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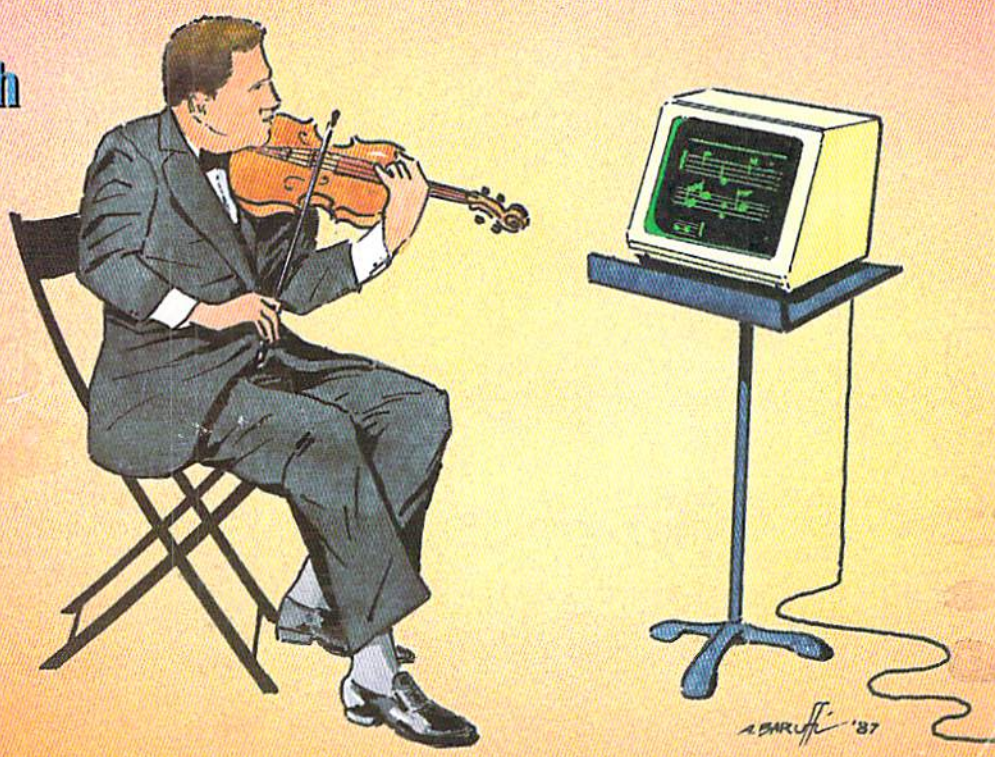

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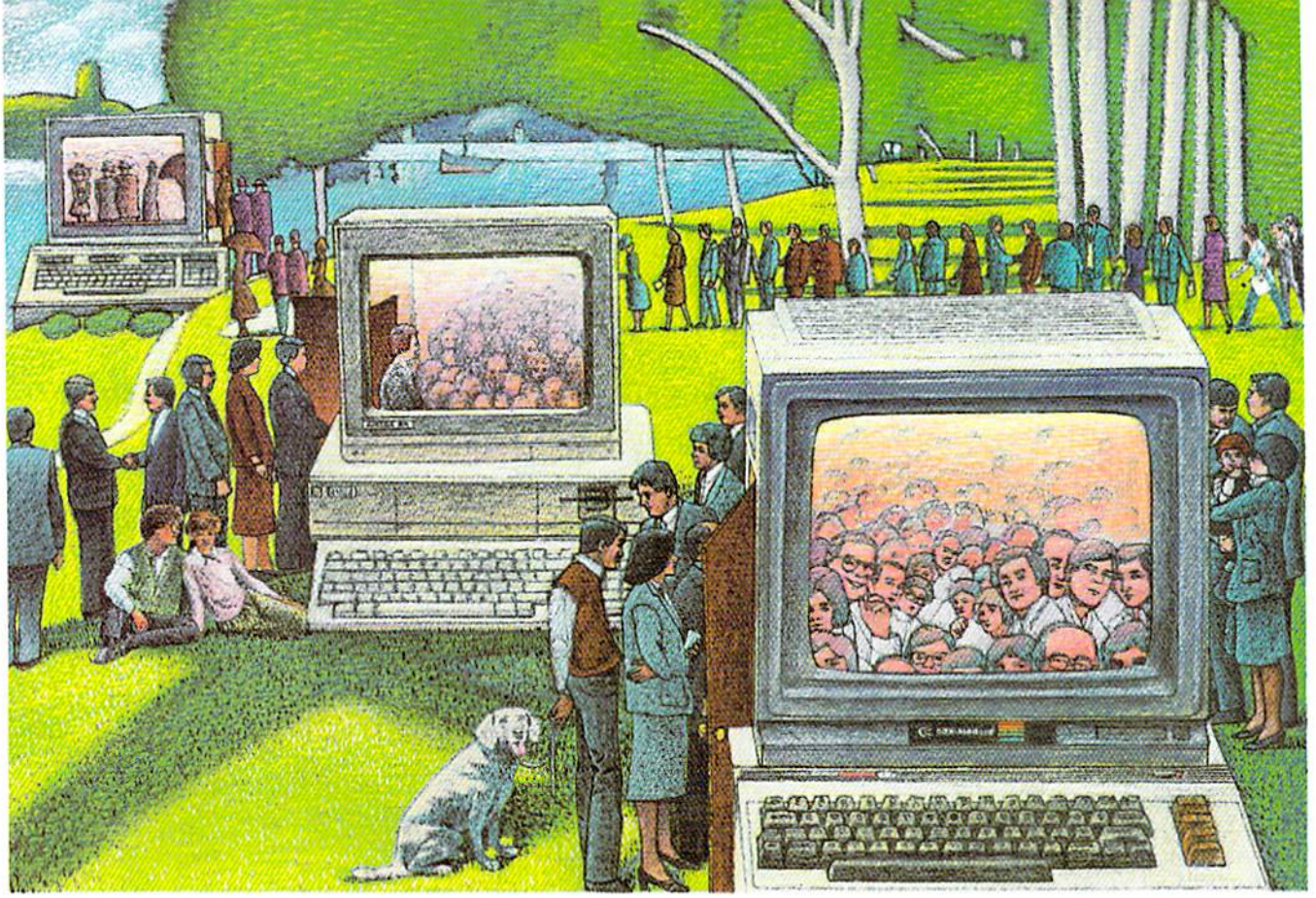

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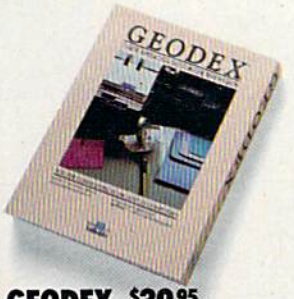

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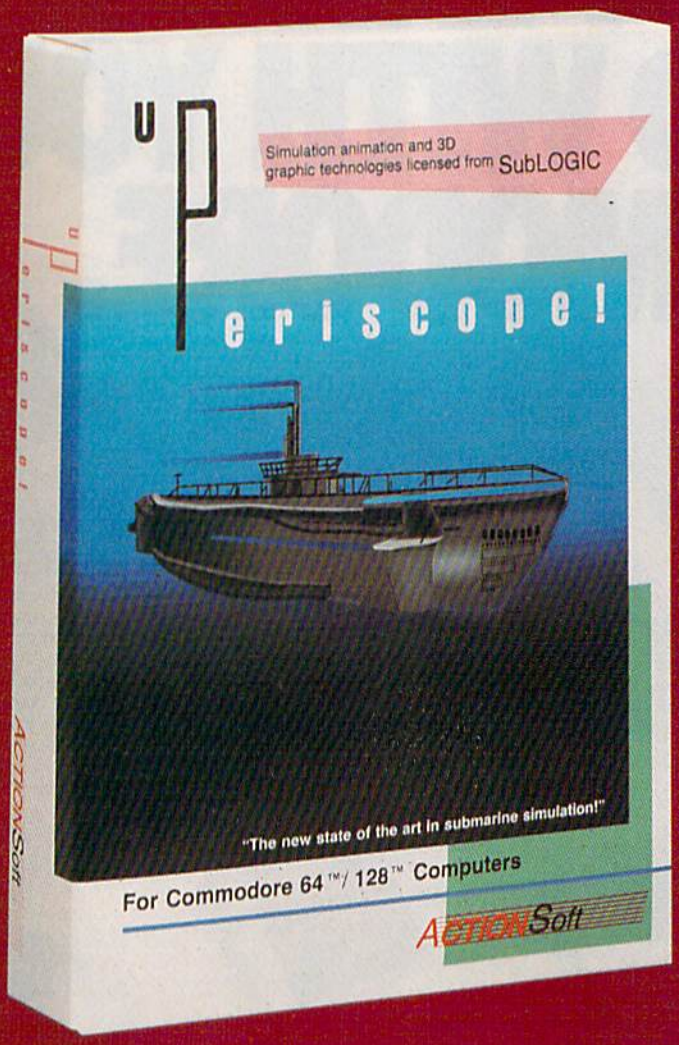

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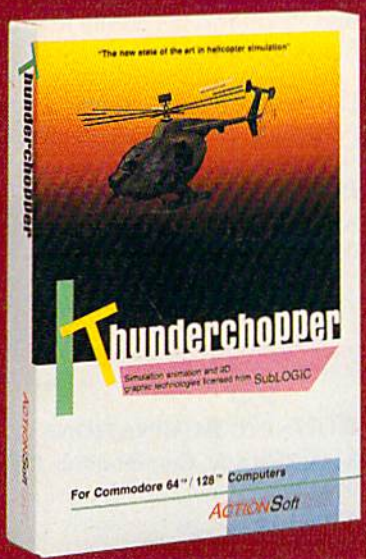

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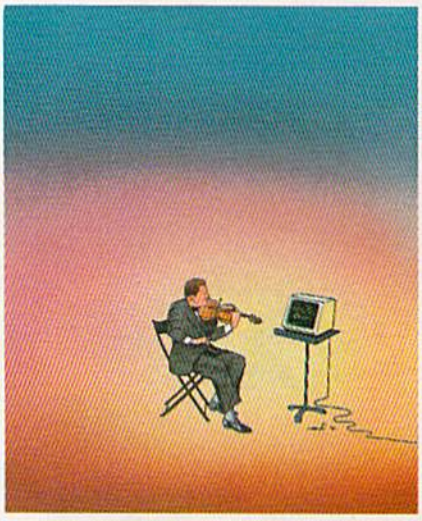

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RUNning Ruminations

Good-by, Thomas and Nigel.

Hello, Irving, Alfred and Richard.

Coup de Commodore

The latest happenings at Commodore contain more intrigue than an episode of Dynasty.

By now we're probably all familiar with the story, which was carried in all the major newspapers: Chief Executive Rattigan and five senior managers (including General Manager Nigel Shepherd) at Commodore are ousted; 67-year-old chairman of the board, Irving Gould, takes over as CEO; Rattigan files suit; Gould brings in Alfred Duncan and Richard McIntyre (both former Commodore Canada officials) to fill the gaps; 50 employees are laid off at Commodore headquarters.

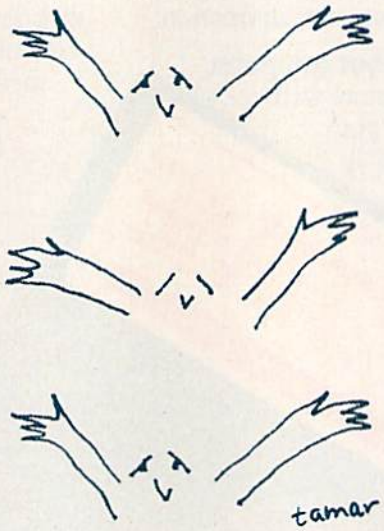
There's not much more to add. However, before we say good-by to Rattigan et al, let's credit them for returning the company to profitability after Commodore posted five consecutive quarter losses.

Looking to the future, let's hope that the reeling company is able to recover from its second major management shake-up in a year. Let's hope that this Canadian trio (Gould, Duncan and McIntyre) can boost Commodore's revenues, but that this sudden, melodramatic turn of events doesn't adversely affect Commodore's support to dealers and users in the form of products and service.

Welcome Aboard, Lou!

RUN magazine is pleased to announce that Louis Wallace has recently joined the magazine staff as technical manager. Wallace is well known in Commodore circles as a software developer, writer and speaker. Many of you are already familiar with Lou as the co-developer of the Ultra Hi-Res Graphics program (see *RUN*, February 1986), which tapped the undocumented high-resolution graphics capability of the C-128 in 80 columns. He is currently working on Basic 8.0, an enhanced version of Basic for the 128.

Or perhaps you know him as the graphics expert who hosts a monthly forum on QuantumLink. Or maybe you are familiar with his work as contributing editor of *Family Computing* and *AmigaWorld*, as well as a frequent contributor to *RUN*. He has had approximately 50 articles relating to Commodore computing published.



Wallace, who has years of computing experience and a valuable knowledge of the Commodore marketplace, will continue to write articles for *RUN*.

In his capacity as technical manager, Wallace will ensure the technical accuracy of the programs and articles published in *RUN*. He will also work with our authors in developing programs and articles for the magazine, oversee our special projects—the ReRUN disk, the special issues and our online bulletin board—and represent the magazine at computer shows.

Before joining the *RUN* staff, Wallace was a computer specialist and research chemist with the Veterans Administration Medical Center in Gainesville, Florida. He was also the charter president of the Gainesville Commodore Users Group.

We look forward to working with Lou and feel that our readers will quickly become aware of his contributions to the magazine.

A New Look

You recognize the name, but the look isn't the same. Well, don't panic. Your favorite computer magazine is indeed sporting a new look. Gone is the familiar *RUN* logo imposed on a set of computer keys.

It has been replaced by a bigger, cleaner, bolder logo to give the magazine more impact on the newsstand. The tag line under the logo now reads, "The Commodore 64/128 Users Guide." The substance hasn't changed; only the style.

You'll notice a different look in the articles and columns as well. The redesign eliminates many of the heavy black bars and opens up the page to give it a clean feel for easy readability.

As part of the redesign, we have also tightened up the text to get more words on the page.

You'll also notice that each author's bio contains a more personal profile of the writer. If you have questions or comments regarding an article, you are invited to write to the author in care of *RUN*.

The use of larger, bolder drop caps; repositioning some of the columns; and the use of different typestyles were all implemented to give the reader an uncluttered feel and create a strong visual impact. We hope our long-time readers, as well as new *RUN* purchasers, will feel comfortable with our new appearance.

We feel that our new look is well-tailored to our audience—authoritative, yet friendly—the same *RUN* you've been accustomed to for years. We hope you like the changes, which are not dramatic, but eliminate some of the design difficulties of the past.

Even though readers are sensitive to design, we still feel that content is more important than form. So if you like—or don't like—the new look, tell us. But more importantly, carefully examine our editorial coverage of Commodore's 64 and 128 computers. If we slip up, it's your responsibility to let us know about it.

Dennis Brisson

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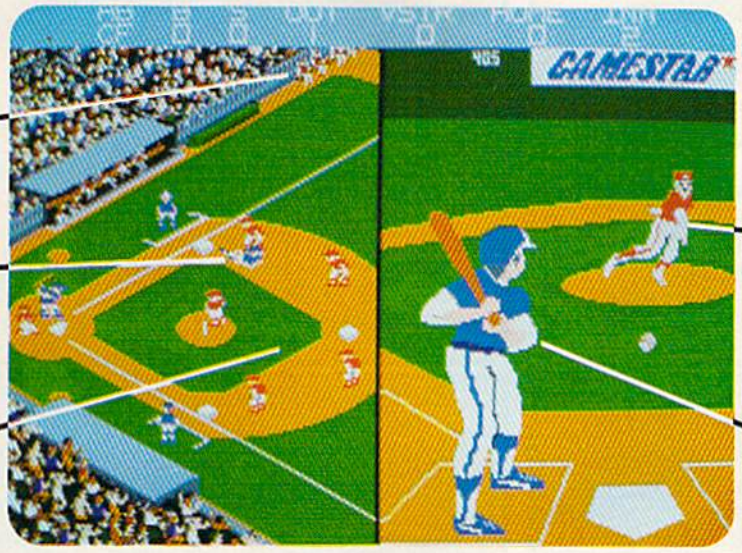

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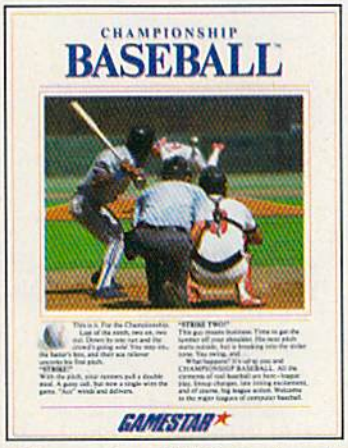

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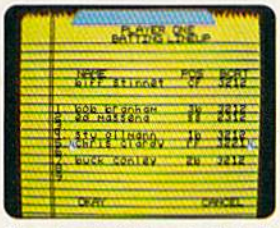

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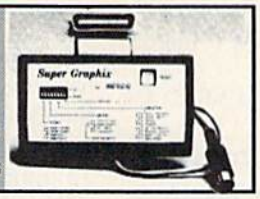

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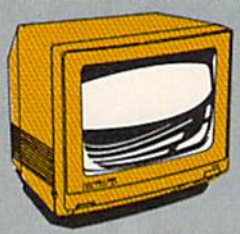

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MAGIC

Give your C-128's screen editor a cut-and-paste feature; play a word-scrambling game; speed up your C-64's cursor movements; make your screen titles fade in and out; and more. compiled by JIM BORDEN

$3F6 C-128 Partial Directories

When I want to print part of a disk directory that I've just loaded, I first enter the Renumber command, list the directory and delete any unwanted text. Then I print it out with OPEN4,4:CMD4:LIST. The only disadvantage is that the block count for the files will be incorrect.

—Adam Kaplan, address unknown

$3F7 Cut-and-Paste C-128 Basic Editing

Modifying the C-128's screen editor with the line below enables your computer to "cut out" part of one program line and "paste" it into another. Type:

```
KEY 1,CHR$(27)+"P{5 CRSR LFs}KEY4,"
+CHR$(34)+CHR$(13)
```

and press return. Now move the cursor to the character before the text you want to grab and press F1. Then move the cursor to the point you want to insert the text and press F4. The text will pop into place.

Keep in mind that the text you want to move cannot contain quotes, and it must start at column 6 or beyond to allow the KEY4," command to fit in front of the text.

—Constantino Grosse, Philadelphia, PA

$3F9 Basic-Blocks-Free Finder

If you need to know how much room is left on a disk while you're running a Basic program, just include this short subroutine. It should work with any Commodore computer. You'll have the answer along with the diskname almost instantly. Keep in mind that with double-sided disks formatted for the 1571 but being used in 1541 mode (or in a 1541 drive), the subroutine will show you only the blocks free on the single side.

```
10 REM BLOCKS FREE FINDER-J.R.CHARNETSKI
20 OPEN1,8,15,"I0:":OPEN8,8,0,"$0:"
30 FORJ=1TO18:GET#8,A$,B$:C$=C$+A$+B$
40 NEXT:CLOSE8
50 B=ASC(A$+CHR$(0))+256*ASC(B$+CHR$(0))
60 PRINT B;"BLOCKS FREE"
70 PRINT"ON DISK: ";MID$(C$,7,16)
80 PRINT#1,"UJ":FORZ=1TO1000:NEXT
90 CLOSE1:REM RETURN
```

—Joseph R. Charnetski, Dallas, PA

$3FA GEOS File Danger

Leaving a GEOS, GEOS Boot or GEOS Kernal file on the Desktop will prevent your C-64 from loading files properly, ►

TRICK OF THE MONTH

$3F8 C-64 Directory Name Array

The program below reads a disk directory, places each of the filenames into a one-dimensional array and prints out the filenames, using Basic code.

After you load and run the loader program, be sure to dimension a string array for the filenames as the first array in your program. Then call up the program with SYS828, which reads the filenames into the array with the number of files stored in location 254.

Here's an example of how to use the program, assuming the loader was run to poke the machine language into memory:

```
10 DIM A$(144):SYS 828:E=PEEK(254)
20 FOR C=1TOE:PRINT A$(C):NEXT:END
```

The program quickly reads the names into the array. The names are actually stored in the "free" area at 49152 ($C000), so you can store the array without using any of Basic's memory.

```
10 REM C-64 DIRECTORY READER-MARK NEWTON
15 C=0:FORA=828TO1006:READ B:POKE A,B:C=C+
   B:NEXT
20 IF C<>22602 THEN PRINT"DATA ERROR..."
25 DATA 169,14,162,8,160,0,32,186,255,169,
   4,162,235,160,3,32,189,255,32,192
30 DATA 255,162,14,32,198,255,160,0,140,57
   ,3,132,250,140,56,3,165,48,133
35 DATA 254,24,165,47,105,7,144,2,230,254,
   133,253,169,0,133,251,169,192,133
40 DATA 252,160,1,32,207,255,166,144,240,1
   5,32,204,255,169,14,32,195,255
45 DATA 172,56,3,136,132,254,96,192,6,144,
   45,201,34,208,10,173,57,3,73,1
50 DATA 141,57,3,16,31,174,57,3,208,30,192
   ,32,208,22,160,0,165,250,145,253
55 DATA 132,250,24,165,253,105,3,144,2,230
   ,254,133,253,76,119,3,200,76,121
60 DATA 3,140,59,3,160,0,145,251,165,250,2
   08,14,160,1,165,251,145,253,200
65 DATA 165,252,145,253,238,56,3,230,250,1
   72,59,3,230,251,208,2,230,252,76
70 DATA 166,3,36,48,58,42
```

—Mark E. Newton, Jamestown, IN

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and it can also keep the master disk from booting. You can avoid this problem by never leaving a file on the Desktop when you close the master disk.

—ROBERT M. ROBY, WHITEMAN AFB, MO

$3FB BLOCKS REQUIRED

If you regularly fill up the space on your disks, then enter the line below for your computer. It will tell you how many blocks are required to save a program.

For the C-64 use:

```
X = PEEK(45) + 256*PEEK(46) – 2049:PRINT INT(X/254) + 1
"DISK BLOCKS REQ'D"
```

For the C-128 use:

```
GRAPHIC CLR:X = 58109 – FRE(0):PRINT INT(X/254) + 1
"DISK BLOCKS REQ'D"
```

For the C-64, X calculates the end of your Basic program and subtracts the starting address (2049) from it. The C-128 version is easier to calculate, since all of Bank 0 except 7427 bytes are available for program storage.

—JEFF ROSS, NEWARK, DE

$3FC WORD MIXER

Here's a short program that scrambles the letters in words and prints them out to use in a word game. Load and run the program and input up to 20 words from a selected topic. The scrambled words will be printed on one sheet of paper and the answers on the next sheet. The program should work with any Commodore computer/printer combination. However, for non-Commodore printers, you might have to use CHR$(95) in line 40. (Here's a challenge for you word wizards: Can you create an anagram program?)

```
Ø PRINT"{SHFT CLR}{4 CRSR DNs}{7 SPACEs}*
  WORD MIXER BY T J RYAN *"
1Ø INPUT "{4 CRSR DNs}{5 SPACEs}TOPIC";T$
2Ø INPUT "{CRSR DN} # OF WORDS";N:IFN>2ØTH
   ENPRINT"2Ø WORDS MAX!":GOTO2Ø
3Ø DIM B(3Ø),J$(N),L$(3Ø),W$(N)
4Ø FOR J=1TO2Ø:B$=B$+CHR$(95):NEXT
5Ø FORW=1TON:PRINT"{CRSR DN} WORD #";W;:IN
   PUT W$
6Ø L=LEN(W$):W$(W)=W$:FORK=1TOL:L$(K)=MID$
   (W$,K,1):B(K)=K:NEXT
7Ø FORK=1TOL:D=INT(RND(1)*L+1):E=INT(RND(1
   )*L+1):T=B(D):B(D)=B(E):B(E)=T:NEXT
8Ø FORK=1TOL:J$(W)=J$(W)+L$(B(K)):NEXT:NEX
   T
9Ø OPEN4,4:CMD4:REM SEND WORDS TO PRINTER
1ØØ PRINT SPC((8Ø-LEN(T$))/2);T$:PRINT
11Ø PRINT:PRINT:FORJ=1TON:PRINTSPC(3Ø-LEN(
    J$(J)));J$(J);"{2 SPACEs}";B$:PRINT:NE
    XT
12Ø FORJ=1TO61-2*N:PRINT:NEXT:FORJ=1TON:PR
    INT W$(J):NEXT
13Ø PRINT#4:CLOSE4
```

—T. J. RYAN, NORWOOD, OH

$3FD FASTER FRACTION ACTION

The program below converts terminating decimals into common fractions in lowest terms more quickly than Magic Trick $3B8 (p. 12, *RUN*, March 1987). It takes advantage of the fact that terminating decimal fractions can be reduced only by dividing by powers of 2 and 5. This saves the time of fruitless division by other integers. The program should work on all Commodore computers.

```
1Ø REM FAST COMMON FRACTIONS-B. HICKERSON
2Ø INPUT"GIVE ME A DEC. NO. ";N$
3Ø FORX=1TOLEN(N$)
4Ø IFMID$(N$,X,1)="."THENFLAG=1:D=X
5Ø NEXT:IFVAL(N$)=ØTHEN END
6Ø IF FLAG<>1THENPRINT N$:GOTO2Ø
7Ø L$=LEFT$(N$,D-1):R$=RIGHT$(N$,LEN(N$)-D
   )
8Ø T$="1":FORY=1TOLEN(R$):T$=T$+"Ø":NEXT
9Ø PRINT L$" "R$"/"T$" IN LOWEST TERMS IS:
   "
1ØØ R=VAL(R$):T=VAL(T$)
11Ø IFR/2=INT(R/2)ANDT/2=INT(T/2)THENR=R/2
   :T=T/2:GOTO11Ø
12Ø IFR/5=INT(R/5)ANDT/5=INT(T/5)THENR=R/5
   :T=T/5:GOTO12Ø
13Ø IFT/R=INT(T/R)THENT=T/R:R=R/R
14Ø R$=STR$(R):T$=STR$(T):R$=RIGHT$(R$,LEN
   (R$)-1):T$=RIGHT$(T$,LEN(T$)-1)
15Ø PRINTL$" "R$"/"T$:RUN
```

—BRYCE R. HICKERSON, CARMICHAEL, CA

$3FE C-128 ELECTRONIC STAMP PAD

This program draws any set of one to eight sprites on a high-resolution screen. Use a joystick in port 2 to position the sprite on the screen and press the fire-button to copy it to the screen. When you're finished, press the space bar to select another sprite, or select sprite 0 to exit the program. When prompted for the template name, enter the name of a binary file containing the desired sprite shapes.

```
1Ø REM STAMPER 2/15-MATTHEW THIE
2Ø PRINT"{SHFT CLR}":GRAPHIC1,1:GRAPHICØ:D
   IRECTORY
3Ø INPUT "{CRSR DN}TEMPLATE NAME";TN$:BLOA
   D(TN$)
4Ø PRINT"{SHFT CLR}":E=4Ø: FORQ=1TO8: SPRI
   TEQ,1,7,1,Ø,Ø,Ø: MOVSPR Q, E, 5Ø:E=E+32
   :NEXT
5Ø PRINT"{3 CRSR DNs}{3 SPACEs}1{3 SPACEs}
   2{3 SPACEs}3{3 SPACEs}4{3 SPACEs}5{3 SP
   ACEs}6{3 SPACEs}7{3 SPACEs}8"
6Ø INPUT"{2 CRSR DNs}SPRITE NUMBER (1-8) Ø
    TO QUIT";SN:IFSN<ØORSN>8THEN6Ø
7Ø IF SN=ØTHENGRAPHICØ:FORU=1TO8:SPRITEU,Ø
   :NEXT:END
8Ø GRAPHIC1:SPRSAV SN,B$
9Ø IFJOY(2)=1ANDTY>ØTHENTY=TY-1Ø
1ØØ IFJOY(2)=7ANDTX>ØTHENTX=TX-1Ø
11Ø IFJOY(2)=5ANDTY<19ØTHENTY=TY+1Ø
12Ø IFJOY(2)=3ANDTX<31ØTHENTX=TX+1Ø
```

Continued on p. 91.

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NEWS AND NEW PRODUCTS

Among this month's new offerings are some clip-art graphics for GEOS and 21 public domain CP/M programs.

compiled by HAROLD R. BJORNSEN

NEW CLIP-ART FOR GEOS

Diskart, a line of clip-art on three separately available disks, has been released for the GEOS graphics/text editor and operating system, which created the programs' hi-res graphics. The ready-to-use graphics for holidays, weather, geoPaint tips, music, U.S. maps and vehicles, among others, can be copied directly into geoPaint and geoWrite documents. Each disk is available for the C-64 for $8.50 from Those Designers, 3330 Lewis Ave., Signal Hill, CA 90807.

Check Reader Service number 400.

CADPAK MOUSE SUPPORT

Abacus Software, publishers of the graphics design and drawing program, Cadpak, has enhanced that package to support Commodore's 1351 mouse. Technical support manager, Scott Allen, says that, "very few software packages are available to support the mouse, and Cadpak is one of the few packages for the Commodore that [does]."

The company states that if you've purchased Cadpak since February 1, 1987, you're entitled to a free upgrade to the mouse version. Earlier buyers of Cadpak may upgrade to the new mouse version for a nominal charge.

DINNER FOR 100,000, PLEASE

If you enjoy cooking for one or a whole city, The Recipe Filer and Serving Converter program might help you. After you input the recipe information and the number of servings, the program tells you the amounts of ingredients you'll need to serve your guests. You can also file and recall recipes and view them on the screen or print them out. It's available for the C-64 for $9.95 from Microcraft, 9245 Washington, Brookfield, IL 60513.

Check Reader Service number 401.

THE SENTRY

In The Sentry, an action-adventure game from Firebird (PO Box 49, Ramsey, NJ 07446), you're stranded in a world with 10,000 landscapes to explore, the urgency of an ever-decreasing time element and a formidable opponent to deal with. Your only defense is a robot, which you use to battle the Sentry and her Landgazers to usurp her position as ruler of the alien landscape. The game is available for the C-64 for $39.95.

Check Reader Service number 402.

C-128 DISK UTILITIES

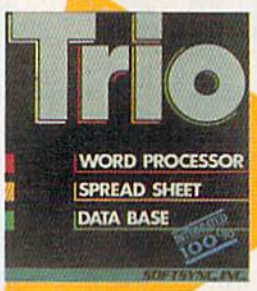
Super Disk Utilities, for the C-128 and 1571 disk drive, copies the contents of an entire disk, copies files, performs many CP/M and MS-DOS utility functions, edits any track or sector, scratches and unscratches files, changes a disk's format without affecting its data, and more. Super Disk Utilities retails for $39.95, and it's available from Free Spirit Software, 538 S. Edgewood, LaGrange, IL 60525.

Check Reader Service number 404.

PRODUCTIVITY TRIO

Softsync (162 Madison Ave., New York, NY 10016) has released Trio, an integrated package for the C-128. It includes a word processor, spreadsheet and database program, all of which take advantage of the C-128's 80-Column mode. Trio is available for $69.95.

Check Reader Service number 405.



Trio's word processor, spreadsheet and database make up a fully integrated package from Softsync.

CP/M PROGRAMS FOR YOUR 128

CP/M Kit, a collection of public domain programs for the C-128's CP/M mode and the 1541 or 1571 disk drives, has been released by Innovative Computer Accessories (PO Box 789, Imperial Beach, CA 92032). With the 21 programs in this package, you can manipulate libraries, do word processing, use a modem and edit files, among other things. The booklet included in the package assumes no previous knowledge of CP/M on the part of the user. The retail price for the CP/M Kit was unavailable at press time.

Check Reader Service number 403.

BUILD YOUR OWN PERIPHERALS

Computer Peripherals That You Can Build, a revised, updated and expanded second edition, highlights state-of-the-art interfacing techniques and peripheral devices for the C-64. The 293-page book covers serial peripherals, digital peripherals with parallel output, parallel digital ports and analog signals and complete pinout diagrams of all integrated circuits used. There are new projects for a mouse, a bar-code reader, paddle-position readers, a trackball, an x-y plotter for data output and a drawing tablet. The trade paperback is available for $16.95 from Tab Books, Blue Ridge Summit, PA 17214.

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DELTA MAN

A nuclear holocaust has destroyed Chicago, but you've survived because you discovered and used a robotic space suit and picked through the wreckage to find supplies, weapons and fuel. You ward off roaming bands of genetic mutants while searching for other surviving humans, until you can escape the city. Delta Man, an action-adventure for the C-64, is available for $19.95 from Cosmi, 415 N. Figueroa St., Wilmington, CA 90744.

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You can use Timeworks' Partner 64 desktop accessory program while it temporarily suspends any other program in memory.

C-64 Desktop Accessory

Partner 64, a 64K, 40-column, cartridge-based desktop accessory program for the C-64, has been released by Timeworks (444 Lake Cook Road, Deerfield, IL 60015). It gives you eight memory-resident desktop accessories that operate concurrently with other programs. Accessories include an appointment calendar and datebook, memo pad, phone list and autodialer, name and address list, calculator, typewriter, label maker and envelope addresser. It's available for $59.95.

Check Reader Service number 409.

Mindscape Moves To Acquire HRW Assets

Mindscape, a publisher of software for the Commodore computers, has announced an agreement in principle with Holt, Rinehart and Winston to purchase most of the assets of the HRW education software unit, formerly known as CBS Interactive Learning. The proposed transaction marks the third acquisition within the last nine months for Mindscape, and, according to the company, makes it one of the largest educational software publishers in North America.

Fly the Jump Jet

Eurosoft International (114 East Ave., Norwalk, CT 06851), has released Jump Jet, a vertical take-off flight and combat simulator for the C-64. After selecting one of five skill levels, you lift the Jump Jet off the deck of an aircraft carrier to seek and destroy enemy aircraft with sidewinder air-to-air missiles. You are given audible warnings with the C-64's voice and sound capabilities. Once you've destroyed the enemy, you must relocate the aircraft carrier and attempt the difficult maneuver of landing the Jump Jet to successfully complete the mission and earn a promotion. It's available for $24.95.

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Fix Your Own Computer

The Brady Guide to Microcomputer Troubleshooting & Maintenance, a step-by-step problem-solver and maintenance manual, has been published by Prentice Hall Press (One Gulf+Western Plaza, New York, NY 10023). The manual guides you in performing routine maintenance and money-saving repairs, familiarizes you with the computer's insides and describes ways to keep them working properly. Troubleshooting "road maps" detail the causes of most computer problems and suggest possible cures. If you find the problem is too complex for you, the manual explains what to expect from a professional service, so you won't spend money on unneeded work. It's available in trade-paperback format for $17.95.

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Invoice Management

With Tisar 128, a database and invoice management system for small- and medium-size businesses, you can store up to 500 records on a disk, keep track of all your customer data on 14 fields and keep special invoice information in separate files on customer invoice disks. The system's Write/Edit mode lets you change and add information to files, search for data on any field, perform unlimited cross searches, sort results of any search and generate reports on bar-type monthly earnings graphs. Tisar 128 is available for the 128 at $69.95 from CW Data-Labs, 1632 Napfle Ave., Philadelphia, PA 19111.

Check Reader Service number 407.

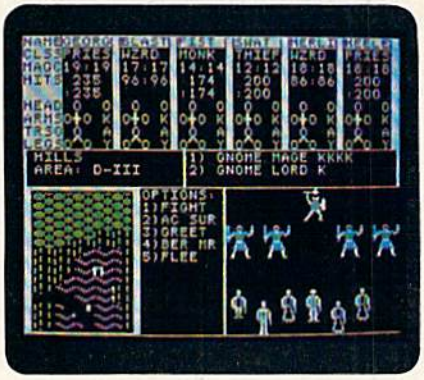
Find a Lover

The Love Quest, for the C-64, allows singles to meet other singles through a nationwide database. It also tells couples how compatible they are and how to improve their relationship. The Love Quest asks you 77 sex-related questions to derive information about your personality, such as sensuality, dominance, materialism, your sex drive and your ability to fall in love. The company will also match you up with some of the 20,000 individuals from around the country. The Love Quest retails for $59.95 and is available from Intracorp, 13500 SW 88th St., Miami, FL 33186.

