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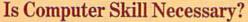


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| D E P A | R T M E N T S |
| RUNNING RUMINATIONS Remembering the past: a loo | 8 |
| | s and tips for performing Commodore com- |
| | rts |
| MAIL RUN | 20 |
| SOFTWARE GALLERY Reviews of: | 24 |
| Basic 8.0 WordPro 64 with | Stickybear Math 2 and Stickybear Reading Comprehension |

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| RUN's column for users of the GEOS operating system. This month: using Commodore's 1351 mouse, Berkeley's geoPrint Cable and the Tymac Connection with GEOS. | 82 |
|--|-------|
| *EASY APPLICATIONS by Michael Browssard Short but useful applications for your Commodore computer. This month: | 84 |
| a super sorting program for string and numeric arrays. | |
| TELECOMPUTING WORKSHOP by David Bradley | 90 |
| Advice and answers to your questions on modems, terminal programs, bulletin boards, and more. | |
| RESOURCE CENTER by Margaret Morabito | 94 |
| RUN's column on Commodores and education. This month: answers to reader questions and directories of the Resource Center Education Disks. | |
| HARDWARE GALLERY | 98 |
| Double Quick Brown Box Blowup | |
| LEARN TO WALK BEFORE YOU RUN | 101 |
| COMMODORE CLINIC by Jim Strasma | 102 |
| HOW TO TYPE RUN LISTINGS Using RUN's Perfect Typist checksum programs. | 119 |
| MEGA-MAGIC by Richard De A'Morelli | 126 |
| COMING ATTRACTIONS | 128 |
| LIST OF ADVERTISERS | 128 |
| *THIS ARTICLE CONTAINS A PROGRAM LISTING. THE PROGRAM IS ALSO AVAILABLE O NOVEMBER-DECEMBER 1987 RERUN DISK. SEE PAGE 96 FOR DETAILS. | N THE |

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Remembering the Past: A Look at PET User Notes.

GLORY DAYS

Although its roots are buried well in the past, the microcomputing industry began just ten short years ago. Most of us were not there at the outset, but each of us has a story to tell about how he became involved with microcomputers.

A decade ago, the two Steves-Wozniak and Jobs-were marketing their Apple II computer, Tandy had introduced its TRS-80 Model I, and 2001 (the computer, not the movie) was Commodore's entrant in the microcomputer market race.

The PET 2001 was announced in May 1977, and delivery of the product started in September of that year.

I recently uncovered a collection (courtesy of David St. John of High Springs, FL) of PET User Notes, which chronicles the travails and triumphs of those early PET owners.

While computer magazines of that time featured articles about the PET, PET User Notes, which premiered in November 1977, was the first publication dedicated to this machine.

Spearheaded by Gene Beals, a fulltime employee at A B Computers in Montgomeryville, PA (a distributor of early PET computers), PET User Notes was a bimonthly publication of the PET User Group and available to nonmembers for \$5 a year.

Although the early issues were mostly written by Beals, User Notes featured articles by other PET users. Most notably, Dan Fylstra, who later introduced the microcomputing world to VisiCalc, and Jim Butterfield, who, through his articles and programs, did (and still does) much to promote Commodore computing.

Most of the articles published in the first issues were tutorial, explaining how to use and program the machine. For example, "CHAINING, or How To RUN Programs Too Large For Your Memory" by Dan Fylstra, "Using the PET's 8 Bit Parallel I/O Port" by Dan Fylstra, "PET Cassette File Usage" by Gene Beals and "PET's FOR-NEXT Loops, Arrays, and a Simple Sort Program" by Jim Butterfield.

The issues also contained program listings and played a very important role as a software exchange for PET users.

The concerns and interests facing these early users bear some resemblance to problems computerists face

-procuring software and hardware. There were a handful of software developers, including Commodore, who were encouraging authors to submit PET programs (on cassette, of course). Commodore was slow to market hardware support for the PET, but they eventually released peripherals such as printers, single- and double-disk drives and memory expansion. Commodore also later came out with 16K and 32K models of the PET.

—lack of documentation. Manuals were sketchy, and readers were starving for information on how to take advantage of their new machines. The PET came with an initial nine-page manual, which was replaced by a 38-page "temporary" manual. Then Commodore introduced a "new and improved" 50-page manual, with promises of a "real" manual. Supposedly, Chuck Peddle, the designer of the PET, left Commodore without finishing the PET manual.

The original PET computers were constructed with a metal case, and two versions were available-the PET 4K for \$595 and the PET 8K for \$795. Doit-yourselfers-by adding a jumper and RAM chips-could upgrade their 4K machines to 8K at a cost of less than the \$200 difference. However, most people were apparently willing to pay more for the installed additional 4K.

The computer came with a nine-inch black-and-white monitor (25 x 40 display), which featured good resolution, and the infamous square keyboard layout. Owners, particularly touch-typists, had a difficult time with this keyboard because the keys were lined up directly under one another-not offset as they are on a typewriter. (Subsequent PET units featured a full-size, standard keyboard.) User Notes also reported that keytop surfaces wore off on the more heavily used keys. At least one thirdparty developer offered frustrated users an alternate keyboard to overcome these shortcomings. However, one nice feature of the PET keyboard was its numeric keypad.

The early marketing thrust of Commodore was toward users to develop software for the machines and "to educational institutions where the PET will receive large exposure." It was also thought that the PET would play an important role in the business community, while, in these early days, little attention was given to the potential for the home market. Purchasers could order machines either directly from Commodore (located in Palo Alto, CA, at the time) or from dealers.

While PET (which stood for Personal Electronic Transactor) was a cute name for a computer, writers-in ads and article headlines-took every liberty with the word: "House-Break Your PET," "Tame Your PET," "Tricks To Help Train Your PET," or, my favorite, "Teaching Your PET to Bark."

PET User Notes may have been the first, but other PET-specific publications soon followed. The PET Paper, which was later incorporated into the now defunct Midnight Software Gazette, started in May '78. The name was quickly changed to simply The Paper upon Commodore's insistence that the word PET is proprietary. Note that both PET User Notes and, later, PET Gazette were obviously not as compliant to Commodore's request and used the PET name with impunity.

As they do today, those early user groups and publications played a comforting role in nurturing the microcomputer market. They were a valuable source of information, programs and, yes, reassurance for those somewhat adventurous, although easily frustrated, pioneers who walked the microcom-

puting frontier.

Lannia Busso

Dennis Brisson Editor-in-Chief



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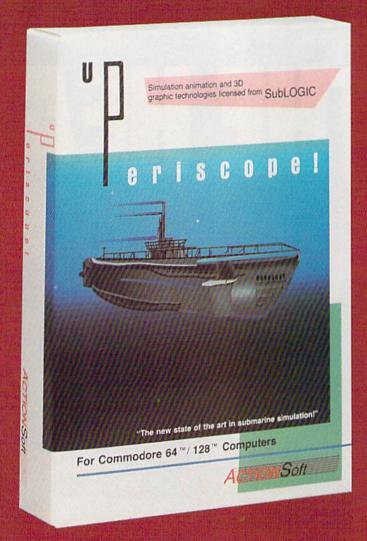
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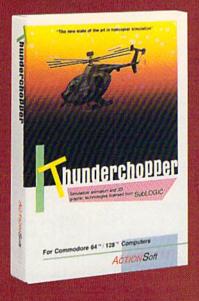
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Compiled by JIM BORDEN

\$43C C-128 DIRECTORY NAME ARRAY

I liked C-64 Directory Name Array (July 1987) so much that I wrote this version for the C-128. In the process, I added a variable, F, for pattern matching.

- 5 REM C128 DIR READ-JON R CURTIS
- 1Ø FORI=3Ø72TO3279:READX\$:X=DEC(X\$):POKEI, X:T=T+X:NEXT
- 15 IFT <> 28 Ø 41 THEN PRINT "DATA ERR. ": END
- 2Ø POKE58,243:CLR:F\$="\$":X=LEN(F\$)
- 25 FORI=1TOX:POKEI+3282,ASC(MID\$(F\$,I)):NE
 XT:POKE3082,X
- 3Ø DATA 169,14,162,8,160,0,32,186,255,169, 1,162,211,160,12,32,189,255,32,192
- 35 DATA 255,162,14,32,198,255,160,0,140,21 0,12,132,250,140,209,12,165,50,133
- 4Ø DATA 254,24,165,49,105,7,144,2,230,254, 133,253,169,0,133,251,169,243,133,252
- 45 DATA 16Ø,1,32,2Ø7,255,166,144,24Ø,13,32,2Ø4,255,169,14,32,195,255,174,2Ø9,12
- 5Ø DATA 202,96,192,6,144,54,201,34,208,10,
- 173,210,12,73,1,141,210,12,16,40,174
 55 DATA 210,12,208,39,192,32,208,31,169,25
 3,141,185,2,165,250,162,1,160,0,32
- 6Ø DATA 119,255,132,25Ø,136,24,165,253,1Ø5,3,144,2,23Ø,254,133,253,76,192,12
- 65 DATA 200,76,61,12,140,208,12,160,0,162, 251,142,185,2,162,1,32,119,255,165

- 7Ø DATA 25Ø,2Ø8,25,16Ø,1,165,251,162,253,1 42,185,2,162,1,32,119,255,2ØØ,165,252
- 75 DATA 162,1,32,119,255,238,209,12,230,25 0,172,208,12,230,251,208,2,230,252
- 8Ø DATA 192,255,24Ø,3,76,1Ø4,12,2ØØ,24Ø,24
- 85:
- 9Ø DIMA\$(145):SYS3Ø72:RREG,N
- 95 FORI=1TON: PRINTA\$(I): NEXT

As with the C-64 version, the array that stores the directory must be the first array dimensioned. In my demo, A\$(0) contains the disk name, with the filenames starting in A\$(1). The number of filenames is passed to Basic with the RREG,N command. Be sure to use a comma before the variable.

-JON R. CURTIS, CENTRAL POINT, OR

\$43D A BETTER FILENAME

Here's a time-saver that will simplify your disk loads. When you save your files, add a prefix of two characters and a shifted space to the beginning of the filename, keeping the prefix plus filename within the usual 16-character limit.

Here's an example. Save the RUN Script boot program to disk with "WP<shifted space>RUNSCRIPT 128". It will appear as "WP"RUNSCRIPT 128 in the directory. As far as the disk is concerned, the file is named WP and can be loaded with LOAD "WP",8. Try it with several programs.

—ERIC PEDERSEN, APO, NY ▶

TRICK OF THE MONTH

\$43E C-64 BSAVE COMMAND

I frequently need to save parts of memory on the C-64, so I wrote the program below to add a BSave-type command to the 64.

- 5 REM MEMORY SAVER-HAZEM JAUNI
- 1 Ø REM SYNTAX=!"NAME", START ADR, END ADR+1
- 15 FOR N=51200T051330:READQ:POKEN,Q:C=C+Q
- 20 NEXT: IFC <> 16574THENPRINT"ERROR!": END
- 25 DATA 120,169,13,160,200,141,8,3,140, 9,3,88,96,120,160,1,177,122,201,33
- 3Ø DATA 2Ø8,77,32,115,Ø,32,115,Ø,2Ø1,34,2Ø8,67,16Ø,1,177,122,24Ø,61,2Ø1,34
- 35 DATA 240,12,201,44,240,53,153,239,20 0,200,192,17,208,236,152,56,101,122
- 40 DATA 133,122,169,0,101,123,133,123,1

- 36,152,162,240,160,200,32,189,255
- 45 DATA 169,2,162,8,160,1,32,186,255,32 ,253,174,32,103,200,169,250,32,216
- 5Ø DATA 255,88,76,174,167,88,76,228,167,32,138,173,32,247,183,32,253,174
- 55 DATA 165,2Ø,133,25Ø,165,21,133,251,3 2,138,173,32,247,183,166,2Ø,164,21
- 6Ø SYS512ØØ:NEW : DATA 96

If you want to use this routine to save memory to tape, add the following line to the listing:

25 POKE 51278,1

The syntax for the new command is !<filename>,<start address>,<end address> + 1.

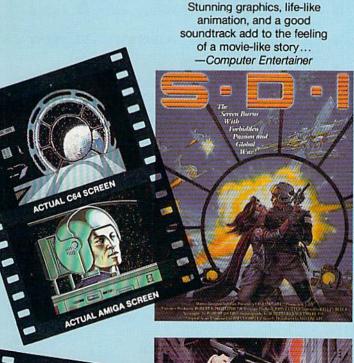
—HAZEM JAUNI, E. JERUSALEM, ISRAEL



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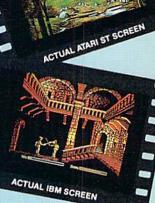
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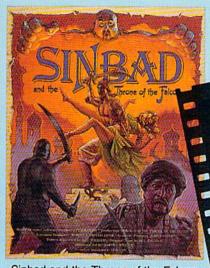




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\$43F Variable Tabs for Any Printer

Tabs don't print out in hard copy the same way they appear on the screen. The following program will show how to align columns at the right or the left to get the tabs to print out right. It will work with any printer and computer.

- 10 REM PRINTER COLUMNS-GEORGE VOGLER
- 20 OPEN4,4:H=20:REM COL WIDTH
- 3Ø FORI=1TO8:READ DA\$:HT=H-LEN(DA\$)
- 4Ø PRINT#4, SPC(HT)DA\$SPC(H)DA\$SPC(HT)"."
- 5Ø NEXT: PRINT#4: CLOSE4
- 6Ø DATA 2,1ØØ,2ØØ2,393939,55,5335,8,4321

The program prints four columns of data. The first column is left-justified, the second is blank, the third is right-justified, with the cursor ready for the fourth. The fourth column contains just a period to show that it's properly aligned.

—GEORGE W. VOLGER, HOUSTON, TX

\$440 64 INPUT WITH SOUND

This Get routine disables the cursor keys and other nonprinting keys and produces a soft beeping sound as each character is typed in.

- 9Ø REM INPUT WITH SOUND EFFECTS-JOSEPH R. CHARNETSKI
- 100 R=54272:FORJ=RTOR+23:POKEJ, 0:NEXT
- 11Ø POKER+5,28:POKER+24,15:PRINT"{SHFT CLR
 }
- 120 PRINT"[PROMPT HERE] ";
- 13Ø PRINT"{CTRL 9} {CRSR LF}{CTRL Ø}";
- 14Ø GETA\$: IFA\$=""GOTO14Ø
- 15Ø IFA\$=CHR\$(13)THENPOKER+1,32:POKER+4,21 :PRINT" ":POKER+4,2Ø:GOTO22Ø
- 16Ø IFA\$=CHR\$(2Ø)ANDLEN(C\$)THENC\$=LEFT\$(C\$, LEN(C\$)-1):GOTO19Ø
- 17Ø IFA\$<CHR\$(32)ORA\$>CHR\$(127)ANDA\$<CHR\$(16Ø)GOTO14Ø
- 18Ø C\$=C\$+A\$
- 19Ø POKER+1,28:POKER+4,17:PRINTA\$;
- 200 IFA\$=CHR\$(34)THENPOKE212,0
- 21Ø POKER+4,16:GOTO13Ø
- 220 REM CONTINUE HERE...

—JOSEPH R. CHARNETSKI, DALLAS, PA

\$441 PROTECT YOUR ML

Commodore 128 programmers who use the Graphic1: Graphic5 commands to relocate the start of Basic to \$4000 to open up a large area in shared RAM (\$1300-\$3FFF) may be placing their programs in jeopardy!

Here's why: The Graphic5 command doesn't clear location \$D8 as Graphic0 does. \$D8 must be cleared to send text to the current screen, using the CHAR command, rather than to the bit-mapped screen where your code is stored. If the byte isn't cleared, CHAR will print the text over your ML code!

Always issue a Graphic0 command prior to Graphic5, or store a 0 in location \$D8 (216 decimal).

-BOB KODADEK, ASTON, PA

\$442 CUSTOMIZER PROGRAM

Here's a program I use to automatically customize my C-128 in either C-128 or C-64 mode. It will also load a menu

program for you, remind you what computer you're using when you're in 40-Column mode and display the function keys at the bottom of the 128 screen. (You should change these to match your own definitions.) If you use a C-64 only, eliminate the If statement at the end of line 40. You don't need to enter lines 90-140.

- 10 REM C-64/128 CUSTOMIZER-BOB KNIBB
- 20 M\$="DO YOU WISH TO SEE A MENU (Y/N) {CT RL 0}?"
- 3Ø POKE5328Ø,Ø:POKE53281,Ø:PRINTCHR\$(142)"
 {2 HOMEs}{SHFT CLR}";
- 4Ø FORS=55333T055335:POKES,1:NEXT:IF FRE(Ø) <>FRE(1)THEN9Ø
- 5Ø POKE646,7:POKE1Ø62,54:POKE1Ø63,52:PRINT
 "{CRSR DN}"M\$;
- 6Ø GETA\$: IFA\$=""THEN6Ø
- 7Ø PRINT" {CRSR LF}"A\$: IFA\$="N"THEN NEW
- 8Ø POKE46, PEEK(44)+8:CLR:LOAD"MENU64",8
- 9Ø KEY1,"DATA ":KEY4,"PRINT":KEY8,"RENUMBE R"+CHR\$(13):COLOR5,15:POKE235,22
- 100 IFPEEK(215)THENFAST:COLOR6,1:PRINT:L=4
 :GOSUB130:WINDOW0,0,79,23:GOTO120
- 11Ø POKE1Ø61,49:POKE1Ø62,5Ø:POKE1Ø63,56:GO SUB13Ø:GOSUB13Ø:WINDOWØ,1,39,22
- 12Ø COLOR4,8:PRINTM\$:GETKEYA\$:PRINT"{SHFT CLR}":IFA\$="Y"THENRUN"MENU128":ELSE NE
- 13Ø PRINT:FORI=1TOL+4:READF\$,K\$:PRINT"{CTR L 9}"F\$"{CTRL Ø} "K\$"{2 SPACES}";:NEXT :RETURN
- 14Ø DATA F1,DATA,F2,LOAD,F3,DIREC,F4,PRINT
 ,F5,SAVE,F6,RUN ,F7,LIST ,F8,RENUM

-BOB KNIBB, WALKERSVILLE, MD

\$443 ML MEMORY TRANSFER

Transferring large blocks of memory on the C-64 sometimes seems to take an eternity. Machine language routines can transfer them quickly, but why reinvent the wheel? Use the built-in Basic ROM routine at \$A3EC (41964). This routine will copy the character set (2K of memory), for example, in less than a second.

You must provide a starting and ending address for the area to be copied and a new starting address to copy it to. These addresses are entered in lines 50 and 80 of the program below. This program demonstrates the transfer command by copying the character set (uppercase/graphics only), and it customizes the character set with an underlined cursor. The subroutine at line 120 calculates the addresses required and does the actual transfer.

- 10 REM MEMORY XFER-ROBERT B COOK
- 20 REM -XFER CHAR ROM-
- 3Ø POKE52,56:POKE55, Ø:POKE56,56:CLR
- 40 POKE56334, 0: POKE1, 51
- 5Ø SA=53248:EA=55296:NS=14336:GOSUB12Ø
- 60 POKE1,55:POKE56334,1:POKE53272,30
- 70 REM -REV TO U.LINE-
- 8Ø SA=14336:EA=15359:NS=1536Ø:GOSUB12Ø
- 9Ø FORI=15367T01639ØSTEP8:POKEI,255:NEXT
- 100 END
- 110 REM -TRANSFER MEMORY SUB-
- 120 EA=EA+1:L=EA-SA:NE=L+NS

MAGIC

13Ø X=INT(L/256):Y=L-256*X

14Ø A=INT((NE-Y)/256):B=NE-256*A-Y

15Ø C=INT((EA-Y)/256):D=EA-256*C-Y

16Ø POKE781, X+1: POKE782, Y

17Ø POKE88, B+1: POKE89, A

18Ø POKE9Ø, D+1: POKE91, C

190 SYS41964: RETURN

-ROBERT B. COOK, BRAINTREE, MA

7Ø GETA\$:IFA\$>""OR F=Ø THENC=C+1:IFC=16THE NC=Ø:FORJ=1TO2ØØ:NEXT

8Ø IFA\$="{HOME}"GOTO2Ø

9Ø IFX>39THENX=Ø

100 IFY>24THENY=0

11Ø IFX < ØTHENX=39

12Ø IFY<ØTHENY=24

13Ø POKE1Ø24+X+4Ø*Y,81:POKE55296+X+4Ø*Y,C

14Ø GOTO3Ø

-ADAM MILLER, BRANDON, SD

\$444 Lo-Res Draw Program

My program lets you make simple drawings on the C-64's 40-column screen, and it's easy enough for a child to use. Use a joystick in port 2 to control the cursor. The fire-button, or any key except home, changes the colors. Change the color to black to erase the drawing. Use the home key to clear the screen and start a new picture.

- 10 REM LO-RES DRAW ADAM MILLER
- 2Ø POKE53281, Ø:POKE5328Ø, Ø:C=1:X=Ø:Y=Ø:PRI NT"{SHFT CLR}"
- 3Ø J=PEEK(5632Ø):F=JAND16:J=15-(JAND15):IF
 J=10RJ=50RJ=9THENY=Y-1
- 4Ø IFJ=2ORJ=6ORJ=1ØTHENY=Y+1
- 5Ø IFJ=4ORJ=5ORJ=6THENX=X-1
- 6Ø IFJ=80RJ=90RJ=1ØTHENX=X+1

\$445 C-128 SPRITE REDUCTION

The following program produces seven consecutive reductions of any sprite you design, to give the illusion that the object is moving away. The program will ask for the sprite number of the sprite you want to reduce. Be sure that any other sprites are saved, since the new ones will be stored in the sprite area. After the reduction is complete, the sprites will be displayed on the screen for you to view.

- 10 REM SPRITE REDUCER-MARCO HAGELSIEB
- 2Ø INPUT "{SHFT CLR}{4 CRSR DNS} SPRITE NU MBER (1-8)";SN:IFSN<1ORSN>8THEN2Ø
- 3Ø COLOR Ø,7:COLOR4,7:COLOR1,8:GRAPHIC1,1:

Continued on p. 120.

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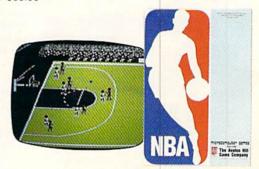
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Check Reader Service number 410.

BACK IN TIME

REDWOOD CITY, CA—Epyx (PO Box 8020, Redwood City, CA 94063) has released Create a Calendar, a program that creates a variety of personal calendars for home, school or business use. The calendar can include a variety of text, graphics and borders; graphics for birthdays, dental appointments, haircuts, jury duty, New Year's Day and

Have fun keeping track of important dates with Create a Calendar from Epyx. Mother's Day. Graphics from Epyx's Graphics Scrapbook collection and other graphics disks compatible with The Print Shop can also be incorporated into the design. You can produce daily, weekly, monthly and annual calendars in sizes ranging from letters to a six-page horizontal annual banner. Create a Calendar is available for the C-64 for \$29.95.

Check Reader Service number 403.

BACK TO KEROVNIA

RAHWAY, NJ—The Guild of Thieves, the illustrated adventure sequel to The Pawn, takes place in the mythical kingdom of Kerovnia. The adventure combines dialogue, graphics, humor and puzzles. A 40-page novella, a Bank of Kerovnia credit card, an Indenture and Contract of Service Certificate, dice and play guide are also included in the package. It's available for the C-64 for \$39.95 from Firebird, PO Box 49, Ramsey, NJ 07446.

Check Reader Service number 404.

SLAY THE BLACK KNIGHT

CAMPBELL, CA—Set in medieval times, Dark Castle features a hero, controlled by the players, who must fight his way through 14 rooms of increasing difficulty against plague-infested rats, attacking bats and a fire-breathing dragon. He must also escape the clutches of the dungeon's torturer and the spells of a diabolical wizard to find and slay the notorious Black Knight. It's available for the C-64 for \$34.95 from Three Sixty, Inc., 2105 S. Bascom Ave., Suite 290, Campbell, CA 95008.

Check Reader Service number 409.

LOCK OR UNLOCK

ENGLEWOOD CLIFFS, NJ—Prentice Hall (Englewood Cliffs, NJ 07632) has released two computer books for popular computers, including the Commodore line.

Computer Cryptology explains how to provide a protective blanket to keep your information from prying eyes. The 300-page softcover, with 83 illustrations, gives methods of disguising your data through encryption and enciphering so that only authorized deciphering can recover the original data. \$21.95.

Keys to Solving Computer Adventure Games has clues for all-text and for graphics/text adventures for players who have struggled so long to find the golden key to the dungeon door or to at last pry open the crypt. The 300-page paperback contains 250 illustrations. \$19.95.

Check Reader Service number 413.

GEORGE BUSH BY A LANDSLIDE

MOUNTAIN VIEW, CA—Strategic Simulations (1046 N. Rengstorff Ave., Mountain View, CA 94043) has announced that George Bush won the 1988 U.S. Presidential election with 499 electoral votes to runner-up Senator Albert Gore's (D-KY) 39 votes. Popular vote percentages were also highly skewed in Bush's favor, 55 percent to 45 percent. Observers termed the victory "a landslide."

SSI, maker of strategy war games for the C-64, used its computer-simulated election game, President Elect—1988 Edition, to conduct the race for President at a charity gaming event in the SSI suite at the Consumer Electronics Show in Chicago last June. The game allows players to simulate any election from 1960 to 1988, using actual figures from a large roster of historical or present-day candidates.

1991 PC

DALLAS—The editors of the Computer Industry Almanac, a 780-page reference volume for the computer industry, have taken a look ahead to describe the capabilities of typical personal computer systems in the \$1000-\$3000 range in 1991.

The Almanac editors say that the \$3000 office system in 1991 will have ten times the computing power, 12 times the main memory and nearly 100 times the mass storage capability of today's typical personal computer, plus a high-speed mo-

Infocom's
Plundered Hearts,
a romance
adventure set on
the high seas, is
specifically aimed
at women.

dem and a built-in local area network interface to allow communication with colleagues and independent electronic information sources.

The \$1000 system will be a scaled-down version of today's office PC, with CD ROM for entertainment and recreation applications. It will have a 32-bit microprocessor, four megabytes of main memory, one 3½-inch floppy disk, a color display, one CD ROM drive and a letter-quality or near-letter-quality printer. Its performance will be between one and one-and-a-half million instructions per second.

MAKIN' BACON

COLORADO SPRINGS—Investment Simulation, for the C-64 and C-128, computes the internal and equity rates of return, present net worth, life-cycle costs and capitalized present value. The focus of the program is on limited equity investments and leveraging. A 51-page handbook is included. Available for \$36 from Pyxis Software, PO Box 18016, Colorado Springs, CO 80935.

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THE KEY TO WRITE PROTECTION

LYONS, CO—The DisKey, a plastic key that takes the place of write-protect tabs, snaps into place in the left side of your disk drive opening, above the floppy disk. It can be inserted any time after the disk is in place and only one key is needed for all your disks. DisKey fits most 5½-inch disks and drives and is available from CroResearch (PO Box 129, Lyons, CO 80540) for \$2.98.

Check Reader Service number 408.

BUYING SOFTWARE FOR TOTS?

YPSILANTI—The 1987 Survey of Early Childhood Software rates 229 early childhood (for ages 3-6) programs published by popular software companies, including Commodore. A brief description and equipment requirements, cost and how to order are included for each pro-

gram. Listings are keyed to eight major curriculum areas to match the software to curriculum goals for your child. The catalog rates each program according to user friendliness, content, technical features, menu design, ease of use, reinforcement and other criteria. Order it from High/Scope Press, 600 N. River St., Ypsilanti, MI 48198 for \$20.

Check Reader Service number 402.

WHAT ARE YOU EATING?

MUSTANG, OK—Diet Analysis monitors your daily intake of food and drink, tracking 25 nutrients and eight amino acids to find the nutrient deficiencies in your diet pattern. Also included in the package are the Nutrient Finder program, which prints out the nutrition contents of foods you select, and Change or Add, which lets you remove, change or add records to fit your needs. Diet Analysis has data of 500 food and drink items and 165 available records for you to add new records. Available for the C-64 for \$29.95. Diet, PO Box 649120, Mustang, OK 73064.

Check Reader Service number 411.

CAN YOU DEFEAT THE RUSSIANS?

McALLEN, TX-Borodino: 1812, Napoleon in Russia, gives you the chance to accomplish what Napoleon Bonaparte could not: conquer Russia. The game covers the entire three days of the bloody battle. Eight historical and whatif scenarios take 15-20 minutes to complete, and the complete battle requires over four hours to finish. The joystickcontrolled system lets you control infantry lines, column formations and infantry stacking. You play Napoleon and the computer plays the Russians, or you can use the two-player option, which includes instructions for playing by mail. There are three levels of play, with Fatigue and Morale options. It's available for the C-64 for \$59.95 from Krentek Software, 5401 N. 10th, Suite 214, Mc-Allen, TX 78504.

Check Reader Service number 412.

DAMSEL IN DISTRESS

CAMBRIDGE—Your decisions determine your fate in Plundered Hearts, the first entry in the romance genre for Infocom (125 CambridgePark Drive, Cambridge, MA 02140). As heroine aboard the *Helena Louise*, you find adventure at every turn as you sail to your ailing father's side. But things are not as they seem. Scheming and deception abound. A damsel in distress could easily end up in Davey Jones' locker. It's available for the C-64 for \$34.95.

Check Reader Service number 405.

SET YOUR COMPUTER FREE

ENGLEWOOD, CO—Image Technology (8150 South Akron St., Suite 405, Englewood, CO 80112) offers a large-capacity print buffer that mounts inside your Epson printer. With it, you can transfer data to the printer at computer speed so you can use your printer without waiting. It's available in 256K (\$133) and 512K (\$157) sizes.

Check Reader Service number 400.

CAD-64/128

POCAHONTAS, AR—Weaselgraphics (606 Thomasville Rd., Pocahontas, AR 72455) has released several CAD disks for the C-64 and C-128 for \$20 each.

With the programs, hobbyists and engineers with technical background can design professional oscillators, amplifiers, power supplies, filters, impedancematching circuits and lay out circuit boards. In addition, the hobbyist can specify drift over exact temperature ranges the circuit will be used in, and the technician can replace tube circuits with solid state circuits. The programs can be used to design new devices, modify old ones and assist in making repairs.

Check Reader Service number 401. ■

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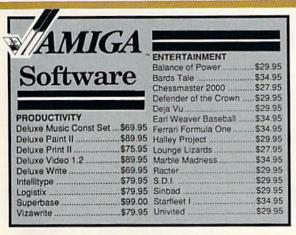
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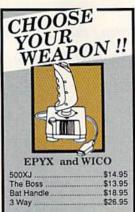
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MAIL RUN

This month: an end to confusion on getting the NLQ Chip, a request for software for the physically disabled, and more.

ESP NEEDED

I'm writing this letter to clear up any difficulty RUN readers may be having in reaching ESP Corporation about the NLQ Chip reviewed in last March's issue. The Chip module improves the typeface on Gemini 10X, 15X and Delta 10/15 printers.

In September of 1986, the company, which is officially called ESP Rollshutter Corporation, moved from 7900 Tamiami Trail, Sarasota, FL, to Village Green Parkway, Bradenton, FL. When the RUN review appeared, it gave our old Sarasota address and phone number. Further complicating matters, there's another ESP Corporation in Sarasota, so people calling telephone information are given their number instead of ESP Rollshutter's. The review also generated a flood of inquiries and orders, and the owner, Hans Roth, contracted my secretarial services to help out.

We're sorry that many RUN readers have been inconvenienced because of our move and the fact that there's another ESP in Sarasota.

—KAREN J. RITTER
ESP ROLLSHUTTER CORPORATION
501 VILLAGE GREEN PARKWAY
BRADENTON, FL 33529
813-794-3876

We're also sorry that an incorrect address and phone number appeared in our pages, and we thank Ms. Ritter for clearing up this confusing situation.

—EDITORS

SOFTWARE FOR THE DISABLED?

I have multiple sclerosis and encounter a number of problems that make using a computer difficult. The problems include fatigue, tremor and spasms in my hands and visual disturbances. If you know of any sources of programs, especially public domain programs, that make using a Commodore easier for the physically handicapped, please let me know. Also, I know there are voice mod-

ules and light pens available to aid in entering information, but how about a magnification screen, similar to an antiglare screen, for reading output on the monitor?

> —CATHERINE S. FIRMIN 3003 LOUISIANA AVE. LAKE CHARLES, LA 70601

In last February's issue of RUN, the Resource Center column was devoted to this subject. It specifically described the work of Don Peterson, a retired electronics engineer who's devoting his "second career" to developing C-64 and VIC-20 software and input and output devices for the handicapped. Don will send you his disks for only \$3 each, and he's donated the programs to QuantumLink for downloading. His address is 2645 E. Southern, A326, Tempe, AZ 85282, or you can call him at 602-831-3519. See also "The Speech-Controlled 64," by Kent Patterson, in the June '87 issue of RUN.

You might also contact distributors of public domain software—both user's groups and commercial enterprises. RUN has published lists of such distributors in the past and hopes to include an expanded and updated list in an upcoming issue. We encourage purveyors of public domain software to send us their names and addresses, and to mention specifically if they have programs for the handicapped.

As for a magnifying screen overlay, does anyone know of such a device?

-EDITORS

PLAYING GAMES WITH THE C-128

The C-128 has the power to be a great game machine, as well as a productivity machine. At first, I thought 80-column hi-res graphics wouldn't be possible on the 128, but *RUN*'s Ultra Hi-Res Graphics (February 1986) and Patech Software's Basic 8.0 have changed that.

There are only two C-128-specific games currently available that I know of—Infocom's Trinity and Bureaucracy, both of which are text adventures. Once I saw an Apple II version of Electronic Arts' adventure The Bard's Tale. The

program was designed for 64K, but it also had an option to expand the scenario and landscape if you had 128K.

Why can't publishers do this for the C-128? They couldn't put the enhanced version on the back of the disk, because the 1571 drive has trouble reading the back side. However, they could include it on a separate disk. This attractive feature probably wouldn't price the program out of sight (I expect I'd pay \$5 extra for it), and it would make C-128 owners happier with their purchase.

—MATTHEW WEBSTER KEYMAR, MD

Infocom has certainly made a start, and Access Software recently announced a C-128 version of Echelon. We also understand that a C-128 version of SubLogic's Stealth is in the works, and rumors are circulating that other C-128 games are being developed as well.

-EDITORS

Q-LINK RESERVATIONS

When you recommend QuantumLink to Commodore users, I believe a certain caveat is in order. After joining, if you don't access the network during a calendar month, they still bill you the \$9.95 monthly fee. According to their spokesperson, they consider Q-Link a service, which you pay for whether you use it or not. As I've discovered, the only way to get rid of the monthly charge is to cancel membership.

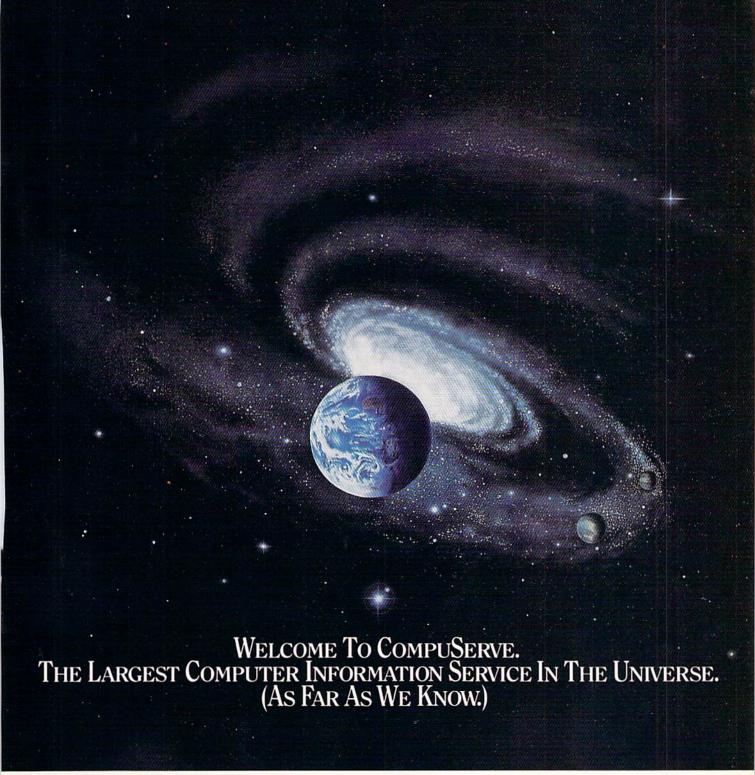
—MICHAEL SCHETTLER RESEDA, CA

We've received other letters this past month pointing out that many of the services offered on Q-Link incur plus time and that Q-Link is slow compared to other online services.

-EDITORS

GEOS QUESTION GOES UNANSWERED

GEOS products have been welcome additions to my software library, but, unfortunately, there are a number of frustrating bugs in them. Berkeley has



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apparently hurried these products to market without complete testing and thorough documentaion.

Even more surprising is their inadequate response when I recently contacted them with a simple formatting question about geoCalc. I was told they couldn't answer the question because the product was still new. If they can't answer questions about how their product operates, how can they expect me to buy more from them?

—KENNETH BUSH INDIANAPOLIS, IN

RUN SCRIPT FEATURES

I must commend Robert Rockefeller and RUN for an excellent product in RUN Script 64. I've tried several word processors and find this one efficient and easy to use. In particular, I'm pleased that it can use all the print options on my NLQ LPrinter, an Epson clone. As an additional bonus, RUN Script 64's Define Macros feature makes defining macros as easy as can be.

—ROBERT FLETCHER ANNANDALE, VA

MORE THAT'S WRITE FOR RUN READERS

Bob Guerra's "What's Write for You?" article about new word processors in last August's issue was enjoyable and interesting. It's good to see people trying to make Commodore programs less stubborn and more versatile—sometimes successfully. The days when you needed to count your word processor's legs to see if it was a computer program or a mule may finally be past.

Some of the programs you reviewed sound pretty good, but others that have been around longer may be better. PaperClip, for instance, offers macros, which none of the "new" programs you reviewed do.

—JOOST VAS DIAS WHITE PLAINS, NY

It's my opinion that Bob Guerra gave poor consideration to Timeworks in his August review of word processors. He reviewed their Word Writer 3 software, which is a C-64 product, instead of Word Writer 128, when many of the other programs were reviewed in their C-128 version. I've used Word Writer 128 for more than six months and have found it to be excellent in the features used for comparison in the review, as well as in spe-

cialty features such as the Thesaurus and Dictionary. Also, it lets me incorporate data from Data Manager 128 and Swiftcalc 128.

—R. J. ARCHAMBAULT PHOENIX, AZ

We asked Bob Guerra to review Word Writer 3, because it's the latest version of the program on the market, and the goal of the article was to cover the latest. However, we're glad you've written to tell other readers about Word Writer 128.

-EDITORS

A CALL TO READERS

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

In last July's Mail RUN column, we intitiated a feature called RUNning Around the World, in which we periodically publish the names and addresses of readers who'd like to correspond with a Commodore user in another state or another country. Since then, we've received letters from more readers, from various countries, who would like computer pen pals. Write to one of the folks below, and you're sure to broaden your horizons.

If you'd like to be listed in RUNning Around the World sometime soon, drop a line to Mail RUN. Make sure your name and address are readable, and mention the machines and computing activities you're particularly interested in.

Canada:

Lucien Gravelle PO Box 373 Lazo, BC Canada V0R 2K0 C-64; telecommunications

Lee Brian Hutchison 846 Clifton St. Winnipeg, MB Canada R3G 2Y1

Malaysia:

Calvin Cheah PO Box 1032 Penang 10840 Malaysia C-64, C-128; CP/M

Mexico:

Esteban Quijaro B.
Barcazas #115
Fracc: Jose Colomo
86100. Villahermosa, Tabasco
Mexico
C-128; programming, games



TAMAR

United States:

Linda Nelsen 9599 Brayton Drive #500 Anchorage, AK 99507 C-64, C-128; word processing to games

Judah D. Hill 549 E. McKellips Rd. #89 Mesa, AZ 85203 C-128; public domain software

Sterling Peoples 223 Melrose Circle Tryon, NC 28782 C-64; role-playing games

Leonard Arnold Route 1, Box 33 Gladstone, VA 24553 C-64; games, programming, telecommunications



SOFTWARE GALLERY

This month, we have graphics programs to tickle the creative funny bones of young and old alike, educational software for the elementary set and etiquette software for the adult social set!

Compiled by BETH S. JALA

BASIC 8.0 A

This New Graphics Language Taps the Potential Of Your C-128!

Basic 8.0 is a graphic illustration of the fact that the C-128 really can be programmed to run high-resolution color displays on its 80-column screen. Adding 53 commands to the C-128's built-in programming language, Basic 8.0 provides your computer with what the developers call "the most powerful and productive graphics system ever developed for an 8-bit machine." Sound impressive? It is.

It's also especially good news for all those graphics devotees who felt a little cheated to discover that Commodore intended for the C-128 to only display hi-res graphics with the VIC chip, which operates exclusively in 40-Column mode.

Addressing that shortcoming, the same authors of the 80-column monochrome graphics program, Ultra Hi-Res, turned their talents toward making the C-128's powerful 8563 chip easily accessible to Basic programmers.

Without slowing other Basic operations, Basic 8.0 gives you the code that Commodore left out by installing a machine language wedge and a patch in the C-128's syntax error routine. The patch checks for the ampersand (@), which precedes every one of the 53 new commands. If the apparent syntax error begins with an ampersand, it's passed to a separate Basic 8.0 interpreter for processing. This efficient approach doesn't affect the speed at which the C-128's regular interpreter processes Basic commands.

Totally compatible with Basic 7.0, Basic 8.0 lets you program 80-column graphics at a resolution of 640 × 200 pixels, twice that of the C-128's 40-column screen. Basic 8.0 features one monochrome and four different color display modes. All have a bit-mapped density of 640 × 200 screen pixels but vary with regard to color resolution.

The mode you select determines the

size of each color cell—the group of pixels that share the same foreground and background colors. Cells can be as small as 8 × 2 pixels or as large as 8 × 16, with two other sizes in between. Naturally, the smaller cells give the greatest color resolution. In addition, Basic 8.0 lets you display all 16 colors on the screen at the same time, in any of the four color modes.

As you might expect, these high-density screens require a large amount of memory. A single Mode 2 image consisting of 128,000 pixels with 8000 associated bytes of color information requires almost 24K of random access memory for storage. To store these screens, Basic 8.0 doesn't steal space allocated to program memory, expecting instead to find 64K screen memory chips serving the 8563 video display processor. At this writing, only Commodore's 128D machine is delivered to you with 64K of screen RAM already installed.

Since most C-128s were built with only 16K of screen RAM, you might conclude that the great majority of these computers can't handle even a single 80-column hi-res image. That's not the case at all: Basic 8.0 will run just fine on any C-128. You are, however, restricted to creating graphics that will fit within the existing 16K screen mem-

ory. If you elect to upgrade your C-128 to 64K, you'll be able to store multiple 640×200 images in screen RAM as well as create virtual screens that are so large they can't be viewed without scrolling.

While the display capabilities are impressive, they don't even hint at what the entire Basic 8.0 package can do. The single unprotected disk contains three independent modules—the extended programming language, a run-time module and a comprehensive drawing program. In addition, the authors provide utility programs to convert images created with their earlier effort, Ultra Hi-Res, as well as standard 40-column fonts to a format that Basic 8.0 can read.

As a programming language, Basic 8.0's commands introduce entirely new ways of creating, storing and manipulating high-resolution color images on your C-128. The program establishes a graphics system that utilizes structures, a term that applies to almost any pattern, design, font or instructions that you create and store for later use, even within another program.

You can define two-dimensional and color patterns. Under program control, Basic 8.0 will make multi-drawn images by incrementing the height parameter of a structure. You can even use this extended language to enter the world

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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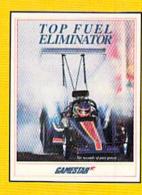
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SOFTWARE GALLERY

of three-dimensional imagery. Basic 8.0 provides an environment within which you can control perspective, rotation, viewing angle, origin and depth of view.

The excellent user's manual explains each new command and offers several sample programs to get you started programming in Basic 8.0. Commands include @Stash, which lets you store several graphic screens in RAM banks 0 and 1; @Scroll, which moves the image in any of eight directions; @Hcopy to send screen graphic displays to your printer; and @Font to assign the character sets available in Text mode.

Other commands that are new include @Windowopen to open a window within which Basic 8.0 can continue to work; @Flash, which reverses the image; and @Zoom to enlarge a previously stored graphic to the screen. The @Scale command even allows for program-controlled compensation for non-symmetrical pixel shapes.

