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RUN

THE COMMODORE 64/128 USER'S GUIDE

May 1989
An IDGC/I Publication

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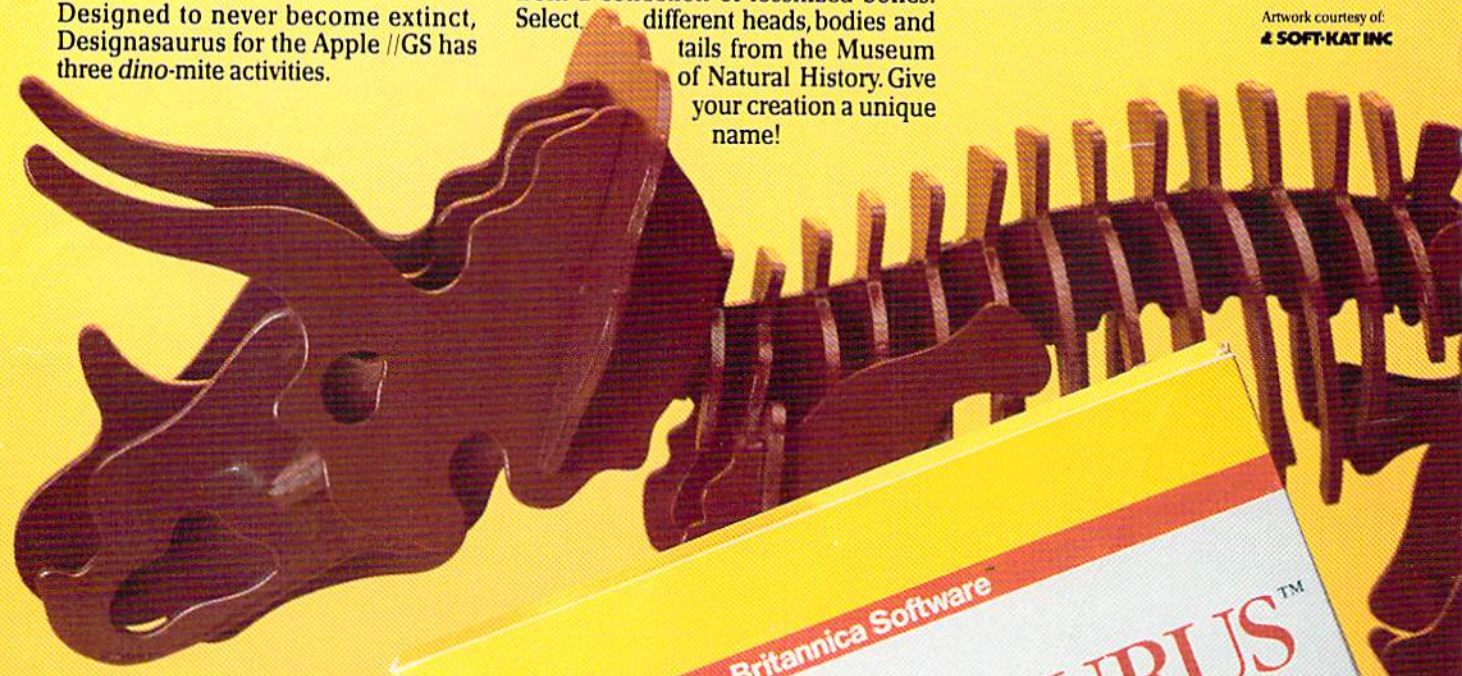

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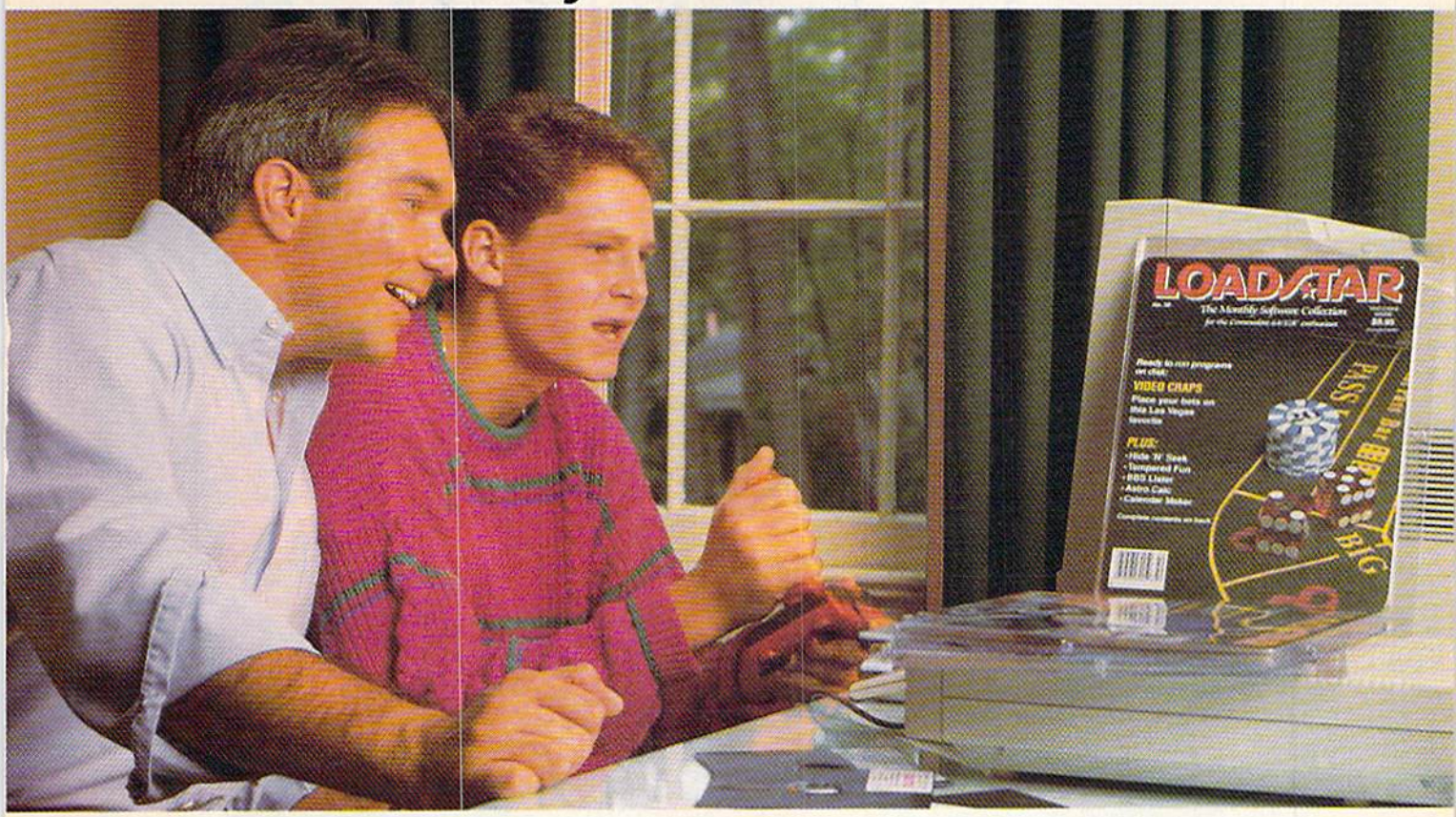

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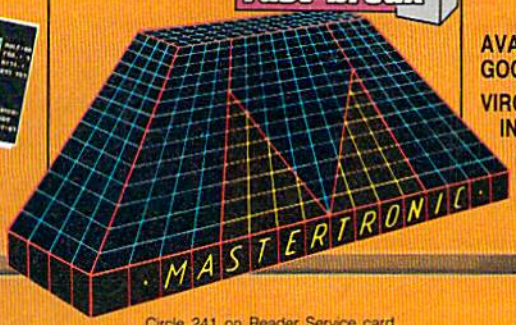

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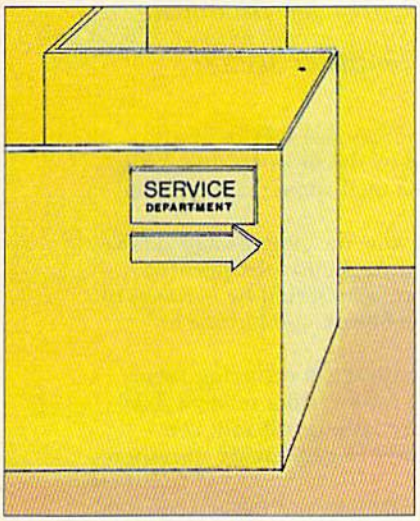
VOLUME 6, NUMBER 5 **MAY 1989**



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BY BOB SCOTT

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RUNning Ruminations

Without support and service, are we becoming a generation of disposable-computer users?

You can't blame Commodore users if they feel they're in a B-rated horror flick. They are terrified by the prospect that Amigas and PC compatibles are taking over the shelf space once occupied by their favorite machine.

In a state of disbelief, they're asking how the support and service for their beloved machine could have mysteriously disappeared. (Perhaps an appropriate title for this scenario would be Invasion of the Eight-Bit Snatchers, The Incredible Shrinking Machine or Hardware on Elm Street.)

This feeling of abandonment and betrayal is a recurring theme in the many letters and phone calls we receive from readers. Like Freddie Krueger, Commodore users are lashing out with complaints that Commodore and the industry in general are unresponsive to their needs.

The cover story in this month's issue attempts to explain some of the problems involved in servicing and supporting the world's best-selling, and least expensive, computer.

According to surveys of *RUN* readers, almost one-half purchased their computer equipment via mail-order, which generally offers the best rates. But when it comes time to get their machines serviced, where do users go?

Not to mail order or to department stores, mass merchandisers or the manufacturer. They head to their local computer store, which, according to one dealer, "spends vast amounts of time helping people who purchased their equipment from a mass marketer. Essentially, this means I end up providing the mass marketer's product support for free. This is not fair, and yet it is expected."

It's no wonder that we're becoming the disposable-computer generation. Commodore users, faced with the grueling task of getting their machines fixed, are tossing their systems and upgrading to either Amiga or MS-DOS machines.

Commodore needs to recommit itself to supporting this network of authorized dealers to give the customer the support and service that he needs.

I invite readers to do two things: Read the lead article that begins on page 26 and send in your comments regarding it. Perhaps you have had a different experience with Commodore service than that relayed in this article. Perhaps you can offer some suggestions to alleviate the situation. Let us hear your ideas.

In a recent issue of the *Twin Cities 128* newsletter, Loren Lovhaug, publisher of the newsletter and author of *RUN*'s lead article, graciously offered to have Commodore set him up in business as the support company for the C-128. Since Commodore doesn't give a tinker's damn about that machine, why not turn it over to someone who is committed to it and has an interest in serving its customers? Loren's pitch may have come in from left field, but it is bound to generate a whole lot of discussion in the industry and especially at Commodore. Good luck, Loren!

For its part, *RUN* is committed to addressing the needs of the 64/128 user, especially at this time, when the support that should be evident in the community is beginning to dwindle.

Dennis Brisson
Editor-in-Chief

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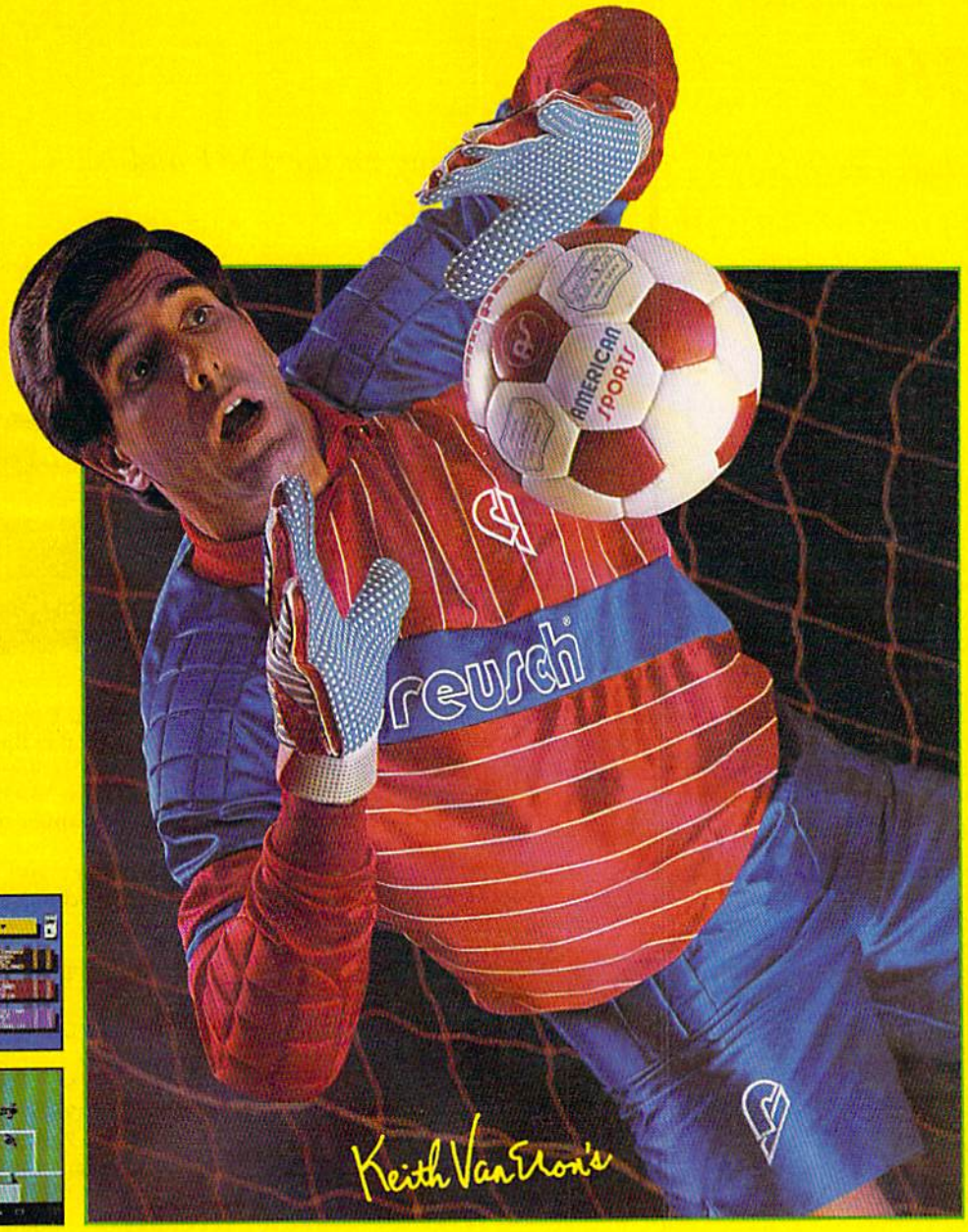

C-64/128 Screens Shown

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Circle 68 on Reader Service card.

MAGIC

Listings that look like MS-DOS output, file copying on the 1581 and disabling list-protection make May Magic memorable.

Compiled by TIM WALSH

$523 A–Z INDEX TABS

I have found that by sticking index tabs to pages in a spiral notebook, I can keep pages alphabetized and organized and can then easily find what I need at a glance. To make the tabs, I use A–Z Index Tabs, a program for the C-64 or C-128. It prints four tabs per one standard 15/16th-inch mailing label. The program will print 26 tabs, labeled A through Z, on seven mailing labels. You can then cut out the tabs from the labels.

While the program is designed to work as is on the Commodore MPS-1000 printer, you may have to adjust the line spacing prior to running the program to get it to work with other printers. The command for setting the line spacing in increments of 1/72nd of an inch is as follows:

```
OPEN4,4:PRINT#4,CHR$(27)CHR$(65)CHR$(n):CLOSE4
```

In the above example, "n" may range from 1 (1/72nd of an inch) through 72 (1 inch). It'll work nicely with a variety of printers if the line spacing is set to 8/72nds or 9/72nds of an inch.

```
Ø REM A-Z INDEX TABS - JEROME REUTER
                                        :REM*85
1Ø REM FOR 15/16 LABELS ON AN MPS-1ØØØ PRI
   NTER                                 :REM*2Ø2
2Ø OPEN6,4,6:PRINT#6,CHR$(18):CLOSE6:OPEN4
   ,4:FORJ=65TO9ØSTEP2                  :REM*235
3Ø PRINT#4,"{SHFT U}{5 SHFT *s}{COMD R}{5
   SHFT *s}{SHFT I} {SHFT U}{5 SHFT *s}{CO
   MD R}{5 SHFT *s}{SHFT I}":GOSUB7Ø
                                        :REM*66
4Ø PRINT#4,"{SHFT -}{4 SPACEs}"+CHR$(J)+"{
   SHFT -}"+CHR$(J)+"{4 SPACEs}{SHFT -}";
                                        :REM*165
5Ø PRINT#4," {SHFT -}{4 SPACEs}"+CHR$(J+1)
   +"{SHFT -}"+CHR$(J+1)+"{4 SPACEs}{SHFT
   -}":GOSUB7Ø                          :REM*254
6Ø PRINT#4,"{SHFT J}{5 SHFT *s}{COMD E}{5
   SHFT *s}{SHFT K} {SHFT J}{5 SHFT *s}{CO
   MD E}{5 SHFT *s}{SHFT K}":PRINT#4:NEXT:
   CLOSE4:END                           :REM*39
7Ø PRINT#4,"{SHFT -}{5 SPACEs}{SHFT -}{5 S
   PACEs}{SHFT -} {SHFT -}{5 SPACEs}{SHFT
   -}{5 SPACEs}{SHFT -}":RETURN    :REM*2Ø1
```

—JEROME E. REUTER, MONCKS CORNER, SC

$524 MAGIC CAPPER 128

Magic Capper 128 gives the listings of 80-Column mode program listings a more professional appearance by printing anything outside of double quotation marks in Uppercase/Graphics mode and everything within in Upper-/Lowercase mode, such as: 10 PRINT"Hello". This makes Basic programs look like programs written on MS-DOS computers, where keywords must be typed in capital letters. You'll find the 80-column screen slowed, because Magic Capper uses the Basic Auto-Insert mode (ESC A).

Activate the program with the F2 key and deactivate it with F4. The SYS2816,1 and SYS2816,0 commands also turn Magic Capper on and off.

```
Ø REM C-128 MAGIC CAPPER - JIM DERRY
                                        :REM*221
1Ø FAST:FORX=2816TO2882:READQ$:POKEX,DEC(Q
   $):NEXTX                             :REM*1Ø9
2Ø PRINT"{3 CRSR DNs}SYS 2816,1 TO ACTIVAT
   E (OR {SHFT F}2)":PRINT"SYS 2816,Ø TO D
   ISACTIVATE (OR {SHFT F}4)":PRINT"{CRSR
   DN}8Ø COLUMNS ONLY!"+CHR$(27)+"A":SYS28
   16,1                                 :REM*132
3Ø KEY2,"SYS2816,1"+CHR$(13)+CHR$(27)+CHR$
   (A):KEY4,"SYS2816,Ø"+CHR$(13)+CHR$(27)+
   "C"                                  :REM*241
4Ø DATA C9,ØØ,FØ,ØD,78,A9,1E,8D,14,Ø3,A9,Ø
   B,8D,15,Ø3,58,6Ø,78,A9,65,8D,14,Ø3,A9,F
   A,8D,15,Ø3,58,6Ø,Ø8,48,8A,48,98,48,A9,Ø
   Ø,8D,ØØ                              :REM*177
5Ø DATA FF,A5,F4,DØ,ØA,A5,F5,DØ,Ø6,2Ø,92,C
   8,4C,3A,ØB,2Ø,8Ø,C8,68,A8,68,AA,68,28,4
   C,65,FA                              :REM*47
```

—JIM DERRY, EAST DETROIT, MI

$525 POKE MAKER 64

Poke Maker prompts for memory locations and the contents you wish to insert, then writes a file to disk that performs the poking. For example, for a white screen and red border, you'd enter 53280 at the first prompt and 3 at the second, then 53281 at the third and 2 at the fourth. Poke Maker 64 then prompts you to save the file to disk. Entering LOAD"POKER.680",8,1 followed by SYS680 instantly displays that combination of colors! ►

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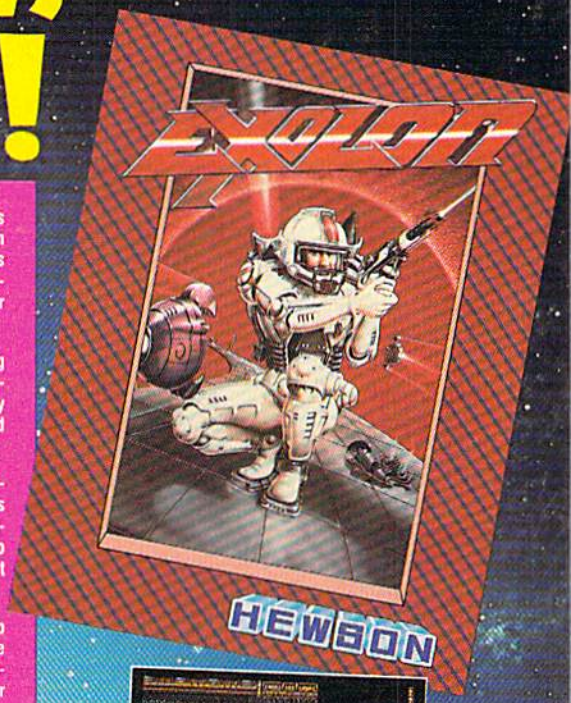
ONE MAN WIPED OUT EUROPE. NOW, HE'S HERE!



Andrew Hewson, arcade king of England, has just blasted his way across the Atlantic with three of the best space fantasy shoot-em-ups in the free world. Dazzling graphics, revolutionary sound and electrifying action will keep your heart racing!

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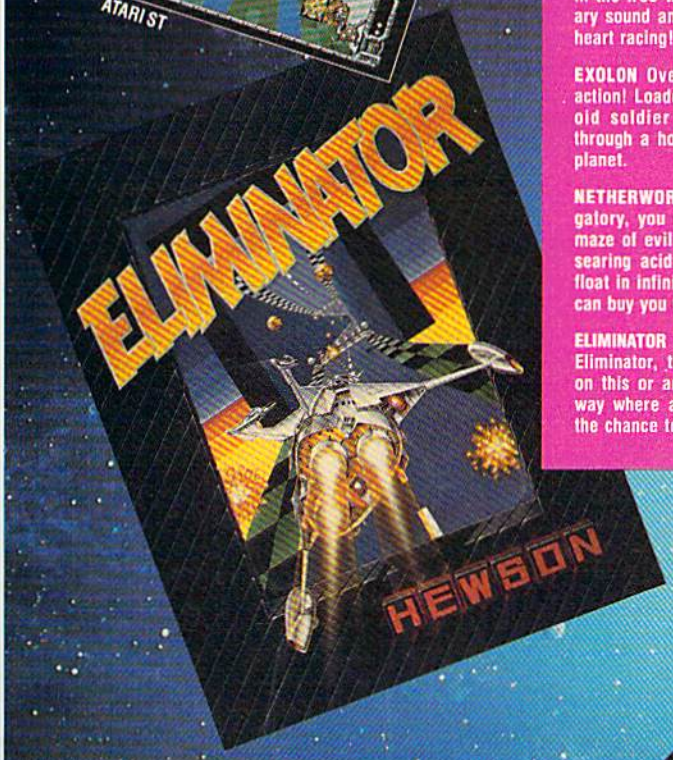
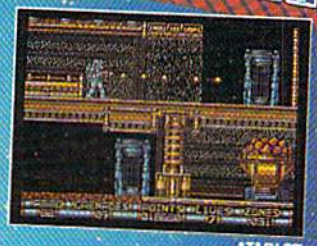
NETHERWORLD Trapped on the Planet Purgatory, you fight your way through an endless maze of evil demons and fantastic magic, skin-searing acid bubbles and tormented souls who float in infinity, searching for the only thing that can buy you freedom: diamonds.

ELIMINATOR You're at the helm of the warship Eliminator, the most powerful fighting machine on this or any world, hammering down a highway where aliens wait at every turn, eager for the chance to make this mission your last.





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At present, Poke Maker is limited to 19 Pokes at location 680, but if you locate it at 49152, you can make a file named POKER.49152 that could contain up to *1300* Pokes!

```
Ø REM 64 ML POKE MAKER - ELAINE FOSTER
                                        :REM*141
1Ø DM=19:DIMAD(DM),CO(DM):REM - 19 POKES M
   AXIMUM                               :REM*11Ø
2Ø INPUT"{SHFT CLR}LOCATION OF POKE MAKER
   68Ø{5 CRSR LFs}";BA:PRINT            :REM*73
3Ø PRINT"{2 SPACEs}ENTER Ø TO EXIT":INPUT"
   ADDRESS TO POKE";AD(N):IFAD(N)=ØTHEN6Ø
                                        :REM*186
4Ø PRINT"CONTENT OF"AD(N);:INPUTCO(N):IFCO
   (N)=ØTHEN6Ø                          :REM*183
5Ø N=N+1:GOTO3Ø                         :REM*192
6Ø DEFFNHI(X)=INT(X/256):DEFFNLO(X)=X-256*
   INT(X/256):B=BA+31:NU=3*N            :REM*67
7Ø POKEB-1,NU:FORM=BTOB+NU-1STEP3:POKEM,FN
   LO(AD(NN)):POKEM+1,FNHI(AD(NN))      :REM*38
8Ø POKEM+2,CO(NN):NN=NN+1:NEXT:POKEM,Ø
                                        :REM*161
9Ø FORN=BATOBA+29:READY:POKEN,Y:NEXT
                                        :REM*18
1ØØ X=5:Y=31:GOSUB19Ø:X=13:GOSUB19Ø:X=19:G
    OSUB19Ø:X=25:Y=3Ø:GOSUB19Ø          :REM*228
11Ø DATA16Ø,ØØØ,162,ØØØ,185,199,ØØ2,24Ø,Ø2
    Ø,133                               :REM*132
12Ø DATA251,2ØØ,185,199,ØØ2,133,252,2ØØ,18
    5,199                               :REM*242
13Ø DATAØØ2,129,251,2ØØ,2Ø4,198,ØØ2,2Ø8,23
    1,Ø96                               :REM*186
14Ø PRINT"{CRSR DN}OK.{2 CRSR DNs}":PRINT"
    SAVE THIS PROG TO DISK? ";:WAIT198,1:G
    ETDI$:PRINTDI$                      :REM*62
15Ø IFDI$<>"Y"THENEND                   :REM*188
16Ø OPEN1,8,1,"POKER."+MID$(STR$(BA),2)
                                        :REM*215
17Ø PRINT#1,CHR$(FNLO(BA));CHR$(FNHI(BA));
                                        :REM*32
18Ø FORP=BATOM:PRINT#1,CHR$(PEEK(P));:NEXT
    :PRINT#1:CLOSE1:END                 :REM*92
19Ø POKEBA+X,FNLO(BA+Y):POKEBA+X+1,FNHI(BA
    +Y):RETURN                          :REM*163
```

—Elaine Foster, Launceston, Australia

$526 C-64 List-Protection Disable

Trying to list a list-protected C-64 program written in Basic can be a pain, because you have to remove all those shifted Ls, embedded deletes and other control characters.

