIN
!!!!":SOUND1,10000,5:G
OTO590
FF 830 REM ****GAME INSTRUCTIO
NS
AB 840 GRAPHIC0,1:PRINT"{RED}
{5 DOWN}{11 SPACES}RAIL
ROAD SOLITAIRE":PRINT"
{BLU}{2 DOWN}THIS GAME
{SPACE}WAS INVENTED FOR
PLAYING ON A":PRINT"TR
AIN WHERE SPACE TO SPRE
AD OUT IS RARE."
MH 850 PRINT"{DOWN} THE IDEA O
F THE GAME IS TO DISCAR
D THE":PRINT"CARDS THAT
ARE BETWEEN END CARDS
{SPACE}OF THE":PRINT"SA
ME VALUE OR SUIT.
{2 SPACES}ALL FOUR CARD
S CAN"
FC 860 PRINT" BE DISCARDED IF
{SPACE}THEY ARE OF THE
{SPACE}SAME":PRINT"VALU
E OR THE SAME SUIT.":PR
INT" IF THERE IS NO PLA
Y GET THE NEXT CARD.":P
RINT"{3 DOWN}PRESS ANY
{SPACE}KEY TO START"
EH 870 GETKEYZ$:RETURN

```

Donald G. Klich lives in Mount Prospect, Illinois.

QUIZ WIZ

By Rizwaan Ahmed Khan

Quiz Wiz is a program for creating multiple-choice quizzes on the 64. The program is so easy to use that even a beginner can use it without reading the instructions. Just select the menu options.

Quiz Wiz lets the parent or teacher enter questions and answers on a variety of subjects. The program then creates a quiz in multiple-choice format with the correct answer and three wrong answers for each question. It provides the correct answers and a score when the student finishes the quiz.

When you enter a question and answer, you aren't required to supply three possible answers as alternate choices. The program asks the question and then supplies the correct answer along with three other choices that it selects at random from the other answers you've entered. The correct answer is never in a predictable location.

Entering the Program

Quiz Wiz is written entirely in BASIC. To help avoid typing errors, enter it with The Automatic Proofreader; see "Typing Aids" elsewhere in this section. Be sure to save a copy of the program before you exit Proofreader.

Make New Entries

When you first run the program, select the option to make new entries. You're then prompted to choose a subject. If the subject you want isn't on the screen, press the Up Arrow key and define the subject of your choice.

You may then enter questions and answers. Each question and answer is allowed a maximum of 80 characters. To exit during the input process, press the @ key and then press Return.

Continue Making Entries

Note the menu. If you wish to continue making entries, select the appropriate choice. If you select the option to make new entries, all work in memory will be erased.

Correction Mode

You can flip through your entries by pressing the < and > keys. When you find the question you want, press Return, and a small menu will appear.

This menu will allow you to fully edit or delete your entries. In this mode, you can rename the topic chosen by pressing the R key.

In correction mode you cannot enter the main menu by pressing the @ key. In this mode, you can use the cursor keys for more editing potential. After you've made any corrections, press Return to exit to the main menu.

Saving Files

When you've entered a minimum of four questions and their answers, you may then save your file. Save files by selecting that option from the main menu. If you try to save a file with a name that is already on the disk, the earlier version will first be scratched.

Loading Files

Load a saved file into memory anytime you want to take a quiz. Any entries that may still be in memory will be erased. After loading, you're automatically quizzed in multiple-choice format. To see a directory at any time, press the D key.

Scratching Files

Select this option from the main menu to erase any file on disk. You need only enter the filename to have the program erase it.

Quiz Time

A quiz begins right after loading, but if you've entered at least four questions, you can take a test immediately. Press the Commodore key; then press the letter next to the answer of your choice.

If you answer incorrectly, the correct answer will be displayed for a short time. At the end of the quiz, your mistakes will again be displayed. You can flip through them by pressing Return. This process lets you review your errors for as long as you wish. After reviewing the final mistake, the computer will display your score. You may then exit to the main menu by pressing f1 or take the quiz again by pressing the Commodore key.

Adding New Entries

You can exit the quiz at any time by pressing f1. To enter more questions, select the option from the menu to continue making entries.

Tape Support

Users with tape drives can easily alter the program to suit their needs. Change the OPEN commands in lines 390 and 1007 to tape format. Then delete lines 62, 80, 915, 930, 935, 980, 982, 985, 986, 987, 990, 992, 993, 995, and 997. These lines contain the routines for calling the disk directory and for scratching files.

QUIZ WIZ

```
ME 0 REM COPYRIGHT 1992 COMPUT
E PUBLICATIONS INTL LTD -
ALL RIGHTS RESERVED
PB 1 DIMD$(200):DIMES$(200):DIM
F$(400):PRINTCHR$(8):PRIN
TCHR$(14)
MQ 5 PRINT"{CLR}{WHT}{2 DOWN}
{4 SPACES}{RVS}
{11 SPACES}{YEL}QUIZ WIZ
{WHT}{14 SPACES}"':PRINT"
{6 SPACES}MENU:"
XD 10 PRINT"{DOWN}{6 SPACES}
{YEL}{RVS}PRESS (1) TO M
AKE NEW ENTRIES.":POKE53
281,2:POKE53280,6
XJ 15 IFES(4)<>"THENPRINT"
{DOWN}{6 SPACES}{RVS}
{YEL}PRESS (2) TO SAVE E
NTRIES."
XD 20 PRINT"{DOWN}{6 SPACES}
{RVS}{YEL}PRESS (3) TO L
OAD ENTRIES.":IFES(1)="
THEN30
FX 25 PRINT"{DOWN}{6 SPACES}
{RVS}{YEL}PRESS (4) TO C
ONTINUE{OFF}{19 SPACES}
{RVS}MAKING ENTRIES."