To ensure that a program written in Basic 8.0 will run on any C-128, the authors supply a run-time system that can be given away or even sold by registered Basic 8.0 owners. This means that you are free to share or sell programs created with Basic 8.0 without paying additional fees or royalties. The compiler includes Workbench, a slick graphics interface that autoboots, controls up to four disk drives and lets users easily enter your program(s).

Another part of this package is Basic Paint, a stand-alone drawing program that lets you access a host of drawing functions in any of the five Graphics modes. A wonderful tool for creating screens and patterns that can be used by any Basic 8.0 program, Basic Paint is reason enough to

buy the whole package.

Controlled by mouse or joystick (although I recommend the 1351 mouse), this comprehensive program for painting electronic pictures also takes full advantage of RAM expanders with high-speed screen storage and provides an image lock to prevent accidental erasure of your work. Drawing functions available at the click of a mouse include zoom, cut and paste, erase, freehand draw, lines and fill.

Basic Paint is a fun program that lets you automatically create boxes, circles, ellipses and other polygons that can be integrated with multiple-type fonts of adjustable size and proportion. A grid can be superimposed on the screen as an alignment aid when cutting and pasting.

Incidentally, Basic Paint is the first program I've used that demonstrates "mouse flicker," a problem apparently peculiar to certain 1351 production runs. The screen pointer flickers annoyingly but does not otherwise seem to interfere with program execution.

As mentioned earlier, making full use of the potential of Basic 8.0 requires additional screen memory. Upgrading to 64K requires swapping your machine's 4416 or 4164 RAM chips for a pair of 4464s. This would ordinarily be a simple operation, if it weren't for the fact that these chips are soldered to the computer's circuit board. Instead of simply unplugging the old RAM, you must unsolder the existing chips and replace them with sockets.



Eighty columns, a variety of fonts and so much more at your fingertips with Basic 8.0.

While plugging in the new chips is child's play, the soldering is best left to an experienced technician. Even so, the upgrade shouldn't cost more than \$50. Remember that opening the case of your computer voids the warranty. You might want to wait until the 91st day before you make this change.

Also, since hi-res color graphics have heretofore been restricted to the 40-column screen, many users have been getting along fine with a composite color monitor. Lacking an RGB monitor when Basic 8.0 first arrived in the mail, I was dismayed to discover that I couldn't even see Basic Paint's critical configuration screen when I connected a monochrome monitor to my C-128's 80-column side.

Although the manual doesn't mention it, a simple modification to your 80-column monochrome monitor cable gives you sharp and clear images until you take the plunge and invest in an RGB monitor. Just open the cover of the nine-pin plug and carefully solder a jumper wire between pins six and seven. This adds the intensity signal to the monochrome video signal, allowing the Basic Paint screens to be seen.

My only complaint with Basic 8.0 is

that there's no way to adjust the default settings. Users should be able to change the screen colors of Basic Paint and run it on a monochrome monitor without pulling out the soldering iron. In addition, while the program supports 11 different printers, there's no provision for changing the default printer driver. If you don't have an Epson or Epsoncompatible printer, you'll have to load the appropriate driver every time you run the program.

If you really fall in love with Basic 8.0, you'll be happy to know that the program is also available on a user installable chip (\$19.95) that plugs into the empty socket in your C-128 or 128D.

Sales of Basic 8.0 should be brisk. I suspect a lot of graphics enthusiasts will want Basic 8.0 available every time they turn on their computer. (Distributed by Patech Software, Inc., PO Box 5208, Somerset, NJ 08873; C-128/\$39.95.)

—JOHN PREMACK LEXINGTON, MA

WORDPRO 64 WITH TURBO LOAD AND SAVE B+

For the Serious User, WordPro 64 Offers Many New Features

The WordPro series has been on the market for a number of years. It has stayed competitive because it truly is a sophisticated tool.

If you're serious about learning a word processor and are willing to devote the time and energy to learning how to use this product, then WordPro 64 is for you.

After you insert the cartridge (which works with many other programs) and disk, the WordPro 64 word processor with Spinnaker's new Turbo Load and Save package loads in 17 seconds. The program and corresponding files load and save at five times the normal speed.

The disk comes with the word processor and spell checker on one side and the SpellPro dictionary of 100,000 words on the other. You're encouraged to copy the unprotected disk, but you must have the cartridge in order for the main program to work.

After loading WordPro, you must load a printer module. The program supports 25 different printers. Chances are, yours will work with one of them.

WordPro uses combinations of keys to issue commands and to imbed printer controls in the text. There are some standard codes like "lm" for left margin and some non-standard codes

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like "pp" for page length. A checkmark begins all code lines. All the terms are listed on one page of the manual.

WordPro 64 has all the traditional features of most word processors: margin settings, line spacing, insert, erase, and copy blocks, to name a few. But, WordPro can do much more. For example, you can link text, search and replace in memory or through the linked text, print out in different lettering styles, align columns on your sheet, print in two columns, make form letters and print your own graphics. After saving a completed document, you can swiftly check your spelling from within the main program.

However, there are some shortcomings with WordPro. While the manual is well organized, I found myself searching through the booklet on a number of occasions. Many of the commands and imbedded characters are not easy to remember. Plan to make a cheatsheet

and keep it nearby.

You should expect to take some time to learn WordPro 64. I found several sample disk files to be very helpful in this process. This isn't a child's toy, but a sophisticated package for the serious user. WordPro 64 with Turbo Load and Save is a good value for the money and the package is highly recommended. (Spinnaker Software, One Kendall Square, Cambridge, MA 02139; C-64/\$39.95.)

> -SAUL COHEN AMBLER, PA

TEDDY BEAR.RELS OF FUN A

This Easy-to-Learn Drawing Program Keeps Kids Entertained for Hours

Teddy Bear.rels of Fun is by far the easiest way to draw graphics on your C-64 that I've seen in a long time! It's designed for use as a learning activity, but can also be used by children to easily create their own pictures. This program is excellent for teachers and classroom settings, and should be kept in mind by parents searching for educational, yet fun and entertaining, activities for their

Included with the program is a booklet that contains 100 activity ideas. Suggestions cover creative art, math, logical thinking, language ability, basic science and social studies. In fact, adults will breathe a sigh of relief when setting up teaching aids with this software: Even if you have no artistic ability, you will find that you're able to generate excellent drawings!

The package's two single-sided disks store libraries of sketches for use in your pictures. The artwork is excellent-the sketches are simple, yet colorful and appealing. The colors on the screen are sharp and distinct, and don't run into each other where objects meet. You can overlap objects and the color of the front object will take precedence, which is great for teaching spatial relationships.

The color combinations of the objects are one of the program's outstanding features; there has clearly been a lot of artistic energy put into the manufacture of this program. Different backgrounds and borders are supplied, as well as the ability to insert captions and a choice of eight typefaces.

The user's guide is well written and clearly organized. Each disk is labelled to make getting started simple and easy.

There's a section in the user's guide that illustrates the sketches that are stored in the disk libraries. One quick look and you immediately know which disk and library contains the sketch you want. In fact, the program runs so smoothly and simply that you should have no trouble following the prompts and will only occasionally need the guide for reference.

The drawing procedure begins with choosing a background, then choosing stick-ons that are cut-outs of various objects to be placed on the background and moved around. If you don't like where you put it-erase it! It's simple with just a few keystrokes and clear, wellwritten prompts. Captions can be edited before final placement.

When you're done, you can save your creation to disk or print it out. If you forgot to format a disk before you started, don't worry-the software does it for you from within the program. If you forgot to switch a disk, the program alerts you with a picture of a disk drive and a bell.

Your final picture can be printed as a label, a poster in two sizes or as a picture with or without shading, in case you'd like to have an outline that you can color in later.

If you have a KoalaPad and Koala-Painter, you can combine those drawings with Teddy Bear's sketches. You can also automatically display a series of ten pictures with the electronic slide-show feature. In addition, the software is compatible with Epyx' Fast Load cartridge.

Both adults and children will enjoy this software. While the children are using it, they're having fun and learning at the same time! All in all, a superb

product! (DLM, One DLM Park, Allen, TX 75002; C-64/\$39.95.)

> -EDITH CHASEN WOODHAVEN, NY

RSVP

How Would Your Manners Rate If You Were Invited to Dinner at the White House?

Almost all competitions require certain basic skills. In hockey, skating is essential. In polo, horsemanship is a must. And in the quests for business and social success-the real-life situations that most people actually compete in-acceptable manners are mandatory.

RSVP explores the role and effects of etiquette in a variety of settings. In addition to its basic game scenario, the software offers a practice mode. Its "international" section lists 18 countries as choices. There are also 17 "national" categories, with features ranging from "business meals" and "correspondence" to "parties" and "weekend out."

Approximately 20 multiple-choice questions regarding manners and social behavior are available for each subject. Many questions are very concrete; for example, how snails should be eaten



RSVP presents some competition to Amy Vanderbilt for etiquette rights!

without snail tongs. Others are more subjective and thought-provoking, like what type of recommendation letter is appropriate for a colleague about whom a businessman has mixed feelings. The face of a supposedly well-mannered individual appears on the screen with each question. A change in his or her expression indicates whether the response is correct.

The Game mode offers a selection of eight different career paths. Among

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them are global banking and U.S. journalism and politics. To win, the player must correctly answer a high percentage of questions, including some about characters and situations that were previously encountered. While the program furnishes positive progress reports when the game is going well, it also announces the decline of a career when too many errors are made.

The software does have some minor problems. A few typos cause confusion at times. Also, some players may not agree with the "proper" responses to some of the more abstract questions. In addition, if someone is interested in only a few of the practice categories, he or she will soon know the answers to all of their questions.

However, the program more than makes up for its limitations. Its best feature is its humor. A number of rather odd alternative responses to the multiple-choice questions and some of the facial expressions indicating incorrect answers can be very amusing.

Though RSVP does have educational

value, most players will enjoy it as a pleasant, low-key recreation. It should appeal to individuals who are interested in the way they present themselves in social situations. That audience, of course, could include practically everyone. (Blue Lion Software, 90 Sherman St., Cambridge, MA 02140; C-64/\$29.95.)

—WALT LATOCHA OAK PARK, IL

VIDEO TITLE SHOP; GRAPHICS COMPANION ... C+

Imagine the Titles You Can Create for Those Old Family Movies!

If anything is more popular than home computers it would surely be VCRs. Now you can put your Commodore to work making pictures for your videotapes.

The computer to VCR connection is fairly simple: It can be done in one of

several ways and is no more difficult than connecting an outside antenna.

Video Title Shop is a tool that lets you create one or more video slides or title screens to enhance your home video tapes. Or, can you use it to create attractive displays for your business or civic group. The Graphics Companion disk (sold separately) provides you with 16 pre-drawn backgrounds to ease the creation of individualized screens. Video Title Shop only comes with two backgrounds.

You'll find a 48-page instruction manual to master, plus an addendum and several other inserts. It seems that after printing the manual, Datasoft made some program changes and realized that some items were not clearly explained. Initially, I still found it difficult to maneuver through the program.

But, looking at the features first, Video Title Shop consists of two main portions. The Video Titler section is where the action takes place. Micro-Painter Plus is a drawing program that you can use to create your own back-

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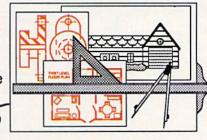
Now anyone can speed up their BASIC programs by 3 to 35 times! Basic-64 and Basic-128 easily convert your programs into fast machine language or speedcode (takes up less space yet protects your programs from prying eyes) or a mixture of both. You can even compile programs written with extensions—Simon's Basic, VICTREE, BASIC 4.0, VideoBasic and others. When the compiler finds an error, it just doesn't stop, but continues to find any other errors as well. Supports overlays and has many other options. 128 version works in FAST mode and allows you to use all 128K of memory. If your program walks or crawls, give it the speed to *RUN!* for C-64 \$39.95

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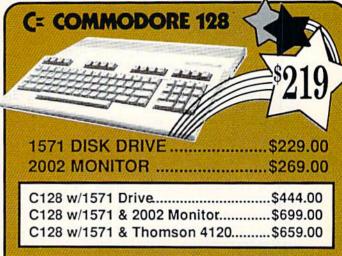
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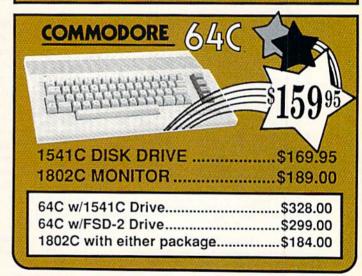
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SOFTWARE GALLERY

grounds. It is adequate as drawing programs go, but I prefer several of the other commercial products.

Video Titler lets you choose predrawn backgrounds and place text on top of them. You have your choice of fonts, colors and pen strokes.

Multiple pages are available to make it easy to sequence your creations. You can then use a variety of title effects to move from one picture to another.

To create an entire video sequence, you must select the pictures you want to use, create a sequence file and save them all on a single disk if you wish to use them again in the future.

The end result can be a very attractive video sequence that'll greatly enhance your video tapes. However, getting the results you want is going to take a lot of time and patience.

Video Title Shop uses a sometimes confusing series of terms and keystrokes to get the job done. For example, selections are finalized by pressing the run-stop key rather than return. Say, for instance, that you want to place some large letters on a blank background. First you press Commodore/F to select the font. You choose the font you want by using the cursor up-down key and pressing run-stop. To select the color of the font, you press Commodore/C, once again scrolling through the available colors, using the cursor up-down key.

To finally enter the text, you press run-stop again, then Commodore/E. Once you've entered your text, you'll also have to remove an obnoxious asterisk at the end. It's not difficult, but it does take extra keystrokes.

The rest of the features are just as awkward to access. Incidentally, the manual constantly refers to tasks and objects. They're explained, but why make it so difficult to begin with?

On a positive note, you can import pictures from KoalaPainter, Paint Magic, Quickdraw and Micro Illustrator for use with Video Title Shop. That greatly adds to the versatility of the program. I highly recommend the Graphics Companion disk for anyone who isn't an artist. It'll give you some beautiful backdrops covering most major and annual events like Christmas, weddings, birthdays, graduations and more.

It's important to stress that Video Title Shop does absolutely everything it claims to do. The final results are beautiful scenes with appealing effects that you can be very proud of. There is little doubt that the longer you work with the program, the easier it'll become to create the videos you want. I feel strongly that the program's features could have

been made much easier to access. At the very least, a step-by-step discussion of how to create a simple sequence would have helped tremendously.

If you are a video nut and want to use your Commodore to spice up your home productions, Video Title Shop should be a welcome addition to your software collection. However, be prepared to spend some long hours learning how to get the most out of it. (Manufactured by Datasoft; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; C-64/\$29.95 Video Title Shop; \$19.95 Graphics Companion.)

—JIM GRUBBS SPRINGFIELD, IL

STICKYBEAR MATH 2 ... A + STICKYBEAR READING COMPREHENSION D

Stick to the Bear Basics with Your School-Age Youngsters

For over six decades, grammar school teachers have distributed the Weekly Reader newspaper in their classrooms. It has proven to be not only a treat for students, but also a valuable learning aid.

The company that publishes the newspaper has added two more titles to its series of educational software programs, which feature a now-famous family of bruins. The first, Stickybear Math 2, continues the firm's tradition of instruction and entertainment, while the second, Stickybear Reading Comprehension, offers little in either area.

Math 2 is a sequel to the popular original Stickybear Math program, which dealt with addition and subtraction. The new software covers multiplication and division.

Math 2 begins by recording a child's name; the program can tailor lessons for and track the progress of 40 different students.

Recommended for children of ages seven and up, this program provides drills and practice sessions. The child answers problems that range from multiplying single digits by one to dividing by two-digit numbers. When a correct answer is given, a high-resolution animated scene with amusing sounds appears as a reward. At lower levels, groups of objects dance to illustrate the solutions to certain questions. The program automatically adjusts its difficulty based on the success a child has had with previous questions.

Math 2 lets parents and teachers se-

lect any one of the 37 levels that best matches the ability and needs of a particular child. An adult can also choose the number of tries allowed for a correct answer and the format required for responses. Math 2 can even issue a report card for each child.

Stickybear Math 2 is an example of educational software at its finest. Its sounds and animation will compel a youngster to continue playing and, thus, learning; its automatic reaction to a child's performance helps to avoid frustration; and its options for levels and formats are powerful tools for individualized learning. The instructions are excellent, not only presenting the software's benefits, but also indicating both its limitations and the effort that's needed for a parent to use it effectively. All in all, it's an excellent product.

Stickybear Reading Comprehension has a structure similar to Math 2. It, too, automatically adjusts its difficulty to a child's capabilities. It also offers parents or teachers the option of setting the number of tries and the starting level for each of up to 40 children.

The Reading disk contains 27 brief stories intended for children ages eight to eleven. They answer from one to nine questions on each, and parents or teachers can create as many as five of their own compositions for personalized instruction.

Reading is much less effective than Math 2. The most obvious problem is that its packaging mentions "a handy practical printout feature," yet neither the instructions nor the program itself indicates how printing can be done. The absence of a sophisticated editing function can make the individually written stories, which could have been the software's strong point, difficult to enter. In addition, a wavy scrolling mechanism and an odd lettering style cause problems when reading the text. Worst of all is the near absence of graphics. Without them, Reading offers little more appeal to children than a printed piece of paper.

Stickybear Reading Comprehension suggests that even an experienced company can sometimes falter in the demanding educational software market. However, the excellence of Stickybear Math 2 offers hope that the Reading Stickybears might learn something from their calculating cousins. (Weekly Reader Family Software, 245 Long Hill Road, Middletown, CT 06457; C-64/\$29.95 each.)

—MARILOU LATOCHA OAK PARK, IL ■

The Best of Magic

USEFUL HINTS AND TIPS from the "Magical" world of Commodore computing.

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Text can be printed in every font available through GEOS. These documents were printed on an Apple Laser Writer

A Berkeley Softworks Publication

Vol. XI MIV Number 456

EARTH TO BEGIN SPINNING IN OPPOSITE DIRECTION



A shocked consortium scientists confirmed the world's worst suspicions Tuesday, when they announced that the Earth was indeed slowing down. They expect the planet to grind to a halt early Thursday, reversing its direction and getting back up to speed by Monday night.

Although the research was startling, the scientists urged people not to panic.

"I suppose I'd lock all the breakables in your cabinets;" offers Dr. Lee Llevano, "but outside of that, I'd just tell people to hold on and enjoy the ride."

Apparently we're in for quite a ride. Dr. Dennis Rowland demonstrated the effect of the sudden

MAN BITES

POODLE!

BERKELEY - Dozens of citizens watched in horror today as a man,

who described himself as an animal

lover, actually bit a miniature teacup

City. California, dismissed the in-

cident as a case of mistaken identity.

Donald Anderson of Studio

poodle.

reversal by dropping a raw egg into a MixMaster blender set on "puree."

"If we assume people have the consistency of this egg." Rowland asserted, "I think it's safe to say that the effect of this phenomenon will leave them in a state somewhat similar to finely ground beef."

Asked if there were anything the ablic could do to prepare for the

"I'd just tell people to hold on and enjoy the ride!"

catastrophe, Dr. Rowland thought a while and offered, "I always recommend fastening your seat belt. It just makes so much sense, don't you think?"

Analyst Staci Glovsky was less distressed with the news, asking "What's the big deal? Jeez, you guys are acting like a bunch of Continued Page 8

"Somebody asked me if I wanted a dog with mustard, and since it was close to lunchtime anyway, I just took a bite without looking."

The dog, responding to the name 'Knockwurst," then gave out a yelp that bystanders recalled as sounding like "a cross between a gun shot and

"Sure it was my mustard. but that doesn't prove thing!"

an air raid siren." In the process, the pinched pooch set a world record in the long jump of thirty feet, two

Anderson was booked on felony charges of dog munching, poodle endangerment and assaulting a canine with intent to commit relish. He was later released on his own recognizance. The man who offered him the poodle has also been charged with attempting to apply mustard to a mutt, a misdemeanor in Alameda County.

"It's a smear tactic," yelled Rob Siegel, the man still being sought by police. "Sure it was my mustard, but that doesn't prove a thing. Besides, they have to prove with



Television Highlights

(4) 6:30 I LOVE LUCY Lucy and lithel bank a plot to get Lucy mon Ricky's slow at the club. (R) (7) 8:30 WILD KINGDOM Markos sits in a studie safe and sound, while lim risks his life for some unsuporture satural. unimportant animal.
(2) 7:30 LAWRENCE WELK IN

BULGARIA
The famed hand leader takes you then gh
fol minutes of crusical merriment, all the
time wondering why he is in Bulgaria.
(5) 9:30 BRICE LEE IN

CS 9:100 BRUCE LIE: IN
REVENGE OF THE MEATRALL
Figure hors lived Lee pusches his way
through purst, and recore a puzza from
600 Nesportian Minuse.
(II) 6:50 Lees Lawy
Leey and Birth hank a pict to get Lawy
into Richyly show at the club. (R)
46: R.W. Gillipse his hand
Gillipse and the Skipper finally wise up
and figure out that Ganger and Many Anna
must be getting arefully leastly right about
now, and go for (Continued Page 4)

Weather

Local weather: Look for clouds throughout the morning, burning off near midday. The morning off near midday the morning of the mid 200's by late afternoon with heavy electrical activity and thunderstorms appearing around, oh, say Continued base?

These days, the biggest story in the news is geoPublish. The page-making program for GEOS-equipped 64's and 128's that replaces lifeless layouts with page after page of powerful, punchy professionalism.

Freedom of the press.

Actually, geoPublish is very patriotic software. After all, what other application guarantees your freedom of selfexpression? Well, geoPublish sure does. In fact, every piece it prints is dedicated to the preservation of your personality on paper.

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ever again.

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roud to announce GeoPublish its latest

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lishing system With

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layout. They could | Georg | The | mode | day | options | o be two, four or sixteen across the page. They could be short and squat, or long and skinny. It's your call. After that, you just

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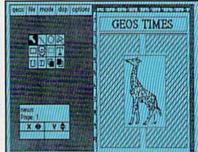
You can resize text. Change fonts. Even insert or delete graphics anywhere on the page. You can lay text over graphics. Graphics over text. Or even wrap text around graphics.

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GEOPUBLISH





The brightest minds are working at Berkeley.



So there you are, furiously working away at your Commodore 128, thinking everything is just peachy.

it hits you. That haunting, hollow, horrible question that every computer owner must inevitably face:

when all of a sudden.

"Is my computer up to date

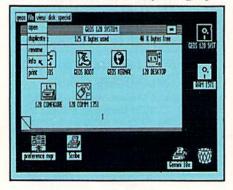
—or out of date?"

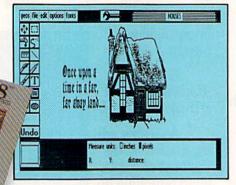
If you use
GEOS 128, that's
a question you—
or your grandchildren's children—won't
ever have
to worry
about.

Because GEOS
128 is the revolutionary
software system designed to
push your hardware to new limits. Unleash its full power across
a full 80 column screen. And
expand its capabilities for years
to come.

We should have installed disk brakes.

Loading up with GEOS turns your 128 into a mousedriven maniac that loads, processes and saves everything up





to seven times faster than normal. Part of that's due to the GEOS diskTurbo, but most of it's due to the fact that GEOS 128 doesn't treat your 128 like a C64.

You see, by recognizing your machine as a 128, GEOS 128 operates at a full 2 MHz, instead of 1 MHz. So you get twice the speed. Twice the power. And since GEOS 128 also supports the quicker 1571 and 1581 double-sided disk drives—and the 1750 RAM expansion unit—there's no telling how much faster that puppy will fly.

Fast and slick with mouse or stick.

Using GEOS is ridiculously simple. All you need is a mouse or joystick, and a keen ability to point and click. Everything else is pretty much a matter of reading *menus* (a technical term for "little lists of things"), or selecting *icons* (a technical term for "little pictures of things"). It's

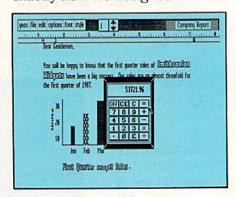
sort of like talking in sign language.

For example, if you want a document for word-processing, you point to the icon that looks like a stack of papers. Click your mouse and bingo—you're in the file. If you want to erase the file, you drag the stack of papers over to the little waste basket and click your mouse.

Poof. That's about as tough as it gets.

Working within the system.

Learning where things are in GEOS is pretty simple, especially if you've ever sat behind a desk. Because that's exactly how we designed



GEOS 128.

You keep your documents and graphics in files; everything else stays right on the desktop: the notepad, the calculator—there's even an alarm clock. In fact, the only thing our desktop

Now, we realize There's more.

doesn't have is a place to put your feet when the boss isn't around.

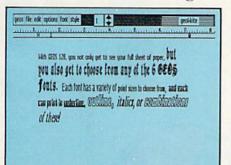
But not only does GEOS give you a place to write and draw, it actually helps you write

and draw better. Because unlike your basic office model, our desktop comes with geoWrite and geo-Paint built right in.

With geoWrite, your way with

words leaves people speechless, as they watch you effortlessly cut, paste and move entire blocks of copy anywhere on the page. And since geoWrite comes with different fonts in a variety of styles and sizes, your documents become even more dazzling.

With geoPaint, you can draw designs. Create with colors. And tantalize your tastes with tons of tones and textures. Invert, rotate or mirror images.



Then place them wherever you want: either in your geoWrite document, or in your GEOS Photo Album for later use.

But no matter what kind of masterpiece you create, you





always get to view it on a beautiful, 80 column-wide screen. No more scrolling left to right. With GEOS 128, what you see really is what you get.

The more you put into your system, the more you get out of it.

Of course, when we say that GEOS 128 has far-reaching implications, we're not kidding around. Every GEOS 128 package includes free QuantumLink software, which hooks you (via modem) into a nationwide network of Commodore people just like vou. There's even a service that will Laserprint your documents for you.



that's a lot to pack into one GEOS package. But as long as we're packing it in, we might as well let you know something else:

The older it gets the better it looks.

It's true. Because there are always new GEOS applications just waiting to jump off the shelves and into your 128. Pack-

GEOCALC 128

ages like geoDex and geoFile, for keeping addresses and data straight. Fontpack and Writer's Workshop. for tweaking text with that special. extra touch. And.

of course, geoCalc, a full-featured graphics spreadsheet for all you number freaks.

They're just the first in a long line of GEOS applications that are constantly being developed to keep your 128 up to date.

So if you'd rather have your 128 grow up than grow old, load up with GEOS. You owe it to yourself. You owe it to your 128.

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The brightest minds are working at Berkeley.





COMMODORE Party Animal

With the emergence of group entertainment games, your Commodore computer can be the life of your next social gathering.

By LONNIE BROWN



ne Saturday this past summer, a friend of mine turned his computer room into a bowling alley. A few days before, he had purchased 10th Frame, the bowling simulation program from Access Software. He

could have plopped down in front of the computer and practiced until he hit 300, then invited his friends over. But noooo. He called and said to come early Saturday afternoon.

By the time I got to his house, the neighbors were there, too, and he had divided them into bowling leagues. The snacks were out, the soft drinks and beer were on ice and the computer was hooked up to the wide-screen, rear-projection television set.

People who normally have only a passing interest in computers were actually enjoying themselves! My friend, far from the party animal suggested by this scenario, had hit upon a recent phenomenon in computer software: competition among human beings—not just man vs. machine. The party personality of your Commodore has been lurking within its beige case all along, but only lately has there been software available to draw it out.

SERFS BECOME SURFERS

The reasons for this are varied. A few years ago, programmers were just learning what the computer could do. Then, as programming matured, so did the programs. In game software, players were given choices: play against the com-

puter or against another player—or even a number of other players.

People who didn't own a computer often used to view both computer hobbyists and their machines as boring or suspect. The hobbyist was a loner who might very well be up to no good—tapping into bank accounts or experimenting with the mainframe at the Pentagon's War Room. Computers were either mysterious entities that wrought havoc with your charge account or something you used at work and wanted to get away from at home. However, as people have become more familiar with them, the atmosphere has changed, and now party software is turning serfs into surfers.

KEYBOARDS AND CHEESE BOARDS

Perhaps another reason more people haven't partied with their computers until recently is that a party calls for food and drink, two things a computer doesn't need. Which brings up a word of caution: Be careful when mingling potato chips, dip and cheese boards with ROM chips, DIP switches and keyboards.

My friend's 10th Frame, golf simulations, Scrabble and other games lend themselves to group play. Most people already know the rules, and the computer can usually handicap players individually, so old pros can't automatically beat a newcomer who plays on the novice level. The controls used in group entertainment games are generally easy to master, and many games allow at least four participants. Some handle as many as eight.

Oh, sure, you can still dig yourself silly with Boulder Dash or go on a solo hustle for Lode Runner's treasure. But doesn't it get a little lonely?

GAMING ONLINE

"We are finding more and more people are downloading games that can be played by two or more people," says Renato Graziano, a spokesman for CompuServe. "Games that pit player against player—instead of player against computer—are becoming increasingly popular. The computer as an opponent generally plays a game the same way every time. You can detect a pattern. There's no telling what a human opponent is going to do."

QuantumLink will let you and your friends play games with people in other states. If you've upgraded to Rabbit Jack's Casino, gather around the poker table. Friends love to give advice when you're trying to fill an inside straight.

Don't forget QuantumLink's People to People connection when you and your friends are sitting around the computer, and your friends might be interested in the hodge-podge town meeting that convenes nightly in the Q-Link lobby. "The computer," says Q-Link spokesman Dan Janal, "is a great equalizer. On QuantumLink, you don't know who you're talking to."

THE NAME OF THE GAME

No one at a party wants to sit around reading a 15-page manual on how to sink the Bismarck or memorize 17 joystick/fire-button combinations to play computerized football. Those trueto-life simulations are fine for computer buffs, but we're after the load-and-play games that will attract people who hate computers.

A game that turns a computer into the life of a party needs four main attributes: It should accommodate at least four players; it should be short, probably taking no more than 15 minutes and certainly no more than a half-hour; the rules should be easy; and it should let players be assigned individual skill levels.



"Murder
parties
have been
popular in
Europe for a
hundred
years....
Now they're
undergoing a
resurgence
here."

Take Scrabble, for instance. Electronic Arts is distributing a fine computer version of this popular crossword game, developed more than 40 years ago by Selchow & Righter and converted for the computer by Leisure Genius. Nearly everyone knows how to play, but the program provides on-screen prompts for novices. Up to four can play, with the computer taking on the boring task of passing out tiles and keeping score (and, in a pinch, providing hints).

If you're home alone, you can play a computer opponent—or even three computer opponents, with each assigned a different skill level. If you don't have enough players for a foursome, the computer will gladly fill in the vacant slots.

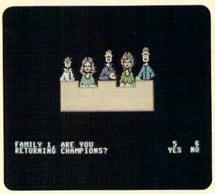
SUCH TRIVIA!

Selchow & Righter also gave the world its bestselling board game, Trivial Pursuit. Once again, nearly everybody knows how to play or can easily pick up the rules, and there are a number of computer versions on the market.

Quizam, put out by Interstel and distributed by Electronic Arts, is a version in which players can control how many spaces tokens move by timing answers. There are several game boards on the disk, and Quizam offers a rare feature for a trivia game: It lets you make up your own questions.

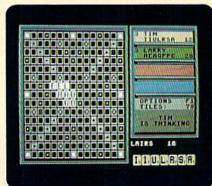
Suncom's Party Quiz Game comes with four controllers that plug into the joystick ports. The controllers each have four buttons, and the computer recognizes which player was first with the correct answer. Even with such sophisticated controllers, I've seen the set sell for under \$20 in catalog-type stores. Some reviews of the game point out that the questions get repetitious after several rounds, but if you can pick it up on sale, this is a good buy. (A hacker friend of mine bought Party Quiz Game just for the controls.)

Professional Software, Inc.'s, Trivia Fever is probably the only computer trivia game that can be used when the power goes off—because it can be played without the computer. The game offers three difficulty levels in seven categories. With-



Survey says... you're on Family Feud!

> Scrabble—an on-screen version of the popular board game.





"You can offer

your friends

an

evening's

entertainment

and send them

home

with . . . an

analysis of

their

personality."

out the computer, players use an inch-thick book of questions and a spinner to determine the categories. Although PSI doesn't market Trivia Fever anymore, a company spokesman says there are still many of them floating through the distribution pipeline. These, too, are available at discounted prices.

WHODUNIT?

Make Your Own Murder Party, from Electronic Arts, may transport computer partying to its ultimate: The computer literally becomes your social director, staging a party for five to seven friends. Murder parties have been popular in Europe for a hundred years, and they were once popular in the United States (there hasn't always been television, you know). Now they're undergoing a resurgence here.

In a professionally produced murder party, actors portray a mock murder, leaving clues along the way. The guests try to solve the crime by observing,

asking questions and examining props.

Now, a computer can provide the script. You and your friends read the script aloud from computer-generated copies, purposely revealing some clues and withholding others, unless directly asked by another player. The computer can also print out the party invitations.

The Murder Party game booklet suggests a menu of appropriate snacks and main courses, and even includes recipes. Once all the preparations are done, the computer drops out of the picture; you don't even need to turn it on during

your party.

Although there are only two basic scripts on the disk, the computer randomly assigns a player as the murderer and rewrites the script accordingly, so the guilty party changes from game to game. Even if you're doing the printing, you won't know the criminal until the plot unfolds (unless, of course, you sneak a peek at the ending).

One of the murders takes place in an upscale neighborhood (the butler did it?), while another harks back to the days of beanbag chairs and incense. If your guests dress appropriately and you don't overcook the lobster thermidor, your murder party should be an event to remember!

SPINNING THE WHEEL

If the people you'd like to lure into your computer room have the slightest interest in television game shows, then the trap is waiting to be sprung. ShareData has produced a well-done series of television game take-offs, including Wheel of Fortune, Jeopardy! and Family Feud.

All three are faithful reproductions of the television programs, but Wheel of Fortune is the one I keep coming back to play. As on the popular show, players take turns spinning a wheel to win money and a chance to guess the letters in a hidden-word puzzle. There are more than 400 phrases on the disk, according to a ShareData spokesman. Friends of mine have worked this program over for days without coming across the same phrase twice. The spritely letter-turner doesn't exactly look like Vanna, but she does clap her hands when the wheel spins and utter "Oh, darn!" when it lands on the bankrupt space.

Up to three can participate in Wheel of Fortune, and any noncomatose person in the house will probably want to. However, if you should be unable to find a second or third player to fill out the panel, the computer will gladly supply letter-guessers. Politely enough, they will even guess wrong letters.

The program keeps a list of winners, so high scorers can come back as returning champions. Game winners go on to the final round, in which they must guess five consonants and a vowel to solve the puzzle within 30 seconds.

Jeopardy! can be played by up to three players. Again, the computer will supply competitors if human ones aren't available. This game and Family Feud each have about 30 sets of questions on the program disk, and you'll play many games before coming across a duplicate board. Jeopardy! questions are tough, too.

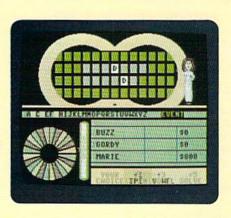
Robot Rascals, from Ozark Softscape (M.U.L.E., Heart of Africa and The Seven Cities of Gold) and distributed by Electronic Arts, weds the com-

Happy Birthday, and welcome to the world. From now on, life will begin to change rapidly. You will have to learn to accept responsibility, build up your resources, and manage yourself physically and emotionally.

CONTINUE

This is the start of your life-long experience with Alter Ego.

> Join Vanna, Pat and your C-64 on Wheel of Fortune.



puter and specially designed playing cards. Two or four players search for artifacts pictured on the cards. On the monitor screen, player-controlled robots search for the artifacts hidden on the planet Laustenfownd. Meanwhile, luck cards give the players a chance to improve their hand, or the Killer Kard may make it impossible to win. Robots can steal items from other robots by bumping into them.

The game's rules are simple, but it takes some time to play proficiently without constantly referring to the rule book. Robot Rascals is best used for a family evening around the computer or at a party where the players are familiar with the game.

PERSONALITY PLUS

You can offer your friends an evening's entertainment and send them home with a two-page analysis of their personality by booting up Luscher Profile. Developed by Dr. Max Luscher, this Mindscape program is like an ink-blot test on disk—and every bit as easy to use. The seven-part test simply asks the subject to list shades of gray in order of preference, or pick which of two colors is the more attractive. The questions take only a few minutes to complete, and then the computer quickly compiles the answers and prints out an analysis.

For added fun, you can have everyone take the



Personal Preference lets others try to guess your likes and dislikes.

test and save the results to disk. Later, while they're sitting around hypnotized by the television, you can read the results and see if they can match each analysis with the proper person.

Mind Prober, from Human Edge Software, produces a similar report, but it uses a different method to come up with the analysis. You pick a person to evaluate, then have him or her leave the room while the other players go through a list of about five dozen adjectives and answer "agree" or "disagree." The result is usually a pretty accurate description of the person under the computer microscope—although the subject will probably disagree. After all, few of us see ourselves as others do.



"The computer can usually handicap players individually, so old pros can't automatically beat a newcomer."

While we're on the subject of personality games, Broderbund, the software people, are now putting out noncomputer games as well. Their Personal Preference is a board game in which players take turns guessing one another's order of preference among four cards dealt onto the table. The game comes with 400 double-sided cards, divided into four categories-people, food and drink, activities and potpourri-and each four-card hand comes from one of the categories. One player is "it" for each round, and the closer the other players come to guessing his or her ranking of the cards, the faster their pieces move around the board. Personal Preference has few rules to learn, and it can also be played by one person alone.

Activision puts out Alter Ego, a computer program that can take you from the cradle to the grave. Versions are sold separately for male and female players of this three-disk game. No, make that "experience." This game is really a text program, where you assume a role and make choices throughout the course of your life in that role.

If it were a movie, Alter Ego would be PG-rated. There are adult situations, including one in the male version where you meet this very attractive woman and she asks you up to her place, even though she notices the wedding band on your finger. You make the decision, and the story line continues from there. But remember, your actions may precipitate undesirable consequences.

While Alter Ego is geared for one player, there's nothing to keep several players from sitting around the computer and making decisions jointly, then watching the results. Players might take turns, each leading the character through one of the seven stages of life.

It's a tall order, but to become really engrossed in Alter Ego, you should set aside a four- or five-hour block of time to spend alone with it. You may be able to go from birth to death in one sitting, but if not, the program can be saved between the major stages of life.

At the close of an evening with my Alter Ego, I found myself making sad choices as my eyesight, hearing and health failed. At the end, when the Great Sleep came...well, I'd rather not talk about it. Even a jaded old adventure-gamer like myself turned off his computer feeling a bit melancholy.

SEX DRIVE FOR YOUR DISK DRIVE

As long as we're passing out movie ratings for computer games, Dr. Ruth's Game of Good Sex is definitely rated R. Surprisingly, this lively game comes from Avalon Hill, best-known for its highly realistic (but somewhat staid) war-simulation games.

Dr. Ruth figures the more the merrier, so up to seven players can be embarrassed at once. They answer multiple-choice questions about sex, relationships and love. Quick answers gain more points, and players familiar with the game



can be handicapped by assigning them a shorter answer time. Each game takes about 15 to 20 minutes to complete and includes a face-off round that pits the two high scorers against each other.

A word of caution: Dr. Ruth's questions are frank. It would be wise to go through the game a few times before asking Bob and Ted and Carol and Alice over, just to make sure things aren't going to get too personal.

So, the next time your friends get together, have them gather around the computer monitor. Tell them it's just like television, except it's interactive. If that doesn't get their attention, tell them the best part: There are no commercial interruptions.

A WORD FROM THE SPONSOR

Wait! Did I say commercials? If your guests insist on an evening glued to the television, bring out The Couch Potato Game from TDC Games. This is no computer game; you play it while you watch commercials. The idea is to spot in the commercials items pictured on the cards you're holding. The game comes complete with four invitations printed on a television screen, and a final instruction suggests, "B.Y.O.B. (bring your own bicarbonate)."

When you find one of your objects in a commercial, you toss away that card. One of your

cards, incidentally, is placed face up in front of you. Should a neighboring player spot that item first, he or she gets to pawn off a card on you, since you weren't watching closely enough.

There are 94 game cards, covering such commonly commercialized items as hamburgers, hats, belts, babies, wheels, soda pop and cars. The cleverly illustrated instruction booklet lists the finds that fall into the "legitimate," "stretching it" and "totally outrageous" classifications.

For example, a throw rug or carpet would be a legitimate find for a carpet card. Stretching it would be calling a doormat a carpet. And outrageous? A toupee (or scalp rug).

The Couch Potato Game, says the instruction booklet, "is not a VCR game, because we didn't charge you enough for it." To make it one, just record your own video. Doing this will also provide a variation on the game: trying to spot objects while fast-forwarding through the commercials.

This game does have some relationship to the computer: After an hour or so of commercials, the most anticomputer person in the world will be gleeful at seeing ?SYNTAX ERROR on a pale blue screen.

Lonnie Brown is an editorial writer and computer columnist for a New York Times-owned newspaper in central Florida.

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Make Your Own Murder Party and
Robot Rascals
Electronic Arts
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San Mateo, CA 94404
\$32.95, \$29.95, \$39.95
and \$39.95, respectively

Party Quiz Game Suncom 260 Holbrook Drive Wheeling, IL 60090 \$29.95

Trivia Fever
Professional Software
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Wheel of Fortune, Jeopardy! and Family Feud ShareData 7400 West Detroit St., Suite 170 Chandler, AZ 85226

Luscher Profile Mindscape 3444 Dundee Rd. Northbrook, IL 60062 \$29.95

\$9.95 each

Mind Prober
Human Edge Software
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pipeline," often at
discount prices.

Personal Preference Broderbund 17 Paul Drive San Rafael, CA 94903 \$28.95 Alter Ego Activision 2350 Bayshore Parkway Mountain View, CA 94043 \$49.95

Dr. Ruth's Game of Good Sex Avalon Hill Game Co. 4517 Harford Rd. Baltimore, MD 21214 \$29.95

The Couch Potato Game TDC Games 4N240 Cavalry Drive, Unit D Bloomingdale, IL 60108 \$14.95

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The Tale Of the RAM And the Mouse

Discover the available software that takes

advantage of Commodore's RAM

expansion cartridges and proportional mouse.

COMMODORE'S NEWEST HARDWARE options, the 1700, 1750 and 1764 RAM expansion cartridges and the 1351 mouse, make the C-64 and C-128 easier to use and more productive. Do you really need one of these products? Probably not, but a number of software developers are betting that once you've seen them in action, you'll want them. In this article, I'll describe these peripherals and survey the software being written to use them.

COMMODORE'S RAM EXPANDERS

RAM expansion cartridges appeal to Commodore owners conceptually. Add 256K of RAM to the C-64 or up to 512K to the C-128 and you have one humongous computer. Right? Well...yes and no.

Commodore's memory expansion has more in common with disk storage than it does with your computer's resident RAM. You can exchange blocks of memory between memory and a RAM expander, which isn't terribly interesting until you realize that those memory transfers, using direct memory access, occur at the rate of 250,000 bytes per second. For comparison, the 1541 transfers at about 256 bytes per second and the 1571 at about 3000.

Using demo programs found on Commodore's

RAM cartridge disks, direct memory access moves a series of screens from the expander into screen memory at blazing speed. One screen follows another so rapidly that the effect is like watching a movie.

The 1700, 1750 and 1764 can all be accessed from either 64 or 128 mode on a C-128. They are visible at the same addresses in both the C-128 and the C-64, and they share the same set of instructions.

Also, all three are physically much alike. The major difference is the number of 64K memory banks each one holds. The 1700 holds 128K in two banks, the 1750 holds 512K in eight banks and the 1764 is in between with 256K in four banks. (When programming these cartridges yourself, you must specify which bank you want to store to or recall from.)

Since the cartridges share power with the computer, the 1764 includes a beefed-up replacement for the C-64's limp-wristed power supply. If you'd like a larger cartridge for your C-64 than the 1764 and you already own a beefed-up power supply, get a 1750, open the case and clip out the resistor marked R4. You can also install a switch to disconnect the R4. A knowledgeable friend installed such a switch for me, so I can use my 1750 with either a C-64 or a C-128.

By BARBARA MINTZ

Programming the RAM expansion cartridges is a nuisance unless you have Basic 7.0's Stash, Swap and Fetch commands. This is especially true with the C-64, which doesn't contain any commands you can use to access the cartridge from Basic. Instead, you have to write to ten different registers in computer memory via Peeks and Pokes. If you can't write your own programs to use the new cartridges, some interesting software already exists for that purpose.

RAMDOS SOFTWARE

One of these programs, Commodore's RAM-DOS for the C-64, works with the 1764 cartridge and comes on the demo disk with the cartridge. RAMDOS lets you assign a device number to the cartridge, so you can use it as a disk drive. "Amazing" best describes the speed at which this RAM

The 1764 Ram Expansion Unit for the C-64 adds an extra 256K, for a total of 320K.

drive performs: It will load a 100-block program from RAM disk into computer memory in about one second. It's also startling to see, for the first time, "2013 blocks free" at the end of your RAM disk directory.