Check Reader Service number 413.

Phantasie Sequel

Strategic Simulations (1046 Rengstorff Ave., Mountain View, CA 94043) has released Phantasie III: The Wrath of Nikademus, a multiple-character role-playing game sequel to its Phantasie adventure game series. This is the final confrontation between a band of adventurers and the Dark Lord Nikademus and his army of vile beasts and creatures.



Assemble a party of adventurers to destroy the Dark Lord in Strategic Simulations' Phantasie III: The Wrath of Nikademus.

The game features more strategy and combat options, enhanced graphics, more magic spells, and increased playing speed as you travel across the wilderness or into dungeons. It's available for the C-64 for $39.95.

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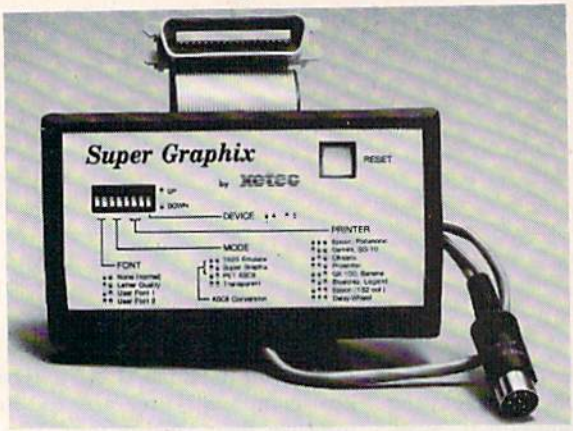
Super Graphix



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AWARD-WINNING SOFTWARE

The Software Publishers Association Spring Symposium Excellence in Software Awards were handed out at the Claremont Hotel in Berkeley, California last March. Among the winners were several Commodore-related packages.

Broderbund Software's Toy Shop, a toy design and customizing package, garnered the awards for Best Creativity Program, Best Concept and Best New Use of a Computer. Another of its programs, Where in the U.S.A. is Carmen Sandiego?, an educational game, took away the awards for Best Primary Education Program and Best General Education Program.

GEOS 1.2, a graphics environment operating system from Berkeley Softworks, won the award for Technical Achievement. Leather Goddesses of Phobos, an interactive adventure game from Infocom, was awarded Best Software Packaging, and Chessmaster 2000, a chess game from Software Toolworks, won Best Entertainment Program.

NO MORE VAGUE COMPUTER MESSAGES

Micro Detective, an automatic error detector for the C-64, contains information about every type of error your computer can throw back at you. Too often, you sit for long periods staring at your monitor screen, trying to decipher vague error messages. The automatic error detection shows and explains almost any error. No more Syntax error, but "Expected a comma"; or, instead of just Illegal Quantity Error, the error is highlighted along with a message, such as "Should be an integer in the range 1-255." Micro Detective is available for $49.95 from American Made Software, PO Box 323, Loomis, CA 95650.

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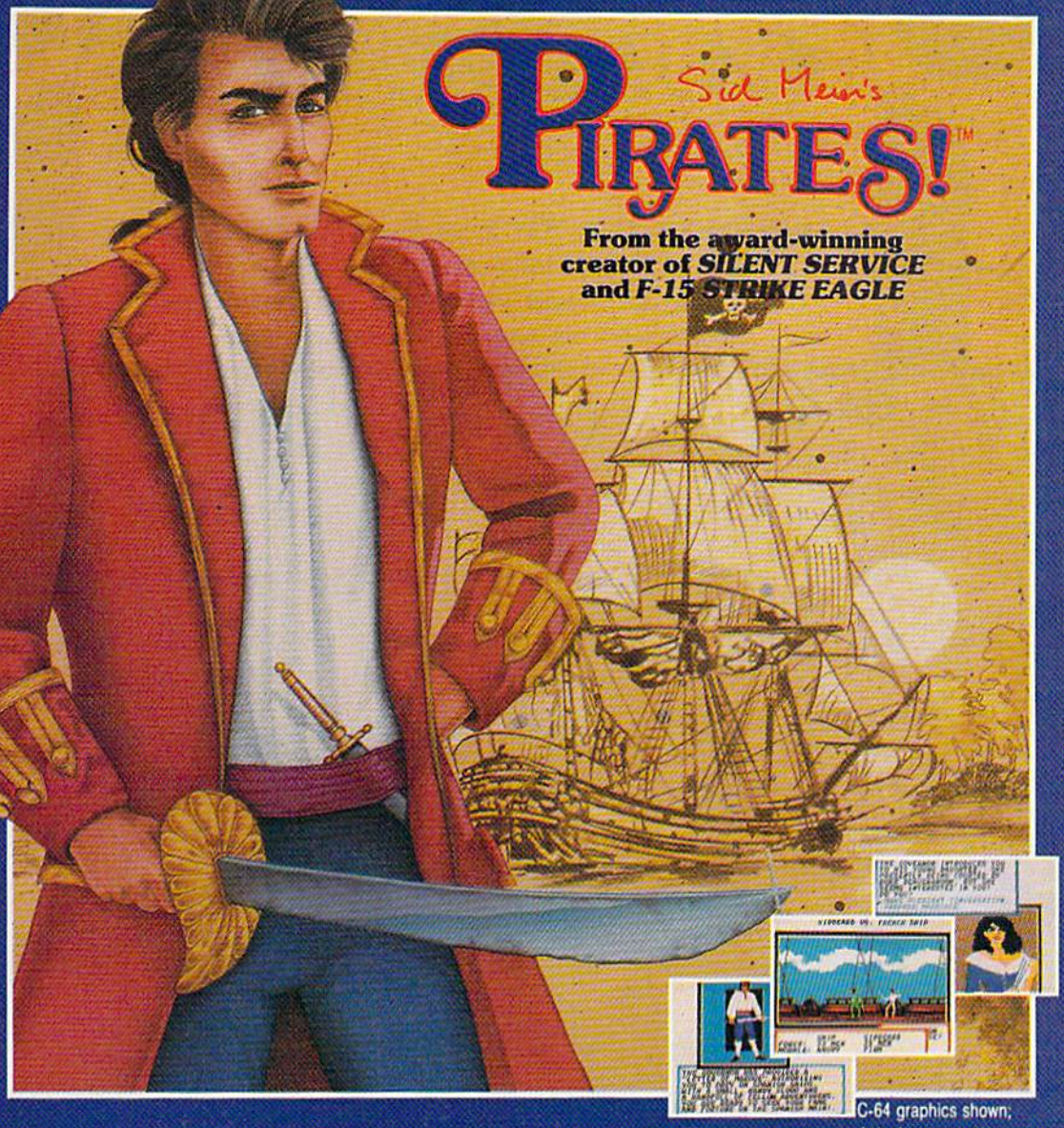

C-64 graphics shown; Actual screens may vary.

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MAIL RUN

This month's Mail RUN includes letters about tax software, mail-in user's groups, the copy-protection controversy and more—plus a list of RUN *readers around the world who are looking for pen pals.*

TAX SOFTWARE UPDATES

We certainly appreciate reviewer Joseph Shaughnessy's comments on our program, Tax Command Professional, in the April 1987 issue of *RUN*. We've tried to keep the program fast and flexible, and we are pleased that he recognized this.

I'd like to explain the "small bug" he encountered in Schedule W. Tax Command Professional compares the total business income with what you enter for yourself and assigns the difference to your spouse. This saves having to enter both spouses' business incomes. I assume that Mr. Shaughnessy moved to the spouse column before entering his own business income. As he notes, he was able to correct the situation easily.

A number of your readers have asked about the availability of Tax Command Planner, briefly mentioned in the article. It's been extensively rewritten to reflect the new tax law and covers the new law from 1987 to 1996. Under the new law, tax treatment varies from one year to the next, with specific changes to rates and exemptions in the early years and changes reflecting inflation in the later years.

The new version of Tax Command Professional should be available by the time you read this issue of *RUN*.

—BRUCE R. THOMPSON
PRACTICAL PROGRAMS, INC.
PO BOX 93104
MILWAUKEE, WI 53203

I would like to commend Joseph Shaughnessy on his excellent review of income tax programs for Commodore computers in last April's issue of *RUN*. I'd also like to correct an error in the review. I have Swiftax/64 and was told by Timeworks that I can only update (for $25) once. After that, I must repurchase the software. This situation is not reflected in the article, which just says yearly updates are available for half the original price.

—M. TUCKER BRAWNER
SAVANNAH, GA

We contacted Timeworks. They said previous owners may purchase the 1987 version of Swiftax/64 for half-price, but will have to buy later updates at the full price.

—EDITORS

THE POWER OF RUN SCRIPT

Serendipity was at work recently when I purchased *RUN*'s Productivity Pak II disk. I ordered the disk to get the updated version of Mike Konshak's Datafile, which I've been using since it was first published in *RUN* several years ago. What I also got, unexpectedly, was RUN Script, which I find to be much better than the word processor I'd been using.

What especially delights me is the ease with which RUN Script can be customized, not only for one-time printing of a particular document, but in permanent formats for printing postcards and other non-lettersize documents. Its other great feature is its ability to use macros.

Robert Rockefeller has done a bang-up job!

—SI LABAR
BETHLEHEM, PA

MORE SHOTS IN THE SOFTWARE WAR

I read "The Software War" in the January 1987 issue of *RUN* and the letters in response to it in the April Mail RUN. I feel copy protection is a catch-22 situation. The companies charge too much for software, so pirates copy it, which takes away from the profits of the companies, so the companies raise their prices, which makes more pirates copy, and the companies proceed to lose more money . . .

If the solution were as simple as lowering prices, then the whole problem could be solved in short order, but lowering prices would start a chain reaction that would send companies straight into financial oblivion. Meanwhile, the honest user is getting ripped to shreds by software expenses.

If people would just stop pirating, prices could be lowered to a reasonable level, and we could be done with this controversy forever.

—MATTHEW LANDRY
ANN ARBOR, MI

I have no complaint about copy protection on games, but applications software should *not* be protected. Most software manufacturers state that they'll provide backup disks to registered owners for X dollars. The problem is that the companies go out of business or stop supporting old programs.

Two programs I use regularly were produced by firms that are now out of business. The programs came copy-protected, but I removed the protection as soon as I got them home.

When one of the original disks went west some time back, I did a three-minute copy back to it, and all is well again. If I hadn't had a backup disk, all the files I'd made with the program, and the hours of work that went into them, would have been lost.

I've recently purchased some new software that's not copy-protected, and it's so stated on the box. That's one of the reasons I chose the package over another brand. I'll support all manufacturers who stop copy protection.

—JIM KNAUSS
HOUSTON, TX

Almost every letter in last April's Mail RUN expressed a complaint about software protection. There *is* a clear solution to copy-protection problems—a solution I've been using for years. I write my own programs and don't give them to anyone!

—JOHN LOGAN
CARMEL, CA

INTERNATIONAL TELECOMMUNICATIONS

I'd like to call bulletin boards in other countries, but I need information on how to make contacts. I'd appreciate it if *RUN* readers in other countries who are involved in telecommunications ►

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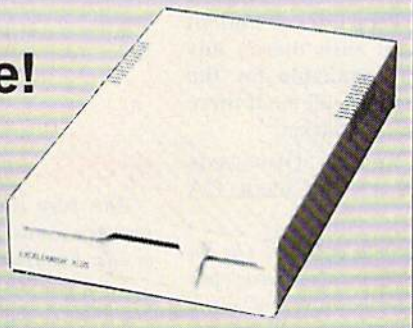

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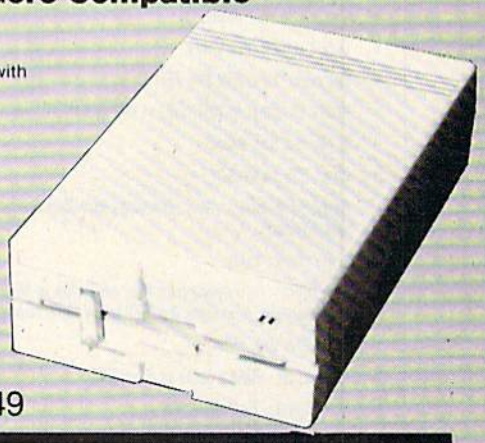

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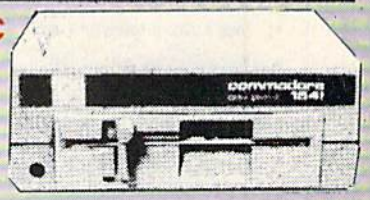

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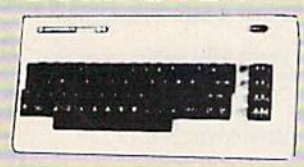

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—MICHAEL TATEISHI
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GRADEBOOK SOFTWARE

I'm an elementary school teacher, and I'm thinking of buying a Commodore computer. However, one of the tasks I want to do with it is keep track of student grades, and I'm not sure there's any gradebook software available for the Commodore. Could you tell me if there is such software on the market?

—CARROLL DUPLESSIS
WALNUT CREEK, CA

Check last month's issue of RUN. *The Resource Center column discussed gradebook programs and described specific features of several of them. See page 6 in this magazine for information on ordering back issues.*

—EDITORS

CORRESPONDENCE CLUB

I'm starting a mail-in computer club for C-64 and C-128 users. It'll have a newsletter and perhaps, eventually, its own BBS. If you'd like to join, send me a letter with any comments you have about Commodore computing and any ideas you have for the club. Please include a self-addressed, stamped envelope, and I'll write back to you.

—MATTHEW MASSA
N7197 HIGHWAY E
TOMAHAWK, WI 54487

A CALL TO READERS

This page is your stage, so stand up and say a few words. Extend praise, air greivances or offer hands-on advice and information.

Send your letters to Mail RUN, 80 Elm St., Peterborough, NH 03458. Each letter must include the writer's name and complete address. RUN *reserves the right to edit letters for style, clarity and space.* ■

RUNNING AROUND THE WORLD

RUN often receives letters from readers who'd like to correspond with other Commodore users. The following list is compiled from such letters, representing quite a few countries. We've indicated some of the special computing interests of writers who've provided that information, and we also mention the systems they own. We'll update the list every so often as we accumulate more names. If you'd like to share computer information and concerns with others in the United States or abroad, here's your chance. Have fun!

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Andre Zielasko
PO Box 77
95590-Tramandai-RS
Brazil
C-64

Great Britain:

Geoff Dean,
Good Drivers Association,
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Games,
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1121 Williams
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C-64; S'More cartridge

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2145 Ocean Ave.,
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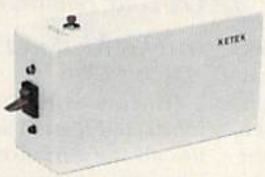

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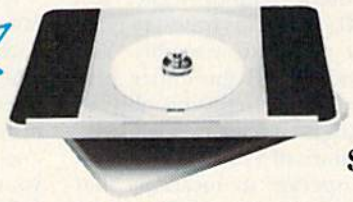

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SYMBOL MASTER ——— B

Here's Software Guaranteed To Catch the Attention Of Earnest ML Programmers

Symbol Master is a program that disassembles C-64 and C-128 machine language programs, using symbolic labels. It quickly produces a cross-reference table of all labels used in the ML code, which is an extremely useful tool in learning just what an ML program is doing. It can also write source files to disk for future modification and reassembly.

One of the best ways to learn ML progamming is to look at actual code written by others. Symbol Master will convert the ML programs found in magazines into a useful disassembly. You might not understand the entire program, but you'll probably be able to learn something.

Several versions of Symbol Master are available to operate in locations that don't conflict with other utilities you use. For disassembly, the ML program is loaded into memory in either 64 or 128 mode. The code can be loaded at almost any user-defined location and disassembled with an offset to generate a source file with correct addresses.

Symbol Master doesn't disassemble without some preliminary investigation of the ML program to find blocks of code and data. (To help with this process, C-64 users can employ a modified version of Micromon, and C-128 users can exercise the 128's built-in ML monitor.) The data is then passed along to Symbol Master through a command file, which is created in the Symbol Master editor and can be saved for later use.

When your command file is ready, you can run Symbol Master, and it will generate a listing of the disassembled program. It's best to send this output to the screen to see if the command file needs any fine tuning. If the program disassembly looks as though it's correct, you can list it to the printer or create a source file on disk. Of course, to use any source files you create, you'll need an assembler. Seven assemblers are supported—MAE, PAL 64, Develop-64, CBM, LADS, Merlin and Panther.

Any byte referenced in the program is assigned a label consisting of the byte's location and a prefix showing how the byte is used. For example, if the code branches to the label location, it will begin with a B, jump targets begin with a J, and so on.

Symbol Master includes a 40-column-only Label Editor program to create label files that suit a program you want to disassemble. Label files can be merged from a library of files you create, or you can use one of those supplied on the disk.

None of the programs on the Symbol Master disk are copy protected. In fact, each disk is assigned a serial number which, when registered, is used for requesting updates and making support calls to Schnedler Systems. You're even encouraged to make a backup copy for your own use.

Symbol Master suffers from three shortcomings. First, while the main C-128 editor works in 80-Column mode, it isn't fully functional. Secondly, the manual is badly in need of an index.

My last complaint is that the main editor is an ML program rather than a wedge. If you want to use a Basic command, you must exit the editor, issue the command and then SYS back to the editor via the warm-start SYS address. A quick-reference card would make the addresses easier to find.

Overall, this is a very good package. The C-64 and C-128 programs are contained on the same side of an unprotected, fast-loading disk. Symbol Master is an efficient instrument for those with ML experience. *(Schnedler Systems, 1501 N. Ivanhoe St., Arlington, VA 22205. C-64/ $49.95 disk.)*

—JIM BORDEN
CARLISLE, PA

THE PAWN ——— A

Let Your Imagination Roam In This Mythical Land

It's easy to praise the merits of this illustrated textual adventure, because it has all the earmarks of a first-rate fantasy software program. From the intriguing gameplay to the unique and powerful parser, The Pawn is a winner right from the start.

Close inspection of the product reveals a deep-rooted sophistication not found in many games of this kind. Oh sure, you'll spend the usual amount of ►

REPORT CARD

A Superb!
An exceptional program that outshines all others.

B Good.
One of the better programs available in its category. A worthy addition to your software library.

C Average.
Lives up to its billing. No major hassles, headaches or disappointments here.

D Poor.
This program has some problems. There are better on the market.

E Failure.
Many problems; should be deep-sixed!

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"...easy to use package with more power than most users should need...ultra-fast compile and link times make program development effortless." Adam Hørst, Transactor

C is one of today's most popular languages. It's easy to transport C source code from one computer to another. With ***Super C*** you can develop software or just learn C on your Commodore. ***Super C*** is easy to use and takes full advantage of this versatile language. Produces 6502 machine code and is many times faster than BASIC. Includes full-screen editor (search, replace and block operations), compiler, linker and handbook. Combine up to seven modules with the linker. Besides the standard I/O library, a graphic library (plot points, lines, fill) and a math library (sin, cos, tan, log, arctan, more) are included. Whether you want to learn C, or program in a serious C environment for your Commodore, ***Super C*** is the one to buy.

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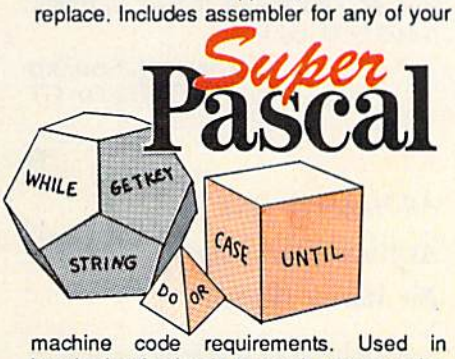

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for C-64 **$39.95** for C-128 **$59.95**

"...everything a good compiler should be...easy to use...efficient...offers a good range of optional features...excellent documentation...inexpensive." Tom Benford, Commodore Magazine

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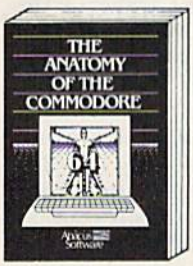

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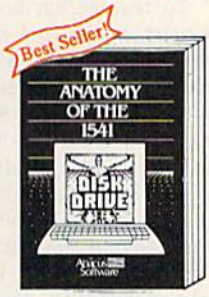

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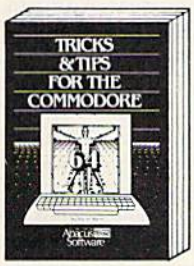

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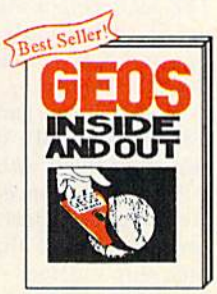

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time typing in "North," "Get key," and so on. Still, there are some things this program has that others do not.

For example, the parser is so powerful that you can tell it to "Get all except the cases but not the violin case then kill the man eating shrew with the contents of the violin case. Remove the shrew's tail and use it to tie the pole and the noose together." Try giving a command like that to your other text games!

The Pawn also has, without a doubt, the most outstanding set of graphics images I've ever seen in a textual adventure. They aren't animated, and you can dispense with them simply by hitting a function key or by using the "cameo" feature. The first time you enter a location during normal gameplay, you see a full-screen rendition of the area. On subsequent visits, you'll be treated only to a cameo, or smaller,

It's your turn to explore the kingdom of Kerovnia in The Pawn.

version of the illustration, which appears in the upper right-hand corner of the screen. By playing in the Cameo mode, you see the smaller version every time you enter a new section of the game; the prompts appear faster, too, which speeds up gameplay.

Another nice function of The Pawn is its Cypheric Help section: a series of alphanumeric inputs available to assist you in getting through some of the more difficult parts of the game. It is not like "hint sections" in some other games. In The Pawn, you key in a particular line to achieve a particular answer, and certain answers can only be obtained when enough points are gathered. All questions have between two and eight cyphers, with each one resulting in a more specific response.

Two more helpful features are a self-copy program and a second disk for backing up and storing saved games. Perhaps the crowning attraction of this game is the novella that is included. "A Tale of Kerovnia" is a charming story about the mythical kingdom that serves as the backdrop to The Pawn. By reading it, you'll gain valuable insights into some of the game's happenings.

If you're looking for an enchanting tale that is sure to engage your attention and keep you entertained for hours, stop by the land of Kerovnia and spend some time with The Pawn. *(Firebird Software, Inc., PO Box 49, Ramsey, NJ 07446. C-64/$39.95 disk.)*

—ROBERT J. SODARO
FAIRFIELD, CT

WARSHIP — B

All Hands on Deck
As You Prepare Yourself
For Marine Warfare

Warship is a tactical wargame that reenacts battles in the Pacific during the years 1941–45. A game for one or two players, you can operate either Allied or Japanese naval forces in one of five types of combat. In all the clashes, you can adjust things like visibility, damage control, game length, time and date of battle, number and type of ships, terrain, and so forth.

There are 27 different Japanese ship classes and 53 various American, British and Dutch classes to choose from. You can also customize your own, or you can let the computer pick your forces. The game comes with historical scenarios—Guadalcanal, Empress Augusta Bay and San Bernardino—or you can design your own.

As with most games from Strategic Simulations (SSI), the action is deliberate and filled with options. SSI rates Warship an advanced level game, which means you can't just move the ships and fire. You control almost every detail of each ship's actions—course, speed and formation. You also have to determine how you are sighting and ranging in on targets, what you are firing and what torpedo speed settings you're going to use.

Once you get the feel of the game—which should only take an hour or two if you are a simulation player—you can set your ships' courses and stop the action only when you need to make adjustments. Battles can last for 30 minutes to two hours, and you can save the games.

So how is Warship? A little disappointing: There are no graphics to speak of, and even though you don't normally expect great graphics in a war simulation, in this case it's sometimes difficult to see the difference between Japanese and Allied ships.

The documentation is filled with details, facts and charts, but still ends up being only 90% complete. For a game with an advanced rating, it was fairly easy to master in a relatively short time, so it probably should be classified as intermediate.

Finally, unless I am a naval tactical genius and never realized it before, I found it too easy to beat the computer, which doesn't often happen with SSI games. Warship is a good game, but not a great one. *(Strategic Simulations, Inc., 1046 N. Rengstorff Ave., Mountain View, CA 94043. C-64/$59.95 disk.)*

—GUY WRIGHT
AMIGA WORLD STAFF

MOEBIUS — A–

Restoring Harmony
By Retrieving the Orb
Reveals a Mystical World

Bad times have befallen the world of Khantun. It seems that Kaimen, the once-favored disciple of Moebius the Windwalker, has stolen the Orb of Celestial Harmony. Now, the long foretold Age of Doom has arrived at Khantun, bringing with it earthquakes, savage tigers, giant water beetles, dreaded forest demons and a host of other horrors.

To restore harmony to this oriental world, someone must traverse the realms of Earth, Air, Water and Fire, battling Kaimen's evil monks along the way and liberating Moebius's monks so they can return to their rightful place in the shrines. Finally, this emancipator must reach Kaimen, destroy him and regain control of the Orb. Naturally, the only adventurer for the job is you!

First, you must become trained in sword fighting, hand-to-hand martial arts and divination. Although none of these preliminary tasks are particularly difficult, they help familiarize you with the basic control scheme of the game.

Moebius is a role-playing fantasy much in the tradition of Origin's Ultima series. However, the graphic elements here are at least twice as large and more detailed than in similar games. In addition, a bamboo frame around the playfield gives it an unusual appearance, while Eastern music helps to establish the Oriental feel.

Another feature distinguishing Moebius is that confrontations are often resolved on a separate combat screen.

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There, you'll employ your sword or bare hands to defeat evil palace guards and assassins. But, if your enemy does get the better of you, you'll lose one of your three game lives.

You begin the game with all the supplies you'll need to get started—a sword, a full waterskin and food pouch, a torch, a whetstone, three body elixers, and three defensive weapons.

You'll have to master not only how to protect yourself in combat, but how to manage these resources.

Another key to success is learning how to communicate with the local villagers. First, you must gain their trust by putting your sword away before approaching them; then, safeguard them from Kaimen's evil henchmen. In return, the villagers provide you with supplies and clues to help you move to the next realm.

Of course, no fantasy is complete without some magic artifacts and spells. By finding things like fish scales, tiger teeth and panda hair, you can become invisible, throw your voice or even pass through solid objects. You can also learn prayers to help you walk on water, restore yourself to full health, produce light and remove enemies from your presence.

I know there's really nothing here that hasn't already been done in countless other role-playing games. Still, Moebius's unique graphic style, flavor and pacing make it appealing even if you've mastered a dozen similar games. The bottom line is that, although Moebius isn't a groundbreaker, it's a solid role-playing adventure that will challenge even veteran gamers. *(Published by Origin Systems, Inc., 136 Harvey Rd., Londonderry, NH 03053; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$39.95 disk.)*

—BOB GUERRA
CHARLESTOWN, MA

THE TOY SHOP — A

Now You Can
Be a Master Craftsperson
In Your Own Home

Did you ever wish you were an elf working for Santa at the North Pole? The Toy Shop can give you a bit of that feeling without having to don your snow shoes and trek all the way to his workshop.

Perhaps the package should've been named "The Toy Shop Pattern Maker," because it creates patterns from which toys can be constructed. Broderbund does an excellent job in presenting the program on the screen in such a way that the manual is only needed as a reference guide. However, when you get down to the construction stage, the 200-plus-page manual comes in handy to enable you to look at the pictures.

You can select the toy you'd like either by name or by browsing through those available, and you have the chance to customize each toy you make in a variety of ways. Graphics patterns on the toys are referred to as paints. You can choose from many designs, or they can be edited to suit your taste. These tailor-made patterns can be saved and loaded from disk.

Another Toy Shop term, decal, refers to designs and pictures that can be applied to designated locations on your model. The Print Shop graphics can even be used as decals here!

Finally, you can add text to predesignated sections of your model. Several fonts and variations thereof are available. While you're at it, give yourself some credit as the builder of the toy.

Realize your creative fantasies as you move from keyboard to cardboard in the Toy Shop.

Once your creation is complete, you can save it to disk or go directly to the print option.

With most of the models, you must paste the patterns onto cardboard before beginning construction. The board is already coated with a peel-and-stick type of surface. A moderate supply of the board and other items (balloons, sticks, and so on) are included with the package.

Construction can involve the use of scissors, a hobby knife, glue, wire and more. The book's construction guide contains both actual photographs and schematic diagrams, along with step-by-step assembly instructions. I tried several of the simpler designs and had very little difficulty. It's apparent, however, that some of the projects aren't appropriate for small children to attempt unsupervised.

You can make many things with Toy Shop—airplanes, carousels, mechanical banks, steam engines and sundials, to name a few. Also, some of the toys lend themselves nicely to group projects.

So, this summer, when the kids scream that they've got nothing to do, and they're tired of Dungeons and Dragons, turn them on to Toy Shop! My guess is that the only problem you'll encounter is letting them do the work. You may not want to give up your "toy-maker" that easily! *(Broderbund Software, 17 Paul Drive, San Rafael, CA 94903. C-64/$59.95 disk.)*

—JIM GRUBBS
SPRINGFIELD, IL

MOONMIST — B

Journey Abroad and Solve
A Ghostly Mystery Without
Leaving Your Computer

Ingredients: Two heaping tablespoons of adventure; add a pinch of suspense. Toss in one specter and seven eccentric characters. Wrap in an attractive package. Yield: Moonmist.

Moonmist is an interactive mystery/adventure that places you in the middle of upper class British society. You're an eminent American detective, and you've received a letter from an old friend, pleading for your help. So, it's off to the Cornish moors with you.

Your friend, a spirited lass named Tamara, is engaged to marry the young lord of Tresyllian Castle. But, alas, foul doings are in the works! An ancient ghost has suddenly reappeared to haunt the old place and to kill Tamara. The servants say the ghost looks amazingly like the lord's former fiancee, who died under mysterious circumstances and whose body has never been found.

To further complicate matters, the previous lord of the castle died and stowed away a treasure: a valuable artifact that must be found in order to pay the former lord's debts.

Top this all off with a 12-hour time limit, a gloomy English castle and a cast of crusty English bluebloods, and you've got a top-notch adventure that will keep you at the keyboard for many hours.

Moonmist is lauded as introductory interactive fiction. This is evident not only through the extensive documentation, but also during the course of play. Moonmist's puzzles are relatively

Continued on p. 32.

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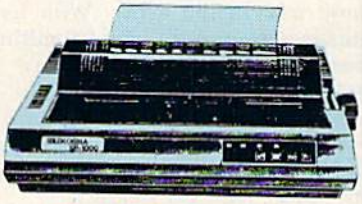

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From p. 29.

simple: Infocom's sophisticated multi-sentence parser is extremely forgiving, and much of the tedious mapping usually required with adventure games has been shelved in favor of a printed castle layout. Battle-hardened hombres take note, however—this one can be solved in as little as two to three hours.

Included with the software are playing instructions, several short stories entitled "Legendary Ghosts of Cornwall," two background letters from Tamara, a tourist brochure for Tresyllian Castle, and a Moonmist iron-on.

The storyline itself is not overly innovative. Furthermore, I found several of the characters rather uninteresting, with cardboard personalities that left me wondering why they had been included in the story at all.

Moonmist can also be exasperatingly slow to play. Disk drive access is constant and can take up to 60 seconds after each command has been entered—something to consider for owners with sensitive 1541 disk drives.

These quirks aside, Moonmist is an excellent entry-level adventure for those new to the genre. With its sophisticated parser, user-friendliness, four variations of replayability, and well-written prose, Moonmist has proved that one hundred words are still worth one thousand pictures. *(Infocom, Inc., 125 Cambridge Park Drive, Cambridge, MA 02140. C-64/$34.95 disk.)*

—JOHN V. RYAN
APO NY

FAIRLIGHT ____ A

Commit Yourself to the Task of Illuminating This Magical Realm

Few software releases combine the exciting play of arcade games with the mental gymnastics of text adventures: Mindscape's Fairlight is a welcome exception.

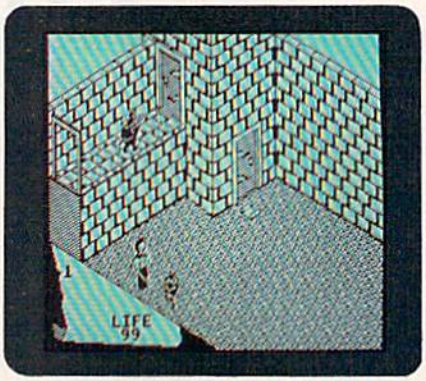
Long ago, the land of Fairlight glowed with loveliness. Its happy folk were ruled by noble kings and queens. But now, alas, its beauty is tarnished, its leadership grown weak and its once-brilliant light all but faded.

Ah, but hope is not yet dead, because there still lives a handsome young hero who can rekindle the flame. He is you—Isvar the Unknown.

First, you must survive the attacks from the deadly guards at the wicked King Avars' castle. Then you must somehow penetrate the secrets of the dungeons of this foul place to free the sorcerer trapped within and recover the lost Book of Light.

No one has entered the evil Castle Avars in 3000 years, and only the fearsome monarch of this treacherous fortress can approach the Book of Light without harm.

Yet, this terrible knowledge doesn't intimidate you. Spying a magical scroll on the ground, you pick it up, and your latest, perhaps greatest, adventure has begun.



You can be a hero to the land of Fairlight by restoring its lost light.

Fairlight, the award-winning game from England, more than lives up to its billing and should prove to be a worthwhile addition to your software library. It is designed for a single player, using a combination of joystick and keyboard or keyboard alone.

Of special note are Fairlight's top-notch graphics, created using Worldmaker 3D technology. The only fault here is the rather subdued coloration of the panels; although, after all, restoring the light of Fairlight is what the adventure is all about. (A feat this reviewer couldn't accomplish in a week of play.)

But the game's action is dandy. Isvar not only wanders through the labyrinth of the evil castle, but he also jumps obstacles, collects objects and battles the castle's vicious denizens.

At the same time, your hero must unravel the mystery of the various clues that he encounters: What help can the magic scroll provide? Can Isvar regain his strength from the food or drink he has found in this latest chamber? Or will it prove to be poison? What door will the key open?

Fairlight features more than enough action and mystery to challenge the keenest arcade game fan. And, as you'll soon learn, this hero business is no easy task.

By the time you've accomplished your mission and set the land of Fairlight once more aflame with freedom, you might find you've had weeks or even months of fun playing Fairlight. *(Mindscape, Inc. 3444 Dundee Rd., Northbrook, IL 60062. C-64/$29.95 disk.)*

—DICK SHERIDAN
FOREST HILLS, NY

ACCOUNTANT, INC. ___ B-

Small-Business Accounting Reduced to Three Essentials

Accountant, Inc. is a simple accounting system for the C-128 that uses the double-entry method of bookkeeping to let you easily enter transactions and produce financial statements. It features a colorful 80-column display and takes advantage of the 128's power by loading the program completely into memory.

This is one of the least expensive accounting packages that combines General Ledger, Accounts Payable and Receivable into one complete system—all on one disk. The program lets you create data disks from the menu. A set of accounts is there to be changed, deleted or added to.

The General Ledger doesn't use account numbers; rather, it prompts for the account name. This may be difficult for a business that has always used account numbers or has already coded the data with account numbers.

Since the program is based on the double-entry method, each checkbook entry must include the account name for the checking account and the offset account name. With each entry being saved to disk after completion, this input can be especially time-consuming.

Unfortunately, the Accounts Receivable and Accounts Payable modules are lacking features found in most other accounting programs. Neither one transfers the entries automatically into the General Ledger module. Instead, an account summary is printed that must be entered as a transaction when you go back into the General Ledger. Invoices in the Accounts Receivable module can only be printed once, and each invoice can contain only the total charges. There are no allowances for breakdown of labor, parts, freight, or sales tax. Moreover, the Accounts Payable module does not print checks or purchase orders.