CQ 30 IFES(1)<>"THENPRINT"
{DOWN}{6 SPACES}{RVS}
{YEL}PRESS (5) FOR CORRE
CTION MODE."
RK 35 PRINT"{DOWN}{6 SPACES}
{RVS}{YEL}PRESS (6) TO S
CRATCH FILES."
BD 40 PRINT"{DOWN}{6 SPACES}
{RVS}{CYN}PRESS F1 TO RE
TURN TO MENU.{DOWN}"
XG 45 PRINT"{12 SPACES}BY
{2 SPACES}RIZWAAN KHAN"
DF 46 PRINT"{HOME}{2 DOWN}":FO
RI=1TO19:PRINT"{WHT}
{4 RIGHT}{+}{31 RIGHT}
{+}{3 RIGHT}":NEXT
JE 50 PRINT"{4 SPACES}{RVS}
{33 SPACES}{OFF}";
BF 55 GETA$:IFA$="5"THENIFES(1
)<>"THENJ=1:GOTO15
BB 60 IFA$="1"THEN940
HA 62 IFA$="D"THEN980
AG 65 IFA$="2"ANDES(3)<>"THEN
360
MG 70 IFA$="3"THEN435
JX 72 IFA$="L"THEN1000
AF 75 IFA$="4"THENZES="1":GOTO
```

PROGRAMS

```

175
KP 80 IFAS="6"THEN915
MJ 85 IFPEEK(56321)=223ANDES(4
)<>"THENM=1:W=1:Q=0:GOT
0520
EK 90 GOTO55
XQ 95 PRINT"{OFF}{CLR}{HOME}
{3 DOWN}{10 SPACES}{PUR}
{RVS}DEFINE SUBJECT"
XQ 100 PRINT"{DOWN}{11 SPACES}
{WHT}1)MATH"
PE 105 PRINT"{DOWN}{11 SPACES}
2)ECONOMICS"
HF 110 PRINT"{DOWN}{11 SPACES}
3)SCIENCE"
KS 115 PRINT"{DOWN}{11 SPACES}
4)HISTORY"
MF 120 PRINT"{DOWN}{11 SPACES}
5)GEOGRAPHY"
BA 125 PRINT"{DOWN}{11 SPACES}
6)ENGLISH"
SD 127 PRINT"{DOWN}{11 SPACES}
↑)OTHER{2 SPACES}"
XS 130 GETAS:IFAS="1"THENNS="M
ATH":GOTO175
BE 135 IFAS="2"THENNS="ECONOMI
CS":GOTO175
HG 140 IFAS="3"THENNS="SCIENCE
":GOTO175
BS 145 IFAS="4"THENNS="HISTORY
":GOTO175
QG 150 IFAS="5"THENNS="GEOGRAP
HY":GOTO175
BA 155 IFAS="6"THENNS="ENGLISH
":GOTO175
RS 160 IFAS=CHR$(133)THENDBS="
":GOTO5
XX 165 IFAS="↑"THENINPUT"SUBJE
CT":NS:GOTO175
KR 170 GOTO130
AG 175 PRINT"{CLR}{BLU}{RVS}
{40 SPACES}":IFDBS="1"TH
HENDBS="":GOTO5
ED 180 IFZE$="1"THENX=X+1:ZE$="
"
MD 185 PRINT"{GRN}{HOME}{RVS}
{SPACE}QUESTION NUMBER"
X"{YEL}SUBJECT:"NS""
GJ 190 PRINT"{WHT}{HOME}
{2 DOWN}{5 SPACES}ENTER
QUESTION (@ TO QUIT)"
{3 SPACES}:POKE53280,2
EQ 191 IFDBS="1"THENPRINT"
{YEL}{HOME}{3 DOWN}
{2 RIGHT}"DAS"":PRINT"
{HOME}{3 DOWN}";
HS 195 INPUTD$(X):IFD$(X)="@"A
NDDBS="1"THEN190
SD 245 IFD$(X)="@"ANDX<>1THENX
=X-1:ZE$="1":GOTO5
RF 246 IFD$(X)="@"ANDX=1THEN5
RE 247 IFDBS="1"ANDD$(X)<>"TH
END$(X)=LEFT$(D$(X),80)
:GOTO845
PS 250 IFD$(X)<>"THEND$(X)=LE
FT$(D$(X),80):GOTO275
XS 255 PRINT"{CLR}{HOME}{BLU}
{RVS}{40 SPACES}":GOTO1
85
KD 275 PRINT:PRINT"(HOME)
{13 DOWN}{WHT}{DOWN}
{4 SPACES}ENTER ANSWER"
HH 276 IFDBS="1"THENPRINT"
{YEL}{HOME}{15 DOWN}
{2 RIGHT}"EAS"":PRINT"
{HOME}{15 DOWN}";
XX 280 INPUTE$(X):IFE$(X)="@"A
NDDBS="1"THEN275
XQ 285 IFDBS="1"ANDES(X)<>"TH
ENE$(X)=LEFT$(E$(X),80)
:GOTO845
RA 290 IFES(X)="@"THEN5
XX 335 IFES(X)<>"THENE$(X)=LE
FT$(E$(X),80):X=X+1:GOT
0175
GR 340 GOTO275
PR 360 NAM$="":PRINT"{CLR}
{DOWN}TYPE IN FILE NAM
E TO SAVE":INPUTNAM$:IF
NAM$=""THEN5
KJ 390 K$="":OPEN7,8,0,NAM$:IN
PUT#7,K$:IFK$=""THENCLO
SE7:GOTO405
JS 395 CLOSE7:PRINT"{2 DOWN} S
CRATCHING OLD FILE.":FT
S="S0":FT$=FT$+NAM$
FM 400 OPEN15,8,15,FT$:CLOSE15
SG 405 OPEN7,8,1,NAM$:PRINT"
{CLR}{HOME}{6 DOWN}
{6 SPACES}{WHT}SAVING :
NAM$"":PRINT#7,NS:PRI
NT#7,X
BQ 410 FORJ=1TOX:PRINT#7,D$(J)
:NEXTJ:ZE$="1"
MP 415 FORJ=1TOX:PRINT#7,E$(J)
:NEXTJ:CLOSE7:M=1:FX=0:
Q=0
EH 430 PRINT"{CLR}{HOME}
{11 DOWN}{6 SPACES}***
{SPACE}DATA HAS BEEN SA
VED ***"
KF 431 FORI=1TO2000:NEXTI:GOTO
520
PR 435 PRINT"{CLR}{RVS}{WHT}
{DOWN}LOAD ERASES ANY
{SPACE}WORK IN MEMORY.