C-64 List-Protection Disable deactivates all list protection on programs to make them easy to list for viewing. Just load and run it, then load in the program that's list-protected and it will list properly.

```
Ø REM 64 LIST PROTECTION DISABLE - RICHARD
   PENN                                 :REM*14Ø
1Ø FORI= 679 TO 713:READ A:POKE I,A: CK=CK
   +A:NEXT                              :REM*169
2Ø IF CK<> 38Ø9 THENPRINT"ERROR IN DATA ST
   ATEMENTS":END                        :REM*153
3Ø POKE 774,167:POKE 775,2              :REM*168
4Ø DATA 8,72,72,169,1,133,216,1Ø4,2Ø1,2Ø4,
   2Ø8,4,169,128,133,15,2Ø1,141         :REM*143
5Ø DATA 2Ø8,4,169,Ø,133,15,1Ø4,2Ø1,13,2Ø8,
   2,169,95,4Ø,76,26,167                :REM*17Ø
```

—Richard Penn, Montreal, Quebec, Canada

$527 1581 File Copying

Many readers have asked me for a source of good Commodore 1581 disk drive file copiers, which are not plentiful, but are in demand. Two programs I highly recommend are Uni-Copy, which is on the 1581 Test Demo disk, and RUN Shell, to be found on *RUN*'s own RUN Works disk.

Uni-Copy, written by Jim Butterfield, is a versatile program that copies to and from the 1581 with no problem. RUN Shell, for both 64 and 128 modes, not only copies files to and from the 1581, but also performs 1581 disk-maintenance functions, such as formatting. Thousands of 1581 owners who have purchased RUN Works seem happy with the way RUN Shell works with their drives.

—Tim Walsh, Magic Columnist

$528 40-Column 128 Custom Characters

Defining fonts on the C-128 in 40-Column mode is a slow process. My short machine language routine, 40-Column Characters, can define 255 characters (in 40-Column mode only) in less than 40 seconds. Space limitations for the Magic column permit us to redefine only a few keys—@, A, B and C—so change the value of CN for each character you want to re-define.

```
Ø REM DEFINING 4Ø-COL. C-128 CHARACTERS -
  GABRIEL NARRO                         :REM*154
1Ø FORI=5376 TO 5438:READ A:POKE I,A:NEXT
                                        :REM*156
2Ø DATA 169,2Ø8,133,137,169,32,133,139,169
   ,Ø,133,136,133,138,162,Ø,16Ø,Ø,177,136,
   145                                  :REM*2Ø6
3Ø DATA138,2ØØ,192,255,2Ø8,247,232,224,16,
   24Ø,29,24,165,136,1Ø5,255,133,136,165,1
   37,1Ø5,Ø,133,137,24,165,138,1Ø5,255,133
   ,138,165,139,1Ø5,Ø,133,139,76,16,21,96,
   Ø                                    :REM*121
4Ø REM DEFINE @, A, B, C                :REM*91
5Ø CN=4:CS=8192:CD=8*CN:BANK14:SYS 5376:PO
   KE 26Ø4,24                           :REM*114
6Ø FOR R= Ø TO CD-1:I=CS+R:READ X:POKE I,X
   :NEXT                                :REM*83
7Ø DATA 62,34,42,46,96,98,126,Ø,62,34,34,1
   26,98,98,98,Ø,12Ø,68,68,124,1Ø2,1Ø2,126
   ,Ø,126,66,64,96,96,98,126,Ø          :REM*155
8Ø PRINT" @ A B C"                      :REM*219
```

—Gabriel Narro, Mexico City, Mexico

$529 Attention-Getting Exits

Select the option to quit on most C-64 programs, and you get little more than the Ready prompt and a flashing cursor. Make your program stand out from run-of-the-mill exits with Ground Zero 64, a short exit routine that rapidly draws

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an exciting and attractive closing screen. Change the SYS 64738 to SYS 2048 if you do not want to erase the program in memory.

```
Ø REM GROUND ZERO 64 - MIKE PURCELL
                                        :REM*139
1Ø POKE 5328Ø,6:POKE 53281,14:POKE646,6
                                        :REM*2ØØ
2Ø PRINTCHR$(147): FORT=2Ø24TO1Ø24STEP-6:P
   OKE T,224:NEXT:SYS 64738             :REM*5Ø
```

—MIKE PURCELL, FPO, NY

$52A C-64 POP-ON SCREENS

Video displays that "pop" into view are more appealing than those that are displayed as they're being created. Unfortunately, Basic's Print command is slow and doesn't lend itself to speed. 64 Screen Pop-On adds a professional touch to your C-64 programs by creating screens that pop into view ready-made.

Set the C-64 border and screen to the same color, then enter Poke 53265,11. Anything printed to the screen from that point on will be invisible. To pop the screen into view, enter Poke 53265,27. My program demonstrates this technique, then displays the traditional technique for comparison.

```
Ø REM C-64 SCREEN POP-ON DEMO - RICHARD PE
  NN                                    :REM*15
1Ø POKE 5328Ø,Ø:POKE 53281,Ø:POKE 53265,11
                                        :REM*2Ø9
2Ø PRINTCHR$(147)CHR$(5);:REM CLEAR SCREEN
                                        :REM*68
3Ø FORT=1 TO 23:PRINTTAB(T+5)CHR$(18)"{7 S
   PACEs}"                              :REM*23Ø
4Ø PRINTTAB(29-T)CHR$(18)CHR$(145)"{7 SPAC
   Es}":NEXT                            :REM*179
5Ø PRINTTAB(15)CHR$(159)"HIT ANY KEY";
                                        :REM*211
6Ø POKE 53265,27:Z=Z+1:IFZ<2THENWAIT198,1:
   GETA$:PRINTCHR$(147)CHR$(28);:GOTO3Ø
                                        :REM*29
7Ø WAIT 198,1:GETA$:PRINTCHR$(147):REM*13Ø
```

—RICHARD PENN, MONTREAL, QUEBEC, CANADA

$52B VERTICAL SCROLLER 64

Vertical Scroller 64 allows everything from single characters to entire screens to scroll vertically on the C-64. After loading and running the program, activate it with SYS 52000,SC,LN,DR, where SC is the first screen line (1024–1063) to be scrolled, LN is the number of lines (1–40) from the first to scroll, and DR is the direction, with 0 for up and 1 for down.

For truly amazing effects, combine Vertical Scroller 64 with my 64 High-Speed Scroll (Magic $477, March 1988).

```
Ø REM VERTICAL SCROLLER - BRET M. TIMMINS
                                        :REM*79
1Ø FOR T=52ØØØ TO 52188:READA:POKE T,A:C=C
   +A:NEXT                              :REM*115
2Ø IF C<>23155THENPRINT"ERROR IN DATA STAT
   EMENTS":END                          :REM*226
3Ø PRINT"FORMAT: SYS 52ØØØ,SC,LN,DR"
                                        :REM*61
4Ø DATA 32,253,174,32,235,183,134,253,32,2
   Ø7,2Ø3,32,253,174,32,158,183         :REM*133
5Ø DATA 138,2Ø8,7Ø,16Ø,Ø,162,24,177,2Ø,72,
   177,251,72,16Ø,4Ø,177,2Ø,72,177      :REM*27
6Ø DATA 251,16Ø,Ø,145,251,1Ø4,145,2Ø,24,16
   5,2Ø,1Ø5,4Ø,133,2Ø,144,2,23Ø,21:REM*123
7Ø DATA 32,2Ø7,2Ø3,2Ø2,2Ø8,225,1Ø4,145,251
   ,1Ø4,145,2Ø,198,253,24Ø,18,56        :REM*61
8Ø DATA 165,2Ø,233,191,133,2Ø,165,21,233,3
   ,133,21,32,2Ø7,2Ø3,8Ø,187,96,24      :REM*74
9Ø DATA 165,2Ø,1Ø5,152,133,2Ø,165,21,1Ø5,3
   ,133,21,32,2Ø7,2Ø3,16Ø,4Ø,162        :REM*1Ø2
1ØØ DATA 24,177,2Ø,72,177,251,72,16Ø,Ø,177
    ,2Ø,72,177,251,16Ø,4Ø,145,251       :REM*244
11Ø DATA 1Ø4,145,2Ø,56,165,2Ø,233,4Ø,133,2
    Ø,176,2,198,21,32,2Ø7,2Ø3,2Ø2       :REM*9
12Ø DATA 2Ø8,225,1Ø4,145,251,1Ø4,145,2Ø,19
    8,253,24Ø,188,24,165,2Ø,1Ø5,193:REM*85
13Ø DATA 133,2Ø,165,21,1Ø5,3,133,21,32,2Ø7
    ,2Ø3,8Ø,187,24,165,2Ø,1Ø5,Ø,133:REM*24
14Ø DATA 251,165,21,1Ø5,212,133,252,96
                                        :REM*156
```

```
Ø REM VERTICAL SCROLL DEMO              :REM*2Ø8
1Ø POKE 53281,Ø:POKE 5328Ø,Ø            :REM*113
2Ø A$="VERTICAL SCROLLER"               :REM*46
3Ø PRINTCHR$(147)"{11 CRSR DNs}"        :REM*244
4Ø PRINT"{CTRL 3}{9 SPACEs}";A$         :REM*73
5Ø FORT=ØTO5ØØ:NEXT                     :REM*131
6Ø FORT=ØTO24:SYS52ØØØ,1Ø33,LEN(A$),1:NEXT
                                        :REM*131
7Ø R1=INT(RND(Ø)*LEN(A$)):R2=INT(RND(Ø)*LE
   N(A$)):IFR1=R2THEN7Ø                 :REM*67
8Ø FORT= Ø TO 24                        :REM*17
9Ø SYS 52ØØØ,1Ø24+9+R1,1,Ø:SYS 52ØØØ,1Ø24+
   9+R2,1,1                             :REM*2Ø
1ØØ NEXT:GOTO7Ø                         :REM*197
```

—BRET M. TIMMINS, SANDY, UT

$52C C-128 DOS SHELL COPYING—AGAIN

Magic Trick $507 (February 1989) is a good way to copy Commodore's 128 DOS Shell from the 1571 Test/Demo disk, but there's an easier way. Boot up C-128 DOS Shell and, with the Test/Demo disk still in the drive, select Disk Copy from the menu and press the space bar. After you've copied the entire 1571 Test/Demo disk to another drive, you will have a perfect working copy of DOS Shell on the copy disk. What could be easier?

—KEITH SILLS, REGO PARK, NY ■

Magic is a forum for RUN*'s imaginative and inventive readers to share their programming tips, brief software or hardware modifications, shortcuts or items of general interest. If you have an idea to make computing easier, faster, more exciting and enjoyable, send it to: Magic, RUN Magazine, 80 Elm St., Peterborough, NH 03458.*

RUN *pays $10 to $40 for each trick published in the column. If you'd like a copy of the latest edition of* RUN*'s Magic Trick Writer's Guide, send your request with a self-addressed, stamped, business-size envelope; you'll receive a copy in two or three weeks.*

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MAIL RUN

Readers defend the C-128, the IconTroller and the Plus/4.

SKETCHPAD 128 CORRECTION

The price for the Sketchpad 128 drawing system described in the March 1989 News and New Products is incorrect. The correct price is $29.95. *RUN* apologizes to the distributor, Free Spirit Software (PO Box 128, Kutztown, PA 19530), for the error.

ERADICATING MENTAL STAGNATION!

Six years ago, at the age of 70, I found myself stagnating mentally after five years of retirement. I bought a VIC-20 with the intention of teaching myself to program it. The manual furnished with it gave me a good start, but I did not expect it to teach me all I wanted to know about Basic programming. So, I bought some books on Basic and subscribed to several computer magazines.

Now, with a C-128, two disk drives and a printer, I consider myself a reasonably competent programmer. I've had one of my programs and several programming tips published in Commodore-specific magazines.

I'm no longer mentally stagnating and have had hundreds of hours of enjoyment from my computers.

—E. STUART JOHNSON
ATHENS, AL

A COMMODORE LOYALIST!

I've been a Commodore computer user since high school, when I first used a 16K PET. That experience started me on my career in programming. I've been a loyal Commodore user ever since, in contrast to the experience of Daniel O'Bryant (see Mail RUN in the February 1989 issue).

I've owned a C-64, C-128 and now a 128D. The only problem I've had with any of these machines was the house fire that melted my 128 into a pool of worthless chips. Although the quality of Commodore's machines has been questioned over the years, I'm glad to say that they have more than answered my personal computing needs. I'm sure Atari makes fine machines, but I wouldn't trade my Commodore for anything.

—WILLIAM C. YOUNG, JR.
ALEXANDRIA, VA

THE ICONTROLLER DEFENDED

I take strong exception to technical editor Tim Walsh's review of the IconTroller in his article, "Trigger-Happy" (*RUN*, February 1989). I use GEOS exclusively, and probably more extensively than most users, in the production of technical reports required for my full-time studies. I find the IconTroller a great improvement over the standard joystick.

It's obvious to me that Mr. Walsh, like most others, spends most of his time playing computer games. If he had spent more time with the IconTroller and considered its potential value to GEOS users, he could better appreciate what an improvement it is over game-oriented joysticks.

—SANDRA KOURCE
LAUREL, MD

Tim Walsh summarizes Suncom's IconTroller as "a good idea that left the drawing board too soon," calling it "awkward to use" and commenting that left-handers will "have great difficulty using it effectively when it's mounted on the keyboard."

I suspect that he considers all joysticks adjuncts to those numberless computer games requiring the keenest eye-hand coordination and speed of response to win. IconTroller was never designed for such applications. The manufacturer makes clear that IconTroller is intended for such graphics-oriented environments as GEOS. Tim Walsh may not have been fully aware of the IconTroller's intended use.

—IRVIN DUNLAP
BARTLESVILLE, OK

PLUS/4 HAS ITS PLUSES

In your article, "What Do You Do with a Dead C-64" (*RUN*, January 1989), one list names the Commodore Plus/4 as a "Commodore product that should never have seen the light of day." I feel that this statement is irresponsible on the part of the article's "authorities," its author and the magazine. While the Plus/4 may not have the graphics capabilities of the C-64, it is possible to design games with it. And, unlike the C-64, the Plus/4 has a built-in spreadsheet, database, graphmaker and word processor.

—STEPHEN C. SHISLER
WILMINGTON, DE

If you had used your Plus/4's word processor instead of writing to us in longhand, *your argument would've been a lot stronger, Stephen.*

—EDITORS

A 1581 ODDITY

Your article on the 1581 disk drive ("Power Drive," *RUN*, February 1989) was consistent with all the other articles I've read on it, save one. The article did not address the question most asked of me at our user group meetings: "Since the 1581 will almost always be used as drive 9, how do we collect, ask for the directory and clear the drive?" The 1581 manual gives no clue. Your readers who own a 1581 drive might like to know that the proper syntax for these directory commands are COLLECTU9, DIRECTORYU9, AND DCLEARU9, all *without* using commas. It is odd, I know, but what else is new in the world of Commodore?

—GIGI CASCIO
FOREST HILLS, NY

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NEWS AND NEW PRODUCTS

The computing world is hot for games, games, games.
Check out all these new releases.

Compiled by HAROLD R. BJORNSEN

SINK 'EM OR BLAST 'EM

ALAMEDA, CA—Spectrum HoloByte (2061 Challenger Drive, Alameda CA 94501) announces **PT-109**, a torpedo-boat simulation to be released for the C-64. In the game, the player takes the helm in one of several South Pacific theatres or in the Mediterranean. The game also has 40 different missions. Price unavailable at press time.

Also slated for later release is the C-64 version of **Falcon**, an F-16 flight simulation. You become the pilot, facing the controls, head-up displays and radar. The game contains 12 missions, varying from air-to-ground bombing runs to dogfighting up to three enemy MIGs at a time. You can also go head-to-head against an opponent on a second computer. Price as yet unavailable.

Check Reader Service number 403.

BOUNCING BALL

COSTA MESA, CA—**Magic Johnson's Fast Break Basketball**, a basketball simulation for the C-64, features extended play and buy-in options, bonus time awards, fast-action moves with special plays and commentary by Magic himself. You can battle through seven rounds of two-on-two to get to the final: a one-on-one match against Magic Johnson. Moves include pick 'n roll, alley-oop, sucker punch and the fast break with a slam-dunk finish. No price set at press time. Virgin Mastertronic, Inc., 711 West 17th St., Suite G9, Costa Mesa, CA 92627.

Check Reader Service number 404.

BATTLES OF ONE SORT OR ANOTHER

NORTHBROOK, IL—Mindscape (3444 Dundee Rd., Northbrook, IL 60062) introduces four new games for the C-64.

In **Sgt. Slaughter's Mat Wars**, a wrestling simulation where you can both play and manage, you choose from one of five managers, head off to the auction to bid for a wrestler, then on to the square circle. Once in the ring, you assume the role of one of five wrestlers, including Fast Ed, Delores and Abdul, to fight your way to survival. $29.95.

It's Bruno vs. Krushna in a fight to the finish in Mindscape's wrestling simulation, Sgt. Slaughter's Mat Wars.

You've got to use your coaching skills and athletic prowess in International Team Sports, from Mindscape.

International Team Sports puts you in the middle of five Olympic-style sports that combine joystick action and coaching strategy. As the coach, you analyze stats, pick the athletes you want to represent your country and select your team's lineups. Then you can be the player, testing your athletic prowess on the playing field. $29.95.

In **After Burner**, a flight-battle simulation, you take to the skies in an F-14 Tom Cat to fight the enemy, using eight maneuvers, including a 360-degree barrel roll. $34.95.

By day, you are Jo Mushapi, a martial arts instructor. But in a crisis, you are capable of ninja feats. Around every corner of the world of **Shinobi** lurks danger. Deep in the caverns of the city, you must find your enemies and rescue their hostages, outmaneuver terrorists, fend off thugs and mongos and defeat the evil Ring of Five. $34.95.

Check Reader Service number 400.

WAR/HEROES

HUNT VALLEY, MD—MicroProse (180 Lakefront Drive, Hunt Valley, MD 21030) is offering two new games for the C-64. Prices had not been set at press time.

Traveller 1: The Zhodani Conspiracy is set in the Spinward Marches, a frontier sector of the Third Imperium. You're assigned to help protect the Marches from the Zhodani Consulate, which is preparing for war with the aid of traitorous Imperial citizens within the marches themselves.

In **Spider Man and Captain America in Doctor Doom's Revenge**, an interactive comic book adventure, players take on the roles of Spider Man and Captain America, who must stop Doctor Doom from launching a nuclear warhead at New York City.

Check Reader Service number 405.

NO GAMES HERE, BUT FUN ANYWAY

NEW YORK—**The Muppet Print Kit** features the Muppet and Muppet Baby characters in 60 poses that can be printed out, along with 20 border designs, seven font styles in three sizes and a variety of special effects, including italics, boldface and outline. The printouts can then be used to make puppets and masks. Available for the C-64 for $14.95.

The Sesame Street Writing Kit, a word processing package for the C-64, enables kids of ages four to six to write, edit and print. They can type words, numbers, lists, stories, poems or letters. It includes an instruction manual with

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suggestions for writing projects and other activities that encourage self-expression. $14.95.

PrintPower Plus, a C-64 package that lets you make posters, signs, greeting cards and banners, has all the features of the original PrintPower, plus an on-screen template and line-by-line text editing. New options include mouse and joystick support and the ability to import and export graphics and to edit images. $14.95. Hi Tech Expressions, 584 Broadway, Suite 1105, New York, NY 10012.

Check Reader Service number 406.

Odd Couple

CHATSWORTH, CA—Titus Software (20432 Corisco St., Chatsworth, CA 91311) has released two C-64 games for $39.95 each.

Professor Hybris, the genius behind all analytical conceptors, is the creator of a brand-new leisure concept, which has been driving crowds crazy. But the game, **Titan**, is deadly. To succeed, you must guide a power sphere across 80 synthetic worlds, using just one magical and magnetic control unit while avoiding death obstacles.

In a remote corner of the galaxy, surveillance units of Gallion have detected what could be an enemy invasion. Your mission in **Galactic Conqueror** is to defeat them, using the latest space fighter, the Thunder Cloud II.

Check Reader Service number 407.

Tank

GRANADA HILLS, CA—Microillusions (17408 Chatsworth St., Granada Hills, CA 91344) introduces **Fire Power**, an arcade-style tank battle and part of the "One to One" series of games the company plans to release for the C-64. You battle against an opponent (computer, another person or over a modem) on split screens, maneuvering your tank (you can choose from three different types) to defend your fortress against the enemy and his helicopter. You also must rescue your troops and return them to the first-aid stations. Multiple plays, fields and random flag locations allow a variety of strategies and difficulties. $24.95.

Check Reader Service number 402.

New in Every Way

REDWOOD CITY, CA—Epyx (PO Box 8020, Redwood City, CA 94063) introduces **Skate Wars**, a futuristic C-64 game with new rules, new physical forces, new playing fields and new equipment. Super-athletes compete in a cross between hockey, soccer and war. Players rack up points by kicking a metal-studded ball into their team's goal, evading explosive mine droids that appear in their paths and roving spinners that can capture an athlete for a muscle-screaming spin. A collision with a fuel cannister could send a skater up in flames. Fancy footwork is required as players leap bottomless pits, spiked balls, hurdles and ice chasms that conspire to snag unwary blades and condemn competitors to the deep freeze. $34.95.

Check Reader Service number 408.

New Joysticks

NEW YORK—Camerica (230 Fifth Ave., New York, NY 10001) has some new joysticks for the C-64 that were showcased at the Winter Consumer Electronics Show in Las Vegas last January: the **Magnum** ($7.99) and the **Warrior** ($7.99), both of which have bubble switches and pistol-grip designs; and the **Dragon** ($9.99), which comes with a combination bubble and micro switch. Also new are the **Turbotronic** joysticks, which combine the look and action of the company's wireless Freedom Stick in a wired (ten-foot cord) design. Individually adjusted speed control provides automatic rapid-fire action. $39.95.

Check Reader Service number 409.

Missions: Impossible

SAN JOSE, CA—In **Bad Dudes**, an action-oriented, street-fighting game for the C-64, you become a modern-day hero on a mission to rescue the President of the United States from kidnappers. Assuming the roles of the tough street fighters, Blade and Striker, you must fight your way through waves of ninjas, dogs and enemies, using different weapons for defense, such as knives, shurikins, numchucks and your fists. A two-player game. $34.95.

In **Guerrilla War**, a combat-action adventure for the C-64, players are involved in a revolution that must overthrow the government, liberate the country's people and rescue fellow guerrillas being held hostage. You'll forge ahead to successfully complete the mission by fighting off tanks, air raids and enemy soldiers with a variety of weapons, including bazookas, flamethrowers and grenades. $29.95. Data East USA, Inc., 470 Needles Drive, San Jose, CA 95112.

Check Reader Service number 401.

A Trilogy and a Fantasy

LONDONDERRY, NH—Origin (136 Harvey Rd., Bldg. B, Londonderry, NH 03053) has recompiled the Ultima I, II and III series of adventures into one package, renamed **The Ultima Trilogy**, for $59.95. The C-64 series chronicles the forbidding tale of the Triad of Evil and the battle to free the world of Brittania from that unholy alliance.

A new fantasy role-playing game for the C-64 is **Tangled Tales: The Misadventures of a Wizard's Apprentice**. Cast in the role of the wizard's apprentice, you are given three progressively difficult tasks to perform as proof of your wizardly worthiness. You'll discover a world of haunted houses, medieval fortresses and contemporary farms. Along the way you will meet more than 50 odd characters. $29.95.

Check Reader Service number 413.

Artura

SAN MATEO, CA—You are **Artura**, son of Pendragon. To stem the tide of invaders, you must unite the Chieftains of Britain under your leadership as High King. To do so, you need to gain possession of the sacred Treasures, lost long ago. Only your close friend and advisor, Merdyn the Mage, knows where they are, but he has vanished, and you suspect foul play. Your only clue is that your evil half-sister, Morgause, has kidnapped Nimue, Merdyn's apprentice. It's available for the C-64 at $39.99. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404.

Check Reader Service number 410.

This Is War!

WEBSTER, TX—**Empire—Wargame of the Century** puts you in command of invasion forces in a full-scale planetary war. You explore uncharted worlds, capture hostile cities and battle the enemy on land and sea. Logistic skills are required: You must plan unit production, choosing from armies, fighters, cruisers, aircraft carriers, destroyers, troop transports, submarines and battleships. It's available for the C-64 for $49.95. Interstel, PO Box 57825, Webster, TX 77598.

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SOFTWARE GALLERY

Wargamers, hackers, gamblers, arcade designers and adventurers: there's something for each of you this month!

Compiled by BETH S. JALA

NEUROMANCER ..... A

A Hacker's Nightmare

"Nowadays, hacking into somewhere you don't belong can get you in trouble. In one hundred years, it will get you killed!"

That quote from the Neuromancer package perfectly describes the flavor of this game. If you've ever wished you could get into someone's database, this is the game for you!

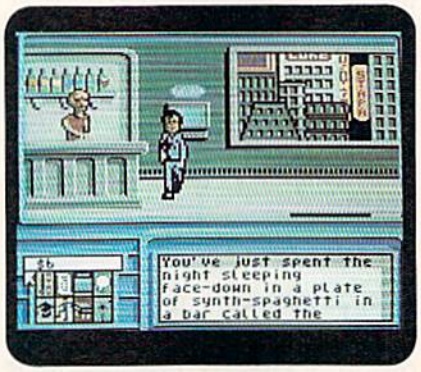
Based on a sci-fi novel and set to digitized music by Devo, Neuromancer takes place on three different levels. The "real world" is Chiba City near Tokyo Bay in Japan. It's a run-down place, populated with techno-criminals whose main activities in life are breaking into computer databases and wreaking havoc. The seedy characters can help you, if you know the right questions to ask. You must begin to gather your skills and software here. In the real world, you must also learn to deal with some of the more mundane chores in life, like how to pay your huge hotel bill and how to procure some money to get your deck out of hock.

If you've gotten some software, you can plug into Comlink and try to gain access to some of the databases. Some passwords are easy to come by; others are cleverly hidden and encoded.

If you've managed to get all the right software and skills and enough money to buy a Cyberspace Deck, you're ready for the real challenge. All the government, corporate and military bases can be reached in Cyberspace. Unfortunately, they're all protected by ICE (Intrusive Countermeasure Electronics), whose primary purpose is to kill intruders.