Despite the aforementioned limitations, Accountant, Inc. may be the program for your particular business. If ►

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you've had difficulty using some of the more complex accounting packages and prefer a simpler way of entering information, Accountant, Inc. provides very good on-screen help and prompts. Or, if you need to provide a financial statement to your banker or a billing statement for your customers, this is the program for you. A well-written manual, which includes tutorials, and a back-to-basics approach to accounting round out this package. *(Softsync, Inc., 162 Madison Ave., New York, NY 10016. C-128/$99.95 disk.)*

—SANDRA COOK JEROME
PHOENIX, AZ

THE MOVIE MONSTER GAME ____ A-

Here's Your Chance To Create Your Own Midnight Thriller

It was six years ago that I bought my first computer game from Epyx: Crush, Crumble and Chomp. Since the game was so popular, it's not surprising that Epyx would resurrect the same idea in a new wrapper.

The Movie Monster Game is different from my old monster chums. None of the original monsters remain. In their places are more famous names: Godzilla, the film monster king; Mr. Meringue, who had a walk-on, climb-on and roast part in Ghostbusters; a wasp-like Sphectra and spider-like Tarantus; a Blob look-alike named Glog; and, for this age of mechanization, it just wouldn't be right without Mechatron.

Each monster is ranked for speed, strength, toughness and the ability to recover. Sphectra is very fast, but weak and not tough enough. Mechatron and Godzilla are very strong and tough. Godzilla is slow to recover and Mechatron won't recover at all. Tarantus is probably the best selection: It's fast, with average qualities in all other areas, and a good place for beginners to start.

Each monster also has a specific weapon: Godzilla breathes fire, Sphectra has a sonic weapon, Mr. Meringue spits meringue globs, Mechatron has a laser, the Glog has an acid touch and Tarantus shoots out a web.

Three target cities have survived from Crush, Crumble and Chomp: New York, San Francisco and Tokyo. London, Paris and Moscow have been added to give The Movie Monster six locations.

You also get to select a goal for your adventure. You can try to destroy a landmark, escape from those nasty humans, search for your offspring or just create havoc by going berserk.

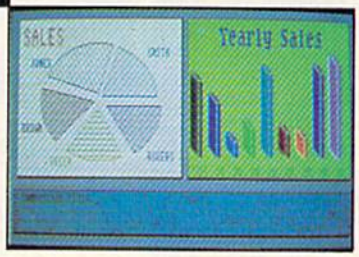
What The Movie Monster Game offers is superb graphics. The animation is smooth, and the characters are well drawn and defined. It really is very much like watching a film, which is exactly how the game is set up: It opens in a theater, the curtains go up, the lights go off and the big screen becomes your computer screen. When the adventure ends, a score indicates how well you accomplished your objective.

There are some nice features in the game—a pause button and a sound track that lets you know when you've reached your goal. I still feel that the game lacks the soul and the flexibility of the original, but perhaps I'm comparing it too much with my personal *Gone With the Wind* of computer games. *(Epyx, 600 Galveston Drive, Redwood City, CA 94063. C-64/$39.95 disk.)*

—RICK TEVERBAUGH
ANDERSON, IN ■

Introducing
BASIC 8

By Lou Wallace & David Darus



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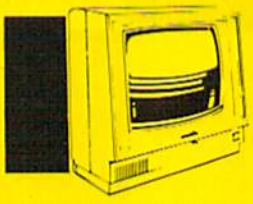

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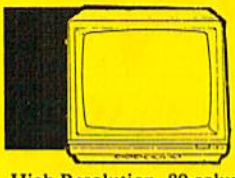

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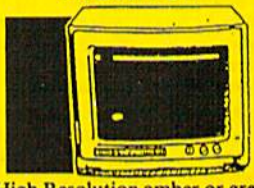

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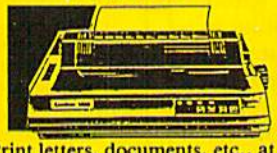

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UXB

SKY RUNNER (D)	$19.95
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Making Music With MIDI

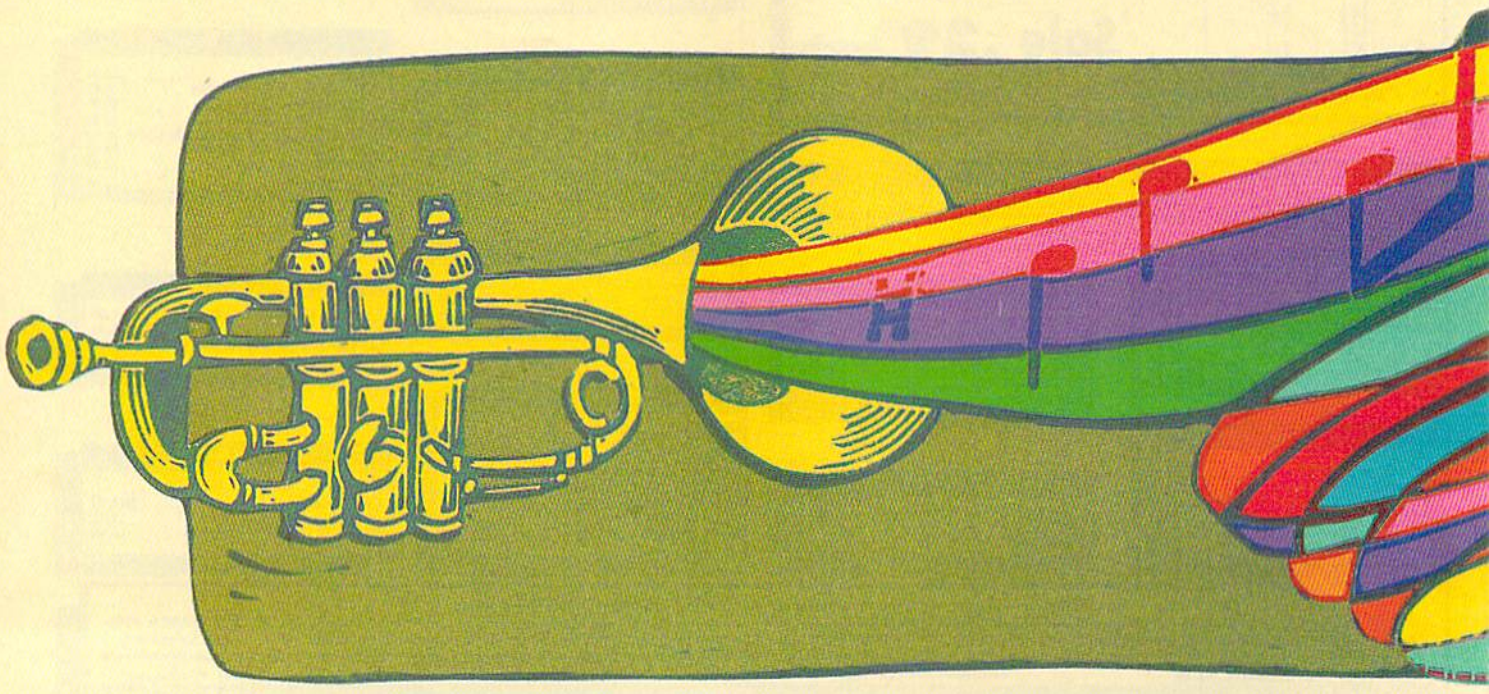
By combining a Commodore with MIDI technology, almost anyone can produce professional-sounding music.

by DAVID BROOKS

THE BEATLES, Glenn Miller, Leonard Bernstein . . . Well, maybe not, but with a C-64 or a C-128 and some MIDI equipment and software, you *can* become a credible and creative musician.

To use MIDI effectively, you need a musical goal to motivate you, because learning to use the hardware and software takes some effort. However, once you've learned, you'll find that MIDI will greatly expand your creative horizons. For me, the motivator is expressing musical ideas that are beyond my technical ability. MIDI is especially valuable to those who are interested in music performance, composition or teaching.

It's possible to assemble a MIDI system for about the price of a Commodore computer system, and, even for that modest amount, it will sound great. In fact, if you've done any music programming with the C-64's SID chip—a device that caused its own musical revolution—you'll



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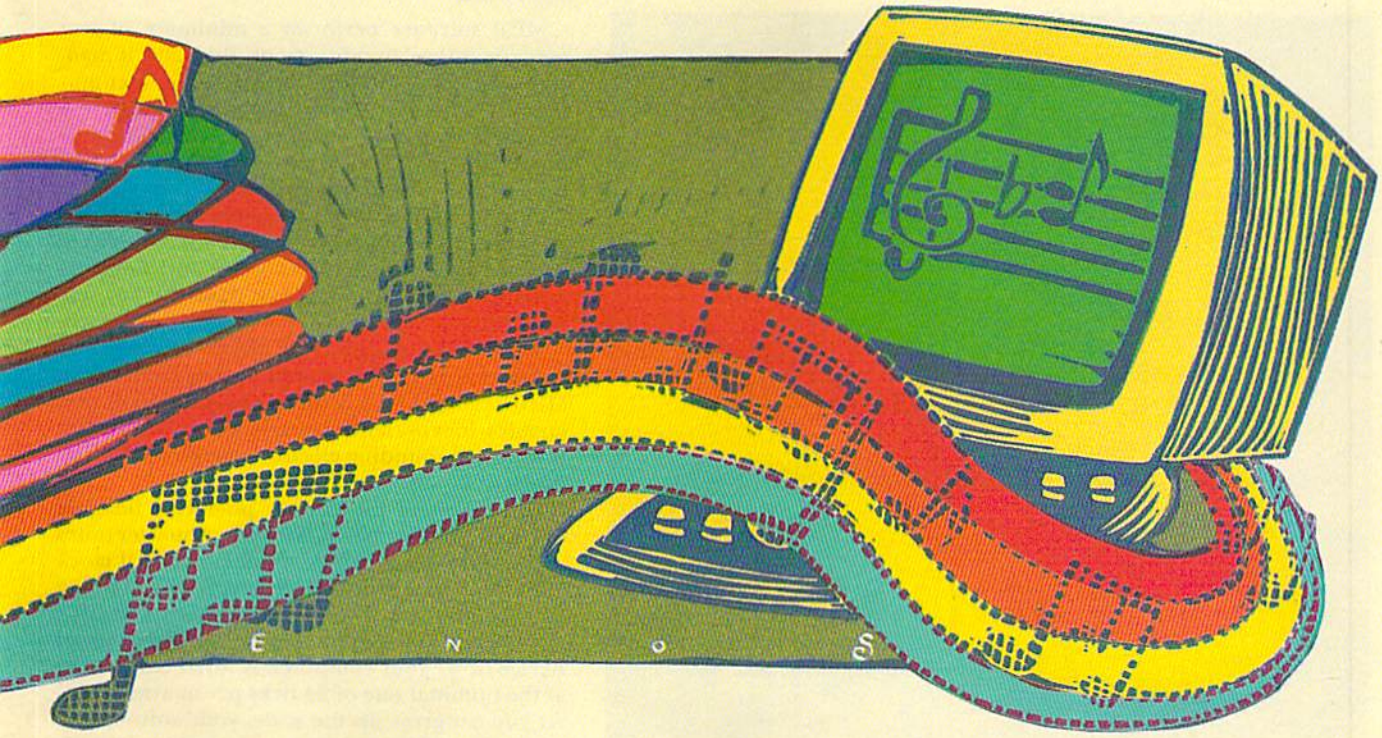
be amazed at MIDI's sound quality. There's also an abundance of good MIDI software available for both the amateur and the professional musician, although it's expensive compared to other "serious" applications for the mass market.

What Is MIDI?

MIDI is an acronym for Musical Instrument Digital Interface, a hardware and software standard for data exchange between devices, such as synthesizers, drum machines and computers, used in producing electronic music. The standard was developed by manufacturers a few years ago in response to a growing dissatisfaction with the proliferation of incompatible equipment. MIDI was an instant and overwhelming success, and now virtually every manufacturer of electronic musical devices produces MIDI-compatible equipment.

As an example of how MIDI works, consider pressing and releasing just one key on a keyboard sound synthesizer. In addition to producing a sound, this is encoded as digital data in a standard format and sent to a MIDI-out port on the synthesizer. (This port is nothing more than a special-purpose serial output port similar to the one on your computer.) If the MIDI-out port is connected to the MIDI-in port of another synthesizer, the second instrument will respond just as though you'd pressed one of *its* keys.

MIDI was originally used to connect instruments like this during live performances, but it soon became obvious that its real power lay in computer control of such systems. A computer equipped with a simple hardware interface can "record" what you play on a MIDI instrument and transmit the data to other MIDI instruments. When the data is stored in the computer, you ►



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can manipulate it using MIDI software, even the simplest of which offers capabilities beyond the most sophisticated conventional music studio.

MIDI standardization specifies only the format and content of transmitted digital information. Individual manufacturers configure their products in a variety of ways within the constraints of the standard. For example, the "system common" MIDI commands for turning notes on and off will be understood by every MIDI instrument, but the audible results may not be the same. MIDI products also come with a variety of "system exclusive" commands that make sense only to the specific device or to various devices from the same manufacturer.

The minimum requirements for a Commodore-based MIDI system are a C-64 with a monitor, a 1541 or equivalent disk drive, a MIDI interface, a MIDI-compatible musical instrument (most likely a keyboard synthesizer) and some software.

The Interface

The hardware interface is the heart of a computer-based MIDI system in that it enables the computer to "talk" with the other components. Often no larger than a game cartridge, it plugs into the cartridge or user port of the computer and has a minimum of one MIDI-out and one MIDI-in jack. The jacks accept standard five-pin DIN plugs, but you must be careful to use only cables that are specifically intended for MIDI connections.

Several hardware interfaces are available, and most adhere to one of two informal "standards": Sequential or Passport. The operational difference between these standards lies only in the way the registers of the interface are addressed.

The Casio CZ-101 with Dr. T's interface and computer.

Synthesizers

Keyboard synthesizers are the most common MIDI instruments, although many other electronic musical devices, like drum machines, come in MIDI-compatible versions. Not all keyboards are MIDI-compatible, including—Commodore owners take special note—the C-64 music keyboards that were popular a couple of years ago.

Most MIDI keyboard synthesizers let you play "polyphonically"—that is, several notes at once. When you play, you choose a particular sound quality defined by a "patch" (including various parameters), and all the notes play with this quality. In MIDI terminology, this is known as "omni" mode, and some keyboards operate only in this mode, even under software control.

Other keyboards, often called "multitimbral," can be programmed to produce several different sound qualities at once. These devices operate in what is called the "mono" mode, because each voice of the synthesizer can be programmed independently with its own sound patch.

A multitimbral instrument can provide a greater variety of sounds under computer control than an omni-only instrument. However, this is not necessarily reflected in the price; a multitimbral may cost less than an omni-only.

Several MIDI synthesizers come in both keyboard and rack-mounted "modular" versions. The rack-mounted modules can be played from a master keyboard or directly from the computer.

Software

MIDI software performs a minimum of two separate but related functions. Basically, it manages communication between the computer and the MIDI devices connected to it through the interface. The most elementary information in this communication is the occurrence of keypresses and releases. However, to provide you with more control, a MIDI system may generate and transmit other types of information as well, such as sound-patch parameters and keypress velocity, which indicates how hard the key was pressed.

The second function of MIDI software, manipulating musical data, is at the forefront of the MIDI revolution. It is this editing function that enables inexperienced musicians to create sophisticated-sounding electronic music with MIDI devices.

For a hint of the editing potential, imagine playing a simple one-octave scale of quarter notes and keeping track of the number of MIDI clock "ticks" between consecutive keypresses. (Timing of events in a MIDI system is controlled by a clock signal that may be generated by an external device or by your computer. A MIDI clock beats at the nominal rate of 24 ticks per quarter note.) As you progress up the scale, your software records elapsed times between the notes of 22, 26,

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20, 23, 24, 21 and 22 ticks. That timing is pretty good, but perhaps you want it even better, say, to synchronize the scale with other notes or with a percussion track from a drum synthesizer. With MIDI software, you can easily accomplish this by rounding off the elapsed time to the nearest multiple of 24 ticks.

To play the scale twice as fast, all you'd have to do is correct the rhythm to the nearest 24 ticks and divide all the times by 2. Presto—perfect eighth notes! You can't do this with a tape recorder, because if you speed it up or slow it down, the pitch changes.

MIDI programs are often termed "sequencers," because they provide a way to record a series of musical parts, or sequences, that you can then combine and edit in a variety of ways. With such a sequencer program, if you want to improvise a melody over a repeating bass line, all you have to do is record the bass line once and instruct the sequencer to repeat the line the required number of times. If you'd like to fill out your composition with supporting harmony, that's no problem either—MIDI supports up to 16 data channels, each one of which can carry its own, possibly polyphonic, part.

Sequencers are designed so you can record all the parts in a piece and then practice one at a time by just turning off the playback channel for the part you want to play yourself. Some of them let you print out, with an appropriate printer, a conventional musical score for a piece you have in a file.

Different MIDI programs employ different approaches to editing. One approach, which provides a comfortable working environment for traditional musicians, mimics recording on a fancy tape recorder, even down to using tape-recording terminology. However, much of the musical potential of MIDI has no counterpart in conventional analog recording, so this approach is restrictive. The best MIDI software lets you manipulate all components of a MIDI event. If a program doesn't easily let you edit key velocity or the timing of events, or let you easily add or delete data, keep looking for one that does!

With some recent MIDI software, you can edit and replace sound patches, although the ROM cartridges required to save patches can be expensive, and the editing process is often rather unfriendly. Patch-programming software falls into two categories: librarians, which manipulate patches and store them on computer disks, and editors, which typically include librarian functions, but also let you create your own patches.

Patch programming is highly synthesizer-specific, and it requires a lot of time and programming skill, plus a thorough understanding of MIDI data structures. Some patch editors use Commodore graphics to display waveforms and amplitude "envelopes."

A Sample System

MIDI technology is still at the stage where you must assemble your own system. To help you in planning it, here's an outline of devices and software I'd recommend.

A Commodore-based MIDI system for a beginner can center on a C-64. However, if you want to use one of the new programs that take advantage of the C-128's increased memory, you'll need to have that machine.

My choice for MIDI software, Dr. T's Keyboard Controlled Sequencer, comes in versions for both the C-64 and the C-128. The 128 version is superior enough to justify purchasing a 128, if you're serious about MIDI music. Files created on the 64 version of Keyboard Controlled Sequencer are upward compatible to the 128 version, and Dr. T offers a liberal trade-in policy on the 64 software. You'll find, however, that most MIDI software for Commodore computers is for the C-64. Dr T's program supports both Passport and Sequential interfaces. As for an interface, you can buy the least expensive one you can find, as long as it follows either the Passport or Sequential standard.

An excellent choice for your first MIDI keyboard would be the Casio CZ-101. It's inexpensive (at widely available discount prices), but it comes with 32 sound patches and can be programmed to play up to four of them at once, a distinct plus for a one-keyboard system. Also, since it has excellent sound quality, you'll still be able to use this instrument if you upgrade to a more sophisticated system. The main disadvantage of the CZ-101 is its insensitivity to keypress velocity. Also, its keys are smaller than on a full-size piano keyboard, but that shouldn't be a problem for most applications. The CZ-1000 is equivalent to the CZ-101, but with full-size keys. ►

TABLE 1. Manufacturers of the products mentioned in the article.

Synthesizers:

Casio CZ-101 or CZ-1000
Casio
15 Gardner Rd.
Fairfield, NJ 07006
201-575-7400
CZ-101, $499; CZ-1000, $699

Ensoniq ESQ-1
Ensoniq
263 Great Valley Parkway
Malvern, PA 19355
215-647-3930
$1395

Yamaha FB-01
Yamaha International Corp.
PO Box 6600
Buena Park, CA 90620
714-522-9011
$350

Timer:

PAIA Model 6770 Master Synchronizer and Model 7700 Power Supply
PAIA
1020 W. Wilshire
Oklahoma City, OK 73145
405-843-9626
Synchronizer, $74.95; Power Supply, $59.95; add $3 shipping and handling for each product

Software:

Dr. T's Keyboard Controlled Sequencer
Dr. T's Music Software
66 Louise Rd.
Chestnut Hill, MA 02167
617-244-6954
C-64 version, $149;
C-128 version, $225

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A MIDI system expanded beyond this basic configuration should include a velocity-sensing keyboard and probably would include some other instruments as well. My choice for a velocity-sensing keyboard is the Ensoniq ESQ-1, an eight-voice synthesizer with extensive MIDI features.

You might also want to consider a rack-mounted synthesizer, such as the Yamaha FB-01. It provides 196 preprogrammed sound patches, can play up to eight patches simultaneously, responds to velocity information and can be programmed and played entirely from the computer. The FB-01 has an especially flexible MIDI implementation. For example, you can program it to assign different sounds to different MIDI key numbers, so the keyboard can be "split" with one patch for a bass line and another for a melody line.

My MIDI system includes an external timing device called a "pulse clock," which replaces the usual software- or drum machine-based MIDI clock and has lots of other uses in controlling musical equipment. This clock, the PAIA Model 6770 Master Synchronizer, is available only in kit form, and it requires a separate power supply, the PAIA Model 7700 or equivalent.

Where To Get It

In Table 1, you'll find the addresses of the manufacturers of the products I've mentioned. Keep in mind that these products are only a sampling of the MIDI products on the market. Also keep in mind that, while the manufacturers may be good sources of product information, you'll have to buy the synthesizers through a music store. Any store that serves the pop and rock community should be able to help you. The timer and power supply can be ordered directly from PAIA.

As for the software, you're better off buying from the publisher, because most traditional stores still haven't adopted a coherent approach to marketing MIDI programs. Unfortunately, this means that a lot of MIDI equipment is being seriously underutilized.

To help you shop for software, I've included the names and addresses of a number of publishers in Table 2. You'll also find that the classified sections of music magazines and the newsletters of instrument-specific user's groups often include software bargains, especially in librarians and patch editors.

There are several places to get additional information about MIDI hardware, software and applications. The International MIDI Association (11857 Hartsook St., North Hollywood, CA 91607) is the primary voice of the MIDI industry. It distributes a regular newsletter, *The IMA Bulletin*, with product reviews and educational articles, and it's the official distributor of documentation describing all aspects of the MIDI standard. Membership in the IMA is essential for anyone interested in MIDI programming.

Several magazines, including *Keyboard*, *Music Technology*, *KCS* and *Electronic Musician* address the needs of musicians, including that still-elusive hybrid, the computer musician. ■

David R. Brooks is classically trained in piano and has a special interest in the performance of Renaissance and Baroque music. He enjoys producing music on his MIDI system of several keyboards and synthesizer modules.

TABLE 2. Publishers of MIDI software.

The Beam Team
6100 Adeline
Oakland, CA 94608
415-658-3208

Dr. T's Music Software
66 Louise Rd.
Chestnut Hill, MA 02167
617-244-6954

Ensoniq
263 Great Valley Parkway
Malvern, PA 19355
215-647-3930

Firebird Software
PO Box 49
Ramsey, NJ 07446
201-444-5700

Hybrid Arts
11920 W. Olympic
Los Angeles, CA 90064
213-826-3777

Key Clique
3960 Laurel Canyon
Studio City, CA 91604
818-905-9136

Korg U.S.A.
89 Frost St.
Westbury, NY 11590
800-645-3188

Mid-Ease
3650 NW 37th St.
Fort Lauderdale, FL 33309
305-486-4799

Mimetics
PO Box 60238, Station A
Palo Alto, CA 94306
408-741-0117

Moog Electronics
2500 Walden Ave.
Buffalo, NY 14225
716-681-7200

Passport Designs
625 Miramontes St., Suite 130
Half Moon Bay, CA 94109
415-726-0280

Roland Corp., U.S.
7200 Dominion Circle
Los Angeles, CA 90040
213-685-5142

Sonic Access
PO Box 4024
Santa Clara, CA 95054
408-942-9061

Sonus
21430 Strathern, Suite H
Canoga Park, CA 91304
818-702-0992

Triangle Audio
PO Box 1108
Sterling, VA 22170
703-437-5162

Ultimate Media
275 Magnolia Ave.
Larkspur, CA 94939
415-924-3644

Valhala Software
205 E. Hazelhurst
Ferndale, MI 48220
313-548-5754

This list was compiled in part from The IMA Bulletin, *International MIDI Association, 11857 Hartsook St., North Hollywood, CA 91607.*

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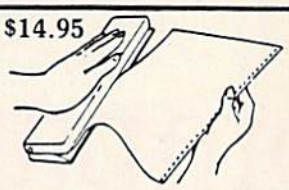
Our Prices Will Get Your Attention

"THE STRIPPER" $14.95



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C-64, Dependable heavy duty replacement power supply NON-repairable. Output: 5VDC, 1.7A, 9VAC, 1.0A **$29.95***

C-64, CPS30, Fused, repairable, all-metal case, 1 year warranty. Output: 5VDC, 2.0A, 10VAC, 1.0A **$39.95***

C-128 CPS-128, 3 sockets with spike suppression, EMI/RFI filtering, lighted on-off switch, fused, repairable, all metal case, 1 yr. warranty. Output: 5VDC, 6.0A, 10VAC, 2.0A **$79.95***

POWER CENTER $59.95

The POWER CENTER provides individual control of up to 5 components plus master on or off switch. EMI filtering, surge/spike protection, 15 AMP breaker, lighted rocker switches, heavy duty cable with 3 prong plug, 20 gauge steel case. Size: 1⅞ H x 12¼ D x 15 W.

MODEM RS-232 INTERFACE $29.95

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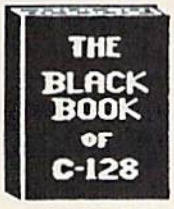


BLACK BOOK of C128 $15.95

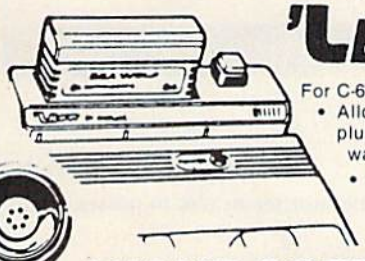
The best friend a C128 owner ever had... Includes C-64, C-128, CPM 3.0, 1541, 1571 disk drives. 261 pages, each chapter color coded for fast reference, 75 easy to read charts and tables, understandably written. The Black Book of C-128 is very much like a dictionary, always ready to answer your questions.

40/80 COLUMN CABLE $21.95

One cable for both 40 or 80 columns for the C128. Flip a switch to change modes. Plugs to back of monitor for a clear picture. 16 colors in 40 column, black/white in 80. Not for RGB monitors or TV sets.

PROTECTION REVEALED $15.95

Now in its sixth printing!!! A beginners guide to software protection. Written to give you a fundamental understanding of a disk and BASIC protection. Identify what you are seeing when examining a disk. Become a master of illusion. Reveals countless tricks and tips that mystify the user. The book is 141 pages and includes a free disk of 21 utility programs.



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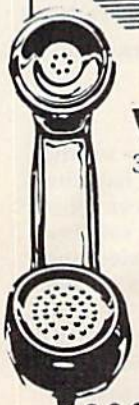

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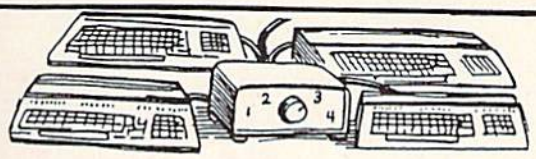

A word about AB switches...

Our AB switches allow you to share equipment rather than buy costly duplicates. Many configurations may be arranged, two computers to one disk drive and printer, or two printers to one computer. No need to ever plug and unplug cables again, just turn a knob to switch from one peripheral to another. Below are the types we have in stock, remember if you need extra cables, we carry a large selection.

$ SAVER SWITCH AB $29.95

VIC-20, C16, Plus 4, C-64, or C-128 compatible. Three female 6 pin sockets.

SUPER SAVER ABCD $79.95

VIC-20, C16, Plus 4, C-64, or C-128 compatible. 4 computers to 1 printer and/or disk drive. 5 female 6 pin sockets, one nine foot cable included.

CENTRONICS AB SWITCH $39.95

All 36 pins switched. Features 3 female sockets, gold pins, high quality push button.

CENTRONICS ABCD SWITCH $59.95

All 36 pins switched. Features 5 female sockets, gold pins, high quality rotary switch.

CABLES

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Drive/printer 9 ft. 6 pin male to male	B69	$ 8.95
Drive/printer 18 ft. 6 pin male to male	B618	$16.95
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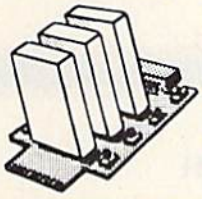
Drive/printer ext. 6 ft. 6 pin male to female	A66	$ 6.95
Monitor 6 ft. 5 pin to 4 RCA plugs	M654	$ 9.95
Monitor 6 ft. 5 pin to 2 RCA plus	M652	$ 6.95
Monitor ext. 6 ft. 5 pin male to female	ME65	$ 6.95
Joystick extension 12 ft. male to female	JS12	$ 7.95
Joystick Y, 1 male to 2 female	JSY	$ 8.95
Power cable, 6 ft. male to right angle female	PR6	$ 9.95
Centronics 6 ft. 36 pin male to male	C6MM	$14.95
Centronics 6 ft. 36 pin male to female	C6MF	$14.95
Centronics 10 ft. 36 pin male to male	C10M	$19.95
RS-232 6 ft. 25 pin male to male	R6MM	$14.95
RS-232 6 ft. 25 pin male to female	R6MF	$14.95
IBM printer 6 ft. 36 pin/DB25 male to male	IBMP	$14.95



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40/80 col. for the 1701/1702 monitor.

$9.95

TERMS: Add $3.00 shipping, Power Center and Last Stand, add $5.00 each, items with *, add $4.00 each. Foreign orders, US funds, plus shipping. C.O.D. minimum $25.00.

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New Companions For the C-64

An updated FSD disk drive and a true proportional mouse and a RAM expander from Commodore are votes of confidence for the C-64.

The vitality of the C-64 has been evidenced recently by the appearance of three significant new hardware products to expand its capabilities. Two, the 1351 mouse and the 1764 RAM expander, are Commodore products that first appeared in public at the CES show in Las Vegas last January. The other is Emerald Components' FSD-2 disk drive, an update of their competitor to the Commodore 1541, that's been on the market for about a year. We reviewed the FSD-1 in our September 1986 issue, and it got high marks.

The current article was written by Tim Walsh, our technical editor, and John Premack, a frequent contributor to *RUN*. They carefully tested the products and have written informative reviews of them. Table 2 in the article lists the names of the manufacturers, their addresses and product prices. We hope you enjoy reading about the expanding horizons of the good ol' C-64.

THE FSD-2 EXCELERATOR + PLUS DISK DRIVE

by TIM WALSH

Commodore-compatible disk drives aren't nearly as plentiful as they were a few years ago. Consequently, the announcement of a new Commodore-compatible disk drive by a third-party manufacturer ensures plenty of excitement among C-64 and C-128 owners.

The newest Commodore-compatible on the market, the FSD-2 Excelerator + Plus, evolved from the popular FSD-1 disk drive, which still enjoys commercial success. Used by many Commodore computerists and sold through most Commodore mail order dealers, the FSD-1 gained popularity because of its high-quality design and nearly flawless compatibility with heavily copy-protected software. The Excelerator seems also to possess these characteristics.

The Hardware

Like the FSD-1, the FSD-2 is housed in a sturdy, light-beige metal case that's less than half the size of a 1541. Two serial plugs on the rear allow interfacing to your system. Dual DIP switches located underneath the unit let you select the device number in the same manner as on the Commodore 1571 disk drive.

Unlike the 1541, the FSD-2 uses a separate 12-volt dc power supply. Because of this, the drive remains at ambient room temperature when in

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use. As a result, any head misalignment should be attributed to reading, writing, formatting and validating disks, but not to internal heat buildup.

The FSD-2's distributor, Emerald Components International, claims that the biggest benefit their disk drive offers over the competition is that it loads files faster. In actuality, it's only ten percent faster than a 1541. The tale of the stopwatch lies in the accompanying chart (Table 1), which compares their load times. As you can see, the FSD-2's load times are minutely faster with noncopy-protected software, yet nearly identical when loading software that's copy-protected.

Compatibility

True to the distributor's word, I uncovered no software compatibility problems, which in turn indicates that attention to detail was obviously a concern in the mechanical design of the FSD-2. Externally and internally, the drive's construction seems to be of higher-than-average quality. In fact, my only complaint was that the label on the front of the drive was put on crooked!

While quite different cosmetically, the two drives are similar in other areas. Like the 1541, the FSD-2 stumbles over Basic 7.0's Boot command when loading a binary file with the C-128. Testing with the 1541's DOS 5.1 wedge revealed no incompatibility problems, and there was also no difficulty using Epyx's Fast Load cartridge.

Testing of CP/M version 3.0 on the new drive revealed no incompatibilities, either. Saving and loading CP/M files were performed without a hitch.

The manual that accompanied the review unit was thorough in describing how to use the drive, but I discovered errors and misspellings on several pages. An engineer at Emerald assures me that the documentation is being rewritten.

For a user wanting to upgrade from a 1541, deciding whether to purchase an FSD-2 or, perhaps, a Commodore 1571, is not easy. The 1571 lets C-64 owners access both sides of a disk without physically flipping the disk over. C-128 owners can not only access both sides of a disk, but also take advantage of the 1571's faster loading speed. The FSD-2 lacks both these attributes, yet it's about $50 cheaper. If the lesser price outweighs the 1571's advantages in your case, you can rest assured that the FSD-2 will do a fine job for you. ►

TABLE 1. FSD-2/1541 Comparison Chart.

C-128 Software	FSD-2	1541
PaperClip II	3 minutes, 05 sec.	3 minutes, 04 sec.
Fleet System II	0 minutes, 38 sec.	0 minutes, 37 sec.
RUN Script 128*	0 minutes, 49 sec.	0 minutes, 52 sec.
C-64 Software		
GEOS	0 minutes, 33 sec.	0 minutes, 33 sec.
Easy Script	1 minute, 02 sec.	1 minute, 03 sec.
Jet	3 minutes, 00 sec.	3 minutes, 00 sec.
Flight Simulator II	4 minutes, 32 sec.	4 minutes, 32 sec.
Miscellaneous Tests		
Load 132 block prg. file	1 minute, 29 sec.	1 minute, 26 sec.
Load 55 block prg. file	0 minutes, 40 sec.	0 minutes, 40 sec.
Format Disk	0 minutes, 55 sec.	1 minute, 21 sec.

*RUN Script 128 is the only program tested that is not copy protected.

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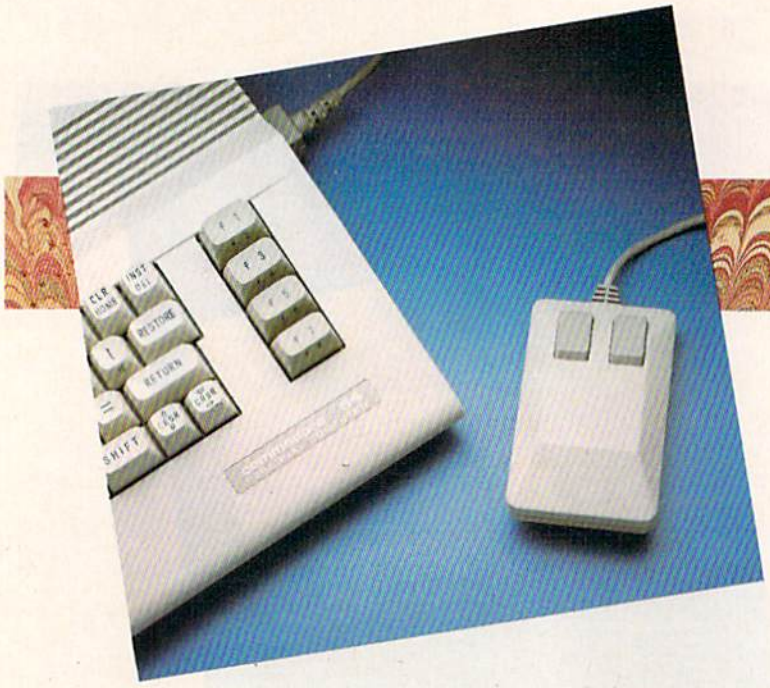

The Commodore 1351 Mouse

by JOHN PREMACK

The introduction of Commodore's 1351 mouse signals the beginning of a new era in effortless communication between Commodore users and their computers. Similar to the earlier 1350 mouse in appearance only, the 1351 is a true proportional mouse, not merely a rolling joystick. Also unlike the 1350, which can send only joystick-style, on-and-off signals to your computer, the 1351 actually measures the distance it has travelled, remembers the distance and direction with a built-in microprocessor and passes this information along to the computer at a convenient time, without interrupting other program tasks.