{4 SPACES}ARE YOU SURE
{SPACE}(Y/N)"
DD 440 GETAS:IFAS="N"THEN5
PA 445 IFAS="Y"THEN1000
DA 450 GOTO440
DP 520 ZX=X:PRINT"{CLR}{HOME}
{SPACE}SCORE={RVS}"Q"
{OFF}{4 SPACES}QUESTI
ON NUMBER={RVS}"W"{OFF}"
EB 525 PRINT"TOTAL NUMBER OF Q
UESTIONS="X"":POKE53280
,6:POKE53281,6
HK 530 PRINT"{YEL}{RVS}
{40 SPACES}";
JG 535 PRINT"[UP]{3 SPACES}
{RVS}SUBJECT : "NS""
CR 540 PRINT"{WHT}QUESTION:
{GRN}{RVS}"D$(M)"{OFF}
{DOWN}":FS
RB 545 Y=INT(4*RND(1))+1
RA 550 T=INT((X+1-1)*RND(1))+1
:U=INT((X+1-1)*RND(1))+
1:V=INT((X+1-1)*RND(1))
+1
FQ 555 IFES(M)=ES(T)ORES(M)=ES
(U)ORES(U)=ES(T)THEN550
EM 556 IFES(V)=ES(M)ORES(V)=ES
(T)ORES(V)=ES(U)THEN550
RH 560 IFY=1THEN575
MA 562 IFY=3THEN570
QB 565 IFY=2THEN580
GJ 567 PRINT"{RVS}{WHT}A {8}"E
$(T)"{DOWN}":PRINT"
{RVS}{WHT}B {8}"E$(U)"
{DOWN}":PRINT"{RVS}
{WHT}C {8}"E$(V)"{DOWN}
"
BG 568 PRINT"{RVS}{WHT}D {8}"E
$(M)"{DOWN}":LS="D":GOT
0585
MH 570 PRINT"{RVS}{WHT}A {8}"E
$(T)"{DOWN}"
RF 571 PRINT"{RVS}{WHT}B {8}"E
$(U)"{DOWN}"
JD 572 PRINT"{RVS}{WHT}C {8}"E
$(M)"{DOWN}":LS="C":PRI
NT"{RVS}{WHT}D {8}"E$(V
)"{DOWN}":GOTO585
KS 575 PRINT"{WHT}{RVS}A {8}"E
$(M)"{DOWN}"
SF 576 PRINT"{RVS}{WHT}B {8}"E
$(T)"{DOWN}"
KM 577 PRINT"{RVS}{WHT}C {8}"E
$(U)"{DOWN}":LS="A":PRI
NT"{RVS}{WHT}D {8}"E$(V
)"{DOWN}":GOTO585
GF 580 PRINT"{WHT}{RVS}A {8}"E
$(U)"{DOWN}"
SS 581 PRINT"{RVS}{WHT}B {8}"E
$(M)"{DOWN}"
HP 582 PRINT"{RVS}{WHT}C {8}"E
$(T)"{DOWN}":LS="B":PRI
NT"{RVS}{WHT}D {8}"E$(V
)"{DOWN}":GOTO585
AM 585 GETAS:IFAS="N"THEN585
XJ 590 IFAS=CHR$(133)THENFX=0:
Q=0:GOTO5
SQ 595 IFAS<>"A"ANDAS<>"B"ANDA
S<>"C"ANDAS<>"D"THEN585
CS 600 IFAS=LSTHENQ=Q+1:PRINT"
{WHT}{2 SPACES}{RVS}COR
RECT!!";FORJ=1TO500:NE
XTJ:GOTO610
GX 605 GOTO655
AD 610 M=M+1:IFW=ZXTHENAD=FX-1
:FX=0:GOTO880
FQ 615 W=W+1:GOTO520
BP 620 PRINT"{CLR}{HOME}
{2 DOWN}{OFF}{WHT}YOU
{SPACE}SCORED{WHT}{RVS}
"Q"{OFF}OUT OF{WHT}
{RVS}"X"{OFF}QUESTIONS
":POKE53281,3
BR 625 IFX/2<=QTHENPRINT"
{2 DOWN}{2 SPACES}{RVS}
YOU PASSED!":GOTO632
GP 630 PRINT"{DOWN}{RVS}SHAME
ON YOU, YOU FAILED!!!"

```

```

HR 632 PRINT "{DOWN}{RVS}PRESS
'F1' TO EXIT."
HF 635 PRINT "{DOWN}{RVS}PRESS
{SPACE}COMMODORE KEY TO
DO THE TEST AGAIN":GOT
0640
DS 640 GETAS:IFAS=CHR$(133)THE
N5
GP 645 IFPEEK(56321)=223THENM=
1:W=1:Q=0:GOTO520
KS 650 GOTO640
EP 655 PRINT "{RVS}INCORRECT!