Unfortunately, not all programs recognize RAMDOS as a disk drive, and copy-protected programs can't be copied into RAMDOS. Also, you can't use the RAM expansion cartridge with programs that require all cartridges to be unplugged. Otherwise, the device is transparent when not in use.

RAMDOS manages to use a minimum of computer memory by using the "now you see me, now you don't" technique. The disk drive emulation program stores itself in the RAM cartridge and activates only when it's needed. Then it uses the RAM expansion's Swap command to move memory-resident code into safe storage in the cartridge, does its own job and then swaps again, putting the original program back into place in computer memory. The program does make continuous use of 255 bytes of memory starting at 52992, an area that's little used. If you need that space, you can select another address for the RAMDOS interface before installing it.

To make RAMDOS-to-disk copies, you must use Jim Butterfield's File Copy program (provided in the package), and you must rerun the RAMDOS program. Unfortunately, this solution is less than satisfactory.

There are several precautions you should heed in using RAMDOS. First, keep in mind that anything in RAM expansion disappears when the power disappears, so it's important to save files to disk often. Second, since a RAM disk doesn't have a flashing light to indicate disk errors, always check to make sure jobs have been performed correctly. Third, remember that system resets performed by some programs change RAMDOS's vectors, and some programs may overwrite its interface area in memory. If that happens, your programs and data will remain in RAM expansion, but you won't be able to access them. The only way you can get out of this predicament requires reinstalling RAMDOS in memory.

My company, Brown Boxes, has adapted Commodore's RAMDOS for use with its battery-supported cartridge, the Double Quick Brown Box. When using the Box, you can restore RAMDOS after a reset with two keystrokes, without having to reload your files. You need an extender board with extra cartridge slots to use our product, since it and the RAM expansion cartridge both occupy the expansion port.

Commodore·128 owners needn't feel neglected—Progressive Peripherals' RAMDOS 128, an English import, is available for their machine. RAMDOS 128 offers user-selectable banks and duplicates disk drive operations. Also, it can be recovered after a system reset and offers partitioning of RAM expansion memory. Partitioning lets you use part of the cartridge as a RAM disk and another part for other direct-memory-access jobs, such as the screen-switching demos I mentioned earlier. An extended Copy command permits file copying between the RAMDOS 128 disk and the disk drive.

A C-128 version of Commodore's RAMDOS should be along any day now. It'll probably be distributed through QuantumLink and Commodore BBSs and should appear in user's group public domain libraries shortly thereafter.

APPLICATIONS SOFTWARE

Since RAM disks don't duplicate the disk drive down to the track and sector level, nor do they respond to direct-access disk commands, most commercial programs won't function with them. Such programs rely on pretty esoteric programming to speed up disk access, and even the simplest machine language programs bypass some of the Kernal routines for loading and saving, if only to shorten the program code.

Professional Software and Digital Solutions, however, have incorporated versions of RAM-DOS into Fleet System 4 and the Pocket series of programs, respectively, to provide all the

speed of a RAM disk.

Fleet System 4, for the C-128, uses a RAM expansion cartridge for its word processor. It accepts the cartridge as device 3 after you've accessed the program's Format function to prepare the RAM disk. Once set up, the RAM disk uses all the normal file access commands.

Digital Solutions' Pocket Writer 2, Pocket Filer 2 and Pocket Planner 2 for the C-128 automatically configure an expansion cartridge as device 2, with an empty directory listing showing 2045 blocks free with the 1750 or 510 blocks with the 1700.

For fast access, both Professional Software and Digital Solutions suggest copying their dictionary and, in Fleet System's case, the thesaurus, into the RAM disk. This makes spell-checking about 33 percent faster and thesaurus accesses easier.

Documents can be saved and loaded in a second or less using the RAM disk. Copying Pocket 2's 546-block dictionary into the RAM disk takes only about one minute, but copying those 546 blocks back to disk takes long enough to enjoy a cup of coffee.

RAMDOS applications aren't limited to RAM expansion. Several graphics programs, including Basic 8 and GEOS, can use a cartridge's direct memory access to swap blocks of data. Several public domain terminal programs will soon be able to use a cartridge for instantaneous storage of a full communication buffer, so online time isn't wasted saving the buffer contents to disk. (Although details aren't yet available, I'm told that a new version of Precision Software's Superbase will use a RAM expansion cartridge.)

THE 1351 MOUSE

The 1351 is a true proportional mouse for the C-64 and the C-128, not just another joystick, as the 1350 mouse was. It's just as accurate and effective (with proper software) as the mice designed for the Amiga and the Macintosh. Pointing and clicking to specify what you want your computer to do is a natural, intuitive form of control, and it saves time you'd spend on searching through manuals for commands and typing in combinations of keys.

The 1351 inspires even more respect if you surrender to temptation and open the case. At its center you'll find a small ball resting on two metal rollers. When you move the mouse, you're actually moving the ball. Two windowed disks, one mounted on each roller, turn in response > www.Commodore.ca



The 1700 Ram Expansion Unit adds 128K of RAM to your C-128, for a total of 256K.



The 1750 Ram Expansion Unit increases the C-128 by 512K, for a total of 640K.

to the ball's movement and interrupt rays of light emitted by tiny diodes. Optical receptors register the pulses of light, which are then translated into signals read into registers in the computer. Software that recognizes those signals positions a pointer on the computer screen accordingly. The subjective experience, provided the software is

The 1351 Mouse gives your C-64 or C-128 a true proportional mouse input device.

well executed, is much like using your hand to manually move the pointer.

SOFTWARE FOR THE MOUSE

Electronic Arts uses that feeling of immediacy in its Instant Music program, which should be available by the time you read this. Instant Music lets you create musical compositions by using color and line, as well as perform what Electronic Arts calls "mouse jamming."

Commodore had the foresight to build a Joystick mode into the 1351, and many joystick-controlled programs (such as the Advanced OCP Art Studio from Firebird) work nicely with it. Unfortunately, the mouse/joystick may be too sensitive for games that require moving objects through mazes and grids. If the program loop that checks the joystick switches is timed for very frequent repeats, the mouse's tiniest movements are registered as a change of direction. You'll probably find it difficult to move your hand steadily enough unless you guide the mouse

along the edge of a ruler. The mouse/joystick does offer good control for games and applications requiring fast, wide maneuvers or movement in a straight line, and I expect new games and applications that take advantage of this device's unique characteristics will be appearing.

Digital Solutions' Pocket Writer 2, Pocket Planner 2 and Pocket Filer 2 support the mouse by providing pull-down windows that remain invisible unless a mouse is in use and the mouse pointer is moved to the top of the screen. The mouse performs the same functions with these programs as the keyboard does, and it's handy both for the novice and for the expert who prefers the point-and-click method of making choices.

The pull-down windows are especially helpful in creating more text area by eliminating the Help screens. For rapid editing, you can use the mouse to scroll back and forth through documents, move the cursor, mark ranges and enter commands. What's best about this arrangement is that you can either use the mouse or ignore it.

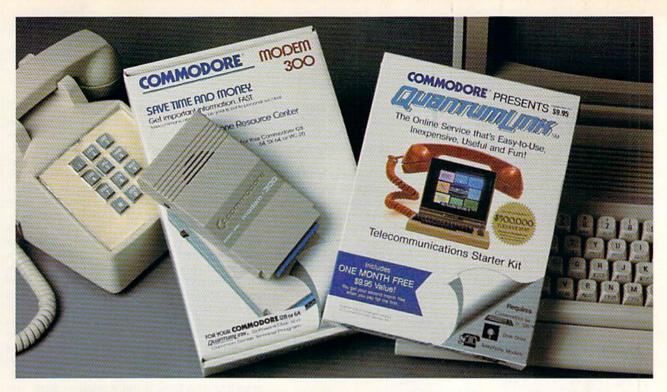
GRAPHICS

Graphics applications that offer mouse support generally retain other forms of input, but few mouse users willingly go back to them. Not even the heralded light pen, once considered the best choice for computer-aided design, offers more accuracy, convenience and ease of use. So, it's no surprise that the Cadpak graphics program (from Abacus) and Flexidraw (from Inkwell) come in updates that support the 1351.

If Cadpak is your favorite design program, you're sure to enjoy it even more in its latest guise. New users, however, may find that some of the features that work well with the keyboard and the light pen are unnecessary and confusing with the mouse. The Accupoint function, for example, which positions the cursor, requires an extra command after the mouse moves the cursor to the correct position. Note that when you use the mouse with Cadpak, you can't use any other peripherals beyond a single disk drive, a printer and a monitor.

T.H.I.S., a C-128, 40-column graphics program, adds a mouse driver to software previously designed for a light pen. You can make one-pixel adjustments of the light pen cursor, but the mouse moves accurately and responsively without need for fine tuning. You can use the mouse to select, from a set of four pull-down windows, all the amenities you'd expect in an up-to-date graphics program. Unfortunately, if the pointer isn't centered on the word you want, you get the wrong selection. Micro Aided Designs planned to offer modular options, including screen animation, that would've had a set of function-keyselectable menus, but according to a spokesperson, they're now planning to just sell out their stock of T.H.I.S. and the light pens.

Basic 8.0, a C-128, 80-column color graphics package from Patech requires neither a mouse nor a RAM expansion cartridge, but it uses both



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in a programming environment—the easiest way to accommodate the language's many features. As an extension to Basic 7.0, Basic 8.0 lets you program graphics that were previously inconceivable on the C-128.

As a novice, you can use the language's 53 new commands to create color graphics on the 80-column screen, for twice the resolution of the normal 40 columns. You can create three-dimensional figures and mouse-driven programs with windows. There are commands to track the mouse, position pointers, define and control windows, and stash and fetch screen areas in the RAM expansion cartridge. Also, thanks to Basic 8.0's RunTime Module, you can freely

Table 1. Manufacturers and prices.

1700, 1750 and 1764 RAM Expansion Cartridges Commodore \$119.95, \$199.95 and \$149, respectively

1351 Mouse Commodore \$49.95

RAMDOS Commodore With the 1764 RAM expansion cartridge

RAMDOS 128 Progressive Peripherals & Software 464 Kalamath St. Denver, CO 80204 \$29.95

Fleet System 4 Professional Software 51 Fremont St. Needham, MA 02194 \$79.95

Pocket Writer 2,
Pocket Filer 2 and
Pocket Planner 2
Digital Solutions
2-30 Wertheim Court
Richmond Hill, Ontario
Canada L4B 1B9
\$59.95 each; Digital
Superpak, \$99.95

Instant Music Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 \$29.95 Cadpak Abacus PO Box 7211 Grand Rapids, MI 49510 C-64, \$39.95; C-128, \$59.95

T.H.I.S.
Micro Aided Designs
215 East Orangethorpe
PO Box 345
Fullerton, CA 92632
\$25 without light pen;
\$85 with Flexidraw
light pen

Basic 8.0 Patech Software, Inc. PO Box 5208 Somerset, NJ 08873 \$39.95

Power Mouse, the Mouse Tool Box Sumware Soft 72 Pearl St. S. Portland, ME 04106 \$15

GEOS Berkeley Softworks 2150 Shattuck Ave. Berkeley, CA 94704 C-64, \$59.95; C-128, \$69.95 distribute your finished programs.

Basic Paint, a hi-res multicolor paint program that comes with Basic 8.0 and uses the mouse as well as a joystick, demonstrates the power of Basic 8.0. It's the only paint program I've ever seen that has a command for creating spheres. Although Basic Paint is a huge program, it operates smoothly even without RAM expansion. However, it's better with RAM expansion present.

Power Mouse, the Mouse Toolbox, from Sumware Soft offers a simplistic approach to programming the 1351 mouse. It lets you create a "mouse environment" with up to four predefined windows for pull-down menus. The Toolbox program creates a pointer sprite and supplies the commands used in the program to track the mouse in Joystick or Proportional mode. The disk contains a Toolbox for the C-64 and one for the C-128, plus a separate utility to convert the mouse environment to Proportional mode. Power Mouse is a clever program and less demanding than Basic 8, but it requires Basic programming skills, and I find the Edit-mode windows tiresome.

GEOS, RAM expansion and the 1351 mouse seem made for each other. In fact, used together, they create a synergistic effect.

GEOS theoretically makes the C-64 a more impressive and easier-to-use machine. However, if you've got a balky joystick that has to be held in two hands, the system loses a lot of appeal. With the 1351 mouse and RAM expansion, GEOS takes off and flies. The mouse darts about with great accuracy, and the RAM expansion used as a second disk drive speeds up operation.

GEOS lets you move the contents of your work disk into drive B (the RAM disk) as if drive B were another 1541, but the speed of the transfer is remarkable. Applications pop onto the screen, and the slow, hesitant page-scrolling of lengthy documents is gone. All the data GEOS needs is now in the RAM expansion, instantly available thanks to the speed of direct memory access.

The GEOS manual claims an improvement in loading and saving speed of ten to 100 times with a RAM expansion cartridge. That figure makes the RAM expansion a pretty good investment.

If you don't need the programs that support the RAM expansion cartridges and mouse now, then perhaps you should wait before purchasing the peripherals. However, if you use any of these programs on a regular basis, you'll find that the hardware makes your work go faster and better.

As you can see, there are already many software applications available for the Commodore RAM expansion cartridges and the 1351 mouse. These programs make a Commodore computer more powerful, versatile and friendly than was thought possible only a year or two ago. If this is any indication of what the next two years will bring, I, for one, can't wait!

Barbara Mintz is director of the Boston Computer Society's Commodore user's group and director of software development for Brown Boxes, Inc.

The Commodore Connection

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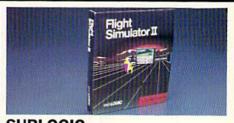


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64 DOS Shell

Now C-64 users can have the equivalent of the useful 1571 DOS Shell that C-128 owners have been enjoying for some time.



By JOHN RYAN

ommodore owners who have purchased the 1571 disk drive received with it a most useful and versatile disk utility—the 1571 DOS (Disk Operating System) Shell. Unfortunately, C-64 users were out of luck, because the 1571 Shell works only in 128 mode. My answer to the problem is a C-64 DOS alternative, which I call the C-64 DOS Shell. (For a basic discussion of the attributes of a "shell," see Tim Walsh's sidebar to this article.)

This program offers most of the features found in the 128 version, plus a few extras. Like its C-128 counterpart, you operate the 64 DOS Shell primarily with the space bar and cursor and function keys. The screen format and key functions perform almost identically to those of the 128 version, so if you're a 1571 DOS Shell user, you should feel right at home.

PREPARATIONS AND NOTES

The 64 DOS Shell is a rather lengthy program, encompassing almost 6K of machine language, so typing it in will take a few hours. I think you'll find the effort well rewarded, however. After typing is completed, save the data statements under any filename and then run 64 DOS Shell.

It takes a few moments for Basic to poke the program into memory, but this need be done only once. After the ready prompt, load and run the short, five-line program in Listing 2. This program compresses the 64 DOS Shell program to a small ML object-file saved on disk. Once you've done this, you can load 64 DOS Shell with LOAD "filename",8,1. Type NEW and enter SYS 34500. The program will then be installed into the operating system.

GETTING STARTED

The 64 DOS Shell program is virtually transparent to the 64 operating



system, and accessing it is as simple as tapping the restore key. Keep in mind that doing this while another program is running stops that program's execution and displays the 64 DOS Shell main menu, which appears as follows:

Disk Setup Copy Files
Run a Program Rename Files
Format a Disk Clean up a Disk
Mode Selection Copy Files
Rename Files
Delete Files
Function Keys
Directory

Use the cursor keys to move through the menu, highlighting the options. You select and execute your choice by pressing the space bar when the option you want is highlighted. Then follow the prompts as they appear. To exit the DOS Shell, press the stop key while in the main menu.

DISK SETUP—The 64 DOS Shell works with either the 1571 or 1541 disk drive. Although two drives may be used at one time, dual drives (drive numbers 0 and 1) are not supported. The 64 DOS Shell uses

drives "A" and "B". These are logical drives, meaning that they are controlled entirely from within the DOS Shell.

You may assign devices 8, 9 or 10 to either the "A" or "B" drive. To change the settings, simply use the cursor keys and press the space bar. After you select the second drive, the program automatically returns you to the main menu. To get there without changing device numbers, press the stop key.

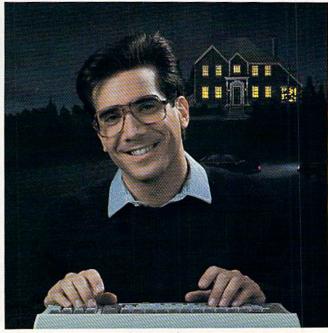
Keep in mind that the 64 DOS Shell looks for a second drive, even when not accessing it. If it doesn't detect a second drive on the serial bus, strange things may occur (see Error section, below).

When using two drives, the 64 DOS Shell prompts you for the logical drive number you wish to use for an operation. Make that choice by using the cursor keys and space bar. As with most 64 DOS Shell operations, pressing the stop key returns you to the main menu or verification menu, depending on the option you are using at the time.

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Commodore's C-128 DOS Shell

By TIM WALSH

THE C-128 DOS SHELL is probably the best disk utility developed to date for the C-128. When you need to copy a variety of disk-based files quickly and effortlessly, rearrange files in a disk directory or restore a scratched file, you won't find many programs better suited for the job.

A BRIEF HISTORY

To understand a C-128 user's appreciation of the DOS Shell, it helps to know the program's background and how it works. Fred Bowen, a key developer of the C-128 who still enjoys employment at Commodore, recently related the following account of the Shell's history.

It was under development from late 1984 through early 1985, when Commodore, caught up in the excitement and anticipation of the C-128's release, was testing and refining peripherals and software to complement and enhance the computer's abilities.

Programmer Dave Middleton, under the watchful eye of Senior Programmer, Eric Cotton, was involved in writing the C-128 DOS Shell disk utility program when he abruptly left the scene at Commodore. Programmers Fred Bowen and Terry Ryan rescued the abandoned project, and by June of 1985 they had made it worthy of packaging—on a demo disk—with the new 1571 disk drive. By making this program available to every new 1571 user, Commodore shaped the way many thousands of C-128 owners view their computer.

USING THE SHELL

Although the background of the C-128 DOS Shell's development is interesting, it's the program, not its story, that wins friends and influences people. You'll find instructions for using it in the 1571 user's manual, but you'll only learn its capabilities and limitations through repeated use.

As mentioned above, the Shell is on the 1571's test/demo disk. It also accompanies the C-128D computer, which features a built-in 1571 drive. Although it's packaged for use with the 1571, it also works with the 1541, and I have yet to



Copying files with the C-128 DOS Shell.

find a third-party Commodore disk drive that objects to it.

To activate the Shell, place the demo disk in your drive and turn your computer on; or, if the computer is already on, just type "boot" and press the return key. The program formats itself to either a 40- or 80-column screen, so it doesn't matter which mode you're in. At a length of over 17K (67 disk blocks), the program is substantial enough to keep the 1571 busy for almost 12 seconds as it loads. Once it's loaded, you're greeted with the statement, "D.O.S. Shell on F-1 Key."

Press F1 and you have seven seconds to press the space bar to select English as your language of choice for the program's menu. If you don't press the space bar soon enough, French, German and Italian options appear at seven-second intervals. Unless you can decipher prompts such as "Inserire disco nuovo e premere spazio," don't press the space bar until the program cycles back to English.

After selecting a language, you're greeted by a menu of ten disk operations—everything from validating a disk to copying an entire disk to rearranging the order of the files in a disk directory. Press F1 again and you're in Basic 7.0, just as if the DOS Shell had never been activated. All the function keys revert to their default definitions with the exception of F1, which places the DOS Shell back in service.

To see where the program resides

in your C-128's memory, exit to Basic with the F1 key, then press F8 to go to the computer's machine language monitor. Next, enter "M 1900" and press return, and in the rightmost columns of the screen you'll see the words "C128 DOS Shell" and the version number you're using, followed by Dave Middleton's name. Press M < return> again to view the contents of location \$1A00, which is the Shell's starting address.

Now, exit the monitor by typing "X" <return>, then return to the DOS Shell by pressing F1. Once in the Shell's menu, use the cursor keys to move about and highlight the menu choices. Unlike most menu-driven programs, the C-128 DOS Shell responds to the space bar instead of the return key when you're making menu selections, so highlight a selection and then press the space bar. When you're ready to activate the selected operation, press F7. To change your file selection, press F5, or to reset the menu, press the stop key.

TYPICAL APPLICATIONS

I typically use the DOS Shell for two purposes—copying files and reordering directories. Although I could copy entire disks sector by sector with this program, I never use that option because there's a faster way—by selecting the File Copy option and highlighting every file on the disk. In this way, in less than five minutes I can make an error-free copy of an entire disk containing a smorgasbord of Basic 2.0, Basic 7.0 and machine language program files, along with scores of word processing, database and spreadsheet files.

Copies of files can be made using one or two drives. Single-drive copies usually require only one disk swap, but there are times when two swaps are necessary.

While the C-128 DOS Shell would be a fantastic program if all it did was copy files, it's also invaluable for restoring scratched files. Just activate the Shell, put the work disk in the drive and select the Restore File option. Ninety-nine times out of one hundred,

64 DOS SHELL

you'll instantly retrieve a Basic program without a hitch.

PROGRAM LIMITATIONS

The C-128 DOS Shell does have its limitations. First of all, while it can copy many different files, it's not a substitute for a "disk cracker." Files that save with nary a trace of copy protection, such as Newsroom graphics, cannot be copied properly using the DOS Shell.

Next, while it can restore many types of deleted files, you'll be hard pressed to retrieve scratched program files originally created with screen codes. For example, scratch a RUN Script program file, then try restoring it with the DOS Shell. Very little, if any, of your file will be recovered.

Finally, if you press run-stop/restore while the program is activated, all the function key definitions are wiped out. When this happens, it's best to rebuilt the DOS Shell than to try salvaging 't unless you're sure you know what you 'e doing.

NEW SHELL ON THE HORIZON?

Commodore Tray have miscalculated the C-128 DOS Shell's popularity when they recently began shipping the 1581 disk drive. They were quickly swamped with protests from C-128 users who discovered that no DOS Shell existed for the new 3½-inch disk drive.

Commodore was caught off guard, primarily because of its own low regard for the C-128 DOS Shell. I'm told the program sees little use back at the home office for several reasons: because it uses the boot sector on its disk, because it resides in a section of memory popular with other programs and because it redefines the function keys.

Talks with our sources at Commodore lead us to believe that a DOS Shell for the 1581 is in the works, so we may see one in the near future. With the 128 version for a template, the result should border on perfection. R

RUN's Technical Editor Tim Walsh is a die-hard DOS Shell advocate.

RUN A PROGRAM—When you select this option, the drive reads the disk directory and displays it in the directory window. You'll notice that this is only a partial listing. To display the rest of the directory, use the cursor keys to scroll up or down.

To select a program to run, move the red arrow to the desired filename and press the space bar. The filename then appears in reverse. To run it, press F7. To change the selection, press F5. (The latter two operations hold true for all of the 64 DOS Shell's selection processes.)

While this option runs most Basic and ML programs, you may experience problems with some ML programs. If you can't get the file to run, it probably means that the program is trying to occupy the same memory space as 64 DOS Shell.

FORMAT A DISK—This option prompts you to input a filename for the format. As with most of the Shell's file operations, the program also asks you to verify your selection prior to formatting a disk. To format the disk, enter a header name (16 characters or less in length), a comma and a unique two-letter ID; then press return. For example: "filename", "ID" (standard format) or "filename" (short format).

By omitting the two-letter ID, you accomplish a short format that erases all files and renames the disk header. Whenever you use an ID, a full disk format will result.

CLEAN UP A DISK—Cleaning up a disk involves the Validate command. Once you've chosen the option, the validation begins immediately, so be sure you have inserted a disk into the desired drive.

MODE SELECTION—This option, for 1571 disk drive users only, allows you to toggle between 1541 and 1571 modes. This option can be useful within the DOS Shell for formatting, copying programs, and so on. The selected mode remains in effect until you reset the drives or select another mode. Use the cursor and space bar to choose the desired mode.

FILE COPY—This option allows you to easily copy files from one disk to another. The option works best with two disk drives, although it may be used with one. (If you're using a 1571 in 1571 mode and get a Drive-not-Ready error, set the drive to 1541 mode and try again.)

If you enter the option with two disk drives, the Shell will ask you which drive you wish to copy from. From then on, the selected drive will be the "Source," while the second logical drive will be the "Target" drive. Using the cursor, space bar and function keys, you may select one or several dozen files to copy. Pressing F7 will begin the copy sequence. Once the copy is complete, the main menu will reappear.

If only one drive is used, respond to the prompt as it asks you to insert either a "Source" or "Target" disk in the drive. The program differs from the 1571 DOS Shell at this point in that you need to format a target disk before beginning this procedure.

The 64 DOS Shell won't allow you to copy over 130 disk blocks. For files over 125 blocks, you may have to reinitialize the program. Also, the File Copy option will not reproduce relative files.

RENAME FILES—This option will allow you to rename a whole directory of files. Again, select from the directory listing the file you want to rename. A highlight bar appears and prompts you to enter a new filename. Do so and then press return. Repeat this process for as many files as you wish. But rename files carefully; duplicating a filename will result in a File Exists error.

DELETE FILES—This option allows you to highlight and scratch files you no longer need. Use F5 to deselect or the stop key to abort. Pressing F7 begins the scratch operation. Be very careful with this option, since you can't restore some scratched files with even the best disk-restoring utility.

FUNCTION KEYS—This versatile option allows you to program any one of the function keys by assigning Basic keywords and short commands to the function keys in the same manner as the C-128's Key command. Once you're into the function key option, select Define Function Keys. Use the cursor to select the key you want to define. If that key has already been programmed, the assignment will appear in the input window. Pressing the space bar will erase the prior definition, allowing you to enter the new assignment. If the key is not already defined, you still need to press the space bar to begin entering the definition. Pressing the stop key aborts the procedure without changes.

Each key definition is limited to 30 characters, so use keyword abbreviations whenever possible to conserve line space. Once you've entered the line, press the return key or F7 to process it. Pressing the return key adds a carriage return to the definition, while pressing F7 adds no carriage return.

To enable the functions keys, select the Enable option from within the Shell. The function keys will not work until you exit the Shell program, nor will they work while you're in Quote mode. You

64 DOS SHELL

may disable the keys by tapping the runstop/restore combination, or by selecting the Disable option. You may also "turn off" individual keys by entering the Define option, pressing the space bar and then pressing F7. This assigns a null value to the key. Function key definitions remain in effect until the program is reinitialized (see below).

DIRECTORY—This option displays disk filenames in the directory window. No selection process is available. Press the stop key to exit.

ney to care

ERRORS AND OTHER THINGS

The 64 DOS Shell was designed to be as user-friendly as possible, and it will catch almost any error you'll ever make. However, to squeeze the program into 6K, I had to make certain trade-offs. A definite program-crasher is the Device-not-Present error, which causes the program to freeze up and may also garble the screen. To get out of it, turn on

the drive that is not present, press the return key and then the stop key *twice* to exit the Shell. Then reinitialize the program by entering SYS 34500.

For any standard disk error, 64 DOS Shell displays the error in the message window. When this happens, you need to press the space bar to get back to the main menu. Look at the light on your drive. It will remain green (red on 1541s) until you press the space bar.

The 64 DOS Shell protects the area in which it resides; however, a large Basic program might sneak some variable storage into the Shell's program area (34500–40859 decimal; \$86C4–\$9F9B hex). Keep this in mind when running or copying large programs, for you may want to protect this area with the following statement:

10 POKE 51, 44: POKE 52, 135: POKE 55, 44: POKE 56, 135: CLR

If the restore key will not reactivate the

DOS Shell, try reinitializing the program.

If you encounter an error that the program did not detect, the display may scroll from the screen during directory access. If this ever occurs, press the stop key to return you to the main menu. Also, remember that once you set up the Shell for two disk drives, it will always look for the second drive, whether accessing it or not. If your screen seems to freeze up, it's a good indication that a drive is not turned on. You may reset the DOS Shell for one-drive operation by reinitializing the program.

If you do as much file maintenance as I do, then the 64 DOS Shell can save you a lot of time and effort. Have fun! R

John Ryan, an air traffic controller, is in charge of computer-based instruction for his section. An advanced machine language programmer, he is experienced on a number of computer systems, including, of course, the Commodore.

Listing 1. The 64 DOS Shell program.

- 10 PRINT" (SHFT CLR) (HOME) (CRSR DN) {2 CRSR RTs}IT WILL TAKE 2.11 MINS TO READ DATA" :REM*152 20 PRINT "{CRSR DN}"SPC(13)"PLE ASE WAIT..." :REM*60 3Ø I=345ØØ:X=Ø :REM*154 40 READ A: IF A=256 THEN 60 :REM*44 50 POKE I, A: I=I+1: X=X+A: GOTO 40 :REM*16Ø 60 IF X (> 697524 THEN PRINTSPC(8)"(CRSR DN)(CTRL 9)ERROR IN DATA STATEMENTS":STOP :REM*246 70 PRINT SPC(7)"{CRSR DN}NOW LO AD AND RUN ML SAVER": END 100 DATA 169,8,141,200,2,141,18 0,2,169,0,141,201,2,141,221 ,2,141,235,2 :REM*166 1Ø5 DATA 141,238,2,162,Ø,157,Ø, 161,232,208,250,162,196,160 ,134,134,51,134,55 :REM*19 11Ø DATA 132,52,132,56,32,94,16 6,120,169,11,141,2,128,169, 135,141,3,128,162 :REM*38 115 DATA Ø,189,7,155,157,4,128, 232,224,5,208,245,88,96,104 ,168,104,170,104 :REM*231 12Ø DATA 88,32,234,255,32,225,2 55,208,3,76,102,254,169,193 ,141,24,3,169,1 :REM*228 125 DATA 133,204,169,0,32,144,2 55,76,137,150,173,188,2,162 ,60,160,3,32,189 :REM*31 13Ø DATA 255,169,1,174,18Ø,2,16 Ø,5,32,186,255,32,192,255,9 6,32,231,255,32 :REM*19Ø
- 135 DATA 12,147,32,110,145,32,1 20,145,144,3,76,199,137,173 ,201,2,240,35,173 :REM*159 14Ø DATA 18Ø,2,2Ø5,2ØØ,2,24Ø,15 ,173,201,2,141,233,2,173,20 0,2,141,234,2 :REM*2Ø6 145 DATA 76,135,135,141,233,2,1 73,201,2,141,234,2,76,135,1 35,173,180,2,141 15Ø DATA 233,2,141,234,2,32,244 ,146,169,58,32,210,148,174, :REM*28 221,2,189,28,155 155 DATA 32,210,255,169,62,32,2 10,148,32,231,146,32,244,14 6,32,2,139,32,94 :REM*55 16Ø DATA 152,32,176,144,32,204, 255, 32, 25, 139, 173, 53, 3, 240, :REM*112 3,76,199,137,32 165 DATA 98,150,32,106,150,32,1 10,145,173,207,2,141,219,2, 162,0,142,220,2 :REM*21 17Ø DATA 232,142,218,2,32,202,1 53,169,0,141,218,2,32,244,1 46,169,66,32,210 :REM*78 175 DATA 148,169,70,32,210,148, 238,230,2,32,67,141,169,0,1 41,230,2,173,186 :REM*239 18Ø DATA 2,2Ø1,1,2Ø8,3,76,199,1 37,173,233,2,141,180,2,173, 201,2,240,8 :REM*160 185 DATA 205,200,2,240,3,76,202 ,137,32,164,137,174,241,2,3 :REM*171 2,15,145,144,8 19Ø DATA 173,242,2,208,50,76,19 9,137,142,241,2,32,59,137,1 73,239,2,201,116 :REM*84 195 DATA 144,11,174,241,2,169,0 ,157,0,160,76,18,136,24,173 ,246,2,109,239 :REM*89

| 200 | |
|-----|----------------------------------|
| | 46,2,238,241,2,238,242,2,76 |
| | ,18,136,174,245 :REM*32 |
| 205 | DATA 2,165,158,157,0,166,16 |
| | 5,159,157,0,167,174,243,2,3 |
| | 2,15,145,142,243 :REM*33 |
| 210 | |
| | ,162,1,32,198,255,160,0,32, |
| | 2Ø7,255,145,158 :REM*138 |
| 215 | DATA 32,183,255,208,6,32,14 |
| | 3,137,76,114,136,32,204,255 |
| | ,32,123,137,32,2 :REM*5 |
| 220 | DATA 145,174,245,2,165,158, |
| | 157,0,168,165,159,157,0,169 |
| | ,32,143,137,238,243 :REM*28 |
| 225 | DATA 2,238,245,2,173,245,2, |
| | 205,242,2,240,3,76,81,136,3 |
| | 2,244,146,169 :REM*221 |
| 23Ø | |
| | 146,32,244,146,32,32,137,32 |
| | ,13,145,169,Ø,157 :REM*42 |
| 235 | DATA Ø,16Ø,32,59,137,32,151 |
| | ,137,32,114,137,174,244,2,1 |
| | 89,0,166,133,158 :REM*205 |
| 240 | DATA 189, Ø, 167, 133, 159, 162, |
| | 1,32,201,255,160,0,177,158, |
| | 32,210,255,174,244 :REM*10 |
| 245 | DATA 2,189, Ø,168,197,158,2Ø |
| | 8,7,189,0,169,197,159,240,6 |
| | ,32,143,137,76 :REM*1 |
| 25Ø | DATA 228,136,32,204,255,32, |
| | 123,137,32,2,145,238,244,2, |
| | 173,244,2,2Ø5,245 :REM*4 |
| 255 | DATA 2,240,3,76,191,136,32, |
| | 47,137,32,164,137,76,18,136 |
| | den ni on nid |

,169,74,32,210

26Ø DATA 148,174,221,2,189,28,1

55,32,210,255,96,32,244,146

:REM*93

Continued on p. 108.





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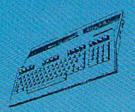
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Wordman

The word is out: This vocabulary and spelling game is fun and educational for all.



By WILLIAM TUMBLESON

ordman, a computer game that teaches vocabulary and spelling skills, will make learning fun. While it's based on the traditional Hangman game, mistakes produce a picture of a character called "the wordman" rather than a gallows scene. Word skills are developed not only by playing the game, but by creating the word lists that the game employs.

Extensive error-trapping and onscreen directions make Wordman easy to use, yet it's flexible enough to meet a variety of instructional needs. The program uses the Kernal Plot routine extensively to move around the screen, particularly in drawing the wordman character. The disk directory is displayed by a machine language routine.

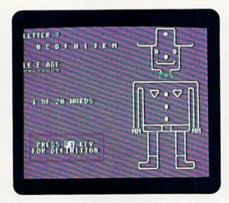
The Wordman menu screen offers six options: 1) choose a word, 2) end session/game, 3) create/edit word file, 4) load word file, 5) delete word file and 6) print word file. The options are accessed by typing their numbers and pressing the return key.

CREATING A WORD FILE

Before play can begin, at least one word file must be created and saved to disk, using option 3. Press 3 and the return key at the menu, then indicate you want to create a new word file by pressing C. Next, type the number of words you intend to put into the file, press return and state whether definitions will be included.

A screen for typing in your words will follow. Type each one, and press return. Do not use hyphenated words. After you have entered all your words, the program will ask if they are okay. If not, they will be redisplayed for acceptance or correction.

When you finish with your list, and if you chose to include definitions, the program displays the first word in your



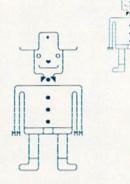
list and asks you to enter a definition up to 36 characters long. The definition appears at the bottom of the screen as you type; then, after you press return, it moves into the box just below the word. If you're satisfied with the definition, press return again; if not, press shift/return for a chance to change it.

You can bypass entering a definition for a particular word by pressing the return key twice. Then a period, instead of a definition, will appear in the area below the word.

After you've finished entering all your words and definitions, you must enter a filename for saving the list, then press return. The filename can be no more than 13 characters long, because Wordman will automatically add the prefix WM, followed by a space, to it. When the file is safely on disk, the menu reappears.

OTHER FILE OPERATIONS

When you want to edit an existing word list, choose option 3 at the menu, then press E, for edit, type the name of the file you want to work on and press return. The file will load, and the program will take you through the list, one word at a time. At each word, make any changes you wish and press return. When you're done with the words, you'll

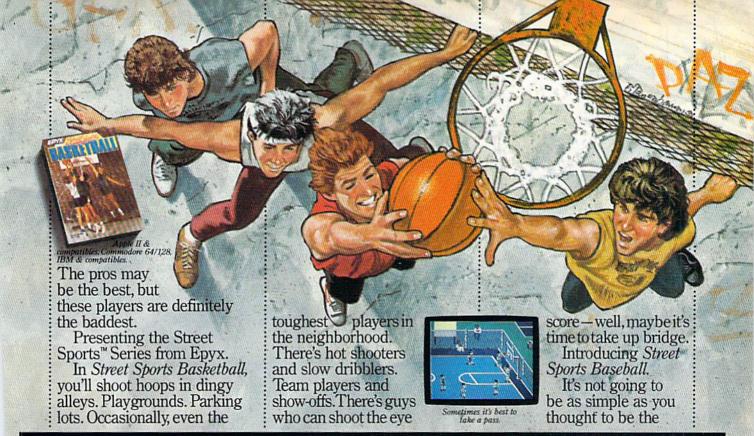


Can you guess the word in this picture?

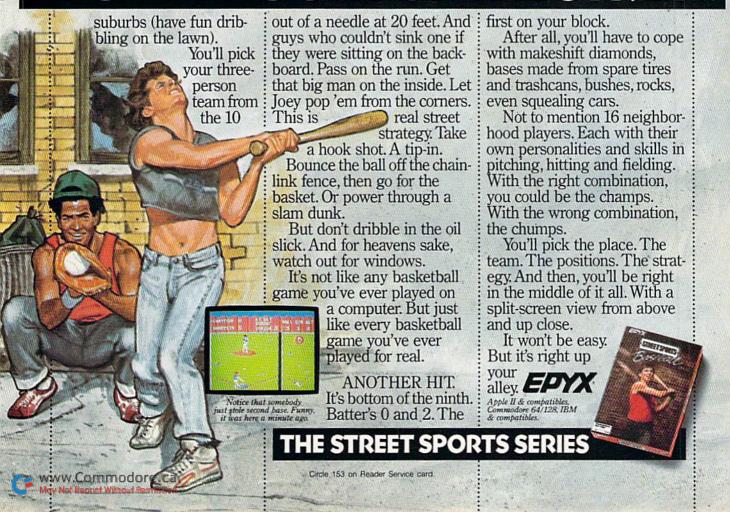
have a chance to change the definitions or add definitions if there were none before. Then save the file under its previous name or a new one. If the latter, limit the filename to 13 characters to avoid an error.

Option 4 is used to load a word file. All you have to do is type the name of the file you want and press return. If you don't know which file you want, or you're unsure of the spelling, you can type \$ and press return to view the disk directory. The filenames in the directory include the WM-space prefix, but you don't need to type that when entering the name of the file to load. Press return to leave the directory. After the file has loaded, the program goes back to the menu.

Option 5 is for deleting a word file. This time you do have to include the prefix when entering the filename. You can use wild cards in the filenames, but be careful you don't accidentally delete any files you wanted to keep. After typing the filename and pressing return, you must verify that the program should go ahead and delete the file you've named. If not, you can reenter the filename. Should you want to abort the deletion process altogether and go back to the menu, press return without entering a filename.



TASTE THE THRILL OF VICTORY AND THE AGONY OF THE STREET.



WORDMAN

Option 6 prints a copy of the word file currently in memory. After you select this option, the program will ask you to confirm that the file in memory is indeed the one you want printed. You can exclude definitions from the printout if you like.

PLAYING WORDMAN

To play Wordman, choose option 1 after loading a word file from disk. The program will randomly select a word from the file and display a line of as many equals signs as there are letters in the word. The display will also indicate how many words you've already used out of the file and whether there's a definition available for the current

word. If there is a definition, you can view it by pressing F1.

Type your first guess for a letter in the word. If you're right, the program will place the letter in its respective position or positions in the line of equals signs. If you're wrong, the letter will be displayed near the top of the screen, as a reminder not to try it again.

Each time you make an incorrect guess, part of the Wordman picture is drawn. After seven incorrect guesses, a tone also sounds, and after ten, the word is shown along with the completed picture of the wordman.

Every time you finish with a word, the program goes back to the menu, and you must choose option 1 again to guess another word. Once you've used all the words in the file, totals for the file are displayed, and the program asks if you want to play again. If so, it takes you back to the menu; if not, it exits to Basic.

You can also exit Wordman by selecting option 2 in the menu. Your score will be displayed, and you'll be asked to verify that you want to leave the program. If you change your mind and say no, you'll return to the menu for another round of . . . Wordman. R

William Tumbleson developed this program to increase his daughter's vocabulary and computing skills. He is a computer technician for Wang Laboratories.

Listing 1. Wordman program.