Molded out of the same beige plastic as the C-128 and 64C, the 1351 is a palm-sized rectangle (2½ × 4¼ inches) sporting two large pushbuttons and a four-foot tail that plugs into the computer's joystick port. It's operated with the narrow end that contains the pushbuttons under your fingertips.

Operation

When you slide the 1351 across a smooth, flat surface, a small ball that protrudes from the mouse's belly rotates. The ball's movement is monitored along both the X and Y axes by a pair of friction rollers, and they, in turn, spin two tiny slotted disks in the path of an electronic beam of light. The resulting pulses are timed, counted and stored by the mouse's microprocessor. The position of the mouse is always available to the computer as a value between 0 and 127 for each axis.

You can disable the Proportional mode if you wish. Just hold the right button down as you turn on your C-64, and the 1351 will come up in a joystick mode. This option is useful when the software you're using doesn't have a mouse-driver routine.

The user's guide that accompanies the 1351 offers three pages of instructions on the care and feeding of your new mouse and 15 pages of information for programmers. The programming section includes Basic and machine language driver listings for the C-64.

The mouse also comes with a two-sided program disk. Side 1 contains some simple demonstration programs that you can incorporate as input subroutines in your own programs.

Many publishers are preparing software that will make full use of the 1351's features, and Berkeley Softworks has provided a GEOS Upgrade kit on side 2 of the disk that comes with the mouse, so GEOS owners can use the device immediately. This special program installs version 1.3 of the GEOS operating system on an existing GEOS 1.2 boot disk. It also provides new versions of deskTop and geoWrite, as well as a mouse driver and several upgraded printer drivers.

GEOS Update

The instructions for installing GEOS 1.3 are easy to follow. Since GEOS 1.2 doesn't recognize input from the 1351, you must use a joystick or power up the 1351 in Joystick mode until the new operating system is running. Be sure to back up your boot disk before installing GEOS 1.3, because the upgrade program actually reformats the original disk.

Once you've booted GEOS 1.3, click the appropriate button at the select-input window, and click it again at the COMM 1351 icon. Then reset the mouse to Proportional mode. You need to unplug the mouse and reconnect it during the reset.

Be very careful in reconnecting the mouse when the computer power is on! The 1351's plug is unlike most others that connect to the joystick port. It's rimmed with metal instead of plastic, and it offers a unique opportunity to destroy your 64's CIA chip if you inadvertently touch the pins with the metal edge.

Instead of attempting to reset the 1351 with the power on, it's much safer to stay in Joystick mode and change the program default settings as described on page 2 of the instruction sheet. This way you can merely turn the computer off, so there's no risk of damaging any chips, and GEOS will reboot with the 1351 ready to go.

Aside from potential trouble from the metal-clad connector, my only other complaint with this product is that the GEOS mouse-driver soft-

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ware doesn't allow fine enough movement. Sliding the mouse vertically only 2¼ inches moves the pointer from the top to the bottom of the screen, and 3¼ inches of lateral motion moves it all the way from side to side. While this amount of control is adequate for point-and-click applications, it makes using a program such as geoPaint a bit difficult.

You'll probably bury your joystick or 1350 in the bottom of a drawer once you've used the 1351. This is the device that GEOS users, in particular, have been waiting for. Make a little space on your computer table to give this mouse a new home.

The Commodore 1764 RAM Expander

by TIM WALSH

The months of waiting paid off last March when the 1764 RAM (random access memory) expander arrived in the *RUN* editorial offices. The expander is designed to plug into the user port of your C-64, whether the computer is a trusty five-year-old 64 or a sparkling new 64C, and boost its available memory by 256K, to a grand total of 340K.

The 1764 physically resembles the C-128 1700 and 1750 RAM expanders, and it works just as flawlessly. Leaving it permanently plugged into your 64's user port is no problem, because it doesn't interfere with any program or hardware operations.

Unfortunately, the 1764's design renders it incompatible with the C-128 in 64 mode. The expander's manual merely states this fact, and, being curious, I contacted Ed Parks, Director of Hardware Development at Commodore, to find out why. According to Parks, it's because the signal from one of the pins on the 1764 differs from the signal used by the 1700 and 1750 RAM expanders.

This incompatibility shouldn't be much of a problem to C-128 owners. They can access the 1700 and 1750 RAM expanders from C-64 mode, so they don't really need the 1764.

The power supply that accompanies the 1764 provides a much-needed hardware upgrade to the C-64. Everyone knows that the C-64's power supply generates energy levels more suited to digital watches—an amount nowhere near enough to operate a RAM expander for extended periods of time. The 1764's 3-amp replacement (essentially halfway between the power supply outputs of the C-128 and the C-64) solves the energy shortage problem.

Accompanying Software

The 1764 also comes with a user's guide and a disk that contains RAM expansion utilities on one side and an upgrade program for GEOS on the other. The programs on the utility side include a DOS wedge that replaces the DOS 5.1 wedge, a program called RAMDOS, a file copier, a RAM expander diagnostic test, two animation demos and a drive-unit number-changing program.

The DOS wedge is needed so both the computer and the expander can recognize DOS wedge commands when you use the 1764 as a RAM disk.

RAMDOS is unique in letting you assign a drive-unit number to the 1764 RAM expander and use it as a high-speed, albeit volatile, disk drive. It displays the number of blocks of memory that remain free in the 1764 at the end of the expander's directory. With no programs stored in the memory, 2013 blocks are available for disk-file storage.

The diagnostic test, which takes about a minute to run, places status messages on the screen regarding the operation of the unit.

The animation demos provide a wealth of information for experienced users to study. Demo 1 displays a rotating planet Earth by using a series of bit-mapped screens. Demo 2, which also accompanies the 1700 and 1750 RAM expanders, creates a three-►

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dimensional, sliding-bar display. The Programmer's Reference Notes with the manual also contains information of value to programmers who want to write for the RAM expander.

To make use of the RAM expander, you must access a memory location referred to as the RAM expansion controller, or REC. A short, well-documented Basic program in the manual shows how to save and read a low-resolution screen to and from the REC.

On the flip side of the utility disk there's an upgrade program that brings your copy of GEOS up to version 1.3. Of course, if you already have this, perhaps from buying the 1351 mouse, reviewed above, then you're just getting a duplicate with the 1764.

The four main programs on the GEOS side of the disk are called Upgrade, Grabber Upgrade, Merge Upgrade and geoDex Upgrade. They modify nearly every file on the GEOS disk, including the geoPaint and geoWrite files. Naturally, version 1.3 makes GEOS compatible with the 1764 expander and 1351 mouse. For accessing the expander, version 1.3 includes files that recognize the 1764 as a RAM disk.

The added RAM capabilities are most noticeable when using geoPaint. Earlier versions of GEOS required loading files from disk to view portions of a large graphics picture located off the visible screen. With GEOS 1.3, the same graphics picture will fit entirely in the 1764's memory, so you can move freely about the graphics picture without activating the disk drive.

As the demos prove, the 1764 RAM expander can handle entertainment and business software matching the performance of programs for 68000-based computers, especially in the area of RAM-disk graphics screens. Time will tell if this device will lengthen the C-64's life. I'm convinced it will. ■

TABLE 2. Manufacturers and prices.

Commodore 1351 Mouse, $49.95
Commodore 1764 RAM Expander, $149
Commodore Business Machines
1200 Wilson Drive
West Chester, PA 19380

FSD-2 Excelerator + Plus Disk Drive, $159
U.S. Distributor:
Emerald Components International
541 Willamette
Eugene, OR 97440
503-683-1154 or 800-526-5178

John Premack is a news photographer, freelance author and SYSOP for the Boston Computer Society Commodore Users Group's bulletin board. Tim Walsh is RUN*'s technical editor and has written numerous articles for the magazine.*

Copy Worldwide Short-wave Radio Signals on Your Computer

Remember the fun of tuning in all those foreign broadcast stations on the short-wave radio? Remember those mysterious sounding coded tone signals that baffled you? Well, most of those beeps & squeals are really digital data transmissions using radioteletype or Morse code. The signals are coming in from weather stations, news services, ships & ham radio operators all over the world. Our short-wave listener cartridge, the "SWL", will bring that data from your radio right to the video screen. You'll see the actual text as it's being sent from those far away transmitters.

The "SWL" contains the program in ROM as well as radio interface circuit to copy Morse code and all speeds/shifts of radioteletype. It comes with a cable to connect to your radio's speaker/earphone jack, demo cassette, and an excellent manual that contains a wealth of information on how to get the most out of short-wave digital DXing, even if you're brand new at it.

For about the price of another "Pac-Zapper" game, you can tie your Commodore 64, 128 or VIC-20 into the exciting world of digital communications with the Microlog SWL. $64. Postpaid, U.S.

MICROLOG CORPORATION,
20270 Goldenrod Lane
Germantown, Maryland 20874
Telephone: 301-428-3227

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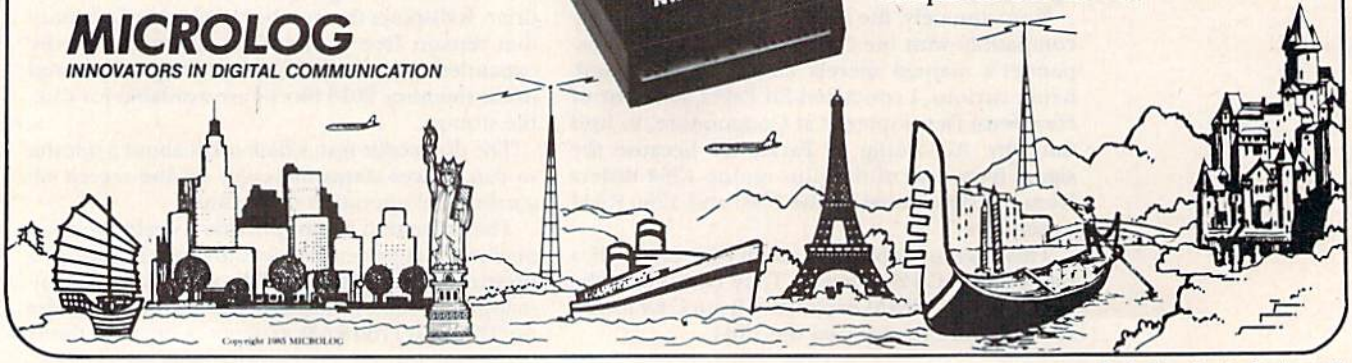

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Do you get lost in a chaos of thoughts when you're writing? Try a thought-processing program to get your ideas organized into an outline.

Outlining Your Thoughts

by JOHN PREMACK

Many professional writers, particularly news reporters, are able to organize a story mentally before committing it to paper. However, those of us who aren't professionals usually just write as the thoughts come and worry about organizing the material later. Then we often spend more time cutting, pasting and rewriting than we do completing the first draft.

Now there's help for those of us who are less than organized about our writing. It's the thought processor, a program that automatically organizes ideas into an outline.

This article reviews three thought processors available today, at least one of which should be suitable for every *RUN* reader: Broderbund's Thinking Cap, for the C-64; Country Road Software's BrainStorm 128, for the C-128 in 128 mode; and Kamasoft's Out-Think, for the C-128 in CP/M mode. Thinking Cap and Out-Think serve as word processors as well as thought processors, while BrainStorm is part of a package, called BrainTrust, that includes a separate word processor.

Thinking Cap

Thinking Cap, from Broderbund Software, is a thought processor that's suitable for even the inexperienced writer. It encourages the uninhibited flow of ideas by being virtually transparent in use. You pour out your thoughts while the program quietly arranges them in up to six levels of topics, then, when you're out of ideas, it's ready to print a neatly formatted formal outline of your work.

Thinking Cap operates in three modes: Brainstorm, Overview and Edit. Brainstorm mode actually creates the outline out of your free-flowing thoughts. It includes a cut-and-paste function for moving material around, and it renumbers the outline automatically when you add or delete material.

Overview mode lets you step back and see what you've done. You can scroll through your entire outline, or you can instruct Thinking Cap to hide subtopics and concentrate only on the major headings.►

ILLUSTRATED BY PAUL MOCK

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Edit mode is for revising your outline or expanding on individual ideas. It includes an insert function so you don't type over material already in your outline, a "safe" buffer where a block of text can be held until needed and a search function for quickly locating a word or phrase and replacing it as desired.

Thinking Cap's 50-page user's guide introduces the program's functions in an easy-to-follow fashion, and you'll find the reference card and pop-up help menu handy if you have questions while using the program. The help menu appears at the touch of the Commodore key and drops out of sight again as soon as you release the key.

Thinking Cap is menu-driven. The easy-to-use, three-level menus zoom in and out in a window on the screen, and you make choices by moving a highlight bar with the cursor keys, then hitting the return key. Ease of operation is further enhanced by the uncomplicated command sequences.

Saving and Printing

Your outline is saved to disk as a user file. The program checks to see whether there's already a file on the disk with the same name, in which case the earlier file can be automatically renamed as a backup before the current document is saved. You can save individual sections of an outline in separate files, and recall and insert them into other outlines. It's also possible to append outlines to each other.

Thinking Cap's printing capabilities rival those of any word processor. Page length, margins and paragraph indentation are all adjustable from a page-layout menu, and the program can be readily customized to work with various printers. You can print your outline in the traditional successive-indent format with either Roman or Arabic numerals, or with hanging indentation and technical-style numbering (1, 1.1, 1.1.1, and so forth).

Using a combination of Thinking Cap's Prose option and its Edit mode, you can turn your outline into a full-fledged report by expanding each brief item into a complete sentence or paragraph. During this process, you can still scan the outline in condensed form and remove all reference numbers from the screen display.

I enjoyed using Thinking Cap, but it does have a few minor problems. First, to boot the program you must turn your C-128 into a C-64, including making your 1571 emulate a 1541. I found that pressing the 128's reset button and the Commodore key simultaneously is the best way to do this. Second, while I was

The pop-up help screen, accessed by the Commodore key, is a handy device in Thinking Cap.

able to call up Thinking Cap's user files with several utilities as well as my favorite word processor, the embedded reference numbers make the files next to impossible to use with other word processors. Finally, the cut-and-paste function is unnecessarily slowed by the need to confirm each instruction.

Thinking Cap would be a worthwhile investment for students, business people and anyone else with a need to draft a fairly complex report. It definitely helps organize thoughts and takes the pain out of creating an outline. The fact that it can be used as a word processor is a nice bonus.

Brainstorm 128

BrainStorm 128, from Country Road Software, is the thought processing half of BrainTrust, a dual-function thought and word processing package. A version of BrainStorm for the C-64 was published in the November 1985 issue of

Let your mind do the creating and your fingers do the talking while Brainstorm does the organizing.

RUN. In this new version, author Mark Jordan has simplified and at the same time expanded on the original.

BrainStorm recognizes that the creative flow of ideas from your brain to your fingertips is a tentative process that can't be easily switched on and off. To encourage this flow, the Idea Entry mode works in a delightfully easy manner. All you have to do is hit the F1 key and type.

BrainStorm accepts 100 raw ideas of up to 68 characters each. When your burst of creativity is exhausted, the escape key delivers you to the Compare mode, where sorting occurs based on decisions you make about the relatedness of your thoughts. The thoughts are displayed on the screen in pairs, and you specify whether they're related, not related or not worth keeping at all. Then the program jumps to a menu screen with your thoughts already grouped under as many as nine headings.

From the menu you can go to an outline composed of labels arranged in a tree-like shape. Your task here is to use on-screen prompts to compose headings for the branches and to rearrange your thoughts if you wish. You can add and delete branchlets, as well as augment detail by subdividing them. Deleted thoughts don't just disappear; they're placed in a buffer from which they can be recalled if you change your mind.

On Automatic Pilot

A special BrainStorm function, Automatic Pilot, checks your outline to make sure you've composed a heading for each branch and that no division or subdivision contains just one further subdivision; there must always be at least two items on a level. Parallel construction—using similar word structure in more than one phrase or clause—is encouraged by on-screen prompts.

You can print your outline at any time by hitting the F4 key. However, to use special printer features, you must boot up BrainPower, BrainStorm's companion word processor, and recall the outline from disk. BrainPower offers no choice of printer modules, but it does accept escape codes embedded in the text. This approach is clumsy for working with documents, but it should be only a minor nuisance for printing outlines, since you probably won't need any font changes. I had no trouble printing through a Cardco G-Wiz interface to my Gemini 10-X and Juki 6100 printers.

The version of BrainStorm 128 that I tested had a few bugs. The help key wouldn't work until I discovered that it

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had to be followed by a return. Of greater concern was my discovery that, despite assurances in the user's guide, my outline was *not* automatically saved when I hit the F7 key to access BrainPower. In fact, exiting to Basic or BrainPower totally wipes out an outline if you don't save it first. Similarly, I found that the contents of the buffer aren't saved to disk along with the outline.

Other shortcomings include an inability to move ideas on the screen to another level without typing them in again and to list newly entered ideas while working in the Subdivide mode. Also, my efforts to leave Automatic Pilot by repeatedly hitting the escape key to cycle through the outline were futile.

Despite these flaws, BrainStorm is straightforward and easy-to-use. This program should be considered by anyone with relatively small writing chores. Its Compare and Automatic Pilot modes simplify the creation of a logical and readable outline and offset the software's shortcomings.

Out-Think

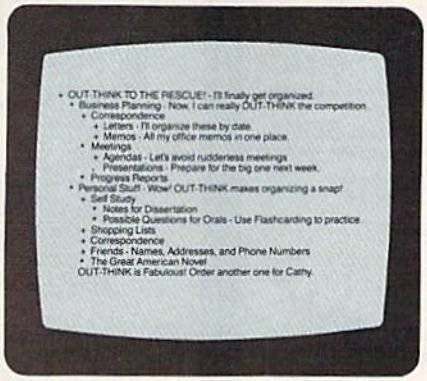
Kamasoft's Out-Think, a thought processor for 8-bit CP/M machines, is an industrial-strength creative tool that can travel from office to home and handle the chores in both environments with ease. It's designed to run from either a hard disk drive or floppies. If you're going to use floppies, you should have two drives to make the program function properly.

You'll need to copy the original disk to make a working version before you load Out-Think into your C-128. Also, make sure your 128 is in 80-Column mode before booting up the CP/M Plus operating system, because Out-Think won't run on a 40-column screen.

The extensive user's guide is initially overwhelming. However, it's possible to get started by just following the directions in the separate installation manual.

Type OT at the A > prompt to access the Topic Manager, the jumping-off place for all your creativity and housekeeping chores. You'll quickly discover that control/C is your passport to the various parts of the program, particularly the extensive help files. Control/C will also get you out of trouble if you enter an incorrect command.

Out-Think requires a fair amount of structure as you input ideas, and it may slow down your thought flow at first. However, you'll soon find that the keystrokes that precede each entry have become second nature. As you rapidly generate ideas, you'll also notice that Commodore's CP/M disk-operating system runs more slowly than dedicated Z-80- or 8080-based computers.



Here's where those random thoughts led you: A completed outline, produced using Out-Think.

Two full-screen editors, one for outlines and the other for "leaves" of text that can be attached to outline titles, provide four ways to access files. If you're familiar with the command-key sequences of WordStar or Perfect Writer, you'll immediately be at home with these editors, since Out-Think can be configured to accept either standard. If both options are new to you, stick with the WordStar commands, because they're used in the examples in the user's guide.

Once you've composed an outline, Out-Think can compress it to give you an overview of its basic structure or expand it to show additional levels of detail. There's no limit to the number of items in a file or level, and there's no limit to the amount of detail in a file. As a practical matter, the only limits to Out-Think are the capacity of the storage disks and your imagination.

Once you're done with an outline, you're not necessarily done with Out-Think. This package is also a full-blown word processor capable of printing documents and exchanging files in both ASCII and WordStar formats. You can search through files for keywords or strings, create flash cards as study aids, define macros to suit your special needs and even lock files with up to three levels of password security.

Not for the novice or occasional user, Out-Think will repay your effort to learn its commands with more power than you'll probably ever need. You may not like this program until you've really learned it, but once you've learned it, you'll love it. ■

Editor's note: Mark Jordan, the author of BrainStorm 128, advises us that most bugs in the version reviewed here have been corrected in version 2.0, which he hopes will be available by the time this appears in print. Updates will cost $8 for owners of the first version.

John Premack, owner of five Commodore computers, is a news photographer, the SYSOP for the Boston Computer Society's Commodore Users Group BBS, and a book and magazine author on computer topics.

TABLE 1. Manufacturers and prices.

Thinking Cap
Broderbund Software
17 Paul Drive, San Rafael, CA 94903
C-64
$49.95

BrainStorm 128 (Part of BrainTrust)
Country Road Software
70284 C.R. 143, Ligonier, IN 46767
C-128 in 128 mode
$22 for BrainTrust, including shipping and handling; mail order only

Out-Think
Kamasoft, Inc.
PO Box 5549, Aloha, OR 97007
C-128 in CP/M mode; 1571 disk drive
$69.95

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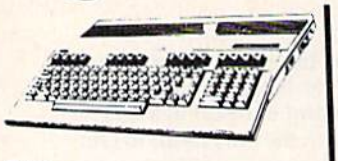
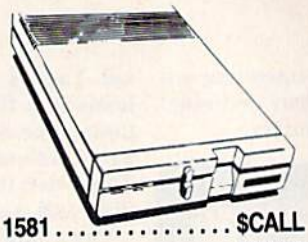
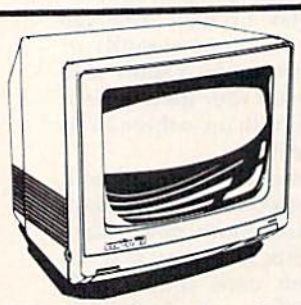


64c .....
128 .....
128D ..... $CALL
* package pricing



1581 ..... $CALL
1541c $169.95
1571 ..... $219.95



1901 (monochrome) ... $99.95
1802c $199.95
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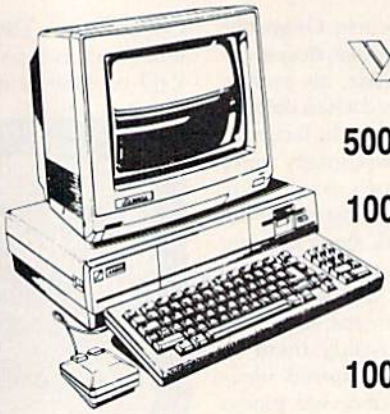

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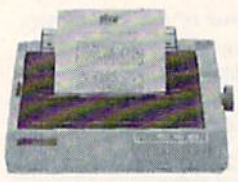

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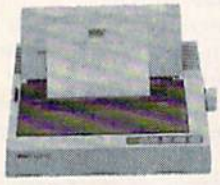

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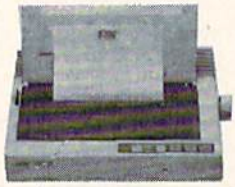

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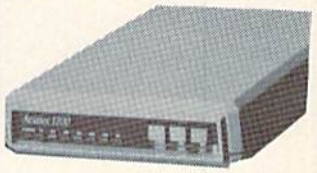

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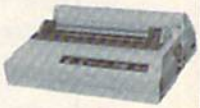

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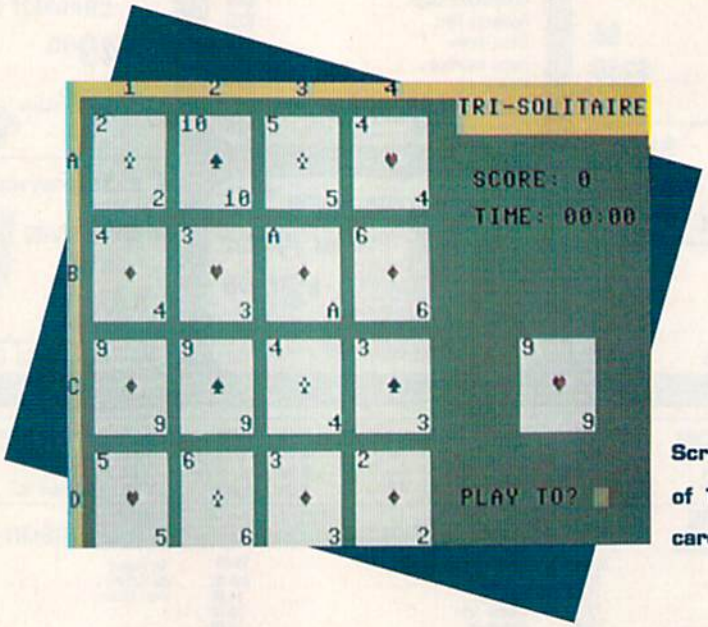
Tri-Solitaire

This new variation of an old game adds up to a good deal of fun.

by JIM and DEBORAH CHAMBERS



Screen display of Tri-Solitaire card layout.

Tri-Solitaire is a fairly simple card game that still can be challenging, even to solitaire aficionados. The program (Listing 1) uses a regular 52-card deck with all the face cards removed, leaving 40 cards to play. Sixteen of the cards are dealt face up in a four-by-four pattern. (These are referred to as table cards.) The remaining 24 cards make up your hand.

The object is to play each card in your hand on a table card so that the total of the other three cards in the same row or column equals the value of your card or its value plus a multiple of ten. For example, if you play a seven, the total of the other three cards in that row or column must equal seven, seventeen or twenty-seven. Also, you can't play your card on a table card of the same value. Card suits don't matter, and aces always count as one.

How To Play

At the start of each game, the program automatically shuffles the cards, then displays the table cards in the four-by-four pattern. The first card in your hand and a Play To? prompt are displayed to the right of the table cards. To play the card, you enter a two-digit command consisting of a letter (A–D) and a number (1–4), such as B3, which represents the location of the table card you want to replace.

If you make a good play, the card in your hand replaces the designated table card, and your score, displayed in the upper-right corner of the screen, is increased by one. The next card in your hand is then displayed.

If you make an incorrect play, an Illegal Move message flashes in place of the Play To? prompt, and everything on the screen remains the same. You can either try to play the card again or examine the next card in your hand by entering a ← (the left arrow key at the upper-left of the keyboard). By repeatedly entering this key, you can flip through and examine as many of the cards in your hand as you like.

You can play the cards in any order. The game is over when you reach a score of 24 or exceed the eight-minute time limit. To adjust the limit, just change the value of LM (line 130) and the word "eight" in line 346.

Note that this program won't run with some ROM cartridges installed, notably the disk fast-load type. If you have a problem running the program, try disconnecting these cartridges. Ⓡ

Jim Chambers is a civil engineer for whom programming is an avocation. Deborah Chambers, an elementary school teacher, assists particularly with the music and sound routines of the family-generated programs.

LISTING 1. Tri-Solitaire program.

```
10Ø REM TRI-SOLITAIRE BY JIM &
    DEBORAH CHAMBERS    :REM*228
11Ø POKE56,56:CLR:CL$=CHR$(147)
    :PRINTCL$:POKE5328Ø,6:POKE5
    3281,Ø              :REM*172
12Ø PRINTTAB(12)CHR$(158)CHR$(1
    8)" TRI-SOLITAIRE "CHR$(146
    ):P=49152:Q=P+23    :REM*158
13Ø DIMP(4,4),CC(4,4),CS(3,4Ø),
    D(13):X=RND(-TI/37):DC=5427
    2:LM=8              :REM*244
14Ø POKE53282,1:POKE53283,7:FOR ►
```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TRI-SOLITAIRE

```
    I=1TO5:PRINT:NEXT:PRINTCHR$
    (5)"RULES:":PRINT  :REM*118
15Ø PRINT"THIS GAME IS PLAYED W
    ITH ONE REGULAR"   :REM*88
16Ø PRINT"DECK WITH FACE CARDS
    REMOVED. SIXTEEN"  :REM*94
17Ø PRINT"CARDS ARE DEALT ON TH
    E TABLE. THE"      :REM*42
18Ø PRINT"REMAINING CARDS ARE Y
    OUR HAND. THE      :REM*144
19Ø PRINT"OBJECT IS TO PLAY EAC
    H CARD IN YOUR"    :REM*62
2ØØ PRINT"HAND ON A TABLE CARD
    SO THAT THE TOTAL" :REM*62
21Ø PRINT"OF THE OTHER THREE CA
    RDS IN THAT ROW OR":REM*198
22Ø PRINT"COLUMN EQUAL THE VALU
    E OF YOUR CARD OR" :REM*32
23Ø PRINT"ITS VALUE PLUS A MULT
    IPLE OF TEN. YOU"  :REM*252
24Ø PRINT"MAY NOT PLAY YOUR CAR
    D ON A CARD OF THE":REM*21Ø
25Ø PRINT"SAME VALUE. SUITS DO
    NOT MATTER, AND"   :REM*156
26Ø PRINT"ACES ALWAYS EQUAL ONE
    .":FORI=PTOP+4Ø:READD:POKEI
    ,D:NEXT            :REM*195
27Ø FORI=1TO4:FORJ=1TO4:P(I,J)=
    1188+(I-1)*24Ø+(J-1)*6:NEXT
    :NEXT:GOSUB1ØØØ    :REM*2Ø1
28Ø PRINTCL$:PRINTCHR$(5)"TO SP
    ECIFY THE TABLE CARD THAT Y
    OU WISH"           :REM*37
29Ø PRINT"TO PLAY ON, ENTER A T
    WO DIGIT COMMAND,"  :REM*79
3ØØ PRINT"A LETTER (A-D) PLUS A
     NUMBER (1-4)."    :REM*147
31Ø PRINT"YOU CAN EXAMINE THE C
    ARDS IN YOUR HAND" :REM*119
32Ø PRINT"BY PRESSING THE "CHR$
    (34)CHR$(95)CHR$(34)" KEY A
    ND <RETURN>."      :REM*61
33Ø PRINT"YOU MAY PLAY YOUR CAR
    DS IN ANY ORDER."  :REM*135
34Ø PRINT:PRINT"A PERFECT SCORE
     = 24 POINTS.":PRINT
                       :REM*129
342 PRINT"THERE ARE TWO VERSION
    S OF THE GAME:"    :REM*2Ø3
344 PRINT" 1. NOVICE: NO TIME L
    IMIT."             :REM*63
346 PRINT" 2. EXPERT: TIME LIMI
    T OF EIGHT MINUTES."
                       :REM*163
348 SYSP,23,6:PRINT"YOUR CHOICE
     (1 OR 2)?":GOSUB1Ø1Ø:GOSUB
    115Ø               :REM*39
35Ø TT=VAL(A$):IFTT<1ORTT>2THEN
    348                :REM*93
36Ø POKE56334,PEEK(56334)AND254
    :POKE1,PEEK(1)AND251:SYSQ
                       :REM*7
37Ø FORI=14624TO14631:POKEI,PEE
    K(I+39144):NEXT    :REM*117
38Ø FORI=14632TO14639:POKEI,PEE
    K(I+3928Ø):NEXT    :REM*1Ø1
39Ø FORI=1464ØTO14647:POKEI,PEE
    K(I+39312):NEXT    :REM*153
4ØØ FORI=14648TO14655:POKEI,PEE
    K(I+3932Ø):NEXT    :REM*217
41Ø POKE1,PEEK(1)OR4:POKE56334,
    PEEK(56334)OR1     :REM*65
42Ø POKE53272,(PEEK(53272)AND24
    Ø)OR14:POKE53265,PEEK(53265
    )OR64              :REM*153
43Ø BL$="":FORI=1TO12:BL$=BL$+C
    HR$(32):NEXT:PL$="PLAY TO":
    IM$="ILLEGAL MOVE" :REM*67
44Ø FORI=1TO13:READD(I):NEXT:SY
    =5:SX=34:P1=22:P2=27:TY=7:T
    X=34               :REM*23
45Ø S=Ø:GOSUB123Ø:FORI=1TO4Ø:CS
    (1,I)=I:NEXT       :REM*241
46Ø FORI=1TO4Ø:AA=I+INT((4Ø-I)*
    RND(Ø)):TP=CS(1,AA) :REM*57
47Ø FORJ=AATOISTEP-1:CS(1,J)=CS
    (1,J-1):NEXT:CS(1,I)=TP:NEX
    T                  :REM*235
48Ø FORI=1TO4Ø:NN=CS(1,I):IFNN<
    11THENCS(1,I)=NN:CS(2,I)=1Ø
    Ø:CS(3,I)=Ø:GOTO52Ø :REM*95
49Ø IFNN<21THENCS(1,I)=NN-1Ø:CS
    (2,I)=1Ø1:CS(3,I)=2:GOTO52Ø
                       :REM*91
5ØØ IFNN<31THENCS(1,I)=NN-2Ø:CS
    (2,I)=1Ø2:CS(3,I)=Ø:GOTO52Ø
                       :REM*167
51Ø CS(1,I)=NN-3Ø:CS(2,I)=1Ø3:C
    S(3,I)=2           :REM*191
52Ø NEXT:PRINTCL$      :REM*14
53Ø FORI=1Ø51TO1Ø63:FORJ=ØTO8ØS
    TEP4Ø:POKEI+J,16Ø:POKEI+J+D
    C,7:NEXT:NEXT      :REM*194
54Ø FORI=1Ø91TO11Ø3:POKEI,D(I-1
    Ø9Ø):POKEI+DC,Ø:NEXT:REM*48
55Ø FORI=1Ø5ØTO1Ø24STEP-1:POKEI
    ,16Ø:POKEI+DC,7:NEXT
                       :REM*112
56Ø FORI=1Ø64TO1984STEP4Ø:POKEI
    ,16Ø:POKEI+DC,7:NEXT
                       :REM*234
57Ø FORI=1TO4:POKE(I*6+1Ø22),I+
    176:POKE(I*6+1Ø22+DC),Ø:NEX
    T                  :REM*32
58Ø FORI=1TO4:POKE(I*24Ø+944),I
    +128:POKE(I*24Ø+944+DC),Ø:N
    EXT                :REM*94
59Ø FORI=1TO4:FORJ=1TO4:Z=P(I,J
    ):GOSUB1Ø3Ø:NEXT:NEXT
                       :REM*114
6ØØ C=Ø:FORI=1TO4:FORJ=1TO4:Z=P
    (I,J):C=C+1:GOSUB1Ø4Ø:CC(I,
    J)=CC:NEXT:NEXT    :REM*32
61Ø Z=1697:C=C+1:GOSUB1Ø3Ø:GOSU
    B1Ø4Ø:SYSP,SY,28:PRINT"SCOR
    E: Ø"              :REM*8
```