{OFF} THE ANSWER IS":FS
(FX)=DS(M):FX=FX+1:FS(F
X)=ES(M):FX=FX+1
FD 660 IFY=1THENPRINT "{RVS}A
{OFF}"ES(M)"";FS:GOTO67
5
ES 665 IFY=2THENPRINT "{RVS}B
{OFF}"ES(M)"";FS:GOTO67
5
BE 670 PRINT "{RVS}C {OFF}"ES(M
)"";FS:GOTO675
AH 675 FORJ=1TO2:POKE54276,0:P
OKE54277,0:POKE54272,0:
POKE54296,15
JX 680 POKE54277,129:POKE54276
,23
RG 685 POKE54273,137:POKE54272
,43:NEXTJ:FORI=1TO1500:
NEXTI:GOTO610
EB 690 POKE1024,82:POKE1025,65
:POKE1026,75:POKE1027,7
2:POKE1028,65:POKE1029,
78
JH 691 GOTO585
HR 715 PRINT "{YEL}{CLR}{HOME}
{RVS}{11 SPACES}CORRECT
ION MODE{14 SPACES}";
BF 720 PRINT "{RVS}{WHT} TOTAL
QUESTIONS ENTERED="X""
:POKE53281,6:POKE53280,
2
DK 725 PRINT "{RVS}{CYN}QUESTI
ON NO."J"{GRN}SUBJECT:"
NS"{DOWN}"
DB 730 PRINT "{YEL}{RVS}QUESTIO
N:{8}"DS(J)"":PRINT
XS 735 PRINT "{YEL}{RVS}ANSWER:
{8}"ES(J)""
SB 740 PRINT "{DOWN} {RVS}{YEL}
PRESS'<' TO FLIP THROUG
H ENTRIES."
EP 741 PRINT "{RVS}{WHT}PRESS'
RETURN'FOR CORRECTION."
FA 743 PRINT "{RVS}{WHT}PRESS'
R'TO RENAME SUBJECT."
GE 745 GETAS:IFAS=CHR$(13)THEN
VB=X:X=J:DBS="1":GOTO78
8
BD 750 IFAS="."THEN782
HD 755 IFAS=CHR$(133)THENDBS="
":GOTO775
MG 760 IFAS="R"THENA$="":DBS="
1":GOTO95
HH 765 IFAS=","THEN785
RJ 770 GOTO745
DM 775 IFVB>0THENX=VB:GOTO5
XP 780 GOTO5
QF 782 IFJ=XTHENJ=1:GOTO715
GF 783 J=J+1:GOTO715
JH 785 IFJ=1THENJ=X:GOTO715
JM 786 J=J-1:GOTO715
BX 788 PRINT "{DOWN} {6}{RVS}PL
EASE SELECT --
{3 SPACES}"
EG 790 PRINT "{RVS}(1) ALTER Q
UESTION."
GR 795 PRINT "{RVS}(2) ALTER A
NSWER.{2 SPACES}"
JD 800 PRINT "{RVS}(3) ALTER B
OTH.{4 SPACES}"
DB 805 PRINT "{RVS}(4) DELETE
{SPACE}BOTH.{3 SPACES}"
:DA$=DS(X):EA$=ES(X)
AD 815 GETAS:IFAS="1"THENS=1:P
RINT "{CLR}":GOTO190
GC 820 IFAS="2"THENS=2:PRINT "
{CLR}":GOTO275
MK 825 IFAS="3"THENS=3:PRINT "
{CLR}":GOTO190
AP 830 IFAS="4"THENMK=VB-J:DB$
="":GOTO860
BD 836 IFAS=CHR$(133)THENDBS="
":X=VB:GOTO5
PR 840 GOTO815
QF 845 IFS=LORS=2THENX=VB:DB$=
"":GOTO5
KM 850 IFS=3THENS=S+1:GOTO275
KJ 855 X=VB:DB$="":GOTO5
FF 860 IFJ=1ANDES(J+1)="":THENR
UN
ER 865 IFES(J+1)="":THENDS(J)="
":ES(J)="":VB=VB-1:X=VB
:GOTO5
SD 870 PRINT "{2 DOWN}
{2 SPACES}{WHT}DELETING
...":FORI=1TOMK:ADS=DS
(J+1):AVS=ES(J+1)
XK 875 DS(J)=ADS:ES(J)=AVS:J=J
+1:NEXTI:VB=VB-1:X=VB:E
S(J)="":DS(J)="":GOTO5
EE 880 IFFS(FX)="":THEN620
PM 885 PRINT "{CLR}{OFF}{HOME}
{2 DOWN} {BLK}THE ONES
{SPACE}YOU GOT WRONG AR
E-{DOWN}":POKE53281,1
CS 890 PRINT "{RED}QUESTION -
{SPACE}"FS(FX)"";FS:FS(F
X)="":FX=FX+1
FP 895 PRINT "ANSWER - "FS(FX)
"";FS:FS(FX)="":PRINT "
{2 DOWN} {RVS}{CYN}PRES
S RETURN"
AR 900 GETAS:IFAS<>CHR$(13)THE
N900
QS 905 IFAD=FXTHENFX=0:GOTO620
MK 910 FX=FX+1:GOTO880
RK 915 PRINT "{CLR}{DOWN} NAME
{SPACE}OF FILE TO SCRAT
CH":INPUTFRS:IFFRS="":TH
EN5
XF 920 PRINT "{DOWN} INSERT DIS
K CONTAINING FILE AND P
RESS{3 SPACES}{RVS}RETU
RN"
PQ 925 GETAS:IFAS<>CHR$(13)THE
N925
AE 930 FT$="S0":FT$=FT$+FR$:O
PEN15,8,15,FT$:CLOSE15
RS 935 PRINT "{2 DOWN}
{2 SPACES}{RVS}{WHT}FIL
E HAS BEEN SCRATCHED":F
ORI=1TO3000:NEXTI:GOTO5
XX 940 PRINT "{CLR}{DOWN}{WHT}
{SPACE}{RVS}MAKING NEW
{SPACE}ENTRIES WILL ERA
SE ANY OLD{OFF}
{3 SPACES}{RVS}ENTRIES
{SPACE}IN MEMORY"
AQ 945 PRINT "{RVS}{WHT}ARE YO
U SURE (Y/N)""
AF 950 GETAS:IFAS="N"THENS
HX 955 IFAS="Y"THEN965
DF 960 GOTO950
DS 965 CLR:DIMS(500):DIMS(50
0):X=1:GOTO95
KK 970 PRINT "{DOWN}{2 SPACES}
{RVS}FILE NOT FOUND":OP
EN15,8,15,"UJ":FORI=1TO
2000:NEXTI:CLOSE15:RUN
MB 980 I=1:PRINT "{WHT}{CLR}":O
PEN2,8,0,"$":GET#2,AS:G
ET#2,AS
CM 982 IFI=2THENI=1:GOTO992
DD 985 GET#2,L$:GET#2,L$:IFST=
64THENCLOSE2:GOTO992
XJ 986 GET#2,LB$:GET#2,HB$:LN=
ASC(LB$+CHR$(0))+256*AS
C(HB$+CHR$(0))
MM 987 PRINT LN;
DD 988 GET#2,AS:IFAS="":THENI=I
+1:PRINTCHR$(13);:GOTO9
82
CD 990 PRINTAS;:GOTO988
KD 992 PRINT "{DOWN} {RVS}PRESS
ANY KEY"
CX 993 GETAS:IFAS="":THEN993
QJ 995 IFST<>64THENPRINT "{CLR}
":GOTO985
JM 997 GOTO5
FH 1000 CLR:DIMS(200):DIMS(2
00):DIMS(400):PRINTCH
R$(8):PRINTCHR$(14)
MH 1005 PRINT "{CLR} {RVS}{WHT}
TYPE IN FILENAME TO LO
AD":INPUTNAM$:IFNAM$="
":THENRUN
EK 1007 NS="":OPEN7,8,0,NAM$:I
NPUT#7,NS
EK 1008 INPUT#7,X:IFN$="":THENC
LOSE7:GOTO970
BR 1009 PRINT "{CLR}{HOME}
{5 DOWN}{4 SPACES}LOAD
ING : {RVS}"NAM$""
HB 1010 FORJ=1TOX:INPUT#7,DS(J
):NEXTJ:ZES="1"
JC 1012 FORJ=1TOX:INPUT#7,ES(J