As if that weren't enough, the more secure bases are also protected by Artificial Intelligence. Rumor has it that AI is trying to wipe out Cyberspace cowboys. It's also rumored that Neuromancer is the most powerful and indestructable AI.

Interplay calls Neuromancer a role-playing adventure. I tend to look at it as more of a graphic adventure. While you're faced with combat situations, the results depend on skills that you acquire though logic and deduction. The clues you get along the way lead you to the skills you need, without depending on luck or magic.



Don't forget to ask questions of the characters you meet in Neuromancer.

You move your three-dimensional character via keyboard or joystick. Interaction is through icons, and most of the dialogue involves cycling through a series of pre-programmed phrases and responses. The graphics are as good as any I've seen on the C-64, and the Cyberspace scenes are exactly as I visualized them when reading the novel.

The game comes on four sides of two, non-copy-protected disks. (A password system with a code wheel is included.) There are periodic disk changes that can be annoying, especially during an exciting part of the game. Thankfully, Interplay used a routine to speed up disk accesses.

Neuromancer is one of the most addicting and exciting games I've played in a long time. *(Interplay; distributed by Mediagenic, 3885 Bohannon Drive, Menlo Park, CA 94025. C-64/$39.95.)*

—ART LEWIS KIMBALL
TUSCOLA, IL

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 or disappointments here.

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

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

ARCADE GAME CONSTRUCTION KIT ..... A

Get What You Want Out of an Arcade Game By Creating Your Own!

At one time or another, every arcade game devotee has dreamed of designing his or her own program. A number of products have already capitalized on the gaming public's creative aspirations. Few, however, have been as comprehensive and user friendly as Broderbund's Arcade Game Construction Kit.

AGCK contains four powerful, easy-to-use editors. The Environment editor controls aspects that affect all levels of the game being planned—joystick control, numbers of lives, and so on. In the Actor editor, the attributes and animation for all moving objects are set. Scenery design, special effects and play testing are implemented within the Level editor. Through the Sound editor, you can compose varied and relatively complex music and create novel, appropriate sound effects.

In addition, the AGCK disks contain five mini-games and a 50-screen adventure/tutorial entitled Labyrinth Master.

Learning to use AGCK is almost as ►

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much fun as playing the games you create or designing originals. The 90-page manual is well organized and engagingly written. All of the program commands are given via the joystick. Choices are made from an almost unlimited number of pull-down menus, pop-up windows, title bars and sliders. Function keys are employed as optional shortcuts. It's almost impossible to make a mistake that can't be corrected. Also, the user doesn't have to worry about accidentally inserting or writing over the wrong disk; AGCK senses errors and alerts the user.

Although highly derivative, Labyrinth Master and the five minis admirably display the wide variety of possible designs. For the most part, the screens and characters are expertly drawn, and the sound elements are more than acceptable. At times, joystick movement is unnecessarily hampered by scenery, but this appears to be confined to certain games and screens. All in all, while they alone are not sufficient reason to buy the program, the mini games are fun to play.

The decision whether or not to purchase AGCK should be based on your desire to design arcade games for enjoyment. Even a simple climbing and jumping scenario takes hours to plan, develop and perfect. All the tools the at-home creator needs are here. The time, effort, ability and perseverance come from you. *(Broderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101. C-64/$29.95.)*

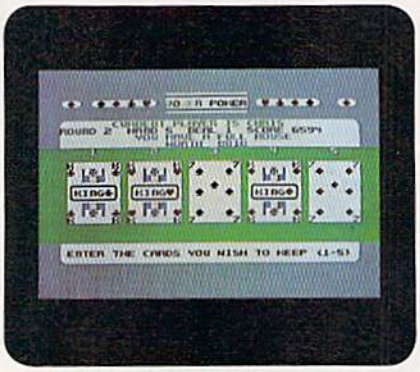
—LEN POGGIALI
SYRACUSE, NY

AUSSIE JOKER POKER ..... B

How Many Card Players Can You Fit Around Your C-64?

A game of skill and chance that lets from two to 90 people play a modified, five-card version of poker, Aussie Joker Poker is particularly well suited to its computer format.

You select the size of the deck and the number of hands to be played in each round. The value of each hand is automatically calculated according to Hoyle's Poker hand values. What's more, a password-protected betting option can be used to select the size of each bet and to keep track of each player's winnings or losses. Players can join or leave the game at any time. When a player leaves, the computer automatically calculates the amount of money he must give to, or receive from, each of the other players.



A full house—this is one hand you want to keep in Aussie Joker Poker!

To be eligible for inclusion in the Joker Poker Hall of Fame, you can simply choose Competition mode. This automatically sets the deck size to cards seven through ace (two through six are eliminated), and lets you play five hands per round.

Your turn begins with the dealing of five cards and a brief evaluation of the hand—one pair, two pairs, three of a kind, and so on. The point value of the current hand is also displayed, along with your cumulative score for the round. To quickly assess your options for the current hand, press A to put your cards in order and B to check the current high score for the round.

You hold the cards you want to keep, and any you throw away are promptly replaced, but unless your new hand results in an improved score, you bust and don't receive any points. Thus, even if you retain a pair of aces, unless you pick up a third ace or another pair, your score won't improve. If your score does increase, you again have the option of getting rid of any unwanted cards.

When you are satisfied with your hand, pressing the space bar accepts it and adds its point value to your score for the round. Each player plays all five hands for a given round in succession, and the scores are totaled. The winner of each round is the player with the greatest total for the five hands.

Although this system takes some getting used to, the added risk of busting each time you throw away a card ultimately makes the game more exciting. Also, because the Competition mode uses only half the deck, hands with three of a kind, two pairs or even a full house are not uncommon, and there's always a good chance that breaking up a pair to go for a straight will pay off.

Joker Poker is easy to play once you've thoroughly read through the rules, which are both in booklet form and on-screen. Although the game doesn't exactly feature breathtaking graphics or sound effects, Joker Poker is, nevertheless, enjoyable enough to please both serious gamblers and casual card players. *(Joker Software; distributed by Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062. C-64/$29.95.)*

—BOB GUERRA
SOUTH BOSTON, MA

CAPTAIN BLOOD ..... B

Perverse Personalities Pervade the Planets

Captain Blood deals with the dilemma of man trapped by technology. As Captain Blood, a hacking name you've adopted, you have found yourself in a horrible predicament.

It all began when you decided to create a computer game to end all computer games. You crafted a strange world filled with exotic places and weird, yet intelligent beings. You added thousands of planets, the majority barren and uninhabitable. Then you coded a universal language, so that all beings could communicate. To make traveling simpler, you created a hyperspace system.

Inexplicably, you've been sucked into this silicon universe and must find a way out. But your biggest problem stems from the fact that your genetic structure was fragmented, leaving five clones of yourself. You must locate the five and assimilate them back into your original body. If you don't, your body parts will start to degenerate and replace themselves with bionic parts.

Initially finding an alien to interrogate is easy because the first planet you must visit is inhabited. But you'd better quickly learn to use the icon-based language, or you might find yourself left with the unnerving prospect of making random visits to the game's 37,000 planets.

There's no typing involved in Captain Blood. All actions, aboard ship and on a planet, are controlled by moving your semi-mechanical arm to a button or icon.

Captain Blood's graphics often border on the surrealistic. Metallic hues of blue and gray await you aboard ship, where the detail imparts not only a feeling of alien technology, but also that space is indeed empty and very cold.

If you manage to locate all five clones (which I haven't *yet*), the last clone gives ►

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you the coordinates of a planet where a beautiful alien awaits. Teleport her to the ship, and the game is almost won. Then all you have to do is figure out a way to get yourself out of the computer and back into the real world!

The game's documentation is concise, and gets you playing with very little effort. Included is a handy reference card and a listing of the icons, which you'll need to refer to quite often.

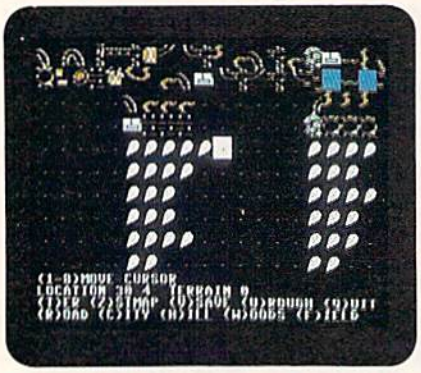
Captain Blood combines adventure, strategy and flight simulation to form a cohesive plot. The icon-based language is deceptively simple, and I found the aliens to be entertaining, intelligent and sometimes suffering from an overactive libido. This program is sure to captivate mature audiences for many hours. *(Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062. C-64/$34.95.)*

—JOHN RYAN
BILOXI, MS

TYPHOON OF STEEL ..... B+

WW II Combat For Advanced Wargamers

A sequel to SSI's Panzer Strike, Typhoon of Steel is both a tactical-level simulation of World War II battles from the Pacific, European and Asian theaters and a construction set that lets you create and fight your own WW II battles. Each battle can be fought head to head against a fellow wargamer or solo against the computer, with your choice of Axis or Allied control.



When positioning your units in Typhoon of Steel, you must take the terrain and the weather into consideration.

Depending on the type of battle being simulated, a scenario can last for either 30 or 60 turns, with each turn consisting of an Orders phase and a Combat phase. During the Orders phase, you can issue movement and combat orders to individual units or entire formations. Information concerning your units' weapons, combat state, line of sight and objectives is also available.

During the Combat phase, you can watch the action unfold as your units and any visible enemy units move around the map and launch attacks. As the battle progresses. you can hear the sounds of machine-gun fire, artillery shells whistling through the air and the explosions of your tanks' cannons.

To be successful in battle, you must understand not only the strengths and weaknesses of your forces and weapons systems, but also the ways in which the land you fight over can affect movement and combat. Battles are waged on a scrolling map of varying terrain. To effectively move and position your units, it's important to know which types of terrain offer cover and how the movement of various units is affected by the land being crossed. Weather is another realistic variable that can affect movement and combat.

Typhoon of Steel comes with two manuals. The first thoroughly explains how to play individual scenarios or the campaign game, and it outlines the steps required to build your own scenarios. The second is a briefing manual that lists, in chart form, unit, weapon and formation data for all American, Japanese, British and German forces.

If you're a long-time fan of SSI's military simulations, you'll welcome Typhoon's complexity and historical detail. Conversely, if you are new to this type of simulation, you might be slightly overwhelmed by the number and variety of forces under your command, as well as by the amount of control you have over their actions. However, with a little patience and a lot of time, and by using available options—such as multiple handicap levels and the ability to place any number of your formations under computer control—you can learn to lead your forces to victory. *(Strategic Simulations, Inc.; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$49.95.)*

BOB GUERRA
SOUTH BOSTON, MA

BATTLESHIP ..... B

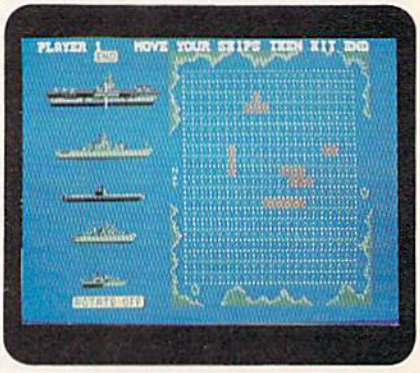
Born of a Board Game, Here's the Latest Version Of Naval Combat

I was first introduced to Battleship when it was played with pencil and paper. Years later, Milton Bradley added tiny ships, red and blue pegs and a pair of plastic carrying cases. The next "improved" version of the game was in 3-D. The dawn of the electronic generation added lights, buzzers and a voice that proclaimed "You sank my battleship!" With the computerization of Battleship, we've once again entered a new age of gaming.

You can play a game with one or two players; choose a tournament to play the best two out of three games; or the winner of each round can take on newcomers. There's a choice between single and multiple shots (the latter lets you blast off as many as 20 shots each turn). Such salvo fire not only speeds things up, but also adds to the action and drama.

Once players have secretly positioned their ships, they place their shots by moving an on-screen sight via the joystick. Firing commences once all the shots are placed. The grid is then replaced by an animated ship lobbing shells into the distance, while bombers fill the sky, dropping their deadly payload.

Hits are rewarded with an explosion on the viewing screen. When a ship is sunk, it drops off the screen and a life preserver marks its demise. Before passing control to the next player, the screen flashes to the playing field to show where each shot landed and whether or not it was a hit. As a player's ships are sunk, his or her total number of shots each round is decreased by four. The round is over when all of a player's ships are sunk, and the winning player's ships sail across the screen.



Man your Battleship, or you'll be crying, "You sank my battleship!"

All of the action is accompanied by airplanes buzzing overhead, bombs screaming through the sky and explosions, as well as various strains of martial music. I've found the best strategy is to remember the configuration of each ship and place shots in patterns that will cover the battlefield with the fewest shots.

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Despite the apparent simplicity of the game, or perhaps because of it, Battleship will provide hours of fun for gamers of all ages. I'm surprised at the fun I had playing this version. Too bad it wasn't around when I first learned to play the game in third grade. *(Epyx, 600 Galveston Drive, Redwood City, CA 94063. C-64/$29.95.)*

—ROBERT SODARO
FAIRFIELD, CT

ALIEN SYNDROME ..... C+

Aliens, Aliens Everywhere... Is There Any Help in Sight?

On the surface, Alien Syndrome resembles any number of other arcade shoot-'em-ups. As the title suggests, vile and murderous creatures inhabit the game's various levels. These malignant beings have seized control of the most modern and sophisticated outcolony in the universe. Your mission is to travel through the colony's seven sectors, freeing the human hostages and killing every alien possible within a certain time limit.

There are some unique characteristics beneath the surface. You can choose from one of five complex weapons and make substitutions at frequent intervals. Although rescuing all the hostages on a screen earns you an extra life, it's only necessary to save a percentage of them in order to escape from a sector. Before completing a level, however, you must go one-on-one against a super alien. Killing a super alien is difficult, as each requires a different method and often a specific weapon. For example, unless you approach the second super alien with flamethrower in hand, your name is quickly on a gravestone.

Regardless of the weapon employed, your character is extremely vulnerable. Malevolent types attack from all directions in this horizontally and vertically scrolling world.

Determining the best strategy for dealing with the super aliens is fun, but surviving all of the previous screens in order to reach new sectors can be an exercise in futility. I question the reasoning of program designers who don't provide beginner and intermediate levels. According to Mindscape, the distributor, Alien Syndrome's creator wouldn't have included the extra life feature if it hadn't been requested. Apparently, he has completed the game. Quite likely, he'll be the only one to do so.

If one can overlook Alien Syndrome's difficulty level, there are some very fine aspects to the program. Each sector is colorful and varied, and the creatures, particularly the super aliens, are nicely rendered and distinctly animated. The killer head in screen one, for instance, is one of the finest representations of evil I've yet seen on a computer monitor.

Joystick control is excellent, and while sound effects are only adequate, the musical score is appropriately eerie. A cooperative two-player game feature is provided. Unfortunately, this only makes things more challenging because of the increased numbers of aliens on the prowl.

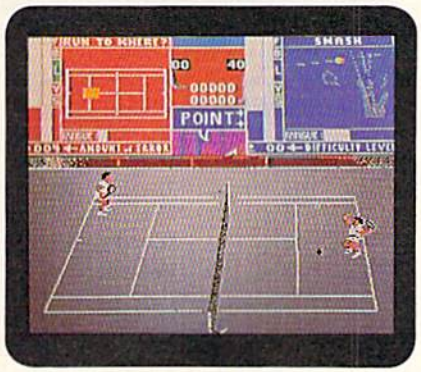
Advanced arcade gamers, as well as those who don't mind long evenings of dying and rebooting, will find much to admire in Alien Syndrome. Those of us who like conclusions as much as beginnings, would do better to curl up with a good book, a video or a copy of Donkey Kong. At least we know that Mario finally gets the girl. *(Sega; distributed by Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062. C-64/$29.95.)*

—LEN POGGIALI
SYRACUSE, NY

SERVE & VOLLEY C

The Thinking Man's Grand Slam

Sometimes things just don't work out the way they should. Take Serve & Volley, for example—great concept, should've been a sure winner.



Serve & Volley features singles tennis, where you can play against a friend or the computer.

Unfortunately, the program never quite makes it. It's not for lack of trying, however, because Serve & Volley valiantly attempts to go where no other tennis simulation has gone before. The computer game tries to capture and recreate the very essence of real tennis—the strategy, timing and anticipation.

Serve & Volley takes an unusual approach. The game's design doesn't provide for direct joystick control over the on-court players. Instead, it's a thinking-man's tennis simulation played by means of unique control boxes. These boxes, which appear at the top two corners of the screen, show a player's fatigue level and shot accuracy, while they also allow you to position your player and select different types of strokes and shots.

You can play Serve & Volley (which features only singles) against a friend or the computer; or the computer can play itself. You can adjust player attributes before matches and save performance statistics, which are then reflected in the player's performance during the next match.

Serve & Volley is as effective as an Ivan Lendl forehand in capturing all the elements that go into playing tennis. Ironically though, the game's designers fell short of hitting a clear winner. The problem is that the control boxes isolate the player a little too much from the spontaneity and sudden spurts of frenetic activity associated with real tennis.

Compounding the problem is animation that I can only describe as mediocre. The court and the background scenery are adequate, and the look and movement of the players are basically realistic, but matters deteriorate once the ball is put into play. Strokes all seem to look the same. Even more annoying is the way balls that never appear to make contact with a racket turn out to be good shots.

Otherwise, Serve & Volley has a lot to offer. It features difficulty levels and different court surfaces. The game also offers various options related to the type and duration of competition. *(Accolade, 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128. C-64/$29.95.)*

—SCOTT WASSER
WILKES-BARRE, PA

TKO ..... B–

Accolade's TKO puts you in the thick of boxing action. You select a contender, and the program lets you edit some of the fighters' faces, names and attributes. How you arrange things like stance, strengths and weaknesses, power hand and best punch ultimately determines your fighter's style.

Two on-screen views are available to aid would-be Rocky Marcianos: face-to-face and overhead. The overhead view gives you an idea of how your blows are affecting your opponent. As more of your punches land, you may notice him backing into the ropes or the corner. ►

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And, when a solid punch connects, a fighter's face begins to bruise or bleed.

At the end of the round, your boxer is graded on how many of his punches connected. At the end of the bout, a winner is established as the surviving fighter with the most points or by a knockout or Technical Knockout.

While TKO's graphics, sound and documentation are commendable, I feel that it's lacking a bit in depth. Once you've beaten the computer champ or your friend a few times, you'll probably feel ready to move on. Moreover, if your joystick wrist isn't in shape before entering the ring, believe me that by the end of the third round, it'll feel like you've been lifting weights in the gym all day.

These criticisms aside, TKO certainly offers a unique perspective to computer boxing. While some parents may find TKO too violent for their youngsters, older gamers can look forward to raw competition in an affordable package. *(Accolade, 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128. C-64/$29.95.)*

—JOHN RYAN

ROCKET RANGER ..... B

Rocket Ranger combines classic elements of 1940's serials—sci-fi, rock 'em-sock 'em action, a brilliant rocket scientist and his beautiful daughter. Naturally, the program is liberally sprinkled with Nazis and other assorted villains; and you, of course, are cast as the hero.

When called upon, you don your rocket pack and take to the skies to defend what's left of the free world. The toughest part of your mission is becoming airborne. The manual suggests that you spend an entire game practicing, and I must agree, even though you're bound to feel like a cad for ignoring the threat of encroaching Nazis.

The program doesn't provide a way to bypass the introductory segment, which wears a bit thin after you've died a few times and have to re-boot the game. A Save Game function would also have been nice.

Once you're past these minor inconveniences, you'll have a whale of a time blowing away enemy ME-109s or fighting it out with German Ubermenschen (supermen). One of the better points in the game occurs during your rescue of the Professor and Jane from the Zeppelin. . .and then there's that entire sequence on the moon base—but I don't want to give away the plot!

Winning in Rocket Ranger only happens with the proper amount of skill, practice and luck. This program should thrill anyone who gets a kick out of the genre, and it will probably convert many a newcomer, as well. *(Cinemaware, 4165 Thousand Oaks Blvd., Westlake Village, CA 91362. C-64/$34.95.)*

—ROBERT SODARO

RENEGADE ..... C–

Renegade is Taito's street-style karate game. Vicious thugs, murderous biker gangs, female marauders, razor-wielding assailants and other assorted riffraff are all bent on shortening your stay on the planet.

You must counter their onslaughts, launch offensives and drain the gang boss's energy before you can move on to successive screens. If you don't, it's back to the beginning for you.

Each of Renegade's backgrounds is clearly and colorfully rendered, as are the various human figures. Animation is effective, and the program responds quite well to joystick commands.

Part of the game's difficulty stems from the need to complete each screen in a limited amount of time. Also, your player starts out with only one life; others may be earned by completing additional levels. However, in most screens, unless you find a relatively safe haven from which to attack and defend, your energy is quickly drained.

Renegade's musical score is limited and harsh sounding. Although there is a roster of high scores, there's no way to save the score to disk. Finally, while the game is mildly entertaining and action packed, it's far too easy at some points and far too difficult at others.

This program may be satisfying for people who enjoy repeating earlier, easier levels many times in order to make slight progress toward later screens. For others, Renegade is not an ideal diversion. *(Taito Software, Inc., 267 West Esplanade, North Vancouver, British Columbia, Canada V7M 1A5. C-64/$34.95.)*

—LEN POGGIALI

CORRUPTION C

So you've finally been made a partner, but you're beginning to suspect that there's something wrong within your company. To make matters worse, you're finding evidence that indicates you're being framed for insider trading and drug dealing!

To unravel this mystery, you'll have to do some eavesdropping, some breaking and entering and some fast talking. Try to stay out of jail; or, worse yet, the morgue.

Corruption's graphics are up to Magnetic Scrolls' (authors of The Pawn and Jinxter) usual standards. You'll soon find yourself caught up in the story line's intrigue.

The documentation is in the form of small, loose-leaf notebook pages. It contains game instructions and important clues. The notebook idea is interesting; unfortunately, if you don't have a binder, you'll probably end up with the pages scattered all over the floor.

It seems to me that this started out to be a much larger adventure. The game depends mostly on timing: you have to be at the right place at the right time in order to discover certain facts necessary to solving your problem and proving your innocence.

All in all, Corruption is an enjoyable game, but it leaves you with the feeling that there should have been more. *(Rainbird; distributed by Mediagenic, 3885 Bohannon Drive, Menlo Park, CA 94025. C-64/$39.95.)*

—ART LEWIS KIMBALL

CLUBHOUSE SPORTS ..... B–

Clubhouse Sports is a six-game electronic smorgasbord. It takes a while to get used to playing **Foosball** with a joystick, but once mastered, the controls work flawlessly. The graphics and animation are first rate in **3-D Pinball**, yet the sound effects are unspectacular. **Skeeball** lacks the look and feel of the real thing, but offers a variety of options. The bright colors and great sound of the **Shooting Gallery** make you feel as if you're at a fair. **Billiards** is loaded with interesting options, yet falls short in some important areas. **Crazy Pool** is a different concept that loses a lot in the translation to the computer screen.

You can learn to live with a few shortcomings when a program provides as much fun and value as Clubhouse Sports. It's obvious that a lot of thought went into this software. Everything from the thorough documentation to the lack of electronic copy protection is proof of that. While load times were too long for my taste (nearly two minutes to get to the initial menu screen), for the most part, Clubhouse Sports is worth the wait. *(Mindscape, Inc. 3444 Dundee Rd., Northbrook, IL 60062. C-64/$29.95.)*

—SCOTT WASSER ■

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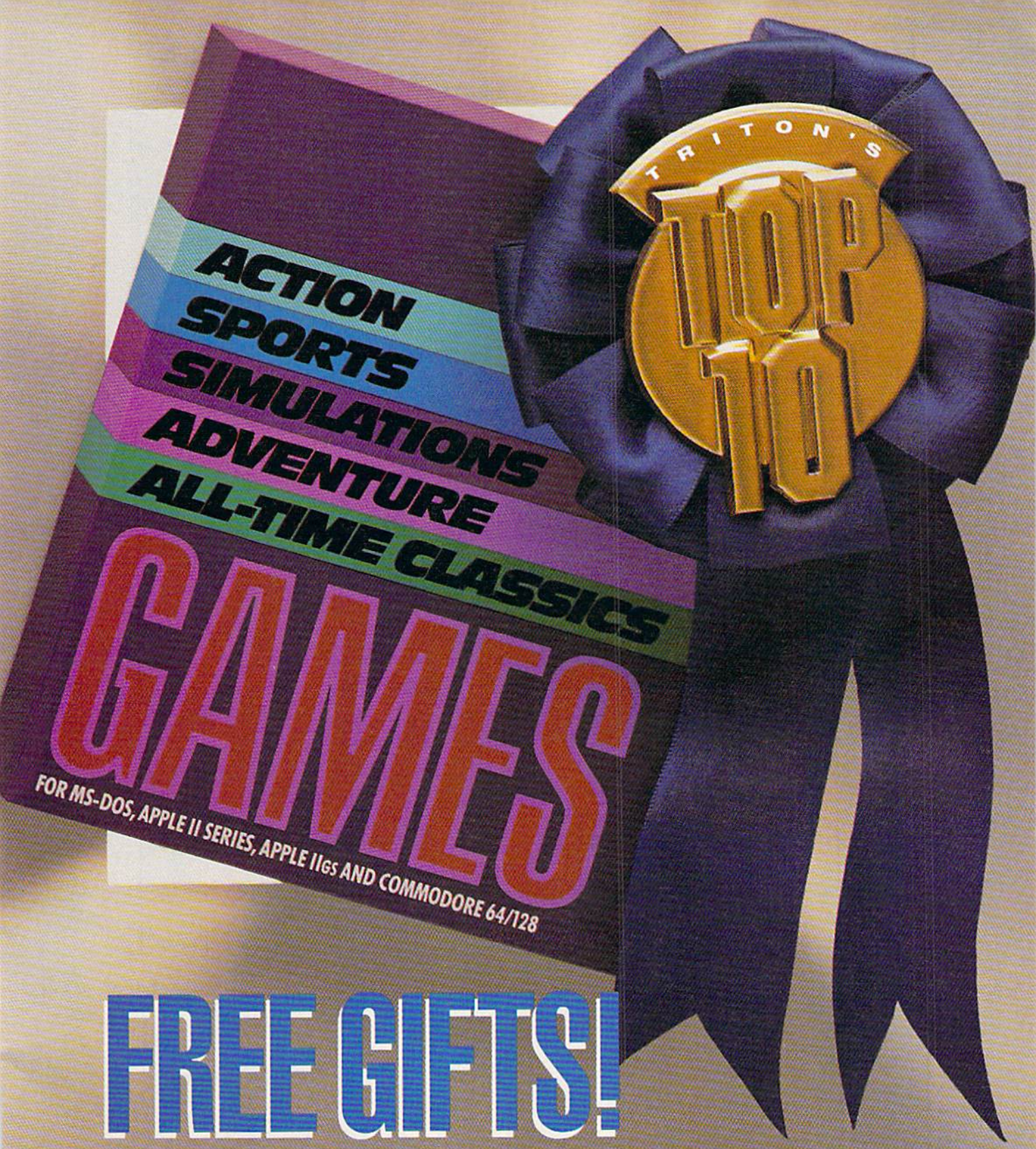

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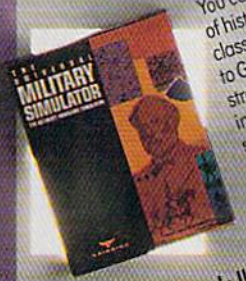

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At Your SERVICE?