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| | B49 | D: PF | INT" | {CR | SR I | UP} | ":NEXT | |
| | | | | | | | :REM*63 | |
| 20 | FO | RI=1 | TO23 | : PO | KE6 | 46, | FNB(Y):PR | |
| | IN' | r" ' | CHR\$ | (FN | A(X |)) T. | AB(38);:G | |
| | | JB40 | | | | | :REM*114 | |
| 25 | PR: | INT: | NEXT | : PR | INT | " { C | RSR RT } {C | |
| | | |)"; | | | | :REM*221 | |
| 30 | FOI | RJ=1 | TO19 | STE | P1: | PRI | NTTAB(J): | - |
| | GO: | SUB4 | Ø:PR | INT | TAB | (39 | -J):GOSUB | |
| | 40 | | | | | | :REM*1Ø2 | |
| 35 | PR | INT' | '(CRS | R U | P}" | :NE | XT:GOTO45 | |
| | | | | | | | :REM*145 | |
| 40 | PO | KE64 | 16,FN | B(Y |):P | RIN | TCHR\$ (FNA | |
| | (X |));: | RETU | RN | | | :REM*252 | |
| 45 | A\$ | =" ' | ':N\$= | " { 7 | SP | ACE | s)WORD | |
| | | | | | | | :REM*1Ø3 | |
| 5Ø | A= | 1:B: | =26:2 : P=41 : HEN1 | =32 | : D= | 1 : K | =Z:L=Z:M= | |
| | Z: | N = Z | P=41 | :R= | 39 | | :REM*58 | |
| 55 | IF | A > B' | THEN 1 | 20 | | | :REM*231 | |
| 60 | G= | 102 | 3+E:F | $I = 1 \emptyset$ | 64- | F:I | =1663+E:J | |
| | | | | | | (N\$ | ,A,D):N2\$ | |
| | | | (N\$,E | | | | :REM*174 | |
| 65 | | N1\$: | =A\$TF | IENA | =A+ | D:E | =E+D:GOTO | |
| | 55 | | | | | | :REM*69 | |
| 70 | IF | N2\$ | =A\$TH | ENB | =B- | D:F | =F+D:GOTO | |
| | 55 | | | | | | :REM*146 | |
| 75 | No. Description | | | | | | K(G):POKE | |
| | G, | ASC | (N1\$) | -64 | :PO | KEH | ,L:H=H+R: | 1 |
| | | | K(H) | | | | :REM*185 | |
| 80 | | | | | | | :REM*34 | |
| 85 | | | | | | | K(I):POKE | |
| | | | | -64 | : PC | KEJ | , N: J=J-P: | |
| | | | K(J) | | | | :REM*119 | |
| 90 | PO | KEJ | , ASC | N25 |)-6 | 4 | :REM*6Ø | |

| | 95 1 | IFG>=ITHENA=A+D:B=B-D:E=E+D: | 170 | PRINTTAB(10)"({CTRL 9}3{CTR |
|----|--------------|------------------------------------|------------------|---|
| , | F | F=F+D:K=Z:L=Z:M=Z:N=Z:GOTO55 | | L Ø}) CREATE / EDIT WORD FI |
| 1 | | :REM*93 | | LE(CRSR DN)" :REM*40 |
| 1 | | GOTO75 :REM*152 | 175 | PRINTTAB(10)"({CTRL 9}4{CTR |
| | 105 | PRINT" (SHFT CLR)": DIMW(20), | | L Ø)) LOAD WORD FILE (CRSR D |
|) | | ER\$(16), WD\$(20), DF\$(20), G\$(| | N}" :REM*153 |
| 5 | | 16) :REM*35 | 18Ø | PRINTTAB(10)"({CTRL 9}5{CTR |
| 2 | 110 | SP\$="{36 SPACEs}":CR\$=CHR\$(| | L Ø) DELETE WORD FILE (CRSR |
| 1 | | 13) :REM*216 | | DN]": PRINTTAB(10)"({CTRL 9 |
| ķ. | 115 | LL\$="{CTRL 2}NAME TOO LONG | |)6(CTRL Ø)) PRINT WORD FILE |
| J | | (MAX OF 13 CHARACTERS) (CTRL | | {2 CRSR DNs}" :REM*18Ø |
| | | 8}" :REM*117 | 185 | PRINTTAB(18)"ENTER{CRSR DN} |
| 3 | 120 | P\$="PRESS {CTRL 9}ANY{CTRL | | ":PRINTTAB(13)"# OF YOUR CH |
| 3 | | Ø) KEY":S=54272:S1=54296:IF | | OICE{CRSR DN}":IFOP <> 1THENO |
| 3 | | RW=1THENRW=Ø:RETURN:REM*22Ø | | P\$="Ø" :REM*79 |
| 1 | 125 | PRINT" {HOME} {5 CRSR DNs}":G | 190 | INPUT" {19 SPACEs}"; OP\$: OP=V |
| 2 | | OSUB725:FORI=1TO3:GOSUB73Ø: | | AL(OP\$):IFOP<1OROP>6THENGOT |
| į. | | NEXT:GOSUB725 :REM*21 | | 0735 :REM*6Ø |
| | 130 | FORT=1TO1ØØ:NEXT:PRINTTAB(| 195 | PRINT" (SHFT CLR)": POKE53281 |
| 3 | | 19)"{2 CRSR DNs}{COMD 6}BY{ | | ,PEEK(820):PRINT"(CTRL 8)" |
| 2 | | CRSR DN)" :REM*34 | | :REM*15 |
| 5 | 135 | PRINTTAB(12)"WILLIAM TUMBLE | 200 | ONOPGOTO205,330,375,520,595 |
| 5 | | SON": PRINTTAB(16)" {CRSR DN} | | ,99Ø :REM*242 |
| A | | (C) 1987":FORA=83ØTO945 | 205 | PRINT"{SHFT CLR}":IFC=ØORWC |
| 2 | | :REM*179 | | =CTHEN745 :REM*195 |
| D | 140 | READB: POKEA, B: NEXT: X=20 | 21 Ø | $R=INT(RND(\emptyset)*(C))+1:IFW(R)=$ |
| 3 | | :REM*2Ø2 | | 99THEN21Ø :REM*122 |
| = | 145 | Y=14:Z\$="{CTRL 8}"+P\$:GOSUB | 215 | $W(R) = 99:WC = WC + 1:RR = \emptyset:IFDF$ \$(|
| В | | 72Ø:X=21:Y=11:Z\$="{COMD 5}(| (and the region | R)="."THENRR=1 :REM*139 |
| 1 | | F8)=BLACK BACKGROUND": POKE1 | 220 | L=LEN(WD\$(R)):FORP=1TOL:ER\$ |
| J | | 98,Ø :REM*97 | | (P)=MID\$(WD\$(R),P,(1)):NEXT |
| \$ | 150 | GOSUB72Ø:GETA\$:ON((A\$="")+2 | | :PRINT"(HOME) (6 CRSR DNs)" |
| 4 | |)GOTO15Ø:IFA\$=CHR\$(14Ø)THEN | | :REM*8Ø |
| 0 | | POKE82Ø,Ø :REM*78 | 225 | FORG=1TOL: PRINT"=";:NEXT:IF |
| 9 | 155 | PRINT" (SHFT CLR)": POKE53281 | | RR=1THEN24Ø :REM*21 |
| 0 | | ,1:PRINT"(COMD 2)":POKE198, | 230 | X=18:Y=9:Z\$="{CTRL 2}{2 COM |
| 6 | | Ø:PRINTTAB(16)"(CRSR DN)M E | | D @s) {CTRL 8}":GOSUB72Ø:X=1 |
| E | 100000 | N U" :REM*185 | | 9:Y=1:Z\$="{2 SPACEs}PRESS { |
| : | 160 | PRINTTAB(16)"(7 COMD Us)(CR | | CTRL 9){CTRL 2}F1{CTRL Ø}{C |
| 5 | 79.00 500.00 | SR DN}" :REM*168 | | TRL 8} KEY ":GOSUB72Ø:X=2Ø |
| 4 | 165 | PRINTTAB(10)"((CTRL 9)1(CTR | | :REM*78 |
| E | | L Ø) CHOOSE A WORD (CRSR DN | 235 | Z\$=" FOR DEFINITION":GOSUB7 |
| : | |)":PRINTTAB(10)"({CTRL 9}2{ | | 20:LE=1:DO=18:WI=16:DE=4:GO |
| 9 | | CTRL Ø)) END SESSION / GAME | | SUB910 :REM*215 |
| Ø | | (CRSR DN)" :REM*177 | 240 | CT=0:X=12:Y=1:Z\$="{COMD 6}" |
| | | | | Continued on p. 116. |
| | | | | |

| | 170 | PRINTTAB(10)"({CTRL 9}3{CTR |
|---|-----------|---|
| | | L Ø}) CREATE / EDIT WORD FI |
| | | LE(CRSR DN)" :REM*40 |
| | 175 | PRINTTAB(10)"({CTRL 9}4{CTR |
| | | L Ø)) LOAD WORD FILE(CRSR D |
| | | N}" :REM*153 |
| | 18Ø | PRINTTAB(10)"({CTRL 9}5{CTR |
| | | L Ø)) DELETE WORD FILE (CRSR |
| | | DN)":PRINTTAB(10)"((CTRL 9 |
| | |)6(CTRL Ø)) PRINT WORD FILE |
| | | {2 CRSR DNs}" :REM*18Ø |
| | 185 | PRINTTAB(18)"ENTER{CRSR DN} |
| | | ":PRINTTAB(13)"# OF YOUR CH |
| | | OICE(CRSR DN)":IFOP > 1THENO |
| | | P\$="Ø" :REM*79 |
| | 190 | INPUT" [19 SPACES]"; OP\$: OP=V |
| | | AL(OP\$):IFOP<10ROP>6THENGOT |
| | | 0735 :REM*6Ø |
| | 195 | PRINT" {SHFT CLR}": POKE53281 |
| | | ,PEEK(820):PRINT"{CTRL 8}" |
| | | :REM*15 |
| | 200 | ONOPGOTO205,330,375,520,595 |
| | | ,99Ø :REM*242 |
| | 205 | PRINT"{SHFT CLR}":IFC=ØORWC |
| | | =CTHEN745 :REM*195 |
| | 21Ø | $R=INT(RND(\emptyset)*(C))+1:IFW(R)=$ |
| | | 99THEN21Ø :REM*122 |
| } | 215 | $W(R) = 99:WC = WC + 1:RR = \emptyset:IFDF$ \$(|
| | (2000)/46 | R)="."THENRR=1 :REM*139 |
| | 220 | L=LEN(WD\$(R)):FORP=1TOL:ER\$ |
| | | (P)=MID\$(WD\$(R),P,(1)):NEXT |
| | | :PRINT"(HOME) (6 CRSR DNs)" |
| I | | :REM*8Ø |
| } | 225 | FORG=1TOL:PRINT"=";:NEXT:IF |
| | 224 | RR=1THEN24Ø :REM*21 |
| | 230 | X=18:Y=9:Z\$="{CTRL 2}{2 COM |
| | | D @s}{CTRL 8}":GOSUB72Ø:X=1 |
| 1 | | 9:Y=1:Z\$="{2 SPACEs}PRESS { |
| | | CTRL 9) (CTRL 2) F1 (CTRL Ø) (C |
| } | | TRL 8} KEY ":GOSUB720:X=20 |
| } | 225 | :REM*78 |
| I | 235 | Z\$=" FOR DEFINITION":GOSUB7 20:LE=1:DO=18:WI=16:DE=4:GO |
| | | SUB910 :REM*215 |
| | | SUB910 : REM*215 |

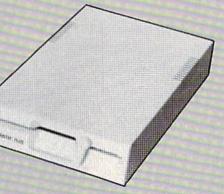
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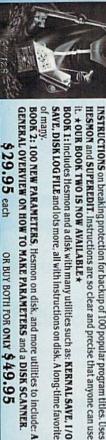
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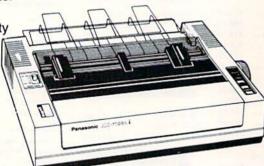
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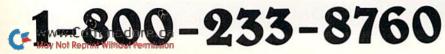
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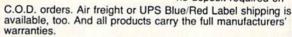
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PRICE GUARANTEE

Color Hi-Res Graphics

Draw in all 16 colors in 80-Column mode with this C-128 graphics utility.



By DANIEL MONTES

he excellent Ultra Hi-Res program by Louis Wallace and David Darus in the February and May 1986 issues of *RUN* gave the C-128 a set of commands for high-resolution (640 × 200 pixels) drawing in 80-Column mode. However, this mode won't let you use all 16 C-128 colors simultaneously. To make this possible, I've written a graphics utility called Color Hi-Res Graphics, which does what you might call pseudo-hi-res drawing in 80-Column mode.

Color Hi-Res Graphics lets you define a new character and update the corresponding attribute address for that character's position. The result: a 256 × 112-pixel frame with colorful highresolution graphics. The program's only limitation is that it allows just one color inside each 8 × 8-pixel character.

Type in Listing 1 carefully and save it. When you run it, a machine language program called CHR.Graph is written to disk. Your own applications program can then load CHR.Graph with the BLoad command. Listing 2, a demonstration program, presents some ideas for applications programs.

If you use other machine language utilities with Color Hi-Res Graphics, make sure each Color Hi-Res command is used in bank-15 configuration. Also, the pi symbol (π) and all control characters with a screen code higher than 63 won't appear in your listings until the original shapes and characters are restored.

NEW COMMANDS

Color Hi-Res Graphics provides seven new drawing commands. They're activated with a SYS command, followed by an address and any necessary parameters. The address of each command can be given in either numeric or variable form. See line 20 of the demonstration program for an example of the latter.

In this pseudo-hi-res mode, the text



Various graphics created with the Color Hi-Res program.

screen is displayed. You can use the Print command if printing occurs outside the borders of the window, so a "black hole" won't appear in your hard copy. After each command is issued, the cursor position for printing text or numbers is preserved.

All commands requiring parameters check the range of the parameters and produce an Illegal Quantity error if your input is out of range.

A list of the new commands follows:

1. SET UP HI-RES AREA: SYS HR,XS,YS. HR equals 4864; XS is the column number of the upper-left border of the hires window (0–48); and YS is the row number of the upper-left border of the hi-res window (0–11).

This hi-res window can be placed anywhere on the screen, as reflected in the ranges allowed for the coordinates. You can't see the window, since it's the same color as the background. After this routine is called, all the standard character shapes are cleared from the window.

2. PLOT A POINT: SYS PL,XP,YP,CP. PL equals 4867; XP is the X-coordinate of the point (0–255); YP is the Y-coordinate of the point (0–111); and CP is the color of the point (0–15).

A point is plotted at the given coordinate. If another point is located nearby, and if both points are involved in the same character, they share the last color defined.

3. UNPLOT (ERASE) A POINT: SYS UP, XP,YP. UP equals 4870; XP is the X-coordinate of the point (0–255); and YP is the Y-coordinate of the point (0–111).

This command erases a point at the given coordinate, giving it the same color as the background.

4. DRAW A LINE: SYS DR,XD,YD,CD. DR equals 4873; XD is the destination X-coordinate of the line (0-255); YD is the destination Y-coordinate of the line (0-111); and CD is the line color (0-15).

Every line is drawn using this method. First, the origin coordinates must be set, usually by plotting a point at that location. Then you must issue a Draw command. The same rules for color zones that apply to the Plot command are applicable here. If this command is the first encountered after the hi-res area has been defined, a default origin of 0.0 is used.

5. UNDRAW (ERASE) A LINE: SYS UD, XD,YD. UD equals 4876; XD is the destination X-coordinate of the line (0–255); and YD is the destination Y-coordinate of the line (0–111).

The line between the last coordinates and the ones specified is erased.

6. CLEAR HI-RES AREA: BSYS CS. CS equals 4879.

All the shapes and characters are cleared, but the hi-res area is still intact.
7. RESTORE CHARACTER SHAPES: SYS RS. RS equals 4882.

The character shapes are restored, and the entire screen is cleared.

80-COLUMN MEMORY CONFIGURATION

Color Hi-Res Graphics creates designs by redefining the shapes of characters instead of using Hi-Res mode (setting bit 7 of register 25). I wrote it



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COLOR HI-RES

this way because the shapes are stored in the 80-column chip's 16K RAM. Here's a brief outline of the memory configuration of this chip:

- 1. \$0000-\$07CF. Video RAM—2000 bytes used to display screen characters. 2. \$07D0-\$07FF. 48 unused bytes.
- 3. \$0800-\$0FCF. Attribute RAM—a 2000-byte area that holds the attributes of the corresponding video RAM, including character color, underlining and flashing.
- 4. \$0FD0-\$1FFF. 48 unused bytes.
- 5. \$2000-\$3FFF. CHARRAM (character generator RAM)—an 8K area where character shapes are defined.

In 80-Column mode, you can define characters and display them anywhere on the screen by just poking them into video RAM. However, not all the shapes



and characters can be modified. I preserved the first 64 definitions, including all the letters in uppercase, numbers 0–9, all the punctuation marks and

some others, so you can include text with your graphics.

Here's how I calculated the number of characters available for redefinition. There is a total of 512 characters (256 each for upper- and lowercase). I subtracted 64 (the number of characters not modified), leaving 448. This allows for a 32 × 14-character window anywhere on the screen, where you can put the available shapes and characters, one after the other.

The net result is a "pseudo" hi-res frame of 256 × 112 pixels. The frame occupies about one quarter of the screen, which is adequate for many applications. R

Daniel Montes is an aeronautical engineer at a research institute in Argentina. He is also president of his local Commodore user's group.

Listing 1. Color Hi-Res Graphics program.

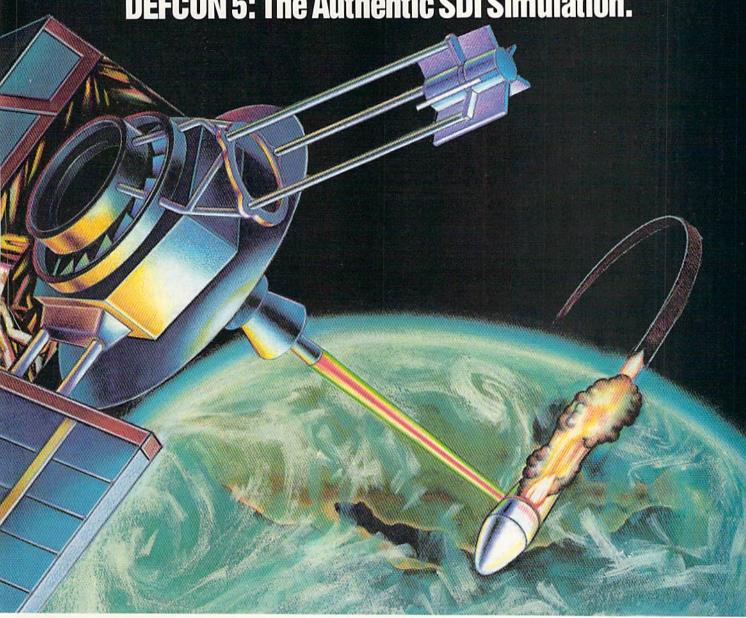
| 10 REM COLOR HIRES GRAPHICS LOA |
|---|
| DER :REM*234 |
| 20 REM BY DANIEL MONTES :REM*52 |
| 3Ø CK=Ø:SCNCLR:PRINT"READING DA |
| TA" :REM*10 |
| 4Ø FOR I=4864 TO 5526:READ A:PO |
| KE I, A: CK=CK+A: NEXT : REM*192 |
| 50 IF CK<>82320 THEN PRINT"ERRO |
| R IN DATA STATEMENTS":STOP |
| :REM*174 |
| 60 PRINT"PUT THE DISK IN THE DR |
| IVE AND PRESS ANY KEY TO CRE |
| ATE CHR.GRAPH" :REM*72 |
| 70 GETKEY A\$:BSAVE "CHR.GRAPH", |
| BØ,P4864 TO P5527 :REM*86 |
| 80 IF DS <> 0 THEN PRINT"DISK ERR |
| OR:";DS\$:STOP :REM*206 |
| 90 PRINT"CHR.GRAPH CREATED": END |
| :REM*76 |
| 100 DATA 76,25,19,76,81,19,76,1 |
| Ø2,19,76,3,2Ø,76,24,2Ø,76,1 |
| 1,21,76,135,21,Ø :REM*58 |
| 110 DATA 0,0,0,32,109,21,201,49 |
| ,176,87,224,12,176,83,141,2 |
| 3 19 142 24 19 · DEM*24 |
| 3,19,142,24,19 :REM*2Ø 12Ø DATA 165,215,48,3,32,95,255 |
| ,32,222,106,32,11,21,32,159 |
| 200 160 64 32 DEM*170 |
| ,200,169,64,32 :REM*178 130 DATA 56,21,32,139,200,169,0 |
| ,32,56,21,32,143,21,169,0,1 |
| 33 251 132 252 • DEM*06 |
| 33,251,133,252 :REM*86 140 DATA 96,32,109,21,224,112,1 |
| 76,31,192,16,176,27,169,1,1 |
| 23 110 22 122 10 .PPM*26 |
| 33,119,32,122,19 :REM*26 15Ø DATA 76,143,21,32,109,21,22 |
| 4,112,176,10,169,0,133,119, |
| 32,122,19,76,143 :REM*2Ø |
| 16Ø DATA 21,76,4Ø,125,169,Ø,133 |
| ,202,169,36,133,203,165,251 |
| ,16Ø,3,32,223,2Ø :REM*74 |
| 17Ø DATA 165,252,16Ø,8,32,223,2 |
| Ø,165,252,41,7,133,9,169,Ø, |
| 133,10,32,240,20 :REM*156 |
| 133,19,32,249,29 : REM 136 |
| ww.Commodore.ca |

| 18Ø | DATA 165,251,41,7,168,185,1 |
|-----------|---|
| | Ø8,2Ø6,133,114,73,255,133,1 |
| | 15,32,254,20,32 :REM*128 |
| 190 | DATA 216,205,166,119,240,4, |
| | 5,114,208,2,37,115,72,32,25 |
| | 4,20,104,32,202 :REM*124 |
| 200 | 4,20,104,32,202 :REM*124 DATA 205,165,119,240,56,165 |
| | ,251,74,74,74,24,109,23,19, |
| | 168,132,6,165 :REM*2Ø6 |
| 210 | DATA 252,74,74,74,24,109,24 |
| | ,19,170,32,240,255,164,6,32 |
| | ,249,205,164,113 :REM*4 |
| 220 | DATA 185,92,206,133,17,32,2 |
| | 16,205,41,224,5,17,133,17,1 |
| | 64,6,32,249,2Ø5 :REM*134 |
| 230 | DATA 165,17,32,202,205,96,7 |
| | 6,40,125,224,112,176,249,19 |
| | 2,16,176,245,32 :REM*6Ø |
| 240 | 2,16,176,245,32 :REM*6Ø DATA 118,21,169,1,133,119,3 |
| | 2,41,20,76,143,21,224,112,1 |
| | 76,228,32,118,21 :REM*21Ø |
| 250 | DATA 169,0,133,119,32,41,20 |
| | ,76,143,21,165,253,141,21,1 |
| | 9,165,254,141,22 :REM*22 |
| 260 | DATA 19,160,0,132,250,132,2 |
| | ØØ,132,2Ø1,165,253,197,251, |
| | 176,16,166,251 :REM*143 |
| 270 | DATA 164,252,165,253,133,25 |
| | 1,165,254,133,252,134,253,1 |
| | 32,254,56,165 :REM*149 |
| 280 | DATA 253,229,251,133,7,56,1 |
| | 65,254,229,252,133,8,16,11, |
| | 56,165,252,229 :REM*167 |
| 290 | |
| | 0,32,122,19,165,7,197,8,144 |
| | ,58,165,251,197 :REM*129 |
| 300 | |
| | 101,8,133,200,165,201,105,0 |
| | ,133,201,165,201 :REM*13 |
| 31Ø | DATA 208,6,165,200,197,7,14 |
| | 4,24,56,165,200,229,7,133,2 |
| | ØØ,165,2Ø1,233,Ø :REM*3 |
| 32Ø | DATA 133,201,165,250,240,5, |
| Section 1 | |

| | | 100 252 76 174 24 224 252 2 |
|----|--------|--|
| | | 198,252,76,170,20,230,252,2 30,251,76,108,20 :REM*139 |
| | 330 | DATA 165,252,197,254,240,31 |
| | 330 | ,24,165,200,101,7,133,200,1 |
| | | 97,8,144,6,229,8 :REM*125 |
| | 34Ø | DATA 133,200,230,251,165,25 |
| | 3.1 | 0,240,5,198,252,76,108,20,2 |
| | | 30,252,76,108,20 :REM*191 |
| | 35Ø | DATA 172,21,19,132,251,172, |
| | | 22,19,132,252,96,74,74,74,1 |
| | | 33,9,169,Ø,133 :REM*91 |
| | 360 | DATA 10,24,6,9,38,10,136,16 |
| | | ,248,24,165,9,101,202,133,2 |
| | | Ø2,165,1Ø,1Ø1 :REM*197 |
| | 37Ø | DATA 203,133,203,96,162,18, |
| | | 165,203,32,204,205,232,165, |
| | | 202,76,204,205 :REM*177 |
| | 38Ø | DATA 162,18,169,36,133,219, |
| | | 32,204,205,232,169,0,133,21 |
| | | 8,32,204,205,169 :REM*63 |
| | 39Ø | DATA Ø,16Ø,15,32,2Ø2,2Ø5,13 |
| | | 6,16,250,24,165,218,105,16, |
| | - 7780 | 133,218,144,237 :REM*233 |
| | 400 | DATA 230,219,165,219,201,64 |
| | | ,144,229,96,133,112,166,252 |
| | | ,164,251,24,32 :REM*93 |
| | 41 Ø | DATA 240,255,32,93,21,164,2 |
| | | 51,32,230,205,160,31,165,11 |
| | 420 | 2,32,202,205,230 :REM*29 DATA 112,136,16,246,230,252 |
| | 420 | ,165,112,208,222,96,164,251 |
| | | ,32,249,205,165 :REM*207 |
| | 430 | |
| | 430 | 136,16,250,96,133,251,134,2 |
| | | 52,132,113,76 :REM*225 |
| | 440 | |
| | 110 | ,132,113,72,165,236,133,142 |
| | | ,165,235,133,143 :REM*237 |
| | 450 | |
| | 10000 | 255,76,98,255,166,143,164,1 |
| R | | 42,24,76,240,255 :REM*87 |
| N. | | |

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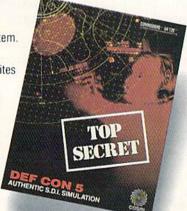


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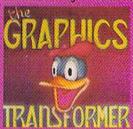
COLOR HI-RES

| Listing | 2. | Demonstration | program. |
|---------|----|---------------|----------|
| | | | |

- 10 REM 80-COLUMN HIRES COLOR DE
- 20 REM BY DANIEL MONTES : REM*52
- 40 BLOAD"CHR.GRAPH", BO: BANK 15: :REM*172
- 50 HR=4864:PL=HR+3:UP=PL+3:DR=U P+3:UD=DR+3:CS=UD+3:RS=CS+3
- :REM*164 60 SYS HR, 22, 10
- 7Ø PRINTCHR\$(19)CHR\$(142)CHR\$(1 49) TAB(25) "COLOR HIRES IN 80 COLUMNS" :REM*18Ø
- 80 CHAR1, 2, 2, "YOU NOW HAVE AN 8 Ø-COL. HIRES SCREEN IN WHICH YOU CAN DRAW IN ALL 16 COLO
- RS." :REM*15Ø 90 RN=RND(-TI) :REM*36
- 100 : :REM*76 110 CHAR1, 30, 9, "RANDOM PATTERNS
- :REM*172 12Ø FOR I=1 TO 35Ø :REM*116
- 13Ø SYS PL, 256*RND(1), 112*RND(1
-),1+15*RND(1) :REM*190
- 140 NEXT :REM*15Ø 15Ø SLEEP 3:SYS CS :REM*4
- 160 :REM*136
- CHAR1, 30, 9, "BUSINESS GRAPHS 170
- 18Ø SYS PL,7,7,1Ø :REM*18Ø
- 19Ø SYS DR, 7, 1Ø4, 1Ø: SYS DR, 248, 104,10 :REM*15Ø
- 200 FOR X=12 TO 236 STEP 32
- :REM*248 21Ø CL=1+15*RND(1):HI=2Ø+7Ø*RND
- :REM*136 (1) 220 FOR XX=X TO X+12 STEP 3
- :REM*236
- 23Ø SYS PL, XX, 1Ø3, CL :REM*148 24Ø SYS DR, XX, 1Ø3-HI, CL: REM*1Ø6
- :REM*254 250 NEXT: NEXT
- 26Ø SLEEP 3:SYS CS :REM*115 :REM*247 270 :
- 280 CHAR1, 29, 9, "DESIGNING FOR F UN" :REM*53
- 29Ø FOR R=4Ø TO Ø STEP -1Ø:SYS PL, 41+R, 40, 1+R/10 :REM*157
- 300 FOR A=0 TO 2*{PI} STEP {PI} :REM*147
- 31Ø SYS DR, 41+R*COS(A), 4Ø+R*SIN (A),1+R/1Ø :REM*61
- :REM*69 320 NEXT: NEXT
- 33Ø FOR X=5 TO 255 STEP 1Ø :REM*253
- :REM*155 340 SYS PL, X, 111, 10 :REM*151 35Ø SYS DR, 255, Ø, 1Ø
- :REM*115 360 NEXT :REM*233 370 FOR I=1 TO 200
- 38Ø SYS PL,1ØØ+6Ø*RND(1),38*RND
- (1), 14:REM*199
- :REM*145 39Ø NEXT 400 CHAR1, 32, 4, "{CTRL O}ENJOY!"
- :REM*163 :SLEEP 4 :REM*221 41Ø SYS RS

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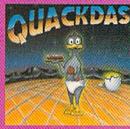


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(C-64(C-125)

*** * * * (Transmission —
The Intelligence Journal)

Chris Zamara & Nick Sullivan (of Transactor Magazine, Earth) did it again with the most comprehensive animation program yet available for any silicon based unit. Unfortunately, you don't have to be intelligent to use it.



QUACKDAS = \$39.95 (C-64/C-128 mode/1541/1571 mode) * * * * * (Operating Systems & Intergalactic Insight)

finally a cartridge that speeds up SAVE's as well as LOAD's (fast format, in-buded FREE!). QUACKDAS comes com-plete and ready to use with its blinding speed, built in DOS wedge, sector editor, and a token disk copier! Definitely something to write home about.



1541 AUNTIE BUMP BOARD - \$49.95

* * * * (Buyit Magazine)

It's surprising that the generic mor-tal species hadn't come po with a device to ELIMINATE the damaging knock on the 1541 disk drive belove tow. After looking at the circuit board, I've come to the con-clusion that they did it almost as good as the Vorkons could ve.



(Amiga/C-64/C-128 compatible) 7 7 7 7 7 7 7 (The Hitchhiker's Guide to

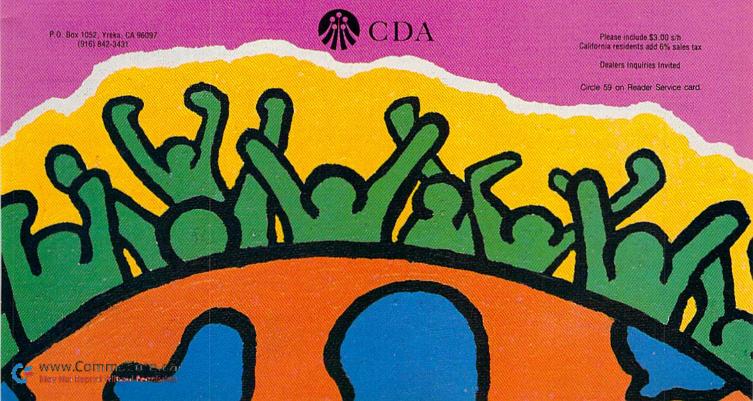
an interesting implementation of an adventure game. It's hard to believe that so many abstract perversions can be contained in eine place. ENTHOPY is destined to become another missions in the realm of interactive fiction.



THE MANDELBROT POSTER - \$9.95

* * * * (Fractagalactic &

what can you say about a software company that markets posters. The fabled Mandelbrot Set is now captured on paper (where available — some restrictions might apply), using the highest resolution ever experienced to date.



Snowflake

Get those snowshovels out—it's a winter wonderland in your C-128.



Program by IAN ADAM; Article by TIM WALSH

an Adam wrote the article that originally accompanied the Snowflake 128 program (Listing 1). Unfortunately, the original manuscript and disk vanished, and we can't contact Mr. Adam, who, according to his office colleagues, is vacationing in "the islands." Rather than postpone publication of the program until Ian Adam can be reached, your technical editor has undertaken to write this documentation.

A program without equal, Snowflake 128 lets you design snowflakes in 40-Column mode on the C-128. Type it in, using 128 Perfect Typist, and save it to disk before running it. Next, run it and, after the introductory snowflake appears, try your hand at custom designing snowflakes on the screen. A menu at the bottom of the screen lets you print them out on any Star Micronics or Epson-compatible printer.

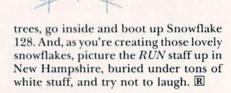
Snowflake 128 also has the advantage of letting you enjoy the beauty of snow-flakes any time of the year, regardless of where you live. If you live in a snow-



Sample screen from Snowflake 128.

belt region, you can hold contests to see who can design the most elegant snowflake. The prize could be a day off from shoveling.

Of course, if you live in Hawaii or Bermuda, such contests aren't very practical. In that case, on a warm January afternoon, when the tropical breezes are gently swaying the palm



Ian Adam has authored several programs for RUN; Technical Editor Tim Walsh spends days and evenings with computers.

Listing 1. Snowflake 128 program.

| A DEM CNOWER AVE 130 PM | TAN |
|---------------------------|-----------|
| Ø REM SNOWFLAKE 128 BY | |
| | :REM*7Ø |
| 10 PRINT" {SHFT CLR}" | :REM*Ø |
| 20 GOSUB 1110, SETUP: GOS | SUB 700,D |
| EMO | :REM*14Ø |
| 3Ø DO | :REM*206 |
| 40 TRAP 70:GOSUB 80 | :REM*62 |
| 50 ON INSTR("ACPO", M\$) | GOSUB 12 |
| Ø,26Ø,65Ø,67Ø | :REM*246 |
| 60 LOOP | :REM*24Ø |
| 70 CLR:GOSUB 1220:GOTO | 30 |
| | :REM*15Ø |
| 8Ø GRAPHIC 2,,23 | :REM*2Ø4 |
| 90 PRINT"A AUTOMATIC{3 | |
| | :REM*208 |
| 100 PRINT"P PRINT THIS | |
|) CANCEL ORDER (2 S | |
| OICE"; | :REM*19Ø |
| 0100 | |

```
11Ø INPUT M$: RETURN
                             :REM*28
12Ø NS=4:BG=RND(Ø)>.5
                            :REM*112
                            :REM*1Ø4
13Ø FOR I=1 TO 4
140 \text{ SD(I)} = INT(1 + RND(0) * 4)
                            :REM*134
15Ø SP(I)=5Ø*(RND(Ø)+I):REM*13Ø
16Ø SC(I)=C(RND(Ø)*5)
                             :REM*54
170 B=280-SP(I): IF B>140 THEN B
                             :REM*90
     =28Ø-B
18\emptyset SZ(I)=6\emptyset+RND(\emptyset)*B
                            :REM*172
19Ø SV(I)=RND(Ø)*4
                            :REM*116
200 IF SD(I)=1 THEN SV(I)=SV(I)
                            :REM*212
210 IF SD(I)=2 THEN BEGIN
                            :REM*248
220 \text{ SV(I)} = \text{SZ(I)} / (1 - (\text{SV(I)} > 2))
                            :REM*25Ø
23Ø SZ(I)=SZ(I)*3
                             :REM*60
```

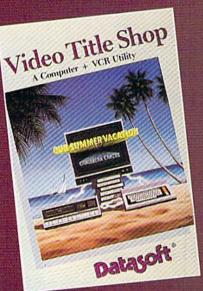
| 240 | IF SP(I)+SZ(I)>LA THEN SP(I |
|-----|-------------------------------|
| |)=Ø :REM*212 |
| 250 | BEND :REM*19Ø |
| 255 | NEXT:GOTO 760 :REM*255 |
| 260 | GRAPHIC 2,1,13:SCALE 1,999, |
| | 8ØØ :REM*43 |
| 270 | PRINT"CUSTOM SNOWFLAKE DESI |
| | GN" :REM*255 |
| 280 | PRINT" (CRSR DN) DESCRIBE THE |
| | SHAPES THAT" :REM*135 |
| 290 | PRINT"YOU WANT ON EACH ARM: |
| | ":REM*193 |
| 300 | COLOR 1,4:NS=Ø :REM*2Ø7 |
| | |

31Ø FOR I=-3 TO 3:LOCATE X+I,Y:

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SNOWFLAKE

| 340 | PRINT"1{2 SPACEs}CHEVRON":P | :REM*132 | :REM*114 |
|-----------------|---|--|---|
| | RINT"2(2 SPACES)HEXAGON":PR | 74Ø SV(1)=25:SV(2)=5Ø:SV(3)=2 | 1170 INPUT M\$:REM*88 |
| | INT"3{2 SPACES}BRANCHES":PR | :REM*134 | 118Ø FOR I=1 TO 25 :REM*188 |
| | INT"4{2 SPACEs}STAR" :REM*177 | 75Ø SC(1)=4:SC(2)=4:SC(3)=2 | 119Ø PRINTCHR\$(27)"W(HOME)"TAB(|
| 35Ø | PRINT"Ø{2 SPACES}FINISHED": | :REM*238 76Ø GRAPHIC 1,1:SCALE 1,999,8ØØ | RND(Ø)*39)"*" :REM*6 1200 NEXT :REM*190 |
| | INPUT"ENTER Ø TO 4";D | :REM*18 | 1210 CHAR, 0, 24: RETURN : REM* 44 |
| | :REM*97 | 770 IF BG THEN COLOR 1,2:FOR I= | 1220 COLOR 0,1:COLOR 4,7 |
| 36Ø | SD(I)=D:IF D<1 THEN I=9:GOT | Ø TO 24:CHAR,RND(Ø)*39,I,"* | :REM*188 |
| 274 | O 49Ø :REM*241 | ":NEXT :REM*127 | 123Ø X=499:Y=4ØØ:LA=33Ø :REM*26 |
| 3/6 | INPUT" (CRSR DN) DISTANCE FRO | 780 FOR HEADING=0 TO 300 STEP 6 | 124Ø G\$=CHR\$(7):PRINTG\$:REM*1Ø2 |
| 380 | M MIDDLE Ø-28Ø"; A :REM*79 SP(I)=ABS(A):IF A>28Ø THEN | Ø :REM*91 79Ø COLOR 1,4 :REM*139 | 1250 FOR I=0 TO 4:READ C(I) |
| 300 | 37Ø :REM*247 | 800 FOR I=0 TO 3:LOCATE X,Y:DRA | 126Ø NEXT:RETURN :REM*18Ø |
| 390 | PRINT" {CRSR DN} COLOR OF THI | W TO 3;1*9Ø:DRAW TO LA;HE:N | 1270 DATA2,4,7,14,15 :REM*4 |
| | S SHAPE, 1 TO 16:" : REM*163 | EXT :REM*71 | 1280 DATA" (CRSR DN) DATELINE:" |
| 400 | INPUT"(2 4 7 14 15 ARE BEST | 81 Ø FOR SHAPE=1 TO NS :REM*125 | :REM*211 |
| 110 |)";A :REM*225 | 820 L=SZ(SH):LL=SV(SH) :REM*109 | 1290 DATA" (3 SPACES) BAFFIN ISLA |
| 410 | SC(I)=((A-1)AND 15)+1 :REM*169 | 83Ø D=HE:B=L/2 :REM*87 | ND, NORTHWEST TERRITORIES" :REM*101 |
| 420 | B=LA-SP(I):IF B>200 THEN B= | 850 LOCATE X V · REM*161 | 1300 DATA"(3 SPACES)DECEMBER 25 |
| | 4ØØ-B :REM*21 | 84¢ COLOR 1,SC(SH) :REM*13 85¢ LOCATE X,Y :REM*161 86¢ LOCATE SP(SH);D :REM*75 | , 1987" :REM*123 |
| 43Ø | PRINT" {CRSR DN}SIZE, RANGE" | 87Ø ON SD(SH) GOSUB 9ØØ,93Ø,1Ø2 | 1310 DATA" (CTRL 4) (CRSR DN) YOUR |
| | 20"TO"B :REM*87 | Ø,1Ø7Ø :REM*163 | ORDER OF SNOWFLAKES IS AL |
| 440 | INPUTL:SZ(I)=L:IF L<20 OR L | 88Ø NEXT:NEXT :REM*119 | MOST" :REM*87 |
| 450 | >B THEN 430 :REM*103 ON D GOSUB 540,570,610,610 | 89Ø RETURN :REM*183 | 1320 DATA"READY. DUE TO PRODUCT ION LIMITATIONS," :REM*205 |
| 430 | :REM*141 | 900 DRAW TO L;D+300:DRAW TO LL; D:DRAW TO L;D+120:DRAW TO L | 1330 DATA"NO TWO WILL BE ALIKE. |
| 46Ø | LL=SV(I):D=Ø:B=L/2:NS=I:COL | ;D+6Ø :REM*245 | " :REM*243 |
| | OR 1,SC(I):LOCATE X,Y | 910 DRAW TO LL; D+180: DRAW TO L; | 1340 DATA" (CRSR DN) YOU CAN DESI |
| | :REM*1Ø9 | D+24Ø :REM*245 | GN CUSTOM FLAKES, OR" |
| 470 | LOCATE SP(I);D :REM*195 | 92Ø RETURN :REM*213 | :REM*189 1350 DATA"SELECT A RANDOM AVALA |
| 400 | ON SD(I) GOSUB 900,930,1020,1070 :REM*103 | 930 IF L <ll draw="" l;d:re<br="" then="" to="">TURN :REM*79</ll> | NCHE." :REM*119 |
| 490 | NEXT :REM*245 | 94Ø L=L/4:D2=D :REM*177 | 1360 DATA" (CRSR DN) SNOWFLAKES C |
| | IF NS=Ø THEN RETURN:REM*143 | 95Ø GOSUB 93Ø :REM*243 | AN BE DELIVERED TO AN" |
| 51Ø | INPUT" (CRSR DN) SNOWY BACKDR | 960 FOR D=D+300 TO D+300 STEP 6 | :REM*187 |
| E24 | OP Y/N";M\$:REM*167 BG=M\$="Y" :REM*228 | 97 GOSUB 93 :REM*49 97 GOSUB 93 :REM*7 98 NEXT :REM*225 | 137Ø DATA"EPSON/STAR COMPATIBLE PRINTER," :REM*251 |
| | BG=M\$="Y" :REM*228 GOTO 76Ø :REM*94 | 97Ø GOSUB 93Ø :REM*7 98Ø NEXT :REM*225 | 1380 DATA"TO CUT OUT & COLOR." |
| | INPUT" (CRSR DN) LENGTH OF CH | 990 DRAW TO L*3; D+60 :REM*87 | :REM*121 |
| | EVRON"; A :REM*186 | 1000 L=L*4:D=D2 :REM*135 | 1390 DATA" (CTRL 2) (CRSR DN) PRES |
| 55Ø | SV(I)=ABS(A):IF A>B THEN 54 | ipip KETOKK | S RETURN FOR SNOW" |
| ccd | Ø :REM*24 | 1020 FOR J=1 TO LL:D=D+60:GOSUB | :REM*137 |
| Profession (197 | RETURN :REM*1Ø8 INPUT"(CRSR DN)GENERATION 1 | 1040:D=D+240:GOSUB 1040:D =D-300:DRAW TO B;D:REM*237 | :REM*113 |
| 370 | OR 2"; A : REM*126 | 1030 NEXT:RETURN :REM*206 | 141Ø DATA16Ø,32,132,251,16Ø,Ø,1 |
| 580 | SV(I)=L/(1-(A>1)) :REM*12Ø | 1040 DRAW TO L;D:DRAW TO B;D-60 | 32,250,160,25,132,252,160, |
| 590 | L=L*3:SZ(I)=L :REM*74 | :DRAW TO B;D+12Ø:DRAW TO B | Ø,185,157,11,32,210:REM*57 |
| | RETURN :REM*148 | ;D+6Ø:DRAW TO B;D+24Ø | 142Ø DATA255,2ØØ,192,9,2Ø8,245, |
| 61Ø | PRINT" (CRSR DN) REPETITION: | :REM*198 1050 DRAW TO B;D:DRAW TO L+B;D+ | 16Ø, 4Ø, 132, 253, 16Ø, 7, 177, 2 5Ø, 162, 7, 42, 118, 166 |
| 620 | HOW MANY OF THESE" : REM*20 INPUT"1 TO 3"; A : REM*104 | 18Ø :REM*166 | :REM*177 |
| | SV(I)=A AND 3 :REM*54 | 1060 RETURN :REM*98 | 1430 DATA202,16,250,136,16,243, |
| 640 | RETURN :REM*188 | 1070 LOCATE L;D+60:WIDTH 2 | 169,7,170,56,101,250,133,2 |
| | GRAPHIC 1 :REM*146 | :REM*214 | 5Ø,144,2,23Ø,251 :REM*37 |
| 66Ø | OPEN 4,4,5:CMD4:PRINTCHR\$(1 | 1080 FOR J=1 TO LL:DRAW TO L*2; | 1440 DATA181,166,32,210,255,202 ,16,248,198,253,208,217,19 |
| | Ø):SYS29ØØ:PRINT#4:CLOSE4:R ETURN :REM*5Ø | D+240:LOCATE L;D:DRAW TO L *2;D+120:LOCATE L+B;D | 8,252,208,196,96 :REM*147 |
| 670 | GRAPHIC Ø,1 :REM*134 | :REM*76 | 1450 DATA27,65,8,13,10,27,75,64 |
| | M\$="HAPPY SHOVELING!":GOSUB | 1090 NEXT :REM*80 | ,1 :REM*197 |
| | 146Ø :REM*23Ø | 1100 WIDTH 1:RETURN :REM*44 | 1460 FOR I=1 TO LEN(M\$) :REM*3 |
| | END :REM*182 | 111Ø GOSUB 122Ø :REM*144 | 1470 PRINT"(CTRL 9)*(CRSR LF)(C |
| D13056 (A.F.) | NS=3:BG=1 :REM*7Ø SD(1)=1:SD(2)=2:SD(3)=3 | 1120 DO:READ M\$:REM*18 1130 GOSUB 1460,MESSAGE:REM*104 | |
| 110 | SD(1)=1:SD(2)=2:SD(3)=3 :REM*22Ø | 1140 LOOP UNTIL LEFT\$(M\$,3)="EN | |
| 720 | SP(1)=55:SP(2)=40:SP(3)=250 | D" :REM*122 | |
| | :REM*21Ø | 115Ø FOR I=29ØØ TO 2981 :REM*96 | |
| 73Ø | $SZ(1) = 55:SZ(2) = 28\emptyset:SZ(3) = 9\emptyset$ | 1160 READ A: POKE I, A: NEXT | :REM*227 ■ |

Superscript Solution

If your printer could not produce superscripts with RUN Script before, it can do so now with this technique.

By CHARLES LEWIS

ne of the advantages of RUN Script, RUN's word processor for the C-64 and C-128 (March and December 1986 issues), is its provision for sending special formatting commands to the printer, using macro characters. These characters are created by the Define Macros accessory program to RUN Script (April 1986 and January 1987 issues).

One application of this feature is printing superscripts—characters raised above the baseline of the type, as in footnote references. However, Define Macros can't produce superscripts if your printer doesn't support superscripts and subscripts, which is true of many letter quality printers and some of the less ex-

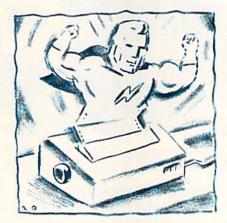
pensive dot matrix printers.

When you need to print out a document that includes footnotes, this limitation is a real problem, because it leaves no way to include the footnote reference numbers in the text. There is a way around this problem, however, using RUN Script's option to print to disk rather than to the printer. Printing your document to disk will create a sequential file with blank lines between the text lines. When you read the file back into memory, the blank lines will appear on the screen, and you can use them to set up footnote reference numbers, using the procedure described below. The final printout of your document will be double-spaced, with the footnote numbers located in the intervening lines. This technique works with RUN Script and virtually any printer.