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```
615 SYSP,TY,28:PRINT"TIME: ØØ:Ø
    Ø":TI$="ØØØØØØ"     :REM*199
62Ø SYSP,P1,P2:PRINTBL$:SYSP,P1
    ,P2:PRINTPL$;:PP$="":INPUTP
    P$:IFPP$<>"{LEFT ARROW}"THE
    N67Ø                :REM*1ØØ
63Ø GOSUB125Ø:IFFL>ØTHEN128Ø
                        :REM*25Ø
635 IFC=4ØTHEN62Ø       :REM*177
64Ø FORI=1TO3:T(I)=CS(I,C):NEXT
                        :REM*2Ø
65Ø FORI=CTO39:FORJ=1TO3:CS(J,I
    )=CS(J,I+1):NEXT:NEXT
                        :REM*19Ø
66Ø FORI=1TO3:CS(I,4Ø)=T(I):NEX
    T:Z=1697:GOSUB1Ø4Ø:GOTO62Ø
                        :REM*162
67Ø IFLEN(PP$)<>2THEN113Ø
                        :REM*62
68Ø Y$=LEFT$(PP$,1):X$=RIGHT$(P
    P$,1):Y=ASC(Y$)-64:X=VAL(X$
    )                   :REM*116
69Ø IFY<1ORY>4ORX<1ORX>4THEN113
    Ø                   :REM*6
7ØØ Z=P(Y,X):N=CS(1,C)  :REM*152
71Ø T1=Ø:T2=Ø:FORI=1TO4:T1=T1+C
    C(Y,I):T2=T2+CC(I,X):NEXT
                        :REM*3Ø
72Ø T1=T1-CC(Y,X):T2=T2-CC(Y,X)
    :IFN=CC(Y,X)THEN113Ø:REM*1Ø
73Ø IFT1=NORT1=N+1ØORT1=N+2ØORT
    1=N+3ØORT2=NORT2=N+1ØORT2=N
    +2ØORT2=N+3ØTHEN75Ø:REM*2Ø4
74Ø GOTO113Ø            :REM*28
75Ø Z=1697:GOSUB1Ø3Ø    :REM*138
76Ø Z=P(Y,X):GOSUB1Ø4Ø:CC(Y,X)=
    N:S=S+1:GOSUB125Ø:IFFL>ØTHE
    N128Ø               :REM*38
77Ø SYSP,SY,SX:PRINTS:IFS=24THE
    N117Ø               :REM*159
78Ø GOSUB115Ø:C=C+1:Z=1697:GOSU
    B1Ø4Ø:GOTO62Ø       :REM*129
1ØØØ SYSP,23,6:PRINTCHR$(18)CHR
    $(158)" PRESS ANY KEY TO C
    ONTINUE "           :REM*227
1Ø1Ø GETA$:IFA$=""THEN1Ø1Ø
                        :REM*41
1Ø2Ø RETURN             :REM*57
1Ø3Ø FORK=Z-82TOZ-78:FORL=ØTO16
    ØSTEP4Ø:POKEK+L,96:POKEK+L
    +DC,1:NEXT:NEXT:RETURN
                        :REM*146
1Ø4Ø CC=CS(1,C):CP=CS(2,C):FC=C
    S(3,C)              :REM*38
1Ø5Ø POKEZ-81,96:POKEZ-81+DC,1:
    POKEZ+81,96:POKEZ+81+DC,1
                        :REM*232
1Ø6Ø IFCC=1ØTHEN1Ø9Ø     :REM*246
1Ø7Ø IFCC=1THEN111Ø      :REM*254
1Ø8Ø POKEZ-82,CC+112:POKEZ-82+D
    C,Ø:POKEZ+82,CC+112:POKEZ+
    82+DC,Ø:GOTO112Ø    :REM*14Ø
1Ø9Ø POKEZ-82,113:POKEZ-81,112:
    POKEZ-82+DC,Ø:POKEZ-81+DC,
    Ø                   :REM*62
11ØØ POKEZ+81,113:POKEZ+82,112:
    POKEZ+81+DC,Ø:POKEZ+82+DC,
    Ø:GOTO112Ø          :REM*24Ø
111Ø POKEZ-82,65:POKEZ-82+DC,Ø:
    POKEZ+82,65:POKEZ+82+DC,Ø
                        :REM*138
112Ø POKEZ,CP:POKEZ+DC,FC:RETUR
    N                   :REM*78
113Ø SYSP,P1,P2:PRINTIM$:FORI=1
    TO1Ø:POKE54296,15:FORJ=1TO
    3:NEXT              :REM*34
114Ø POKE54296,Ø:FORJ=1TO2:NEXT
    :NEXT:GOSUB125Ø     :REM*214
1142 IFFL>ØTHEN128Ø      :REM*172
1144 GOTO62Ø             :REM*126
115Ø POKEDC+24,15:POKEDC+1,11Ø:
    POKEDC+5,9:POKEDC+6,9:POKE
    DC+4,17:POKEDC+4,16
                        :REM*21Ø
116Ø RETURN             :REM*198
117Ø FORI=ØTO15:POKE5328Ø,I:FOR
    J=ØTO1ØØ:NEXT:GOSUB12ØØ:NE
    XT:POKE5328Ø,6      :REM*92
118Ø SYSP,P1,P2:PRINT"PLAY AGAI
    N?";:GOSUB1Ø1Ø:IFA$="Y"THE
    NGOSUB123Ø:GOTO45Ø  :REM*3Ø
119Ø SYS5826Ø            :REM*62
12ØØ SYSP,P1,P2:PRINTBL$:FORK=Ø
    TO5Ø:NEXT:SYSP,P1,P2:PRINT
    " WINNER!"          :REM*17Ø
121Ø IFI/5=INT(I/5)THENGOSUB115
    Ø                   :REM*52
122Ø RETURN              :REM*2
123Ø PRINTCL$:POKE53281,12:SYSP
    ,12,6:PRINTCHR$(144)"SHUFF
    LING THE CARDS NOW..."
                        :REM*66
124Ø RETURN             :REM*22
125Ø FL=Ø:MM$=MID$(TI$,3,2):SS$
    =RIGHT$(TI$,2):MM=VAL(MM$)
    :TT$=MM$+":"+SS$    :REM*46
126Ø SYSP,TY,TX:PRINTTT$:IFTT=2
    ANDMM>=LMTHENFL=1   :REM*26
127Ø RETURN             :REM*52
128Ø FORI=1TO1Ø:SYSP,P1,P2:PRIN
    TBL$:FORT=ØTO1ØØ:NEXT
                        :REM*191
129Ø SYSP,P1,P2:PRINT"GAME OVER
    ":FORT=ØTO15Ø:NEXT:NEXT:GO
    TO118Ø              :REM*53
2ØØØ DATA 32,13,192,132,251,32,
    13,192,166,251,76,24Ø
                        :REM*235
2Ø1Ø DATA 255,32,253,174,32,158
    ,173,32,17Ø,177,96  :REM*15
2Ø2Ø DATA 16Ø,Ø,185,Ø,2Ø8,153,Ø
    ,56,185,Ø,2Ø9,153,Ø,57,2ØØ
    ,2Ø8,241,96         :REM*119
2Ø3Ø DATA 148,146,137,173,147,1
    43,14Ø,137,148,129,137,146
    ,133                :REM*89
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Attention, Shoppers!

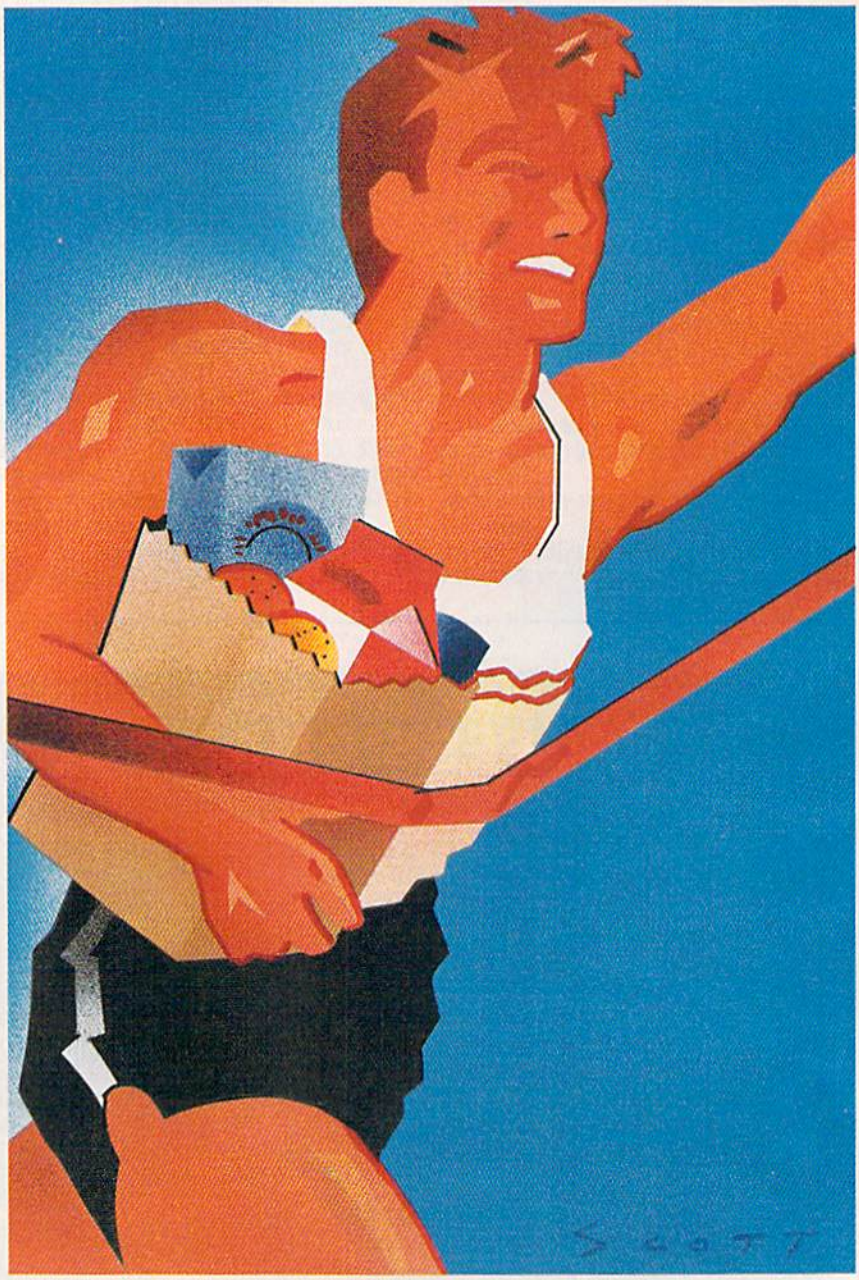
Whip your way through those long supermarket aisles with this time-saving 64 or 128 program.

by BOB KODADEK

Doing the weekly food shopping at the supermarket can be a long and tedious task, but now my Shopping List program can make your trips to the store faster and more efficient. It will let you "browse" through the aisles before you even leave home, compiling a complete shopping list arranged according to where products are located in the store.

To use the program, you establish, in the Data statements beginning at line 1000, a basic list of all items you might want to buy during any shopping trip. Each time you run the program to make a specific list, all these items appear in a succession of screen displays, and you specify the ones you want to buy on that particular day. The program saves those items in a sequential file you can call up to start your next shopping list. You can alter the basic list in the Data statements during any Shopping List session.

The printout you take to the store lists all the products you intend to buy, along with the quantity, unit price and total price for each, the aisle number where it's located and the total you'll have to pay at the cash register. If you enter products in the order you come to them in the store, they'll be listed that way, thus saving you considerable time in trips back and forth across the supermarket.



ILLUSTRATED BY BOB SCOTT

Compiling the List

Type in and save the program in Listing 1, giving it the filename Shopping List. It's important that you use this particular filename, as the program needs it during execution. I've included some preliminary Data statements in the proper format to show you how to set up your own. You'll have to make additions, deletions and alterations to them to match your needs.

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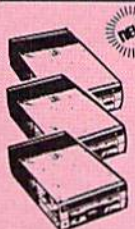

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Shopping List, take notes on prices and aisle locations as you do your shopping so you can add more items to the Data statements. Thereafter, you'll also need to keep track of price and location changes and alter the Data statements accordingly.

Adding Data Statements

As you add Data statements, keep line 1000 as the starting point for items located in aisle 1 at the store, line 2000 as the starting point for items in aisle 2, and so on for all the aisles in the store. There are four data items necessary for each product, the first two being name and price. Although I've included some leading zeroes in the prices to make the display neater, neither they nor trailing zeroes are necessary. The third data item is the quantity of the product you want, and the fourth is the number of the aisle where the product is located.

As you're working with the Data statements, keep in mind that line 40000 must always remain in the program. It signifies the end of the data to be read.

Making a Shopping List

When you run Shopping List, first it will ask, "Have you made any additions, deletions, or corrections? (Y or N)." This refers to the Data statements. If you have altered the Data statements, type Y to save and replace the program listing with the new Data statements. If you haven't changed them, type N.

Next, the first screen display of items in the Data statements will appear. The product list occupies the top of the display, and across the middle of the screen you'll see a line that includes the program title, messages about program operation, the "page" number of that screen display and the aisle in the store where the first item on the page is located. Note that the page number refers to the screen display only, not the printout; I assumed most shopping lists would fit on only one printout page. At the bottom of the screen there's a menu of keypress commands to use in creating your list.

You'll notice that some of the products are displayed in white, some in green. Those in white list a quantity of at least one. When you load the sequential file holding your previous shopping list, any items in it that are in addition to the Data statement items will turn white also. All the white items will appear in the printout, unless you decrease their quantity to zero (at which point they'll turn green).

The green items in the display have zero for a quantity and won't appear in the printout unless you change their amount to something other than zero. The maximum quantity for each product is nine.

The highlighted item in the display is where the cursor is resting.

List-Making Commands

To *increase the quantity* of the highlighted product, press the *cursor-right* key. If the starting quantity is zero, increasing it will add the item to your shopping list.

To *decrease the quantity* of the highlighted product, press the *cursor-left* key. Decreasing the quantity to zero will eliminate it from your shopping list.

To *browse* through the list of items on the current screen page by moving the highlight down, press the *cursor-down* key. At the bottom of the page, the highlight will wrap around to the top of the list.

To move to the *next screen page*, press the *return* key.

To display the *previous screen page*, press the *cursor-up* key.

To *print out* your list, press *P*.

To *load* into memory the sequential file containing your previous shopping list, press *L*.

To *save with replace* your current shopping list into the sequential file, press *S*.

To *view* the sequential file in memory, press *V*. As the list scrolls by, you can freeze it by pressing the space bar.

To *erase* the sequential file, press *E*.

Other Considerations

When using the Shopping List on a C-128 with an 80-column monitor, you can remove the first two Pokes in line 2 and use the space they leave to add the Fast command, without having to renumber the program. The Pokes are needed only to set the screen and border colors for the 40-column screen.

Also, when you use the Save and Load functions of Shopping List, be sure to make all additions to and deletions from the Data statements prior to starting a new shopping list. Ⓡ

Bob Kodadek is a computer programmer and freelance writer.

LISTING 1. Shopping List program.

```
1 MA$=".ØØ":MO=64:KP=197:T$=CHR
  $(16):IFPEEK(4Ø96Ø)=ØTHENMO=1
  28:KP=212                :REM*59
2 POKE5328Ø,Ø:POKE53281,Ø:PG$="
  PAGE":AS$="AISLE":N$="DEMO SH
  OPPER":GOTO5             :REM*254
3 IFMO=64THENPOKE781,X:POKE782,
  Y:POKE783,Ø:SYS6552Ø:RETURN
                           :REM*215
4 POKE7,X:POKE8,Y:POKE5,Ø:SYS65
  52Ø:RETURN               :REM*156
5 V=3ØØ:DIMA$(V),B(V),Q%(V),S%(
  V):Y$="{COMD 6}":E$="{CTRL 2}
  ":PRINTCHR$(14)"{SHFT CLR}{5
  CRSR DNs}"Y$N$           :REM*45
6 PRINT"{CRSR DN}HAVE YOU MADE
  ANY ADDITIONS, DELETIONS, OR
  CORRECTIONS? Y/N"        :REM*2Ø8
7 IFPEEK(KP)=39THEN12      :REM*115
8 IFPEEK(KP)<>25THEN7      :REM*2Ø2
9 OPEN1,8,15:PRINT"SAVE @Ø:"N$:
  SAVE"@Ø:"+N$,8           :REM*239
1Ø INPUT#1,A$,B$,C$,D$:PRINTA$"
  ,";B$",";C$",";D$        :REM*216
11 PRINT"{CRSR DN}VERIFY "N$:VE
  RIFY N$,8                :REM*213
12 PRINT"{CRSR DN}OK, READING D
  ATA...":I$="ITEM":S$="TOTAL
  $"                       :REM*11Ø
13 A=A+1:READA$(A),B(A),Q%(A),S
  %(A):IFA$(A)<>"END"THEN13
                           :REM*195
14 CLOSE1:L=1:SU=Ø:AI=1:P=Ø
                           :REM*72
15 PRINT"{SHFT CLR}{CTRL 8}":X=
  17:Y=Ø:GOSUB3:PRINTN$SPC(6)P
  G$AI,AS$S%(L)            :REM*169
16 PRINT"{CTRL 6}{CRSR DN}CRSR
   RT = + "I$SPC(3)"CRSR LT = -
   "I$                     :REM*16
17 PRINT"CRSR DN = BROWSE"SPC(3
  )"CRSR UP = LAST "PG$
                           :REM*157
18 PRINTSPC(6)"P = PRINT"SPC(5)
  "RETURN = NEXT "PG$ :REM*214
19 PRINTSPC(6)"S = SAVE"SPC(11)
  "L = LOAD":PRINTSPC(6)"V = V
  IEW LIST";               :REM*1
2Ø PRINTSPC(6)"E = ERASE":X=1:Y
  =Ø:GOSUB3:F=Ø            :REM*17Ø
21 FORI=LTOL+14:IFI>ATHENA$(I)=
  "{8 SPACEs}"             :REM*157
22 PRINTY$;:IFQ%(I)THENPRINTE$;
                           :REM*242
23 PRINTA$(I)TAB(2Ø)Q%(I)" @"Y$
  TAB(3Ø);:N1=B(I):GOSUB65:PRI
  NT:NEXT                  :REM*89
```

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SHOPPERS

```
24 X=1:Y=Ø:GOSUB3:GOSUB42:F=Ø
                          :REM*32
25 D$="":GETD$            :REM*29
26 IFD$="{CRSR DN}"THENF=F+1:IF
   F<=14THENGOSUB43:L=L+1:GOSUB
   42:GOTO37              :REM*24Ø
27 IFD$="{CRSR UP}"ANDL>15THENL
   =(L-15-F):AI=AI-1:GOTO15
                          :REM*2Ø5
28 IFD$=CHR$(13)THENL=(L+15-F):
   AI=AI+1:GOTO15         :REM*13Ø
29 IFD$="{CRSR RT}"THEN44
                          :REM*255
3Ø IFD$="{CRSR LF}"THENGOSUB49:
   GOTO37                 :REM*182
31 IFD$="V"THEN53         :REM*155
32 IFD$="{CRSR DN}"ANDF=15THENG
   OSUB43:L=L-14:GOTO24:REM*116
33 IFD$="P"THEN38         :REM*185
34 IFD$="S"THENCM$="WRITING FIL
   E...":GOSUB48:GOSUB46:GOTO14
                          :REM*144
35 IFD$="L"THENCM$="READING FIL
   E...":GOSUB48:GOSUB47:GOTO14
                          :REM*111
36 IFD$="E"THENFORI=1TOA:Q%(I)=
   Ø:NEXT:GOTO14          :REM*82
37 GOTO25                 :REM*49
38 CM$="PRINTER READY? Y/N{19 S
   PACEs}":GOSUB48        :REM*48
39 R$="":GETR$:IFR$=""THEN39
                          :REM*233
4Ø IFR$<>"Y"THEN14        :REM*4Ø
41 P=1:GOTO53             :REM*141
42 Z$="{CTRL 9}"          :REM*188
43 GOSUB51:PRINTZ$+A$(L):Z$="{C
   TRL Ø}{CRSR UP}":RETURN
                          :REM*31
44 IFQ%(L)<9THENQ%(L)=Q%(L)+1
                          :REM*136
45 PRINT"{CTRL 2}{CRSR UP}{CTRL
    9}"A$(L)"{CTRL Ø}"TAB(2Ø)Q%
   (L)" @":GOTO25         :REM*221
46 OPEN1,8,2,"@Ø:S.LIST,S,W":FO
   RI=1TOA:PRINT#1,Q%(I):NEXT:P
   RINT#1:RETURN          :REM*144
47 OPEN1,8,2,"Ø:S.LIST,S,R":FOR
   I=1TOA:INPUT#1,Q%(I):NEXT:RE
   TURN                   :REM*189
48 X=17:Y=Ø:GOSUB3:PRINTE$CM$:R
   ETURN                  :REM*19Ø
49 IFQ%(L)THENQ%(L)=Q%(L)-1:GOS
   UB51                   :REM*5
5Ø PRINT"{CRSR UP}{CTRL 9}"A$(L
   )"{CTRL Ø}"TAB(2Ø)Q%(L)" @":
   RETURN                 :REM*152
51 PRINTY$;:IFQ%(L)THENPRINTE$;
                          :REM*39
52 RETURN                 :REM*11Ø
53 PRINT"{SHFT CLR}{COMD 8}":IF
   PTHENOPEN1,4:PRINT#1,SPC(3Ø)
   N$                     :REM*61
54 IFPTHENPRINT#1,SPC(5)I$SPC(1
   1)"QTY"SPC(6)"UNIT"SPC(7)"SU
   B"SPC(7)AS$            :REM*134
55 IFPTHENPRINT#1,SPC(5)"{4 COM
   D Ts}"SPC(11)"{3 COMD Ts}"SP
   C(6)"{4 COMD Ts}"SPC(7)"{3 C
   OMD Ts}"SPC(7)"{5 COMD Ts}"
                          :REM*13
56 FORI=1TOA:IFQ%(I)=ØTHEN62
                          :REM*16Ø
57 IFPEEK(KP)=6ØTHEN57    :REM*1Ø3
58 SQ=Q%(I)*B(I):SU=SU+SQ:IFPTH
   ENPRINT#1,A$(I)T$"2Ø"Q%(I);
                          :REM*186
59 PRINTA$(I)TAB(18)Q%(I)" @"TA
   B(25);:IFPTHENPRINT#1,T$"28"
   ;                      :REM*129
6Ø N1=B(I):GOSUB65:PRINTTAB(33)
   ;:IFPTHENPRINT#1,T$"39";
                          :REM*1ØØ
61 N1=SQ:GOSUB65:PRINT:IFPTHENP
   RINT#1,T$"5Ø"S%(I)     :REM*99
62 NEXT:PRINT"{CRSR DN}"S$;:IFP
   THENPRINT#1,CHR$(13)S$;
                          :REM*148
63 N1=SU:GOSUB65:PRINT:IFPTHENP
   RINT#1                 :REM*55
64 PRINT"{CTRL 9}PRESS RETURN";
   :SYS65487:GOTO14       :REM*96
65 D1=INT(N1):CT=N1-D1:CT$=MID$
   (STR$(INT((CT*1ØØ)+.5)),2)
                          :REM*97
66 CS$=LEFT$(MA$,3-LEN(CT$))+CT
   $:DL$=STR$(D1)+CS$:IFPTHENPR
   INT#1,DL$;             :REM*42
67 PRINTDL$;:RETURN       :REM*141
1ØØØ REM AISLE #1 VEGETABLES
                          :REM*77
1ØØ1 REM{2 SPACEs}**********
     *****,X.XX,X,X       :REM*26
1Ø1Ø DATA LETTUCE (HEAD){4 SPAC
     Es},Ø.59,Ø,1         :REM*49
1Ø2Ø DATA CABBAGE (HEAD){4 SPAC
     Es},Ø.79,Ø,1         :REM*245
1Ø3Ø DATA POTATOES 5 LBS.{3 SPA
     CEs},Ø.79,Ø,1        :REM*2ØØ
1Ø4Ø DATA ONIONS 5 LBS.{5 SPACE
     s},Ø.99,Ø,1          :REM*132
199Ø REM                  :REM*11
2ØØØ REM AISLE # 2 DAIRY PRODUC
     TS                   :REM*17
2ØØ1 REM{2 SPACEs}**********
     *****,X.XX,X,X       :REM*6
2Ø1Ø DATA YOGURT 8 OZ. CUP{2 SP
     ACEs},Ø.59,Ø,2       :REM*13
2Ø2Ø DATA CHEESE 16 SLICES{2 SP
     ACEs},1.59,Ø,2       :REM*199
2Ø3Ø DATA SWISS CHEESE LB.{2 SP
     ACEs},2.49,Ø,2       :REM*195
2Ø4Ø DATA EGGS LARGE DOZEN{2 SP
     ACEs},1.Ø9,Ø,2       :REM*221
2Ø5Ø DATA MILK 2% LOW FAT{3 SPA
     CEs},1.79,Ø,2        :REM*28
299Ø REM                  :REM*247
3ØØØ REM AISLE # 3 MEATS:REM*27
3ØØ1 REM{2 SPACEs}**********
     *****,X.XX,X,X       :REM*242
3Ø1Ø DATA HOT DOGS LB.{6 SPACEs
     },1.89,Ø,3           :REM*87
3Ø2Ø DATA SLICED HAM LB.{4 SPAC
     Es},2.39,Ø,3         :REM*99
3Ø3Ø DATA CHICKEN LB.{7 SPACEs}
     ,1.59,Ø,3            :REM*33
3Ø4Ø DATA PORK CHOPS LB.{4 SPAC
     Es},2.Ø9,Ø,3         :REM*35
399Ø REM                  :REM*227
4ØØØØ DATA END,Ø,Ø,Ø      :REM*98
```

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GEOS One Year Later

GEOS was recently named software technical achievement of 1986. Berkeley Softworks president, Brian Dougherty, tells about some of the enhancements and new applications—including a GEOS 128 version.

by DENNIS BRISSON

Is your C-64 suffering from a case of the blahs? Do you wish you could pep up your system to give it the productivity prowess of an IBM PC, the graphics capability of an Amiga or the user-friendliness of a Mac?

Well, Berkeley Softworks claims to have the cure. With GEOS, 64 users can take advantage of untapped features and put their machines on a par with much more expensive computers. This is quite a promise for a computer system that a year ago was considered to be nearing the end of the line.

Berkeley Softworks president, Brian Dougherty, was convinced, however, that he could bring new life to this aging machine. "Commodore never appreciated what they had on their hands with the 64. The machine wasn't perceived for the power it possessed."

Dougherty saw the potential of the 64 as greater than many realized. In comparison to the Apple II, for example, "it's got better graphics resolution, comes with more resident memory and has a true interrupt structure so you can do multiprocessing within applications." From a software developer's viewpoint, he also favors the 64 over the IBM PC, "which is a good machine for productivity or business applications, but is fairly slow when it comes to graphics manipulations."

And graphics is what GEOS is all about.

GEOS is a line of productivity software that introduces the 64 user to the use of an operating system of icons, pull-down menus, dialogue boxes and windows—graphics features heretofore found only with higher-priced machines. This family of software—all designed to work together—covers a broad range of applications. GEOS includes a word processor, geoWrite, and a drawing program, geoPaint. Other packages from Berkeley Softworks include a selection of fonts and typestyles, Fontpack; an index program, geoDex; a database, geo-File; a spreadsheet, geoCalc; and a collection of enhancements and applications (Deskpak and Writer's Workshop). More are in the works.

GEOS (pronounced jē ōs) stands for graphic environment operating system. If you ask 64 users about operating systems, you may receive a blank stare. They're used to having their machines come up functioning in Basic—not a real operating system environment. Dougherty admits that one of the challenges he faces with GEOS is "convincing users that this is a new operating system and not just a group of integrated applications." ►

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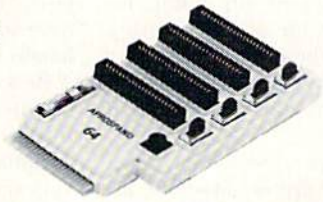

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The impetus for developing GEOS, which was introduced in March 1986, arose from the need to develop a productivity application for a system that was primarily viewed for entertainment. "We felt that the whole productivity area for Commodore had been somewhat neglected," observes Dougherty. Since GEOS was introduced, the user base has expanded to approximately 400,000, making it one of the top-selling products for the 64 market.

"QuantumLink has allowed us to keep our prices low and provide very good customer service for users."

A Rocky Start

A year ago, you might not have predicted the product would do this well. It met with mixed reactions when first introduced.

GEOS was criticized for being incompatible with a lot of the existing Commodore hardware, particularly printers. And geoWrite, the package's word processor, was slow and awkward to use.

Dougherty states that while most users realized and appreciated the capability of GEOS, a few were guilty of "looking at the hole instead of the doughnut."

"People looked at the initial geoWrite program and said, 'Gee, it doesn't have superscripts or subscripts or automatic page numbering.' And they missed the fact that for the first time on a 64 they could create high-resolution documents incorporating multiple proportionally spaced fonts. They could not only have italicized bold, but could use any of a wide range of font styles to give them a very high range of flexibility in the way the documents can be prepared."

Dougherty also emphasizes the difference between a proportionally spaced, graphically oriented font word processor (geoWrite) and a simple character word processor. "Granted, the 2.0 version of geoWrite wasn't as fast as character-based word processing systems, but it allowed them to generate much better-looking documents. The unique thing about our word processor is the quality of the presentation that you can create. With laser-printing capability, GEOS offers basically the kind of printing and publishing capability that never existed on personal computers before the Mac came along."

Like any top-quality company, Berkeley Softworks continually works to make its products compatible with existing hardware, to enhance its existing software and create new and exciting applications.

Since introducing GEOS last March, Berkeley Softworks has updated GEOS three times and generated a complete line of productivity applications. For example, version 1.2 GEOS featured 11 printer drivers, which supported about 25 printers. The current version of GEOS has 40 printer drivers, which support over 60 printers. "So we think we have addressed just about every printer," laughs Dougherty.

Berkeley Softworks' success this year can also be attributed to some very propitious alliances that the company has established.

Commodore itself is actively promoting GEOS by bundling it with new 64 computer packages. If you buy Commodore peripherals (1351 mouse and 1764 RAM expander), you'll also receive the latest GEOS updates. This relationship is responsible for the wide distribution of the product (in addition to Berkeley Softworks' direct sales efforts).

The QuantumLink Connection

An even more favorable arrangement involves Berkeley and QuantumLink, the Commodore-specific, on-line electronic network.

Dougherty relates an incident that occurred one Saturday while he was working in his Berkeley Softworks office. He answered a call from a woman in Vermont who had just purchased GEOS and needed a program to enable her to print out on her Okidata 120 printer. Dougherty found out that she belonged to QuantumLink and informed her that she could download the program she needed from there.

"She called me back a couple of hours later to say that she had downloaded the 120 printer driver and everything was now working great."

This points out a convenient solution to the need for Berkeley to inform its users about changes, improvements and the latest developments for its product. If you subscribe to QuantumLink, you can download for free the latest GEOS upgrades.

Dougherty admits that this on-line service has been an effective and cost-savings tool in helping Berkeley Softworks to reach its customers and to support its product. QuantumLink has "allowed us to keep our prices low and provide very good customer service for users." He notes that without QuantumLink, the cost of customer service would have to be reflected in the price of the product. Dougherty also recognizes a "certain inequity" because "people who don't need help end up subsidizing people who do need a lot of support."

Besides offering upgrades and GEOS software to download, Berkeley also offers a special programming and technical information area on QuantumLink for developers and users. In addition, GEOS owners can download "BandAid programs," which correct any obscure bugs that Berkeley Softworks may have run across and also produce laser-quality printouts of their GEOS files via QuantumLink.

"QuantumLink's a terrific vehicle for presenting a very few small problems that account for the majority of customer service questions. Users can get on and look at a bulletin board that will have those questions answered for them, as well as being able to get lots of help for other GEOS users."

GEOS Support

Third-party hardware and software developers have been slow to embrace GEOS. Dougherty explains: "Before companies could really get into developing for the GEOS operating system, we had to get the GEOS programmers manual out, and that took us longer than expected."

Their manual is now in widespread distribution, and the company is also running the technical information board on QuantumLink and answering questions from software developers about programming in the GEOS environment. Berkeley Softworks has received inquiries from several software developers, most notably, Timeworks, which, according to Dougherty, is working on GEOS applications. (Their Partner 64 program is GEOS-compatible.)

Despite the slow acceptance from the development community, Dougherty recently received a big boost at the annual Software Publisher's Association awards ceremony. GEOS was voted the software technical achievement of the year, an honor that particularly pleased Dougherty because GEOS, as judged by other developers, bested seemingly more powerful products for the IBM, Mac and Amiga.

Dougherty, himself a GEOS user ("I do all my business correspondence with GEOS on a C-64 and a Laser Writer."), is somewhat of a 64 crusader. He states,

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"I really believe the 64 is the best personal computer value on the market." His staff is currently working on a product for the school environment, which "will help keep the Commodore market alive," he says.

Berkeley Softworks is continually developing new applications and enhancements to existing ones and is attempting to bring more users into the GEOS fold. "We think the new applications we've just released (geoFile and geoCalc) will really help owners to see GEOS as a lot more than one integrated applications package."

New Ventures

Buoyed by the success of GEOS for the 64, Berkeley Softworks will be releasing a 128 version sometime this summer. (GEOS 128 was demonstrated at the Las Vegas CES last January.) The most notable improvement is that GEOS 128 will take advantage of the 80-column capability, "plus a couple of other technical improvements that take advantage of the extra memory and the 2 MHz clock speed to improve overall system performance." Current and planned 64 GEOS applications will also be implemented in a full 80-column 128 version.

At the same time, the Berkeley Softworks staff is currently working on releasing more 64 applications, such as geoSpell; geoFont, a font editor (due out this month); geoProgrammer, which Dougherty describes as "a really elegant programming environment for people to develop GEOS applications"; geoPublish, which promises full-blown desktop publishing capabilities for GEOS users; and geoBasic, a new Basic that will fully exploit the GEOS operating system.

The features of GEOS are best appreciated when used in conjunction with two recent hardware developments from Commodore—the 1351 mouse and the 1764 RAM expander. An input driver for the 1351 mouse is available, and a new program called Configure (which comes with the 1764) allows you to create a RAM disk using the 1764. Configure also supports the 1571 and the new 1581 3½-inch disk drive.

Berkeley Softworks plans to release its own mouse device, which Dougherty describes as a "true proportional mouse with a battery-backed-up clock." With this device, he explains, the time and date will automatically be set every time a user powers up his system.

Dougherty is pleased with the level of support and popularity for GEOS among the user community and is optimistic about the future.

"We had high expectations for GEOS," he says, "and many of our hopes have been realized, but we're by no means complacent. We feel that there are still a lot of people out there who may not be using their Commodores anymore and don't have GEOS. We're trying to reach these people to get them to see that you don't need to go out and spend $2000 for the latest computer to get the latest in computer technology." ■

Dennis Brisson has been Editor-in-Chief of RUN *magazine ever since it started to take shape in the summer of 1983. He is now a confirmed GEOS user.*

THE WORLD OF COMMODORE

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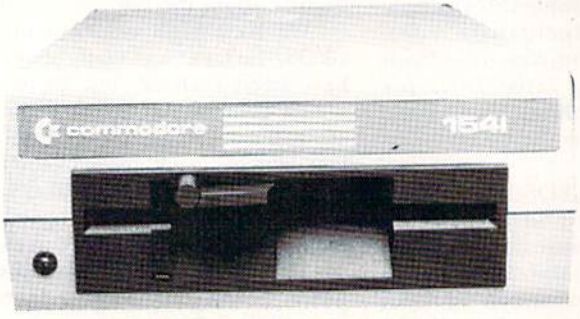

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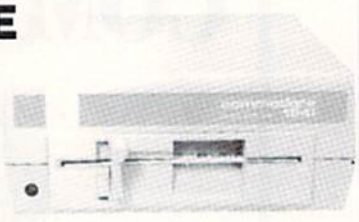

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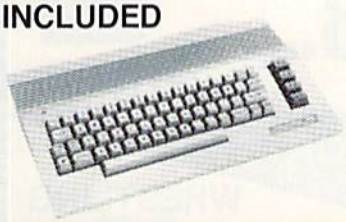

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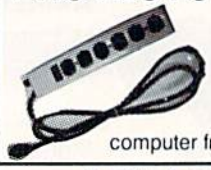

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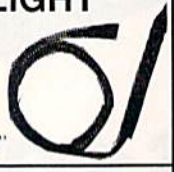

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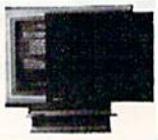

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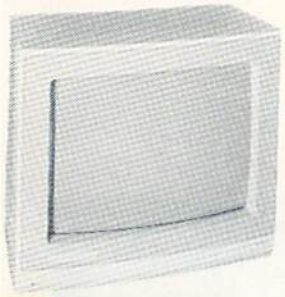

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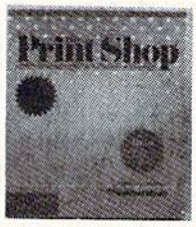

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Linker 128

This valuable substitute for the missing C-128 Append command lets you combine a number of Basic program files into one.

by DALE S. BROWN

In the 1986 *RUN* Special Issue, Morton Kevelson's article, "C-128 Programmer's Aid," contained a sidebar entitled "Missing Link Uncovered!" (p. 66) that dealt with the C-128's lack of a Merge or Append command. The article was helpful, but the Appender program in it had some problems.