Commodore customers are often frustrated in their attempts to get their C-64 or 128 systems repaired. Here's a look at the sources of their dissatisfaction.

By LOREN LOVHAUG

Imagine a room filled with avid C-64 and C-128 owners—a user's group meeting, perhaps, or a seminar at a Commodore computing exposition. The discussion is aimed at identifying the good and bad aspects of Commodore computing, and within minutes people are vigorously recounting their joys and frustrations.

Over the past couple of years, I've led many such discussions on telecommunications networks, at user's group meetings and at large Commodore shows. Although the participants always have various interests and levels of expertise, two opposing themes invariably arise.

One is that most people are very pleased with their C-64s and C-128s, viewing them as good general-purpose home computers that are capable of performing a variety of tasks. In stark contrast, most users express a great deal of dissatisfaction with the level of customer support and service offered by Commodore. As you'll see, these complaints cover a number of issues, from poor availability of certain Commodore products to problems with dealers and repair facilities.

This paradox of satisfaction with the computers but disgruntlement with the company triggered my investigation into Commodore customer service and support. My digging spanned six weeks, from early November to mid-December 1988, during which I spoke with and read letters from hundreds of people representing nearly every facet of the Commodore computing community: users, dealers, journalists, software developers, and present and former Commodore employees. My goal was to gain and pass on some insight into the problems surrounding Commodore customer service.

A FEW STORIES

Many of the negative perceptions that users and dealers expressed about Commodore customer support and service can be traced to the way C-64s and C-128s are sold and serviced in North America. Here are some representative comments taken from user correspondence:

"The other day I stopped at my local dealer's store to try out a 1351 mouse with some of my software. The dealer, who is authorized by Commodore, knew I had bought my computer by mail order and told me I could "rent" his equipment to try out the mouse. If I bought the mouse from him, the rental would be applied toward the purchase; otherwise I was out the rental fee. I was incensed. Commodore, how can you let this go on?"

"Our local authorized service center is also our local dealer, and the owner says he won't fix my computer, although it is under warranty, because I didn't buy it from him. I don't want to return my computer to the mail order company because of stories I've heard about mail-order outfits letting dead computers get 'lost in the shuffle.' Now I have a dead computer and the people who are supposed to fix it won't."

". . .my 1581 disk drive was eating my files. I took it to a nearby repair center, and after two weeks they told me they couldn't find anything wrong, then charged me $20 for their time! I took it to another "busy" service center and three weeks passed before I learned that they also couldn't find anything wrong with the unit. Finally I went to a third repair facility, whose proprietor said he had received a bulletin a few months earlier from Commodore on some 1581 controller chip problems in early units such as mine. This technician ordered a new part, and after another two weeks presented me with a working drive, free of charge. Although I finally received satisfaction, why did it cost me $20 and seven weeks of downtime to get my 1581 fixed?"

"I went through four C-128Ds before I finally got one that functioned properly. As if my hardware problems weren't bad enough, after I showed up at my dealer's shop the third time, he had the nerve to suggest that I was somehow responsible."

"My Commodore printer has been at the repair shop for eight weeks now because Commodore has the part it needs on back order."

REALITIES OF SALES AND SERVICE

Two groups of Commodore's customer-support structure are identified in these comments: hardware retailers and service centers. The retailers can be divided into two additional categories: local computer dealers and mass marketers (mail-order houses and chain stores, such as Sears and Toys "R" Us). The mass marketers vastly outsell the local outlets, for two reasons.

First, as affordable computers targeted for the home market, the C-64 and C-128 have relatively low profit margins compared to other consumer electronic products, including more expensive computers. This means the key to making a solid profit selling 64s and 128s is buying and selling them in large quantities.

Second, Commodore has never established a strong local dealer network. Many dealers mention inconsistency in the

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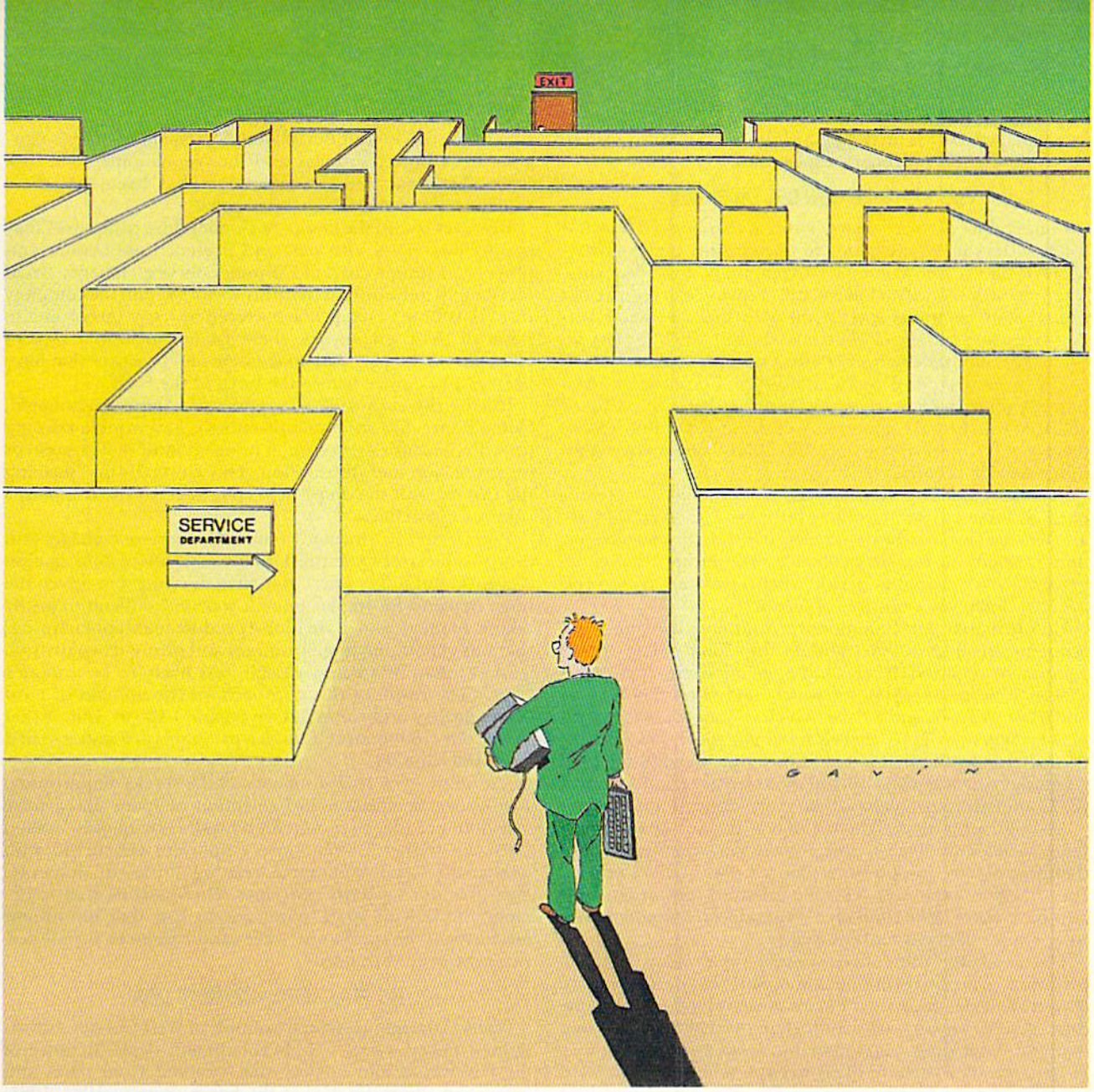

company's sales and support policy (it has oscillated over the past five years from using third-party wholesale representatives to direct regional sales offices for local dealers), as well as a lack of sensitivity to local dealers in general.

Although mass marketers can frequently offer lower hardware prices than local dealers, because they buy and sell in volume and maintain low operational costs, they are not as well equipped to offer post-sale customer support. The typical mail-order house operator or chain store clerk is not hired because of his Commodore computer knowledge; he's hired to process your order, period. When something goes wrong with your equipment, or you have questions about its operation, it's quite likely that he won't be able to offer any assistance.

By contrast, a local Commodore dealer must demonstrate an intimate knowledge of Commodore computers as a competitive advantage to offset the mass marketers' low-price advantage. This knowledge, combined with accessibility, makes local dealers the most dependable source (with the possible exception of user's groups) for Commodore customer support.

The theory is that local dealers should thrive because they can offer a superior level of support; in fact, this is what Commodore tells its dealers. However, support does not necessarily translate into sales.

Curt Swanson, the owner of Computer Stuff, a Minneapolis Commodore-exclusive retailer, puts it this way: "It's not uncommon for me to spend hours in the store or on the phone helping people. . .and I don't mind doing it, when the time leads to a successful and profitable relationship with a customer. However, all too often I'm helping people who purchased their equipment from a mass marketer, which means I'm providing the mass marketer's product support for free. This isn't fair, yet customers expect it." Several other dealers concurred that this situation leads local dealers to feel animosity toward both mass marketers and customers, thereby eroding the quality of support.

Embedded in this equation is the fact that price competition from the mass marketers forces local dealers to maintain low margins on their wares. John Crookshank, a Commodore dealer near Chicago, states that "for years the Commodore market has been extremely competitive. There was a time when the dealer's cost for a C-64 was higher than K-Mart's retail price. Things have gotten better in that regard, but the margin on the 8-bit hardware is still tight, and, as the market matures, it remains difficult to gauge time ►

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investment versus return. Meanwhile, it's crucial to inspire goodwill to get a customer's repeat business."

THE SERVICE CENTER DILEMMA

Commodore service centers, which are authorized by CBM headquarters in West Chester to do warranty and non-warranty repair work on Commodore computers, are of two types. The first category, which I like to call "repair factories," are not Commodore-computer specific, meaning that they repair various types and brands of electronic devices. Such centers include the nationwide network of RCA service centers.

The second type of service facility is Commodore-computer specific, and, in most instances, either owned by or affiliated with a local Commodore dealership. For this reason, there are far more repair factories than Commodore-computer-specific centers.

For the repair factories, like the mass retailers, success is partially linked to doing volume business. However, they are also like the local hardware retailer in having to allocate their time carefully to remain profitable. Technician time is expensive, so it's crucial to decide what repairs are most profitable and allocate resources accordingly.

Unfortunately for Commodore computer owners, these economic realities often translate into long delays to get equipment repaired. After all, if a technician's bench holds a 24-inch stereo television set, which might net $250 in parts and labor charges, and a C-64, which commonly sells brand-new for less than $150, there's no doubt which job will take precedence, assuming the amount of time needed for each is anywhere near equal; and, unless it's fairly straightforward, the Commodore problem will be more difficult to diagnose.

Adding to the probability of delays is the fact that most large facilities are likely to assign their less experienced, and therefore slower, people to repair a C-64, because experienced help is expensive. Less experienced technicians may also have spent little time on Commodore equipment, and so are more likely to make mistakes.

The smaller, Commodore-specific repair facilities have problems related to economics, too. Since many of them are also small dealerships, their personnel may have to pull triple duty, making repairs, sales and telephone calls. In addition, many of these shops can't afford to keep a large inventory of parts, so they're more likely to experience delays related to parts orders. (See accompanying sidebar to learn how one repair shop helps Commodore owners avoid computer breakdown.)

Many of the repair personnel I spoke with commented that Commodore's service department at times aggravates the structural and economic difficulties. They feel that the company should stock a larger supply of parts, especially for equipment that's old or no longer being made. In addition, they mentioned that many of the smaller Commodore repair centers, which have small credit lines, often find West Chester slow in updating payments and credits to their accounts, further causing ordering delays.

INSIDE COMMODORE

All of the repair personnel I spoke with were quick to praise Commodore's ability to design and produce inexpensive, yet high-quality equipment. They call the folklore about shoddy design and "nonexistent" quality control greatly exaggerated, since they see all devices with mechanical components failing from time to time.

Frank Girard, a repair technician who's been working on Commodore computers since the PET days, put it bluntly: "The people who gripe a lot about Commodore quality simply don't know what they're talking about. There have been some fairly well documented problems, such as marginal C-64 power supplies and the troublesome 1541 disk drive alignment, but my experience has been that these machines are generally well designed."

However sound the design of Commodore computers may be, my interviews with past and present Commodore employees (including current Customer Service Manager Brian McDonald) indicate that there are factors within the company that contribute to the problems faced by users. According to some of these employees, these factors include a lack of foresight on the part of management and practices that have been in place since before the birth of the C-64.

During the early 1980s, as personal computers boomed, Commodore, like most manufacturers, had trouble keeping up with demand. As a result, it invested most of its resources in production and distribution. This emphasis on "pushing the product out the door" adversely affected the company's support capabilities.

Paul Gerhardt, a former Commodore service manager and now producer of QuantumLink's Commodore Information Network, put it this way: "You have to remember, given the huge demand for the product, it was very difficult to justify taking money from a division [production/manufacturing] that was generating huge revenues and giving it to a division [service] that, by its very design, was likely to be a money loser." The result of this approach, in the opinion of most of the dealers and Commodore people I spoke with, is that to this day Commodore's service programs are understaffed and underfunded.

"At times, even basic functions of the service department, such as the acquisition and retention of spare parts, were sacrificed in order to sustain high production quotas," added Gerhardt. Other Commodore employees concurred with Gerhardt's assessment, some relating stories of desperate measures during parts shortages. One told me that sometimes the lack of spare parts got so bad that brand-new machines in the warehouse were cannibalized to supply service centers in dire need.

THE FULL-REPLACEMENT DEAL

Perhaps the quintessential example of West Chester's shortsighted policy was the "full-replacement deal." Because of the frustration and anxiety that resulted from parts and technician shortages during the boom years of 1983–1985, Commodore adopted the practice of simply replacing out-of-warranty computers and peripherals for a nominal fee—$55 in the case of the C-64. On the surface, this seemed like a reasonable move, since the company's capacity to produce new machines far outstripped its ability to supply parts, technical training and information to local service outlets. However, this policy turned out to be a financial and public relations disaster.

In the case of the C-64, the $55 pretty much covered production of the replacement machine, but it didn't cover the costs of processing the replacement order, mailing the new machine and storing the broken one. Initially, it was thought that some of these costs could be recovered through refurbishing the defective units or cannibalizing them for parts. However, the costs associated with both of these practices proved prohibitive, so most of the defective machines were just stored. This, in turn, increased the cost of the program, as new storage facilities had to be built.

The public relations effect of this program was even more costly, for the easy exchange policy fostered the notion that Commodore products were "so cheap" they weren't worth fixing, even when the culprit was only a 20-cent blown fuse. This perception also led to abuses by mass marketers, who

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AVOID SERVICE HASSLES WITH COMPUTER SAVER

By JOHN PREMACK

THIRTY PERCENT of the computers that arrive at Dave Kentley's Bedford, Massachusetts, repair shop have defective power supplies. Surprised? You shouldn't be. Kentley is quick to confirm what many C-64 owners suspect: The original-equipment power supply is the weakest component in the entire computer, prone to fail with no warning. The result may be fried microprocessor and memory chips, and an expensive repair bill.

Commodore's power supply is a relatively simple device containing a transformer that reduces 117-volt ac to 9 and 5 volts, along with a few electronic components. The 9-volt ac goes directly to the computer, while the 5-volt output, since it is destined to power the chips on the motherboard and in peripheral devices, is converted to dc and passed through a voltage regulator. This regulator ensures (hopefully) that your computer's delicate integrated circuits get exactly the right voltage, and, if it fails, the chips may be subjected to more voltage than they can handle.

Now, either Kentley is tired of replacing fried chips, has more business than he can handle or is just a nice guy. Whichever it is, he's decided to do something a little out of the ordinary: share a "secret" device he uses to protect against malevolent power supplies.

Actually, this simple electrical gadget, commonly known as a "crowbar," is no secret to anyone familiar with basic electronics, and Dave Kentley thinks Commodore should have installed one in every computer they built. Since they didn't, he's giving C-64 and C-128 owners the opportunity to obtain this electronic insurance policy through his company, D5 Associates, Inc.

Kentley connects a plug-in version of this device, called Computer Saver, between each power supply and computer that lands on his test bench. If the power supply is defective or fails during testing, his bench accessory prevents damage to the computer.

Computer Saver provides this same protection for any model C-64 or C-128 you own. Taking the form of a $1\frac{1}{2} \times \frac{3}{4} \times 1$-inch plastic box, it's secured to an open spot on the computer's printed circuit board with double-sided tape. Its two wires, red and black, intercept the 5-volt circuit at the cassette port.

Basic installation, which requires a soldering iron, takes less than ten minutes from the time you begin to open the case. The factory-installed red power LED shows only 5-volt dc, but an optional green LED that indicates 9-volt ac comes with the unit. Adding the second LED requires soldering two additional connections and drilling a small mounting hole in the computer's plastic case.

Once installed, Computer Saver needs no further attention. It constantly monitors the 5-volt line entering your computer, and, if there's even a momentary surge above 5.6 volts, it automatically shuts the computer down. Of course, you'll lose the data currently in memory, but the alternative is to risk losing both the data *and* your computer.

You can confirm that Computer Saver has swung into action by noting the status of the LEDs. If the red LED is out but the green one remains lit, you'll know that, while the computer is no longer receiving 5 volts, the power supply is still on. This points to a power supply failure. If both LEDs are lit, the power supply is okay. If both LEDs are out, you've probably lost power to the supply itself.

Don't confuse Computer Saver with another computer-protective device known as the surge suppressor. The latter provides a degree of protection against power surges that originate in the wiring in your house or neighborhood, but none whatsoever from a power supply that's run amok. If Computer Saver has responded to a voltage surge in the power lines, turning your computer off will automatically reset the device.

Dave Kentley has such confidence in Computer Saver that his company offers a one-year "free repair" warranty for any damage to chips caused by power supply failure when Computer Saver is in use. For further information, write or phone D5 Associates, Inc., 19 Crosby Drive, Bedford, MA 01730; 617-275-8892. Computer Saver normally costs $29.95, but is available now at the limited-time introductory price of $24.95. If you're uncomfortable with a soldering iron or wary of opening the case of your computer, D5 Associates will install Computer Saver for you for $5. Ⓡ

John Premack is a news photographer, freelance author and SYSOP for the Boston Computer Society Commodore Users Group bulletin board.

demanded and got liberal return deals on defective items, then used these policies to return overstocked items to Commodore for credit.

To make matters worse, end users began employing the mass merchants as return stations for out-of-warranty merchandise, thereby bypassing both the $55 fee and the wait necessary to get a replacement machine. Of course, the mass marketers, who received full credit for the defective merchandise, were more than happy to participate in this charade in order to keep their customers happy.

In the end, the whole program collapsed under the weight of its internal costs and the abuse it spawned, but its effects are still felt today. That a well-intentioned service program could end up costing so much understandably bred mistrust on the part of Commodore. Add to this the personal computer sales slump of 1986, financial difficulties and a management changeover during this period, and you have a recipe for an even more subdued service program. After all, in hard times, the first areas any company cuts are those that are least profitable. Ironically, it was an unwillingness to expand service capabilities that led to the flawed exchange idea in the first place.

A former Commodore service employee also cited a lack of involvement by the service department during product development and distribution. All too often, Commodore has acted only after a problem—and maybe even a public outcry—has arisen, instead of anticipating problems and planning appropriately.

AND NOW?

Today, Commodore maintains a network of service centers that receive assistance through a technical newsletter. West Chester also provides users and owners with technical assistance on-line and through magazine articles.

However, it's the consensus of many users and dealers that Commodore's customer service operation still lacks adequate insight and funding. The company has earned a reputation for favoring production, not service. Also, it has relied heavily on customer loyalty, and there's evidence that, as the C-64 and C-128 product lines mature, the brand-name loyalty is eroding.

Now, more than ever, it's crucial that Commodore develop a visible, full-service dealer network and make a marked effort to support customers. That support must include stocking peripherals and parts, as well as providing technical advice for the C-64 and C-128 lines into the 1990s. Without such a demonstration of goodwill, I fear that even amazing new products won't sustain Commodore's profits. ■

Writer/programmer Loren Lovhaug is editor of Twin Cities 128, *a newsletter for C-128 users. He's also SYSOP of Q-Link's C-128 SIG and a co-SYSOP of GEnie's Commodore Flagship.*

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MS-DOS Disks to Order

Now you can format any MS-DOS disks you may need with a 1571 drive and either a C-64 or C-128.

By MIKLOS GARAMSZEGHY

Part I of this series of articles (*RUN*, April 1989) presented a program, The MS-DOS Connection, that allows the C-128 to copy files to and from MS-DOS disks. The program accompanying this article lets you format new MS-DOS disks automatically on your 1571 drive, using either a C-128 or C-64. You can thus provide yourself with a supply of MS-DOS-formatted disks to use with any MS-DOS file transfer program for the 64 or 128—without depending on the availability of an MS-DOS computer.

The Commodore 1571 disk drive has the capability of formatting disks in the industry-standard MFM recording method. MFM is used by most CP/M, MS-DOS, Atari ST and even Amiga computers. Therefore, with a little knowledge and imagination, you can format virtually any type of disk with a 1571 drive. Unfortunately, 3½-inch disks formatted on a 1581 drive will not work in IBM-type machines under any circumstances. This article is therefore concerned only with 5¼-inch disks formatted in the 1571 drive.

Type in and save a copy of MS-DOS Disk Formatter (Listing 1), which is written entirely in Basic for clarity. All of the required MS-DOS boot record machine language is included in the Data statements at the end of the listing. Pay special attention to the values in these Data statements, because they are used by the MS-DOS operating system to determine the characteristics of the disks. Also, be sure not to make any changes to the text contained in lines 130–150 of the program, since this text is also used in the "boot block" of the MS-DOS disk.

Note that the MS-DOS disk created with this program is a "non-system" disk; therefore, it will not be "bootable" under MS-DOS. However, you can easily make it into a boot disk by using the MS-DOS program SYS.COM to transfer the required system programs to it.

Using the Program

MS-DOS Disk Formatter can create MS-DOS disks in any of four standard types: single-sided, with either 8 or 9 sectors per track, or double-sided with 8 or 9 sectors per track. The program assumes that you will create your disks on device 8. If you want to use another drive, such as device 9, change the value of the variable DV in line 100 to the appropriate value.

MS-DOS Disk Formatter presents prompt and status messages to let you know what is going on. When you run the program, you first get a brief sign-on status message, asking you to wait while the Data statements are being read and table values initialized. For C-128 users in 80-Column mode, you can speed things up by entering the Fast command beforehand.

Commodore 64 users must add the following line to make sure that the 1571 disk drive is in 1571 mode, not 1541-Emulation mode, which is the power-up default for the C-64.

```
481 PRINT#15,"U0>M1"
```

When the main menu appears, you can select the type of disk to format. The "9 sector, double-sided" format (selection 2) is by far the most common MS-DOS disk format. However, all four disk types are fully supported by MS-DOS 2.0 or later versions thereof. They are also supported by the C-128 version of The MS-DOS Connection file-transfer program and the C-64 version thereof, which we plan to publish in the third and final installment of this series.

After selecting the type of disk to format, you are prompted to insert a new disk into the drive and then to press any key to continue. As with any formatting process, all existing information on the disk will be destroyed. If you decide to abort the formatting process, just press the run-stop key. If you then decide to continue, press any other key and the formatting process will resume.

Throughout the process, messages are displayed on the screen to inform you of the step currently being performed. The first is the actual formatting of the disk. This will take about 20 seconds for a single-sided disk or 40 seconds for a double-sided one. The next step is to write the boot block and the file allocation table (FAT) sectors to the disk. The MS-DOS FAT is similar to the Commodore DOS's bit allocation map (BAM), which keeps track of the status of sectors on the disk.