THE PROCEDURE

To create the footnote numbers, first type in the text of your document with the numbers included as normal numbers in the text lines. Place each number immediately after the preceding letter or punctuation mark; don't leave any space between.

When you've finished entering the www.Commodore.ca



document, use the RUN Script dot commands to set the margins as you normally would and to specify double spacing (i.e., .ls1).

Now print out your document and proofread it. Be sure to read carefully so you'll catch everything you might want to change, because making any changes later will be difficult.

Once you're satisfied with the document, press F1 and P to print. Normally you'd print to device 4 or 5, the printer, but this time you must print to device 8 or 9, the disk drive. When prompted for a filename, add, w to the name (filename,w), so RUN Script won't try to read the file instead of writing it and give you a File Not Found error. You'll end up with a "printed" sequential file on disk.

Now enter F1 and R to read the file back into memory. If you're using RUN Script 128 and an 80-column screen, the document will appear as it will print out—double-spaced, with the left and right margins set properly. If you're using RUN Script 64, the display won't resemble the printout, because the screen is only 40 columns wide. However, there will be a blank line between each two display lines of text.

Move the cursor to the carriage re-

turn on the blank line above the first text line containing a footnote number. Switch to Insert mode and use the space bar to insert spaces until the cursor is immediately above the number. Then type the number on the blank line.

Now switch out of Insert mode, move the cursor to the original number and use the space bar to erase it. Don't use the delete key, or you might change the margins and end up with the footnote number over a letter rather than over a space.

RUN Script 64 users must bear in mind that if the original number appears in the second line of text, after the wraparound, enough spaces must be inserted to create a second blank line, as below:

2

2-

This is material that has been printed in the manner indicated. When it is

3

4-

printed, footnotes will be located in the right places.

Continue this process for each footnote number. Unless you have a lot of numbers in the text itself, you can save time by using the F2 search-and-replace function to locate the original numbers.

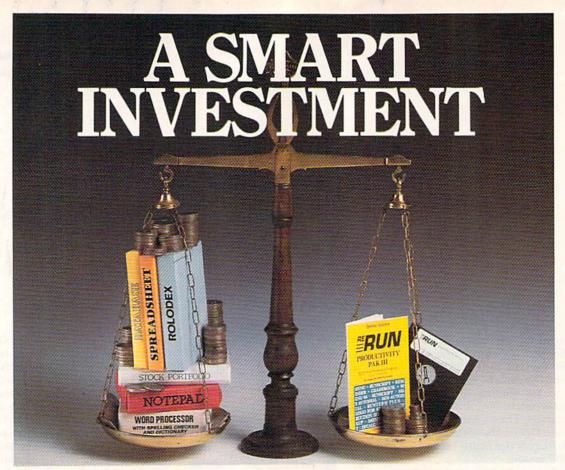
Once you've finished making the changes, move to the top of the document and set the margins as follows:

.lm1.rm1.tm1.bm1

These settings will keep RUN Script from changing the margins that were set when you printed to disk earlier.

Now save the revised document and print it. The footnote numbers will be placed in their correct locations, above the text lines.

Charles Lewis is a high school English teacher. He programs computers and writes in his free time.



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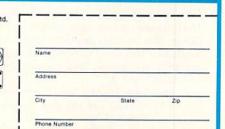
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GEO WATCH

The Commodore 1351 mouse, Berkeley's geoPrint Cable and the Tymac Connection all work with GEOS—to varying degrees.

By MATTHEW STERN

had hoped to review a new GEOScompatible education program this month, but my computer system had other ideas—both my 1541 disk drive and my RGB monitor called in sick. I depend on my computer a lot, so it's frustrating when it doesn't work right.

With hardware problems on my mind, I decided to show you how to avoid difficulties with the new Commodore 1351 mouse. I'll also review Berkeley Softworks' first hardware product, the geoPrint Cable, and dip into the geoWatch mail bag for information from a reader on another GEOS-compatible printer interface.

GEOS AND THE 1351 MOUSE

I bought my Commodore 1351 mouse two months ago, and so far, I've been quite pleased with it. It's very responsive, and its sculpted case fits well in my hand.

As you'd expect, the mouse's proportional movement helps me create better geoPaint pictures, but I've also found that its design helps me with geoWrite. Instead of taking both hands off the keyboard to reach for the joystick, I can keep one hand on the keys and move the mouse with the other. Since I've used other mouse-controlled machines like the Apple Macintosh and the Atari ST, I'm accustomed to this technique and find it a more comfortable way to write.

I have only one warning about the 1351 and GEOS: Don't use the driver installation program included with the mouse! That program has bugs, and some users have told me it can render a GEOS boot disk useless. A safer and easier way to configure GEOS for the 1351 is to copy the drivers to your boot disk, using the following procedure:

I. Check the back of your newer GEOS disks (Writer's Workshop, geo-File, and so forth) for the Commodore 1351 mouse driver and deskTop 1.3. (These files are also available on QuantumLink.) You need deskTop 1.3 to use the 1351; the mouse driver won't work with deskTop 1.2.

2. Plug your joystick into port 1 and boot GEOS, then use the Backup program to copy the files on your GEOS boot disk to another disk. Backup is designed especially for this purpose. You can't boot the copy, but you can use it to restore the files back to your boot disk, if necessary. You should always make a copy of the files on your boot disk before modifying them.

3. Throw the old deskTop icon into the trash can icon and copy the deskTop 1.3 icon to your boot disk.

 Copy the Commodore 1351 driver to your boot disk, so it's the first input device driver listed in your disk notepad.

5. Quit GEOS and turn off your machine, then plug your 1351 mouse into port 1. (Never plug or unplug any peripherals while the computer is on.) Then run GEOS. The 1351 driver will come up as the default, and your mouse will be ready to go.

THE GEOPRINT CABLE

So far, I've been generally impressed with Berkeley's software. However, I have reservations about their first hardware release—the geoPrint Cable.

The cable arrived in my mailbox just as my three-year-old Cardco Card?/G + interface decided to take an extended convalescence. Since I was stuck without a printer interface, I decided to give the geoPrint Cable a try.

The cable itself seems well made. It's six feet long, so your printer doesn't have to be right next to your computer. There's a metal Centronics parallel printer connector at one end and a plastic connector for Commodore's user port at the other. The user port connector has a plastic tab, so it fits only one way and you can't accidentally stick it into your computer upside down. There's no interface box, so you don't have to worry about any circuitry failing on you, either.

The geoPrint Cable comes with a disk of printer drivers. You select the appropriate driver for your printer and copy it to your boot and work disks. A one-page sheet serves as the user's manual, but I didn't really need it to set up the cable with GEOS. There's no need to fiddle with switch settings, nor

to turn the linefeed on or off.

The cable works well with GEOS, printing my files flawlessly. As for Berkeley's claim that it "speeds up your printing process," my data seems to go to the printer slightly faster with the geoPrint cable than with my Cardco G+, but not much. (If the cable had a printer buffer on it, the story would be different.)

If GEOS were the only program I used on my Commodore, I might be completely satisfied with the geoPrint Cable. However, this is not the case. For example, I do word processing with PaperClip II.

Here, the documentation sheet leaves me completely on my own, and I've found that I can't just choose parallel as my printer port selection and start printing. I first have to initialize the user port by selecting RS-232 for printer type and pressing the Print command. At this point, the file will preview on the screen, but it still won't print, so I have to go back and change the printer port to parallel and print again. This configuration routine is a kludge, but it's the only way I can use the geoPrint Cable with PaperClip II.

The cable won't work at all with programs that send printer output only to device 4. Also, if your program requires Commodore 1525/MPS-801 printer commands and characters, forget it. The geoPrint Cable can't do 1525 emulation.

You can't use the cable with programs that call for a modem, either, since both devices plug into the user port. Therefore, you can't use your printer with geoDex and QuantumLink. Whenever you have the geoPrint Cable plugged in and need to use your modem, you have to unplug the cable and plug in your modem interface. Not only is this inconvenient, but it can wear out the user port connectors.

The geoPrint Cable's redeeming features are that it's easy to install, it works well with GEOS and it seems a little faster and more reliable than the average printer interface. However, I don't recommend it if you're an average Commodore user, especially if you have a modem. A better choice would be a serial printer interface with a buffer.

AN INTERFACE ALTERNATIVE

One printer interface you might want to consider is the Tymac Connection.

SteveE4 on QuantumLink reports that this interface is compatible with GEOS, and he explains that to use it, you need to "send some commands to take care of some defaults." Steve wrote this short program to set up the necessary configuration:

- 1 REM TYMAC CONNECTION INTER FACE PROGRAM FOR GEOS
- 2 REM BY STEVEE4

- 10 OPEN 1,4: REM OPEN PRINTER CHANNEL FOR DEVICE 4
- 20 PRINT #1,CHR\$(27)"W"CHR\$(00): REM TURN OFF WIDTH DEFAULT
- 30 PRINT #1,CHR\$(27)"L": REM TURN OFF AUTO LINEFEED
- 40 PRINT #1,CHR\$(27)"*6": REM LOCK INTO TRANSPARENT MODE

COMING UP: GEOS HOLIDAY SHOPPING GUIDE

Do you have a GEOS user on your holiday shopping list, or do you want to drop some hints for yourself? Next month, I'll give you some suggestions for distinctly GEOS gifts. You'll find stocking stuffers, books, hardware and last-minute holiday goodies. Keep watching! ■

The monthly geoWatch column addresses the needs of RUN readers who use GEOS, Berkeley Softworks' alternative operating system for the C-64 and C-128. Your questions and comments are welcome. Send them to:

> Matthew Stern geoWatch RUN Magazine 80 Elm St. Peterborough, NH 03458

You can also contact Matthew Stern on Q-Link. His online name is Matt S3.

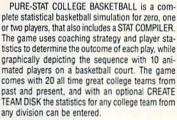
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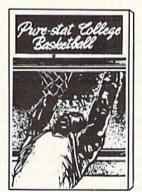
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EASY APPLICATIONS

SUPER SORT: Sort your string, floating point or integer arrays in the wink of an eye.

By MICHAEL BROUSSARD

f you write Basic programs, sooner or later you'll be faced with the chore of sorting arrays—lists of names, for example. My all-purpose sorter, called Super Sort, can be used as a subroutine in your own programs to sort any type of array.

Super Sort is short (only 332 bytes) and fast, especially when sorting large numbers of strings. In one test I ran, Basic took nearly 29 minutes to sort 600 strings, while Super Sort did them in 41 seconds—42 times faster than Basic! Table 1 shows the relative speed of Super Sort compared to Basic when sorting various lists of 600 elements.

For a demonstration of Super Sort, type in the program in Listing 1, using 64 Perfect Typist. Be sure to save a copy to disk before you run it, because the program is sensitive to typing errors. A single mistake could lock up the computer, and you'd lose the program.

Line 100 is the important part of the program; it pokes the machine language subroutine into the proper memory locations. The Data statements numbered 1000–1180 define the subroutine. To use the sort, these lines must be included in your own program.

Once it's been poked into memory, the sort is invoked with a SYS statement like this:

SYS SRT,X(1),100

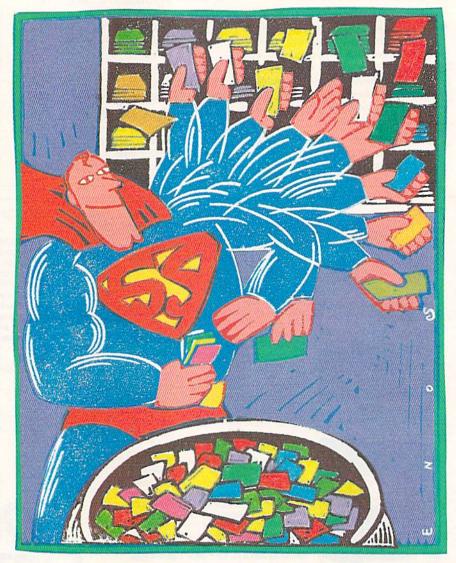
SRT represents the starting address of the machine language subroutine (in either variable or numeric form); X(1) means the sort should start with the first element of the array; and 100 indicates the number of elements in the array.

To sort only part of the array, use a statement like the following:

SYS SRT,X(21),10

This example would sort elements 21-30.

For Super Sort to work properly, you must specify which element of the array



it should start with, because X and X(1) are different variables as far as Basic is concerned. One is a single floating-point variable, and the other is an array. Attempting to sort a nonarray value may corrupt other variables in your program, and even lock up the computer.

Similarly, don't try to sort 200 elements of an array dimensioned for 100 elements. Super Sort will obligingly attempt to sort past the end of the array, with potentially disastrous results.

If you're sorting an array of strings, you can specify which character of the ▶

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string should be the starting point for comparison. For example,

SYS SRT, X\$(1), 100,3

specifies that the first 100 elements of array X\$ are to be sorted, beginning with the third character of each string. Any strings less than three characters long are sorted to the beginning of the array in arbitrary order. If you don't specify a starting character position for the sort, Super Sort defaults to the first character. Bear in mind that the concept of starting position holds true only for string arrays. The following statement will generate a syntax error, because N is not a string array:

Table 1. Speed comparison, in minutes and seconds, between Basic and Super Sort, sorting lists of 600 elements.

| and the second | | | The same of the sa | - |
|----------------|------|-------|--|------|
| Element | type | Basic | Super | Sort |

| String | 28:42 | 00:41 |
|----------------|-------|-------|
| Floating Point | 25:46 | 02:45 |
| Integer | 26:58 | 03:34 |

SYS SRT,N(1),100,2

As a bonus, Super Sort is completely

relocatable. You can place it anywhere in memory just by changing the value assigned to SRT on line 100. Just be sure to use a memory location that doesn't interfere with Basic.

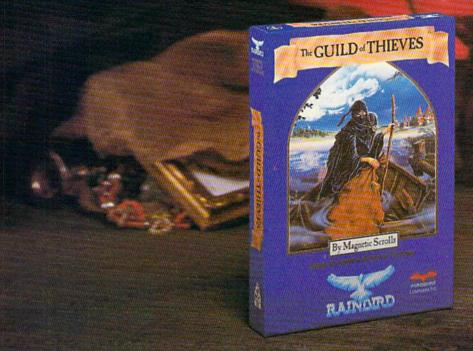
To keep Super Sort as short as possible, I used many subroutines that are part of the C-64's Basic ROM. For this reason, the program will run only on a C-64 (or a C-128 in 64 mode). It uses the following zero-page locations for temporary storage: 7, 8, 20, 21, 25–32 and 251–254. R

Michael Broussard is a systems engineer for Stratus Computer, a manufacturer of fault-tolerant super-minicomputers.

Listing 1. Super Sort program.

| - 1 - 1 - 1 - 1 - 1 | a reper des programm | |
|--|---|---|
| SS | EM SORTER PROGRAM BY M. BROU SARD :REM*150 | 300 FOR K=1 TO 10 : REA PRINT TAB(10);X(K) |
| 100 | SRT=50000:FORK=SRTTOSRT+331 | K |
| | :READN:C=C+N:POKEK,N:NEXT | 310 SYS SRT, X(1), 10 |
| | :REM*1Ø4 | 320 PRINT"THE SORTED FL |
| 110 | IF C 42632 THEN PRINT"ERRO | ES ARE:" |
| | R IN DATA STATEMENTS!": END | 33Ø FOR K=1 TO 1Ø : PRI |
| | :REM*234 | Ø);X(K) : NEXT K |
| 12Ø | DIM X\$(1Ø), X%(1Ø), X(1Ø) | 340 PRINT" (CRSR DN) PRES |
| | :REM*134 | Y TO SEE OFFSET STR |
| 130 | PRINT" (SHFT CLR) PRESS ANY K | |
| | EY TO SEE STRING SORT" | 35Ø GETA\$: IF A\$="" TH |
| | :REM*92 | |
| 140 | GETA\$: IF A\$="" THEN 140 | 360 INPUT"SORT ON WHICH |
| A CONTRACTOR OF THE PARTY OF TH | :REM*18 | ER";N |
| 150 | PRINT" (CRSR DN) THE UNSORTED | 370 PRINT" (CRSR DN) THE |
| 0.000 | STRINGS ARE:" :REM*62 | STRINGS ARE:" |
| 160 | FOR K=1 TO 10 : READ X\$(K) | 380 FOR K=1 TO 10 : REA |
| 000000 | : PRINT TAB(10); X\$(K) : NEX | : PRINT TAB(10); X\$(|
| | T K :REM*162 | тк |
| 170 | SYS SRT, X\$(1),10 :REM*28 | 390 SYS SRT, X\$(1), 10, N |
| | PRINT"THE SORTED STRINGS AR | 400 PRINT"THE SORTED ST |
| | E:" :REM*54 | E:" |
| 190 | FOR K=1 TO 10 : PRINT TAB(1 | 410 FOR K=1 TO 10 : PRI |
| | Ø); X\$(K) : NEXT K : REM*22 | Ø);X\$(K) : NEXT K |
| 200 | PRINT" {CRSR DN} PRESS ANY KE | 1000 DATA 32,253,174,32 |
| | Y TO SEE INTEGER SORT" | ,133,251,132,252,1 |
| | :REM*11Ø | 1,255,240,12,165 |
| 210 | GETA\$: IF A\$="" THEN 210 | 1010 DATA 14,208,4,169, |
| | :REM*182 | 169,2,208,2,169,3, |
| 220 | PRINT" (CRSR DN) THE UNSORTED | 2,121,0,201,44 |
| LLD | INTEGERS ARE: : : REM*166 | 1020 DATA 240,9,162,11, |
| 234 | FOR K=1 TO 10 : READ X%(K) | 2,14,76,55,164,32, |
| 230 | : PRINT TAB(10); X%(K) : NEX | 32,170,177,201 |
| | T K :REM*25Ø | 1030 DATA 128,176,241,1 |
| 244 | SYS SRT, X%(1),10 :REM*100 | 3,26,165,53,201,3, |
| | PRINT"THE SORTED INTEGERS A | 69, Ø, 133, 2Ø, 32 |
| 250 | RE:" :REM*66 | 1040 DATA 121,0,201,44, |
| 264 | FOR K=1 TO 10 : PRINT TAB(1 | |
| 200 | Ø);X*(K): NEXT K :REM*95 | 2,131,174,32,170,1 |
| 274 | PRINT"{CRSR DN}PRESS ANY KE | Ø,133,21,165,21 |
| 210 | Y TO SEE FLOAT NUMBER SORT" | 1050 DATA 208,206,132,2 |
| | :REM*207 | ,165,25,208,5,165, |
| 284 | GETA\$: IF A\$="" THEN 280 | ,96,165,25,133,7 |
| 200 | :REM*191 | 1060 DATA 165,26,133,8, |
| 204 | PRINT" (CRSR DN) THE UNSORTED | 133,253,165,252,13 |
| 290 | FLOAT VALUES ARE: ": REM*177 | 5,7,208,2,198,8 |
| | FLOAT VALUES ARE: : KEM*1// | 1070 DATA 198,7,208,29, |

| ØØ | FOR K=1 TO 10 : READ X(K) : | | 8,25,165,25,208,2,198,26,1 |
|--------|---------------------------------|-------------------------|--------------------------------|
| | PRINT TAB(10); X(K) : NEXT | | 98,25,24,165,251 :REM*58 |
| | K :REM*19 | 1080 | DATA 101,53,133,251,165,25 |
| 10 | SYS SRT, X(1), 10 : REM*221 | | 2,105,0,133,252,169,1,208, |
| | PRINT"THE SORTED FLOAT VALU | | 192,24,165,253 :REM*252 |
| | ES ARE:" :REM*69 | 1090 | |
| 30 | FOR K=1 TO 10 : PRINT TAB(1 | 15.00 | 4,105,0,133,254,160,0,165, |
| | Ø); X(K) : NEXT K : REM*207 | | 53,201,5,208,2 :REM*96 |
| 40 | PRINT" (CRSR DN) PRESS ANY KE | 1100 | DATA 240,83,201,2,208,2,24 |
| 220 | Y TO SEE OFFSET STRING SORT | T. M. Tales | 0,108,177,251,133,27,209,2 |
| | " :REM*19 | | 53,144,4,177,253 :REM*144 |
| 50 | GETA\$: IF A\$="" THEN 350 | 111ø | DATA 133,27,197,20,144,186 |
| | :REM*1Ø1 | | ,56,229,20,133,27,200,177, |
| 60 | INPUT"SORT ON WHICH CHARACT | | 251,133,29,177 :REM*232 |
| O P | ER";N :REM*189 | 1120 | |
| 70 | PRINT" (CRSR DN) THE UNSORTED | 1120 | 1,133,30,177,253,133,32,16 |
| | STRINGS ARE: " : REM*27 | | 4,20,177,29,209 :REM*128 |
| RØ | FOR K=1 TO 10 : READ X\$(K) | 1130 | |
| Op | : PRINT TAB(10); X\$(K) : NEX | 1130 | 8,27,208,243,169,0,240,130 |
| | T K :REM*127 | | ,16Ø,Ø,177,251 :REM*68 |
| o d | SYS SRT, X\$(1), 10, N : REM*93 | 1111 | DATA 72,177,253,145,251,10 |
| | PRINT"THE SORTED STRINGS AR | 1140 | |
| WW | | | 4,145,253,200,196,53,144,2 |
| 1 0 | | 1154 | 41,176,233,165 :REM*25Ø |
| 1 p | FOR K=1 TO 10 : PRINT TAB(1 | 1150 | |
| dda | Ø);X\$(K) : NEXT K :REM*243 | | 7,32,15,188,165,253,164,25 |
| ppy | DATA 32,253,174,32,139,176 | 1100 | 4,32,162,187,169 :REM*12 |
| | ,133,251,132,252,165,13,20 | 1169 | DATA 4,133,18,24,32,22,176 |
| 410 | 1,255,240,12,165 :REM*107 | | ,165,98,240,208,208,202,20 |
| 10 T V | DATA 14,208,4,169,5,208,6, | | Ø,177,251,133,2 :REM*1Ø |
| | 169,2,208,2,169,3,133,53,3 | 117Ø | |
| 400 | 2,121,0,201,44 :REM*67 | | 145,179,32,15,188,200,177, |
| Ø29 | | | 253,133,2,136 :REM*1Ø6 |
| | 2,14,76,55,164,32,131,174, | 1180 | DATA 177,253,164,2,32,145, |
| | 32,17Ø,177,2Ø1 :REM*81 | | 179,169,1,208,209,32 |
| 1034 | DATA 128,176,241,132,25,13 | | :REM*238 |
| | 3,26,165,53,201,3,208,29,1 | 2000 | DATA HORSE, ZEBRA, GORILLA, C |
| | 69, Ø, 133, 2Ø, 32 :REM*86 | | AT, AARDVARK, QUAIL, SNAKE, CO |
| Ø48 | | N. C. C. S. W. P. C. S. | W, DOG, HIPPOPOTAMUS: REM*201 |
| | 2,131,174,32,170,177,132,2 | 2010 | DATA 123, 789, 456, Ø, -23 |
| | Ø,133,21,165,21 :REM*72 | | 45, 999, 6, 12345, -1,1 |
| Ø50 | DATA 208,206,132,20,198,20 | | :REM*25 |
| | ,165,25,208,5,165,26,208,1 | 2020 | DATA 1.23, 78.9, 2.13E15, |
| | ,96,165,25,133,7 :REM*54 | | -46.443, Ø, 12, -55E-12, 6 |
| Ø69 | DATA 165,26,133,8,165,251, | | 6.5, -66.5, 213 :REM*5 |
| | 133,253,165,252,133,254,16 | 2030 | DATA HORSE, ZEBRA, GORILLA, C |
| | 5,7,2Ø8,2,198,8 :REM*228 | | AT, AARDVARK, QUAIL, SNAKE, CO |
| Ø78 | DATA 198,7,208,29,165,8,20 | W | ,DOG,HIPPOPOTAMUS:REM*231 ■ |
| | | | |
| | | | |



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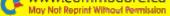
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TELECOMPUTING WORKSHOP

This month: The Aprotek 12C, Mercury and TCM-1200H modems; compacting program time trials; fixing a modem cable with broken tabs; and more.

By DAVID BRADLEY

I'VE RECEIVED A NUMBER of letters asking for advice on using the Aprotek 12C modem (from Aprotek, 1071-A Avenida Acaso, Camarillo, CA 93010), but I haven't been able to help much, because I didn't have one. Now I finally do, and I've been checking it out. The Aprotek 12C is the same as the Volks 6480, and it's a fine modem, but it simply doesn't work like any other modem on the market, so software support for it is sparse. Two public domain programs I've recently found for the Aprotek 12C/Volks 6480 are Multiterm 5.2, with a special boot program called 6480 Multiterm, and ST/R Terminal.

-If you're looking for an inexpensive, good-quality Hayes-compatible 300/1200 modem that will work with both a C-64 and a C-128 and also with an Amiga or PC-10, check out the Mercury modem from Computer Friends (14250 NW Science Park Drive, Portland, OR 97229). It sells for just \$149 and is 100 percent Hayes-compatible.

Computer Friends doesn't sell an RS-232 interface for the C-64 and C-128, but Aprotek (address above) has a good one for just \$39.95, plus \$3 shipping and handling. I like the Aprotek interface, because, in addition to providing an RS-232 port, it extends the user port. For some, this feature is very important.

-Another inexpensive, good-quality Hayes-compatible 300/1200 modem to use with a C-64 or C-128 is the TCM-1200H, from Trans Comm, Inc. (703 Annoreno, Suite 13, Addison, IL 60101). Unlike most Commodore-specific modems, this one doesn't stick out of the user port and take up a lot of desk space. Instead, it comes with a user port connector and a three-foot cable that goes into the back of the modem, so you can keep it on top of your monitor or disk drive, or anywhere else within three feet of the computer.

The TCM-1200H also comes with eight LED indicators, plus eight DIP switches on the back, so you can get at them with ease. Most Hayes-compatible modems have the DIP switches inside, under the front plate, so that making changes requires opening the case.

Another important feature of the TCM-1200H is its support of Bell 103/ 212 as well as CCITT V.22/V.21. If you ever spend time in a country that uses a CCITT phone system, all you have to do is flip one DIP switch or send one command, and you'll be ready to telecommunicate. Watch for more information about this gem of a modem in

upcoming columns.

—Many people who are tired of having to buffer incoming text and then save it to disk have written in asking for a terminal program for the C-64 and C-128 that will let them save data directly to disk. I know of no terminal programs that will do this, because the interrupts that handle sending and receiving via the modem and the interrupts that handle writing to disk will lock each other up if they try to work at the same time.

The only solution to this problem I've found is to use a terminal program that sends an X-Off (stopping transmission from the computer you're calling in most cases), then saves the information stored in the buffer, and then sends an X.On to continue the flow of incoming text. A commercial program that does this is Sixth Sense, and a public domain program that does it is ThirdTerm. If this method won't work for you, the PET/CBM computers are capable of dumping information directly to disk. You'll need a PET, an IEEE disk drive (a Commodore 4040 or 8050, for example), an RS-232 modem, an Intel-Com-type cable and an IntelCom-type terminal program.

MODEM-PHONE LINE SECURITY

Disconnecting your modem from the phone line during electrical storms is an excellent idea, but there is one bad side effect of this constant plugging and unplugging. The little tabs on the ends of the cable tend to break off, and it's then all too easy to accidentally pull the phone line out of the modem or the wall when you're online. Of course, this usually happens when you've downloaded 99 percent of a 400 block file from a pay system.

Before you get out the Scotch tape, go to your local hardware store and see if they have a modular-plug crimping tool and some modular outlet plugs. I just bought one of these tools, and it's a life saver! The model I got has a wirestripping section and a crimping section. One of the sweetest sounds I hear now is the "click" of a secure telephone connection before I go online.

If you can't find one of these tools in your area, write to Gemini Industries, Inc., 215 Entin Rd., Clifton, NJ 07014. By the way, the crimper and ten outlet plugs cost me less than \$10.

INTERNAL MODEMS?

A lot of people have left me mail on Q-Link recently, including many who want to know the difference between internal and external modems. I don't understand what has prompted all the questions, because I don't know of any internal modems for the C-64 or the C-128. I do know that computers like the PC-10 can be outfitted with an internal modem, and I know that some people have mounted modems inside their C-64s or 128s, but I'm aware of no production internal 64/128 modems.

In any case, you'll get the same quality from an internal or external modem. Most internal modems take power from the computer, so you don't need to find another wall outlet, but, depending on your system, it's possible (although unlikely) that you'll need a stronger power

One nice thing about an external modem is that you can use it on various machines, as long as you have the proper interface. An internal modem for the PC-10 can be used with other IBM-compatibles, but not with a C-64 or C-128.

-In my "Plugging Into Telecommunications" article in last September's issue, I mentioned that Jo-Anne Park of Toronto had made an interface that enabled her to use her Commodore 1670 modem with her Amiga. At that time, I didn't know of a company that sold such a device, but now I do. LRA Enterprises (35615 Ave. D, Yucaipa, CA 92399) sells one for \$44.95. When ordering, be sure to tell them if you want a male or female RS-232 connector on the interface, and make your check payable to Lawrence R. Anderson.

—If you're looking for a VT100 terminal emulator for your C-64, an update to the public domain Kermit program I mentioned in last April's column offers this feature. When I wrote the April column, I thought the program already supported VT100, but I was mistaken; the current version at that time was only a VT52 emulator.

—Prompted by all the discussions I've seen online about which file-compacting program is best, I've done some experiments with Arc, Lynx and Library (which I mentioned in the August issue). I tested all three programs for creating one file out of a 113-block program file and a 74-block sequential file that included documentation. Table 1 summarizes my findings.

As you can see, Lynx won hands down for file-creation time. It beat Library by 6 minutes and 40 seconds and Arc by 7 minutes.

Arc won in the compressing department, reducing the file by 55 blocks. At 300 baud and using Punter protocol, 55 blocks equals 9.16 minutes of download time. Using Arc and 300 baud, you could download and break up the file about 2 minutes and 20 seconds faster than you could with Lynx. However, at 1200 baud, that 55 blocks represents only 2.6 minutes of download time. So, using 1200 baud and Lynx, you could download and break up the file about 4 minutes and 20 seconds faster than you could with Arc.

My opinion is that each of these pro-

grams has its own strengths, and one can't be called generally superior to another. But I would like to hear what you have to say. If you use any of these programs, please write to tell me which one you prefer, and why. I'm also interested in your experiences, good or bad, with any of these programs. In a few months, I'll tabulate and post the results of my survey, as well as some of the comments I receive.

—Alex Dominguez has written in response to a letter in the July issue from Dennis McNelis, who asked whether his 1541 disk drive could be burned out if a user on his BBS hung up at the wrong moment during a disk access. Mr. Dominguez reports that a couple of his friends had their drives damaged by thoughtless users. He offers no solution to the problem; he just urges users of BBSs to be responsible and treat the BBS equipment as if it were their own.

Now on to this month's questions and answers.

On page 85 of the May issue of RUN, I saw an ad for the Aprotek 1200C, a Hayes/Commodore-compatible 1200-baud modem. It looked good, so I started saving up for it. Then, in the very next issue, Aprotek advertised another 1200-baud modem, the 12C.

In addition to being Hayes/Commodorecompatible, the 1200G was described as having a built-in speaker and eight status LEDs, and supporting direct connects, autodial and autoanswer, and tone/pulse switching. The 12C was described as easy to set up; supporting autoanswer and autodial, tone/pulse switching and direct connects; and packaged with the ComTerm 64 terminal software.

I'd like to know whether Aprotek still

carries the 1200C and, if not, whether a similar modem is available elsewhere. I'd also like to know if the 12C is just another modem like the Volks 6480 (not compatible with anything).

—MICHAEL CHEU RIDGEWAY, ONTARIO, CANADA

The Aprotek 12C is just like the Volks 6480 (as I mentioned above), and Aprotek no longer seems to have the 1200C any more. Another modem that's similar to the 1200C is the TCM-1200H, which I also mentioned above.

I want to use my Racal-Vadic VA3451P modem with my C-128, but I don't know where to get the RS-232C interface I need. It's an excellent modem, and I'd hate to replace it with one I probably wouldn't like as well, just because I can't get an interface.

—REYNOLD WONG PACIFIC GROVE, CA

Aprotek's (address above) universal RS-232 interface, which costs \$39.95, should do the job. To make sure, before you buy it, write Aprotek and describe your requirements to them.

I'm having trouble joining Q-Link. I called their 800 number (800-392-8200) and ordered the \$39.80 package that includes a four-month membership and a Commodore 1660 modem. I charged it to my VISA card. Since then, I've received four calls from Q-Link. Each time they've told me that due to a computer error, they've lost my order.

Is there any way to get the Q-Link software from another source, and, if so, is Q-Link worth the time, effort and money?

—LLOYD J. ROBINSON, JR. TUSCALOOSA, AL

If you were to go out and buy a Commodore 1660 or 1670 modem from a dealer, you'd find the Q-Link software in it. That package would cost more than \$39.80, but at least you'd have what you need.

Most manufacturers of Commodore- ▶

Table 1. Comparative performances of file-combining programs.

| Program | Starting Block Size | Ending Block Size | Elapsed Time |
|-------------|------------------------|----------------------|-----------------|
| Lynx XI | 187 | 188 | 55 |
| Arc 230 | 187 | 132 | 475 |
| Library 9.0 | 187 | 187 | 455 |

TELECOMPUTING WORKSHOP

compatible modems bundle the Q-Link software these days. I know the TCM-1200H and Aprotek 12C come with it. Q-Link software also accompanies the Commodore 64C, but it's not worth buying another computer to get it.

I think once you do get a modem and software and get on Q-Link, you'll find it worth the time, effort and money. Q-Link is easy to use, and when you're just starting out in the world of telecomputing, the easier the better.

You might consider getting a 1200-baud modem, such as the TCM-1200H, as Q-Link charges the same for 1200 as it does for 300 baud. If you downloaded files for ten hours at 1200 baud, you'd save about 30 hours of plus time, or about \$108 (30 × \$3.60), over 300 baud.

When I bought my Mitey Mo modem, I remember the ad saying it would handle up to 1200 baud. I am, indeed, given the option of 1200 baud when I'm setting up the modem, but a note in the owner's manual says, "Mitey Mo can accommodate up to 300 baud. Disregard the 600 and 1200 choices that appear." Can I upgrade my modem to handle 1200 baud?

—GLENN CORBETT VISALIA, CA

I haven't seen that ad, but I suspect they said the software included with the modem could handle 1200 baud, even though the modem cannot. Regardless, I know of no way for you to upgrade your Mitey Mo to 1200 baud.

TIPS OF THE MONTH

If you're new at telecomputing and there are things you don't know, don't be afraid of looking stupid—go ahead and ask for help. After all, everybody started out just where you are, and I find people love to share their telecomputing experiences. Besides, if you don't ask, you're the one who loses out.

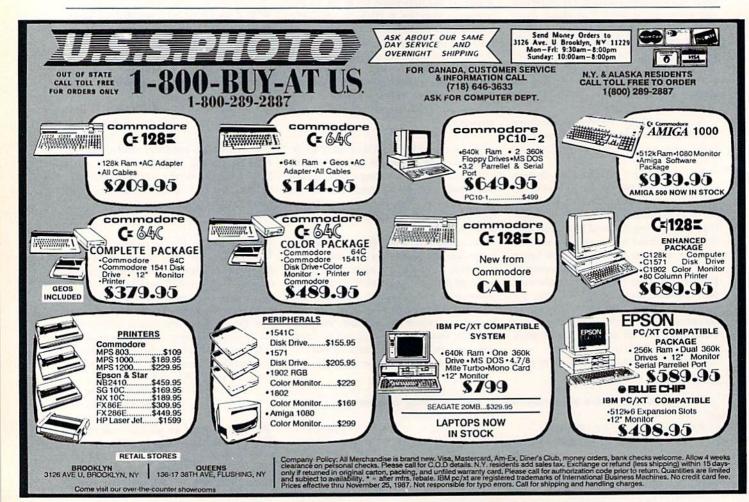
As I've mentioned in previous columns, when a thunderstorm may come your way, you should unplug your modem from your phone line and unplug your computer system from the wall. I want to reemphasize that warning. Until I moved to Florida, I had no idea how many people suffer severe damage to their systems from lightning.

Remember, besides questions, I appreciate getting your comments and constructive criticism about Telecomputing Workshop.

Telecomputing Workshop is a monthly column dedicated to the needs of RUN readers who are using, or intend to use, a Commodore computer for telecommunications. We invite you to submit your questions and comments to:

> David Bradley Telecomputing Workshop RUN Magazine 80 Elm St. Peterborough, NH 03458

You can leave online messages for David Bradley on QuantumLink (DavBradley), American PeopleLink (DavBradley), Delphi (DavidBradley) or via the PunterNet to 13/ Sysop or 13/David Bradley.



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RESOURCE CENTER

The Resource Center responds to readers' requests for educational programs.

By MARGARET MORABITO

SO MANY OF YOU have been writing to the Resource Center, I haven't been able to answer all of you personally. So, this month, I'm going to catch up on my mail.

What happened to the disk I sent you a few months ago? I really want the public domain educational programs you offered in the September and November 1986

—EVERYONE HOMETOWN, USA

This is the question I get most often. The answer is that, since I left my full-time position with RUN last February, I haven't been able to keep up with the free education disk distribution project—mainly because I don't have the equipment at home or the finances to support it.

I'd like to continue the project, however, so I've decided to change the conditions. I originally asked you to send a blank disk, on which I'd make a copy and return it for free. Now I must ask that you send, not a disk, but \$10 to cover duplication and mailing costs. This way, I can have the disks duplicated in bulk and continue this service.

In Table 1 you'll find a list of the directories for both Volumes 1 and 2, so you can see what programs are on them. To order a disk, see the instructions at the end of this article.

I have Volumes 1 and 2 of the Resource Center Education Disks and enjoy them very much. Will you be coming out with more volumes?

—ALMOST EVERYONE HOMETOWN, USA

Yes. I plan on coming out with four education disks in 1988, one to be released each quarter. I'll let you know when the first one is ready, and at that time I'll list the directory of the disk in this column, so you'll know exactly what it contains before ordering.

Table 1. Directories of the Resource Center Education Disks.

Volume 1, Side 1:

SpellingFindwordMenu (Lexikos)Cell QuizPhoncentrationGraphic MathBrainstormOne Col MathSpellerTictacarithWord ScramblerMath Worksheet

Volume 1, Side 2:

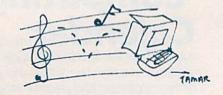
Menu (23 math tutorials written by Ricky Brewer for his junior high students)

Volume 2, Side 1:

Quick Check Menu 48 Add Prob (part of a math series USA by William Townsend) Spell It Add Special Ed Elem Add/Sub Subt 3 Digits Alphabet Decimal Adds Guess My Number Dec Div-1361 Tree Tutor Dec Mult Rd Robot Math Fract Reduce **Division Tutor** Averages Homonyms Percent Of Munchmath Circle Circumference and Area Fast Reading Gradebook 128 Page Printer Spanish

Volume 2, Side 2:

Menu Flashquiz 64 Typing Practice Letter Attack Keyboard Intro Keyboard Bilingual Spell New States/Caps New Zealand Name Records Mark Records Analogies Analogy Practice Comal80.Can Microscope Quiz (Comal program) Periodic Loader (Comal program)



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RESOURCE CENTER

I'm a 5th grade teacher, and I'm looking for information on free or inexpensive software to use on the C-64s in my classroom. -LYNDA KELLER PAULINA, LA

In last April's issue, I devoted the entire column to answering this question. Order this back issue, and you will get suggestions for various sources of low-cost educational software, along with a list of names and addresses to

Thank you so much for mentioning KIDware in your recent article concerning low-cost educational software. Now we've moved our offices and would appreciate it if you'd publish our new address.

> -KIDWARE 1380 156TH NE SUITE H2 Bellevue, WA 98007 206-643-7645

Sure!

Your article in the April issue on educational software was very good. I thought of running a national education user's group in another magazine this year, to help distribute teacher-written educational programs. However, with your distribution of educational material through RUN, I decided you and your column were in a much better position to carry out this function than I am as an individual.

Unfortunately, I've been disappointed, because for months there's been no additional mention in your column of public domain educational material. I wish you would devote at least a paragraph each month to covering the material available and encouraging educators to donate programs that they've written for their classes.

> -RICKY BREWER MIDWAY, TX

I wish I could include more in the Resource Center on public domain software, but I, too, am just an individual at this point. All the public domain program testing, compiling and distribution I do is on my own, and distributing disks is an expensive and time-consuming proposition.

However, at the urging of hundreds of readers like yourself to continue this service, I'm now renewing my offer for the Resource Center Education Disks, with the difference, as mentioned above, that I must ask for some money to cover my expenses. (By the way, Ricky, thanks again for your donation of the Math Series that I placed on Volume 1 last year!) ■

If you're using Commodore computers for education at home or in school, write to me and share your experiences. Also, please donate public domain educational programs to the Resource Center for sharing with others. Send letters and programs on disk, with a brief description, to:

> Margaret Morabito Resource Center **RUN Magazine** 80 Elm St. Peterborough, NH 03458

To order a Resource Center Education Disk, send \$10 per disk and state the volume number you want.

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HARDWARE GALLERY

If you're in need of extra screen dump capabilities or extra memory, then this column is for you!

Compiled by BETH S. JALA

DOUBLE QUICK BROWN BOX

You'll Never Lose Your Cool, Or Your Programs, With This Utility

While a computer's brain may be made of silicon, its lifeline is the power cord. Who hasn't experienced a stab of panic followed by a feeling of utter helplessness as you endured the instant evaporation of your electronic efforts? Everything in memory can be lost in an instant if the electrical power is even momentarily interrupted.

Actually, it doesn't always take a power failure for amnesia to strike your computer. Even experienced users occasionally forget to back up newly entered programs before taking them for a test drive. Random Access Memory (RAM) might as well be called Readily Absent Memory when the program crashes and your keyboard locks up.

How many times have you wished you could turn your computer off after a crash and not lose a byte of data? Wouldn't it also be handy to have your favorite telecommunications program or utility already loaded whenever you turn on your computer?

Users of laptop computers already enjoy these conveniences, thanks to a special type of chip known as a CMOS (complementary metal oxide semiconductor) RAM. It consumes a lot less electrical power than a conventional chip, and it can be left on all the time.

CMOS chips are considerably more expensive than the garden variety 8K memory chips that populate the circuit boards of the C-64 and C-128. They also require an internal battery to keep them active when the computer is turned off.

But while manufacturer's costs conspire to deny us non-volatile RAM, devices such as the Double Quick Brown Box are letting Commodore users enjoy some of the advantages previously restricted to owners of battery-powered portables.

Actually, the Double Quick Brown Box probably needs a new name. It's not really a box, but a plug-in cartridge for the C-128 (in 128 mode) as well as the C-64. Made of brown plastic by a man with the first name of Brown, the device has double the capacity of his



The Double Quick Brown Box plugged into the C-128's expansion port.

original CMOS memory enhancement tool for the C-64 (see *RUN*, Hardware Gallery, July 1986).

With a capacity of 16K, the DQBB may appear feeble in comparison with the latest 128K and 512K RAM expanders, but this little box is unique. It converts RAM into ROM (Read Only Memory) by switching out 16K of memory beginning at \$8000 and replacing it with CMOS RAM. Short of dropping it into the sink or waiting ten years for the internal lithium battery to wear out, the DQBB will never lose its memory, even when disconnected from the computer.

Outwardly, the Double Quick Brown Box is identical to its 8K predecessor. A red push-button generates a system reset for the C-64 that bails you out of a crash while your faulty program remains in memory. The two-position slide switch lets the DQBB switch between 64 and 128 modes. Your C-128 won't come up as a C-64, even though the cartridge port is occupied, when the switch is in the proper position.

The designer's partner has written a series of utilities that let you put as many as eight programs into the DQBB at once. When loaded, each program is listed on a menu and can be called up with a two-character command. Machine language programs for the C-128 that don't employ a Basic loader are the only ones that won't work in this fashion. Otherwise, the DQBB automatically figures out where in memory a

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E Failure.

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| Driver/printer, 6 ft. 6 pin male/fem | . A66 | \$ 5.95 |
| Monitor, 6 ft. 5 pin to 4 RCA plugs | M654 | \$ 6.95 |
| Monitor, 6 ft. 5 pin to 2 RCA plugs | M652 | \$ 4.95 |
| Monitor ext., 6 ft. 5 pin male/femal | e ME65 | \$ 5.95 |
| Joystick extension 12 ft. male/fem. | JS12 | \$ 4.95 |
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HARDWARE GALLERY

program wants to be and sends it to the proper location.

Since a special boot utility activates the software-controlled write-protect tab and lets you reload the box with other programs in less than one minute, you'll probably develop a series of disk files, each containing one or more programs that are used together.