Prior to an "appending load," the program changed the start-of-Basic pointers at locations 45 and 46 to locations 174 and 175, because, as the article stated, "the end of the Basic program is stored in addresses 174 and 175." However, addresses 174 and 175 actually store the end address for the last load, save or verify operation. As a result, if you load and edit the main program and then try to append a program segment or subroutine to it, the address that locations 174 and 175 point to will be obsolete.

Fortunately, Basic 7.0 gave me the tools to build an append program that really works. Linker, as I call it, first checks to see if you're in 40- or 80-Column mode and formats the screen accordingly. Then it prompts you for the filename of your main program, the number and filenames of the program segments or subroutines you want to link to it and the filename you want the final program to have.

There are three rules to follow in using Linker:

1. The main program and all the files to be linked to it must be on the same disk.

2. Subroutines or program segments to be linked to the main program must have line numbers greater than the main program.

3. The filenames of the subroutines or program segments must be entered at the prompts or assigned to the array variables.

Linker can handle no more than nine linked files each time it's used. This ensures that variables won't quickly exceed the memory limitations of bank 1, and it permits easy checking for erroneous input data in line 240. If you need more variable capacity, you can increase the DIM of B$(X) in line 65 and remove line 240.

ILLUSTRATED BY ROB COLVIN

LISTINGS 1–5

Listings 1–5 contain Linker and some short programs for demonstration ►

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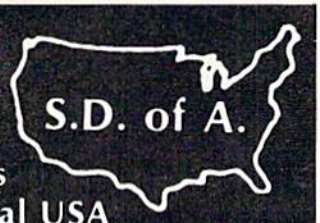

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purposes. Here are brief descriptions of them:

Listing 1, Linker, is the "work" program that links files together. Be sure to save it with the filename LINKER, because the demonstration programs will be looking for it with that name.

Listing 2, LinkLDR, is a short, main program to use for demonstration purposes. It prompts you to insert a disk containing Linker, then loads and runs it.

Listing 3, PressKey.400, is a subroutine that provides a colorful "press any key to continue" prompt once you've performed some other action the program has requested, such as inserting the proper disk as prompted by the subroutine in Listing 4.

Listing 4, InsertDisk.401, prompts you to insert a disk, previously defined in KD$, into the drive.

Listing 5, SoundPrompt.402, is a subroutine that plays a note or notes (depending upon the value in KS) to alert the user that something needs doing. Lines 40210–40225 set up the notes the first time the routine is called. Line 40245 contains the tune—in this case the first few notes of Yankee Doodle. If you change line 40425, be sure to change the 7 in line 40240 to match your final number of notes.

Using Linker

Type in and save Listings 1–5 under the filenames indicated in their initial lines. Then load and run the actual Linker program itself (Listing 1).

". . . you must declare any variables . . . at the beginning of the . . . listing, as you would in Pascal."

At the first prompt, input LINKLDR, and at the second prompt, input 3, the number of subroutines to link. Then input the filenames of the subroutines in this order:

PRESSKEY.400
INSERTDISK.401
SOUNDPROMPT.402

At the final prompt, input a filename for the combined program. It needs to be less than 16 letters long, and it can't already be used on the disk.

You'll notice that the filenames for the three subroutines contain the first three digits of their starting line numbers. These digits are referenced by a Gosub during execution.

Mini-Linker

Listing 6, Mini-Linker, is for advanced programmers who may want to keep Linker in memory as a wedge. It does no disk-error checking, and it's meant to be loaded prior to starting your program.

To set up Mini-Linker, you must append your main program to it, starting at Mini-Linker's line 100. Also, you must declare any variables in your main program at the beginning of the main program's listing, as you would in Pascal. Finally, you must declare, before line 100 of Mini-Linker, the subroutines that you want to link to your main program.

When you use a Gosub to access a new subroutine not previously linked to your program, declare the subroutine filename as one of the B$(X) array variables. Then, when you're ready to link files, go back and rearrange the B$ array numbers (the numbers in brackets) to agree with the ascending progression of line numbers for your subroutines.

Next, update the value of X in line 10 to agree with the total number of subroutines you'll be linking and input RUN 5. When that's done, enter DELETE – 99 to eliminate Mini-Linker, and you'll be able to use the Renumber command. Ⓡ

After more than 20 years working in electronics on the DEW (Distant Early Warning) line in Canada, Dale Brown now owns a fishing resort in Manitoba, where he spends the winter months playing with computers and writing.

Listing 1. Linker.

```
2Ø REM LINKER 128 - DALE S. BRO
   WN                          :REM*88
6Ø CLR:PRINTCHR$(142);         :REM*2Ø2
65 DIM B$(9)                   :REM*151
7Ø IF PEEK(215)=128 THEN BEGIN
                               :REM*98
8Ø COLOR 6,1                   :REM*138
9Ø WINDOW Ø,Ø,79,24,1          :REM*212
1ØØ PRINTTAB(2Ø)"{COMD 6}{CTRL
    9}{3 SPACEs}BASIC SUBROUTIN
    E LIBRARY LINKER           :REM*184
11Ø WINDOW Ø,1,79,24,1         :REM*4Ø
12Ø BEND:ELSE BEGIN            :REM*1Ø2
13Ø COLOR Ø,1                  :REM*14Ø
14Ø COLOR 4,1                  :REM*182
15Ø WINDOW Ø,Ø,39,24,1         :REM*12
16Ø PRINT "{CRSR RT}{COMD 6}{CT
    RL 9}{3 SPACEs}BASIC SUBROU
    TINE LIBRARY LINKER        :REM*44
17Ø WINDOW Ø,1,39,24,1         :REM*96
18Ø SCREEN=4Ø                  :REM*62
19Ø BEND                       :REM*13Ø
2ØØ PRINT"{CRSR DN}{COMD 3}{CTR
    L 9} IMPORTANT {CTRL Ø}: {C
    TRL 4}PROGRAMS MUST BE ENTE
    RED IN ORDER OF ASCENDING L
    INE NUMBERS."              :REM*1ØØ
21Ø INPUT"{2 CRSR DNs}{CTRL 6}E
    NTER FILENAME OF MAIN (LOWE
    ST NUMBERED) PROGRAM{CTRL 8
    }";B$(Ø)                   :REM*214
22Ø PRINT"{CRSR DN}{CRSR RT}{CT
    RL 4}ENTER NUMBER OF PROGRA
    M SEGMENTS TO BE LINKED WIT
    H {CTRL 8}";B$(Ø)          :REM*92
23Ø INPUT "{CTRL 4}NUMBER (1-9)
    {CTRL 8}";N$               :REM*168
24Ø IF ASC(N$)<49 OR ASC(N$)>57
     THEN 23Ø                  :REM*156
25Ø N=VAL(N$):J=1              :REM*68
26Ø DO                         :REM*181
27Ø PRINT"{CRSR DN}{CTRL 6}ENTE
    R FILENAME OF #";J;        :REM*93
28Ø IF SCREEN=4Ø THEN PRINT
                               :REM*7
29Ø INPUT"PROGRAM SEGMENT{CTRL
    8}";B$(J)                  :REM*41
3ØØ J=J+1                      :REM*51
31Ø LOOP UNTIL J>N             :REM*65
315 :                          :REM*36
32Ø INPUT"{2 CRSR DNs}{COMD 7}E
    NTER FILENAME FOR LINKED PR
    OGRAM{CTRL 8}";C$          :REM*219
33Ø J=Ø                        :REM*15
34Ø BLOAD (B$(Ø)),B1,P7168
                               :REM*251
35Ø J=1                        :REM*51
36Ø GOSUB5ØØ                  :REM*83
37Ø DO                         :REM*35
38Ø AD=((PEEK(175)*256)+PEEK(17
    4))-2                      :REM*53
39Ø BLOAD (B$(J)),B1,P(AD)
                               :REM*25
4ØØ GOSUB5ØØ                  :REM*123
41Ø J=J+1                      :REM*161
42Ø LOOP UNTIL J>N             :REM*175
43Ø DA=((PEEK(175)*256)+PEEK(17
    4))                        :REM*27
44Ø BSAVE (C$),B1,P7168 TO P(DA
    )                          :REM*163
45Ø GOSUB54Ø                  :REM*237
46Ø PRINT"{SHFT CLR}{3 CRSR DNs
    }{CTRL 4}{3 CRSR RTs}LINKED
     PROGRAM HAS BEEN SAVED UND
    ER";                       :REM*169
47Ø IF SCREEN=4Ø THEN PRINT"{CR
    SR DN}"                    :REM*247
48Ø PRINT"{CRSR RT}FILENAME: {C
```


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```
    TRL 8}";C$          :REM*121
49Ø END                 :REM*237
5ØØ IF DS<2Ø THEN RETURN:REM*91
51Ø PRINT"{SHFT CLR}ERROR LOADI
    NG: ";B$(J)         :REM*17
52Ø PRINTDS$            :REM*76
53Ø END                 :REM*22
54Ø IF DS<2Ø THEN RETURN
                        :REM*132
55Ø PRINT"{SHFT CLR}ERROR SAVIN
    G: ";C$             :REM*26
56Ø PRINTDS$            :REM*116
57Ø END                 :REM*62
```

Listing 2. LinkLDR.

```
1Ø REM LINKLDR PROGRAM  :REM*26
2Ø COLOR 6,1:WINDOW Ø,Ø,79,24,1
                        :REM*232
3Ø FOR N=Ø TO 1Ø:FOR M=2 TO 11
                        :REM*4
4Ø COLOR 5,M            :REM*222
5Ø PRINT"{CTRL 9} LINKER{2 SPAC
   Es}LOADER ";         :REM*92
6Ø NEXTM :NEXTN         :REM*56
7Ø KD$="LINKER":LN=8:GOSUB4Ø1ØØ
   :REM CALL INSERTDISK:REM*216
8Ø LN=2Ø:GOSUB 4ØØØØ:REM CALL P
   RESSKEY              :REM*152
9Ø DLOAD"LINKER":END    :REM*164
```

Listing 3. PressKey.400.

```
4ØØØØ REM * PRESSKEY.4ØØ * DEMO
      *                 :REM*122
4ØØØ5 REM LN=LINE NUMBER FOR PR
      OMPT              :REM*169
4ØØ1Ø KC=1:KS=1         :REM*5Ø
4ØØ15 WINDOW 2Ø,LN,59,LN+2,1
                        :REM*219
4ØØ2Ø IF RV$="{CTRL 9}" THEN RV
      $="{CTRL Ø}":ELSE RV$="{C
      TRL 9}"           :REM*2Ø
4ØØ25 PRINT RV$;"{HOME}{CRSR DN
      }{2 CRSR RTs}{5 SPACEs}PR
      ESS ANY KEY TO CONTINUE{5
       SPACEs}{CTRL Ø}" :REM*75
4ØØ3Ø GOSUB 4Ø2ØØ:REM SOUNDPROM
      PT.4Ø2 SUBROUTINE MUST BE
       LINKED           :REM*168
4ØØ35 KC=KC+1:IF KC=17 THEN KC=
      2                 :REM*169
4ØØ4Ø COLOR 5,KC        :REM*74
4ØØ45 GET A$            :REM*219
4ØØ5Ø IF A$="" THEN 4ØØ2Ø
                        :REM*244
4ØØ55 WINDOW Ø,Ø,79,24,1
                        :REM*141
4ØØ6Ø RETURN            :REM*82
```

Listing 4. InsertDisk.401.

```
4Ø1ØØ REM * INSERTDISK.4Ø1 * DE
      MO *              :REM*132
4Ø11Ø REM KD$=DISKNAME :REM*188
4Ø12Ø REM LN=LINE NUMBER FOR PR
      OMPT              :REM*28
4Ø13Ø WINDOW 15,LN,64,LN+2,1
                        :REM*186
4Ø14Ø K$="PLEASE PLACE {COMD 3}
      "+KD$+"{CTRL 8} DISK IN D
      RIVE"             :REM*154
4Ø15Ø K=(5Ø-LEN(K$))/2 :REM*226
4Ø16Ø PRINT"{CTRL 8}{2 CRSR DNs
      }";TAB(K);K$      :REM*122
4Ø17Ø WINDOW Ø,Ø,79,24,Ø
                        :REM*192
4Ø18Ø RETURN            :REM*2Ø2
```

Listing 5. SoundPrompt.402.

```
4Ø2ØØ REM * SOUNDPROMPT.4Ø2 * D
      EMO *             :REM*71
4Ø2Ø5 REM KS=NUMBER OF NOTES
                        :REM*252
4Ø21Ø IF KZ=Ø THEN BEGIN:REM*65
4Ø215 PLAY "V1O4T7U8H"  :REM*4Ø
4Ø22Ø KZ=1              :REM*11
4Ø225 BEND              :REM*13Ø
4Ø23Ø KJ=Ø              :REM*117
4Ø235 DO UNTIL KJ=KS    :REM*4
4Ø24Ø KN=KN+1:IF KN>7 THEN KN=1
                        :REM*19
4Ø245 PLAY MID$("FFGAFAG",KN,1)
                        :REM*166
4Ø25Ø KJ=KJ+1           :REM*7
4Ø255 LOOP              :REM*144
4Ø26Ø RETURN            :REM*27
```

Listing 6. Mini-Linker.

```
Ø GOTO 1ØØ              :REM*186
5 CLR: REM ENTER 'RUN 5' IN DIR
  ECT MODE              :REM*243
1Ø N=X:REM X = NUMBER OF SUBROU
   TINES TO LINK        :REM*16Ø
15 DIM B$(N)            :REM*171
2Ø B$(Ø)="MAIN PROGRAM FILENAME
   "                    :REM*252
25 B$(1)="FIRST SUBROUTINE FILE
   NAME"                :REM*75
3Ø B$(2)="SECOND SUBROUTINE FIL
   ENAME"               :REM*166
35 B$(3)="THIRD SUBROUTINE FILE
   NAME"                :REM*83
4Ø B$(4)="FOURTH SUBROUTINE FIL
   ENAME"               :REM*128
45 REM CONTINUE UNTIL 'N' IN LI
   NE 1Ø IS REACHED     :REM*93
5Ø C$="FILENAME FOR LINKED PROG
   RAM"                 :REM*1Ø8
55 J=Ø:BLOAD (B$(Ø)),B1,P7168:J
   =1                   :REM*2Ø7
6Ø DO                   :REM*236
65 AD=((PEEK(175)*256)+PEEK(174
   ))-2                 :REM*249
7Ø BLOAD (B$(J)),B1,P(AD)
                        :REM*216
75 J=J+1                :REM*81
8Ø LOOP UNTIL J>N       :REM*9Ø
85 DA=((PEEK(175)*256)+PEEK(174
   ))                   :REM*193
9Ø BSAVE (C$),B1,P7168 TO P(DA)
                        :REM*68
95 END                  :REM*97
1ØØ REM MAIN PROGRAM STARTS HER
   E                    :REM*15Ø■
```


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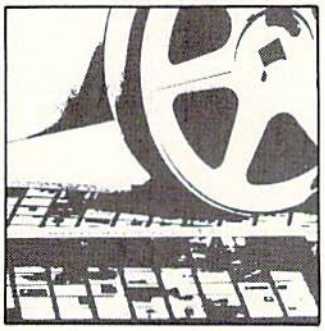

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Input Sentry

Safeguard your programs against potentially disastrous input errors.

by ROBERT L. SENFT

Has your computer ever locked up while you were entering data into a spreadsheet or other number-crunching program? The chances are good that it has, especially if your software contains Basic's Input statement.

It's discouraging to get an error message after you've entered large quantities of data. And it's tedious to fix data-entry errors after you've already pressed the return key. Fortunately, these and many other data-entry problems are preventable. *Un*fortunately, numerous input routines, commercial and otherwise, don't do the job very well.

Recently, a brand name financial software package was observed to halt execution when input values were not to its liking. Each time this happened, the poor user had to turn off the computer, reload the program and start from scratch. Worse yet, he was given no clue as to what sort of error was committed. Not exactly what you would call user-friendly. There's a crying need for reliable, error-tolerant and user-considerate data-entry routines.

Many articles have addressed the Input statement's well-publicized limitations, which include the forbidden characters (commas, colons and quotation marks) as well as the sometimes cryptic error messages that can ruin the input screen format. Another nuisance is the unrestricted use of the cursor-control keys, which can lead to data errors or screen-scrolling problems.

Some, if not all, of these limitations have been solved, but many more remain. For instance, there may be times when you would like to limit maximum or minimum input values or to prevent a zero entry that might produce a "division-by-zero" error.

It would also be desirable to catch the accidental entry of alphabetic characters in numeric fields. Of even greater value would be the ability to easily identify and correct errors without leaving the data-field area. It is usually much easier to fix data problems at entry time than later, when the output is all fouled up.

At this point you may ask, "How can the Input statement, or any of its substitutes, possibly do all this?" It can't. But don't despair—here at last is Super Input, the bullet-proof utility that can and *does* do it all.

What It Offers

Super Input is a data-validation subroutine that solves all the problems ►

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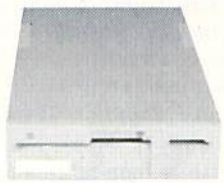

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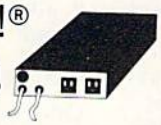

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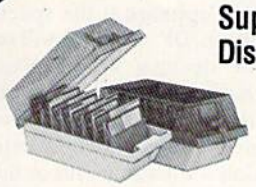

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mentioned above and provides many additional features, as follows.

- Decimal justification in numeric fields.
- Controlled field length and field positioning.
- Field area underlining, if desired.
- Audiovisual alert of improper entries.
- Error message and correction on bottom line of screen.
- Cursor on-off control.
- Crash-proof input sequence.

Here's how it works. First, nine control variables that define the data-input parameters are passed to Super Input. You must assign appropriate values to these variables prior to accessing the subroutine for the first time. You can do this on a variable-by-variable basis or with a Gosub 70, which sets them all to default values. (The values in line 70 were chosen to work with the demo program, lines 0–9 in Listing 1, and can be changed to suit your specific needs.) See Table 1 for the list of control variables and their functions.

Super Input was designed to be easily merged with any Basic program. All internal variable names consist of two alphabetic characters that begin with the letter *X*. Be careful not to use the field-control variables outside the subroutine.

The demo program (lines 0–9 in Listing 1) illustrates some of the possible entry formats. All data is printed to the screen at the end of the input sequence, or whenever the CTRL and left-arrow keys are pressed.

The last four Pokes in line 0 disable the run-stop key and should be omitted until the entire listing is entered, debugged and saved. Otherwise, after attempting a run, you may inadvertently lose the whole program. These Pokes make Super Input crash-proof and must be included in your main program if you want to retain this feature. Also, don't forget to delete the demo lines when merging Super Input with your own software.

Pointers To Heed

When using Super Input in conjunction with any of your programs, keep the following points in mind.

1. Make sure you initially assign acceptable values to the appropriate control variables. If you omit this step, all variables will be equal to 0, which is unacceptable for DP, FL and FP.

Also, since some control variables are interdependent, restrictions are placed on certain combinations. These restrictions, plus acceptable ranges for all control variables, are stated in Table 1. A Gosub 70 in your Basic program, prior to accessing Super Input, will assign acceptable default values to all variables.

2. Make sure your data field does not attempt to wrap around to the next screen row. An example of this would be a field position, FP, of 20 and a field length, FL, of 30. Hence, the (FP + FL)<40 restriction.

3. Whenever you print an input prompt message, Super Input will attempt to place the data field on the same screen line, at whatever column your FP or DP assignments dictate. Make sure these control variables are sufficiently large to prevent the data from overwriting your prompt.

When your data field is too long to fit on the same line with the prompt, insert one or more blank Print statements, before the Super Input Gosub statement, to move the data field down a corresponding number of lines.

4. All control variables retain their current values until new ones are assigned. It is therefore unnecessary to reassign values each time you access Super Input, as long as the data items are similar. Change these variables only when the nature of the expected input requires it.

5. Super Input will accept an open quote in a string data field. However, if you later attempt to print this field from your Basic program, it's possible to run into some problems. Insert a POKE 212,0 immediately after your Print statement to terminate the Quote mode and prevent the printing of garbage following the data field.

Listing 2, a home inventory Basic program format example, illustrates how to integrate Super Input into your program. If you wish to try this, proceed as follows:

1. Load Listing 1, Super Input, as listed.
2. Delete lines 0–9.
3. Add Listing 2 to Listing 1 and save to tape or disk.
4. Run combined Listing 1/Listing 2 program.

Using Super Input

Once you've loaded and run Listing 1, print your Input prompt message and enter GOSUB 10 (for string inputs) or GOSUB 11 (for numeric inputs). When entering strings, the cursor will appear at the specified column position, FP, on the same row with your prompt message. The field underline, if on, will extend right from the cursor by an amount equal to FL.

The numeric input is similar, except that the cursor appears at the specified decimal position, DP. All digits will scroll left until the decimal key is pressed. However, characters that would otherwise force the entry to extend beyond the underlined area will not be accepted. One exception is a leading plus or minus sign, which can extend one column left of the normal field area. This accommodation prevents sign prefixes from occupying a normally available digit position.

As you input information, each character is checked for proper type and, if correct, accumulated in a string variable. The entry is terminated with the return key. In the event of an input type or parameter error, you'll be notified visually (border flashes red) and audibly (short beep). A message describing the error and needed corrective action is displayed, after which the cursor returns

TABLE 1. Control variables and their functions.

Variable	Function	Range	Data Type
CU	Cursor switch (1 = on, 0 = off)	0 or 1	all
DD	Maximum number of decimal digits permitted	0–36	numeric
DP	Decimal position (column number)	2–38	numeric
FL	Field length (maximum number of characters)	1–37	string
FP	Field position (start column number)	2–38	string
HI	High input value limit	*	numeric
LO	Low input value limit	*	numeric
NZ	Zero input allowed (0 = yes, 1 = no)	0 or 1	numeric
UL	Underline data field (1 = yes, 0 = no)	0 or 1	all

Restrictions: (FP + FL)<40 and (DP + DD)<39
DP> (number of HI or LO significant digits) + 1
*HI and LO limit range is −999999999 to +999999999 and HI>LO

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to its last occupied field position and awaits your response. Also, the return key is temporarily disabled to prevent the accidental entry of incorrect data.

At this or any other point during data entry, you can edit with either the insert/delete key, which functions as a backspace, deleting characters as it moves left, or the left-arrow key, which erases the entire field. Either one of these two editing actions reenables the return key, which permits entry of corrected data.

In the event that Super Input excluded the error-causing keystroke, but you wish to enter the data "as is," press the return key twice, and—assuming no further errors—your entry will be executed. Note that under no circumstances can you move the cursor outside the designated field area. The normal cursor keys are inoperative.

Upon return from Super Input, the variable I$ contains a string representation of your data. If the input was numeric, variable IV contains the floating-point value. At this time, it's up to you to determine where and how to store the data. This detail must be taken care of, as both I$ and IV will have new values when the next data item is entered.

Note that each data item is limited to one screen line (a maximum of 37 characters). Normally, this is more than adequate for most database applications. Graphics characters will not be accepted at any time, and only numbers or leading plus or minus signs will be permitted in numeric fields. In instances when your input value cannot be 0, set NZ equal to 1.

You can set the range of input values by assigning the desired high limit to variable HI and the low limit to variable LO. The left-of-decimal field length is automatically set to accommodate the larger of the absolute values of the HI or LO limits. The remaining control variable functions should be relatively self-evident from Table 1.

To escape the data entry sequence, press the control and left-arrow keys together; this sets internal variable XA equal to 6 and returns you to your main program. You may then branch to wherever you desire with an "IF XA = 6 THEN whatever" statement following a Gosub to the Super Input routine. If this check is omitted, then the control and left-arrow combination simply imitates the return key.

Super Input eliminates the normally time-consuming and error-prone aspects of data entry. Take advantage of it. R

LISTING 1. Super Input program.

```
Ø POKE5328Ø,Ø:POKE53281,Ø:POKE7
  49,165:POKE75Ø,145:POKE751,96
  :POKE8Ø9,2              :REM*3Ø
1 PRINT"{SHFT CLR}{CTRL 8}{CTRL
   9} EXIT = CTRL + {LEFT ARROW
  } ":PRINT:PRINTTAB(12)"DATA E
  NTRY DEMO":I=Ø:GOSUB7Ø:REM*75
2 PRINT:PRINT"ENTER YOUR NAME":
  X=1:GOSUB7:X=2:         :REM*116
3 R=RND(1)*9:HI=INT(4{UP ARROW}
  R):LO=HI-5ØØØØ:PRINT:PRINT"E
  NTER "LO"< # <"HI:GOSUB7
                          :REM*5
4 GOSUB7Ø:PRINT:PRINT"ENTER NON
  -ZERO QUANTITY":NZ=1:GOSUB7
                          :REM*6Ø
5 PRINT:PRINT"NO ENTRY FIELD UN
  DERLINE":NZ=Ø:UL=Ø:GOSUB7:UL=
  1:PRINT:FORJ=1TO2       :REM*99
6 PRINT"ENTER 3 #'S":FORK=ØTO2:
  DP=18+9*K:GOSUB7:NEXTK,J:GOTO
  8                       :REM*22Ø
7 ONXGOSUB1Ø,11:IA$(I)=I$:ON-(X
  A=6)GOTO8:I=I+1:RETURN:REM*89
8 PRINT:PRINT"{CTRL 4}********
  EXIT DATA ENTRY MODE ********
  "                       :REM*7Ø
9 PRINT:FORJ=ØTO4:PRINTIA$(J);:
  POKE212,Ø:PRINTTAB(2Ø)IA$(J+5
  ):NEXT:END              :REM*135
1Ø XP=FP:XD=FL-1:XV=Ø:XX=1:XZ=1
  :GOTO13                 :REM*26
11 XX=Ø:XZ=Ø:XN=HI:IFABS(HI)<AB
  S(LO)THENXN=LO          :REM*85
12 XV=LEN(STR$(INT(XN)))-1:XP=D
  P:XD=DD:IFABS(XN)<1THENXV=Ø
                          :REM*96
13 XS=1:XL=Ø:XY=Ø:I$="":IFXH=ØT
  HENGOSUB6Ø              :REM*129
14 IFUL=1THENPRINTTAB(XP-XV-1);
  :FORXN=ØTOXV+XD:PRINT"{COMD
  T}";:NEXT               :REM*25Ø
15 PRINT"{2 CRSR UPs}":PRINTTAB
  (XP-XL-1)I$;:POKE212,Ø
                          :REM*127
16 FORXN=1TO3Ø:GETXG$:IFXG$<>""
  THENPRINT" {CRSR LF}";:GOTO2
  1                       :REM*122
18 IFXN<16THENPRINTXC$(CU);:NEX
  T                       :REM*122
2Ø PRINT" {CRSR LF}";:NEXT:GOTO
  16                      :REM*182
21 XA=ASC(XG$):ON-(XA<32ORXA>94
  )GOTO33:IFXZ=1THEN26:REM*253
22 ON-(XA>47ANDXA<58)GOTO26:IFX
  A=46THENXN=8:ON-(XX=1)GOTO5Ø
  :XX=1:GOTO26            :REM*236
23 IFXA<>45ANDXA<>43THENXN=4:GO
  TO5Ø                    :REM*19
24 IFI$=""THENXS=Ø:GOTO26
                          :REM*252
25 XN=6:GOTO5Ø            :REM*199
26 IFLEN(I$)>XV-XSANDXX=ØTHENXN
  =2:GOTO5Ø               :REM*72
28 IFXX=ØTHENXL=XL+1:GOTO31
                          :REM*124
3Ø XY=XY+1:IFXY>XD+1THENXY=XY-1
  :XN=1+XZ:GOTO5Ø         :REM*16
31 IFXO=2THENXO=1          :REM*3
32 I$=I$+XG$:PRINT:GOTO15
                          :REM*12Ø
33 ON-(XA=13)-2*(XA=6)-3*(XA=2Ø
  )-4*(XA=95)GOTO34,34,42,55:X
  N=4-XZ:GOTO5Ø           :REM*87
34 ON-(XZ=1)GOTO37:IV=VAL(I$):I
  FNZ=1ANDIV=ØTHENXN=5:GOTO5Ø
                          :REM*3Ø
35 XN=7:ON-(IV>HI)-2*(IV<LO)GOT
  O58,59                  :REM*25
37 IFXO=1THENXN=Ø:GOTO52
                          :REM*253
38 IFXO=2THENXO=1:GOTO16:REM*72
39 IFUL=1THENPRINT:PRINTXM$(Ø)"
  {2 CRSR UPs}"           :REM*75
4Ø PRINT:RETURN           :REM*72
42 XO=1:IFLEN(I$)<1THEN16
                          :REM*2Ø6
44 IFXX=1THENPRINT"{CRSR LF} {C
  RSR LF}":GOTO46         :REM*126
45 PRINT"{CRSR UP}":PRINTTAB(XP
  -XV-2):FORXN=ØTOXV+XD+1:PRIN
  T" ";:NEXT:PRINT:XL=XL-1
                          :REM*1Ø3
46 IFRIGHT$(I$,1)="."ANDXZ=ØTHE
  NXX=Ø:XY=XY-1           :REM*66
47 IFI$="+"ORI$="-"THENXS=1
                          :REM*71
48 I$=LEFT$(I$,LEN(I$)-1):ON-(X
  X=Ø)GOTO15:XY=XY-1:GOTO15
                          :REM*156
5Ø POKE54277,7:POKE54276,17:POK
  E54273,8Ø:POKE54272,97:XB=PE
  EK(5328Ø)               :REM*46
51 POKE5328Ø,1Ø:FORXI=1TO15Ø:NE
  XT:POKE54276,Ø:POKE5328Ø,XB:
  XQ=PEEK(211)            :REM*255
52 XM=PEEK(214):XJ=PEEK(646):FO
  RXI=XMTO23:PRINT:NEXT:PRINT"
  {CTRL 9}{COMD 3}"XM$(XN);:XO
  =2                      :REM*126
53 POKE646,XJ:FORXI=XMTO23:PRIN
  T"{2 CRSR UPs}":NEXT:IFXN=ØT
  HENXO=Ø:GOTO39          :REM*13
54 PRINTTAB(XQ):GOTO16    :REM*15Ø
55 XO=1:XL=Ø:XS=1:XX=Ø:XY=Ø:I$=
  "":PRINT"{CRSR UP}":PRINTTAB
  (XP-XV-2);:IFXZ=1THENXX=1
                          :REM*157
56 FORXN=ØTOXV+XD+1:PRINT" ";:N
  EXT:PRINT"{CRSR UP}":PRINTTA
  B(XP-XL-1);:GOTO16      :REM*8Ø
58 XM$(7)=LEFT$("{5 SPACEs}ENTE
  R VALUE < OR ="+STR$(HI)+"{1
  Ø SPACEs}",39):GOTO5Ø:REM*26
59 XM$(7)=LEFT$("{3 SPACEs}ENTE
  R VALUE > OR ={2 SPACEs}"+ST
  R$(LO)+"{9 SPACEs}",39):GOTO
  5Ø                      :REM*255
6Ø XM$(Ø)="{CTRL Ø}{39 SPACEs}"
```

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```
   :POKE54296,15          :REM*134
61 XM$(1)="{3 SPACEs}TOO MANY D
   ECIMAL DIGITS ATTEMPTED.{2 S
   PACEs}":XC$(Ø)=" {CRSR LF}":
   XC$(1)="{CTRL 9} {CTRL Ø}{CR
   SR LF}"                :REM*9
62 XM$(2)=" LAST KEY ENTRY EXCE
   EDED FIELD LENGTH{2 SPACEs}"
                          :REM*2
63 XM$(3)="{2 SPACEs}ENTER ALPH
   ANUMERIC CHARACTERS ONLY.{2
   SPACEs}"               :REM*77
64 XM$(4)=" ENTER NUMBERS OR LE
   ADING +/-SIGN ONLY ":REM*12Ø
65 XM$(5)="{4 SPACEs}PLEASE ENT
   ER NON-ZERO QUANTITY.{4 SPAC
   Es}"                   :REM*113
66 XM$(6)="{2 SPACEs}IMBEDDED +
    OR - SIGN NOT PERMITTED.{2
   SPACEs}"               :REM*242
68 XM$(8)="{2 SPACEs}EXTRA DECI
   MAL POINT ENTRY ATTEMPTED{2
   SPACEs}":XH=1:RETURN :REM*78
7Ø CU=1:DD=2:DP=36:FL=16:FP=23:
   HI=9ØØ:LO=-9ØØ:NZ=Ø:UL=1:RET
   URN                    :REM*116
```