Since the program uses the normal serial bus and not Burst mode for sending data to the disk drive, the sector-writing process may take a moment or two. After the process is complete, you are returned to the opening menu. If you don't wish to format any more disks, simply select option 5 to quit. R

Miklos Garamszeghy has developed many public domain, shareware and commercial software programs for both Commodore and MS-DOS computers. ►

RUN it right: **C-64 or C-128; 1571 disk drive.**

ILLUSTRATED BY ANN DILLON

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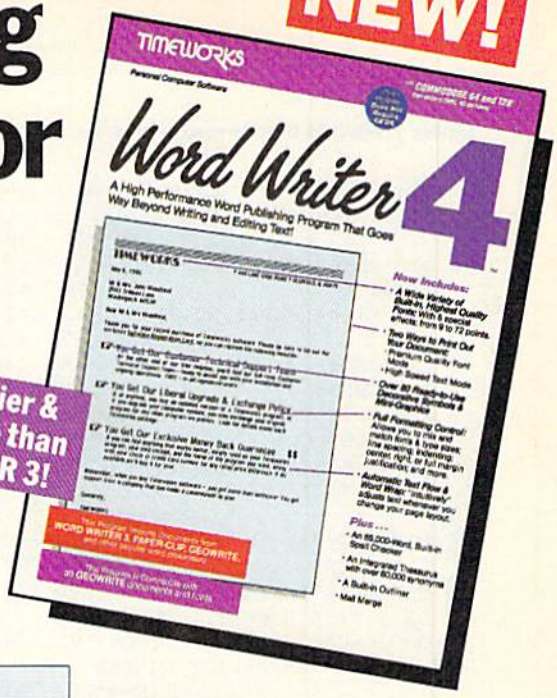

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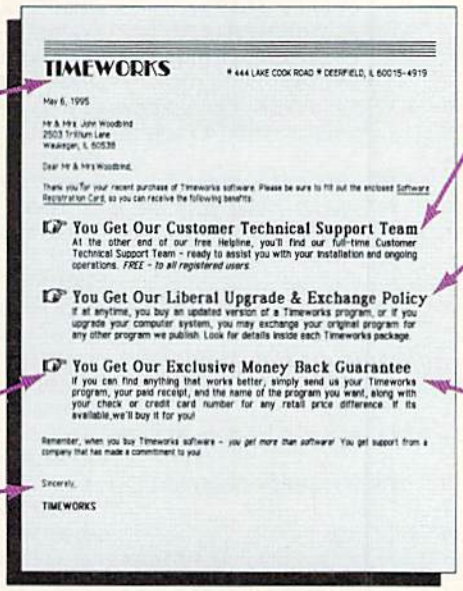
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Listing 1. MS-DOS Disk Formatter program. (Available on ReRUN disk. See page 52.)

```
10 REM 64-128/1571 MS-DOS DISK
   FORMATTER - M. GARAMSZEGHY
                          :REM*241
20 DIM PB(4,16),BB(512),MD(4),T
   Y$(4)                  :REM*90
30 DIM B1(4),SK(4),NU(4),FB(4)
                          :REM*217
40 CR$=CHR$(13)+CHR$(10):REM*45
50 CL$=CHR$(147)          :REM*155
60 REM THIS TEXT APPEARS IN THE
    MS-DOS BOOT SECTOR: :REM*31
70 MS$="THIS DISK WAS FORMATTED
    ON A 1571 DRIVE."+CR$
                          :REM*41
80 MS$=MS$+"IT IS NOT BOOTABLE.
   "+CR$+CR$              :REM*99
90 MS$=MS$+"REPLACE IT WITH A D
   OS SYSTEM DISK ... THEN RE-B
   OOT."+CR$              :REM*102
100 DV=8 : REM DEVICE NUMBER
                          :REM*107
110 HD$= CL$+"1571 MS-DOS DISK
    FORMATTER V1.0"+CHR$(13)
                          :REM*250
120 PRINT HD$ : PRINT  :REM*178
130 PRINT "CREATING MS-DOS DATA
     TABLES ..."          :REM*44
140 PRINT "PLEASE WAIT":REM*169
150 RESTORE               :REM*35
160 FOR I=1 TO 4 : READ MD(I)
                          :REM*70
170 READ TY$(I){2 SPACEs}: NEXT
                          :REM*126
180 FOR I=1 TO 4 : READ B1(I) :
     NEXT                 :REM*63
190 FOR I=1 TO 4 : READ SK(I) :
     NEXT                 :REM*231
200 FOR I=1 TO 4 : READ NU(I) :
     NEXT                 :REM*37
210 FOR I=1 TO 4 : READ FB(I) :
     NEXT                 :REM*32
220 FOR I=1 TO 11 : READ BB(I)
    : NEXT                :REM*229
230 FOR I=1 TO 4          :REM*54
240 FOR J=1 TO 16 : READ PB(I,J
    ) : NEXT              :REM*42
250 NEXT                  :REM*125
260 FOR I=49 TO 104       :REM*147
270 READ BB(I)            :REM*231
280 NEXT                  :REM*155
290 FOR I=1 TO LEN(MS$):REM*125
300 BB(104+I)=ASC(MID$(MS$,I,1)
    )                     :REM*143
310 NEXT                  :REM*185
320 BB(511)=85:BB(512)=170
                          :REM*19
330 PRINT HD$ : PRINT  :REM*143
340 PRINT "THIS PROGRAM FORMATS
     5 1/4 INCH"          :REM*108
350 PRINT "MS-DOS DISKS WITH A
    1571 DRIVE" : PRINT:REM*156
360 PRINT "SELECT MS-DOS DISK T
    YPE:" : PRINT         :REM*66
370 FOR I=1 TO 4 : PRINT I;" =
    ";TY$(I) : NEXT       :REM*95
380 PRINT : PRINT " 5{2 SPACEs}
    = QUIT"               :REM*220
390 PRINT : INPUT "SELECTION --
    -> ";TY               :REM*113
400 IF TY>4 THEN CLOSE 15 : END
                          :REM*18
410 FOR I=1 TO 16         :REM*80
420 BB(I+11)=PB(TY,I)     :REM*24
430 NEXT                  :REM*50
440 PRINT : PRINT         :REM*148
450 PRINT "INSERT NEW DISK IN D
    RIVE"DV               :REM*31
460 PRINT "THEN PRESS A KEY TO
    CONTINUE..."          :REM*242
470 GET K$ : IF K$="" THEN 470
                          :REM*212
480 CLOSE 15 : OPEN 15,DV,15
                            :REM*6
490 PRINT CL$;HD$ : PRINT
                          :REM*70
500 PRINT "FORMATTING ... ";TY$
    (TY) : PRINT          :REM*140
510 F$="U0"+CHR$(B1(TY))+CHR$(1
    29)+CHR$(SK(TY))+CHR$(2)+CH
    R$(39)                :REM*239
520 PRINT#15,F$+CHR$(NU(TY))+CH
    R$(0)+CHR$(0)+CHR$(FB(TY))
                          :REM*131
530 INPUT#15,DD$          :REM*39
540 PRINT "WRITING MS-DOS BOOT
    BLOCK ..." : PRINT    :REM*24
550 PRINT#15,"U0"+CHR$(10)
                          :REM*246
560 FOR I=1 TO 510{2 SPACEs}STE
    P 32                  :REM*108
570 AD=3*256-1+I          :REM*23
580 AL=AD AND 255 : AH=INT(AD/2
    56)                   :REM*153
590 BB$="" : FOR J=0 TO 31
                          :REM*202
600 BB$=BB$+CHR$(BB(I+J))
                          :REM*16
610 NEXT J                :REM*123
620 PRINT#15,"M-W"+CHR$(AL)+CHR
    $(AH)+CHR$(32)+BB$    :REM*215
630 NEXT I                :REM*137
640 PRINT#15,"U0"+CHR$(194)+CHR
    $(0)+CHR$(1)+CHR$(1)+CHR$(0
    )                     :REM*21
650 PRINT "WRITING FAT SECTORS
    ..." : PRINT          :REM*158
660 BB$="" : FOR I=1 TO 32
                          :REM*99
670 BB$=BB$+CHR$(0) : NEXT
                          :REM*117
680 FOR AD=3*256 TO 5*256 STEP
    32                    :REM*62
690 AL=AD AND 255 : AH=INT(AD/2
    56)                   :REM*106
700 PRINT#15,"M-W"+CHR$(AL)+CHR
    $(AH)+CHR$(32)+BB$    :REM*103
710 NEXT AD               :REM*146
720 PRINT#15,"M-W"+CHR$(0)+CHR$
    (3)+CHR$(3)+CHR$(MD(TY))+CH
    R$(255)+CHR$(255)     :REM*73
730 PRINT#15,"U0"+CHR$(194)+CHR
    $(0)+CHR$(2)+CHR$(1)+CHR$(0
    )                     :REM*140
740 F2=4 : IF TY>2 THEN F2=3
                          :REM*224
750 PRINT#15,"U0"+CHR$(194)+CHR
    $(0)+CHR$(F2)+CHR$(1)+CHR$(
    0)                    :REM*163
760 PRINT#15,"UI"         :REM*242
770 GOTO 330              :REM*79
780 DATA 252, "9 SECTOR, SINGLE
     SIDED"               :REM*9
790 DATA 253, "9 SECTOR, DOUBLE
     SIDED"               :REM*101
800 DATA 254, "8 SECTOR, SINGLE
     SIDED"               :REM*254
810 DATA 255, "8 SECTOR, DOUBLE
     SIDED"               :REM*90
820 DATA 70,102,70,102 :REM*116
830 DATA 1,1,2,2          :REM*61
840 DATA 9,9,8,8          :REM*207
850 DATA 0,0,229,229      :REM*235
860 DATA 235,46,144       :REM*139
870 DATA 67,45,49,50      :REM*19
880 DATA 56,46,46,46      :REM*62
890 REM SS-9 PARAMETER BLOCK
                          :REM*57
900 DATA 0,2,1,1,0,2,64,0
                          :REM*101
910 DATA 104,1,252,2,0,9,0,1
                          :REM*33
920 REM DS-9 PARAMETER BLOCK
                          :REM*57
930 DATA 0,2,2,1,0,2,112,0
                          :REM*81
940 DATA 208,2,253,2,0,9,0,2
                          :REM*117
950 REM SS-8 PARAMETER BLOCK
                          :REM*0
960 DATA 0,2,1,1,0,2,64,0
                          :REM*161
970 DATA 64,1,254,1,0,8,0,1
                          :REM*173
980 REM DS-8 PARAMETER BLOCK
                          :REM*0
990 DATA 0,2,2,1,0,2,112,0
                          :REM*141
1000 DATA 128,2,255,1,0,8,0,2
                          :REM*189
1010 REM BOOT BLOCK (COMMON TO
     ALL)                 :REM*100
1020 DATA 250,49,192,142,208,18
     8,0,124              :REM*63
1030 DATA 22,7,6,31,251,190,101
     ,124                 :REM*126
1040 DATA 46,138,4,60,0,116,10,
     180                  :REM*108
1050 DATA 14,187,7,0,205,16,70,
     235                  :REM*70
1060 DATA 239,180,1,205,22,117,
     250,180              :REM*132
1070 DATA 1,205,22,116,250,205,
     25,0                 :REM*80
1080 DATA 32,32,32,32,13,10,13,
     10                   :REM*163
```

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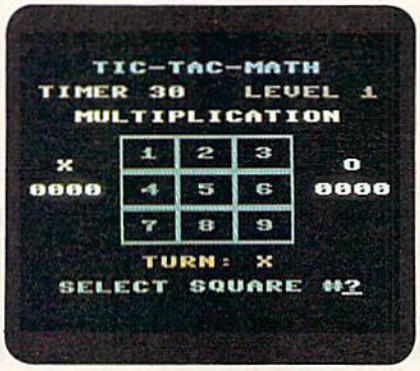
Arithmetic-Tac-Toe

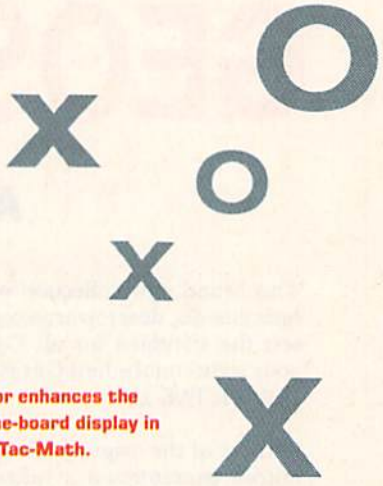
Arithmetic drills add up to fun when your kids play this C-64 version of tic-tac-toe.

By TONY BRANTNER

Round up the kids and bring them over to the computer. It's time to have fun—and practice arithmetic—with Tic-Tac-Math, a C-64 version of tic-tac-toe, in which players solve addition, subtraction, multiplication and division problems to capture squares. Two people can play against each other, or one person can play against the computer.

Type in Listing 1 and save it to disk. When you run the program, there's a brief delay while the game is set up, and then a menu asks which math operation you'd like to practice, the number of people playing, the skill level (1–3) desired and the time limit for solving each problem (15 seconds, 30 seconds or no limit). After the questions are answered, the vividly colored game screen appears.





Color enhances the game-board display in Tic-Tac-Math.

As in the traditional game, Tic-Tac-Math players take turns. Each turn consists of selecting an empty square, 1–9, to mark and solving a math problem. If you answer correctly, a short fanfare will proclaim that you've won the square, along with one point, which is added to your score. If you exceed the time limit or give a wrong answer, the right answer is displayed, and you lose that turn. The first player to capture three squares in a column, row or diagonal wins the game and scores an additional three points.

Note that entering 0 at a prompt for the square number ends the game early and returns you to the menu. Use this feature at the first prompt to change the game parameters.

The C-64 is very good at arithmetic, so it always gets right answers. However, it's not perfect at choosing squares, so if you can't find a human opponent, try to beat the machine! Ⓡ

Tony Brantner, a carpenter by trade, is a self-taught programmer who loves his C-64 for its graphics capabilities.

Listing 1. Tic-Tac-Math program. (Available on ReRUN disk. See page 52.)

```
10 REM---TIC TAC MATH-T. BRANTNER :REM*23
20 POKE52,56:POKE56,56:CLR :REM*127
30 DEFFNY(A)=INT(A/3):DEFFNX(A)=A-FNY(A)*3 :REM*103
40 DIMCH(15),BD(8),DI(7,2),SC(1),MA$(4) :REM*83
50 FORA=0TO15:READCH(A):NEXT:FORA=0TO7:FORZ=0TO2:READDI(A,Z):NEXT:NEXT :REM*71
60 SC=1024:S1=54272:TC=646:Z=RND(-TI) :REM*94
70 TT$="TIC-TAC-MATH":FORA=1TO39:SP$=SP$+CHR$(32):NEXT :REM*218
80 MA$(1)="ADDITION":MA$(2)="SUBTRACTION":MA$(3)="MULTIPLICATION" :REM*42
90 MA$(4)="DIVISION" :REM*91
100 GOSUB1130:FORA=S1TOS1+23:POKEA,0:NEXT:POKES1+5,11:POKES1+24,15 :REM*1
110 GOSUB1000:IL$="0":IH$="9":SC(0)=0:SC(1)=0:LG=0:REM*121
120 REM---START :REM*115
130 GOSUB720:FORA=0TO8:BD(A)=0:NEXT :REM*72
140 LG=1-LG:XO=LG:MN=0 :REM*221
150 REM---MAIN :REM*58
160 XO=1-XO :REM*12
170 CY=17:GOSUB910:CC=8:A$="TURN: "+MID$("XO",XO+1,1):GOSUB930 :REM*150
180 IFPL=1ANDXOTHENGOSUB630:GOTO320 :REM*33
190 TM=0:AL=1:CY=19:CC=5:A$="SELECT SQUARE #":GOSUB470 :REM*47
200 IFIN$="0"THEN110 :REM*63
210 BL=VAL(IN$)-1:IFBD(BL)THEN190 :REM*234
220 POKETC,1:GOSUB860:N1=INT(RND(1)*R1+L1):N2=INT(RND(1)*R2+L2) :REM*214
230 ONMAGOSUB570,580,600,610 :REM*153
240 CY=21:CC=12:A$=MID$(STR$(N1),2)+" "+MID$("+-*/",MA,1)+STR$(N2)+" = " :REM*56
250 TM=TL:AN$=MID$(STR$(AN),2):AL=LEN(AN$):GOSUB470 :REM*154
260 CY=23:CC=3:A$="CORRECT":IFIN$<>AN$THENA$="THE ANSWER IS "+AN$ :REM*10
270 GOSUB930:IFIN$=AN$THEN290 ►
```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ARITHMETIC-TAC-TOE

```
                                :REM*167
28Ø POKES1+4,32:POKES1+4,33:FOR
     A=35TO3STEP-.3:POKES1+1,A:N
     EXT:GOTO3ØØ                :REM*213
29Ø POKES1+4,16:POKES1+4,17:FOR
     A=1TO12:POKES1+1,A*7:FORZ=1
     TO5Ø:NEXT:NEXT             :REM*18
3ØØ FORA=1TO2ØØØ:NEXT:FORCY=19T
     O23:GOSUB91Ø:NEXT          :REM*14
31Ø POKETC,11:GOSUB86Ø:IFIN$<>A
     N$THEN16Ø                  :REM*3Ø
32Ø MN=MN+1:BD(BL)=XO*2-1:GOSUB
     83Ø:SC(XO)=SC(XO)+1:GOSUB79
     Ø                          :REM*79
33Ø WI=7                        :REM*32
34Ø A=Ø:FORZ=ØTO2:A=A+BD(DI(WI,
     Z)):NEXT:IFABS(A)<>3THEN37Ø
                                :REM*92
35Ø SC(XO)=SC(XO)+3:GOSUB79Ø
                                :REM*225
36Ø A$=MID$("XO",XO+1,1)+" HAS
     TIC-TAC-TOE!":GOTO41Ø
                                :REM*42
37Ø WI=WI-1:IFWI>-1THEN34Ø
                                :REM*4
38Ø IFMN<9THEN16Ø               :REM*5
39Ø A$="TIE GAME"               :REM*32
4ØØ REM---END                   :REM*181
41Ø CY=19:CC=4:GOSUB93Ø:CY=21:C
     C=3:A$="PRESS ANY KEY":GOSU
     B93Ø:POKE198,Ø             :REM*139
42Ø IFWI<ØTHENWAIT198,15:GOTO13
     Ø                          :REM*2Ø4
43Ø POKETC,RND(1)*14+2:FORAA=ØT
     O2:BL=DI(WI,AA):GOSUB86Ø:NE
     XT                         :REM*152
44Ø GETA$:IFA$=""THEN43Ø
                                :REM*114
45Ø GOTO13Ø                     :REM*2
46Ø REM---INPUT                 :REM*243
47Ø CX=2Ø-(LEN(A$)+AL):GOSUB94Ø
     :CX=CX+LEN(A$)*2:CY=CY+1:GO
     SUB89Ø                     :REM*144
48Ø POKETC,1:FORA=1TOAL*2:PRINT
     "{COMD T}";:NEXT:CY=CY-1
                                :REM*6Ø
49Ø IN$="":POKE198,Ø:CC=1:TI$="
     ØØØØØØ"                    :REM*35
5ØØ A$="?":GOSUB94Ø:A$=" ":GOSU
     B94Ø:GETA$:Z=LEN(IN$)
                                :REM*223
51Ø IFTMTHENIFVAL(TI$)=>TMTHENR
     ETURN                      :REM*142
52Ø IFA$=CHR$(13)THENIFZTHENRET
     URN                        :REM*66
53Ø IFA$=CHR$(2Ø)THENIFZTHENIN$
     =LEFT$(IN$,Z-1):CX=CX-2:GOT
     O5ØØ                       :REM*14Ø
54Ø IFA$<IL$ORA$>IH$ORZ=ALTHEN5
     ØØ                         :REM*83
55Ø IN$=IN$+A$:GOSUB94Ø:CX=CX+2
     :GOTO5ØØ                   :REM*44
56Ø REM---MATH                  :REM*236
57Ø AN=N1+N2:RETURN             :REM*136
58Ø IFN1<N2THENA=N1:N1=N2:N2=A
                                :REM*41
59Ø AN=N1-N2:RETURN             :REM*174
6ØØ AN=N1*N2:RETURN             :REM*222
61Ø AN=N1*N2:A=N1:N1=AN:AN=A:RE
     TURN                       :REM*41
62Ø REM---COMPUTER MOVE:REM*215
63Ø CY=19:CC=5:A$="COMPUTER'S M
     OVE":GOSUB93Ø              :REM*152
64Ø M1=1:FORA=ØTO7              :REM*23Ø
65Ø MØ=Ø:CM=Ø:FORZ=ØTO2:REM*191
66Ø IFBD(DI(A,Z))=ØTHENMØ=2:EP=
     DI(A,Z)                    :REM*126
67Ø CM=CM+BD(DI(A,Z)):NEXT
                                :REM*46
68Ø IFMØTHENIFABS(CM)=2THENMØ=3
     :IFCM=2THENMØ=4            :REM*43
69Ø MØ=MØ+RND(1):IFMØ>M1THENM1=
     MØ:BL=EP                   :REM*144
7ØØ NEXT:GOTO91Ø                :REM*78
71Ø REM---SCREEN                :REM*235
72Ø PRINT"{SHFT CLR}":CY=1:CC=1
     4:A$=TT$:GOSUB93Ø          :REM*172
73Ø CY=3:CX=2:CC=1Ø:A$="TIMER"+
     STR$(TL):IFTL=ØTHENA$="TIME
     R OFF"                     :REM*72
74Ø GOSUB94Ø:CX=24:CC=2:A$="LEV
     EL"+STR$(LV):GOSUB94Ø
                                :REM*79
75Ø CY=5:CC=7:A$=MA$(MA):GOSUB9
     3Ø                         :REM*47
76Ø POKETC,11:CC=11             :REM*54
77Ø FORBL=ØTO8:GOSUB86Ø:CY=CY+1
     :CX=CX+2:A$=CHR$(BL+49):GOS
     UB94Ø:NEXT                 :REM*164
78Ø CY=9:CX=4:CC=7:A$="X":GOSUB
     94Ø:CX=34:CC=13:A$="O":GOSU
     B94Ø                       :REM*126
79Ø CX=1:A$=STR$(SC(Ø)):GOSUB81
     Ø                          :REM*2Ø5
8ØØ CX=31:A$=STR$(SC(1)):REM*95
81Ø CC=1:CY=11:A$=LEFT$("ØØØØ",
     5-LEN(A$))+MID$(A$,2):GOTO9
     4Ø                         :REM*214
82Ø REM---PRINT X/O             :REM*121
83Ø CY=8+FNY(BL)*3:CX=13+FNX(BL
     )*6:CC=7:A$="X":IFXOTHENCC=
     13:A$="O"                  :REM*227
84Ø GOTO94Ø                     :REM*154
85Ø REM---PRINT SQUARE          :REM*248
86Ø CY=7+FNY(BL)*3:CX=11+FNX(BL
     )*6                        :REM*178
87Ø GOSUB89Ø:PRINT"{SHFT O}{4 C
     OMD Ys}{SHFT P}":PRINTTAB(C
     X)"{COMD H}{4 CRSR RTs}{COM
     D M}":PRINTTAB(CX)"{SHFT L}
     {4 COMD Ps}{SHFT @}":RETURN
                                :REM*123
88Ø REM---PLOT                  :REM*184
89Ø POKE214,CY-1:PRINT:PRINTTAB
     (CX);:RETURN               :REM*251
9ØØ REM---CLEAR LINE            :REM*2Ø4
91Ø POKE214,CY-1:PRINT:PRINTSP$
     :RETURN                    :REM*64
92Ø REM---PRINT WIDE STRING
                                :REM*57
93Ø CX=2Ø-LEN(A$)               :REM*118
94Ø SL=SC+CY*4Ø+CX              :REM*24
95Ø FORA=1TOLEN(A$)             :REM*66
96Ø Z=(ASC(MID$(A$,A,1))AND63)*
     2                          :REM*27
97Ø POKESL+S1,CC:POKESL+S1+1,CC
     :POKESL,Z+128:POKESL+1,Z+12
     9:SL=SL+2                  :REM*96
98Ø NEXT:RETURN                 :REM*114
99Ø REM---MENU                  :REM*23Ø
1ØØØ PRINT"{SHFT CLR}":CY=1:CC=
     14:A$=TT$+" MENU":GOSUB93Ø
                                :REM*89
1Ø1Ø CC=7:CX=2:FORMA=1TO4:A$=ST
     R$(MA)+"-"+MA$(MA):CY=3+MA
     :GOSUB94Ø:NEXT             :REM*1ØØ
1Ø2Ø TM=Ø:CY=9:A$="OPERATION (1
     -4) ":AL=1:IL$="1":IH$="4"
     :GOSUB47Ø:MA=VAL(IN$)
                                :REM*47
1Ø3Ø CY=12:CC=5:A$="PLAYERS (1/
     2) ":IH$="2":GOSUB47Ø:PL=V
     AL(IN$)                    :REM*1Ø4
1Ø4Ø CY=15:CC=2:A$="LEVEL (1-3)
      ":IH$="3":GOSUB47Ø:LV=VAL
     (IN$)                      :REM*161
1Ø5Ø R1=1Ø{UP ARROW}LV:R2=R1:IF
     MA>2ANDLV=3THENR1=1ØØ
                                :REM*9
1Ø6Ø IFMA>2ANDLV>1THENR2=1Ø{UP
     ARROW}(LV-1)               :REM*243
1Ø7Ø L1=R1/1Ø:L2=R2/1Ø:R1=R1-L1
     :R2=R2-L2                  :REM*197
1Ø8Ø CX=8:CY=18:CC=1Ø:A$="1-TIM
     ER OFF":GOSUB94Ø           :REM*81
1Ø9Ø CY=19:A$="2-15 SECONDS":GO
     SUB94Ø:CY=2Ø:A$="3-3Ø SECO
     NDS":GOSUB94Ø              :REM*48
11ØØ CY=22:A$="TIMER (1-3) ":GO
     SUB47Ø:TL=15*(VAL(IN$)-1)
                                :REM*183
111Ø RETURN                     :REM*224
112Ø REM---REDEFINE CHARACTERS
                                :REM*35
113Ø POKE5328Ø,Ø:POKE53281,Ø:PR
     INTCHR$(8)CHR$(147):REM*8Ø
114Ø CY=12:CX=14:GOSUB89Ø:PRINT
     "{COMD 7}SETTING UP..."
                                :REM*169
115Ø POKE56334,PEEK(56334)AND25
     4:POKE1,PEEK(1)AND251
                                :REM*32
116Ø POKE781,5:POKE782,1:POKE91
     ,212:POKE9Ø,Ø:POKE89,6Ø:PO
     KE88,Ø                     :REM*189
117Ø SYS41964:POKE1,PEEK(1)OR4:
     POKE56334,PEEK(56334)OR1
                                :REM*223
118Ø POKE53272,(PEEK(53272)AND2
     4Ø)OR14                    :REM*29
119Ø N1=14336:N2=N1+1Ø24:N3=N2+
     8                          :REM*136
12ØØ FORA=ØTO63:FORZ=ØTO7
                                :REM*82
121Ø CN=PEEK(N1+A*8+Z):AA=CH((C
     NAND24Ø)/16):ZZ=CH(CNAND15
     )                          :REM*47
122Ø POKEN2+A*16+Z,AA:POKEN3+A*
     16+Z,ZZ                    :REM*157
123Ø NEXT:NEXT:RETURN           :REM*242
124Ø DATAØ,3,12,15,48,51,6Ø,63,
     192,195,2Ø4,2Ø7,24Ø,243,25
     2,255                      :REM*222
125Ø DATAØ,1,2,3,4,5,6,7,8,Ø,3,
     6,1,4,7,2,5,8,Ø,4,8,2,4,6
                                :REM*19
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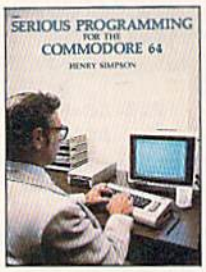

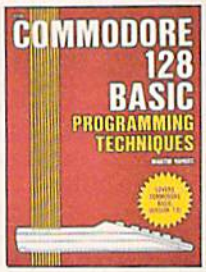

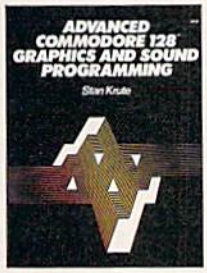

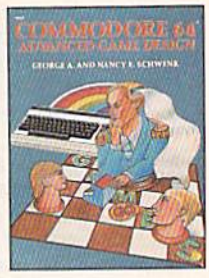

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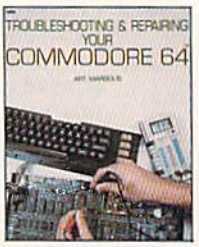

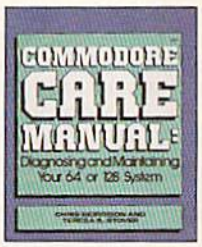

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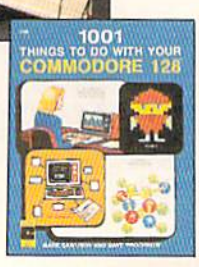

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Troubleshooting Troublesome Type-Ins

For smooth-running programs every time, follow these tips from RUN's expert bug-buster.

By TIM WALSH

In the spirit of George Bush's kinder and gentler nation, this article will add some kindness and gentleness to the tedious task of typing in *RUN* program listings. It details trade secrets we use at the magazine to troubleshoot even the most complicated listings, usually in a minute or two. After reading this article, dig out your old disks containing copies of typed-in programs that never worked for you, and you'll have them running in short order.

We hope this information will help our many readers who call and write asking why programs we publish don't work. The vast majority of our programs *do* work; we test them thoroughly to make sure. As with any magazine, an occasional misprint or omission sneaks in that might interfere with a program's functioning, and, once aware of it, we mention it in our RUN Amok column. But bear in mind that nearly every program published in *RUN* is entirely free of printing or other errors.

To ensure that your type-ins will run properly, first read the "How To Walk Before You RUN" page that we publish periodically (the latest occasion being page 90 of the February 1989 issue) and then use our Checksum program to detect errors as you enter code. A listing of the Checksum, along with instructions for its use, is published in every issue of the magazine. But what if you can't get *it* to work? Let's examine that problem and what to do about it; then you can follow the same advice for troubleshooting other programs.

RUN's Checksum

RUN's Checksum program is designed for both the C-64 and the C-128 in 64 or 128 mode. It works by calculating for each program line a number, from 0 to 255, based on the characters you type into the line, and then displaying that number in the Home position on the screen when you press

return to end the line. If that number agrees with the number printed after :REM* in the line in the magazine, you have typed the line correctly. Suppose :REM*123 appears in the magazine; then the Checksum program should print 123 at the top of the screen. (By the way, don't include the :REM* and checksum number when you enter program lines.)

I spend considerable time soothing the anger of readers who complain that our Checksum program is filled with errors. Most of them swear that not only they, but their spouse, the computer whiz-kid next door, even their pastor and the neighborhood Girl Scout troop have compared their typed-in listing, line for line, to the one in the magazine. Therefore, it must be right. The volume of complaints has me wondering if some morning the reporting staff from "60 Minutes" will be waiting in the office, demanding we print a correct version of *RUN*'s Checksum.

I tell these readers to make a printout of their listing to compare to the one in the magazine, instead of just comparing from the screen. If they don't have a printer, they should list only a few lines of their work to the screen at a time.

Whichever you do, here are three steps to follow in comparing listings:

1. Study your Data statements carefully to make sure you didn't substitute any periods for the commas between data numbers. More than half the complaints we receive about the Checksum program result from this mistake. Correct any discrepancies and resave the program.

2. Check for missing or transposed numbers, such as 13 entered as 31. Again, make any necessary corrections and resave the program.

3. Try listing each line individually, to see whether you pressed the return key after typing it. For example, if LIST 110 displays both lines 110 and 120, you'll know you didn't press return at the end of line 110—even though the double line may be broken so it looks like you did.

Note that because *RUN*'s Checksum contains a New command, it erases itself from Basic memory when it finishes running. Therefore, when you correct an error in the Checksum listing, be sure to save the corrected version to disk before running it. In fact, save-before-run is good practice with all programs.

If you still can't get the Checksum program to work, see the end of this article for information on obtaining additional help.

Hex Loaders

Next to the Checksum, hex loaders are the greatest source of agony for *RUN* readers typing in listings. What is a hex loader? Well, it's any one of the lengthy programs, such as RUN Paint, RUN Term and RUN Copy, that employ Data statements in creating and saving to disk an executable, or "working," file (usually in machine language object code). These Data statements consist of a line number, the word DATA and three twenty-character groups of actual data, as in: ►

ILLUSTRATED BY NELLE DAVIS

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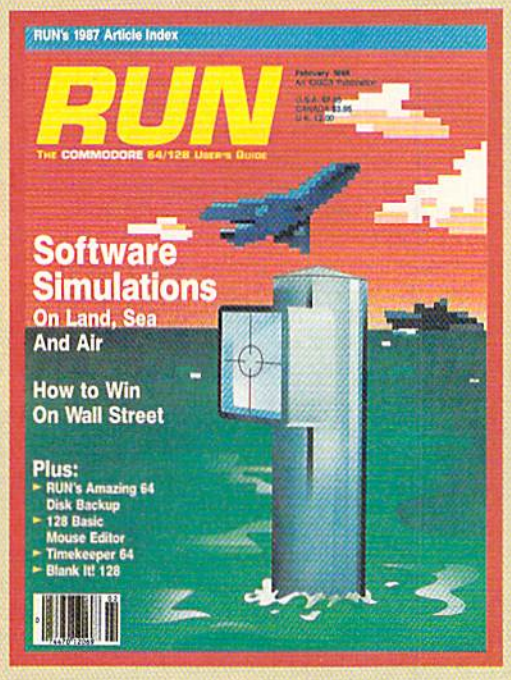

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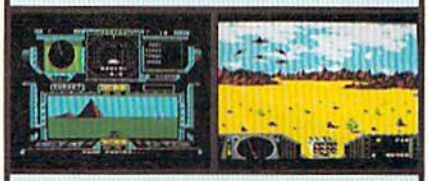

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```
101 DATA 0394A94C8DA7028DAA02 8
DAD028D399AAD0203C9 60D009A
D0303C997D002      :REM*80
```