The convenience of switching instantly from one program to another can't be overstated. My DQBB usually contains the two programs that I use while maintaining the Boston Computer Society's Commodore Bulletin Board-a machine language text editor and a compiled disk utility program. I've also saved this particular configuration as a single disk file, which allows me to empty the box for use as a crashproof Basic workspace and easily restores my utility programs when it's time to work on the BBS.

The documentation provides step-bystep instructions for beginners and fairly thorough guidance for experienced programmers who want to plant some of their own ideas in the box's

CMOS memory chips.

With a one-year repair or replacement warranty and a 30-day unconditional refund period, the Double Quick Brown Box is one of the safest computer investments you can make. (Brown Boxes, Inc., 26 Concord Rd., Bedford, MA 01730; \$69 plus \$3 shipping.)

> -IOHN PREMACK LEXINGTON, MA

BLOWUP

Don't Let the Name Of This Product Deceive You!

Honestly, would you plug anything into your computer that's called Blowup? Surely, it wouldn't really terminate the computer! Actually, Blowup is a nifty utility cartridge that just might be of use to you-read on!

Blowup comes as a program cartridge rather than as a disk. That's important to its operation, as you'll soon see. Blowup simply sits in your computer's expansion port and waits for you to push the button on its top. When you do, it grabs control of the machine and lets you do some very special things.

Have you ever wanted to obtain a printed copy of the screen from one of your favorite programs? I'm not talking about just dumping text screens or lowresolution graphics, I'm talking about bit-mapped, high-resolution pictures, including sprites! Perhaps you've thought it would be great to modify such a picture if you could only get it into a format that your drawing program could use.

For a number of years, I've been borrowing pictures from programs to create my own images. It involves a pretty thorough knowledge of machine language programming and the inner workings of your computer. Once you locate the picture in memory, it has to be saved to disk and then modified so that it'll be loaded properly into the



You can do a lot of maneuvering with Blowup.

drawing program. If you can't find a separate picture file on the disk and the program won't let you break it once it's been started, you'll never be able to get at the picture. With Blowup, you don't have those problems.

You begin by inserting Blowup in the memory expansion port of your computer. It doesn't work in 128 mode, and that's not made clear in the instruction manual. That's not too much of a restriction, though, since a lot of programs that employ pretty graphics run in 64 mode anyway.

Next, you load whatever program you want to capture a picture from. You do everything just as you would without Blowup inserted. Since the Blowup program has its own memory, it shouldn't interfere with the main program.

Once your program has finished loading, whenever you see a picture on the screen that you want to save, just hit the button and let Blowup take control. A detailed menu appears on the screen that lets you do several things. You can print the picture in either normal or reversed image. You can even rotate the picture-since your screen is horizontal and printer paper is usually

vertical, this makes it easy to get the whole picture to print properly. You can crop a section of the picture and save it to disk in normal (bit-map), Koala or Doodle! format.

You can enlarge or reduce the image in either the X or Y plane by using the magnify option; you can choose to include sprites in the printout or file; and you can reverse the picture by using mirror imaging.

Another function lets you specify a delay after every printed line to keep you from overheating the print head. You can even use Blowup to load a previously stored text file. And, Blowup supports a wide variety of printers.

Theoretically, by selecting the warmstart option after you capture the picture, you can return to the main program at the point where you stopped it. The coldstart option resets the computer to Basic.

Sounds like a pretty dandy program, doesn't it? If everyone followed the same programming techniques, it probably would be possible for Blowup to do its job effectively every time. However, programmers seldom do things the same way each time, and that can result in some conflicts.

Some of the problems I encountered include an inability to capture a picture on the screen while disk loading was still in progress. I also found the sound on many programs to be affected when Blowup was activated and not all programs operated correctly, if at all, after interrupting them with Blowup. The instructions include some possible solutions for these problems, but they didn't clear the difficulty in all cases. You can end up with a locked keyboard or other problems.

It appears that Blowup comes about as close to being a universal "screen dump" as technology permits. I was generally pleased with the results and certainly don't mind having a tool that eliminates the need for me to perform computer gymnastics just to play with a high-resolution picture.

I've graded this program slightly below excellent due to the omission of information on using it with the C-128. In addition, I think a short paragraph describing the problems you can encounter with some programs would also

be appropriate.

If you like to play with graphics or have a need to capture pictures for use elsewhere, consider Blowup as a good utility cartridge to have. (Data Share, Inc., 717 South Emporia, Wichita, KS 67211; \$59.95.)

- IIM GRUBBS SPRINGFIELD, IL

LEARN TO WALK BEFORE YOU RUN

We receive many letters from new Commodore owners who want to type in program listings from *RUN* and need help in getting started. To answer many of the questions novice users have, we present the following guidelines.

- First, keep in mind that as a beginner you should enter only short Basic programs. Avoid machine language listings and lengthy Basic programs until you get the hang of what you're doing.
- To help you catch mistakes in typing in listings, we publish two checksum programs each month, called 64 Perfect Typist and 128 Perfect Typist. (Follow the directions in How To Type RUN Listings, elsewhere in this issue.)
- 3. If you intend to save the program you're typing in on a brand new disk, you must format that disk. To do this, insert the disk in your drive and type:

OPEN15,8,15 press return>
PRINT#15,"N0:NAME,##" press return>

The ## is a two-character identifier that can be any combination of letters or digits. NAME can be any title for the disk that you choose, as long as it's 16 characters or less.

After entering the above lines, wait for a few minutes while the disk spins inside the drive. When the disk stops, the formatting is done. Then type:

CLOSE15 cturn>

In 128 mode on a C-128, you can shorten this procedure by typing:

HEADER "NAME,##" return>

Caution: The formatting process erases any material already on the disk, so if you're formatting a used disk, make sure it doesn't contain any programs you want to keep. See item 11 below, on reading the disk directory, if you need to find out what's on the disk.

- 4. Before you start typing in a program listing, your computer's memory needs to be empty. To make sure it is, turn the computer off, wait a few seconds, and turn it on again.
- As you type in the listing, remember to press the return key after each line. The return enters the line into memory.
- 6. If you want to review what you've entered, type LIST and press the return key; all the lines you've entered will scroll by. You can slow the scrolling on the C-64 by holding down the control key, and on the C-128 by pressing the no scroll key. To view certain specific lines, type LIST, followed by the line numbers you want; then press the return key. For example, LIST 10–50 displays lines 10 through 50, and LIST 20 displays only line 20.
- 7. If you find an error in a line, delete the incorrect characters with the insert-delete key, then retype that

portion and press return to enter the new line in memory.

8. Be sure to save the program to disk fairly often during the typing process. Otherwise, you could lose all your work if a power glitch wipes out your computer's memory. To save a partial or complete Basic program listing, type:

SAVE "NAME",8 press return>

In 128 mode on a C-128, you can press F5, type in NAME and press the return key. Here, NAME is the filename you want the program to have, not the disk name you used when formatting.

Each time you save a revised program to the same disk, you must change its filename, or a disk error will occur, even if only one character is changed. An easy way to vary the filename is by adding version numbers to the end of the basic name (Program.1 and Program.2, for example). The numbers will also tell you which version is the latest.

9. If you wish to erase (scratch) unwanted programs from a disk, type:

OPEN15,8,15 press return>
PRINT#15,"S0:filename" press return and wait a few seconds>
CLOSE15 press return>

In 128 mode on a C-128, you can type:

SCRATCH "NAME" return>

Be sure not to erase the final version!

- 10. Always save the final version of a program to two disks, so you have a backup copy in case one of the disks gets damaged. When saving to two different disks, you can use the same program name in each case.
- To view a complete list of the filenames on a disk (i.e., read the disk directory), type:

LOAD "\$",8 press return>
LIST

In 128 mode on a C-128, you can just press F3.

12. When you know what program you want to load, next make sure you know *exactly* how its filename is spelled in the disk directory, including punctuation, special characters and spaces. A mistake in the filename will keep the load from working.

If the disk directory is still on the screen when you enter the Load command, you can refer to that for the spelling. If the directory will be gone from the screen by the time you enter the Load command, jot down the exact spelling of the filename for reference. Once you're sure of the filename, load the program by typing:

LOAD "NAME",8 <press return>

In 128 mode on a C-128, you can just press F2, type in the filename and press the return key.

After you've loaded the program, enter RUN to use it. ■

COMMODORE CLINIC

What happens to a program when it's abandoned by its vendor, and how can you use a laser printer with your Commodore?

By JIM STRASMA

HARDWARE

Are there any 1571-compatible, non-Commodore disk drives on the market yet, and will the 1581 work with both the C-64 and C-128?

> —RONALD PACK AURORA, CO

I certainly haven't heard of any 1571-compatible disk drives yet and wouldn't expect to for a while. Even for Commodore, the 1571 provided many design challenges whose solutions will take some time to reverse-engineer.

As for the new 1581 microfloppy disk drive, yes, it works with both the C-64 and the C-128, adding storage space to both.

I've read that Commodore is developing a new ROM chip for the 1571 disk drive. Is this chip available yet, and if so, where can I get one?

—RAYMOND HYMAN PHILADELPHIA, PA

A ROM that upgrades the 1571's performance is indeed now available. I got mine today, thanks to a group purchase by the Fox Valley 64 Users Group. The part number of the new chip is 310654-05. With that information, any authorized Commodore service center should be able to order one for you.

Fox Valley lists it as available from Microtech, 328 W. Hillside, N. Aurora, IL 60542; phone 312-892-3551. The upgraded ROM was also listed in a recent ad from K. Boufal Consulting Services (244 Fitzwater St., Philadelphia, PA 19147), so you won't have to go far to find it.

SOFTWARE

A while back you indicated that you and two other gentlemen had put to-

gether a church package for the C-64. I would appreciate your sending me any information available regarding that software.

> —STACY HALL GRAY COURT, SC

Unfortunately, sales of The Electric Evangelist didn't match expectations, and the author who was to provide support no longer has a C-64. Therefore, we no longer sell the program.

Those who have The Electric Evangelist are welcome to share it with others for non-commercial use. I have also given our remaining copies to my local user's group (S.O.S.U.G., PO Box 6108, Macomb, IL 61455), which will be happy to provide copies. Contact them directly for details.

I'm looking for a C-64 program that can save to disk pictures I draw with a program that came with an Edumate light pen. I bought the light pen about five years ago, and now the maker is out of business.

-KOLMAN GLICKSBERG 427 WOODLAWN AVE. GLENCOE, IL 60022

The program you want is Peripheral Vision, from Futurehouse, the company that made your light pen. The last address I have for them is PO Box 3470, Chapel Hill, NC 27514; phone 919-967-0861.

I've included your full address in case the program is still available from a source willing to contact you or other readers have copies they'd be willing to pass on.

It's incorrect to assume that a product is abandoned by its authors merely because the vendor is out of business. On the other hand, when a good program truly is unavailable, it seems better to share copies with those who still need it than to allow it to disappear from the earth. Just be ready to pay for your copy if you later find the program available commercially.

And, vendors, when abandoning a product, why not give a noncopy-protected shareware version to the nearest user's group? That will both benefit those who still need the program and possibly bring in added income as those who copy it send donations.

I need a program that will list about 300 phonograph albums by publisher, album title, song title, composer, orchestra and conductor. Do you know of any software that can do this?

—WADE JORDAN MACON, GA

If you treated each song as a separate entry, almost any commercial data manager would meet your needs. However, you'd run out of storage on most Commodore disks long before you'd saved all of your data.

A better solution is to use a relational data manager, such as Precision Software's Superbase (sold by Progressive Peripherals, 464 Kalamath St., Denver, CO 80204). That way you can have an entry for each album in one data file, with a separate entry in a second related file for each song on the album. The information shared by all the songs on an album is entered only once. (Depending on the number of songs per album, you may still need to use some abbreviations to get all your data on a 1541 data disk.)

Can you recommend a laser printer for use with our Plus/4 and 64C computers? What interfaces would be required for small-business use?

—PAUL HEIL LANCASTER, PA

Jim Oldfield reports that his Midnite Press book How to Get the Most Out of GEOS was written using a Quadram Quadlaser printer, connected to a C-128 via a Xetec Super Graphix interface in Transparent mode and using WordPro 128/S, from Spinnaker Software.

The Quadlaser comes with four builtin fonts and has a megabyte of RAM into which to load other fonts. The only



obstacle to using this printer with a Commodore computer is that your favorite word processor may be unable to embed long sequences of control characters within a document.

For a Plus/4, you may also want to consider using an MW350 printer interface. It is particularly recommended by the Plus Exchange, and it also works well with the C-64 and C-128.

A far more costly but also more flexible laser printer is Apple's LaserWriter. You can use it with your 64C (but not the Plus/4) via the GEOS geoLaser driver and such GEOS programs as geoWrite and geoPublish. Since IBM has just joined Apple in endorsing the LaserWriter's Postscript page description language, the LaserWriter should be compatible with new products for years to come, making up for its relatively high price.

PROGRAMMING

I'm running out of array memory on my C-128. Is there a way to use idle Basic program memory for arrays?

—JIM LYNCH ST. THOMAS, VIRGIN ISLANDS

Yes, although it isn't very convenient and works best when all the data values in the array to be stored that way are small numbers or single characters, so each element can fit in a single byte of memory.

The basic idea is to directly poke the data into, and peek it back out of, unneeded space in the Basic program bank of memory. You'll need to find a safe starting address within the unused space and then locate each element in the poked array relative to that address. It's also up to you to make sure nothing tampers with that memory, since Basic offers very few safeguards when using the Peek and Poke commands.

Before going to that extreme, I'd remind you of integer arrays. If a numeric array variable name ends with a percent sign (%), each of its elements take up

three fewer bytes of memory than usual. The savings in a large array are sufficient to be worth a serious effort to limit data values to integers.

I'm writing a program that accesses 30 relative files. Do I have to use 30 Open and Close statements, or can I make a subroutine using variables?

—KEN PAOLINO PITTSBURGH, PA

Here's a program example for the C-64 that uses variables and a subroutine to open and close three previously existing relative files, one at a time. (The 1541 disk drive allows only one relative file to be open at a time.) The same technique should work for any reasonable number of files.

99 REM INITIALIZATION

100 DU = 8: REM DISK UNIT

110 DD\$="0": REM DATA DRIVE

120 OPEN 15,DU,15 : REM DISK CMD CHANNEL

199 REM FIRST CALL

200 RF\$ = "FIRSTFILE"

210 GOSUB 1000

220 REM FIRST FILE IS NOW OPEN

299 REM SECOND CALL

300 RF\$ = "SECONDFILE"

310 GOSUB 1000

320 REM SECOND FILE IS NOW OPEN

399 REM THIRD CALL

400 RF\$ = "THIRDFILE"

410 GOSUB 1000

420 REM THIRD FILE IS NOW OPEN

900 GOTO 9998

996 REM S/R TO CLOSE A CURRENTLY OPEN

997 REM FILE, THEN OPEN ANOTHER EXISTING

998 REM RELATIVE FILE WHOSE NAME IS IN

999 REM VARIABLE RF\$ ON DISK UNIT

1000 CLOSE 5

1010 OPEN 5,DU,5,DD\$ + ":" + RF\$

1020 GOSUB 2000

1030 RETURN

1998 REM S/R TO CHECK DISK FOR ERRORS 1999 REM USING VARIABLES EN, EM\$, ET & ES.

2000 INPUT#15,EN,EM\$,ET,ES

2010 IF EN>0 THEN PRINT EN,EM\$,ET,ES: STOP

2020 RETURN

9998 CLOSE 15

9999 END

I have a couple of questions about using FRE(X) to find the space used in RAM. First, what's the formula for the C-64? Also, some programs show no space used. Don't machine language programs use up space in RAM?

—WALLACE EDSON LOMPOC, CA

The FRE() function on the C-64 finds your remaining Basic work space by subtracting the current contents of a pointer to the start of the Basic program work space from the contents of a pointer to the end of the current Basic program. The difference is the remaining number of free bytes, stored as a two-byte integer.

Since two-byte integer values greater than 32767 are interpreted as negative and there are initially 38911 Basic bytes free on the C-64, if you try? FRE(0) immediately after switching on your computer, the machine will report – 26627 bytes free. When you get a negative number of bytes free,? 65536 + FRE(0) shows the correct answer.

If you give the latter command immediately after switching on, the response will be 38909, two bytes fewer than claimed by Commodore's sign-on message. The difference is due to two zero bytes that end each Basic program and are present even before a program is written or loaded. Commodore considers them initially free, but FRE(0) counts them as used.

As for machine language programs, they do use space in RAM, but unless they emulate Basic in the way they allocate that space, FRE(0) may not even know they're in memory. Then, too, some machine language programs use

COMMODORE CLINIC

portions of memory unavailable to Basic and don't reduce Basic's work space. nesses is Money Machine, a bi-monthly magazine from Redwood Empire, PO Box 6609, San Mateo, CA 94403.

DO FB BNE LOOP

-DARREN SPRUYT GRAVENHURST, ONTARIO, CANADA

OTHER

Can you recommend any good sources of information on starting a home business, such as doing word processing or maintaining mail lists?

> -DIANE HIEM HIGHLAND, IL

The most helpful resource I ever found along those lines was the book The Incredible Secret Money Machine, by Don Lancaster. Don was a true pioneer in the microcomputer revolution and has been quite successful over the years in making a living working at home. This book details his methods, several of which I've found useful in my own work.

A more recent resource specifically for Commodore owners with small busi-

UPDATE

In the June Clinic, you gave reader Todo Brye an assembly language version of a small Basic program he sent in. However, the assembly code you published has a problem. The code should read:

| Object | Source |
|------------|---------------|
| Code: | Code: |
| A0 03 | LDY #3 |
| B1 2D | LDA (\$2D), Y |
| 85 14 | STA \$14 |
| C8 | INY |
| B1 2D | LDA (\$2D), Y |
| 85 15 | STA \$14+1 |
| A9 00 | LDA #0 |
| A8 | TAY |
| 91 14 LOOP | STA (\$14),Y |
| C8 | INY |

You're absolutely right. Leaving out those first six lines is an example of an error I've had a good bit of trouble with over the years-overlooking a level of indirection in a problem that requires multiple levels of indirection. Thanks so much for the correction.

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

> Commodore Clinic clo RUN Magazine 80 Elm St. Peterborough NH 03458

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

Hot Shot Advanced Graphics Printer The Hot Shot PLUS is the most advanced and useful printer interface ever created for the Commodore computer. The Hot Shot PLUS has the standard features you have come to expect in a printer interface, including Full Commodore Emulation and Transparent operating modes, giving you the maximum capability and performance possible from your printer! However, that is just the beginning! The Hot Shot PLUS

| HOT SHOT PLUS VS SUPER GRAPHIX SR. | Super Graphics Sr. | Hot Shot |
|------------------------------------|-----------------------|----------|
| NUMBER OF BUILT IN FONTS | 1 | 6 |
| POSSIBLE FONTS IN MEMORY | 3 | 42 |
| STANDARD BUFFER PROVIDED | 8K | 8K |
| BUFFER USER EXPANDABLE | NO | YES |
| MAXIMUM BUFFER EXPANSION | n/a | 64K |
| BUILT IN ITALIC & BOLD FONTS | NO | YES |
| BUILT IN FONT EDITOR | NO | YES |
| FONT EDITOR PLUS4 COMPATIBLE | NO | YES |
| GRAPHICS ENHANCEMENT SELECTION | NO | YES |
| GEOS" FONT ENHANCEMENT SELECTION | | YES |
| CPM SELECTION | NO | YES |

comes with a built-in BK buffer, which you can expand to a 16K, 32K, 48K, or 64K buffer just by adding additional chips! A built-in Reset button allows you to clear the buffer. The Hot Shot PLUS has been designed you to clear the butter. The Hot Shot PcCornab beet designed to take complete advantage of your printers special graphics features! The Hot Shot PLUS has 6 Near Letter Quality Fonts

built into its ROM, giving most popular printers greatly increased printing quality and versatility. Users can design and upload from 2to 42 additional customized fonts into the Hot Shot PLUS memory. The Hot Shot PLUS comes complete with its Fantastic Font Editor built into its ROM. You load it into your computer just as if the Hot Shot PLUS were a disk drive! The Fantastic Font Editor is compatible with the C64, C128 in 128 mode, and the Plus4! A disk is included with many additional fonts, and fonts from the Xetec Super Graphics Sr" can be converted to the Hot Shot PLUS format. The Hot Shot PLUS has been designed to eliminate print head Shuffling and maximize graphics printing speed. The Hot Shot PLUS has a unique Graphics Enhancement Mode which allows you to print standard graphics printouts in Double or PLUS has a unique Graphics Enhancement Mode which allows you to print standard graphics printouts in Double or Quadruple Density! Graphics quality with programs such as The Printshop". Sideways", and Geos" fonts are dramatically improved using this feature, which is compatible with most popular printers. No other interface has this great feature! The Hot Shot PLUS also has two sets of DIPswitches, allowing you to directly select and change all the above settings. CP/M Mode selection also. All this and more at a list price of only \$99.95.

\$49.95

SO We think the features above show the Hot Shot PLUS is a far better choice than the Xetec Super Graphics Sr at the same list price. Don't buy a printer interface until you get more information on these products! Call us today to ask us why you should choose our interfaces. This ad does not let us fully describe the features of these products. These are the best printer interfaces on the market, and we know you will like them better than any other. We also have a trade-in offer and other incentives! Call us and let us send you full information. Or mark the reader service card if you're not in a hurry. But don't choose less satisfaction. Instead, call us today!



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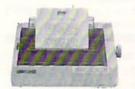
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| From p. 56. | | ra 147,162,12,160,5,177,2 | 480 | DATA 232,2,208,8,174,225,2, |
| ,169,154,32,21Ø,148:REM*149 | | ,72,177,171,72,169,40,32, | | 142,188,2,24,96,174,225,2,2 |
| 265 DATA 32,231,146,96,169,1,14 1,226,2,32,188,151,32,29,14 | | 2,147,1Ø4,145,171:REM*153 | 405 | Ø1,13,208,3 :REM*1 |
| 5,200,177,253,201 :REM*78 | | TA 104,145,253,169,40,32, 0,147,200,192,40,208,229, | 405 | DATA 76,128,140,169,0,157,6 0,3,76,111,140,32,120,145,1 |
| 27Ø DATA 32,2Ø8,4,2ØØ,76,71,137 | | 9,40,32,170,147,202 | | 44,3,76,137,15Ø :REM*8Ø |
| ,72,174,188,2,169,44,157,60 | | :REM*21Ø | 490 | DATA 32,106,150,32,98,150,3 |
| ,3,232,1Ø4,157 :REM*2Ø9 | 38Ø DA | TA 208,219,162,11,160,6,2 | | 2,110,145,169,16,32,210,148 |
| 275 DATA 60,3,232,169,44,157,60 | | 32,240,255,160,6,169,32,3 | | ,169,20,32,210,148 :REM*85 |
| ,3,232,169,82,157,60,3,142, | 2, | 210,255,200,192,38 | 495 | DATA 162, Ø, 142, 2Ø3, 2, 142, 2Ø |
| 223,2,142,188 :REM*1Ø4 28Ø DATA 2,96,32,2Ø4,255,32,2,1 | 385 DA | :REM*233 TA 208,246,96,169,0,32,18 | | 2,2,169,1,141,195,2,169,8\$, 141,198,2,169 :REM*16 |
| 39,32,45,135,32,176,144,32, | | 255,169,15,174,180,2,168, | 500 | DATA 197,133,253,169,5,133, |
| 204,255,173,53 :REM*177 | | ,186,255,32,192 :REM*19Ø | | 254,169,13,141,204,2,162,1, |
| 285 DATA 3,208,1,96,32,2,145,10 | | TA 255,96,169,1,32,195,25 | | 32,244,147,32,36 :REM*217 |
| 4,104,76,199,137,230,158,24 | | 169,15,32,195,255,96,32,1 | 505 | DATA 147,144,3,76,137,150,1 |
| Ø,1,96,23Ø,159 :REM*252 29Ø DATA 96,172,223,2,169,87,15 | | ,145,144,3,76 :REM*55 TA 137,150,32,106,150,32, | | 73,186,2,2Ø1,1,2Ø8,13,169,7 |
| 3,60,3,200,140,188,2,96,32, | | Ø,145,32,244,146,169,Ø,32 | 510 | 7,141,63,3,169 :REM*118 DATA 48,141,64,3,76,235,14Ø |
| 244,146,32,32 :REM*129 | | 1Ø,148,174,221,2 :REM*1Ø4 | 3.7 | ,169,77,141,63,3,169,49,141 |
| 295 DATA 137,169, Ø, 141, 241, 2,14 | | TA 189,28,155,32,210,255, | | ,64,3,162,Ø :REM*9 |
| 1,242,2,141,243,2,141,244,2 | | 9,4,32,210,148,32,78,149, | 515 | DATA 189,18,155,157,60,3,23 |
| ,141,246,2,141 :REM*182 | | 3,177,2,201,32 :REM*243 | | 2,224,3,208,245,169,5,141,1 |
| 300 DATA 245,2,169,1,133,158,16 | | TA 240,8,32,36,147,144,24 76,137,150,169,8,32,210,1 | End | 88,2,32,208,146 :REM*9 DATA 32,176,144,32,204,255, |
| 9,8,133,159,96,76,137,15Ø,3 2,231,255,32,164 :REM*159 | | ,32,115,145,169 :REM*112 | 320 | 32,25,139,76,137,150,162,0, |
| 3Ø5 DATA 137,32,13,145,144,3,76 | | TA 12,32,210,148,169,3,14 | | 142,220,2,232,142 :REM*72 |
| ,137,150,169,0,157,0,160,14 | | 225,2,141,228,2,169,22,14 | 525 | DATA 226,2,142,218,2,32,2,1 |
| 2,243,2,32,59 :REM*242 | 1, | 227,2,162,1Ø :REM*123 | | 39,32,81,152,32,176,144,32, |
| 31Ø DATA 137,173,239,2,2Ø1,116, | 415 DA | TA 16Ø,17,32,176,139,144, | Ead | 2Ø4,255,32,25 :REM*43 |
| 144,3,76,202,137,173,233,2, 141,180,2,32,114 :REM*57 | | 76,137,150,169,1,141,230, 32,244,146,169 :REM*56 | yec | DATA 139,173,53,3,240,3,76, 132,141,173,207,2,141,219,2 |
| 315 DATA 137,162,1,32,198,255,1 | | TA 158,32,210,148,32,67,1 | | ,32,202,153,32 :REM*200 |
| 60,0,32,207,255,145,158,32, | | ,206,230,2,173,186,2,201, | 535 | DATA 12,147,32,12,147,169,2 |
| 183,255,208,6,32 :REM*142 | | 2Ø8,3,76,137 :REM*17 | | 4,32,210,148,169,3,141,204, |
| 32Ø DATA 143,137,76,253,137,32, | | TA 150,169,78,141,60,3,16 | | 2,141,199,2,169 :REM*71 |
| 143,137,165,158,133,181,165 | | 48,141,61,3,169,58,141,62 ,32,208,146 :REM*66 | 540 | DATA 52,133,253,169,5,133,2 |
| ,159,133,182,32,204 :REM*19 325 DATA 255,32,123,137,32,2,14 | | TA 32,25,139,76,137,150,2 | | 54,162,0,142,198,2,232,142, 203,2,142,202,2 :REM*186 |
| 5,32,190,137,174,243,2,32,1 | | 32,240,255,169,0,133,198, | 545 | DATA 32,244,147,173,230,2,2 |
| 51,137,173,234,2,141 | | 1,224,2,32,78 :REM*125 | | 40,1,96,173,186,2,201,1,208 |
| :REM*1Ø8 | | TA 149,32,36,147,144,2,56 | | ,3,76,132,141 :REM*143 |
| 33Ø DATA 18Ø,2,32,114,137,162,1 | ,, | 6,32,228,255,240,241,72,3 234,147,169,0 :REM*190 | 550 | DATA 169,6,141,194,2,162,Ø, |
| ,32,2Ø1,255,16Ø,Ø,177,158,3 2,21Ø,255,32,143 :REM*99 | | TA 133,198,104,201,34,208 | | 142,192,2,174,192,2,32,15,1 45,144,11,169 :REM*12 |
| 335 DATA 137,165,158,197,181,20 | | 1,72,165,212,73,128,133,2 | 555 | DATA Ø,141,218,2,141,226,2, |
| 8,242,165,159,197,182,208,2 | | ,104,76,23,140,201 | | 76,137,150,142,192,2,238,19 |
| 36,32,204,255,32,123:REM*78 | W17/201 2016 | :REM*117 | | 2,2,169,Ø,133 :REM*177 |
| 34Ø DATA 137,32,2,145,76,2Ø2,13 | | TA 17,240,15,201,29,240,1 201,145,240,7,201,157,240 | 560 | DATA 253,169,168,133,254,22 |
| 7,169,184,133,253,133,171,1 69,5,133,254,169,217 | | 3,76,2,14Ø,141 :REM*224 | | 4, Ø, 24Ø, 8, 169, 34, 32, 2Ø2, 147, 2Ø2, 2Ø8, 248, 162, 3: REM*194 |
| :REM*119 | | TA 181,2,165,212,240,191, | 565 | DATA 160,0,177,253,240,8,15 |
| 345 DATA 133,172,169,40,32,202, | | 3,181,2,76,23,140,201,13, | 505 | 7,60,3,200,232,76,173,141,1 |
| 147,162,12,160,5,177,253,72 | | Ø,97,201,136,240 :REM*237 | | 42,188,2,169,82 :REM*2Ø5 |
| ,177,171,72,169,40,32 | | TA 93,201,20,240,33,201,1 | 570 | DATA 141,60,3,169,48,141,61 |
| :REM*228 | | 3,240,29,174,224,2,208,164 | | ,3,169,58,141,62,3,32,208,1 46,32,176,144 :REM*160 |
| 350 DATA 170,147,104,145,171,10 4,145,253,169,40,32,202,147 | | 32,210,255,174,225 :REM*62 ATA 2,157,60,3,232,142,225 | 575 | DATA 32,204,255,32,25,139,7 |
| ,200,192,40,208,229:REM*241 | 400 07 | 2,236,227,2,144,146,238,22 | 313 | 6,124,141,169,0,133,253,169 |
| 355 DATA 169,40,32,202,147,202, | 4, | 2,76,187,139 :REM*2Ø5 | | ,168,133,254,32,12 :REM*1Ø1 |
| 208,219,169,15,141,134,2,16 | 465 DA | TA 169, Ø, 133, 198, 173, 225, | 58Ø | DATA 147,169,30,32,210,148, |
| 2,23,160,0,24,32,240 | | 205,228,2,208,3,76,187,13 | | 32,115,145,169,21,141,193,2 |
| :REM*162 36Ø DATA 255,16Ø,6,169,32,32,21 | | .56,32,240,255 :REM*0 ATA 136,24,32,240,255,169, | 585 | ,162,7,160,19,32 :REM*126 DATA 236,148,169,0,141,225, |
| Ø,255,2ØØ,192,39,2Ø8,246,16 | | 2,32,210,255,56,32,240,255 | 505 | 2,141,228,2,169,16,141,227, |
| 9,6,141,134,2,96 :REM*23 | | 36,24,32,240,255 :REM*193 | | 2,162,7,16Ø,19 :REM*143 |
| 365 DATA 169,152,133,253,133,17 | | ATA 174,225,2,202,142,225, | 590 | DATA 32,176,139,32,110,145, |
| 1,169,7,133,254,169,219,133 | | ,169,Ø,157,6Ø,3,141,224,2, | | 174,211,2,240,8,169,34,32,2 |
| ,172,169,40,32,170 :REM*20 | 7. | 5,187,139,174 :REM*68 | | Ø2,147,2Ø2,2Ø8,248 :REM*22Ø |

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- 595 DATA 160,0,185,60,3,145,253 ,200,204,188,2,208,245,169, 61,145,253,200,140 :REM*185 600 DATA 192,2,165,253,72,165,2 54,72,174,211,2,32,188,151, 32,29,145,104,133 :REM*20 6Ø5 DATA 254,1Ø4,133,253,162,Ø, 172,192,2,189,60,3,145,253, 200,232,236,188,2 :REM*95 61Ø DATA 2Ø8,244,169,Ø,145,253, 32,98,150,24,96,162,1,142,2 :REM*72 18,2,142,231,2 615 DATA 169, Ø, 141, 220, 2, 32, 2, 1 39, 32, 81, 152, 32, 176, 144, 32, 204,255,32,25 :REM*81 62Ø DATA 139,173,53,3,24Ø,3,76, 168,142,173,207,2,141,219,2 :REM*224 ,32,202,153,32 625 DATA 12,147,169,1,141,230,2 ,169,34,32,210,148,32,67,14 1,206,230,2,173 :REM*107 63Ø DATA 186,2,2Ø1,1,2Ø8,11,169 ,0,141,218,2,141,231,2,76,1 :REM*60 37,150,162,0 635 DATA 142,192,2,174,192,2,32 ,15,145,144,3,76,168,142,14 2,192,2,238,192 :REM*193 64Ø DATA 2,32,188,151,169,3,141 ,229,2,32,34,145,169,83,141 ,60,3,169,48 :REM*64 645 DATA 141,61,3,169,58,141,62 ,3,32,208,146,32,176,144,32 ,204,255,32,25 :REM*223 65Ø DATA 139,76,184,142,32,244, 146,32,98,150,32,106,150,32 ,11Ø,145,169,38,32 :REM*124 655 DATA 210,148,169,42,32,210, 148,169,46,32,210,148,169,2 1,141,204,2,169,80 :REM*199 660 DATA 141,198,2,169,0,141,20 3,2,141,202,2,169,193,133,2 53,169,5,133,254 :REM*148 665 DATA 162,2,142,195,2,32,244 ,147,32,36,147,144,3,76,137 ,150,173,186,2 :REM*129 67Ø DATA 2Ø1,1,2Ø8,3,76,6Ø,144, 201,3,208,3,76,42,144,32,11 0,145,169,50 :REM*212 675 DATA 32,210,148,169,4,141,2 Ø4,2,141,199,2,169,7,141,2Ø :REM*49 2,2,162,0,142 68Ø DATA 195,2,142,198,2,232,14 1,203,2,169,213,133,253,169 ,6,133,254,162,Ø :REM*192 685 DATA 32,244,147,32,36,147,1 44,3,76,137,150,32,12,147,1 69,54,32,210,148 :REM*211 69Ø DATA 169,1,141,232,2,206,18 6,2,169,0,141,192,2,174,186 :REM*122 ,2,240,12,24 695 DATA 173,192,2,105,31,141,1 92,2,202,208,244,162,7,160, :REM*73 4,24,32,240,255 700 DATA 32,115,145,32,123,150, 174,192,2,189,0,161,240,11, :REM*96 201,13,240,7,32 7Ø5 DATA 21Ø, 255, 232, 76, 181, 143 ,32,130,150,32,78,149,173,1
- 71Ø DATA 147,144,17,32,12,147,3 2,110,145,32,98,150,169,0,1 41,232,2,76,72 :REM*180 715 DATA 143,32,234,147,32,110, 145,160,0,140,228,2,140,225 :REM*255 ,2,169,54,32,210 72Ø DATA 148,169,3Ø,141,227,2,1 62,7,160,4,173,192,2,72,32, :REM*6 176,139,144,4 725 DATA 104,76,213,143,104,170 ,160,0,185,60,3,240,12,201, :REM*223 13,240,8,157,0 73Ø DATA 161,232,200,76,19,144, 157,0,161,76,213,143,120,16 9,71,141,20,3,169 :REM*172 735 DATA 144,141,21,3,88,238,23 5,2,76,137,150,32,138,255,1 69, 0, 141, 235, 2 :REM*9 74Ø DATA 76,137,15Ø,173,238,2,2 Ø8,97,173,235,2,2Ø8,3,76,17 3,144,165,212,208 :REM*192 745 DATA 85,173,141,2,141,184,2 ,165,203,201,3,144,73,201,7 ,176,69,141,185 :REM*1Ø1 75Ø DATA 2,32,234,147,173,185,2 ,56,233,3,141,185,2,173,184 ,2,201,1,208 :REM*182 755 DATA 9,24,173,185,2,105,4,1 41,185,2,174,185,2,189,30,1 55,170,32,123 :REM*89 76Ø DATA 15Ø,189,Ø,161,24Ø,2Ø,2 \$1,13,24\$,7,32,21\$,255,232, 76,145,144,169,13 :REM*134 765 DATA 141,119,2,169,1,133,19 8,32,130,150,76,49,234,32,2 :REM*183 Ø4,255,162,15,32 77Ø DATA 198,255,32,207,255,201 ,50,144,51,141,53,3,169,0,1 33,199,32,244,146 :REM*87 775 DATA 169,2,141,134,2,24,162 ,7,160,7,32,240,255,173,53, :REM*118 3,32,210,255 78Ø DATA 32,207,255,201,13,240, 6,32,210,255,76,220,144,169 :REM*211 ,1,141,53,3,32 785 DATA 231,146,96,32,207,255, 201,13,240,3,76,242,144,169 , Ø, 141, 53, 3, 96 :REM*106 79Ø DATA 169,1,32,195,255,169,1 5,32,195,255,96,162,0,189,0 :REM*79 ,160,208,7,232 795 DATA 224,255,208,246,56,96, 24,96,169,0,141,229,2,160,2 55,200,177,253,201 :REM*48 800 DATA 34,208,249,200,174,229 ,2,177,253,201,34,240,8,157 ,60,3,200,232,76 :REM*11 8Ø5 DATA 47,145,142,188,2,152,7 2,165,253,72,165,254,72,169 ,3,32,170,147,160 :REM*36 81Ø DATA Ø,177,253,141,239,2,2Ø 0,177,253,141,240,2,104,133 ,254,104,133,253,104:REM*49 815 DATA 168,96,162,0,169,0,157 ,0,160,232,208,250,96,169,0 ,133,199,96,169 :REM*24Ø 820 DATA 1,133,199,96,173,201,2 ,208,7,169,8,141,180,2,24,9 6,32,244,146 :REM*139
 - 825 DATA 32,106,150,32,110,145, 169,78,32,210,148,169,52,13 3,253,169,5,133,254 :REM*76 83Ø DATA 169,1,141,203,2,169,1, 141,202,2,169,3,141,204,2,1 41,199,2,162 :REM*23 835 DATA 1,32,244,147,32,36,147 ,144,2,56,96,173,186,2,201, :REM*8 1,208,13,169 84Ø DATA Ø,141,221,2,173,200,2, 141,180,2,24,96,169,1,141,2 21,2,173,201 :REM*183 845 DATA 2,141,180,2,24,96,169, 29,133,253,169,176,133,254, :REM*200 96,160,0,185,25 85Ø DATA 155,145,167,169,2,145, 169,200,192,3,208,242,96,16 Ø,Ø,169,32,145,167 :REM*97 855 DATA 200,192,3,208,249,96,1 69, 184, 133, 167, 133, 169, 169, 5,133,168,169,217,133 :REM*52 86Ø DATA 17Ø,96,24,165,167,1Ø5, 40,133,167,165,168,105,0,13 3,168,24,165,169,1Ø5:REM*41 865 DATA 40,133,169,165,170,105 , Ø, 133, 17Ø, 96, 56, 165, 167, 23 3,40,133,167,165,168 :REM*144 87Ø DATA 233, Ø, 133, 168, 56, 165, 1 69,233,40,133,169,165,170,2 33, Ø, 133, 17Ø, 96, 2Ø1: REM*239 875 DATA 10,144,26,201,100,144, 11,169,7,141,209,2,169,25,1 41,210,2,96,169 :REM*242 88Ø DATA 8,141,209,2,169,26,141 ,210,2,96,169,9,141,209,2,1 69,27,141,210 :REM*229 885 DATA 2,96,174,222,2,134,253 ,172,223,2,132,254,169,30,3 2,170,147,160,0 :REM*156 89Ø DATA 177,253,141,2Ø5,2,2ØØ, 177,253,141,206,2,169,3,32, 17Ø,147,56,165,253 :REM*53 895 DATA 233,29,141,207,2,165,2 54,233,176,141,208,2,162,5, 78,208,2,110,207 :REM*160 900 DATA 2,202,208,247,96,169,0 ,174,180,2,172,217,2,32,186 ,255,169,60,170 :REM*97 9Ø5 DATA 169,3,168,173,188,2,32 ,189,255,169,Ø,166,155,164, 156,32,213,255,142 :REM*62 91Ø DATA 222,2,14Ø,223,2,96,173 ,188,2,162,6Ø,16Ø,3,32,189, 255,169,15,174 :REM*225 915 DATA 180,2,168,32,186,255,3 2,192,255,96,32,159,255,165 ,2Ø3,2Ø1,6Ø,2Ø8,247 :REM*64 920 DATA 32,234,147,96,32,110,1 45,162,0,169,32,157,144,5,1 57,128,6,232,208 :REM*169 925 DATA 247,157,112,7,232,224, 80,208,248,32,110,145,162,7 ,160,0,24,32,240 :REM*22Ø 93Ø DATA 255,16Ø,Ø,169,32,32,21 Ø,255,2ØØ,192,39,2Ø8,246,96 ,173,177,2,2Ø1,255 :REM*119 935 DATA 208,2,56,96,24,96,169, ►