LISTING 2. Home inventory Basic program format example.

```
1 GOTO1ØØ                 :REM*187
1Ø XP=FP:XD=FL-1:XV=Ø:XX=1:XZ=1
   :GOTO13                :REM*26
11 XX=Ø:XZ=Ø:XN=HI:IFABS(HI)<AB
   S(LO)THENXN=LO         :REM*85
12 XV=LEN(STR$(INT(XN)))-1:XP=D
   P:XD=DD:IFABS(XN)<1THENXV=Ø
                          :REM*96
13 XS=1:XL=Ø:XY=Ø:I$="":IFXH=ØT
   HENGOSUB6Ø             :REM*129
14 IFUL=1THENPRINTTAB(XP-XV-1);
   :FORXN=ØTOXV+XD:PRINT"{COMD
   T}";:NEXT              :REM*25Ø
15 PRINT"{2 CRSR UPs}":PRINTTAB
   (XP-XL-1)I$;:POKE212,Ø
                          :REM*127
16 FORXN=1TO3Ø:GETXG$:IFXG$<>""
   THENPRINT" {CRSR LF}";:GOTO2
   1                      :REM*122
18 IFXN<16THENPRINTXC$(CU);:NEX
   T                      :REM*122
2Ø PRINT" {CRSR LF}";:NEXT:GOTO
   16                     :REM*182
21 XA=ASC(XG$):ON-(XA<32ORXA>94
   )GOTO33:IFXZ=1THEN26:REM*253
22 ON-(XA>47ANDXA<58)GOTO26:IFX
   A=46THENXN=8:ON-(XX=1)GOTO5Ø
   :XX=1:GOTO26           :REM*236
23 IFXA<>45ANDXA<>43THENXN=4:GO
   TO5Ø                   :REM*19
24 IFI$=""THENXS=Ø:GOTO26
                          :REM*252
25 XN=6:GOTO5Ø            :REM*199
26 IFLEN(I$)>XV-XSANDXX=ØTHENXN
   =2:GOTO5Ø              :REM*72
28 IFXX=ØTHENXL=XL+1:GOTO31
                          :REM*124
3Ø XY=XY+1:IFXY>XD+1THENXY=XY-1
   :XN=1+XZ:GOTO5Ø        :REM*16
31 IFXO=2THENXO=1          :REM*3
32 I$=I$+XG$:PRINT:GOTO15
                          :REM*12Ø
33 ON-(XA=13)-2*(XA=6)-3*(XA=2Ø
   )-4*(XA=95)GOTO34,34,42,55:X
   N=4-XZ:GOTO5Ø          :REM*87
34 ON-(XZ=1)GOTO37:IV=VAL(I$):I
   FNZ=1ANDIV=ØTHENXN=5:GOTO5Ø
                          :REM*3Ø
35 XN=7:ON-(IV>HI)-2*(IV<LO)GOT
   O58,59                 :REM*25
37 IFXO=1THENXN=Ø:GOTO52
                          :REM*253
38 IFXO=2THENXO=1:GOTO16:REM*72
39 IFUL=1THENPRINT:PRINTXM$(Ø)"
   {2 CRSR UPs}"          :REM*75
4Ø PRINT:RETURN           :REM*72
42 XO=1:IFLEN(I$)<1THEN16
                          :REM*2Ø6
44 IFXX=1THENPRINT"{CRSR LF} {C
   RSR LF}":GOTO46        :REM*126
45 PRINT"{CRSR UP}":PRINTTAB(XP
   -XV-2):FORXN=ØTOXV+XD+1:PRIN
   T" ";:NEXT:PRINT:XL=XL-1
                          :REM*1Ø3
46 IFRIGHT$(I$,1)="."ANDXZ=ØTHE
   NXX=Ø:XY=XY-1          :REM*66
47 IFI$="+"ORI$="-"THENXS=1
                          :REM*71
48 I$=LEFT$(I$,LEN(I$)-1):ON-(X
   X=Ø)GOTO15:XY=XY-1:GOTO15
                          :REM*156
5Ø POKE54277,7:POKE54276,17:POK
   E54273,8Ø:POKE54272,97:XB=PE
   EK(5328Ø)              :REM*46
51 POKE5328Ø,1Ø:FORXI=1TO15Ø:NE
   XT:POKE54276,Ø:POKE5328Ø,XB:
   XQ=PEEK(211)           :REM*255
52 XM=PEEK(214):XJ=PEEK(646):FO
   RXI=XMTO23:PRINT:NEXT:PRINT"
   {CTRL 9}{COMD 3}"XM$(XN);:XO
   =2                     :REM*126
53 POKE646,XJ:FORXI=XMTO23:PRIN
   T"{2 CRSR UPs}":NEXT:IFXN=ØT
   HENXO=Ø:GOTO39         :REM*13
54 PRINTTAB(XQ):GOTO16    :REM*15Ø
55 XO=1:XL=Ø:XS=1:XX=Ø:XY=Ø:I$=
   "":PRINT"{CRSR UP}":PRINTTAB
   (XP-XV-2);:IFXZ=1THENXX=1
                          :REM*157
56 FORXN=ØTOXV+XD+1:PRINT" ";:N
   EXT:PRINT"{CRSR UP}":PRINTTA
   B(XP-XL-1);:GOTO16     :REM*8Ø
58 XM$(7)=LEFT$("{5 SPACEs}ENTE
   R VALUE LESS THAN "+STR$(HI)
   +"{1Ø SPACEs}",39):GOTO5Ø
                          :REM*1Ø8
59 XM$(7)=LEFT$("{3 SPACEs}ENTE
   R VALUE GREATER THAN "+STR$(
   LO)+"{9 SPACEs}",39):GOTO5Ø
                          :REM*85
6Ø XM$(Ø)="{CTRL Ø}{39 SPACEs}"
   :POKE54296,15          :REM*134
61 XM$(1)="{3 SPACEs}TOO MANY D
   ECIMAL DIGITS ATTEMPTED.{2 S
   PACEs}":XC$(Ø)=" {CRSR LF}":
   XC$(1)="{CTRL 9} {CTRL Ø}{CR
   SR LF}"                :REM*9
62 XM$(2)=" LAST KEY ENTRY EXCE
   EDED FIELD LENGTH{2 SPACEs}"
                          :REM*2
63 XM$(3)="{2 SPACEs}ENTER ALPH
   ANUMERIC CHARACTERS ONLY.{2
   SPACEs}"               :REM*77
64 XM$(4)=" ENTER NUMBERS OR LE
   ADING +/-SIGN ONLY ":REM*12Ø
65 XM$(5)="{4 SPACEs}PLEASE ENT
   ER NON-ZERO QUANTITY.{4 SPAC
   Es}"                   :REM*113
66 XM$(6)="{2 SPACEs}IMBEDDED +
    OR - SIGN NOT PERMITTED.{2
   SPACEs}"               :REM*242
68 XM$(8)="{2 SPACEs}EXTRA DECI
   MAL POINT ENTRY ATTEMPTED{2
   SPACEs}":XH=1:RETURN :REM*78
7Ø CU=Ø:DD=3:DP=35:FL=1Ø:FP=25:
   HI=1ØØ:LO=Ø:NZ=1:UL=1:RETURN
                          :REM*14
1ØØ POKE749,165:POKE75Ø,145:POK
   E751,96:POKE8Ø9,2      :REM*148
11Ø POKE5328Ø,Ø:POKE53281,Ø:GOS
   UB7Ø                   :REM*142
12Ø N=N+1:PRINTCHR$(147)"{CTRL
   8}HOME INVENTORY RECORD - -
    - ITEM #"N            :REM*214
125 PRINT"{36 COMD Ts}":REM*127
13Ø PRINT"ITEM CATEGORY =":FP=1
   8:FL=1Ø:GOSUB1Ø:IN$(N,1)=I$
                          :REM*166
14Ø PRINT"{CRSR DN}ITEM NAME{5
   SPACEs}=":FL=21:GOSUB1Ø:IN$
   (N,2)=I$               :REM*52
145 PRINT"{CRSR DN}DESCRIPTION{
   3 SPACEs}={2 SPACEs}{COMD *
   }{SHFT LB.}":PRINT"{CRSR DN
   }":FL=37:FP=2:GOSUB1Ø:IN$(N
   ,3)=I$                 :REM*1Ø5
15Ø PRINT"{CRSR DN}LOCATION{6 S
   PACEs}=":FP=18:FL=15:GOSUB1
   Ø:IN$(N,4)=I$          :REM*174
16Ø PRINT"{CRSR DN}QUANTITY{6 S
   PACEs}=":DP=24:DD=Ø:NZ=1:LO
   =Ø:HI=1ØØØ:GOSUB11:IN$(N,5)
   =I$:QT=IV              :REM*1Ø
17Ø PRINT"{CRSR DN}UNIT COST{5
   SPACEs}=":DD=2:NZ=Ø:HI=1ØØØ
   Ø:GOSUB11:IN$(N,6)=I$:CO=I
   V                      :REM*148
18Ø PRINT"{CRSR DN}DATE ACQUIRE
   D{2 SPACEs}=":FL=8:GOSUB1Ø:
   IN$(N,7)=I$            :REM*32
19Ø PRINT"{2 CRSR DNs}TOTAL VAL
   UE THIS ITEM = $"QT*CO
                          :REM*6
2ØØ PRINT"{3 CRSR DNs}MORE ITEM
   S TO ENTER?{2 SPACEs}(Y OR
   N)"                    :REM*9Ø
21Ø GETA$:IFA$=""THEN21Ø
                          :REM*182
22Ø IFA$="Y"THEN12Ø       :REM*172
23Ø IFA$<>"N"THEN21Ø      :REM*48
24Ø PRINTCHR$(147):FORJ=1TON:FO
   RK=1TO7:PRINTIN$(J,K):POKE2
   12,Ø:NEXT:PRINT:NEXT:REM*16
```

■

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EASY APPLICATIONS

FLASH CARDS: If your child is learning arithmetic, or you're a bit rusty yourself, use this program for review.

by BARBARA SCHULAK

During summer vacation, reviewing school subjects with your children can be a good idea, but you'll want to make it fun. Flash Cards is a program I wrote that fits the bill by turning arithmetic review into a game. You'll find it useful not only for vacation-time review, but to reinforce your child's learning throughout the year. Perhaps you'd enjoy practicing on it, too, if your calculator has erased the multiplication tables from your memory.

Flash Cards provides flash card-type practice on the computer, eliminating the need to buy or make sets of paper cards. The program is designed for interactive use between a child and parent, but youngsters can use it alone to a certain extent. A joystick plugged into port 2 is required for operation.

Type in Listing 1 and save it to disk. Then run the program. First it will ask for the type of problem your child wants to practice: addition, subtraction, multiplication, division or an assortment of all four.

Then you must select the range, 0–9, of numbers to be used. For example, if you choose 0 as the lower limit and 5 as the upper limit after selecting multiplication, you'll get problems with a multiplier in the range 0–5 and a multiplicand (the number being multiplied) in the range 0–9. If you specify the same number for both the lower and upper limits, your child can practice just one multiplication table, such as 5 times 0 through 9. This flexibility in choosing numbers makes Flash Cards appropriate for children at all levels.

Your final choice is how long the program should run. You can select any length of time from one to nine minutes, depending on your child's attention span.

After you've responded to all the options, Flash Cards will begin displaying problems in large numerals on the screen. When your child gives a correct answer, push the joystick fire-button to advance to the next problem. If the child doesn't know the answer to a problem, push the joystick in the up direction to display the answer. Then, push the fire-button to move to the next problem.

Continue this process until time runs out. At the end of the program, the time elapsed and number of problems answered correctly are displayed. Press Y to play again. ►

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I deliberated long and hard on whether to make Flash Cards respond to keyboard replies or to require a person-to-person verbal response. I finally settled on the verbal response, even though the computer can't check the correctness of the answers, because I felt typing might slow a child down in a speed drill. Also, verbal responses get parents involved in the learning experience.

My children have enjoyed Flash Cards, and their math skills have improved rapidly. I hope you and your youngsters enjoy it, too. R

Barbara H. Schulak, a programmer who's published a number of articles, is also the mother of two school children.

LISTING 1. Flash Cards program.

```
10 X=RND(-TI):S=54272:NP=0:DIMA$(9,5)                    :REM*66
20 W$="FLASH CARDS"                                      :REM*114
30 POKE53281,0:PRINT"{SHFT CLR}{CTRL 8}"                 :REM*212
40 FORI=0TO24:POKES+I,0:NEXT                             :REM*198
50 FORI=1TO11:PRINT"{HOME}{10 CRSR DNs}"SPC(14)LEFT$(W$,I):POKE53280,I:GOSUB1330:NEXT
                                                         :REM*146
60 FORI=0TO9:FORJ=1TO5                                   :REM*120
70 READA$(I,J)                                           :REM*186
80 NEXT:NEXT                                             :REM*84
90 PRINT"{SHFT CLR}{CTRL 9}{COMD 1}{14 SPACEs}FLASH CARDS{15 SPACEs}"
                                                         :REM*184
100 PRINT"{3 CRSR DNs}{CTRL 2}"SPC(5)"[1] ADDITION       :REM*40
110 PRINTSPC(5)"[2] SUBTRACTION                          :REM*192
120 PRINTSPC(5)"[3] MULTIPLICATION                       :REM*68
130 PRINTSPC(5)"[4] DIVISION                             :REM*218
140 PRINTSPC(5)"[5] MIXED                                :REM*198
150 GETK$:IFK$=""THEN150                                 :REM*178
160 T1=VAL(K$):IFT1<1ORT1>5THEN90                        :REM*18
170 T2=T1:IFT1=5THENT2=1                                 :REM*200
180 :                                                    :REM*156
190 PRINT"{SHFT CLR}{CTRL 9}{COMD 6}{13 SPACEs}FLASH CARDS{16 SPACEs}"
                                                         :REM*38
200 PRINT"{3 CRSR DNs}{CTRL 2}{2 SPACEs}LOWER LIMIT OF PROBLEMS (0-9):";   :REM*130
210 GETK$:IFK$=""THEN210:REM*12
220 R1=VAL(K$):IFR1<0ORR1>9THEN200                       :REM*80
230 PRINTK$                                              :REM*232
240 PRINT"{3 CRSR DNs}{CTRL 2}{2 SPACEs}UPPER LIMIT OF PROBLEMS (0-9):";   :REM*102
250 GETK$:IFK$=""THEN250:REM*54
260 R2=VAL(K$):IFR2<0ORR>9THEN240                        :REM*105
270 PRINTK$                                              :REM*17
280 IFR1>R2THEN190                                       :REM*65
290 R2=R2+1                                              :REM*137
300 IFT1=4ORT1=5ANDR1=0ANDR2=1THEN1460                   :REM*129
310 :                                                    :REM*31
320 PRINT"{SHFT CLR}{CTRL 9}{COMD 7}{13 SPACEs}FLASH CARDS{16 SPACEs}"
                                                         :REM*233
330 PRINT"{3 CRSR DNs}{CTRL 2}"SPC(5)"PLAYING TIME (1-9 MIN): "   :REM*9
340 GETK$:IFK$=""THEN340                                 :REM*113
350 TM=VAL(K$):IFTM<1ORTM>9THEN320                       :REM*151
360 TM=TM*100                                            :REM*215
370 PRINT"{SHFT CLR}{CTRL 9}{CTRL 5}{13 SPACEs}FLASH CARDS{16 SPACEs}"
                                                         :REM*157
380 PRINT"{5 CRSR DNs}{CTRL 2}"SPC(3)"PRESS {CTRL 9}FIRE{CTRL 0} TO MOVE TO NEXT PROBLEM   :REM*45
390 PRINTSPC(3)"{CRSR DN}MOVE JOYTICK {CTRL 9}UP{CTRL 0} FOR ANSWER   :REM*139
400 FORT=1TO2000:NEXT                                    :REM*25
410 :                                                    :REM*131
420 TI$="000000"                                         :REM*147
430 ONT1GOSUB1070,1120,1180,1230,1290                    :REM*139
440 ONT2GOSUB620,740,870,990                             :REM*147
450 FB=PEEK(56320)AND16:FR=15-(PEEK(56320)AND15)         :REM*45
460 IFFR=1THENGOSUB1390                                  :REM*83
470 IFVAL(TI$)>TMTHEN540:REM*51
480 IFFB<>0THEN450                                       :REM*197
490 NP=NP+1:GOSUB1330                                    :REM*19
500 IFFLTHENNP=NP-1                                      :REM*203
510 FL=0                                                 :REM*173
520 IFVAL(TI$)<TMTHEN430                                 :REM*8
530 :                                                    :REM*252
540 PRINT"{SHFT CLR}{CTRL 9}{CTRL 5}{14 SPACEs}FLASH CARDS{15 SPACEs}"
                                                         :REM*68
550 PRINT"{2 CRSR DNs}{CTRL 2}"SPC(11)"TIME:"TM/100"{CRSR LF}:00 MIN"   :REM*150
560 PRINTSPC(5)"# PROBLEMS:{2 SPACEs}"NP                 :REM*214
570 PRINTSPC(5)"{2 CRSR DNs}PLAY AGAIN [Y/N]             :REM*34
580 GETK$:IFK$=""THEN580                                 :REM*162
590 IFK$="Y"THENRUN                                      :REM*64
600 SYS2048:END                                          :REM*156
610 :                                                    :REM*76
620 PRINT"{SHFT CLR}{CTRL 9}{COMD 7}{9 SPACEs}FLASH CARDS: ADDITION{10 SPACEs}{2 CRSR DNs}{CTRL 3}"   :REM*194
630 FORI=1TO5:PRINTSPC(18)A$(X,I):NEXT                   :REM*200
640 PRINT:PRINT                                          :REM*84
650 PRINTSPC(18)A$(Y,1):REM*164
660 PRINTSPC(18)A$(Y,2):REM*190
670 PRINTSPC(13)"{CTRL 9}{CTRL 2} {CTRL 3}{CTRL 0}";SPC(4);A$(Y,3)   :REM*212
680 PRINTSPC(12)"{CTRL 9}{CTRL 2}{3 SPACEs}{CTRL 3}{CTRL 0}";SPC(3);A$(Y,4)   :REM*60
690 PRINTSPC(13)"{CTRL 9}{CTRL 2} {CTRL 3}{CTRL 0}";SPC(4);A$(Y,5)   :REM*234
700 PRINT                                                :REM*36
710 PRINTSPC(12)"{CTRL 9}{CTRL 2}{11 SPACEs}"            :REM*254
720 RETURN                                               :REM*12
730 :                                                    :REM*196
740 PRINT"{SHFT CLR}{CTRL 9}{COMD 6}{8 SPACEs}FLASH CARDS: SUBTRACTION{8 SPACEs}{2 CRSR DNs}{CTRL 3}"   :REM*4
750 IFL=1THENFORI=1TO5:PRINTSPC(18)A$(Z,I):NEXT          :REM*72
760 IFL=2THENFORI=1TO5:PRINTSPC(11)A$(Z1,I)SPC(2)"{CTRL 0}"A$(Z2,I):NEXT   :REM*188
770 PRINT:PRINT                                          :REM*215
780 PRINTSPC(18)A$(Y,1) :REM*39
790 PRINTSPC(18)A$(Y,2) :REM*65
800 PRINTSPC(18)A$(Y,3) :REM*91
810 PRINTSPC(11)"{CTRL 9}{CTRL 2}{3 SPACEs}{CTRL 3}{CTRL 0}";SPC(4);A$(Y,4)   :REM*163
820 PRINTSPC(18)A$(Y,5):REM*143
830 PRINT                                                :REM*167
840 PRINTSPC(10)"{CTRL 9}{CTRL 2}{13 SPACEs}"            :REM*27
850 RETURN                                               :REM*143
860 :                                                    :REM*71
870 PRINT"{SHFT CLR}{CTRL 9}{CTRL 4}{7 SPACEs}FLASH CARDS: MULTIPLICATION{6 SPACEs}{2 CRSR DNs}{CTRL 3}":REM*151
880 FORI=1TO5:PRINTSPC(18)A$(X,I):NEXT                   :REM*195
890 PRINT:PRINT                                          :REM*79
900 PRINTSPC(18)A$(Y,1):REM*159
910 PRINTSPC(18)A$(Y,2):REM*185
920 PRINTSPC(12)"{CTRL 9}{CTRL 2} {CRSR RT} {CTRL 3}{CTRL 0}";SPC(3);A$(Y,3)   :REM*15
930 PRINTSPC(12)"{CTRL 9}{CTRL 2}{CRSR RT} {CRSR RT}{CTRL 3}{CTRL 0}";SPC(3);A$(Y,4)   :REM*251
940 PRINTSPC(12)"{CTRL 9}{CTRL 2} {CRSR RT} {CTRL 3}{CTRL 0}";SPC(3);A$(Y,5)   :REM*43
950 PRINT                                                :REM*31
```


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96Ø PRINTSPC(12)"{CTRL 9}{CTRL
    2}{11 SPACEs}"      :REM*249
97Ø RETURN                :REM*7
98Ø :                     :REM*191
99Ø PRINT"{SHFT CLR}{CTRL 9}{CT
    RL 8}{9 SPACEs}FLASH CARDS:
     DIVISION{1Ø SPACEs}{5 CRSR
     DNs}{CTRL 3}"        :REM*19
1ØØØ PRINTSPC(16)"{CTRL 9}{CTRL
     2}{15 SPACEs}"       :REM*221
1Ø1Ø PRINTSPC(16)"{CTRL 9} {CTR
    L 3}"                 :REM*155
1Ø2Ø IFL=1THENFORI=1TO5:PRINTSP
    C(9)A$(X,I);"{CTRL 9}{CTRL
     2}{2 CRSR RTs} {2 CRSR RT
    s}{CTRL Ø}{CTRL 3}";A$(Z,I
    ):NEXT                :REM*47
1Ø3Ø IFL=2THENFORI=1TO5:PRINTSP
    C(9)A$(X,I);"{CTRL 9}{CTRL
     2}{2 CRSR RTs} {2 CRSR RT
    s}{CTRL Ø}{CTRL 3}"A$(Z1,I
    )"{CTRL Ø} "A$(Z2,I):NEXT
                          :REM*128
1Ø4Ø PRINTSPC(16)"{CTRL 9}{CTRL
     2} "                 :REM*148
1Ø5Ø RETURN               :REM*88
1Ø6Ø :                    :REM*16
1Ø7Ø X=INT(RND(1)*1Ø)     :REM*12Ø
1Ø8Ø Y=INT(RND(1)*(R2-R1))+R1
                          :REM*94
1Ø9Ø Z=X+Y                :REM*12Ø
11ØØ RETURN               :REM*138
111Ø :                    :REM*66
112Ø X=INT(RND(1)*1Ø)     :REM*17Ø
113Ø Y=INT(RND(1)*(R2-R1))+R1
                          :REM*144
114Ø Z=X+Y:Z$=STR$(Z):L=LEN(MID
    $(Z$,2))              :REM*1Ø8
115Ø IFL=2THENZ1=VAL(LEFT$(Z$,2
    )):Z2=VAL(RIGHT$(Z$,1))
                          :REM*23Ø
116Ø RETURN               :REM*198
117Ø :                    :REM*126
118Ø X=INT(RND(1)*1Ø)     :REM*23Ø
119Ø Y=INT(RND(1)*(R2-R1))+R1
                          :REM*2Ø4
12ØØ Z=X*Y                :REM*38
121Ø RETURN               :REM*248
122Ø :                    :REM*176
123Ø X=INT(RND(1)*(R2-R1))+R1:I
    FX=ØTHEN123Ø          :REM*62
124Ø Y=INT(RND(1)*1Ø)     :REM*38
125Ø Z=X*Y:Z$=STR$(Z):L=LEN(MID
    $(Z$,2))              :REM*26
126Ø IFL=2THENZ1=VAL(LEFT$(Z$,2
    )):Z2=VAL(RIGHT$(Z$,1))
                          :REM*84
127Ø RETURN               :REM*52
128Ø :                    :REM*237
129Ø T2=INT(RND(1)*4)+1:REM*253
13ØØ ONT2GOSUB1Ø7Ø,112Ø,118Ø,12
    3Ø                    :REM*189
131Ø RETURN               :REM*93
132Ø :                    :REM*21
133Ø POKES+24,15:POKES+6,24Ø:PO
    KES+4,17              :REM*241
134Ø POKES+1,25:POKES,177
                          :REM*35
135Ø FORT=1TO2Ø:NEXT      :REM*55
136Ø POKES+4,16           :REM*87
137Ø RETURN               :REM*153
138Ø :                    :REM*81
139Ø PRINT"{HOME}{CTRL 2}{21 CR
    SR DNs}"SPC(12)"ANSWER:";
                          :REM*163
14ØØ IFT2=1THENPRINTZ     :REM*53
141Ø IFT2=2THENPRINTX     :REM*123
142Ø IFT2=3THENPRINTZ     :REM*2Ø1
143Ø IFT2=4THENPRINTY     :REM*19
144Ø FL=1:RETURN          :REM*73
145Ø :                    :REM*151
146Ø PRINT"{3 CRSR DNs}DIVISION
     BY ZERO NOT ALLOWED."
                          :REM*141
147Ø PRINT"PLEASE START OVER BY
     PRESSING ANY KEY.":REM*35
148Ø GETK$:IFK$=""THEN148Ø
                          :REM*221
149Ø RUN                  :REM*1
15ØØ :                    :REM*2Ø1
151Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*49
152Ø DATA "{CTRL 9} {3 CRSR RTs
    } "                   :REM*247
153Ø DATA "{CTRL 9} {3 CRSR RTs
    } "                   :REM*1
154Ø DATA "{CTRL 9} {3 CRSR RTs
    } "                   :REM*12
155Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*9Ø
156Ø :                    :REM*6
157Ø DATA "{CTRL 9}{2 CRSR RTs}
    {2 SPACEs}{CRSR RT}"
                          :REM*72
158Ø DATA "{CTRL 9}{2 CRSR RTs}
    {2 SPACEs}{CRSR RT}"
                          :REM*82
159Ø DATA "{CTRL 9}{2 CRSR RTs}
    {2 SPACEs}{CRSR RT}"
                          :REM*92
16ØØ DATA "{CTRL 9}{2 CRSR RTs}
    {2 SPACEs}{CRSR RT}"
                          :REM*1Ø2
161Ø DATA "{CTRL 9}{2 CRSR RTs}
    {2 SPACEs}{CRSR RT}"
                          :REM*112
162Ø :                    :REM*66
163Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*17Ø
164Ø DATA "{CTRL 9}{4 CRSR RTs}
     "                    :REM*16
165Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*19Ø
166Ø DATA "{CTRL 9} {4 CRSR RTs
    }"                    :REM*126
167Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*21Ø
168Ø :                    :REM*126
169Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*23Ø
17ØØ DATA "{CTRL 9}{4 CRSR RTs}
     "                    :REM*76
171Ø DATA "{CTRL 9}{2 CRSR RTs}
    {3 SPACEs}"           :REM*218
172Ø DATA "{CTRL 9}{4 CRSR RTs}
     "                    :REM*96
173Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*14
174Ø :                    :REM*186
175Ø DATA "{CTRL 9} {2 CRSR RTs
    } {CRSR RT}"          :REM*218
176Ø DATA "{CTRL 9} {2 CRSR RTs
    } {CRSR RT}"          :REM*228
177Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*54
178Ø DATA "{CTRL 9}{3 CRSR RTs}
     {CRSR RT}"           :REM*152
179Ø DATA "{CTRL 9}{3 CRSR RTs}
     {CRSR RT}"           :REM*162
18ØØ :                    :REM*247
181Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*95
182Ø DATA "{CTRL 9} {4 CRSR RTs
    }"                    :REM*31
183Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*115
184Ø DATA "{CTRL 9}{4 CRSR RTs}
     "                    :REM*217
185Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*135
186Ø :                    :REM*51
187Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*155
188Ø DATA "{CTRL 9} {4 CRSR RTs
    }"                    :REM*91
189Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*175
19ØØ DATA "{CTRL 9} {3 CRSR RTs
    } "                   :REM*117
191Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*195
192Ø :                    :REM*111
193Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*215
194Ø DATA "{CTRL 9}{3 CRSR RTs}
    {SHFT LB.} "          :REM*2Ø1
195Ø DATA "{CTRL 9}{2 CRSR RTs}
    {SHFT LB.} {CTRL Ø}{SHFT L
    B.}"                  :REM*165
196Ø DATA "{CTRL 9}{CRSR RT}{SH
    FT LB.} {CTRL Ø}{SHFT LB.}
     "                    :REM*135
197Ø DATA "{CTRL 9}{CRSR RT}{2
    SPACEs}{2 CRSR RTs}"
                          :REM*151
198Ø :                    :REM*171
199Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*19
2ØØØ DATA "{CTRL 9} {3 CRSR RTs
    } "                   :REM*217
2Ø1Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*39
2Ø2Ø DATA "{CTRL 9} {3 CRSR RTs
    } "                   :REM*237
2Ø3Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*59
2Ø4Ø :                    :REM*231
2Ø5Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*8Ø
2Ø6Ø DATA "{CTRL 9} {3 CRSR RTs
    } "                   :REM*22
2Ø7Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*1ØØ
2Ø8Ø DATA "{CTRL 9}{4 CRSR RTs}
     "                    :REM*2Ø2
2Ø9Ø DATA "{CTRL 9}{5 SPACEs}"
                          :REM*12Ø ■
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TELECOMPUTING WORKSHOP

Every month, RUN*'s telecommunications column answers questions from our readers who are using, or intend to use, a Commodore computer online.* by DAVID BRADLEY

AS I OFTEN DO, I'll start this month's column with notes on a few miscellaneous topics.

If you're looking for a VIC-1011A RS-232 interface, Ricky Chang from Nu-Tek Computers & Electronics (1635 Kingsway, Vancouver, B.C., Canada V5N 2S2; 604-873-2002) says they still have some in stock. They sell for $59.95 Canadian or $45 U.S., and Nu-Tek will ship anywhere in either country.

I got a letter from Ralph S. Lees, Jr., of Poseidon Electronics concerning Rich Vadagriff's search (in last April's issue) for a Kermit program for his C-128 in 128 mode. The one Ralph's company puts out is not for 128 mode, but CP/M mode. If you have a 128 and a 1571 and want to use Kermit protocol from CP/M, write to Ralph at 103 Waverly Place, New York, NY 10011. His disks cost $16, and all checks must be made payable to him.

It seems that BBSs aren't being operated just by computer-related organizations anymore. Shannon O'Rear from Elizabethtown, Kentucky, reports that the skateboard magazine *Thrasher* is running a BBS in San Francisco, so its readers can talk online about skateboarding and related subjects. The number to call is 415-822-5630.

Now on to this month's questions.

Q *I became interested in Q-Link, so I purchased a modem and the Q-Link software. The modem is a Volks 6480 (300/1200 baud) from Anchor Automation. After reading the software instructions and making several unsuccessful attempts to connect, I finally called the Q-Link customer service number. They told me their software won't work with my modem and I have to get software from Anchor Automation. Why does the Q-Link software work with many other modems but not the 6480, and why doesn't Q-Link warn people about this incompatibility?*

—FRANK MCGRAW
OTTAWA, IL

A I don't think Q-Link should take the blame for this situation. Their software supports a lot of modems (its modem menu offers 17 options), but the Volks 6480 is too different to be included. Anchor Automation has picked up the slack and is now packaging the needed software with the 6480. From what I've been told, they're also including the Q-Link program on the flip side of their disk. I guess you got one of the earlier 6480s, before Anchor started bundling the software.

Q *I want to get a good modem at a reasonable price, but I don't know much about modems. Could you suggest one? Also, should I get 300 or 1200 baud?*

—DANNY MEYERS
SAINT CLAIR, MI

A If you want a good, inexpensive modem, get the Commodore 1600 (see below). It doesn't sing and dance like some more expensive modems, but it will get you online with very little investment.

If you can afford to get a 1200-baud modem, I'd say do so. It'll save you a lot of online time, and time is money. The Commodore 1670 (also see above) supports both 300 and 1200 baud.

Q *I recently bought a Volks 6480 modem, and now I've discovered that there aren't many companies supporting it. Are there any terminal or BBS programs available for this modem besides the software it came with? If not, is there any way I can make other programs work with it?*

—KIM CUMBERLAND
ROCHESTER, NY

A As I mention fairly often in this column, if you're in the market for a modem, it's best to stick to one that works like a Commodore 1650 or a Hayes. Those two have become the standards in the Commodore world and most Commodore telecommunications software supports them.

I do know of one terminal program for the Volks 6480—a public domain program, written by Guill Grace, called Volks Term 6480. It supports the Xmodem and Punter protocols, has a graphic terminal mode, as well as a normal terminal mode, and supports 300, 450 and 1200 baud.

You can find it on Richard Bradley's BBS, 416-492-2300, or you can get it through the mail for $5, plus $1 postage and handling, from Public Domain Solutions, PO Box 832, Tallevast, FL 34270.

If you have any other terminal or BBS programs that are in Basic or in a form you can edit, you should be able to alter them to support the Volks 6480. I don't have one of these modems, so I can't tell you anything about how they work, but considering the number of questions I've been receiving about them, I may get one.

Q *I want to use a 1200-baud modem with my C-128 and QuantumLink terminal program. What are the differences between the Commodore 1600, 1650, 1660 and 1670 modems, and will one of them suit my purpose?*

—MIKE DALESSIO
FREDERICK, MD

A The Commodore 1600 is a non-dialing 300-baud modem, the 1650 and 1660 are autodial/autoanswer 300-baud modems and the 1670 is an autodial/autoanswer 300/1200-baud modem. All of them will work with the VIC-20, the C-64 and the C-128. The 1670 will also work with the Plus/4.

The 1660 and the 1670 both have speakers in them, so you can hear what's happening on your phone line when you call out. This feature is especially helpful if you dial a voice number instead of a BBS; you'll hear quickly if something isn't right.

The 1670 supports dialing, as well as other commands sent to the modem from the terminal mode of *any* terminal program. To make the 1650 or the 1660 dial, you must have a terminal program that works with that modem specifically.

The 1650 and the 1670 are well supported by commercial and public domain programs and are pretty much

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the standard for Commodore users. If you're looking for 1200 baud, the one for you is the 1670.

Q *I'm running a BBS on a C-64, two 1541 disk drives and an Okimate 10 printer. I recently read* RUN*'s article on hard drives in the April 1987 issue and was wondering if I could use a hard drive with the C-Net V10.0 or V11 BBS software.*

—RICHARD WILLS
SOCORRO, NM

A I'm not familiar with the software you mention, but I am quite sure you could operate it on a hard drive. I'm currently experimenting with the Xetec Lt. Kernal on my BBS, and it's *very* impressive! Before going out and taking the hard-drive plunge, I'd suggest you talk to the manufacturer of the unit you're interested in to make sure your program will work with it. However, unless your BBS program does things in a 1541-specific way, I can't imagine you'd have any trouble.

Q *Could you tell me how to get* Toronto Computes!? *I understand it's a free monthly newspaper produced in that city.*

—PHILIP GOLDMAN
KETTERING, OH

A *Toronto Computes!*, which features BBS number listings for Toronto every month, offers U.S. subscriptions, but for $17 per year or $29 for two years. For more information, write to *Toronto Computes!*, Attention Eric and David, 3092 Danforth Ave., Suite D, Toronto, Ontario, Canada M1L 1B1.

Q *I'm a C-64 owner and interested in starting a BBS. However, I've heard via the grapevine that there's a snafu in the works concerning BBSs running on a C-64 and 1541 disk drive.*

The problem, as reported, is that if a caller to the BBS hangs up at just the wrong moment during a disk access, the system will hang up with the disk motor still running. The disk access won't terminate, and the modem won't reset to answer the next call. If the operator fails to notice what's happened, the drive motor might be permanently damaged, or even burn out (depending on the condition of the drive, the ventilation around it and its age).

This problem, so the story goes, results from the interaction between Basic and the operating system built into the drive. Therefore, unless you know that a program is specifically designed to avoid the problem, you should consider it unsafe.

Have you or any other Telecomputing Workshop readers heard of this problem? If so, do you know of any safe software or any other techniques I might use to protect my system?

—DENNIS MCNELIS
FORT WAYNE, IN

A I've put my ear to every grapevine I could find, but nowhere did I hear any talk about what you've described, and I've never heard of it elsewhere in more than five years of running Commodore BBSs.

If anyone else has any information about this potentially serious problem, please let me know, so I can pass the word along.

Q *You mentioned the Thirdterm terminal program in your September 1986 column and, lo and behold, I found it on a local BBS. However, it doesn't seem to work with my Commodore 1660. Is there any way I can make this program work with that modem?*

—LEO DIAMOND
NEW YORK, NY

A Thirdterm evolved from Higgyterm, a program written by Paul Higginbottom and David Berezowski of Commodore Business Machines, now of Digital Solutions. Higgyterm can't upload and download, but it does support the 1660. There are versions of Higgyterm for the C-64 and the Plus/4, and you can get both on the TPUG section of Q-Link or through the mail from Public Domain Solutions, PO Box 832, Tallevast, FL 34270, for $5, plus $1 shipping and handling.

I've seen other versions of Higgyterm that do up- and download. Unfortunately, they work with the Mitey Mo and HesModem II, but not with the 1660. If I hear of a version of Thirdterm that supports your modem, I'll let you know.

Q *Every once in a while I have problems with prank phone calls. I own a Commodore model 1660 modem, and I'm wondering if I can trace the calls with it.*

—GEORGE ROEDL
GOSHEN, AL

A You can't trace phone calls with any modem that I know of. Where I presently live, the only way to trace calls is to keep a log of when they occur and give it to the telephone company. Then they can find out where the calls are coming from.

There is a new phone system being tested that will tell you the number a call is coming from *before* you answer. It will also lock out numbers by giving them a busy signal. These features may be available from your local telephone company in a couple of years.

TELECOMPUTING TIP OF THE MONTH

This month's tip may sound like common sense, but it's *very* important and people forget about it. It is, be sure to turn your computer off before you connect or disconnect your modem. I don't mean your phone line; I mean the actual modem. Many people get away with not turning the computer off, but it's possible to ruin the modem, the computer or both. ■

We invite you to submit your telecommunications questions or comments to:

David Bradley
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c/o RUN Magazine
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Peterborough, NH 03458

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RESOURCE CENTER

With nothing more than a word processor and some art supplies, you and your child can create a storybook together. The project will be educational for your child, and you'll both have fun. by MARGARET MORABITO

One of the best ways to teach your children how to write is to encourage them to create their own stories. For young children especially, writing stories, illustrating them, then reading what they've written and sharing it with others promotes creative expression.

As with many other learning activities, your home computer can play an important role in this kind of project. There are commercial programs available that direct students through writing and editing exercises. Some of these programs culminate in printed storybooks that are laid out like real books and illustrated with stickers or computer graphics.

However, you don't need a special writing program to help your child create illustrated stories. Similar results can be accomplished with a word processor, such as RUN Script, and some guidance from you. You and your child can design imaginative page layouts and type in the text with the word processor, and then your child can add the illustrations. Using the procedures outlined below, together you can create illustrated stories, poems, letters, photo albums and school reports.

Writing and Editing

Let's say your child wants to produce a short story. The first job is the writing; then you'll work on page layout, printing and illustration.

The writing involves several steps: brainstorming for ideas, organizing the ideas, writing the first draft, and then proofreading, editing and rewriting. In this kind of limited project, planning can be done without your computer, although you may want to use a thought processing program if you have one. [See "Outlining Your Thoughts" in this issue for more on thought processors.] Your word processor comes into play for actually writing, revising and printing the story.

While some children will have plenty of story ideas, others will find planning the story the most difficult part of the project and will need help from you. You could suggest writing a story about him- or herself, family, friends or heroes, or perhaps rewriting a favorite television show, movie or fable. Maybe your child already has a story that was written at school.

For the first draft, some children prefer to write with pencil and paper; others like to start right off with the word processor. Either way, after the story has been typed into the computer, save it to disk and print it out in double-spaced form. The printout will provide an immediate reward for the child's effort and make the story easy to read and edit.