The data is in base 16, or hexadecimal, form, hence the name "hex loader."

Hex loaders are the most condensed form in which we can publish machine language programs. While they are no more difficult to type in than other kinds of programs, many readers have trouble making them work. The Checksum numbers may come out fine, yet, when they try to run the program, all they get is a flashing light on the disk drive.

Believe it or not, it's remarkably easy to detect typing errors in troublesome hex loaders and have them running in minutes. Just follow these steps:

1. Check to be sure you've included all three spaces (the one after the word Data and the two that separate the groups) in the Data statements, because the Checksum for the line will not take account of these. The program looks only for spaces that are between quotation marks, so the line's checksum would be the same whether or not you left out a space or typed in extra ones. All Data statements except the last line in a hex loader must follow the format shown above.

2. If your disk drive light flashes every time you run the loader, a disk error—most likely a File Exists error—has occurred. When this happens, be sure you haven't already saved the loader's working file (or any other file) to that disk with the filename the loader is trying to use in writing to disk. You'll typically find that filename in the first few lines of the loader listing. For example, if line 10 reads:

```
10 OPEN 8,8,8,"+PROGRAM ML,P,W"
```

the filename is +PROGRAM ML.

In this situation, you should change the filename that already exists on disk, using the following command:

```
OPEN 15,8,15,"R0:RENAME PROGRAM=
+PROGRAM ML":CLOSE 15
```

This would change +PROGRAM ML to RENAME PROGRAM, and then you could run the hex loader to create your new +PROGRAM ML file.

3. Carefully follow all instructions for activating the working file. For example, some working files require a short boot program to get under way. Others, such as RUN Paint, need to have four different files, created by four different hex loaders.

Because hex loaders write a file to disk when you run them, you must place another disk in the drive once the hex loader is run. If you want a hex loader to write a second copy of its working file to disk, you must rename the first copy or change the filename of the file it writes to disk.

Spaces Inside Quotes

RUN readers frequently encounter trouble with type-in listings because they put the wrong number of spaces inside the quotation marks in a Print or Input statement. As an illustration, examine the following two lines:

```
100 PRINT "{CTRL 9} {SHFT E}NTER
    YOUR NAME:":INPUT N$
100 PRINT "{CTRL 9}{SHFT E}NTER
    YOUR NAME:":INPUT N$
```

While the second line may seem at a glance to be identical to the first, there's no space between the {CTRL 9} and the {SHFT E}, so it will produce a different checksum number. If you can't get the proper checksum number for a Print or Input statement, count the spaces inside the quotation marks to be sure the right number is there.

Further Assistance

RUN's Checksum and hex loaders aside, the majority of the programs published in *RUN* use a straightforward, conventional format. Occasionally, we publish a non-hex loader program that will write an executable file to disk, but this is rare. Some programs contain little-used symbols that few readers recognize, such as the ↑, meaning raise to the indicated power, or π, the symbol for the numerical constant pi (3.14159. . .), represented as PI in a listing.

Any time you type in a listing that won't work no matter what you try, let us know. Modem owners can get a speedy response by calling our *RUN*ning Board BBS at 603-924-9704 or posting mail in the *RUN* area on Q-Link. Also, both *RUN*'s BBS and Q-Link provide *RUN*'s Checksum program for downloading.

If all else fails, send your listing, with an explanation of your problem, to me c/o RUN Editorial, 80 Elm St., Peterborough, NH 03458, enclosing a SASE for a reply. You may also send me a disk containing typed-in listings you can't correct, and I'll fix them for you. Just be sure to enclose a disk mailer and sufficient return postage. ■

Tim Walsh, RUN's technical editor, is typically seen hunched over the keyboard testing new programs.

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Box Scores

You win at this traditional connect-the-dots game when you get a corner on the box market.

By MICHAEL MURTAGH

Remember that pencil-and-paper game you played as a kid, where you and your opponent connected the dots in a big square matrix, with the objective of completing, and thus claiming, the most squares? Well, Boxes is a C-64 version of that game. It's fun and challenging to play, and suited to both children and adults.

Type in Listing 1 and save it to disk before running it. The game can be played with one or two joysticks; if only one will be used, plug it into *port 1*.

The program begins by asking you and your opponent to enter your names. Then it displays a six-by-six matrix of stars (instead of dots) and tells the player who entered his or her name first to take a turn. After that, you and your opponent usually alternate.

When it's your turn, use the joystick lever to move the cursor-line to an empty space between adjacent stars and then press the button to replace the cursor-line with a box-line. To move the cursor-line horizontally or vertically, you press the joystick lever left-right or up-down. Moving the lever diagonally switches the cursor line from horizontal to vertical position, or vice-versa.

If you complete a box, you win it, and your player number (1 or 2) appears inside it; you also then have another turn. If you don't complete a box, control passes to your opponent. To prevent confusion, the program always displays the name of the player whose turn is next. The winner is the player with the greatest number of boxes when the matrix has been completely filled in. After a winner has been declared, you can play another game, and the previous loser has the first turn.

Boxes is easy to learn, but it's tricky and not at all easy to win! R

Michael Murtagh is a research physicist who likes to take a break from working on mainframes by writing C-64 programs.

Listing 1. Boxes program. (Available on ReRUN disk. See page 52.)

```
10 REM BOXES                    :REM*179
20 DIM XS(10),YS(10),ZS(10,2),L
   D(11,11),FB(25)              :REM*217
30 GOTO220                      :REM*99
40 REM **]SUB **{2 SPACEs}JOYST
   ICK ROUTINE                  :REM*137
50 FR=1:JV=PEEK(JL):FR=JVAND16:
   IFFR=0THEN80                 :REM*125
60 JV=MK-JVANDMK:IFJV>0THEN80
                                :REM*159
70 GOTO50                       :REM*200
80 RETURN                       :REM*222
90 REM ** SUB ** CHECK IF BOX F
   ILLED                        :REM*248
100 N=0:GB=0:FORI=1TO25:IFFB(I)
    >0THENN=N+1:GOTO190         :REM*3
110 FL=0:VB=INT((I-1)/5)+1:HB=I
    -5*(VB-1)                   :REM*130
120 IFLD(2*HB-1,2*VB)=1THENFL=F
    L+1                         :REM*58
130 IFLD(2*HB,2*VB-1)=1THENFL=F
    L+1                         :REM*87
140 IFLD(2*HB+1,2*VB)=1THENFL=F
    L+1                         :REM*79
150 IFLD(2*HB,2*VB+1)=1THENFL=F
    L+1                         :REM*81
160 IFFL<4THEN190               :REM*43
170 GB=1:FB(I)=P:N=N+1:A=48+P:B
    =C(P):XB=XO+80*(VB-1)+4*(HB
    -1)+42                      :REM*141
180 POKEXB,A:POKEXB+DC,B
                                :REM*240
190 NEXT                        :REM*65
200 RETURN                      :REM*87
210 REM INITIALIZE              :REM*154
220 GOSUB610:GOSUB780           :REM*133
230 REM START GAME LOOP         :REM*72
240 GOSUB50:IFFR=0GOTO380
                                :REM*206
250 XT=XL+XS(JV):YT=YL+YS(JV):G
    M=0                         :REM*147
260 IFXT<0 OR XT>20 OR YT<0 OR
    YT>10 THEN240               :REM*135
270 IFLD(HO,VO)=0THENPOKEBO,32:
    POKEBO+DC,1:GOTO290:REM*118
280 POKEBO,BS:POKEBO+DC,3
                                :REM*42
290 A=XS(JV):B=YS(JV)           :REM*169
300 IFA<>0THENHO=HO+A/2:REM*180
310 IFB<>0THENVO=VO+B           :REM*10
320 XL=XT:YL=YT:BB=XO+40*YL+XL:
    BS=ZS(JV,BL):POKEBB,BS:POKE
    BB+DC,12:BO=BB              :REM*6
330 FORI=0TO3:A=2{UP ARROW}I:IF
    A=JVTHENGOTO360             :REM*105
340 NEXT                        :REM*215
350 BL=BL+1:IFBL>2THENBL=1
                                :REM*206
360 GOTO240                     :REM*178
370 REM DRAW LINE AND CHECK IF
    BOXES FILLED                :REM*220
380 IFLD(HO,VO)=1THEN240
                                :REM*237
```

RUN it right: **C-64; joystick**

ILLUSTRATED BY LAURA JOHNSON

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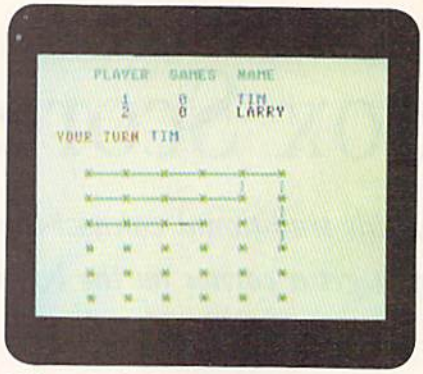
BOX SCORES

```
39Ø B=BO:II=Ø:IFBL=1THENII=2:B=
     BO-1                  :REM*231
4ØØ FORI=ØTOII:POKEB+I,BS:POKEB
     +I+DC,3:NEXT          :REM*35
41Ø LD(HO,VO)=1:           :REM*187
42Ø GOSUB1ØØ:IFN=25GOTO48Ø
                           :REM*185
43Ø POKEBO,BS:POKEBO+DC,12
                           :REM*141
44Ø IFGB=1THEN24Ø          :REM*227
45Ø P=P+1:IFP>2THENP=1     :REM*8Ø
46Ø JL=NJ(P):PRINTH$M$C$(P)N$(P
     )BB$:GOTO24Ø          :REM*254
47Ø REM ** GAME WON ** FIND THE
      WINNER               :REM*234
48Ø FORI=1TO2:BT(I)=Ø:NEXT
                           :REM*184
49Ø FORI=1TO25:J=FB(I):BT(J)=BT
     (J)+1:NEXT            :REM*133
5ØØ PRINTCHR$(147)D2$D2$:REM*51
51Ø FOR I=1TO2:PRINTA5$C$(I)BT(
     I)A5$N$(I):PRINT:NEXT
                           :REM*153
52Ø J=1:IFBT(2)>BT(1)THENJ=2
                           :REM*19
53Ø PRINTD2$A5$C$(J)"THE WINNER
      IS "N$(J)            :REM*195
54Ø NG(J)=NG(J)+1          :REM*113
55Ø PRINTD2$A5$"PLAY AGAIN (Y/N
     )?"                   :REM*145
56Ø GETYN$:IFYN$=""THEN56Ø
                           :REM*58
57Ø IFYN$="Y"THENGOSUB78Ø:GOTO2
     4Ø                    :REM*159
58Ø IFYN$<>"N"THEN56Ø      :REM*235
59Ø STOP                   :REM*22Ø
6ØØ REM ** SUB ** SETUP INITIAL
      GAME                 :REM*13
61Ø PRINTCHR$(147):POKE5328Ø,3:
     POKE53281,1:DC=55296-1Ø24:M
     K=15                  :REM*13Ø
62Ø D1$=CHR$(17):D2$=D1$+D1$:A1
```



Millions of schoolchildren must have played this game in study periods.

```
     $=CHR$(29):A2$=A1$+A1$:A5$=
     A1$                   :REM*1Ø4
63Ø FOR I=1TO4:A5$=A5$+A1$:NEXT
     :C(1)=14:C(2)=4:C$(1)=CHR$(
     154):C$(2)=CHR$(156)
                           :REM*192
64Ø H$=CHR$(19)+D2$+D2$+D2$+A5$
     +CHR$(13):B$=CHR$(32):BB$=B
     $                     :REM*144
65Ø FORI=1TO9:BB$=BB$+B$:NEXT:M
     $=CHR$(15Ø)+"{3 SPACEs}YOUR
      TURN ":MM$="BOXES" :REM*97
66Ø FORJ=1TO4:FORI=1TO2:PRINTD1
     $C$(I)MM$;:NEXT:NEXT:PRINTD
     1$CHR$(15Ø)           :REM*117
67Ø FORI=1TO2:NG(I)=Ø      :REM*154
68Ø PRINT"NAME OF PLAYER #"I;:I
     NPUTN$(I):NEXT        :REM*22
69Ø PRINT:INPUT"NUMBER OF JOYST
     ICKS ";N              :REM*11
7ØØ NJ(1)=56321:NJ(2)=NJ(1):IFN
     =2THENNJ(2)=5632Ø     :REM*172
71Ø FORI=1TO1Ø:READA,B:XS(I)=A:
     YS(I)=B:NEXT          :REM*22Ø
72Ø FORI=1TO2:FORJ=1TO1Ø:READA:
     ZS(J,I)=A:NEXT:NEXT :REM*53
73Ø DATAØ,-2,Ø,2,Ø,Ø,-4,Ø,-2,-1
     ,-2,1,Ø,Ø,4,Ø,2,-1,2,1
                           :REM*9Ø
74Ø DATA67,67,Ø,67,66,66,Ø,67,6
     6,66                  :REM*114
75Ø DATA66,66,Ø,66,67,67,Ø,66,6
     7,67                  :REM*6
76Ø RETURN                 :REM*133
77Ø REM ** SUB ** DRAW BOXES FO
     R NEW GAME            :REM*135
78Ø PRINTCHR$(147)D1$      :REM*18
79Ø PRINTCHR$(159)A5$A2$"PLAYER
     "A2$"GAMES"A2$"NAME"CHR$(15
     Ø)                    :REM*143
8ØØ FORI=1TO2:VV=48+NG(I):V=48+
     I                     :REM*112
81Ø Q$(I)=C$(I)+A5$+CHR$(V)+A5$
     +CHR$(VV)+A5$+N$(I):NEXT
                           :REM*1Ø1
82Ø PRINT:FORI=1TO2:NB(I)=Ø:PRI
     NTA5$Q$(I):NEXT:PRINTCHR$(1
     54)                   :REM*1Ø5
83Ø XO=143Ø:S=42:SC=5      :REM*2Ø9
84Ø FOR I=1TO12STEP2       :REM*228
85Ø YO=XO+4Ø*(I-1)         :REM*151
86Ø FORJ=1TO24STEP4        :REM*39
87Ø XY=YO+J-1:POKEXY,S:POKEDC+X
     Y,SC:NEXT:NEXT        :REM*41
88Ø FORI=1TO25:FB(I)=Ø:NEXT:FOR
     I=1TO11:FORJ=1TO11:LD(I,J)=
     Ø:NEXT:NEXT           :REM*213
89Ø JL=NJ(1):XL=2:YL=Ø:JV=1:HO=
     2:VO=1:P=P+1:IFP>2THENP=1
                           :REM*14Ø
9ØØ BB=XO+2:BS=ZS(1,1):POKEBB,B
     S:POKEBB+DC,12:BO=BB:BL=1
                           :REM*236
91Ø PRINTH$M$C$(P)N$(P)BB$
                           :REM*14
92Ø RETURN                 :REM*34 ■
```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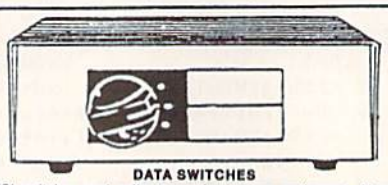

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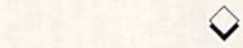
Anatomy of Calculations

This program tutorial not only does your arithmetic calculations, but shows you what's happening in the process.



By JIM BUTTERFIELD

Calculator is a two-for-one arithmetic program that evaluates expressions employing either decimal or hexadecimal numbers. As a bonus, it gives you a chance to see a couple of related programming concepts—stacks and reverse Polish notation—at work.

The program accepts both decimal and hexadecimal integers as input, and you can use both bases in the same calculation—just put a $ before any hex number you enter. It will not accept decimal fractions *per se*, but you can get around this limitation by substituting expressions such as, for example, 37/10 or 3+7/10 for the decimal 3.7.

You can type in either single numbers, to get their decimal or hex equivalents, or expressions to be evaluated. Make entries in the style of Basic, using + for addition, − for subtraction, * for multiplication, / for division and ↑ to raise to a (positive integral) power. You may use parentheses to indicate which calculations should be done first. Calculator follows the Basic conventions for the order of operations, raising to a power first, then multiplication and division, and finally addition and subtraction.

Calculator always gives answers in both decimal and hex form, with the hex rounded to the nearest integer. (If a result is negative, the hex version is shown as its 2's complement, which I haven't space to explain here.)

If you enter an expression that can't be evaluated, the computer echoes the line as far as the snag, then adds a series of question marks. For example, if you type 3+4**5−1, the computer will respond 3+4**??? to tell you where it got lost.

The program issues two reports on how an evaluation was done. The first shows your expression converted to reverse Polish notation (see below), and the second details the arithmetic steps in the evaluation, using descriptions such as "multiply 4 by 5" and "add 20 to 3." You can turn off the reports by removing the word REM from lines 700 and 850, respectively.

After the program has displayed the result of a calculation, it asks for new input. To stop the program, type an illegal expression; the letter E for "end" will do nicely.

Reverse Polish Notation

Computer scientists have long used reverse Polish notation (RPN), in conjunction with stacks, to increase the efficiency of calculations. The Forth computer language uses this notation, as do many calculators, notably those made by Hewlett-Packard.

In RPN, an arithmetic operator (+, *, or whatever) *follows* the numbers it is to operate on; thus, 3+4 becomes 3 4 +. To help you see how RPN works, let's trace the steps used to evaluate the following expression: 3+(9−4*2)+7.

First the computer translates the expression into RPN: 3 9 4 2 * − + 7 +. Then it puts the 3, 9, 4 and 2 onto the stack (in that order, so the 2 is on top), multiplies the top two numbers (2 and 4) and places the result (8) on the stack, so it contains 3, 9 and 8. Next the computer subtracts the top number on the stack (8) from the second number (9) and places that result (1) on the stack, leaving it with 3 and 1. The machine adds these together, producing 4, then puts the 7 on the stack and does the final addition, for an end result of 11. All without parentheses!

Now take a look at the code. Lines 200–290 store the characters you enter into array C. When you press the return key, the computer scans these characters and places the operators (in proper order) on the stack, array S, ready to pop back out when needed. Then lines 400–610 convert the expression to RPN and store it in array B. The actual computation, using the stack again, but in a different way, happens in lines 800–950. R

Jim Butterfield is a widely known programmer and writer who has devoted years to the support of Commodore computing.