77,2,240,248,32,36

:REM*51

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| | | 2Ø9,133,253,169,5,133,254,1 | | 193,2,232,189,25Ø,158 :REM*93 | 1145 | DATA 40,208,241,169,114,32 |
|----|----------------|--|---|--|------|--|
| | | 69,2,141,202,2 :REM*56 DATA 169,1,141,203,2,169,3, | 1050 | DATA 141,194,2,232,189,250 | | ,210,148,169,118,32,210,14 8,169,122,32,210,148:REM*9 |
| | | 141,199,2,141,204,2,173,200 | 1,6-6 | ,158,72,232,189,250,158,16 | 1150 | DATA 169,126,32,210,148,32 |
| | | ,2,141,181,2 :REM*1Ø1 | | 8,104,170,140,179,2:REM*46 | | ,110,145,96,32,110,145,169 |
| | | DATA 173,201,2,141,182,2,16 | 1055 | DATA 142,178,2,173,194,2,1 | | ,130,32,210,148,32,115 |
| | | 2,1,32,244,147,32,36,147,14 | | 41,134,2,169,38,133,247,16 | | :REM*22Ø |
| | | | | 9,155,133,248,160,0 | 1155 | DATA 145,169,134,32,210,14 |
| | | 4,3,76,157,147 :REM*116 | | :REM*189 | 1133 | 8,96,32,110,145,169,138,76 |
| | | DATA 24,169,7,109,186,2,141 | 1060 | DATA 177,247,205,193,2,240 | | ,210,148,165,1,41,254 |
| | | ,200,2,141,180,2,173,177,2, | 1,000 | ,6,32,64,149,76,2,149,24,1 | | :REM*163 |
| | | 2Ø1,7,2Ø8,1 :REM*227 | | 74,178,2,172,179,2,32 | 1160 | DATA 133,1,96,165,1,9,1,13 |
| | | DATA 96,169,33,133,253,169, | | :REM*128 | 1100 | 3,1,96,32,123,150,173,12,1 |
| | | 6,133,254,162,1,32,244,147, | 1065 | DATA 240,255,160,1,177,247 | | |
| | | 32,36,147,144,3 :REM*36 | 1003 | | 1165 | 55,201,1,240,3 :REM*152 DATA 108,14,155,32,192,149 |
| | | DATA 76,157,147,173,177,2,2 | | ,24Ø,32,2Ø1,255,24Ø,7,32,2 1Ø,255,2ØØ,76,27,149 | 1105 | ,32,99,145,169,0,141,226,2 |
| | | Ø1,7,2Ø8,1,96,24,169,7,1Ø9, | | :REM*83 | | ,141,218,2,141,232 :REM*31 |
| | | 186,2,141,2Ø1 :REM*93 | 1070 | | 1170 | |
| | | DATA 2,96,173,181,2,141,200 | 1 10 7 10 | DATA 200,152,72,238,178,2, | 1170 | DATA 2,169,1,141,238,2,169 |
| | | ,2,173,182,2,141,201,2,96,1 | | 174,178,2,172,179,2,24,32, | | ,42,133,253,169,4,133,254, 170,169,40,141,198 :REM*38 |
| | | 41,171,2,56 :REM*17Ø | 1075 | 240,255,104,168,76:REM*108 | 1175 | |
| | | DATA 165,253,237,171,2,133, | 1975 | DATA 27,149,96,24,165,247, | 11/5 | DATA 2,169,22,141,199,2,16 |
| | | 253,165,254,233,Ø,133,254,5 | | 1Ø5,1,133,247,165,248,1Ø5, Ø,133,248,96,32,159 | | 9,1,141,2Ø2,2,169,15,141,2 |
| | | 6,165,171,237,171,2:REM*173 | | :REM*1Ø3 | 1100 | Ø4,2,169,Ø,141 :REM*21 |
| | | DATA 133,171,165,172,233,0, | 1000 | | 1100 | DATA 203,2,32,244,147,173, |
| | | 133,172,96,141,171,2,24,165 | 1000 | DATA 255,173,141,2,141,187 | | 177,2,201,255,208,3,76,71, |
| | | ,253,109,171,2,133 :REM*62 | | ,2,32,159,255,165,2Ø3,2Ø1, 6Ø,2Ø8,9,32,234,147 | 1105 | 151,173,186,2,201 :REM*194 |
| | | DATA 253,165,254,105,0,133, | | :REM*116 | 1105 | DATA 1,208,3,76,9,152,201, |
| | | 254,24,165,171,109,171,2,13 | 1005 | | | 10,208,32,32,2,139,32,81,1 |
| | | 3,171,165,172,105,0:REM*231 | 1005 | DATA 169,32,141,177,2,96,2 Ø1,63,2Ø8,9,169,255,141,17 | 1100 | 52,32,176,144 :REM*163 |
| | | DATA 133,172,96,32,159,255, | | | 1190 | DATA 32,204,255,32,25,139, |
| | | 165,2Ø3,2Ø1,64,2Ø8,247,96,1 | 1000 | 7,2,32,234,147,96 :REM*95 | | 173,53,3,24Ø,3,76,137,15Ø, |
| | 700 V 200 V 10 | 42,195,2,32,186,148:REM*156 | עפעו | DATA 201,3,208,9,169,7,141 ,177,2,32,234,147,96,201,6 | 1105 | 32,12,147,32,2Ø5 :REM*48 |
| | | DATA 169,0,141,196,2,141,19 | | ,208,9,169,5 :REM*220 | 1195 | DATA 153,76,137,150,201,3, |
| | | 7,2,169,1,141,186,2,32,78,1 | 1005 | DATA 141,177,2,32,234,147, | | 208,3,76,132,151,201,7,208 |
| | | 49,173,177,2 :REM*7 | 1095 | | 1244 | ,3,76,26,152,2Ø1 :REM*253 |
| | | DATA 240,248,201,32,240,35, | | 96,201,7,240,21,201,2,208, 34,173,187,2,240 :REM*47 | 1200 | DATA 5,208,3,76,31,139,201,9,208,3,76,134,140,201,6, |
| | | 2Ø1,2,24Ø,66,2Ø1,1,2Ø8,3,76 ,58,148,2Ø1,4 :REM*92 | 1100 | DATA 6,169,3,141,177,2,96, | | 208,3,76,12 :REM*200 |
| | | | 1100 | 169,4,141,177,2,96,173,187 | 1205 | DATA 141,201,4,208,3,76,97 |
| | עעעו | DATA 208, 3, 76, 131, 148, 201, | | | 1200 | ,142,201,8,208,3,76,242,14 |
| | | 3,208,3,76,160,148,201,255 ,208,1,96,201,7 :REM*103 | 1105 | ,2,240,6,169 :REM*252 DATA 1,141,177,2,96,169,2, | | 2,201,2,208,3 :REM*11 |
| | 1005 | DATA 208,210,96,173,186,2, | 1195 | 141,177,2,96,169,0,141,177 | 1210 | DATA 76,69,135,76,137,150, |
| | LAND | 96,173,203,2,208,200,173,1 | | ,2,96,169,147 :REM*117 | , | 32,234,147,169,0,133,198,1 |
| | | 96,2,240,195,32,186 | 1110 | DATA 32,210,255,162,0,169, | | 41,238,2,169,71,141 |
| | | :REM*188 | 1119 | 6,157,0,216,157,0,217,157, | | :REM*128 |
| | 1010 | DATA 148,173,198,2,32,170, | | Ø,218,157,Ø,219 :REM*22 | 1215 | DATA 24,3,169,147,32,210,2 |
| | | 147,206,186,2,206,186,2,20 | 1115 | DATA 232,208,241,169,6,141 | | 55,169,6,141,33,208,32,130 |
| | | 6,196,2,76,120,148:REM*207 | | ,194,2,169,15,141,33,208,1 | | ,150,169,14,141,32:REM*195 |
| | 1015 | DATA 173,203,2,208,169,173 | | 69,14,141,32,208,162 | 1220 | DATA 208,141,134,2,173,218 |
| | | ,196,2,205,195,2,240,26,32 | | :REM*73 | | ,2,208,3,108,2,160,32,89,1 |
| | | ,186,148,173,198,2 :REM*54 | 1120 | DATA Ø,169,160,157,0,4,169 | | 66,32,51,165,169 :REM*186 |
| | 1020 | DATA 32,202,147,238,196,2, | | ,11,157,0,216,232,224,40,2 | 1225 | DATA Ø,141,218,2,32,144,25 |
| | | 238,186,2,238,186,2,32,186 | | Ø8,241,162,Ø,169 :REM*14Ø | | 5,32,142,166,76,174,167,32 |
| | | ,148,16Ø,75,32,2Ø1:REM*229 | 1125 | DATA 121,157,64,5,169,160, | | ,2,139,32,81,152 :REM*77 |
| | 1025 | DATA 148,76,7,148,173,197, | A DEVICE OF | 157,104,5,169,11,157,104,2 | 1230 | DATA 32,176,144,32,204,255 |
| | in some | 2,205,202,2,208,3,76,7,148 | | 17,157,64,217,232,224 | | ,173,53,3,240,6,32,20,139, |
| | | ,238,197,2,32 :REM*39 | | :REM*89 | | 76,137,150,32,20 :REM*254 |
| | 1030 | DATA 186,148,173,199,2,32, | 1130 | DATA 40,208,233,162,0,169, | 1235 | DATA 139,162,1,142,218,2,1 |
| | | 202,147,238,186,2,76,120,1 | | 160,157,40,4,169,6,157,40, | | 62,1,142,219,2,202,142,220 |
| | | 48,173,197,2,208,3:REM*208 | | 216,232,224,200,208 | | ,2,32,202,153,176 :REM*49 |
| | 1035 | DATA 76,7,148,206,197,2,32 | | :REM*1ØØ | 1240 | DATA 3,76,137,150,32,13,14 |
| 15 | | ,186,148,173,199,2,32,170, | 1135 | DATA 241,169,120,157,40,4, | | 5,144,3,76,137,150,169,35, |
| | | 147,206,186,2,76 :REM*5 | | 169,6,157,40,216,232,224,2 | | 133,253,169,176,133 |
| | 1040 | DATA 120,148,160,0,177,253 | | 40,208,241,32,115,145 | | :REM*162 |
| | The service of | ,73,128,145,253,200,204,20 | | :REM*143 | 1245 | DATA 254,224,0,240,8,169,3 |
| | | 4,2,208,244,96,162,0 | 1140 | DATA 169,110,32,210,148,16 | | 2,32,202,147,202,208,248,1 |
| | | :REM*19Ø | 100-40-40-00-00-00-00-00-00-00-00-00-00-0 | 2,0,169,160,157,192,7,169, | | 73,226,2,24Ø,1,96 :REM*13 |
| | 1045 | DATA 202,208,253,136,208,2 | | 14,157,192,219,232,224 | 1250 | DATA 173,231,2,240,1,96,32 |
| | | 48,96,170,189,250,158,141, | | :REM*28 | | ,2,139,32,29,145,169,255,1 |
| | | | | | | |

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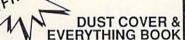


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| | 41,217,2,32,169 :REM*242 | | 210,255,32,123,150,104 | 1460 | DATA 192,29,208,245,96,177 |
|--------|----------------------------|----------------|----------------------------------|--|--|
| 1255 | DATA 146,32,176,144,32,204 | | :REM*166 | | ,167,174,211,2,189,0,160,2 |
| | ,255,173,53,3,240,6,32,20, | 1360 | DATA 32,68,146,32,110,145, | | 40,2,56,96,24,96 :REM*189 |
| | 139,76,137,150,32 :REM*45 | | 32,251,154,144,3,32,115,14 | 1465 | DATA 195,194,205,56,48,1,0 |
| 1260 | DATA 20,139,165,175,133,46 | | 5,24,16Ø,13,174,181:REM*47 | | ,0,0,36,48,85,48,62,82,85, |
| | ,165,174,133,45,76,71,151, | 1365 | DATA 2,32,240,255,172,209, | | 78,8,195 :REM*42 |
| | 32,98,150,32,115,150 | | 2,162,0,177,253,201,34,240 | 1470 | DATA 195,190,65,66,186,0,6 |
| | :REM*17Ø | | ,9,32,210,255,232 :REM*16 | | 2,124,217,31,93,155,1,77,7 |
| 1265 | DATA 32,47,147,169,0,141,2 | 137Ø | DATA 200,192,25,208,241,22 | | 9,86,69,32,67 :REM*183 |
| | Ø3,2,76,137,15Ø,32,12Ø,145 | | 4,16,240,9,169,32,32,210,2 | 1475 | DATA 85,82,83,79,82,32,84, |
| | ,144,3,76,137,150 :REM*189 | | 55,232,76,163,153,32 | | 72,69,78,32,80,82,69,83,83 |
| 1270 | DATA 32,244,146,169,142,32 | | :REM*163 | | ,32,83,8Ø :REM*22Ø |
| 102300 | ,210,148,174,221,2,189,28, | 1375 | DATA 110,145,24,160,32,174 | 1480 | DATA 65,67,69,32,84,79,32, |
| | 155,32,210,255,169,2 | | ,181,2,32,240,255,172,210, | | 83,69,76,69,67,84,0,2,68,8 |
| | :REM*54 | | 2,177,253,32,210,255 | | 2,73,86 :REM*97 |
| 1275 | DATA 141,188,2,169,86,141, | | :REM*11Ø | 1485 | DATA 69,58,0,3,70,82,69,69 |
| 1213 | 60,3,169,48,141,61,3,32,20 | 1294 | DATA 200,192,30,208,246,96 | 1405 | 그리고 하는 아니는 사람들이 가는 사람들이 가장 사람들이 가장 그렇게 되었다. 그 사람들이 가장 그렇게 되었다. |
| | | 1300 | | | ,Ø,4,68,82,73,86,69,32,83, |
| 1204 | 8,146,32,176,144 :REM*65 | | ,32,98,150,32,106,150,32,2 | 1104 | 69,84 :REM*242 |
| 1200 | DATA 32,204,255,32,25,139, | | 55,145,32,226,145,169 | 1490 | DATA 85,80,255,82,85,78,32 |
| | 76,137,150,32,120,145,144, | 4205 | :REM*2Ø9 | | ,65,32,8Ø,82,79,71,82,65,7 |
| | 8,32,25,139,104,104 :REM*5 | 1385 | DATA 6,141,134,2,32,78,149 | | 7,255,70,79 :REM*13 |
| 1285 | DATA 76,137,150,169,239,14 | | ,173,177,2,201,1,208,3,76, | 1495 | DATA 82,77,65,84,32,65,32, |
| | 1,40,3,162,0,189,16,155,15 | | 65,154,2Ø1,2 :REM*58 | | 68,73,83,75,255,67,76,69,6 |
| | 7,60,3,232,189,16 :REM*194 | 1390 | DATA 208,3,76,121,154,201, | | 5,78,85,8Ø :REM*8 |
| 1290 | DATA 155,157,60,3,169,2,14 | | 255,208,2,24,96,201,7,208, | 1500 | DATA 32,65,32,68,73,83,75, |
| | 1,188,2,169,0,133,155,141, | | 2,56,96,2Ø1,32 :REM*123 | | 255,77,79,68,69,32,83,69,7 |
| | 217,2,169,176,133 :REM*83 | 1395 | DATA 208,40,173,218,2,240, | | 6,69,67,84 :REM*177 |
| 1295 | DATA 156,32,169,146,169,23 | | 35,173,219,2,205,220,2,240 | 1505 | DATA 73,79,78,0,5,67,79,80 |
| | 7,141,40,3,32,109,146,169, | | ,27,32,251,154,176 :REM*56 | | ,89,32,70,73,76,69,83,255, |
| | Ø,141,215,2,141,211 | 1400 | DATA 22,174,211,2,169,1,15 | | 68,69,76 :REM*234 |
| | :REM*148 | HALLES | 7,0,160,238,220,2,32,235,1 | 1510 | DATA 69,84,69,32,70,73,76, |
| 1300 | DATA 2,141,212,2,173,207,2 | | 54,173,226,2,240 :REM*183 | The state of the s | 69,83,255,82,69,78,65,77,6 |
| | ,208,8,169,0,141,216,2,76, | 1105 | DATA 3,32,218,141,173,177, | | 9,32,70,73 :REM*105 |
| | 18Ø,152,2Ø1,14 :REM*191 | 1405 | 2,201,5,208,16,32,251,154, | 1515 | DATA 76,69,83,255,70,85,78 |
| 1305 | DATA 176,6,141,216,2,76,18 | | 144,11,169,0,157 :REM*244 | | ,67,84,73,79,78,32,75,69,8 |
| 1000 | Ø,152,169,13,141,216,2,169 | 1111 | | | 9,83,255,68 :REM*15Ø |
| | ,6,133,253,169,176:REM*12Ø | 1410 | DATA Ø,16Ø,2Ø6,22Ø,2,32,23 | 1520 | DATA 73,82,69,67,84,79,82, |
| 1214 | | | 5,154,76,219,153,173,215,2 | 1320 | 89,0,6,80,82,69,83,83,32,1 |
| 1310 | DATA 133,254,24,162,9,160, | 1415 | ,208,23,173,211,2 :REM*203 | | 46,7Ø,53 :REM*37 |
| | 10,32,240,255,169,11,141,1 | 1415 | DATA 240,43,206,211,2,32,2 | 1525 | |
| 1215 | 34,2,23Ø,199,16Ø,Ø :REM*79 | | 43,145,32,179,138,32,172,1 | 1525 | DATA 18,32,84,79,32,85,78, |
| 1313 | DATA 177,253,32,210,255,20 | | 54,32,226,145,76,219 | | 83,69,76,69,67,84,32,47,32 |
| | 0,192,16,208,246,24,162,9, | | :REM*188 | 4524 | ,146,83,84 :REM*238 |
| | 160,7,32,240,255,174 | 1420 | DATA 153,32,243,145,32,41, | 1539 | DATA 79,80,18,32,84,79,32, |
| | :REM*17Ø | | 146,206,215,2,206,211,2,16 | | 67,65,78,67,69,76,32,0,7,3 |
| 1320 | DATA 221,2,189,28,155,32,2 | | Ø, 25, 32, 201, 148, 32: REM*251 | | 2,68,82 :REM*39 |
| | 10,255,32,130,150,160,28,1 | 1425 | DATA 226,145,160,25,32,201 | 1535 | DATA 73,86,69,32,65,58,32, |
| | 62,9,24,32,240,255 :REM*61 | | ,148,76,219,153,174,215,2, | | 68,69,86,73,67,69,32,35,32 |
| 1325 | DATA 173,206,2,174,205,2,3 | | 232,236,216,2,144,27 | | ,61,32,56 :REM*8 |
| | 2,205,189,32,123,150,173,2 | | :REM*36 | 1540 | DATA 32,32,57,32,32,49,48, |
| | 16,2,208,8,162,0 :REM*202 | 1430 | DATA 174,211,2,232,236,207 | | 255, 255, 32, 68, 82, 73, 86, 69, |
| 1330 | DATA 202,208,253,76,137,15 | | ,2,176,235,238,211,2,32,24 | | 32,66,58,32 :REM*92 |
| | 0,230,199,169,29,133,253,1 | | 3,145,32,9Ø,138,32 :REM*23 | 1545 | DATA 68,69,86,73,67,69,32, |
| | 69,176,133,254,169,11 | 1435 | DATA 202,154,32,226,145,76 | | 35, 32, 61, 32, 56, 32, 32, 57, 32 |
| | :REM*171 | | ,219,153,32,243,145,32,14, | | ,32,49,48 :REM*233 |
| 1335 | DATA 141,181,2,169,6,141,1 | | 146,238,215,2,238,211 | 155Ø | DATA Ø,11,84,72,69,78,32,8 |
| | 82,2,169,0,141,183,2,169,1 | | :REM*18 | | Ø,82,69,83,83,32,83,8Ø,65, |
| | 46,32,210,148,32,110 | 1440 | DATA 2,76,105,154,32,217,1 | | 67,69,Ø :REM*152 |
| | :REM*16Ø | //c/e8/2015-80 | 45,174,211,2,240,8,169,32, | 1555 | DATA 14,32,32,32,32,32,83, |
| 1340 | DATA 145,169,6,141,134,2,3 | | 32,202,147,202,208 :REM*33 | | 73,90,69,32,32,32,32,32,32 |
| | 2,76,153,238,183,2,173,183 | 1445 | DATA 248,169,11,141,181,2, | | ,7Ø,73,76 :REM*145 |
| | ,2,2Ø5,216,2,2Ø8 :REM*233 | | 169,6,141,182,2,32,76,153, | 1560 | DATA 69,32,78,65,77,69,32, |
| 1345 | DATA 1,96,169,32,32,202,14 | | 96,32,217,145,174 :REM*246 | | 32,32,32,32,32,32,84,89 |
| 1343 | 7,238,181,2,76,50,153,32,1 | 1450 | DATA 211,2,236,207,2,240,8 | | ,8Ø,69,32 :REM*182 |
| | 1Ø,145,169,6,141 :REM*56 | . 450 | ,169,32,32,202,147,202,208 | 1500 | DATA 32,32,32,0,15,70,82,7 |
| 1354 | DATA 134,2,24,174,181,2,17 | | ,248,169,23,141,181 | 1202 | |
| 1330 | 2,182,2,32,240,255,160,3,1 | | | | 9,77,32,87,72,73,67,72,32, 68,82,73 :REM*45 |
| | | 1/55 | :REM*199 | 1574 | |
| 1255 | 77,253,72,170,200 :REM*211 | 1435 | DATA 2,169,6,141,182,2,32, | 15/0 | DATA 86,69,58,32,65,32,32, |
| 1355 | DATA 177,253,72,32,130,150 | | 76,153,96,160,13,177,167,7 | | 66,32,0,16,68,73,83,75,32, 67,76,69 :REM*0 |
| | ,104,32,205,189,169,13,32, | | 3,128,145,167,200 :REM*254 | | 67,76,69 :REM*0 |
| | | | | | |

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| 1575 DATA 65,78,45,85,80,32,87, 79,82,75,73,78,71,32,79,78, 32,68,82 1580 DATA 73,86,69,32,0,17,73,7 8,83,69,82,84,32,68,73,83, 75,32,73 1585 DATA 78,36,66,32,80, 82,69,83 1590 DATA 83,32,68,82,73,86,69, 17,02,69,78,84,69,82,32,68, 73,83,75 1590 DATA 32,78,65,77,69,58,22, 0,21,32,32,32,32,32,32,32,32,32,32,32,32,32, | | | |
|---|------|--|------|
| 158Ø DATA 73,86,69,32,Ø,17,73,7 8,83,69,82,84,32,68,73,83, 75,32,73 1585 DATA 78,32,68,82,73,86,69, 32,Ø,19,32,65,78,68,32,8Ø, 82,69,83 1599 DATA 83,32,83,8Ø,55,67,69, Ø,2Ø,69,78,84,69,82,32,68, 73,83,75 1595 DATA 32,78,65,77,69,58,32, Ø,21,32,32,32,32,32,32,32,32,32,32,32,32,32, | 1575 | 79,82,75,73,78,71,32,79,78 | 169Ø |
| 1585 DATA 78,32,68,82,73,86,69, 32,0,19,32,65,78,68,32,80, 82,69,83 REM*25 1590 DATA 83,32,83,80,55,67,69, 0,20,69,78,84,69,82,32,68, 73,83,75 REM*188 1595 DATA 32,78,65,77,69,58,32, 0,21,32,32,32,32,32,32,32,32,32,32,32,32,32, | 158Ø | DATA 73,86,69,32,0,17,73,7 | 1695 |
| 82,69,83 | 1585 | DATA 78,32,68,82,73,86,69, | 1700 |
| 73,83,75 | 159ø | 82,69,83 :REM*25 DATA 83,32,83,80,65,67,69, | 17Ø5 |
| 32,32,32 | 1595 | 73,83,75 :REM*188 DATA 32,78,65,77,69,58,32, | 1719 |
| 53,52,49 1605 DATA 32,77,79,68,69,0,23,8 3,69,84,32,49,53,55,49,32, 77,79,68 1610 DATA 69,0,24,79,75,65,89,3 1,72,9 2,84,79,32,68,69,76,69,84,69,32,70 1615 DATA 73,76,69,45,76,73,83, 84,32,32,78,32,32,89,32,0, 26,79,75 1620 DATA 65,89,32,84,79,32,82, 69,78,65,77,69,32,70,73,76,69,45,76 1625 DATA 73,83,84,32,32,78,32,32,89,32,0,27,78,69,87,32,70,73,76 1630 DATA 69,32,78,65,77,69,58,0,28,68,73,83,65,66,76,69,32,70,85 1635 DATA 78,67,84,73,79,78,32,75,69,89,83,0,29,69,78,65,76,676,69 1640 DATA 32,70,85,78,67,84,73,79,78,32,75,69,89,83,0,30,68,69,70 1645 DATA 73,78,69,32,70,85,78,67,84,73,79,78,32,75,69,89,83,0,31 1650 DATA 32,70,78,78,75,69,89,83,0,31 1650 DATA 32,70,49,32,32,70,50,32,32,70,53,32,70,53,32,70,53,32,70,53,32,70,55,32,32,70,55,32,32,32,32,32,32,32,32,32,32,32,32,32, | 1600 | 32,32,32 :REM*251 DATA 32,32,32,32,32,32,32, | 1715 |
| 77,79,68 1610 DATA 69,0,24,79,75,65,89,3 2,84,79,32,68,69,76,69,84,69,32,70 1615 DATA 73,76,69,45,76,73,83, 84,32,32,78,32,32,89,32,0, 26,79,75 1620 DATA 65,89,32,84,79,32,82, 69,78,65,77,69,32,70,73,76,69,45,76 1625 DATA 73,83,84,32,32,78,32, 70,73,76 1630 DATA 69,32,78,65,77,69,58,0,28,68,73,83,65,66,76,69,32,70,85 1635 DATA 78,67,84,73,79,78,32, 75,69,89,83,0,29,69,78,65,66,76,69 1640 DATA 32,70,85,78,67,84,73,79,78,32,75,69,89,83,0,30,68,69,70 1645 DATA 73,78,69,32,70,52,32,32,70,53,32,70,55,32,32,70,51,32,32,70,50,32,32,70,50,32,32,70,56,32,32,32,32,32,32,32,32,32,32,32,32,32, | 16Ø5 | 53,52,49 :REM*196 DATA 32,77,79,68,69,0,23,8 | 1729 |
| 69,32,7Ø :REM*8Ø 1615 DATA 73,76,69,45,76,73,83, 1736 84,32,32,78,32,32,89,32,0, 26,79,75 :REM*5 1620 DATA 65,89,32,84,79,32,82, 69,78,65,77,69,32,70,73,76 ,69,45,76 :REM*98 1625 DATA 73,83,84,32,32,78,32, 70,73,76 :REM*41 1630 DATA 69,32,78,65,77,69,58, 0,28,68,73,83,65,66,76,69, 32,70,85 :REM*176 1635 DATA 78,67,84,73,79,78,32, 75,69,89,83,0,30, 68,69,70 :REM*129 1640 DATA 32,70,85,78,67,84,73, 79,78,32,75,69,89,83,0,30, 68,69,70 :REM*145 1650 DATA 73,78,69,32,70,85,78,67,84,73,79,78,32,75,69,89,83,0,30, 176,84,73,79,78,32,75,69,89,83,0,30, 176,93,70,78,32,70,50, 176,93,70,78,32,70,50, 176,93,70,78,32,70,50, 176,93,70,78,32,70,50, 176,93,70,78,32,70,50, 176,93,70,78,78,78,78,78,78,78,78,78,78,78,78,78, | 1610 | 77,79,68 :REM*153 DATA 69,0,24,79,75,65,89,3 | 1725 |
| 26,79,75 1620 DATA 65,89,32,84,79,32,82, 69,78,65,77,69,32,70,73,76 ,69,45,76 1625 DATA 73,83,84,32,32,78,32, 70,73,76 1630 DATA 69,32,78,65,77,69,58, 0,28,68,73,83,65,66,76,69, 32,70,85 1635 DATA 78,67,84,73,79,78,32, 75,69,89,83,0,29,69,78,65, 66,76,69 1640 DATA 32,70,85,78,67,84,73, 79,78,32,75,69,89,83,0,30, 68,69,70 1645 DATA 73,78,69,32,70,85,78, 67,84,73,79,78,32,75,69,89 ,83,0,31 1650 DATA 32,70,49,32,32,70,50,32,32,70,55,32,32,70,56,32,0,33,75, 69,89,61 1655 DATA 32,32,70,54,32,32,70,55,32,32,70,56,32,32,32,32,32,32,32,32,32,32,32,32,32, | 1615 | 69,32,7Ø :REM*8Ø DATA 73,76,69,45,76,73,83, | 1736 |
| 1625 DATA 73,83,84,32,32,78,32, | 1620 | 26,79,75 :REM*5 DATA 65,89,32,84,79,32,82, | 1735 |
| 163Ø DATA 69,32,78,65,77,69,58, | 1625 | ,69,45,76 :REM*98 DATA 73,83,84,32,32,78,32, | 1749 |
| 32,70,85 :REM*176 1635 DATA 78,67,84,73,79,78,32, 75,69,89,83,0,29,69,78,65, 66,76,69 :REM*129 1640 DATA 32,70,85,78,67,84,73, 79,78,32,75,69,89,83,0,30, 68,69,70 :REM*96 1645 DATA 73,78,69,32,70,85,78, 67,84,73,79,78,32,75,69,89, 83,0,31 :REM*145 1650 DATA 32,70,49,32,32,70,50, 32,32,70,51,32,32,70,52,32,32,70,53 :REM*48 1655 DATA 32,32,70,54,32,32,70,52,32,32,70,53 :REM*125 1660 DATA 18,32,32,32,32,32,32,32,32,32,32,32,32,32, | 163Ø | DATA 69,32,78,65,77,69,58, | 1745 |
| 164Ø DATA 32,7Ø,85,78,67,84,73, 79,78,32,75,69,89,83,Ø,3Ø, 68,69,7Ø :REM*96 1645 DATA 73,78,69,32,7Ø,85,78, 67,84,73,79,78,32,75,69,89 ,83,Ø,31 :REM*145 165Ø DATA 32,7Ø,49,32,32,7Ø,52,32 ,32,7Ø,53 :REM*48 1655 DATA 32,32,7Ø,54,32,32,7Ø, 55,32,32,7Ø,56,32,Ø,33,75, 69,89,61 :REM*125 166Ø DATA 18,32,32,32,32,32,32, 32,32,32,32,32,32,32,32,32,32,32,32,32,3 | 1635 | 32,70,85 :REM*176 DATA 78,67,84,73,79,78,32, | 175 |
| 1645 DATA 73,78,69,32,70,85,78, 67,84,73,79,78,32,75,69,89 ,83,0,31 :REM*145 1650 DATA 32,70,49,32,32,70,50, 32,32,70,53 :REM*48 1655 DATA 32,32,70,54,32,32,70, 55,32,32,70,56,32,0,33,75, 69,89,61 :REM*125 1660 DATA 18,32,32,32,32,32,32, 32,32,32,32,32,32,32,32,32,32,32,32,32,3 | 1640 | DATA 32,70,85,78,67,84,73, | 175 |
| 165Ø DATA 32,7Ø,49,32,32,7Ø,5Ø, 32,32,7Ø,51,32,32,7Ø,52,32 ,32,7Ø,53 :REM*48 1655 DATA 32,32,7Ø,54,32,32,7Ø, 55,32,32,7Ø,56,32,Ø,33,75, 69,89,61 :REM*125 166Ø DATA 18,32,32,32,32,32,32, 32,32,32,32,32,32,32,32,32,32,32,32,32,3 | 1645 | DATA 73,78,69,32,70,85,78, | 176 |
| 1655 DATA 32,32,70,54,32,32,70,55,32,32,70,56,32,0,33,75,69,89,61 :REM*125 1660 DATA 18,32,32,32,32,32,32,32,32,32,32,32,32,32, | 165Ø | DATA 32,70,49,32,32,70,50, | 176 |
| 166Ø DATA 18,32,32,32,32,32,32,32,32,32,32,32,32,32, | 1655 | DATA 32,32,70,54,32,32,70, | 177 |
| ,32,32,32 :REM*100 1665 DATA 32,32,32,32,32,32,32,32,32,32,32,32,32,3 | 166Ø | DATA 18,32,32,32,32,32,32, | List |
| 167Ø DATA 84,32,67,79,80,89,32, 20 68,73,83,75,32,73,78,84,79 30 8,32,68,82 :REM*202 1675 DATA 73,86,69,58,32,0,36,3 40 2,32,79,75,65,89,32,84,79,32,67,79 :REM*89 50 1680 DATA 80,89,32,70,73,76,69,45,76,73,83,84,32,32,78,32,32,89,32 :REM*150 1685 DATA 0,37,70,73,76,69,32,67,79,80,89,32,87,79,82,75, | 1665 | DATA 32,32,32,32,32,32,32, | |
| 1675 DATA 73,86,69,58,32,0,36,3 40 1 2,32,79,75,65,89,32,84,79, 32,67,79 :REM*89 50 1 1680 DATA 80,89,32,70,73,76,69, 45,76,73,83,84,32,32,78,32 ,32,89,32 :REM*150 1685 DATA 0,37,70,73,76,69,32,6 7,79,80,89,32,87,79,82,75, | 167Ø | DATA 84,32,67,79,80,89,32,68,73,83,75,32,73,78,84,79 | 20 |
| 168Ø DATA 8Ø,89,32,7Ø,73,76,69, 45,76,73,83,84,32,32,78,32 ,32,89,32 :REM*15Ø 1685 DATA Ø,37,7Ø,73,76,69,32,6 7,79,8Ø,89,32,87,79,82,75, | 1675 | DATA 73,86,69,58,32,0,36,3 2,32,79,75,65,89,32,84,79, | |
| 1685 DATA Ø,37,7Ø,73,76,69,32,6 7,79,8Ø,89,32,87,79,82,75, | 168Ø | DATA 80,89,32,70,73,76,69, 45,76,73,83,84,32,32,78,32 | |
| | 1685 | DATA Ø,37,7Ø,73,76,69,32,6 | |

| | 3 . | | |
|---|------------------------|--|---|
| | 169Ø | DATA 32,70,82,79,77,32,68, | |
| | 1036 | 82,73,86,69,58,32,0,38,73, | |
| | | 78,83,69 :REM*84 | |
| | 1695 | DATA 82,84,32,84,65,82,71, | |
| | | 69,84,32,68,73,83,75,32,65 | |
| | Commission of the last | ,78,68,32 :REM*217 | |
| | 1700 | DATA 80,82,69,83,83,32,83, | |
| | | 80,65,67,69,0,40,80,82,79, | |
| | 17Ø5 | 71,82,65 :REM*114 DATA 77,32,73,78,32,77,69, | |
| | 1705 | 77,79,82,89,32,87,73,76,76 | |
| | | ,32,66,69 :REM*51 | |
| | 1710 | DATA 32,68,69,83,84,82,79, | |
| | | 89,69,68,0,41,73,78,83,69, | |
| | | 82,84,32 :REM*21Ø | |
| | 1715 | DATA 83,79,85,82,67,69,32, | |
| | | 68,73,83,75,32,65,78,68,32 | |
| | | ,8Ø,82,69 :REM*97 | |
| | 1720 | | |
| | | 69, Ø, 42, 32, 32, 32, 32, 32, 79, | |
| | 1725 | 75,65,89 :REM*246 DATA 32,84,79,32,70,79,82, | |
| | 1723 | 77,65,84,32,68,73,83,75,32 | |
| | | ,32,78,32 :REM*149 | |
| | 1730 | DATA 32,89,32,0,17,2,7,1,1 | |
| | and the second second | 9,2,7,23,20,6,10,1,21,6,10 | |
| | | :REM*244 | |
| | 1735 | DATA 17,22,6,11,13,23,6,13 | |
| | | ,13,26,2,7,3,0,0,27,6,7,4 | |
| | | :REM*81 | |
| | 1740 | DATA 24,2,7,3,28,6,11,9,29 | |
| | | ,6,13,9,3Ø,6,15,9,31,6,18 :REM*1ØØ | |
| | 1745 | DATA 5,33,6,7,0,34,6,11,5, | |
| | 1,13 | 11,6,13,12,40,6,11,2,36,2 | |
| | | :REM*79 | , |
| | 175Ø | DATA 7,3,37,6,11,5,15,2,7, | |
| | | 11,8,6,11,7,9,6,13,4,10 | |
| | | :REM*4 | |
| | 1755 | DATA 6,14,8,11,6,15,12,12, | |
| | | 6,18,8,13,6,20,5,11,6,21,1 | |
| | 1700 | 2 :REM*85 | |
| | 1760 | DATA 1,11,0,1,2,11,9,1,3,1 1,9,34,4,6,1,2,5,6,1 | |
| | | :REM*17Ø | 5 |
| , | 1765 | DATA 24,1,2,7,1,6,11,0,1,7 | , |
| 2 | .,,,, | ,6,11,5,16,2,7,3,14,14 | |
| 3 | | :REM*1Ø7 | , |
| | 177ø | DATA 10,0,38,6,11,3,41,6,1 | |
| | | 1,3,42,2,7,3,256 :REM*84 | |
| 5 | | | |

ing 2. The DOS Shell Saver gram.

| 10 | REM DOS SHELL SAVER : REM*196 |
|----|---------------------------------|
| | INPUT"FILENAME"; NM\$: REM*152 |
| 30 | SYS 57812NM\$, 8,1: POKE 193,1 |
| | 96: POKE 194,134 :REM*24 |
| 40 | POKE 174,156:POKE 175,159:SY |
| | S 62957 :REM*32 |
| 50 | PRINT"SAVE COMPLETE. CHECK D |
| | RIVE FOR ERRORS" : REM*146 |

WORDMAN

From p. 62.

| +STR\$(WC)+ | " | OF' | 1+5 | STRS | (C) | +" | W |
|-------------|----|-----|-----|------|-----|-------|---|
| ORDS (CTRL | 8) | ":(| 305 | SUB7 | 20: | V = 1 | 1 |
| 47:EC=Ø | | | | | :RE | M*9 | ø |
| | | | | | | | |

245 MT=Ø:M1=Ø:PRINT"(HOME){CRSR DN LETTER ?";: POKE198, Ø :REM*99

25Ø WAIT198,1:GETG\$:IFASC(G\$)=1 33ANDRR=ØTHEN795 :REM*26

255 IFASC(G\$) < 650RASC(G\$) > 9ØTHE :REM*85

26Ø ON((CT>Ø)+2)GOSUB3Ø5:ONM1GO TO245:FORF=1TOL:IFG\$=ER\$(F) THEN3ØØ :REM*253

265 NEXT:ON((CT=L)+2)GOTO325:ON MTGOTO245:EC=EC+1:IFEC>9THE NGOSUB715:GOTO320 :REM*34

27Ø ONECGOSUB64Ø,65Ø,66Ø,665,68 5,690,700,705,710:POKEV,ASC :REM*1Ø5 (G\$)-64:V=V+2

275 IFEC<>7THEN245 :REM*164

280 POKES1,7:FORT=1TO20:POKES+2 4,15:POKES+1,110:POKES+5,9: POKES+6,9:POKES+4,17 :REM*189

285 POKES+4,16:NEXT:POKES1,Ø

290 IFAL=1THENPRINT" (5 CRSR DNs) (CTRL 2) (3 SPACES) THIS WIL L {CTRL 8}NOT{CTRL 2} SAVE YOUR WORD LIST(CTRL 8)":RET :REM*49 URN

295 GOTO245 :REM*202 300 POKE1263+F, ASC(G\$)-64:MT=1:

CT=CT+1:G\$(CT)=G\$:GOTO265

3Ø5 FORT=1TOCT: IFG\$=G\$(T)THENM1 :REM*148 =1 310 NEXT: RETURN :REM*251

315 PRINT" (SHFT CLR)": X=12:Y=13

:Z\$="USED ALL WORDS":GOSUB7 2Ø:FORT=1T025ØØ:NEXT:GOT033 :REM*118

320 PRINT" (HOME) (6 CRSR DNs)"; W D\$(R):GOSUB755:ON((WC=C)+2) GOTO315:GOTO155 :REM*255

325 PRINT" (HOME) (9 CRSR DNs) (2 CRSR RTs) (CTRL 9) CORRECT (CT RL Ø}":GOSUB755:ON((WC=C)+2)GOTO315:GOTO155 :REM*32

330 POKE53281, 0: PRINT" (SHFT CLR }":LE=5:DO=4:WI=30:DE=14:GO SUB910 :REM*221

335 LE=7:DO=6:WI=26:DE=10:GOSUB 910 :REM*22Ø

34Ø GW=WC-MW:PRINT" (HOME) "TAB(1 73)"{CTRL 8}{4 CRSR DNs}MIS SED WORDS =";MW:POKE198,Ø :REM*255

345 PRINTTAB(12)"{CRSR DN}CORRE CT WORDS ="; GW: PRINTTAB(27) "{3 COMD Ys}{CRSR DN}"

35Ø PRINTTAB(14)"TOTAL WORDS =" :REM*109 ;WC

:REM*152

355 PRINTTAB(253)"(CRSR DN)(CTR L 4}"+P\$:WAIT198,1 :REM*68

36Ø PRINT" (SHFT CLR) (CTRL 8) {3 CRSR DNs) (4 SPACES) DO YOU W ISH TO PLAY AGAIN? {2 SPACES

WORDMAN

| | }{CTRL 9}Y/N":POKE198,Ø :REM*17 | | T CLR (CRSR DN) (2 CRSR RTs) "+LL\$:GOSUB770:GOTO470 | 635 | :REM*64 CLOSE5:PRINT#15,"SØ:"+ID\$:C |
|------|---|-------|---|-----|---|
| 365 | GETA\$: IFA\$="N"THENPRINT" {SH | 1000 | :REM*1Ø7 | | LOSE15:GOTO595 :REM*191 |
| | FT CLR)": POKE788,49:END : REM*202 | 495 | OPEN15,8,15:OPEN5,8,5,"Ø:WM "+ID\$+",S,W":GOSUB76Ø:IFET | 64Ø | X=0:Y=28:Z\$="{SHFT U}{3 SHI T *s}{SHFT I}":GOSUB720:FOR |
| 37Ø | ON((A\$="Y")+2)GOTO155:GOTO3 | Edd | =8THEN47Ø :REM*44 | | X=1TO2:Z\$="{SHFT -}{3 SPACE |
| 375 | 65 :REM*21 X=10:Y=3:Z\$="PRESS (CTRL 9) | משכ | FORM=1TOWD:IFDF\$(M)=""THEND F\$(M)="." :REM*1Ø5 | | s){SHFT -}":GOSUB72Ø:NEXT: |
| | C{CTRL Ø} TO CREATE A NEW F ILE":GOSUB72Ø:X=9:Y=9:Z\$="{ | | NEXT :REM*4 FORDC=1TOWD:PRINT#5,WD\$(DC) | 645 | Z\$="(SHFT J){2 SHFT *s}{CON |
| | COMD @}" :REM*134 | SID | ;CR\$;DF\$(DC):NEXT:GOSUB760: | | D R) {SHFT K) {3 SPACES} {SHFT J} {COMD R) {2 SHFT *s} {SHFT |
| | GOSUB72Ø :REM*151 | | IFET=8THEN155 :REM*89 | | K)":GOSUB72Ø:RETURN |
| 305 | X=12:Y=9:GOSUB72Ø:X=13:Y=3: Z\$="PRESS {CTRL 9}E{CTRL Ø} | 515 | CLOSE5:CLOSE15:CLR:RW=1:GOS UB1Ø5:GOTO155 :REM*63 | 65Ø | :REM*159 X=4:Y=27:Z\$="{SHFT -}{SHFT |
| | TO EDIT AN EXISTING FILE": | | CLR:RW=1:GOSUB1Ø5 :REM*146 | | W) (3 SPACES) (SHFT W) (SHFT - |
| 390 | GOSUB720 :REM*120 GETA\$:IFA\$<>"C"ANDA\$<>"E"TH | 525 | ON((SF=1)+2)GOTO595:C=1:PRI NT"(SHFT CLR)(3 CRSR DNs)EN | | <pre>}":GOSUB720:X=5:Z\$="{SHFT - }{2 SPACEs}{SHFT S}{2 SPACE</pre> |
| | EN39Ø :REM*165 | 5 2 d | TER FILE NAME:" :REM*207 | | s) {SHFT -}":GOSUB720:X=6:ZS |
| 395 | IFA\$="E"THENCLR:RW=1:GOSUB1 Ø5:WW=1:ED=1:GOTO525 | 539 | PRINTTAB(6)"{CRSR DN}(PRESS {CTRL 9}\${CTRL Ø} & {CTRL | | ="{SHFT -}{SHFT J}{3 SHFT 's s}{SHFT K}{SHFT -}" :REM*34 |
| 1111 | :REM*218 | | 9)RETURN(CTRL Ø) FOR DIRECT | 655 | GOSUB720:X=7:Z\$="{SHFT J}{S |
| 400 | CLR:RW=1:GOSUB105:PRINT"{2 CRSR DNs} ENTER # OF WORDS{ | 535 | ORY)" :REM*52 PRINT"{4 SPACEs}DEPRESSING | | HFT *) (SHFT I) (SHFT U) (SHF T *) (SHFT K)":GOSUB720:RETU |
| | CRSR DN)":INPUT"(3 SPACES)(| | SHIFT KEY STOPS SCROLLING": | ccd | RN :REM*47 |
| | CTRL 9}MAXIMUM(CTRL Ø) OF 2 Ø";WD\$:REM*231 | 540 | POKE198, Ø :REM*69 PRINTTAB(7)"(PRESS (CTRL 9) | 660 | X=8:Y=29:Z\$="{CTRL 6}{SHFT LB.}{SHFT Q}{COMD *}{CTRL 8 |
| 405 | WD=VAL(WD\$):IFWD>2ØORWD<1TH EN155 :REM*15Ø | | RETURN(CTRL Ø) TO EXIT TO M | | }":GOSUB72Ø:RETURN :REM*178 |
| 41 Ø | EN155 :REM*15Ø PRINT"(3 CRSR DNs)(CRSR RT) | | ENU) {CRSR DN}":PRINT:ID\$="" :INPUTID\$:REM*152 | 665 | X=9:Y=23:Z\$="{SHFT U}{13 SF FT *s}{SHFT I}":GOSUB72Ø:X= |
| | INCLUDE DEFINITIONS? {CTRL 9}Y/N{CTRL 0}":REM*11 | 545 | IFID\$=""THENSF=0:C=0:GOTO15 5 :REM*195 | | 10:25="{SHFT -}{SHFT U}{SHF |
| 415 | GETAS: IFAS <> "Y"ANDAS <> "N"TH | | IFID\$<>"\$"THEN560 :REM*130 | | T I){9 SPACEs}(SHFT U){SHFT I){SHFT -}":GOSUB720 |
| 420 | EN415 :REM*5Ø IFA\$="Y"THENDF=1 :REM*177 | 555 | PRINT"{SHFT CLR}":GOSUB6Ø5: PRINTTAB(14)"{CRSR DN}{CTRL | 674 | :REM*113 FORX=11TO15:Z\$="{3 SHFT -s} |
| 425 | AJ\$=" ":PRINT"{SHFT CLR}{5 | | 2)"+P\$+"(CTRL 8)":WAIT198, | 079 | (9 SPACEs) (3 SHFT -s)":GOSL |
| | SPACEs MAXIMUM LENGTH = 16 CHARACTERS (HOME) (CRSR DN)": | | 1:ONSFGOTO595:ONEDGOTO525 :REM*75 | | B720:NEXT: Z\$="{2 SHFT -s}{C OMD Q}{3 SHFT *s}{COMD R}{5 |
| | FORI=1TOWD :REM*128 | 56Ø | IFSF=10RAL=1THENPRINTTAB(12 | | HFT *) (COMD R) {3 SHFT *s} {0 |
| 439 | IFI>9THENAJ\$="":REM*133 ONWWGOTO775:PRINTAJ\$;I;"{2 | |)"{CRSR DN}{CTRL 2}ARE YOU SURE? {CTRL 9}Y/N{CTRL 0}{C | 675 | OMD W) (2 SHFT -s)" :REM*238 GOSUB720:X=17 :REM*105 |
| | SPACES) {2 CRSR LFs}";:INPUT | | TRL 8}":GOTO61Ø :REM*118 | | Z\$="MM{SHFT J}{COMD R}{SHFT |
| 440 | WD\$(I) :REM*36 IFWD\$(I)=""ORLEN(WD\$(I))>16 | | IFID\$="\$"THEN520 :REM*15 OPEN15,8,15:OPEN5,8,5,"0:WM | | *){COMD R}{COMD E}{SHFT *) {COMD E}{COMD R}{SHFT *}{CO |
| | THENGOSUB79Ø:GOTO435 | | "+ID\$+",S,R":GOSUB760:IFET | | MD R) {SHFT K}MM":GOSUB72Ø:F |
| 445 | :REM*125 NEXT :REM*200 | 575 | =8THEN155 :REM*114 IFEN=62THENGOSUB765:ONEDGOT | 685 | ETURN :REM*166 Y=26:FORX=18TO2Ø:Z\$="{SHFT |
| 45Ø | PRINTTAB(12)"(CRSR DN)WORDS | | O525:GOTO52Ø :REM*87 | | -} {SHFT -}{3 SPACEs}{SHFT |
| | O.K.? {CTRL 9}Y/N{CTRL Ø}" :GETA\$:IFA\$="N"THENWW=1:GOT | 580 | INPUT#5, WD\$(C), DF\$(C):C=C+1 :IFST=ØTHEN58Ø :REM*174 | | -} {SHFT -}":GOSUB72Ø:NEXT: RETURN :REM*91 |
| 455 | O425 :REM*213 IFA\$<>"Y"THENPRINT"(3 CRSR | 585 | CLOSE15:CLOSE5:C=C-1:IFED=1 | 69Ø | Y=26:X=21:Z\$="{COMD Q}{SHFT |
| | UPs]":GOTO450 :REM*118 | | THENWD=C:GOTO425 :REM*2Ø1 GOTO155 :REM*25Ø | | *){COMD W}{3 SPACEs}{COMD Q}(SHFT *){COMD W}":GOSUB72 |
| 46Ø | IFDF=1ORED=1THENGOSUB800 :REM*31 | 595 | PRINT" (SHFT CLR) (CRSR DN) E NTER FILE NAME (CTRL 9) EXAC | | Ø:X=22:Y=24:Z\$="{SHFT U}{SF |
| | ONEDGOTO96Ø :REM*82 | | TLY{CTRL Ø} AS SHOWN":PRINT | | FT *}{SHFT K} {SHFT -}{3 SF ACEs}{SHFT -} {SHFT J}{SHFT |
| 470 | PRINT" (SHFT CLR) (2 CRSR DNs) ENTER FILE NAME (MAX OF 1 | 600 | " ON THE DIRECTORY" :REM*55 SF=1:GOTO53Ø :REM*218 | | *){SHFT I}":GOSUB720 |
| | 3 CHARACTERS) (CRSR DN)" | | SYS83Ø:OPEN15,8,15:GOSUB76Ø | 695 | :REM*150 X=23:Z\$="{SHFT J}{3 SHFT *s |
| 475 | :REM*21 A\$="":PRINTTAB(5)"(PRESS {C | | :CLOSE15:ON((ET=8)+2)GOTO52 5:RETURN :REM*189 | | <pre>}{SHFT K}{3 SPACEs}{SHFT J} {3 SHFT *s}{SHFT K}":GOSUB7</pre> |
| | TRL 9)RETURN(CTRL Ø) TO"; | 61ø | GETA\$: IFA\$<>"Y"ANDA\$<>"N"TH | | 2Ø:RETURN :REM*143 |
| 480 | :REM*26 PRINT" EXIT TO MENU)(CRSR D | 615 | EN610 :REM*238 IFAL=1THENAL=0:RETURN | 700 | X=1:Y=30:Z\$="{CTRL 2}*{CTRL 8}":GOSUB720:RETURN:REM*46 |
| | N)":ID\$="":INPUTID\$:IFID\$=" "THENAL=1:GOSUB280:GOSUB560 | | :REM*119 | 7Ø5 | Y=3Ø:FORX=11T015STEP2:Z\$="{ |
| | :REM*211 | | IFA\$="N"THEN595 :REM*82 OPEN15,8,15:OPEN5,8,5,"Ø:"+ | | SHFT Q}":GOSUB72Ø:NEXT:RETU RN :REM*1Ø5 |
| 485 | ON((A\$="Y")+2)GOTO155:ON((A \$="N")+2)GOTO47Ø :REM*136 | | ID\$+",S,R":GOSUB76Ø:IFET=8T | 71Ø | Y=27:X=10:Z\$="{2 COMD Ps}{3 |
| | 4- 11 /+2/00104/9 :KEM*136 | | HEN595 :REM*53 | | SPACEs) (2 COMD Ps)":GOSUB7 |