You both can proofread the printout and make revisions to the story on the paper. In the process, point out and correct errors in spelling and sentence structure insofar as the child can understand them.

When you've finished going over the story, have your child type the corrections into the computerized document, using the word processor. This process will produce a great sense of accomplishment; even deleting a single letter provides a sense of control not available with pencil and paper. Be sure to save the changes to disk and use the revised version for the final printout.

Page Layout

Now you can get to work on the next job: page layout. With your help, the sentences can be artfully arranged on the printout for placement of illustrations in varied positions. Some pages will have a blank space at the bottom for an illustration; some will have a blank area off to the right or left side; some will have one at the top.

I usually leave plenty of room for illustrations—about half the page. This space will be needed if the pictures are to be drawn freehand, and younger children are likely to write tiny stories, so large pictures will help fill out the pages.

Use the formatting commands of your word processor to control the page layout. You needn't burden your child with entering these commands; this task is best done by you. Some of the commands must appear at the beginning of the document, and some have to go within the text. Experiment on the screen with a few formatting commands to see what results they produce.

I use the screen-print option in RUN Script to preview page layouts. To activate this option, press F1, then P for print, N for noncontinuous output and S for screen.

When you format the story, you'll probably want to leave the top half of the first page blank for a lead-off picture, as in illustrated books and magazines. You'll also probably want to include the title of the story and the page number as a header on each page.

In Table 1 you'll find a sample sequence of commands for formatting a child's story. The first command produces the header on each page. The two commands on the second line print three blank lines between the title and the text on each page and designate double spacing for the entire document.

The command on the third line inserts 20 blank lines above the text on page 1. It's followed by ten lines of text and a force-page command to end printing on page 1. You'll need a force-page command anywhere you want a page-break to occur. For the first printout, you'll have to estimate where the force-page commands should go. I usually place one at the end of a paragraph, with one or two paragraphs per page.

After the force-page command that ends page 1, there comes a series of commands that control the layout of page 2. They produce a small left margin and a large right margin, compressing the text into a 30-character-wide left column and leaving room for an illustration on the right.

After the force-page command ending page 2, another line of margin commands sets up page 3 with a right column of text and a picture on the left.

The fourth page will have room for a picture across the bottom. Its formatting commands reset the margins for a full line length and limit the text on the top half of the page to ten screen lines.

These sample commands should get you started on some interesting page

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TABLE 1. Sample page-formatting commands.

Format for page spacing: .hd Title .hs3.ls1	**Force-page:** .fp
Page 1 format: .el20 (Insert ten screen lines of text.)	**Page 3 format:** .lm30.rm5 (Continue text for five or six screen lines.)
Force-page: .fp	**Force-page:** .fp
Page 2 format: .lm5.rm45 (Continue text for about five or six more screen lines.)	**Page 4 format:** .lm5.rm5 (Continue text for ten screen lines.)
	Force-page: .fp

layouts. You can experiment with line spacing, margin widths and page widths to create your own text arrangements. Print out some samples, and let your child choose which layout he or she wants for each page. Most commercial word processors include similar formatting features, so you can easily apply the principles illustrated here to your own program.

Illustrations

Writing and page layout are just part of the fun of creating a storybook with a word processor. After the story has been reprinted according to your layout, it's time for the illustrations. These can be done in several ways. Your child could draw pictures on the printed pages and color them in, or perhaps decorate the pages with colorful stickers, available inexpensively at most variety stores. He or she could also cut pictures out of magazines and glue them onto the printed pages, and you might even donate some family photographs to the cause.

Of course, the computer can produce illustrations, too, but this wouldn't be as easy for your child. If you want to use the computer, a graphics program would help. After the graphics have been created, run each page of text back through the printer to add the graphics in the reserved blank spaces. Then your child can color the pictures in.

When they are all illustrated, you might paste the pages of the story onto cardboard or construction paper and place them in a colorful binder, perhaps with plastic page protectors. You could also photocopy the pages to make several books. Use your imagination, and you'll end up with storybooks that your child will be proud to show to friends, relatives and teachers.

More Ideas?

While a word processor can't take the place of a well-designed commercial writing program, it's perfectly adequate for enhancing a young child's writing and reading skills. You'll also find that story writing fosters a desire to do more creative activities and that your child's school work will improve from using a word processor at home. If you invent other interesting projects to do with your word processor, let me know what you come up with. ■

If you're using Commodore computers for educational purposes (at home or in school) and would like to share your experiences through the Resource Center, write me a letter detailing the equipment you're using, subject areas you teach, grade level or age of your students, software you're using and any other information you feel like including.

Also, if you'd like to donate public domain education programs to the Resource Center for sharing with other educators or parents, please send along a disk with a brief description of the program. Send correspondence and disks to:

Margaret Morabito
Resource Center
c/o RUN Magazine
80 Elm St.
Peterborough, NH 03458

You can also leave mail in my on-line mail boxes: CompuServe (70616,714) or QuantumLink (MARGM).

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COMMODORE CLINIC

This month, we'll tell you how to speed up your disk drive's performance, warn you about a particular type of terminal program you should avoid and offer insights and solutions to your most perplexing computing problems. by JIM STRASMA

HARDWARE

Q *Will the graphics interfaces I've seen advertised for Commodore computers let my non-graphics printer print graphics characters?*

—VINNIE ZAK
SHELTON, CT

A No, normally they won't. Graphics interfaces are designed to convert the Commodore graphics commands for Commodore graphics printers into equivalent commands for other graphics printers. Such interfaces became necessary when Commodore chose not to support Centronics parallel printers or Epson graphics and not to offer its own high-quality graphics printer.

Q *I have a Commodore C-128D, which has all the capabilities of the C-128 plus a detached keyboard and a built-in disk drive. Why don't I see it advertised in magazines like* RUN? *Is it unavailable in the U.S.?*

—W. JOHANNES
YOGYAKARTA, INDONESIA

A That's correct. Although the C-128D was unveiled over two years ago at the Consumer Electronics Show in Chicago, Commodore has thus far chosen not to sell it here.

Historically—and surprisingly—the U.S. market hasn't been all that important in Commodore's planning. This is at least the fourth time Commodore has sold a computer model nearly everywhere except in the U.S. Presumably there is less competition and more profit potential elsewhere.

Q *I'm considering souping up my 1541 with a more powerful electric motor to make up for the drive's slow speed. However, I'm afraid this might render my disks useless or even refuse to load or save programs. Any advice?*

—LEONARD ARNOLD
GLADSTONE, VA

A Actually, it isn't the motor in the 1541 that makes it run so slowly. The real slowpoke is the bit-serial interface method Commodore chose to use with the drive and computer in order to cut costs. So, even if you could increase the rotation speed of your floppy disks, you probably wouldn't notice any improvement in data transfer speed.

If you want to speed up your disk drive's performance, get a program that speeds data transfers, such as the Mach 5 from Access Software.

SOFTWARE

Q *A program I wrote is about 8K long and loads in less than three seconds. However, data from one of my Swiftcalc 128 spreadsheets takes six minutes to save. Why is there such a drastic difference in speed?*

—BRIAN HARDING
CARROLLTON, TX

A Several factors make loading a program much quicker than saving spreadsheet data. First, when you load a program, there's no question about where the information will go or where the next sector in the program is located. The first two bytes of the program are its load address, and each sector includes all the information needed to find the next sector in the program.

A save, on the other hand, first needs to find space for each new sector of data in turn, without any quick way for the disk drive to know in advance how many sectors will be needed in all. Also, it has to link all the sectors together so they can be read or loaded later.

Second, you load a program, as a single operation, into a block of contiguous memory. However, when you save data, it's written from a much smaller buffer area, which means only a small part of the total file can be written at a time.

Third, if the computer has to change any string variables, it may require occasional time-outs to get rid of unneeded strings created by the file-save operation. There'll be short periods when the computer seems to go dead, then resumes as though nothing had happened.

Finally, your spreadsheets may be much larger than 8K. One spreadsheet I use allocates as data every cell to the left of or above any cell in which I have written anything, even if I erase the cell. This can dramatically increase the space taken up by a spreadsheet.

If the time delay matters a lot to you, try another spreadsheet. I can't ever recall having to wait more than a minute or so for a spreadsheet to save its data.

Q *Is there a terminal program for the C-64 that dials numbers having a specific prefix and saves the ones that answer with a computer tone?*

—JEREMY MAPPUS
AUSTIN, TX

A Programs that do what you ask do exist. One was even featured in the movie *WarGames*, where it got its user into deep trouble. Morally and legally, however, there is almost no defense for their use, and it might even be illegal for me to help you find one.

Just because a computer answers the phone doesn't give you the right to access it. Laws regarding this are getting more strict, and properly so. If you insist on getting into a computer uninvited, limit your explorations to trying the programs Hacker and Hacker II from Activision. That way, your next letter to the Clinic won't have to be mailed from the clink.

Q *Where can I get a replacement disk for The Manager database?*

—KAREN LANDRETH
FLORENCE, SC

A Packed with your original program disk and manual is a card telling you how to get a replacement

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disk directly from Commodore. Send the original disk to Customer Support at Commodore Business Machines (1200 Wilson Drive, West Chester, PA 19380), with a check for $5.

Q *I've called nearly every dealer in northeast Ohio for a copy of the* Programmer's Reference Guide for the Commodore Plus/4. *Where can I buy a copy? Also, does Commodore or any dealer carry software for the Plus/4?*

—KEITH SCHRODE
SALEM, OH

A According to the information I received from Calvin Demmon, president of the Plus/4 Users Group (PO Box 1001, Monterey, CA 93942), the reference guide is published by Scott Foresman Professional Publishing Group (1900 East Lake Ave., Glenview, IL 60025) and retails for $22. Any bookstore should be able to order it for you. You'll also be happy to know that you may order 50 or so programs for the Plus/4 directly from Commodore, and PLUG offers some public domain programs itself. Membership in PLUG is $20 a year, and it's probably a good investment for any Plus/4 owner.

PROGRAMMING

Q *What do the terms text file and binary file mean, and what is put on the disk for each?*

—TED CHIDESTER
SANTA FE, NM

A An easy way to distinguish between text and binary files is that text files are made up of printable characters that people can read, whereas binary files are made up of binary codes that only computers can easily read.

The distinction is obvious in CP/M mode on the C-128, and under MS-DOS on the PC-10 and PC-20, all of which have a type command to list the contents of a disk file. If it's a text file that ends with extensions such as .TXT, .ASM or .SRC, you'll be able to read its contents as it scrolls across your screen. On the other hand, if you try to type in a binary file, such as a machine language program, you'll get only what appears to be garbage on the screen.

To a purist, a text file should be made up only of letters, numbers, punctuation and special symbols, and not include any control codes or graphics. A binary file, however, may include any character. If it's also a program file, its first two characters will also be the absolute address in memory into which the program should be loaded to run properly.

Q *I need a program that turns machine language programs into Basic so that I can debug them, and then reassembles the modified version. If this isn't possible, then how can I list machine language?*

—LEONARD ARNOLD
GLADSTONE, VA

A The only products that do this are some uncompilers that take a compiled Basic program and convert it back into an equivalent Basic source code. But, such programs work only if the compiled program is in Basic, and compiled by one specific compiler.

Apart from that, the only way to do it is with an unassembler, or symbolic disassembler. I developed one several years ago that's probably still in some user group libraries, but the best I've seen is Symbol Master by Schnedler Systems, 1501 N. Ivanhoe, Arlington VA 22205; phone 703-237-4796.

Q *In some of my programs, I poke screen display codes into locations 1024–2023 of my C-64. This should print the character to the screen location I choose, but I can see the characters only when the cursor is flashing at the same location. How can I solve this problem?*

—JOSHUA CARON
QUIMBY, ME

A When you poke a character into screen memory, you also need to poke a code for the color you want the character to be in color memory. Otherwise, its default color will be the same as the background color, making it invisible until the background color changes by either a flashing cursor or an additional Poke. Color memory on the C-64 begins at location 55296 and has one location for the color of each screen location, stored in the same order as character positions in the screen memory beginning at location 1024. You may poke any number in the range 0–15 into each color memory location, with each number representing one of the 16 available colors.

REPAIR

Q *Is there a way to remove keys from a keyboard without ruining them? I want to swap some of the keytops on a C-16 keyboard (bought from Radio Shack for $5) that are incorrectly located for the C-64.*

—JERRY VAN VACTOR
SPEARFISH, SD

A Simply fashion a small hook from a paper clip, slip it into the gap between the keys, then into the recess underneath the keytop you want to remove, and gently pull up on the hook. The keytop should easily slip off its post. Then recap the post by gently pressing the C-16 keytop back onto it so that the slot in the keytop mates with the post. ■

Do you have a problem or question about your Commodore computer? Commodore Clinic can help. Just send your question on a postcard to:

Jim Strasma
Commodore Clinic
PO Box 6100
Macomb, IL 61455-6100

Queries are answered only through this column, and, due to the volume of mail, only questions that appeal to the majority of our readers can be published.

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How To Type *RUN* Listings

To simplify typing *RUN*'s program listings, we include checksum numbers. These follow a REM statement at the end of each line (e.g., :REM*123) and necessitate your using *RUN*'s Perfect Typist programs, listed below.

Type in 64 Perfect Typist (Listing 1) for 64 programs, or 128 Perfect Typist (Listing 2) for 128-mode programs, and save it before running. When you want to type in a 64- or a 128-mode program, first load and run the appropriate Perfect Typist listing. Two SYS numbers appear on your screen. Jot them down, since you'll need them for deactivating and reactivating the checksum program.

If, when you run a Perfect Typist program, you get an "Out of Data error in line 30" in 64 Perfect Typist (or "in line 10" in the 128 version), it means you made an error in entering the data statements. Carefully compare what you typed with the data statements in the magazine. Correct any discrepancies, then re-save the corrected Perfect Typist program, and it should work well. (The reference to line 30—or 10—is irrelevant; that's not where the error is.)

After Perfect Typist has been loaded and run, start typing in the program listing from *RUN*. After you press the return key to log in each line, the checksum number, ranging from 0 to 255, appears below the line at the left margin.

If this matches the checksum printed in the listing after the :REM*, you have typed that line correctly. You then type the next line right over the previous line's checksum value. If the numbers do *not* agree, analyze the line on screen for errors. Make the needed changes and press return again to log them in. Compare the new checksum that appears with the magazine's number and then proceed.

When finished entering your program, disable the Perfect Typist by typing the appropriate SYS number and pressing return. Now you can save your program as usual, but before attempting to run it, turn the computer off and back on to completely clear out the Perfect Typist program.

You may save an incomplete program and continue it later. To do so, reload and run Perfect Typist, then load your program, list it, and go on from where you left off.

The 128 Perfect Typist works in either 40 or 80 columns and lets you use automatic line-numbering. If Auto is on, the checksum is printed below the line you just entered, and the next line number appears below the checksum.

All listings in *RUN* have been translated so the graphics and control characters become understandable key combinations. Follow instructions inside curly brackets. (What you see on screen looks quite different from what's inside the brackets.) For example, {SHIFT L} means hold down the shift key and press the L key. Another example is {22 SPACEs}, which instructs you to press the space bar 22 times. ®

Listing 1. *64 Perfect Typist program.*

```
1 REM 64 PERFECT TYPIST
2 REM BY: JAMES E BORDEN
10 POKE56,PEEK(56)-1:POKE52,PEEK(56):CLR
20 PG=PEEK(56):ML=PG*256+60
30 FORX=ML TO ML+154:READD:T=T+D:POKEX,D:N
   EXT
40 IFT<>16251 THEN PRINT"ERROR IN DATA..."
   :END
60 POKEML+4,PG:POKEML+10,PG:POKE ML+16,PG
70 POKE ML+20,PG:POKE ML+32,PG:POKE ML+38,
   PG
80 POKE ML+141,PG
89 PRINT"{SHFT CLR}{CRSR RT}**************
   ************************"
90 SYS ML:PRINT "{CRSR RT}** 64 PERFECT TY
   PIST IS NOW ACTIVE{2 SPACEs}**"
100 PRINT "{CRSR RT}** SYS"ML"=ON{5 SPACEs
    }SYS"ML+30"=OFF **"
101 PRINT"{CRSR RT}**********************
    ***************":NEW
```

```
110 DATA 173,005,003,201,003,208,001,096
120 DATA 141,105,003,173,004,003,141,104
130 DATA 003,162,103,160,003,142,004,003
140 DATA 140,005,003,096,234,234,173,104
150 DATA 003,141,004,003,173,105,003,141
160 DATA 005,003,096,032,124,165,132,011
170 DATA 162,000,142,240,003,142,241,003
180 DATA 189,000,002,240,051,201,032,208
190 DATA 004,164,212,240,040,201,034,208
200 DATA 008,072,165,212,073,001,133,212
210 DATA 104,072,238,241,003,173,241,003
220 DATA 041,007,168,104,024,072,024,104
230 DATA 016,001,056,042,136,016,246,109
240 DATA 240,003,141,240,003,232,208,200
250 DATA 173,240,003,024,101,020,024,101
260 DATA 021,141,240,003,169,042,032,210
270 DATA 255,169,000,174,240,003,032,205
280 DATA 189,162,003,189,211,003,032,210
290 DATA 255,202,016,247,164,011,096,145
300 DATA 013,032,032
```

Listing 2. *128 Perfect Typist program.*

```
1 REM 40/80 COL C128 PERFECT TYPIST
2 REM BY: JAMES E BORDEN
10 FORX=5120TO5379:READD:T=T+D:POKEX,D
20 NEXT:IFT<>28312 THENPRINT"{2 CRSR DNs}E
   RROR IN DATA...":END
25 A$="":IFPEEK(215) THENA$="{20 SPACEs}"
30 PRINT"{SHFT CLR}"A$" ****************
   ******************"
40 PRINTA$" ** 128 PERFECT TYPIST IS NOW A
   CTIVE **"
50 PRINTA$" **{2 SPACEs}SYS 5120=ON{7 SPAC
   Es}SYS 5150=OFF{2 SPACEs}**"
60 PRINTA$" ****************************
   ********":SYS5120:NEW
70 DATA 173,5,3,201,20,208,1,96,141,45,20,
   173,4,3,141,44,20,162,43,160,20
80 DATA 142,4,3,140,5,3,96,234,234,173,44,
   20,141,4,3,173,45,20,141,5,3,96
90 DATA 32,13,67,140,255,19,162,0,142,252,
   19,142,253,19,142,254,19,189,0,2
100 DATA 201,32,240,8,201,48,144,7,201,58,
    176,3,232,208,238,189,0,2,240,54
110 DATA 201,32,208,5,172,254,19,240,42,20
    1,34,208,10,72,173,254,19,73,1
120 DATA 141,254,19,104,72,238,253,19,173,
    253,19,41,7,168,104,24,72,24,104
130 DATA 16,1,56,42,136,16,246,109,252,19,
    141,252,19,232,208,197,173,252
140 DATA 19,24,101,22,24,101,23,141,252,19
    ,169,42,32,241,20,32,188,20,160
150 DATA 2,185,185,20,32,241,20,136,16,247
    ,165,116,208,9,165,117,208,5,169
160 DATA 145,32,241,20,172,255,19,96,13,32
    ,32,162,0,173,252,19,232,56,233
170 DATA 100,176,250,105,100,202,240,3,32,
    232,20,201,10,176,5,205,252,19
180 DATA 240,15,162,0,232,56,233,10,160,250
    ,24,105,10,202,32,232,20,170,72
190 DATA 138,9,48,32,241,20,104,96,170,173
    ,0,255,72,169,0,141,0,255,138,32
200 DATA 210,255,104,141,0,255,96
```

■

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From p. 14.

```
13Ø IFJOY(2)=128THEN GSHAPE B$,TX,TY
14Ø GETA$:IFA$=CHR$(32)THENGRAPHICØ:GOTO6Ø
15Ø MOVSPR SN,TX+24,TY+5Ø:GOTO9Ø
```

—MATTHEW THIE, INDIANAPOLIS, IN

$3FF PERMANENT SCREEN MAPPER

I'd like to share an improvement I made to the Screen Mapper trick ($3A8) in the February 1987 Magic. I glue a screen map produced by the Screen Mapper program to a stiff sheet of cardboard and cover it with a clear plastic cover. I use a grease pencil for drawing, and wipe off the plastic with a damp cloth when I'm finished.

—DALE PIZZO, ROXBOROUGH, PA

$400 C-64 TURBO-CURSOR

These Poke commands will make the cursor move much faster around the screen, which is helpful in programs requiring frequent cursor use. Just enter this line:

```
POKE 650,128:POKE 56325,10
```

Poking location 650 with 128 enables all the keys to repeat. You can change the cursor's speed by poking different values into location 56325 (lower numbers give faster speeds). (Can any reader create a program that enables the cursor to move diagonally in all directions?)

—M. PELLEGRINO, SPENCER, MA

$401 C-64 FADE-IN/FADE-OUT TEXT

I use the technique of "fading" in my screen titles to give my presentations a professional look. The subroutine I use (lines 1000–1080) shows how to employ the technique. I put my title or message in variable A$, the location numbers of the screen lines I want my message to appear on in variable A, and then call up the subroutine. If you want to produce a fade-out effect, just add REM in front of DATA in line 1060. (See if you can figure out why the fade-out effect works.)

```
1Ø REM MAGIC FADING BY DON JONES
2Ø PRINT"{SHFT CLR}":POKE53281,Ø
3Ø A$="{17 SPACEs}FADING":A=2:GOSUB1ØØØ
4Ø A$="{19 SPACEs}IS":A=3:GOSUB1ØØØ
5Ø A$="{17 SPACEs}MAGIC!":A=4:GOSUB1ØØØ
6Ø A$="{14 SPACEs}BY DON JONES":A=6:GOSUB1
   ØØØ
7Ø PRINT"{CTRL 2}":END
1ØØØ REM *FADE-IN ROUTINE*
1Ø1Ø FOR L=1TO5
1Ø2Ø PRINT"{HOME}{CRSR UP}";:FORPD=1TOA:PR
     INT"{CRSR DN}";:NEXTPD
1Ø3Ø READC,D:POKE646,C:PRINTA$;
1Ø4Ø FORW=ØTOD:NEXT
1Ø5Ø NEXTL:PRINT:RESTORE:RETURN
1Ø6Ø DATA Ø,15,11,15,12,15,15,15,1,3ØØ
1Ø7Ø REM FADE OUT DATA
1Ø8Ø DATA 1,15,15,15,12,15,11,15,Ø,3ØØ
```

—DON JONES, VIRGINIA BEACH, VA

$402 C-64 TWINKLE, TWINKLE, LITTLE STARS

The short routine below fills the screen with twinkling stars. I first designed it as a backdrop for a space game and later found it useful as a visual distraction for users during a program's short waiting periods. (Can anyone put shooting stars in this program?)

```
1Ø REM TWINKLING STARS-MARCE BALAGUER
2Ø PRINT"{SHFT CLR}":DEF FNS(A)=INT(RND(Ø)
   *1ØØØ)
3Ø S=1Ø24:D=54272:C=S+D
4Ø FORX=1TO5Ø:F=FNS(X)
5Ø FORY=1TO2:FORR=1TO4:READA,B
6Ø POKES+F,A:POKEC+F,B
7Ø NEXT:RESTORE:NEXT:NEXT
8Ø DATA 86,1,91,5,42,7,46,1
```

—MARCO BALAGUER, BROOKLYN, NY

$403 BACH IS BACK

This program plays a short song written by Johann Sebastian Bach. Just type in the program, run it and enjoy.

```
1Ø REM HARPSICHORD PLAYER-JESSE BROWN
2Ø TEMPO 17:FILTER 15ØØ,1,Ø,Ø,15
3Ø A$="V1O4T6X1HA V2O3T5X1QDQAQD V1O4IG#IF
   V2O3QA V1O4IEIDM V1O4HA V2O3QDQAQD V1O
   4IG#IF V2O3QA V1O4IEIDM V2O3WD V1O4#IFI
   GQA#QFM"
4Ø AA$="V2O3HA V1O4QE V2O3HD V1O4#QFQDM"
5Ø AB$="V2O3HA V1O4QEQAHD V2O3HDM"
```


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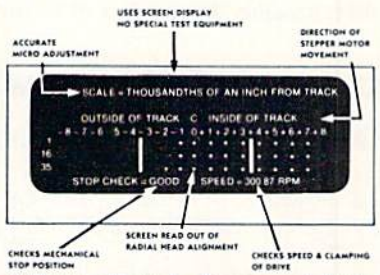
1541 Physical Exam Sample Screen



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```
6Ø C$="V2O3WA V1O4IE#IFQGIE#IFQGM V2O3WD V
   1O4#QFQAHAM V2O3WA V1O4IE#IFQGIE#IFQGM
   V2O3WD V1O4#QFQDHDM"
7Ø PLAY A$:PLAY AA$:PLAY A$:PLAY AB$:PLAY
   C$:PLAY A$:TEMPO 15:PLAY AB$
```

—JESSE B. BROWN, EUNICE, LA ■

Magic is the original *column of reader-submitted hints and tips. Each month we present brief, useful computer "tricks" to help you get the most out of your Commodore computing system—whether you're a beginning or advanced computerist, a C-64 or C-128 owner. Magic is a forum for* RUN*'s imaginative and inventive readers to share their programming tips, brief software or hardware modifications, shortcuts or items of general interest. If you have an idea to make computing easier, faster, more exciting and enjoyable, send it to:*

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Peterborough, NH 03458

RUN *pays $10 to $40 for each trick accepted for publication in the column. A payment of $50 and a Magic Contributor T-shirt is awarded for the Trick of the Month. To be eligible, the Trick of the Month must be for the C-64 or the C-64 and C-128. Tricks for the C-128 only are not eligible for the Trick of the Month.*

If you'd like a copy of RUN*'s latest edition of the Magic Trick Writer's Guide, enclose a self-addressed, stamped business envelope with your request, and you'll receive a copy in two to three weeks.*

RUN it right: **C-128**

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ULTRA HI-RES PIE CHARTS

I've added a pie-chart maker routine to *RUN*'s Ultra Hi-Res graphics program that appeared in the February and May 1986 issues. Listing 1, Ultra Hi-Res Pie Charts, works with version 1.1 of Ultra Hi-Res, which includes the @Fill and @HCopy commands.

To create a pie chart, boot up Ultra Hi-Res V1.1 and load and run the pie chart program. You'll be asked to give your chart a name, the number of sectors you want in the chart, the area of each sector as a percent of the entire circle and a short description of each sector to print in the legend area below the chart. The routine won't fill a sector with a pattern if it occupies an area less than 1.5 percent of the chart, so if you have more than one such sector, you might want to group them into an "other" category. R

—CAMERON GOODAIR, KOOLAN ISLAND, W. AUSTRALIA

Listing 1. Ultra Hi-Res Pie Charts program.

```
1Ø REM ULTRA HIRES PIE CHARTS-CAMERON GOOD
   AIR                                :REM*1Ø
2Ø POKE47,Ø:POKE48,68:CLR             :REM*194
3Ø BANK1:PRINTCHR$(27)"E":PRINT"{SHFT CLR}
   "                                  :REM*48
4Ø TRAP4ØØ:CM$="{23 CRSR DNs}":@TEXT
                                      :REM*196
5Ø FAST:PRINTCHR$(27)"U":PRINT"{CRSR DN}{3
    CTRL Is}{CRSR RT}NAME OF PIE CHART"
                                      :REM*23Ø
6Ø INPUT"{HOME}{2 CRSR DNs}{5 CTRL Is}{2 C
   RSR RTs}";N$                       :REM*58
7Ø PRINT"{SHFT CLR}"CM$"{3 CTRL Is}MAXIMUM
    OF 22 SECTORS PLEASE"             :REM*13Ø
8Ø INPUT"{HOME}{2 CRSR DNs}{3 CTRL Is} HOW
    MANY SECTORS";N                   :REM*238
9Ø IFN>22THENPRINTCHR$(15)"{HOME}"CM$"{3 C
   TRL Is}MAXIMUM OF 22 SECTORS PLEASE"CHR
   $(143):SLEEP5:GOTO7Ø               :REM*66
1ØØ DIMA(N),C$(N),W$(N),H(N),T(N):Q=36Ø:R=
    6Ø:C=2.4:YD=16Ø:RN=57.296         :REM*58
11Ø PRINT"{SHFT CLR}";:H=INT(8Ø/N):V=H*4:C
   G=LEN(N$):CG=CG*8:CN$="{CRSR DN}":CO$=
   ""                                 :REM*126
12Ø FORI=1TON:PRINT"{3 CTRL Is}PERCENTAGE
   OF SECTOR" I:NEXTI                 :REM*18
13Ø PRINT"{HOME}"CM$"{3 CTRL Is}PERCENTAGE
    SO FAR"                           :REM*98
14Ø G=O:FORI=1TON:PRINT"{HOME}"CO$;:INPUT"
   {6 CTRL Is}";W$(I):A(I)=VAL(W$(I))
                                      :REM*128
15Ø G=G+A(I):PRINT"{HOME}"CM$"{5 CTRL Is}{
   2 CRSR RTs}"G"{CRSR LF}{5 SPACEs}";:CO
   $=CO$+CN$:NEXTI                    :REM*8Ø
16Ø IFG<>1ØØTHENPRINT"{HOME}"CM$CHR$(15)"{
   3 CTRL Is}THE TOTAL MUST = 1ØØ%{4 SPAC
   Es}"CHR$(143):SLEEP5:GOTO11Ø       :REM*182
17Ø PRINT"{SHFT CLR}{2 CTRL Is}{CRSR DN}A
   SHORT DISCRIPTION FOR SECTOR"      :REM*244
18Ø PRINT"{HOME}"CM$"{3 CTRL Is}NO MORE TH
   AN"(H-1)"CHARACTERS":PRINT"{HOME}":FOR
   I=1TON                             :REM*84
```

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```
19Ø PRINT"{6 CTRL Is}"I;:INPUT C$(I)
                                   :REM*128
2ØØ IFLEN(C$(I))>(H-1)THENPRINT"{HOME}"CM$
    CHR$(15)"{3 CTRL Is}NO MORE THAN"(H-1)
    "CHARACTERS"CHR$(143):SLEEP5:GOTO18Ø:E
    LSE21Ø                         :REM*144
21Ø NEXTI:@GRAPHIC,Ø,2:@CLR,Ø      :REM*126
22Ø @DRAW,Ø,Ø,639,Ø,1:@DRAW,639,Ø,639,199,
    1:@DRAW,639,199,Ø,199,1:@DRAW,Ø,199,Ø,
    Ø,1                            :REM*21Ø
23Ø X=319:Y=88:YR=R:XR=R*C:BANKØ   :REM*132
24Ø PRINT"{HOME}":@CHAR,53248,(32Ø-CG),3,1
    ,2,N$                          :REM*14Ø
25Ø @CIRCLE,1,X,Y,XR,YR            :REM*176
26Ø @DRAW,X,Y,(X+XR),Y,1:BANK1:T=Ø:XD=Ø:S=
    Ø                              :REM*77
27Ø YA=YD+16:X1=Ø:Y1=Ø:X9=XR-3:Y9=YR-3
                                   :REM*125
28Ø FORI=1TON:T=((A(I)/1ØØ)*36Ø):XA=XD+V
                                   :REM*149
29Ø S=T+S:IFT<2THENS1=S-1:ELSES1=S-3
                                   :REM*219
3ØØ X1=INT((COS(S/RN)*XR)+.5):Y1=INT((SIN(
    S/RN)*YR)+.5)                  :REM*161
31Ø XE=X+X1:YE=Y-Y1:XC=X+INT(COS(S1/RN)*X9
    ):YC=Y-INT(SIN(S1/RN)*Y9)      :REM*55
32Ø BANKØ:@DRAW,X,Y,XE,YE,1:BANK1  :REM*225
33Ø FORP=1TO8:READM(P):NEXTP:BANKØ:REM*253
34Ø @PAINT,XC,YC,1,M(1),M(2),M(3),M(4),M(5
    ),M(6),M(7),M(8)               :REM*249
35Ø @BOX,XD,YD,XA,YA,1:BANK1:XF=XD+1:YF=YD
    +1:BANKØ                       :REM*1Ø3
36Ø @PAINT,XF,YF,1,M(1),M(2),M(3),M(4),M(5
    ),M(6),M(7),M(8)               :REM*213
37Ø @CHAR,53248,XD,18Ø,1,1,C$(I)   :REM*155
38Ø BANK1:XD=XA+V:NEXTI:GETKEY A$  :REM*127
39Ø REM{3 SPACEs}@HCOPY,2,5        :REM*223
4ØØ @TEXT:HELP:PRINTCHR$(27)"S":PRINTCHR$(
    27)"F"                         :REM*51
41Ø REM FILL PATTERNS FOLLOW...    :REM*39
42Ø DATA255,255,255,255,255,255,255,255, 1
    28,192,224,24Ø,248,252,254,255:REM*137
43Ø DATAØ24,Ø24,Ø24,255,255,Ø24,Ø24,Ø24, 2
    31,231,231,ØØØ,ØØØ,231,231,231:REM*213
44Ø DATAØØØ,ØØØ,ØØØ,ØØØ,Ø85,17Ø,Ø85,17Ø, 1
    7Ø,Ø85,17Ø,Ø85,17Ø,Ø85,17Ø,Ø85 :REM*15
45Ø DATA129,195,1Ø2,Ø6Ø,Ø24,Ø6Ø,1Ø2,195, 2
    Ø4,2Ø4,2Ø4,2Ø4,2Ø4,2Ø4,2Ø4,2Ø4:REM*183
46Ø DATA254,252,248,24Ø,224,192,128,ØØØ, Ø
    8Ø,16Ø,Ø8Ø,16Ø,Ø8Ø,16Ø,Ø8Ø,16Ø:REM*111
47Ø DATAØØ3,ØØ6,Ø12,Ø24,Ø48,Ø96,192,128, 2
    55,255,ØØØ,ØØØ,255,255,ØØØ,ØØØ :REM*97
48Ø DATA252,249,243,231,2Ø7,159,Ø63,127, Ø
    24,Ø6Ø,126,255,255,126,Ø6Ø,Ø24:REM*159
49Ø DATAØØ1,ØØ3,ØØ7,Ø15,Ø31,Ø63,127,255, 1
    26,Ø6Ø,153,195,231,195,153,Ø6Ø :REM*61
5ØØ DATA127,Ø63,Ø31,Ø15,ØØ7,ØØ3,ØØ1,ØØØ, 1
    92,Ø96,Ø48,Ø24,Ø12,ØØ6,ØØ3,ØØ1 :REM*65
51Ø DATAØ51,153,2Ø4,1Ø2,Ø51,153,2Ø4,23Ø, Ø
    63,159,2Ø7,231,243,249,252,254 :REM*71
52Ø DATA255,255,255,255,ØØØ,ØØØ,ØØØ,ØØØ, 2
    Ø4,153,Ø51,1Ø2,2Ø4,153,Ø51,1Ø3:REM*46■
```


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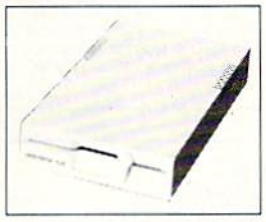

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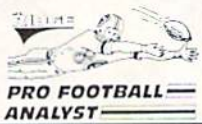

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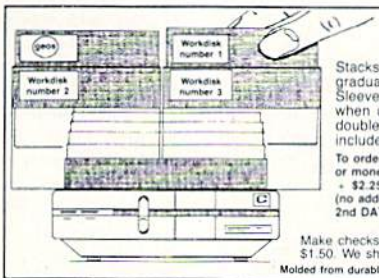

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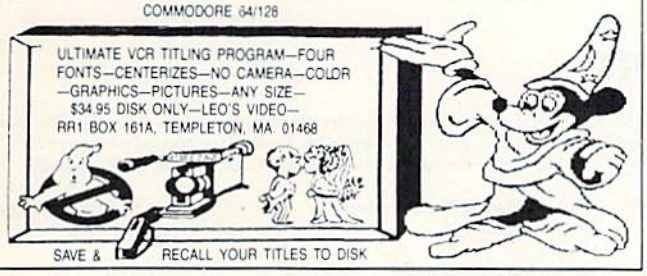

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