Listing 1. Calculator program. (Available on ReRUN disk. See page 52.)

```
100 PRINT CHR$(147)       :REM*51
110 PRINT "{CTRL 4}{6 SPACEs}CA
    LCULATOR!"            :REM*16
120 PRINT "{COMD 6}{9 SPACEs}JI
    M BUTTERFIELD"        :REM*223
130 PRINT                 :REM*26
140 PRINT "{CTRL 4}ENTER BASIC-
    STYLE EXPRESSION...":REM*80
150 PRINT "{CTRL 4}NO DECIMALS
    .. USE OPERATORS{2 SPACEs}+
     - * / {UP ARROW}" :REM*146
160 PRINT "{CTRL 4}{10 SPACEs}.
    ..AND PARENTHESES AS DESIRE
    D"                    :REM*94
170 PRINT "{CTRL 4}EXAMPLE:{2 S
    PACEs}2*(3+4)-5+3{UP ARROW}
    2"                    :REM*123
180 PRINT                 :REM*76
190 DIM C(80),B(50,1),S(50,1)
                          :REM*99
200 PRINT:PRINT "{CTRL 4}ENTER
    EXPRESSION: {CTRL 8}";
                          :REM*79
210 B=0:C=0               :REM*177
220 PRINT CHR$(164);CHR$(157);
                          :REM*63
230 GET X$:X=ASC(X$+CHR$(0))
                          :REM*244
240 IF X=13 AND C>0 GOTO 300
                          :REM*121
250 IF X=20 AND C>0 GOTO 290
                          :REM*217
260 IF X=94 GOTO 280      :REM*79
270 IF X<32 OR X>70 GOTO 230 ►
```

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CALCULATIONS

```
                              :REM*9Ø
28Ø C(C)=X:C=C+1:PRINT X$;:GOTO
    22Ø                       :REM*129
29Ø PRINT X$;:C=C-1:GOTO 22Ø
                              :REM*124
3ØØ PRINT " "                 :REM*243
4ØØ REM PARSE HERE            :REM*17Ø
41Ø C(C)=Ø:S=Ø:LØ=Ø           :REM*167
42Ø V=Ø:VØ=Ø:V9=1             :REM*144
43Ø FOR J=Ø TO C              :REM*85
44Ø C1=C(J)                   :REM*43
45Ø IF C1>64 THEN C9=C1-55
                              :REM*192
46Ø IF C1<58 THEN C9=C1-48
                              :REM*3
47Ø IF C9<Ø OR C9>15 GOTO 5ØØ
                              :REM*42
48Ø IF VØ=Ø THEN VØ=1Ø        :REM*7Ø
49Ø V=V*VØ+C9:IF C9<VØ GOTO 61Ø
                              :REM*2
5ØØ IF VØ=Ø AND C1=45 THEN V9=-
    1:GOTO 61Ø{4 SPACEs}:REM UN
    ARY -                     :REM*86
51Ø IF VØ=Ø AND C1=4Ø THEN LØ=L
    Ø+1Ø:GOTO 61Ø             :REM*15Ø
52Ø IF C1=36 AND VØ=Ø THEN VØ=1
    6:GOTO 61Ø{4 SPACEs}:REM $
                              :REM*227
53Ø IF VØ=Ø GOTO 6ØØ          :REM*126
54Ø IF C1=41 THEN LØ=LØ-1Ø:IF L
    Ø>=Ø GOTO 61Ø             :REM*44
55Ø B(B,Ø)=V*V9:B(B,1)=Ø:B=B+1:
    V=Ø:VØ=Ø:V9=1             :REM*23Ø
56Ø IF C1=Ø THEN L=1:GOSUB 2ØØØ
    :GOTO 61Ø                 :REM*121
57Ø IF C1=94 THEN L=LØ+4:GOSUB
    2ØØØ:GOTO 61Ø{1Ø SPACEs}:RE
    M {UP ARROW}              :REM*146
58Ø IF C1=42 OR C1=47 THEN L=LØ
    +3:GOSUB 2ØØØ:GOTO 61Ø :REM
     */                       :REM*85
59Ø IF C1=43 OR C1=45 THEN L=LØ
    +2:GOSUB 2ØØØ:GOTO 61Ø :REM
     +-                       :REM*19
6ØØ FOR K=Ø TO J:PRINTCHR$(C(K)
    );:NEXT K:PRINT"{CTRL 2}???
    {CTRL 4}":STOP            :REM*254
61Ø NEXT J                    :REM*123
7ØØ REM GOTO 8ØØ              :REM*2Ø2
71Ø PRINT "{COMD 7}RPN: {CTRL 4
    }";                       :REM*49
72Ø FOR J=Ø TO B-1            :REM*161
73Ø IF B(J,1)=Ø THEN PRINT B(J,
    Ø);                       :REM*144
74Ø IF B(J,1)<>Ø THEN PRINT CHR
    $(B(J,Ø));" ";            :REM*167
75Ø NEXT J                    :REM*Ø
76Ø PRINT                     :REM*146
8ØØ REM                       :REM*172
81Ø IF LØ>Ø THEN PRINT "{CTRL 2
    }')' MISSING !{CTRL 4}"
                              :REM*1Ø4
82Ø IF C1=Ø THEN L=Ø:GOSUB 2ØØØ
                              :REM*113
83Ø FOR J=Ø TO B-1            :REM*12
84Ø IF B(J,1)=Ø THEN S(S,Ø)=B(J
    ,Ø):S=S+1:GOTO 95Ø        :REM*149
85Ø REM GOTO 86Ø              :REM*141
851 IF B(J,Ø)=94 THEN PRINT "{C
    OMD 3}RAISE{CTRL 4}";S(S-2,
    Ø);"{COMD 3}TO POWER{CTRL 4
    }";S(S-1,Ø)               :REM*224
852 IF B(J,Ø)=42 THEN PRINT "{C
    OMD 3}MULTIPLY{CTRL 4}";S(S
    -2,Ø);"{COMD 3}BY{CTRL 4}";
    S(S-1,Ø)                  :REM*226
853 IF B(J,Ø)=47 THEN PRINT "{C
    OMD 3}DIVIDE{CTRL 4}";S(S-2
    ,Ø);"{COMD 3}BY{CTRL 4}";S(
    S-1,Ø)                    :REM*45
854 IF B(J,Ø)=43 THEN PRINT "{C
    OMD 3}ADD{CTRL 4}";S(S-2,Ø)
    ;"{COMD 3}TO{CTRL 4}";S(S-1
    ,Ø)                       :REM*114
855 IF B(J,Ø)=45 THEN PRINT "{C
    OMD 3}SUBTRT{CTRL 4}";S(S-1
    ,Ø);"{COMD 3}FROM{CTRL 4}";
    S(S-2,Ø)                  :REM*245
86Ø IF B(J,Ø)=Ø GOTO 1ØØØ
                              :REM*52
87Ø IF B(J,Ø)<>94 GOTO 91Ø
                              :REM*11Ø
88Ø S=S-1:P=1                 :REM*13Ø
89Ø FOR K=1 TO S(S,Ø):P=P*S(S-1
    ,Ø):NEXT K                :REM*131
9ØØ S(S-1,Ø)=P                :REM*214
91Ø IF B(J,Ø)=42 THEN S=S-1:S(S
    -1,Ø)=S(S-1,Ø)*S(S,Ø)
                              :REM*14
92Ø IF B(J,Ø)=47 THEN S=S-1:S(S
    -1,Ø)=S(S-1,Ø)/S(S,Ø)
                              :REM*1Ø9
93Ø IF B(J,Ø)=43 THEN S=S-1:S(S
    -1,Ø)=S(S-1,Ø)+S(S,Ø)
                              :REM*217
94Ø IF B(J,Ø)=45 THEN S=S-1:S(S
    -1,Ø)=S(S-1,Ø)-S(S,Ø)
                              :REM*23
95Ø NEXT J                    :REM*2ØØ
96Ø STOP                      :REM*84
1ØØØ V=S(S-1,Ø)               :REM*2Ø7
1Ø1Ø PRINT "{CTRL 2}CALCULATED
     VALUE: {COMD 3}";V;
                              :REM*153
1Ø2Ø V=INT(V+.5)              :REM*1Ø4
1Ø25 IF V<Ø THEN V=V-16777216
                              :REM*43
1Ø3Ø V=V/1Ø48576:PRINT "{CTRL 6
    }${COMD 6}";              :REM*99
1Ø4Ø FOR J=1 TO 6             :REM*123
1Ø5Ø V1=INT(V)                :REM*17Ø
1Ø55 V=(V-V1)*16              :REM*242
1Ø6Ø IF V1>9 THEN V1=V1+7
                              :REM*63
1Ø7Ø PRINT CHR$(V1+48);       :REM*21
1Ø8Ø NEXT J                   :REM*75
1Ø9Ø PRINT                    :REM*223
11ØØ GOTO 2ØØ                 :REM*143
2ØØØ IF S=Ø GOTO 2Ø4Ø          :REM*68
2Ø1Ø IF L>S(S-1,1) GOTO 2Ø4Ø
                              :REM*1Ø
2Ø2Ø S=S-1                     :REM*59
2Ø3Ø B(B,Ø)=S(S,Ø):B(B,1)=S(S,1
    ):B=B+1:GOTO 2ØØØ         :REM*52
2Ø4Ø S(S,Ø)=C1:S(S,1)=L:S=S+1
                              :REM*68
2Ø5Ø RETURN                   :REM*152
```

■

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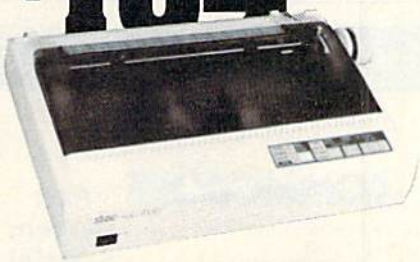

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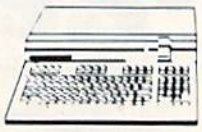

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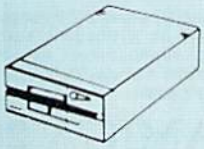

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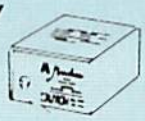

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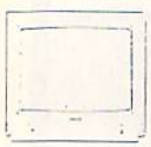

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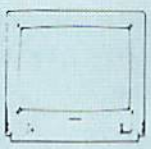

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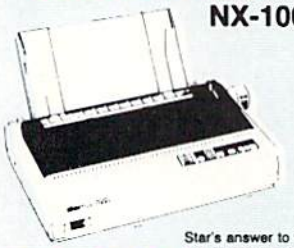

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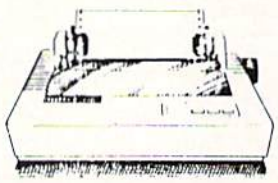

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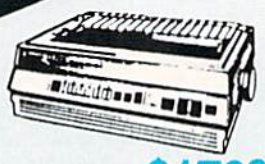

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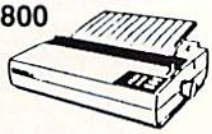

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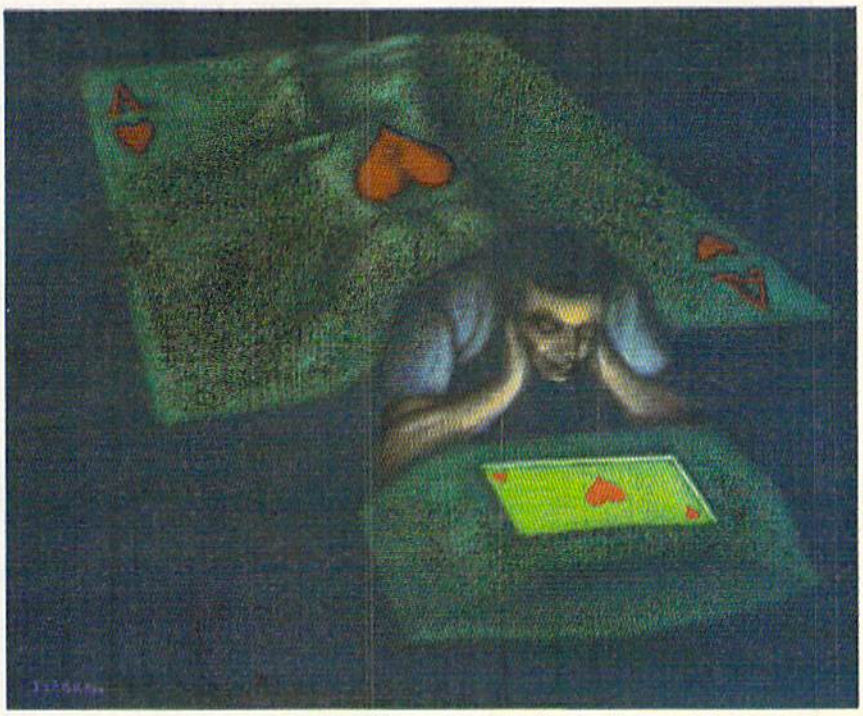
Solitaire Extraordinaire

You'll love this version of a one-player card game that uses a 5 × 7 format.

By MICHAEL BROUSSARD



Five-by-Seven is a computer version of a solitaire game—unaccountably called Golf—that I learned from a friend of mine. The object is to eliminate all the cards from a 5-row-by-7-column layout before the rest of the cards in the deck are exhausted.

The game is easy to learn but devilishly difficult to win. It's also addictive, and, since it doesn't take long to play, you'll find yourself saying, "Well, just *one* more before bed."

Type in Listing 1 and be sure to save it to disk before running it. When you start the program, and it asks whether you want directions, answer Y to see a brief summary of the rules. Otherwise, press any other key to begin play.

There's a brief delay as the cards are "shuffled;" then the layout appears on the screen, with a face-down card, representing the remainder of the deck, to the layout's left. The number on this card is the number of cards that are left in the deck.

At the start, a lone turned-up card is exposed in the discard area at the bottom of the screen. Cards are played from the bottom of each column in the layout face-up onto the currently exposed card in the discard area.

Each column of the layout is identified by a letter of the alphabet; to play a card, just press the appropriate letter. When you can't (or choose not to) make any more moves from the layout, press the space bar or the colon key to deal a card from the deck. If the deck runs out before you eliminate the layout, the game is over and you lose.

For a card to be playable, it must differ in rank by one from the card exposed in the discard area, but it may be of any suit. For example, if the exposed card is a six, you can play any five or seven that's showing at the bottom of a column. Ace is low and king is high, so you may play an ace only on a two, but never on a king. In fact, since the king is at the top of the sequence, only a queen can be played on it.

Surprisingly, it's all right to take back the last move you made from the layout. To "undo" a move, just press U. Note that the Undo command doesn't work if you last dealt a new card from the top of the deck; that would give unscrupulous players a way to cheat.

You can abort a game in progress by typing an exclamation point. Then the program will give you the option of playing another game or returning to Basic.

If you don't like the background or character colors in the screen display, it's possible to change them by altering line 100 in the listing. The Color command in that line sets the background color, and variable Q$ holds the code for the character color.

You'll find that there's more strategy to Five-by-Seven than appears at first glance. For example, you must be careful when removing queens from the layout, as they're the only cards on which kings may be played. If you play the last queen, and there's still a king buried, you'll never win.

So, that's it—short and sweet. And now that this article is finished, maybe I have time for just one more. . . R

Michael Broussard, a systems analyst in the manufacture of fault-tolerant superminicomputers, has authored many RUN *programs over the years.* ►

RUN it right: **C-128 (in 80-Column mode)**

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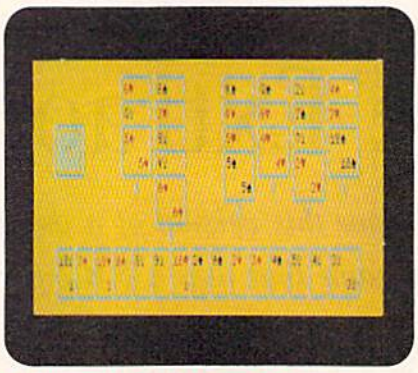
Listing 1. Five-by-Seven Solitaire program. (Available on ReRUN disk. See page 52.)

```
1Ø REM SOLITAIRE - BROUSSARD
                              :REM*176
1ØØ Q$="{COMD 5}":COLOR6,1Ø
                              :REM*62
11Ø FORJ=1TO8Ø:L$=L$+"{SHFT *}"
    :B$=B$+" ":NEXT:PT=DEC("FFF
    Ø")                       :REM*25Ø
12Ø DIMC(52),L(5,7),XP(7),YP(5)
    ,CT(7),S$(4),R$(13):REM*112
13Ø FORJ=ØTO3:READS$(J):NEXT:FO
    RJ=ØTO12:READR$(J):NEXT
                              :REM*19Ø
14Ø WY=7:WX=26:E$="{7 SPACEs}{C
    RSR DN}{7 CRSR LFs}":E$=E$+
    E$+E$+E$+E$+E$            :REM*227
15Ø SCNCLR:PRINT"{CTRL 2}";:X=1
    9:Y=7:H=7:W=38:GOSUB55Ø:X=X
    +16:Y=Y+2:SYSPT,,Y,X,Ø
                              :REM*34
16Ø PRINT"{CTRL 9} {1Ø CRSR LFs
    }SOLITAIRE EXTRAORDINAIRE {
    CTRL Ø}";:X=X-14:Y=Y+2:SYSP
    T,,Y,X,Ø                  :REM*225
17Ø PRINT"WOULD YOU LIKE INSTRU
    CTIONS (Y/N)?";:GETKEYX$
                              :REM*245
18Ø IF X$="Y" THEN GOSUB 61Ø
                              :REM*1Ø8
19Ø SCNCLR:LR=-1:NL=35:FM=1:FOR
    J=ØTO51:C(J)=J:NEXT:REM*251
```



Card layout in Five-by-Seven Solitaire.

```
2ØØ FORJ=ØTO51:K=J+(52-J)*RND(Ø
    ):T=C(J):C(J)=C(K):C(K)=T:N
    EXT:T=Ø                   :REM*2Ø8
21Ø FORI=ØTO4:YP(I)=I*2:FORJ=ØT
    O6:L(I,J)=C(T):T=T+1:XP(J)=
    16+J*7:CT(J)=5            :REM*97
22Ø CH$="":IF I=4THENCH$=CHR$(J
    +ASC("A"))                :REM*16Ø
23Ø N=L(I,J):X=XP(J):Y=YP(I):GO
    SUB48Ø:NEXTJ:NEXTI:X=2:Y=4:
    H=5:W=7:GOSUB55Ø          :REM*67
24Ø SYSPT,,Y,X+1,Ø:PRINT"{CRSR
    DN}{5 COMD +s}{CRSR DN}{5 C
    RSR LFs}{5 COMD +s}{CRSR DN
    }{5 CRSR LFs}{5 COMD +s}";
                              :REM*2Ø2
25Ø X=2:Y=14:M$=":":GOTO32Ø
                              :REM*151
26Ø IF UK=Ø THEN SYSPT,,6,5,Ø:P
    RINTMID$(STR$(52-T),2)"{COM
    D +}";                    :REM*77
27Ø M$="":GETKEYM$:IF M$<>"!" T
    HEN 32Ø                   :REM*175
28Ø X$="GAME OVER"            :REM*176
29Ø X=WX:Y=WY:H=7:W=28:PRINT"{C
    TRL 2}":GOSUB55Ø:SYSPT,,WY+
    2,WX+9,Ø                  :REM*27
3ØØ PRINTX$;:SYSPT,,WY+4,WX+4,Ø
    :PRINT"ANOTHER GAME (Y/N)?"
    ;                         :REM*15Ø
31Ø M$="":GETKEYM$:IF M$<>"N" T
    HEN 19Ø:ELSE SCNCLR:END
                              :REM*4
32Ø IF (M$<>" ")AND(M$<>":")THE
    N 34Ø                     :REM*73
33Ø IF T=52THEN28Ø:ELSE N=C(T):
    T=T+1:CH$="":GOSUB48Ø:UK=Ø:
    GOTO41Ø                   :REM*222
34Ø IF(M$<"A")OR(M$>"G")THEN43Ø
                              :REM*13
35Ø J=ASC(M$)-ASC("A"):IFCT(J)=
    ØTHEN26Ø                  :REM*123
36Ø I=CT(J)-1:N2=L(I,J):IF ABS(
    INT(N2/4)-LR)<>1THEN26Ø
                              :REM*26
37Ø UK=1:CT(J)=CT(J)-1:L(I,J)=-
    1:X2=X:Y2=Y:X=XP(J):Y=YP(I)
                              :REM*31
38Ø CH$="":N=-1:GOSUB48Ø:LM$=M$
```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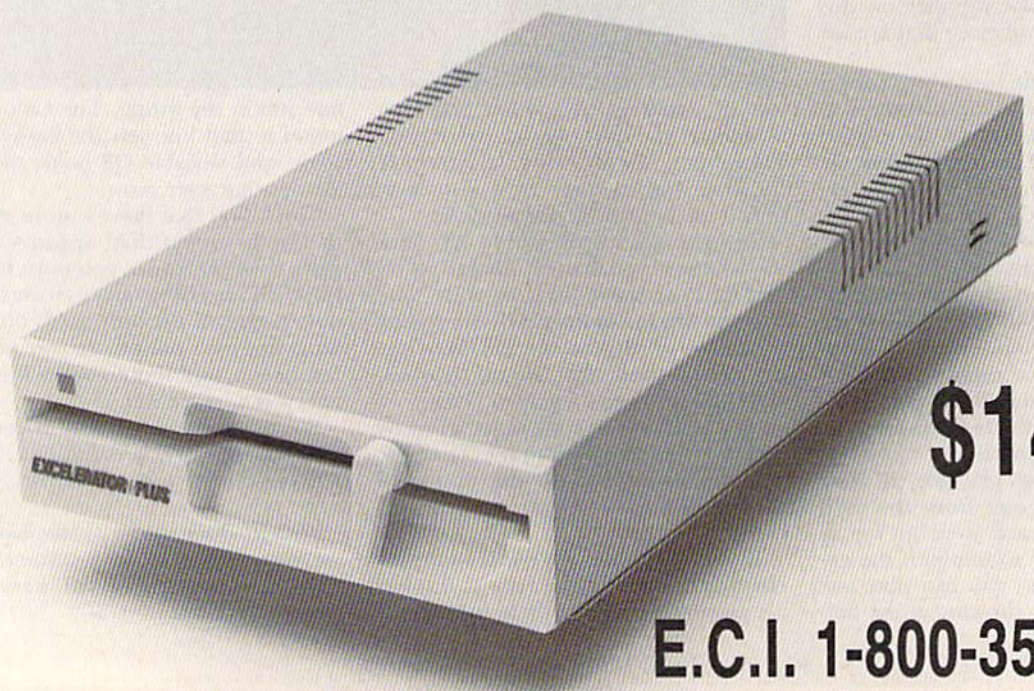

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```
                              :REM*111
39Ø IF CT(J)THENN=L(I-1,J):X=XP
    (J):Y=YP(I-1):CH$=LM$:GOSUB
    48Ø                       :REM*163
4ØØ LI=I:LJ=J:LN=N2:LS=LR:N=N2:
    X=X2:Y=Y2:CH$="":GOSUB48Ø:N
    L=NL-1                    :REM*51
41Ø LR=INT(N/4):X=X+4:IF X>72TH
    ENX=2:Y=Y+2               :REM*138
42Ø IFNL<>ØTHEN26Ø:ELSEX$="YOU
    WIN!!":GOTO29Ø            :REM*169
43Ø IF(M$<>"U")OR(UK=Ø)THEN26Ø
                              :REM*238
44Ø UK=Ø:NL=NL+1:CT(LJ)=CT(LJ)+
    1:L(LI,LJ)=LN:LR=LS:X=X-4
                              :REM*24Ø
45Ø IF X<1 THEN Y=Y-2:X=7Ø
                              :REM*122
46Ø N=-2:CH$="":GOSUB48Ø:N=LN:X
    2=X:X=XP(LJ):Y2=Y:Y=YP(LI):
    CH$=LM$                   :REM*223
47Ø GOSUB48Ø:Y=Y2:X=X2:GOTO26Ø
                              :REM*5Ø
48Ø SYSPT,,Y,X,Ø:IF N=-1 THEN P
    RINTE$;:RETURN            :REM*37
49Ø SYSPT,,Y,X,Ø:IF N=-1 THEN P
    RINTE$;:RETURN            :REM*43
5ØØ IFN=-2THENH=5:W=7:GOSUB56Ø:
    RETURN                    :REM*41
51Ø R=INT(N/4):S=N-(R*4):X$=R$(
    R)+S$(S):C$="{CTRL 1}":IFS>
    1THENC$="{CTRL 3}"        :REM*117
52Ø X2$=X$:K=5-LEN(X$):X$=X$+LE
    FT$(B$,K):X2$=LEFT$(B$,K)+X
    2$                        :REM*196
53Ø PRINTQ$"{SHFT U}{5 SHFT *s}
    {SHFT I}{CRSR DN}{7 CRSR LF
    s}{SHFT -}"C$X$Q$"{SHFT -}{
    CRSR DN}{7 CRSR LFs}{SHFT -
    }{5 SPACEs}{SHFT -}{CRSR DN
    }{7 CRSR LFs}{SHFT -}"C$X2$
    ;                         :REM*4
54Ø PRINTQ$"{SHFT -}{CRSR DN}{7
    CRSR LFs}{SHFT J}{5 SHFT *
    s}{SHFT K}{CRSR DN}{4 CRSR
    LFs}"CH$;:RETURN          :REM*51
55Ø SYSPT,,Y,X,Ø:PRINT"{SHFT U}
    "LEFT$(L$,W-2)"{SHFT I}";:S
    YSPT,,Y+1,X,Ø             :REM*96
56Ø SYSPT,,Y,X,Ø:PRINT"{SHFT U}
    "LEFT$(L$,W-2)"{SHFT I}";:S
    YSPT,,Y+1,X,Ø             :REM*122
57Ø FORJ2=1TOH-2:PRINT"{SHFT -}
    "LEFT$(B$,W-2)"{SHFT -}";:S
    YSPT,,Y+J2+1,X,Ø:NEXT
                              :REM*118
58Ø PRINT"{SHFT J}"LEFT$(L$,W-2
    )"{SHFT K}";:RETURN:REM*116
59Ø PRINT"{HOME}":PRINTLEFT$("{
    24 CRSR DNs}",Y);SPC(X);:RE
    TURN                      :REM*77
6ØØ DATA "{SHFT A}","{SHFT X}",
    "{SHFT S}","{SHFT Z}",A,2,3
    ,4,5,6,7,8,9,1Ø,J,Q,K
                              :REM*194
61Ø RESTORE 65Ø:SCNCLR:X=9:Y=6:
    H=11:W=61:GOSUB55Ø:X=12:Y=7
    :READ D$                  :REM*171
62Ø DO UNTIL D$="FINI" : Y=Y+1
    :SYSPT,,Y,X,Ø:PRINT D$;:REA
    D D$ : LOOP               :REM*188
63Ø GETKEYD$:PRINTQ$;:RETURN
                              :REM*253
64Ø SYSPT,,6,7,Ø:PRINTMID$(STR$
    (52-T),2)"{COMD +}";:RETURN
                              :REM*188
65Ø DATA"TO WIN, PLAY ALL CARDS
     FROM THE LAYOUT INTO THE D
    ISCARD"                   :REM*17Ø
66Ø DATA"AREA AT THE BOTTOM OF
    THE SCREEN. TO PLAY A CARD,
     PRESS"                   :REM*165
67Ø DATA"THE LETTER BENEATH ITS
     COLUMN.{3 SPACEs}CARDS MAY
     BE PLAYED IN"            :REM*49
68Ø DATA"ASCENDING OR DESCENDIN
    G ORDER REGARDLESS OF SUIT.
    {2 SPACEs}KING"           :REM*245
69Ø DATA"IS HIGH AND ACE IS LOW
    -NO CARD MAY BE PLAYED ON A
     KING."                   :REM*33
7ØØ DATA"PRESS THE SPACE BAR TO
     DEAL ANOTHER CARD FROM THE
     DECK."                   :REM*96
71Ø DATA"TO UNDO THE VERY LAST
    MOVE, PRESS 'U'.{2 SPACEs}{
    CTRL 9}{CTRL 3} PRESS ANY K
    EY {CTRL Ø}"              :REM*69
72Ø DATA FINI                 :REM*88 ■
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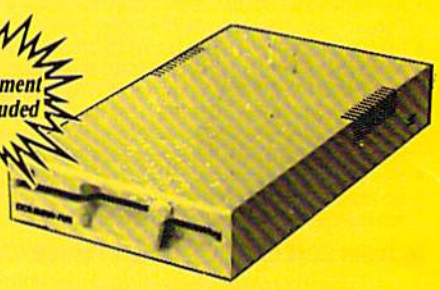

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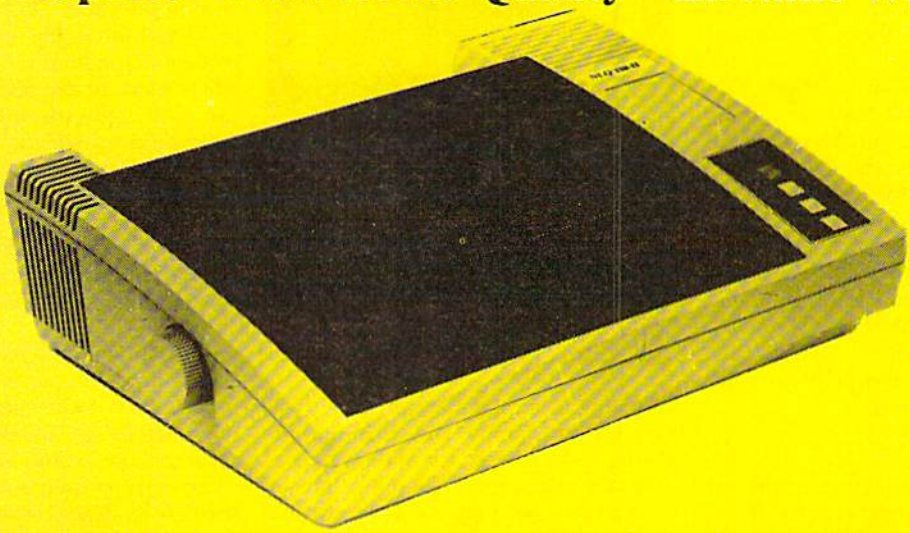

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GAMES GALLERY

In this dogfight between two C-64 combat-flight simulators, one emerges as Top Gun.