):NEXTJ:CLOSE7:M=1:FX=
0:Q=0:W=1:GOTO520

```

Rizwaan Ahmed Khan lives in
Tahape, New Zealand. □

Machine Language Entry Program MLX for Commodore 64

Ottis R. Cowper

Type in and save some copies of MLX—you'll want to use it to enter future ML programs from Gazette. When you're ready to enter an ML program, load and run MLX. It asks you for a starting address and an ending address. These addresses appear in the article accompanying the MLX-format program listing you're typing.

If you're unfamiliar with machine language, the addresses (and all other values you enter in MLX) may appear strange. Instead of the usual decimal numbers you're accustomed to, these numbers are in *hexadecimal*—a base 16 numbering system commonly used by ML programmers. Hexadecimal—hex for short—includes the numerals 0–9 and the letters A–F. But even if you know nothing about ML or hex, you should have no trouble using MLX.

After you've entered the starting and ending addresses, you'll be offered the option of clearing the workspace. Choose this option if you're starting to enter a new listing. If you're continuing a listing that's partially typed from a previous session, don't choose this option. A functions menu will appear. The first option in the menu is Enter Data. If you're just starting to type in a program, pick this. Press the E key and type the first number in the first line of the program listing. If you've already typed in part of a program, type the line number where you stopped typing at the end of the previous session (be sure to load the partially completed program before you resume entry). In any case, make sure the address you enter corresponds to the address of a line in the listing you are entering. Otherwise, you'll be unable to enter the data correctly. If you pressed E by mistake, you can return to the command menu by pressing Return alone when asked for the address. (You can get back to the menu from most options in the program by pressing Return with no other input.)

Entering a Listing

Once you're in Enter mode, MLX prints the address for each program line for you. You then type in all nine numbers on that line, beginning with the first two-digit number after the colon (:). Each line represents eight data bytes and a checksum. Although an

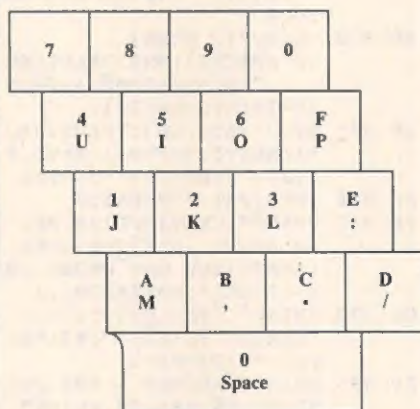
MLX-format listing appears similar to the "hex dump" listings from a machine language monitor program, the extra checksum number on the end allows MLX to check your typing.

When you enter a line, MLX recalculates the checksum from the eight bytes and the address and compares this value to the number from the ninth column. If the values match, you'll hear a bell tone, the data will be added to the workspace area, and the prompt for the next line of data will appear. But if MLX detects a typing error, you'll hear a low buzz and see an error message. The line will then be redisplayed for editing.

Invalid Characters Banned

Only a few keys are active while you're entering data, so you may have to unlearn some habits. You *do not* type spaces between the columns; MLX automatically inserts these for you. You *do not* press Return after typing the last number in a line; MLX automatically enters and checks the line after you type the last digit.

64 MLX Keypad



Only the numerals 0–9 and the letters A–F can be entered. If you press any other key (with some exceptions noted below), you'll hear a warning buzz. To simplify typing, a numeric keypad function is included. The keypad is active only while entering data. Addresses must be entered with the normal letter and number keys. The figure below shows the keypad configuration.

MLX checks for transposed characters. If you're supposed to type in A0

and instead enter 0A, MLX will catch your mistake. There is one error that can slip past MLX: Because of the checksum formula used, MLX won't notice if you accidentally type FF in place of 00, and vice versa. And there's a very slim chance that you could garble a line and still end up with a combination of characters that adds up to the proper checksum. However, these mistakes should not occur if you take care while entering data.