63Ø IFEN=62THENGOSUB765:GOTO595

:REM*64 15,"SØ:"+ID\$:C :REM*191 (SHFT U) (3 SHF ':GOSUB72Ø:FOR HFT -) {3 SPACE OSUB72Ø:NEXT:Y :REM*62 2 SHFT *sl(COM 3 SPACES } { SHFT SHFT *s) (SHFT :RETURN :REM*159 {SHFT -}{SHFT SHFT W) (SHFT -=5:Z\$="{SHFT -HFT S}{2 SPACE OSUB72Ø:X=6:Z\$ FT J){3 SHFT * FT -)" : REM*34 Z\$="{SHFT J}{S } {SHFT U}{SHF :GOSUB72Ø:RETU :REM*47 {CTRL 6}{SHFT COMD *) (CTRL 8 ETURN :REM*178 (SHFT U) (13 SH ":GOSUB72Ø:X= -) {SHFT U} {SHF (SHFT U) (SHFT GOSUB720 :REM*113 \$="{3 SHFT -s} SHFT -s}":GOSU "{2 SHFT -s}{C *s) {COMD R} {S }{3 SHFT *s}{C -s}" :REM*238 :REM*105 {COMD R}{SHFT OMD E) {SHFT *} R}{SHFT *}{CO MM":GOSUB720:R :REM*166 02Ø:Z\$="{SHFT SPACEs } (SHFT GOSUB720:NEXT: :REM*91 "{COMD Q}{SHFT SPACES | (COMD MD W}":GOSUB72 \$="{SHFT U}{SH (SHFT -) (3 SP {SHFT J}{SHFT GOSUB720 :REM*150 I J){3 SHFT *s PACEs | {SHFT J} HFT K)":GOSUB7 :REM*143 CTRL 2)*{CTRL RETURN: REM*46 15STEP2: Z\$="{ 372Ø:NEXT:RETU :REM*105 {2 COMD Ps}{3

490 IFLEN(ID\$)>13THENPRINT" (SHF

2Ø:X=11:Z\$="{SHFT M}{SHFT N ▶

WORDMAN

| |) (SHFT Q) (SHFT M) (SHFT N) | | MD P}"; :REM*4 | | 2,186,255,32,192 :REM*3 |
|-----------|--|-----|--|---------|--|
| | ":GOSUB72Ø:RETURN :REM*226 | 820 | NEXT: PRINT :REM*173 | 935 | DATA255,24,162,1,32,198,255 |
| 715 | X=6:Y=28:Z\$="{SHFT U}{3 SHF | | PRINTTAB(XA)"(CTRL 8)*** (C | | ,176,75,32,207,255,32,207,2 |
| | T *s}{SHFT I}":GOSUB72Ø:MW= | | TRL 9){CTRL 2}"WD\$(LO)"{CTR | | 55,169,13,32,210,255 :REM*0 |
| | MW+1:RETURN :REM*157 | | L Ø){CTRL 8} ***":PRINTTAB(| 940 | DATA32,207,255,32,207,255,3 |
| 720 | POKE781, X: POKE782, Y: SYS6552 | | 36)"{COMD 6}"LO:GOSUB91Ø | | 2,207,255,133,252,32,207,25 |
| 725 | Ø:PRINTZ\$:RETURN :REM*252 | | :REM*236 | | 5,133,251,165,144 :REM*219 |
| 125 | PRINTTAB(12)"{CTRL 3}* * * | 83Ø | PRINT"(CRSR DN)":PRINTTAB(3 | 945 | DATA208,44,165,251,166,252, |
| 730 | * * * * * * ":RETURN :REM*27 PRINTTAB(12)"*"SPC(15)"*":R | |)"{CRSR DN}{CTRL 8}TOTAL NU | | 32,205,189,169,32,32,210,25 |
| 130 | ETURN :REM*144 | | MBER OF CHARACTERS CAN NOT" :REM*87 | 054 | 5,32,207,255,32,210:REM*148 |
| 735 | PRINT" (SHFT CLR) (3 CRSR DNs | 835 | PRINTTAB(5)"EXCEED (CTRL 9) | 950 | DATA255,174,141,2,208,251,1 66,145,224,127,240,15,32,20 |
| |)"TAB(255)"MUST USE A":PRIN | 033 | (CTRL 2)36(CTRL 8)(CTRL Ø). | | 7,255,1Ø5,Ø,2Ø8,235 :REM*83 |
| | TTAB(15)"{2 CRSR DNs}{CTRL | | (2 SPACES) (INCLUDING SPACES | 955 | DATA169,13,32,210,255,76,10 |
| | 9) HIGHLIGHTED" :REM*255 | |){CTRL 2}{CRSR DN}":IFED=1A | | 2,3,24,169,1,32,195,255,32, |
| 740 | PRINTTAB(17)"{2 CRSR DNs}NU | | NDE2=ØTHENGOTO85Ø :REM*194 | | 204,255,96,36,48 :REM*84 |
| | MBER":FORT=1TO2ØØØ:NEXT:GOT | 840 | POKE19,64:X=17:Y=2:Z\$=" | 960 | PRINT" (SHFT CLR) (3 CRSR DNs |
| | O155 :REM*112 | | | | }{2 CRSR RTs}SAVE THIS FILE |
| 745 | PRINT"{SHFT CLR}"TAB(253)"{ | | {UP ARROW} {CRSR UP}":GO | | USING THE":PRINT"(CRSR DN) |
| | 2 CRSR DNs)NO WORDS IN MEMO | | SUB72Ø :REM*211 | | (2 CRSR RTs)(CTRL 9)ORIGINA |
| | RY":PRINTTAB(14)"{CRSR DN}O PTION {CTRL 9}4{CTRL Ø} TO | 845 | INPUT" (2 CRSR RTs) (CRSR UP) | | L(CTRL Ø) NAME OF(CTRL 9) |
| | LOAD" :REM*105 | | .{CRSR LF}";DF\$(LO):E2=Ø:IF LEN(DF\$(LO))>36THENE2=1:GOT | 065 | {CTRL 2}"; ID\$:REM*217 PRINTTAB(13)"{2 CRSR DNs}PR |
| 750 | PRINTTAB(93)"THEN PRESS {CT | | 088Ø :REM*6 | 903 | ESS {CTRL 9}Y/N{CTRL 8}{CTR |
| , 5 p | RL 9}RETURN(CTRL 2)":X=22:Y | 850 | XA=INT(4Ø-(LEN(DF\$(LO))))/2 | | L Ø}" :REM*13Ø |
| | =14:Z\$=P\$:GOSUB72Ø:WAIT198, | | :X=8:Y=XA:Z\$="{CTRL 2}"+DF\$ | 970 | GETAS: IFAS<>"Y"ANDAS<>"N"GO |
| | 1:GOTO155 :REM*134 | | (LO):GOSUB72Ø :REM*163 | | TO97Ø :REM*85 |
| 755 | X=15:Y=1:Z\$="{COMD 6}* "+P\$ | 855 | PRINT" (6 CRSR DNs)"TAB(249) | 975 | ONPPGOTO1010,1015,1020:IFA\$ |
| | +" *{CTRL 8}":GOSUB72Ø:WAIT | | "PRESS {CTRL 9}RETURN{CTRL | | ="N"GOTO47Ø :REM*42 |
| | 198,1:RETURN :REM*119 | | Ø) TO ACCEPT(CRSR DN)" | 98ø | OPEN15,8,15:OPEN5,8,5,"@Ø:W |
| 76Ø | INPUT#15, EN, EM\$, ET, ES: IF(EN | oca | :REM*44 | | M "+ID\$+",S,W":GOSUB76Ø:IFE |
| | <20)OR(EN=62)THENET=0:RETUR N:REM*160 | 860 | PRINTTAB(8)"{CTRL 9}SHIFT{C TRL Ø} {CTRL 9}RETURN{CTRL | 005 | T=8THEN960 :REM*177 GOT0500 :REM*182 |
| 765 | N :REM*16Ø PRINT"{7 CRSR DNs} {CTRL 9} | | Ø) TO RE-ENTER" :REM*51 | 905 | IFID\$=""THEN745 :REM*35 |
| 103 | {CTRL 2}DISK ERROR{CTRL Ø}" | 865 | GETA\$:ON((A\$=CHR\$(13))+2)GO | 995 | PRINT"(SHFT CLR)(2 CRSR DNs |
| | EN" (CRSR LF), "EM\$", "ET" (CR | | TO87Ø:ON((A\$=CHR\$(141))+2)G | | }{2 CRSR RTs}THE NAME OF TH |
| | SR LF}, "ES" (CTRL 8)": ET=8 | | OTO890:GOTO865 :REM*182 | | E FILE (CRSR DN)": PRINT" (2 C |
| | :REM*79 | 870 | IFED=1THENGOSUB895 :REM*7 | | RSR RTs THAT WILL PRINT IS- |
| 770 | PRINT" {CRSR DN} {7 SPACEs}"+ | 875 | NEXT: PRINT" (SHFT CLR) (CTRL | | - {CTRL 9}{CTRL 2}"; ID\$ |
| | P\$+" TO CONTINUE":WAIT198,1 | | 8}":RETURN :REM*44 | | :REM*2Ø4 |
| | :CLOSE5:CLOSE15:POKE198,Ø:R | 880 | PRINTTAB(137)"{CTRL 8}{CTRL 9}TOO{CTRL Ø} {CTRL 9}LONG | | Ø PRINT" (CTRL 8)" : REM*145 |
| 775 | ETURN :REM*95 PRINTAJ\$;I;"{2 SPACEs}{CTRL | | (CTRL 2)":PRINTTAB(88)P\$+" | 1 10 10 | 5 PRINTTAB(6)"{2 CRSR DNs} I S THIS THE CORRECT FILE?": |
| 113 | 9}"; WD\$(I): WD\$(I)="": PRINT | | TO RE-ENTER" :REM*109 | | PP=1:GOTO965 :REM*16Ø |
| | "(CRSR UP)(3 CRSR RTs) ";:I | 885 | WAIT198,1:GETA\$:GOTO810 | 101 | Ø ON((A\$="N")+2)GOTO155:PRIN |
| | NPUTWD\$(I) :REM*244 | | :REM*222 | | T" (2 CRSR DNs) (9 SPACES) IS |
| 78ø | IFWD\$(I)=""ORLEN(WD\$(I))>16 | 89Ø | X=8:Y=2:Z\$=SP\$:GOSUB72Ø:GOT | | THE PRINTER READY?":PP=2: |
| | THENWD\$(I)="":GOSUB790:GOTO | | 09ØØ :REM*125 | | GOTO965 :REM*193 |
| PENNS WAY | 775 :REM*227 | 895 | Y=2:Z\$=SP\$:FORX=3TO4:GOSUB7 | 101 | 5 ON((A\$="N")+2)GOTO155:PRIN |
| | NEXT:GOTO450 :REM*116 | | 20:NEXT:X=8:GOSUB720:RETURN | | T"{2 CRSR DNs}{9 SPACEs}IN |
| 190 | X=I+1:Y=3:Z\$=SP\$+"{CRSR UP} ":GOSUB72Ø:RETURN :REM*95 | 944 | :REM*156 FORX=2ØTO23:GOSUB72Ø:NEXT:I | | CLUDE DEFINITIONS?":PP=3:G OTO965 :REM*226 |
| 795 | Y=INT((38-(LEN(DF\$(R))))/2) | 200 | FED=ØTHENPRINT"(HOME)(2 CRS | 100 | Ø OPEN4,4:XA=INT(8Ø-(LEN(ID\$ |
| 193 | :X=24:Z\$="{CTRL 2}*"+DF\$(R) | | R DNs)":GOTO815 :REM*127 | 102 |)))/2:GOSUB1Ø45:PRINT#4,"" |
| | +"*{CRSR UP}{CTRL 8}":GOSUB | 905 | GOTO84Ø :REM*19Ø | | TAB(XA); ID\$: GOSUB1 Ø 45 |
| | 72Ø:GOTO245 :REM*218 | | POKE211, LE: POKE214, DO: PRINT | | :REM*61 |
| 800 | FORLO=1TOI-1: IFLO>1THENGOSU | | "{CRSR UP}";:FORB=1TOWI:PRI | 102 | 5 PRINT#4, CHR\$(10): FORX=1TOC |
| | B895:ONED+1GOTO900:PRINT"{H | | NT"{CTRL 3}{COMD P}";:NEXT: | | :IFA\$="Y"THEN1Ø35 :REM*163 |
| | OME } { 2 CRSR DNs }": GOTO815 | | PRINT :REM*119 | 103 | Ø PRINT#4,"(3 SPACES)"WD\$(X) |
| 02000 | :REM*89 | 915 | FORB=1TODE: PRINTTAB(LE);"(C | | ,CHR\$(10):NEXT:CLOSE4:GOTO |
| | LE=1:DO=7:WI=38:DE=3:REM*74 | | OMD J)"; TAB(LE+WI-1)"(COMD L)" :REM*242 | 142 | 155 :REM*166 5 PRINT#4,"{3 SPACEs}"WD\$(X) |
| 810 | PRINT" (SHFT CLR) (CRSR DN) (C TRL 2) "TAB(11)" DEFINITION (2 | 924 | L)" :REM*242 PRINT"{CRSR UP}":NEXT:POKE2 | 193 | ;""TAB(25-LEN(WD\$(X)));DF\$ |
| | SPACES) SCREEN": PRINTTAB(10 | 320 | 11, LE: POKE214, DO+DE+1: PRINT | | (X), CHR\$(1Ø):NEXT :REM*239 |
| |)"{CTRL 8}{2Ø COMD Ys}" | | "{CRSR UP}";:FORB=1TOWI:PRI | 104 | Ø CLOSE4:GOTO155 :REM*42 |
| | :REM*207 | | NT" {COMD Y}"; :REM*155 | | 5 FORX=1TO8Ø:PRINT#4,"-";:NE |
| 815 | XA=INT(32-(LEN(WD\$(LO))))/2 | 925 | NEXT:RETURN :REM*100 | | XT:RETURN :REM*249 |
| | :PRINTTAB(XA+4):FORI=1TOLEN | 930 | DATA169,2,162,176,160,3,32, | | |
| | (WD\$(LO)):PRINT"{CTRL 2}{CO | | 189,255,169,1,162,8,160,0,3 | | |
| | | | | | |

HOW TO TYPE RUN LISTINGS

To simplify typing RUN's C-64 and C-128 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 to either tape or disk before running. When you want to type in a 64- or a 128-mode program, first load and run the appropriate Perfect Typist listing. Jot down the two SYS numbers that appear on your screen. They are the SYS numbers that you type in for deactivating and reactivating the checksum program.

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, a 1-, 2- or 3-digit number will appear below the line at the left

margin. This is the checksum number, ranging from 0 to 255.

If this matches the checksum printed in the listing after the :REM*, you have typed that line correctly. Then type the next program line over the previous line's checksum value. If the checksum numbers do not agree, analyze the line on screen for errors or omissions. Make the needed changes and press the return key again to log them in. A new checksum will appear in place of the old one. Compare this to the magazine's number and then proceed to the next line.

When you've finished typing in your program, disable Perfect Typist by typing in the appropriate SYS number for either 64 or 128 mode, and press the return key. 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 any time and continue it later. To do so, reload and run the Perfect Typist program, then load the program you were working on, list it, and continue from

where you left off.

The 128 Perfect Typist will work in either 40 or 80 columns. Also, it lets you use the C-128's automatic line-numbering. If Auto is on, the checksum will be printed below the line you just entered, and the C-128 will place the next line number below the checksum.

All listings in RUN have been translated so that the graphics and control characters are designated as understandable key combinations. Follow instructions inside curly brackets. For example, {SHIFT L} means you should hold down the shift key and press the L key. What you see on your screen will look quite different from what is designated inside the brackets. Another example is {22 SPACEs}, which instructs you to press the space bar 22 times. R

Listing 1. 64 Perfect Typist program.

```
1 REM 64 PERFECT TYPIST
                                             110 DATA 173,005,003,201,003,208,001,096
                                             12Ø DATA 141,1Ø5,ØØ3,173,ØØ4,ØØ3,141,1Ø4
2 REM BY: JAMES E BORDEN
1Ø POKE56, PEEK(56)-1: POKE52, PEEK(56): CLR
                                             13Ø DATA ØØ3,162,1Ø3,16Ø,ØØ3,142,ØØ4,ØØ3
  PG=PEEK(56):ML=PG*256+6Ø
                                             140 DATA 140,005,003,096,234,234,173,104
3Ø FORX=ML TO ML+154:READD:T=T+D:POKEX,D:N
                                             150
                                                DATA ØØ3,141,ØØ4,ØØ3,173,1Ø5,ØØ3,141
                                             160 DATA 005,003,096,032,124,165,132,011
40 IFT <> 16251 THEN PRINT"ERROR IN DATA..."
                                             17Ø DATA 162,000,142,240,003,142,241,003
   : END
                                             18Ø DATA 189,000,002,240,051,201,032,208
  POKEML+4, PG: POKEML+1Ø, PG: POKE ML+16, PG
                                             190 DATA 004,164,212,240,040,201,034,208
   POKE ML+20, PG: POKE ML+32, PG: POKE ML+38,
                                             200 DATA 008,072,165,212,073,001,133,212
   PG
                                             21Ø DATA 1Ø4, Ø72, 238, 241, ØØ3, 173, 241, ØØ3
8Ø POKE ML+141, PG
                                             220
                                                DATA Ø41, ØØ7, 168, 1Ø4, Ø24, Ø72, Ø24, 1Ø4
  PRINT" {SHFT CLR} {CRSR RT} ***********
                                             230
                                                DATA Ø16, ØØ1, Ø56, Ø42, 136, Ø16, 246, 1Ø9
   **********
                                             240 DATA 240,003,141,240,003,232,208,200
  SYS ML: PRINT "{CRSR RT} ** 64 PERFECT TY
                                             250 DATA 173,240,003,024,101,020,024,101
   PIST IS NOW ACTIVE (2 SPACES) **"
                                             26Ø DATA Ø21,141,24Ø,ØØ3,169,Ø42,Ø32,21Ø
100 PRINT "{CRSR RT}** SYS"ML"=ON{5 SPACES
                                             27Ø DATA 255,169,ØØØ,174,24Ø,ØØ3,Ø32,2Ø5
    }SYS"ML+3Ø"=OFF **"
                                             28Ø DATA 189,162,003,189,211,003,032,210
1Ø1 PRINT" {CRSR RT} ****************
                                                DATA 255,202,016,247,164,011,096,145
                                             29Ø
    300 DATA 013,032,032
```

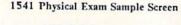
Listing 2. 128 Perfect Typist program.

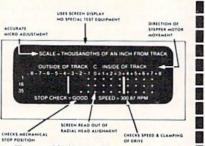
```
1 REM 40/80 COL C128 PERFECT TYPIST
2 REM BY: JAMES E BORDEN
10 FORX=5120TO5379:READD:T=T+D:POKEX,D
  NEXT:IFT <> 28312 THENPRINT" {2 CRSR DNs}E
   RROR IN DATA ... ": END
25 A$="":IFPEEK(215) THENA$="{2Ø SPACES}"
  PRINT" {SHFT CLR}"A$" *************
   *********
  PRINTA$" ** 128 PERFECT TYPIST IS NOW A
   CTIVE **"
  PRINTA$" **{2 SPACEs}SYS 512Ø=ON{7 SPAC
   Es SYS 5150=OFF(2 SPACES)**"
  PRINTAS" *****
   ********":SYS512Ø:NEW
7Ø DATA 173,5,3,201,20,208,1,96,141,45,20,
   173,4,3,141,44,20,162,43,160,20
  DATA 142,4,3,140,5,3,96,234,234,173,44,
   20,141,4,3,173,45,20,141,5,3,96
  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
12Ø DATA 141,254,19,1Ø4,72,238,253,19,173,
    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
   DATA 100,176,250,105,100,202,240,3,32,
    232,20,201,10,176,5,205,252,19
18Ø DATA 24Ø,15,162,0,232,56,233,10,16,25Ø
    ,24,105,10,202,32,232,20,170,72
190 DATA 138,9,48,32,241,20,104,96,170,173
    ,Ø,255,72,169,Ø,141,Ø,255,138,32
200 DATA 210,255,104,141,0,255,96
```

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MAGIC

From p. 15.

ES=1:SPRSAV SN, A\$:GSHAPE A\$, 20, 20

- 4Ø CHAR 1,9,13,CHR\$(14)+"{SHFT W}ORKING... {SHFT P}LEASE {SHFT W}AIT"
- 50 FOR I=1T07:ES=ES-.1:EY=ES+.06:PX=1:PY=1
- 60 FOR XX=0TO24:FORYY=0TO21
- 7Ø LOCATE XX+2Ø, YY+2Ø: IFRDOT(2) <> ØTHEN GOS UB 12Ø
- 80 NEXTYY, XX, I:SPRSAVA\$, 1:PRINT" {SHFT CLR}
- 9Ø FOR I=1TO7:SSHAPE B\$(I+1), I*25+21, 5Ø, I* 25+43,71:NEXT:GRAPHICØ
- 100 FOR I=1TO8:SPRITE I,1,1,1:MOVSPR I,50+ 30*I,115:SPRSAV B\$(I),I
- 110 NEXT: END
- $12\emptyset X1 = ((I*25) + ((XX*ES) + (12 (12*ES)))) + 2\emptyset$: $Y1 = 5\emptyset + ((YY*EY) + (1\emptyset - (1\emptyset*EY)))$
- 13Ø DRAW 1, X1, Y1: RETURN
- -MARCO HAGELSIEB, GUADALAJARA, JALISCO, MEXICO

\$446 Magic 80-Column Cursor

Unlike on the C-64, it's easy to program a blinking cursor on your C-128's 80-column screen. You need only turn the 8563 video display chip's Cursor mode on, then off when

To turn it on, enter BANK15:SYS49182,70. This prints an escape/F through the escape character routine at \$C01E. The accumulator contains the value for the character F. Use SYS 52684,16,10 to turn the Cursor mode off. This writes to register 10 in the 8563 by calling the screen editor routine at \$CDCC in bank 15. The X register must contain the value for the 8563's register, while the accumulator holds the data you wish to write (in this case, 16). The demo program below shows how to put the magic cursor to work in your own programs.

- 10 REM MAGIC CURSOR DEMO-BOB KODADEK
- 2Ø IFPEEK(215)=ØTHENPRINT"8Ø COL ONLY!":EN
- 30 PRINT: PRINT"1. VIEW DIRECTORY"
- 40 PRINT"2. LIST PROGRAM"
- 50 PRINT"3. QUIT DEMO": PRINT
- 60 PRINT"ENTER CHOICE: ";
- 70 BANK 15:SYS49182,70:REM CURSOR ON
- 8Ø GETKEY A\$:K=VAL(A\$):IFK<1ORK>3THEN8Ø
- 90 PRINT A\$:SYS52684,16,10:REM CURSOR OFF
- 100 ON K GOSUB 120,130,140
- 110 IF K<>3THEN30:ELSE END
- 120 CATALOG: RETURN
- 13Ø LIST: RETURN
- 140 PRINT"ALL DONE!": RETURN

—BOB KODADEK, ASTON, PA

\$447 80-COLUMN TOGGLER

Use this simple ML program to toggle between two 80column screens. Type in the listing below and run it for a brief demo. Note that you should always clear the second screen the first time it's accessed. One warning: If you have

MAGIC

any bank-switching in your program, remember that my routine will always exit in bank 15.

- 10 REM TOGGLER 80-EDWARD B SULLIVAN
- 2Ø PA=4864:FORX=PATOPA+51:READE:POKEX,E:C= C+E:NEXT
- 30 IFC<>5611THENPRINT"ERROR!":STOP
- 4Ø DATA 169,0,141,0,255,162,12,32,204,205, 141,46,10,169,8,162,20,32,204,205
- 5Ø DATA 141,47,10,96,234,169,0,141,0,255,1 69,16,162,12,32,204,205,141,46,10
- 6Ø DATA 169,24,162,2Ø,32,2Ø4,2Ø5,141,47,1Ø,96,234
- 7Ø S1=PA:S2=PA+25: REM ** DEMO
- 8Ø PRINT"{SHFT CLR}":KEY1,"SYS"+STR\$(S1)+C
 HR\$(13):KEY2,"SYS"+STR\$(S2)+CHR\$(13)
- 9Ø DIRECTORY: PRINT"SCREEN #1 IS THE DEFAUL T SCREEN": GETKEYA\$
- 100 SYS S2:PRINT"(SHFT CLR)ALWAYS CLEAR SC REEN # 2 THE FIRST TIME ACCESSED":LIST :GETKEYA\$
- 11Ø SYSS1:GETKEYA\$:SYSS2:GETKEYA\$:GOTO11Ø

-EDWARD B. SULLIVAN, BRANSON, MO

\$448 C-64 METRONOME

Here's a program that will transform your C-64 into an instrument for marking time. The program produces an animated screen display with a metronome-like sound and runs until you press any key.

- 1Ø PRINT"{SHFT CLR}C-64 METRONOME JOSEPH
 R. CHARNETSKI"
- 20 INPUT "{CRSR DN}BEATS PER MINUTE (40-208)":N
- 3Ø IFN<4Ø OR N>2Ø8THEN END
- 40 FORI=1TO9
- 5Ø B\$=B\$+"{SHFT M}{CRSR DN}":C\$=C\$+"{CRSR
- 6Ø D\$=D\$+" {CRSR DN}":E\$=E\$+"{CRSR UP}{SHF T N}"
- 7Ø NEXT
- 8Ø H\$="{HOME}{9 CRSR DNs}{1Ø CRSR RTs}"
- 9Ø A\$(Ø)=H\$+B\$+"*"+C\$:A\$(1)=H\$+D\$+"*"+E\$
- 100 S=54272:FORJ=STOS+23:POKEJ, 0:NEXT
- 110 POKES+1,84:POKES+6,9:POKES+24,15
- 120 Y=1:Z=INT(1299/N*45-N/2)
- 13Ø PRINT A\$(XANDY):POKES+4,21
- 14Ø FOR T=1TOZ:NEXT:POKES+4,2Ø
- 15Ø GETK\$:IFK\$=""THEN X=Y-X:GOTO13Ø
- 16Ø PRINT" (SHFT CLR)": POKES+24, Ø

—JOSEPH R. CHARNETSKI, DALLAS, PA

\$449 C-128 THREE-POINTER

My program will show football fans a perfect field goal every time, on their C-128!

- 10 PRINT"{SHFT CLR}FIELD GOAL BY MICHAEL B LACKMON":FORG=3584T03839:POKEG,.:NEXT
- 20 FORX=1TO4:READS,A:FORG=S TO A:READP:POK EG,P:NEXT:NEXT
- 3Ø COLORØ,6:SPRCOLOR3,7:GRAPHIC3,1:COLOR1,
 8:COLOR2,2:WIDTH1

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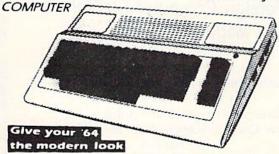
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MAGIC

- 4Ø DRAW2,Ø,12ØTO28Ø,12Ø:FORG=ØTO6:DRAW1,G* 2Ø,12ØTO+4Ø,199:NEXT:COLOR1,1Ø
- 5Ø DRAW1,15Ø,14ØTO15Ø,16Ø:DRAW1,145,12ØTO1 45,135TO155,145TO155,13Ø:SPRSAV1,A\$
- 6Ø SPRITE1,1,2,,,,1:SPRITE4,1,1Ø:MOVSPR1,2 Ø,18Ø:MOVSPR4,95,18Ø:MOVSPR1,9Ø#1
- 7Ø FORG=1TO6:GOSUB1ØØ:SPRSAV2,1:GOSUB1ØØ:S PRSAVA\$,1:NEXT:MOVSPR1,9Ø#Ø:SPRSAV3,1
- 8Ø FORX=45TO135STEP15:MOVSPR4,X#2:FORZ=1TO 265:NEXTZ,X:SLEEP2:GRAPHICØ
- 9Ø SPRITE1, Ø:SPRITE4, Ø:MOVSPR4, Ø#Ø:END
- 100 FORX=1TO100:NEXT:RETURN
- 110 DATA3597,3645,20,,,20,,,21,,,20,,,16,,,168,,,170,,2,42,,2,40,128,2,40,128
- 12Ø DATA,2Ø,,,6Ø,,,252,,,252,,,2Ø4,,,2Ø4,,,204,,,255,3661,371Ø,2Ø,,,2Ø,,,21,,,2Ø,,,16
- 13Ø DATAØ,,1Ø4,,,17Ø,,2,42,,2,4Ø,128,2,4Ø, 128,,2Ø,,,63,,,51,,,51,,,51,,,51,,,63
- 14Ø DATA192,3725,3773,2Ø,Ø,Ø,2Ø,Ø,Ø,21,32,
 ,2Ø,128,,16,128,,17Ø,48,,168,48,2,4Ø
- 15Ø DATA24Ø,2,4Ø,192,2,43,192,,23,,,63,,,6 Ø,,,12,,,12,,,15,3825,3837,32
- 16Ø DATAØ,,112,,,112,,,112,,,32

-MICHAEL BLACKMON, PALESTINE, TX

\$44A SIMPLE C-64 PIANO

I programmed this short top-row keyboard piano for quick key response. I find it nice to play simple tunes on. The number row is for sharps and flats, and the second row is for regular notes.

- 10 REM 64 PIANO-ANDREW SENFT
- 2Ø S=54272:FORZ=STOS+27:POKEZ,Ø:NEXT:POKES +24,15:POKES+6,127:POKES+4,35
- 3Ø F%=1145:DATA62,59,9,8,14,17,16,22,19,25,24,3Ø,33,32,38,35,41,46,43,49,48,54
- 4Ø FORZ=ØTO127:POKE49152+Z,Ø:NEXT:FORZ=1TO 22:READK%:T%=2{UP ARROW}(1/12)*F%+.5
- 5Ø F%=T%:POKE49152+K%,T%/256:POKE49216+K%, (T%/256-PEEK(49152+K%))*256:NEXT
- 6Ø DATA 166,197,189,Ø,192,2Ø1,Ø,24Ø,247,14 1,1,212,189,64,192,141
- 70 DATA 0,212,228,197,240,252,169,0,141,1, 212,141,0,212,76,128,192,0
- 8Ø FORZ=ØTO32:READA%:POKE4928Ø+Z,A%:NEXT
- 90 PRINT" {2 CRSR DNS}SIMPLE PIANO BY ANDRE W SENFT": SYS49280

-ANDREW SENFT, AUBURN, NY

\$44B Reflections on the C-128

This program lets you create some interesting graphics displays by creating "reflections" of your drawings. Use a joystick in port 1 to draw by moving the cursor around the hi-res screen. Draw in the lower-left corner, so the cursor directions will seem correct. The display will be reflected four times around the screen. Clear the screen with the fire-button.

- 10 REM REFLECTIONS JON ALLEN
- 20 SLOW: GRAPHIC1, 1: COLORØ, 1: COLOR1, 8

MAGIC

- 3Ø COLOR4, 1:SCALE1: X=75Ø: Y=25Ø
- 40 J=JOY(1): IFJ=128THENSCNCLR
- 5Ø IFJ=1ORJ=2ORJ=8THENY=Y+1Ø
- 6Ø IFJ=60RJ=50RJ=4THENY=Y-1Ø
- 7Ø IFJ=80RJ=70RJ=6THENX=X-1Ø
- 8Ø IFJ=2ORJ=3ORJ=4THENX=X+1Ø
- 9Ø IFX < ØTHENX = Ø
- 1ØØ IFX<ØTHENX=Ø
- 110 IFY OTHENY = Ø
- 12Ø IFX>1ØØØTHENX=1ØØØ
- 13Ø IFY>1ØØØTHENY=1ØØØ
- 140 DRAW1, X, Y: DRAW1, 1000-X, Y
- 15Ø DRAW1, X, 1ØØØ-Y: DRAW1, 1ØØØ-X, 1ØØØ-Y
- 16Ø GETAS: IFA\$="{LB.}"THENGRAPHICØ: PRINT"{ CTRL 21": END
- 17Ø GOTO4Ø

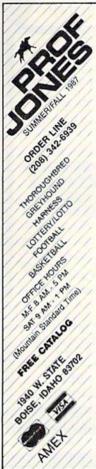
—JON ALLEN, NEWFANE, NY

\$44C BASIC SCRAMBLER

Sometimes a need for program security arises, and my Basic Scrambler program offers some measure of protection. To use it, just load it and run it to poke the machine language into memory. Then load the program you want to protect and enter SYS49152, <code1>, <code2>. The codes can be any two different numbers from 0 to 255 (for example, SYS49152.10.20).

After a program is scrambled, save it to disk. It can be loaded as usual, but when you list it, only garbage will be printed to the screen. To unscramble the program, follow the same procedure used to scramble it, using the same codes.

- 5 REM 64 BASIC SCRAMBLER RICHARD PENN
- 1Ø FORU=49152TO49346:READQ:POKEU,Q:C=C+Q:N
- 15 IFC <> 26195THENPRINT"CHECK DATA!":STOP
- 2Ø POKE5ØØØØ, Ø: POKE5ØØØ1, Ø: POKE77Ø, 164: POK E771,192
- 25 PRINT" (SHFT CLR) (CRSR DN) BASIC SCRAMBLE R ENABLED": PRINT" (CRSR DN)SYS 49152, [Ø -255], [Ø-255] - TO USE"
- 3Ø DATA 32,241,183,142,82,195,32,241,183,1 42,83,195,165,43,133,251,165,44
- 35 DATA 133,252,160,0,32,38,192,177,251,77 ,82,195,77,83,195,145,251,76
- 4Ø DATA 22,192,165,251,197,45,2Ø8,6,165,25 2,197,46,240,12,230,251,165,251
- 45 DATA 201,0,240,1,96,230,252,96,152,145, 251,32,50,192,145,251,32,50
- 5Ø DATA 192,145,251,165,43,133,251,165,44, 133,252,32,50,192,32,50,192,32
- 55 DATA 50,192,32,50,192,177,251,201,0,208 ,247,32,5Ø,192,165,252,72,165
- 6Ø DATA 251,72,165,43,133,251,165,44,133,2 52,104,145,251,32,50,192,104,145
- 65 DATA 251,76,123,227,215,72,152,72,8,16Ø ,ø,177,187,2Ø1,36,24Ø,14,165
- 7Ø DATA 44,141,8Ø,195,169,255,133,44,169,1 ,141,81,195,40,104,168,104,76
- 75 DATA 165,244,169,131,141,48,3,169,192,1 41,49,3,173,81,195,201,1,208



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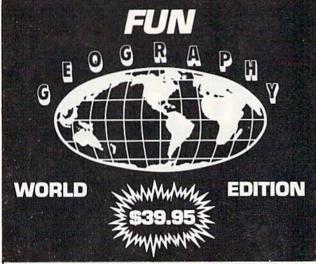
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MAGIC

8Ø DATA 1Ø,173,8Ø,195,133,44,169,Ø,141,81, 195,76,131,164,8Ø

-RICHARD PENN, MONTREAL, QUEBEC, CANADA

\$44D DIRECTORY PRINTER

The following program reads each filename in a directory into an array and sorts the filenames alphabetically. You can then print out the directory in one or two-column format with any Commodore computer and any printer.

- 1 REM DIRECTORY PRINTER-J.R.CHARNETSKI
- 2 PRINT" (SHFT CLR) WHEN READY PRESS RETURN"
- 3 GETA\$:ON-(A\$<>CHR\$(13))GOTO3:PRINT"{SHFT CLR}WORKING..."
- 4 DIML\$(146):OPEN1,8,0,"\$0":GET#1,A\$,B\$
- 5 GET#1, A\$, B\$: IFB\$=""THENCLOSE1:GOTO12
- 6 GET#1, A\$, B\$: N=N+1
- 7 LB=ASC(A\$+CHR\$(\emptyset)):HB=ASC(B\$+CHR\$(\emptyset))
- 8 C\$=MID\$(STR\$(LB+256*HB),2)+" "
- 9 GET#1, D\$: IFD\$ <> ""THENC\$=C\$+D\$: GOTO9
- 1Ø IFN>1THENL\$=LEFT\$(C\$,27):GOTO5
- 11 L\$(N)="Ø{2 SPACES}"MID\$(C\$,4):GOTO5
- 12 FORI=2TON-2:FORJ=I+1TON-1
- 13 IFMID\$(L\$(I),7,16)>MID\$(L\$(J),7,16)THEN T\$=L\$(I):L\$(I)=L\$(J):L\$(J)=T\$
- 14 NEXT: NEXT: X=INT(N/2): PRINT" {SHFT CLR}";
- 15 INPUT"{CTRL 9}1-2-PRINT 3-DISPLAY 4-END ":; A:ONA+1GOTO15,16,17,:END
- 16 OPEN4, 4: CMD4: IFA=2THEN18
- 17 FORI=1TON: PRINTL\$(I): NEXT: GOTO20
- 18 FORI=1TOX:PRINTL\$SPC(7)L\$(X+I)
- 19 NEXT: IFN=XTHENPRINTSPC(34)L\$(N)
- 20 ON-(A=3)GOTO15:PRINT#4:CLOSE4:GOTO15

-JOSEPH R. CHARNETSKI, DALLAS, PA ■

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 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 or more enjoyable, send it to:

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—RICHARD DE A'MORELLI, ARLETA, CA

Listing 1. Delete 64 program.

- 6398Ø REM DELETE 64 BY RICHARD DE A'MORELL
- 63981 POKE53281,1:POKE5328Ø,6:B=82Ø:H=256: PRINT" (SHFT CLR) (CRSR DN) (CTRL 7)";
- 63982 INPUT"ERASE FROM LINE# ";F:INPUT" {8 SPACES TO LINE# ";T
- 63983 INPUT"INCREMENT (1-255)"; I:IFI<10RI> H-10RF<10RF>6398ØORF>TTHEN63991
- 63984 PRINT" (SHFT CLR) (3 CRSR DNs) (UP ARR OW } ERASING": POKEB+4, I
- 63985 POKEB, F/H: POKEB+1, F-PEEK(B)*H: POKEB+ 2, T/H: POKEB+3, T-PEEK(B+2)*H
- 63986 H=256:B=82Ø:D=PEEK(B)*H+PEEK(B+1)
- 63987 PRINT" (HOME) {CRSR DN} {CTRL 7}"D" {CTR L 2}":IFD=>PEEK(B+2)*H+PEEK(B+3)THEN
- 63988 L=PEEK(B+1)+PEEK(B+4):IFL>H-1THENPOK EB, PEEK(B)+1:L=L-H
- 63989 POKEB+1,L
- 6399Ø PRINT"GOTO63986":POKE631,19:FORX=ØTO 2:POKE632+X,13:NEXT:POKE198,4:END
- 63991 PRINT" (SHFT CLR) {2 CRSR DNs} {CTRL 7} DELETE 64 FINISHED!":FORJ=BTOB+4:POK EJ, Ø: NEXT: END

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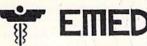
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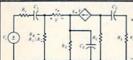
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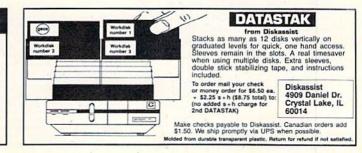
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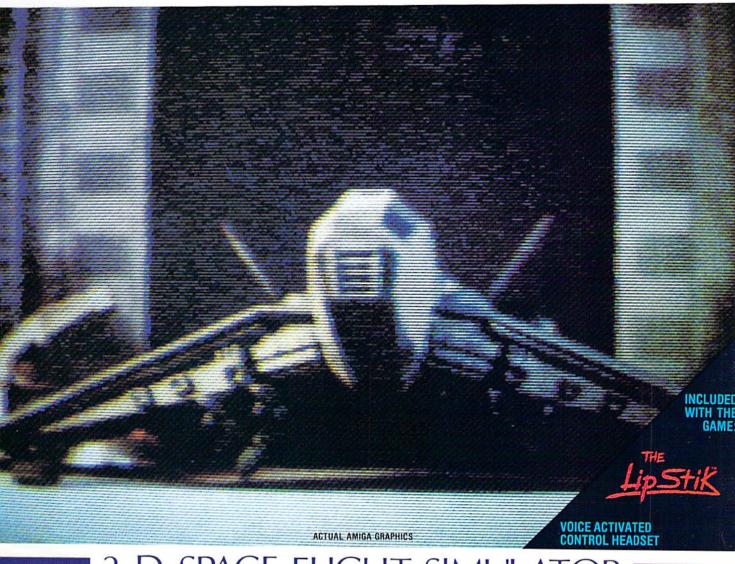
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*Commodore Magazine, July 1987





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