Editing Features

To correct typing mistakes before finishing a line, use the Inst/Del key to delete the character to the left of the cursor. If you mess up a line badly, press Ctr/Home to start the line over. The Return key is also active, but only before any data is typed on a line. Pressing Return at this point returns you to the command menu. After you type a character, MLX disables Return until the cursor returns to the start of a line. Remember, press Ctr/Home to quickly get to a line-number prompt. To make corrections in a line that MLX has redisplayed for editing, compare the line on the screen with the one printed in the listing and then move the cursor to the mistake and type the correct key. The cursor-left and -right keys provide the normal cursor controls. (The Inst/Del key now works as an alternative cursor-left key.) You cannot move left beyond the first character in the line. If you try to move beyond the rightmost character, you'll reenter the line. During editing, Return is active; pressing it tells MLX to recheck the line. You can press the Ctr/Home key to clear the entire line if you want to start from scratch or if you want to get to a line-number prompt to use Return to get back to the menu.

Display Data

The second menu choice, Display Data, examines memory and shows the contents in the same format as the program listing (including the checksum). When you press D, MLX asks you for a starting address. Be sure that the starting address you give corresponds to a line number in the listing. Otherwise, the checksum display will be meaningless. MLX displays program lines until it reaches the end of the program, at

which point the menu is redisplayed. You can pause the display by pressing the space bar. (MLX finishes printing the current line before halting.) Press the space bar again to restart the display. To break out of the display and get back to the menu before the ending address is reached, press Return.

Other Menu Options

Two more menu selections let you save programs and load them back into the computer. These are Save File and Load File. When you press S or L, MLX asks you for the filename. You'll then be asked to press either D or T to select disk or tape.

You'll notice the disk drive starting and stopping several times during a load or save. This is normal behavior. MLX opens and reads from or writes to the file instead of using the usual LOAD and SAVE commands. Also note that the drive prefix 0: is added to the filename (line 750), so this should *not* be included when entering the name. This also precludes the use of @ for save-with-replace, so be sure to give each version saved a different name.

Remember that MLX saves the entire workspace area from the starting address to the ending address, so the save or load may take longer than you might expect if you've entered only a small amount of data from a long listing. When you're saving a partially completed listing, make sure to note the address where you stopped typing.

MLX reports the standard disk or tape error messages if any problems are detected during the save or load. It also has three special load error messages: INCORRECT STARTING ADDRESS, which means the file you're trying to load does not have the starting address you specified when you ran MLX; LOAD ENDED AT address, which means the file you're trying to load ends before the ending address you specified when you started MLX; and TRUNCATED AT ENDING ADDRESS, which means the file you're trying to load extends beyond the ending address you specified when you started MLX. If you see one of these messages and feel certain that you've loaded the right file, exit and rerun MLX, being careful to enter the correct start-

ing and ending addresses.

The Quit menu option has the obvious effect—it stops MLX and enters BASIC. The Run/Stop key is disabled, so the Q option lets you exit the program without turning off the computer. (Of course, Run/Stop-Restore also gets you out.) You'll be asked for verification; press Y to exit to BASIC, or press any other key to return to the menu. After quitting, you can type RUN again and reenter MLX without losing your data, as long as you don't use the Clear Workspace option.

The Finished Product

When you've finished typing all the data for an ML program and saved your work, you're ready for the results. Refer to the corresponding article for details on loading and running the program.

An Ounce of Prevention

Don't take chances—use The Automatic Proofreader to type the new MLX, and then test your copy *thoroughly* before first using it to enter any significant amount of data. Make sure all the menu options work as they should. Enter fragments of the program starting at several different addresses; then use the display option to verify that the data has been entered correctly. Test the save and load options to ensure that you can recall your work from disk.

64 MLX

```
SS 10 REM VERSION 1.1: LINES 0
30,950 MODIFIED, LINES 4
85-487 ADDED
EK 100 POKE 56,50:CLR:DIM IN$,
I,J,A,B,A$,B$,A(7),N$
DM 110 C4=48:C6=16:C7=7:Z2=2:Z
4=254:Z5=255:Z6=256:Z7=
127
CJ 120 FA=PEEK(45)+Z6*PEEK(46)
:BS=PEEK(55)+Z6*PEEK(56)
):H$="0123456789ABCDEF"
SB 130 R$=CHR$(13):L$="{LEFT}"
:S$=" ":D$=CHR$(20):Z$=
CHR$(0):T$="{13 RIGHT}"
CQ 140 SD=54272:FOR I=SD TO SD
+23:POKE I,0:NEXT:POKE
{SPACE}SD+24,15:POKE 78
8,52
FC 150 PRINT "{CLR}"CHR$(142)CH
R$(8):POKE 53280,15:POK
E 53281,15
EJ 160 PRINT T$ "{RED}{RVS}
{2 SPACES}{8 @}
```

```
{2 SPACES}"SPC(28)"
{2 SPACES}{OFF}{BLU} ML
X II {RED}{RVS}
{2 SPACES}"SPC(28)"
{12 SPACES}{BLU}"
FR 170 PRINT "{3 DOWN}
{3 SPACES}COMPUTE!'S MA
CHINE LANGUAGE EDITOR
{3 DOWN}"
JB 180 PRINT "{BLK}STARTING ADD
RESS{4}";:GOSUB300:SA=A
D:GOSUB1040:IF F THEN18
0
GF 190 PRINT "{BLK}{2 SPACES}EN
DING ADDRESS{4}";:GOSUB
300:EA=AD:GOSUB1030:IF
{SPACE}F THEN190
KR 200 INPUT "{3 DOWN}{BLK}CLEA
R WORKSPACE {Y/N}{4}";A
$:IF LEFT$(AS,1)<>"Y"TH
EN220
PG 210 PRINT "{2 DOWN}{BLU}WORK
ING...";:FORI=BS TO BS+
EA-SA+7:POKE I,0:NEXT:P
RINT"DONE"
DR 220 PRINTTAB(10)" {2 DOWN}
{BLK}{RVS} MLX COMMAND
{SPACE}MENU {DOWN}{4}";
PRINT T$ "{RVS}E{OFF}NTE
R DATA"
BD 230 PRINT T$ "{RVS}D{OFF}ISP
LAY DATA":PRINT T$"
{RVS}L{OFF}OAD FILE"
JS 240 PRINT T$ "{RVS}S{OFF}AVE
FILE":PRINT T$ "{RVS}Q
{OFF}UIT{2 DOWN}{BLK}"
JH 250 GET AS:IF AS=N$ THEN250
HK 260 A=0:FOR I=1 TO 5:IF AS=
MID$("EDLSQ",I,1)THEN A
=I:I=5
FD 270 NEXT:ON A GOTO420,610,6
90,700,280:GOSUB1060:GO
TO250
EJ 280 PRINT "{RVS} QUIT ":INPU
T "{DOWN}{4}ARE YOU SURE
{Y/N}";AS:IF LEFT$(AS,
1)<>"Y"THEN220
EM 290 POKE SD+24,0:END
JX 300 IN$=N$:AD=0:INPUTINS:IF
LEN(IN$)<>4THENRETURN
KF 310 B$=IN$:GOSUB320:AD=A:B$
=MID$(IN$,3):GOSUB320:A
D=AD*256+A:RETURN
PP 320 A=0:FOR J=1 TO 2:A$=MID
$(B$,J,1):B=ASC(A$)-C4+
(A$>"@")*C7:A=A*C6+B
JA 330 IF B<0 OR B>15 THEN AD=
0:A=-1:J=2
GX 340 NEXT:RETURN
CH 350 B=INT(A/C6):PRINT MID$(
H$,B+1,1);:B=A-B*C6:PRI
NT MID$(H$,B+1,1);:RETU
RN
RR 360 A=INT(AD/Z6):GOSUB350:A
=AD-A*Z6:GOSUB350:PRINT
":";
BE 370 CK=INT(AD/Z6):CK=AD-Z4*
CK+Z5*(CK>Z7):GOTO390
```

PROGRAMS

```

PX 380 CK=CK*Z2+Z5*(CK>Z7)+A
JC 390 CK=CK+Z5*(CK>Z5):RETURN
QS 400 PRINT"DOWN"STARTING AT
      {4}";:GOSUB300:IF IN$<>
      N$ THEN GOSUB1030:IF F
      {SPACE}THEN400
EX 410 RETURN
HD 420 PRINT"{RVS} ENTER DATA
      {SPACE}":GOSUB400:IF IN
      S=N$ THEN200
JK 430 OPEN3,3:PRINT
SK 440 POKEL98,0:GOSUB360:IF F
      THEN PRINT IN$:PRINT"
      {UP}{5 RIGHT}";
GC 450 FOR I=0 TO 24 STEP 3:B$
      =S$:FOR J=1 TO 2:IF F T
      HEN B$=MID$(IN$,I+J,1)
HA 460 PRINT"{RVS}"B$LS;:IF I<
      24THEN PRINT"{OFF}";
HD 470 GET A$:IF A$=N$ THEN470
FK 480 IF (A$>"ANDAS<")OR(A
      $>"ANDAS<G")THEN540
GS 485 A=- (A$="M")-2*(A$=",")-
      3*(A$=".")-4*(A$="/")-5
      *(A$="J")-6*(A$="K")
FX 486 A=A-7*(A$="L")-8*(A$=":
      ") -9*(A$="U")-10*(A$="I
      ") -11*(A$="O")-12*(A$="
      P")
CM 487 A=A-13*(A$=S$):IF A THE
      N A$=MID$("ABCD123E456F
      0",A,1):GOTO 540
MP 490 IF A$=R$ AND ((I=0)AND (J
      =1)OR F)THEN PRINT B$;:
      J=2:NEXT I=24:GOTO550
KC 500 IF A$="HOME" THEN PRI
      NT B$:J=2:NEXT I=24:NEX
      T:F=0:GOTO440
MX 510 IF (A$="RIGHT")ANDF TH
      ENPRINT B$LS;:GOTO540
GK 520 IF A$<>L$ AND A$<>D$ OR
      ((I=0)AND (J=1))THEN GOS
      UB1060:GOTO470
HG 530 A$=L$+S$+L$:PRINT B$LS;
      :J=2-J:IF J THEN PRINT
      {SPACE}L$;:I=I-3
QS 540 PRINT A$;:NEXT J:PRINT
      {SPACE}S$;
PM 550 NEXT I:PRINT"PRINT"{UP}
      {5 RIGHT}";:INPUT#3,IN$
      :IF IN$=N$ THEN CLOSE3:
      GOTO220
QC 560 FOR I=1 TO 25 STEP3:B$=
      MID$(IN$,I):GOSUB320:IF
      I<25 THEN GOSUB380:A(I
      /3)=A
PK 570 NEXT:IF A<>CK THEN GOSU
      B1060:PRINT"{BLK}{RVS}
      {SPACE}ERROR: REENTER L
      INE {4}":F=1:GOTO440
HJ 580 GOSUB1080:B=BS+AD-SA:FO
      R I=0 TO 7:POKE B+I,A(I
      ):NEXT
QQ 590 AD=AD+8:IF AD>EA THEN C
      LOSE3:PRINT"{DOWN}{BLU}
      ** END OF ENTRY **{BLK}
      {2 DOWN}":GOTO700
GQ 600 F=0:GOTO440
QA 610 PRINT"{CLR}{DOWN}{RVS}
      {SPACE}DISPLAY DATA ":G
      OSUB400:IF IN$=N$ THEN2
      00
RJ 620 PRINT"{DOWN}{BLU}PRESS:
      {RVS}SPACE{OFF} TO PAU
      SE, {RVS}RETURN{OFF} TO
      BREAK{4}{DOWN}"
KS 630 GOSUB360:B=BS+AD-SA:FOR
      I=BTO B+7:A=PEEK(I):GOS
      UB350:GOSUB380:PRINT S$
      ;
CC 640 NEXT:PRINT"{RVS}";:A=CK
      :GOSUB350:PRINT
KH 650 F=1:AD=AD+8:IF AD>EA TH
      ENPRINT"{DOWN}{BLU}** E
      ND OF DATA **":GOTO220
KC 660 GET A$:IF A$=R$ THEN GO
      SUB1080:GOTO220
EQ 670 IF A$=S$ THEN F=F+1:GOS
      UB1080
AD 680 ONFGOTO630,660,630
CM 690 PRINT"{DOWN}{RVS} LOAD
      {SPACE}DATA ":OP=1:GOTO
      710
PC 700 PRINT"{DOWN}{RVS} SAVE
      {SPACE}FILE ":OP=0
RX 710 IN$=NS:INPUT"{DOWN}FILE
      NAME{4}";IN$:IF IN$=N$
      {SPACE}THEN220
PR 720 F=0:PRINT"{DOWN}{BLK}
      {RVS}T{OFF}APE OR {RVS}
      D{OFF}ISK: {4}";
FP 730 GET A$:IF A$="T"THEN PR
      INT"DOWN":GOTO880
HQ 740 IF A$<>"D"THEN730
HH 750 PRINT"D{DOWN}":OPEN15,8
      ,15,"I0":B=EA-SA:IN$="
      0":+IN$:IF OP THEN810
SQ 760 OPEN 1,8,8,IN$+",P,W":G
      OSUB860:IF A THEN220
FJ 770 AH=INT(SA/256):AL=SA-(A
      H*256):PRINT#1,CHR$(AL)
      ;CHR$(AH);
PE 780 FOR I=0 TO B:PRINT#1,CH
      R$(PEEK(BS+I));:IF ST T
      HEN800
FC 790 NEXT:CLOSE1:CLOSE15:GOT
      O940
GS 800 GOSUB1060:PRINT"{DOWN}
      {BLK}ERROR DURING SAVE:
      {4}":GOSUB860:GOTO220
MA 810 OPEN 1,8,8,IN$+",P,R":G
      OSUB860:IF A THEN220
GE 820 GET#1,A$,B$:AD=ASC(A$+Z
      $)+256*ASC(B$+Z$):IF AD
      <>SA THEN F=1:GOTO850
RX 830 FOR I=0 TO B:GET#1,A$:P
      OKE BS+I,ASC(A$+Z$):IF (
      I<>B)AND ST THEN F=2:AD
      =I:I=B
FA 840 NEXT:IF ST<>64 THEN F=3
FQ 850 CLOSE1:CLOSE15:ON ABS(F
      >0)+1 GOTO960,970
SA 860 INPUT#15,A,A$:IF A THEN
      CLOSE1:CLOSE15:GOSUB10
      60:PRINT"{RVS}ERROR: "A
      $
GQ 870 RETURN
EJ 880 POKEL83,PEEK(FA+2):POKE
      187,PEEK(FA+3):POKE188,
      PEEK(FA+4):IFOP=0THEN92
      0
HJ 890 SYS 63466:IF(PEEK(783)A
      ND1)THEN GOSUB1060:PRIN
      T"{DOWN}{RVS} FILE NOT
      {SPACE}FOUND ":GOTO690
CS 900 AD=PEEK(829)+256*PEEK(8
      30):IF AD<>SA THEN F=1:
      GOTO970
SC 910 A=PEEK(831)+256*PEEK(83
      2)-1:F=F-2*(A<EA)-3*(A>
      EA):AD=A-AD:GOTO930
KM 920 A=SA:B=EA+1:GOSUB1010:P
      OKE780,3:SYS 63338
JF 930 A=BS:B=BS+(EA-SA)+1:GOS
      UB1010:ON OP GOTO950:SY
      S 63591
AE 940 GOSUB1080:PRINT"{BLU}**
      SAVE COMPLETED **":GOT
      O220
XP 950 POKEL47,0:SYS 63562:IF
      {SPACE}ST>0 THEN970
FR 960 GOSUB1080:PRINT"{BLU}**
      LOAD COMPLETED **":GOT
      O220
DP 970 GOSUB1060:PRINT"{BLK}
      {RVS}ERROR DURING LOAD:
      {DOWN}{4}":ON F GOSUB98
      0,990,1000:GOTO220
PP 980 PRINT"INCORRECT STARTIN
      G ADDRESS (";:GOSUB360:
      PRINT"):RETURN
GR 990 PRINT"LOAD ENDED AT ";:
      AD=SA+AD:GOSUB360:PRINT
      D$:RETURN
FD 1000 PRINT"TRUNCATED AT END
      ING ADDRESS":RETURN
RX 1010 AH=INT(A/256):AL=A-(AH
      *256):POKE193,AL:POKE1
      94,AH
FF 1020 AH=INT(B/256):AL=B-(AH
      *256):POKE174,AL:POKE1
      75,AH:RETURN
FX 1030 IF AD<SA OR AD>EA THEN
      1050
CR 1040 IF (AD>511 AND AD<6528
      0) THEN GOSUB1080: F=0
      : RETURN
HC 1050 GOSUB1060:PRINT"{RVS}
      {SPACE}INVALID ADDRESS
      {DOWN}{BLK}":F=1:RETU
      RN
AR 1060 POKE SD+5,31:POKE SD+6
      ,208:POKE SD,240:POKE
      {SPACE}SD+1,4:POKE SD+
      4,33
DX 1070 FOR S=1 TO 100:NEXT:GO
      TOL090
PF 1080 POKE SD+5,8:POKE SD+6,
      240:POKE SD,0:POKE SD+
      1,90:POKE SD+4,17
AC 1090 FOR S=1 TO 100:NEXT:PO
      KE SD+4,0:POKE SD,0:PO
      KE SD+1,0:RETURN

```