By JOHN RYAN

WHEN I WAS ASKED to do a comparative review of two combat-flight simulators for this column, I was somewhat aghast. More flight simulators? Aren't there enough? Don't get me wrong: Designing a first-rate flight simulator for an eight-bit machine is quite a feat, and there are many good simulations available for the Commodore 64. But, a lousy simulator ranks on my popularity list with ozone depletion.

This month's Games Gallery presents you with a mixed bag: F-18 Hornet ($34.95), from Absolute Entertainment, and F-14 Tomcat ($39.95), by Activision; both distributed by Mediagenic. They are similar in aim, but vastly different in performance.

F-18 HORNET

This new combat-flight simulator promises you the "most realistic flying experience." However, I found it less a flight simulation than a simple combat game. Using other simulations as a reference, I feel that F-18 Hornet has locked itself into being too unorthodox in style and presentation to satisfy the current "standard," and programs that stray too far from this standard risk losing a large following.

Standards aside, is the Commodore world ready for more acrobatics? Absolute's Vice President of Engineering, Steve Kitchen, explained the rationale for bringing out another flight simulator: "We wanted a simulator that would portray a world that is real, not just a bunch of pretty pictures or a movie. You can do things in F-18 that you could never do with other simulations, because our world has real depth and purpose. If you fly through a canyon one way, then turn around and come back through the canyon again, you'll still see the same canyon, yet through a slightly different perspective. That canyon's not going to go away or suddenly disappear on you. In the computer's eye, it's real. It's not made up of a bunch of sprites just floating underneath you."

To get down to details, F-18 Hornet rather assumes that you know everything about air combat, but new pilots can try a training run through the China Lake Naval Air Station, where you take off, practice bombing runs on tank drones, and try some combat maneuvers. Once you've mastered the first training mission (or even if you don't), you go on to any of the nine remaining missions.

Lining up on your final approach to a carrier landing needs careful attention.

You fly the F-18 with the joystick and the C-64's four function keys, using the stick to climb, turn or descend. You increase or decrease thrust by pressing the firebutton and then moving the joystick forward or backward. Since you also fire missiles with the firebutton, but without moving the joystick, you'll probably trigger several of them accidentally if you don't concentrate on what you're doing.

You're about to touch down, hopefully at the right spot on the deck.

F-18 may be a bit too easy to fly, but that presents a myriad of possibilities within the game. "F-18 was meant to be easy and fun to fly," explained Kitchen, rather emphatically. "In this program, there's lots to see and do. It's not just another 'go-out-and-kill-the-enemy-then-land-your-plane' type of simulation. You can be crazy with this program—land your plane on the desert, then drive around the highways and take in the scenery. Try flying through hangers or underneath bridges. How many other programs let you get away with that?"

Instrumentation includes everything you'll need to operate the plane: compass (which doesn't seem to work well), airspeed gauge, altimeter, and so forth. Much of the analog information on the dials is duplicated at the bottom of the display as digital readouts, making at-a-glance readings easy.

The graphics for the hangers, aircraft carriers and other structures are nicely done; much care was taken to develop 3-D perspective. But once in the air, there is very little else to impress you.

As a combat-flight simulator, F-18 hasn't left the ground. You have a hard time determining when you're actually airborne, for, although indicators begin moving, not much happens outside the cockpit to give the feeling of flight. The horizon doesn't change much, for example; even when you bank the aircraft, it stubbornly remains horizontal. A dreadfully slow turn rate doesn't help matters; turning 180 degrees seems to take forever—not good when you're fighting for your life!

F-18 Hornet gives you very little help in learning to fly and survive, other than offering a few hints. Dogfights are especially tedious; while you can track the enemy on radar, their aircraft seem to pop out of thin air. Kitchen advises that the secret to success here is to keep moving. "Don't stay in level flight with the enemy on your radar. Dive, climb or bank, then try to get him lined up in your sights. You can bet that if he's got you visually, there'll be a missile along shortly." ►

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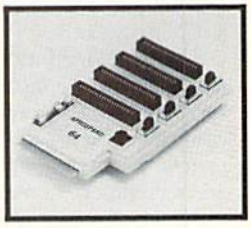

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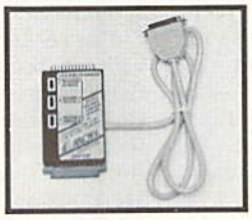

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I found F-18 Hornet limiting and frustrating, and quickly turned my attention to F-14 Tomcat.

F-14 Tomcat

The Tomcat promises prospective flyers the "total experience." Where F-18 Hornet assumes you've taken care of the details of earning your jet, F-14 Tomcat leads you from enlistment to your final assignment on an aircraft carrier.

Terry Ishida, the program's producer, wanted to avoid having F-14 perceived as just another flight simulator. "We weren't so much trying just for flight simulation realism," he explained. "We wanted to get across the total experience—what it's really like to go through pilot training."

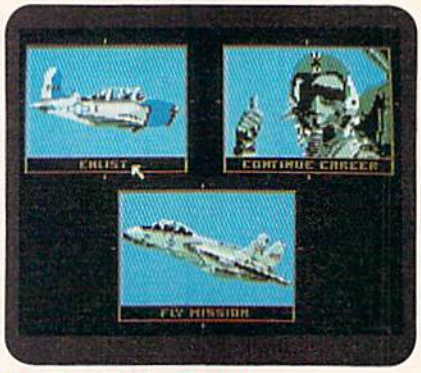
The emphasis is on learning your new profession. From the start, F-14 imparts a sense of solemn responsibility as you take your oath of enlistment in the U.S. Navy. You then go through the rigors of basic military training and on to your first assignment—basic flight training in a T-2 Buckeye.

F-14 is also riding the coattails of the popular movie, *Top Gun*, and does so successfully for several reasons. First, the computerized F-14's capabilities are patterned after the real thing, including aerodynamics, maneuverability, acceleration and weapons systems, which include the awesome Phoenix missile. "We did a *lot* of research," Ishida said. But he made it clear that it didn't just involve hitting the books. "We talked to pilots and had the opportunity to study the plane up close—took a lot of pictures."

Going for the total experience means some sacrifices had to be made. Don't expect a lot of pretty scenery here—it's the combination of training and combat that makes the program take off.

In flight school, you'll go through three phases. First you'll practice taking off and landing your T-2. If you do well, it's on to the maneuvers phase, where you'll fly directly behind your Commanding Officer. He'll demonstrate a series of moves and expect you to shadow him. Combat gyrations, such as the Low-G Yo-Yo, Split-S and Immelmann, need to be mastered before you can progress in your training. If you don't, expect to be assigned to propeller aircraft or helicopters for further training until you make it to jets.

Graduating from basic flight training means assignment to Pensacola Naval Air Station. Here, you go head to head (in simulated dogfights) against the cocky Captain Vice, applying some of the hot moves you learned in training. Once you pass this training, you're assigned a Radar Intercept Officer, your partner for the rest of your career.



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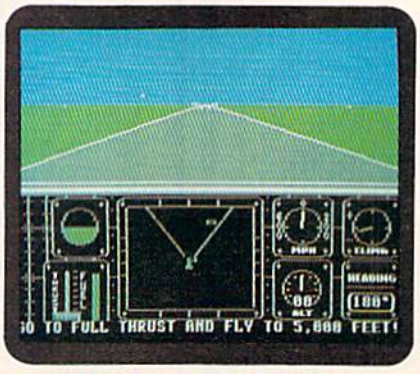
It's surprising how easy F-14 Tomcat is to fly. And you won't have to memorize several dozen keypresses. That was a key design aspect all through the program's development. Moreover, several innovative design features make it easy to control the Tomcat. This program even includes a keypress that automatically aligns your aircraft with the runway and lands it for you! "We wanted it to be easy to fly," said Ishida. "Many simulations are just so difficult—there's too much to learn. This program was meant to be fun. After we added auto-landing to the game, we discovered—by accident, really—that such systems really exist and are often used!"

The cockpit display is full-featured, without being cluttered or tedious. Everything is there that should be, including a heads-up display, radar, tactical information display, weapon indicators and flight instruments. Weapons include the Phoenix, AM-RAAM and Sidewinder missiles, and, for close-up encounters, you can always rely on a Vulcan cannon.

Becoming a Top Gun, however, depends on how well you've learned combat maneuvers, which will save your skin more than once. "You've got to keep the enemy off your 'six,' " says Ishida. "If an aircraft gets behind you, attempt to shake him using hard turns, or, better yet, apply the basic combat maneuvers. Break out or use the Split-S or Scissors to shake him. If you overshoot your enemy, pull a High-G Yo-Yo to get back on him. It's also possible to evade missiles by letting the missile come in close, then executing one of the combat maneuvers."



Once you're off the ground, get up to altitude as fast as you can.

A dangerous miscalculation made by many rookies is the tendency to panic. "Try not to panic when you get fired at," Ishida cautions. "A common mistake is to launch your flares or chaff too early. Wait a minute; let the missiles come in. Use chaff and flares to draw the missiles away from you at the last minute."

Ishida chuckled deviously when I asked him what he thought was the best missile to use in a dogfight. "Oh, the Sidewinder, definitely. This is probably the most devastating weapon inside, say, six miles or so. You'll want to get directly behind the enemy. It's not a good idea to attempt a shot from the side, and never head-on, where your chances of hitting are very slim. When you get close in, if you're having a tough time getting a missile lock, switch to the cannon."

The Top Gun

F-18 Hornet would have been more acceptable several years ago, when there weren't many good simulators to choose from. But, in 1989, I can't take this program seriously, especially with such formidable programs as Jet, Stealth Fighter, F-15 Eagle, F-19 Stealth Fighter and, now, F-14 Tomcat. Although console and structure graphics are very nice, graphics alone does not make a simulation, especially when the response is so unrealistic and sluggish that the program is a pain to play.

F-14 Tomcat, however, is a serious entry in the flight-simulation genre. Its features, reminiscent of those found in Gunship, are innovative and blend in well with the storyline. And I guess that is a very important point to this program: Without the storyline, F-14 Tomcat might have been just another above-average program. In my opinion, this one's the new Top Gun. ■

John Ryan, a regular contributor to RUN, *is an air traffic control instructor. He lives in Biloxi, Mississippi with his wife and three children.*

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The Cartridge Wars. For a while there, it was tough going - but we kept fighting to be the best. The result? Just ask the user groups. Ask the dealers. Ask the magazines. Public opinion is unanimous. The Cartridge Wars are over - and Super Snapshot is the clear winner!

How did we do it? By understanding that it is not enough anymore just to be the most powerful. In today's market, you've also got to be smart. Like Super Snapshot v4.

As the list of features at the right clearly shows, we've given Super Snapshot v4 enough capabilities to dazzle even the most demanding power user. But we've also worked hard to give those utilities a sense of style and grace. To make sure that not only could you do a task, but that you could do it easily and logically. While our competitors were making utilities for Commodore computers, we were designing our utilities for the people who own those computers.

So when you choose a multi-function cartridge for your system, choose Super Snapshot v4 - the cartridge that was designed to appeal to a higher intelligence. Yours.

Super Snapshot Features Include:

- Works with ALL Commodore 8 bit computers & drives.
- Totally transparent when disabled.
- Turbo mode - Up to 15X faster loading, 7X faster saving.
- Super DOS Wedge supports devices 8, 9, 10, & 11 with extra commands.
- Archive ALL memory resident programs to disk as autobooting files.
- Exclusive - C-64 Boot Sector.
- Dump screens to disk in popular graphic program formats.
- Dump screens including sprites to printer (many supported) in 3 sizes.
- Only Super Snapshot dumps BOTH multi-color & hi-res formats.
- Sprite disable/re-enable & extended life Game Master features.
- Sprite monitor & full featured sprite editor.
- Fast disk copier for 1 or 2 drives supports 1541/1571/1581.
- Extensive BASIC additional commands for power programmers.
- Fast file copier for 1 or 2 1541/1571/1581 drives.
- 24 Hour BBS support is available!
- Free Kracker Jax Parameter disk - over 100 parameters!
- Includes the legendary Shotgun II from Kracker Jax!
- M/L Monitor does NOT corrupt memory. Interrupt, examine, modify, and resume a running program. All standard commands PLUS bank-switching, bi-directional scrolling, IO command, track & sector editor, ASCII hunt, and drive monitor.

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THE 1750 CLONE

Thanks For The Memory

Most Commodore users are content to use their computers within the constraints placed on them by a limited amount of RAM. But some people want more. More speed. More power. And that means just one thing - more memory.

Power users have long known that the ideal solution to their memory problems is out there in the form of Commodore's incredible 1750 RAM expansion module. Just plug it in and you've got a whopping 512k of onboard RAM - the same amount of memory found on most IBM computers! This is the memory cartridge that all serious Commodore power users want. There's only one problem.

You can't find them.

That's right. These RAM units are almost impossible to buy. We've always specialized in finding solutions to Commodore related problems - here's what we came up with.

First, we bought brand new Commodore 1764 RAM expansion units, the ones with only 256k of RAM onboard. Next, we had Chip Level Design engineer and produce a custom upgrade that takes a 1764 to a full 512k! That's the same half meg of RAM as a regular 1750! Finally, we tested each and every cartridge, and warranteed them to be free from defects.

Now there's nothing to stop you from taking your Commodore 64 or 128 to levels of power and sophistication that the original designers never even dreamed of! If you're using programs like GEOS from Berkeley; the Pocket Series from Digital Soutions; future versions of Maverick from Kracker Jax; Fleet System IV from Professional Software; or the potent PaperClip III from Batteries Included; if you're using ANY of these programs, you won't believe the difference that the extra memory makes!

IMPORTANT NOTES - READ CAREFULLY

*C-64/64c (but NOT C-128/128D) owners MUST buy a heavy-duty power supply to use these units. The power supply is NOT included - it is available from us seperately.

* If you ALREADY own a 1764 RAM cartridge, we can upgrade it for you. Your unit MUST be in perfect working order for us to upgrade it. The turnaround time on upgrades is approx. 2 weeks. It will NOT be necessary for you to purchase a new power supply - the one that came with your 1764 will still work fine.

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WATTS The Matter - Can't Get ample power?

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This doesn't have to happen to you. We are now selling a heavy-duty power supply that will greatly diminish your fear of a power supply failure. These are NOT aftermarket units - they are made by Commodore, and are ideal for use with RAM expanders. They will provide you with a more stable, dependable source of power. This unit will work on ALL C-64's and 64c' on the market.

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1541 RAMBOard*

Byte The Copy Protection bullet!

Let's face it - war is hell. And in the Commodore world, one of the ugliest wars of all is being waged by the copy protection industry. They're tough. They're clever. And they're very, very determined. If you've seen some of the current ice out there, you know just how determined they are. Well, we're just as determined. And we've got a way to walk right through the coldest ice out there.

What's our secret? The new RAMBOard, a small card that can easily be installed in your 1541 in 5 minutes using just a screwdriver. With this remarkable piece of firmware in place, backup hassles are a thing of the past!

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Get your RAMBOard today. And the next time some company tries to charge you for an "authorized" backup of a program you've already paid for, remind them that war IS hell - and you know how to raise a little hell of your own.

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SYSRES

Your Last Chance To Own A Classic.

All good things must come to an end. That's true for everything, including software. The time has come to say goodbye to an old friend - SYSRES, the finest BASIC enchancement system ever created for th Commodore computer.

Software Support owns the exclusive rights to produce SYSRES. Reluctantly, we've decided to stop producing this incredible program. Why? The simple fact is that most of the serious BASIC programmers out there already own SYSRES, and there aren't enough new BASIC programmers entering the arena to warrant the expense of continued production of SYSRES.

If you're one of the few serious BASIC programmers out there who isn't yet using SYSRES, maybe you should take a look at some of these features:

- Easy code entry with features like auto line numbering, enhanced key repeat, and fast up and down scrolling of program listings!
- Macros: any shifted key may be set to represent any BASIC or SYSRES KEYWORD. All files may be listed, loaded, run, copied, or scratched by entering a two character command in front of the file name listed in the directory!
- Find/Change any variable phrase or keyword used anywhere in your program. Over 700 search variations are available including pattern matching with wild cards and limitation symbols. Now you can automatically remove spaces and REMS to streamline run-time versions of your programs!

List BASIC programs and relative and sequential files without loading them into memory first!

- Edit text files and assembler source code without having to leave BASIC!
- Do a partial renumber. Move a subroutine to a more logical starting place while preserving all other line numbers and updating all line references!
- Debug with a variable speed TRACE. Display the current and the five previous operations. Display variables as they change or are defined; send the TRACE to the printer!

We haven't even scratched the surface of SYSRES. With features like screen print, multiple drive support, full printer support, and program merge capabilities, it's easy to see why SYSRES is the most comprehensive BASIC programmers' aid package ever produced. And just as comprehensive is the professional documentation: over 110 pages, bound in an attractive three ring binder. You'll also be pleased to know that SYSRES is UNprotected!

So there you have it. If you use BASIC at all, this is the enhancement system that you need. And this is absolutely your last chance to own this classic. As a going away present, we've even cut the price in half! Now there's no reason for you to limp by on plain vanilla BASIC any more. Get SYSRES today - and get involved with some serious programming power!

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GEOWATCH

GEOS 128 2.0 makes its appearance on the scene and promises to be a star performer on the GEOS stage.

By TIM WALSH

Berkeley Softworks' GEOS 128 2.0 is one of the better software packages to come along for the C-128. In case you're new to the Commodore community, GEOS stands for Graphics Environment Operating System, a screen-icon operating system for Commodore eight-bit computers that allows them to function much like the more expensive Apple Macintosh and Amiga computers.

The system, operating from an area called the deskTop, allows you to perform functions with your C-128 in either 40- or 80-Column mode by selecting icons on the screen, thus reducing the need to learn complicated keyboard commands.

GEOS 128 2.0 represents the latest upgrade of the earlier GEOS 128, which has been available for about a year. With it come three double-sided disks and enough documentation to keep newcomers and GEOS veterans busily reading for hours. These instructions consist of a 300-page manual (shared by the C-64 version of GEOS 2.0), plus a 107-page, purely C-128 addendum.

The expansive documentation is necessary because many application programs are included. While you can find these on earlier versions of GEOS for both the 64 and the 128, they now include minor improvements. For the benefit of newcomers to GEOS, these applications include geoPaint, which is a 40- and 80-column graphics-creation program, geoWrite and geoSpell, Berkeley Softworks' word processor and spelling checker, and an assortment of lesser programs. Included with GEOS 128 2.0 are also various niceties such as geoLaser, a laser printer driver for use with the Apple LaserWriter printer.

GETTING STARTED

Before you can do anything with GEOS 128 2.0, you are prompted to perform an operation known as "keying," which means serializing your older GEOS applications to work with 2.0. This is necessary because the copy protection employed by GEOS allows only one master boot disk per application. If you choose not to key at this point, you have lost the opportunity to make use of any previous GEOS applications you have on hand.

Users of earlier versions of GEOS could perform the ritualistic keying and disk copying common to setting all versions of GEOS without referring to the documentation. I did just that, but I strongly recommend that you read the documentation before you do the keying, especially if you have a multi-drive C-128 system, since this latest version of GEOS employs a multi-file copy option. Furthermore, included in the documentation is an in-depth tutorial that will help you learn all the idiosyncracies of the system.

The documentation not only shows shortcuts for 1764 and 1750 REU (RAM expansion unit) owners, but also for making backup copies to a 1581, a process that is different from making a backup copy on a 5¼-inch second drive. You cannot use the normal disk-copy feature of GEOS 128 2.0; rather, you must use the multi-file copy option mentioned above.

I've become a fan of GEOS 128 2.0 mainly because of this multi-file copy option, which is used on a system employing multiple disk drives. By holding down the Commodore key with one hand and using the mouse to select files from a deskTop page with the other, you can make GEOS 128 2.0 copy selected files. To use the multi-file copy option for copying *all* the files on a disk, just press Commodore/W, and the files are automatically selected and the pages flipped open. The copy option greatly increases the functionality of GEOS under a variety of hardware configurations.

While GEOS 128 2.0 recognizes up to three disk drives, only two can be used simultaneously for disk copying and other functions. The three drives are labeled A, B and C on the deskTop screen. Using the file called Configure 2.0, I've configured all my copies of GEOS 2.0 so that the default drive configuration upon booting the system is a 1571 designated as drive A, either a 1764 or 1750 REU as drive B and a 1581 as drive C.

Incidentally, if you have a 1764, which is Commodore's official 256K REU for the C-64, you'll find that it functions perfectly as a GEOS RAM disk when plugged into either a C-128 or C-128D. By simply making a ghost of the drive-C icon and placing it on either the drive A or B icon, the 1581 changes designations with the one it "displaces."

One shortcoming that I uncovered in this newly enhanced multi-drive system is that a disk error occurs if a disk that's formatted on both sides in 1571 mode is used on a 1541 (or 1541 clone) configured as drive B or C. You must re-format the disk in 1541 mode in order to access that drive.

GEOPAINT

As previously mentioned, geoPaint 128, which is included with GEOS 128 2.0, works in either 40- or 80-Column mode; but if you want to use all 16 colors ►

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The GEOS 128 2.0 deskTop, showing a number of the icons.

in one drawing, you must use 40-Column mode. Furthermore, if you're a long-time GEOS user, rest assured that your earlier geoPaint drawings are compatible with this version of geoPaint, even if they were created on GEOS 64.

Whether you're in 40- or 80-Column mode when using geoPaint, only a portion of the screen is displayed at one time. C-128s equipped with an REU allow you to move about the screen at will, displaying any portion of it almost instantly. If your geoPaint drawing was stored on either a 1571 or 1581, there's a noticeable pause when the picture is loaded from disk as you move about the screen. If you're using a 1541 disk drive, don't despair; thanks to fast disk-access routines, the data is loaded from disk with reasonable speed as you move about the screen.

For architectural drawings, the documentation includes a transparent plastic grid that fits over drawings for proper scaling. A Grid function is now implemented within geoPaint to aid in the accurate reproduction of most drawings.

GEOWRITE, TEXT GRABBER, GEOSPELL AND GEOMERGE

The two most prominent programs included with GEOS 128 2.0 are geoWrite 2.1 and geoSpell. While you can use GEOS 128 2.0 with just a 40-column composite monitor, you need an 80-column monitor to use geoWrite and geoSpell. The greatest enhancement of geoWrite 2.1 over earlier versions of the program is that it no longer uses a "writing window," which displayed only about a third of a page at a time. Instead, it now displays a more conventional WYSIWYG (What You See Is What You Get) page. Complementing geoWrite is Text Grabber, which converts non-GEOS-compatible word processing files into geoWrite documents.

Fortunately, both geoWrite 2.1 and geoSpell can take advantage of the 1764 and 1750 REUs as disk drives to greatly enhance speed. GeoSpell is simple to use. Just select a geoWrite document and then a dictionary—either a personal one or that provided with GEOS 128 2.0. GeoSpell's dictionary, appropriately called geoDictionary, takes up an enormous amount of disk space and makes the use of an REU more of a necessity than a luxury.

GeoMerge, another application included with GEOS 128 2.0, is mainly used to automatically merge a list of names and addresses (created either with geoDex, geoFile or even geoWrite) into a form letter created with geoWrite.

PAINT DRIVERS

By incorporating Paint Drivers, GEOS 128 2.0 provides something that's been sorely missing since the inception of GEOS several years ago. These give GEOS the ability to create a geoPaint-like rendering of a geoWrite document. For example, one of the options permitted by Paint Drivers is Paint PAGES, which breaks down a geoWrite page into a series of geoPaint pages. One of the many advantages of this process is that geoPaint tools can be used to enhance geoWrite documents.

SUMMARY

Many other features, either new or common to earlier versions of GEOS, are packed into GEOS 128 2.0. A Photo Manager for handling geoPaint graphics, a notepad, a calculator and an alarm clock are also included as part of the standard package.

As a C-128 fan, but a software skeptic, I have to admit that GEOS 128 2.0 breathes new life into the C-128. Even if you don't invest in any of the numerous application programs available for GEOS, you still get a good word processor, paint program and other worthwhile utilities and applications with the base package.

I've been only a fair-weather fan of GEOS over the last few years, but the advent of GEOS 2.0, first for the C-64 and later for the 128, has led me to view GEOS as a serious piece of software for Commodore 8-bit computers. Equip your C-128 with either a 1764 or, preferably, a 1750 REU, and you'll make using your C-128 a fast, productive and pleasant experience. For that reason alone, GEOS 128 2.0 is worth the price of admission, which is $69.95. ■

The spirits of Tim Walsh, RUN's technical editor, have risen appreciably since GEOS 128 2.0 arrived in town.

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TELECOMPUTING WORKSHOP

RUN's columnist picks the four best programs in the world of public domain terminal software.

By LOREN LOVHAUG

IN THE JULY 1988 installment of this column, I suggested that a good portion of Commodore telecomputing's popularity stems from the vast array of public domain software available for the C-64 and C-128. I listed a wealth of utilities, entertaining games and insightful applications that can be acquired online at little or no expense.

I've since noted that many readers appreciated that information, as well as my subsequent discussions of the national telecomputing networks. In light of your comments, I plan to devote the next several columns to the exploration of products, both public domain and commercial, that I feel are both most useful and of highest quality. This month's topic is public domain terminal software.

As I've previously indicated, choosing the right terminal program, always a highly subjective process, is critical to getting the most out of your computer and modem. There are hundreds of terminal programs available for both the 64 and 128. I've chosen to discuss the following public domain programs because they exemplify the criteria I outlined in my October 1988 column—modem support, user friendliness, file-transfer protocols and capture buffers. They are also well documented and easy to use.

C-64 Terminal Software

CBTERM 5.0—Written by Chris Dunn, this fine program (GEnie File #1637) made its appearance in early 1987. By virtue of its sheer power, it has withstood the test of time and stiff competition. Written in assembly language, CBTERM is one of the fastest C-64 terminal programs I've ever used, in both its 40- and 80-Column modes. (Yes, you read that right!)

The 80-column display, generated via software, is quite readable, especially on a monochrome monitor. In addition to letting you view twice as much text on the screen at one time, the 80-Column mode features a split-screen edit line. This is ideal for online chatting in crowded public discussion rooms, where incoming text can scramble your typing.

CBTERM also includes fast Xmodem file transfers, automatic redial, an on-screen clock, a 22.5K capture buffer (the contents of which you can load and save from and to disk), incoming and outgoing linefeed control, six programmable function keys (with command-macro support), the ability to get a disk directory and send DOS commands to your drive while online, 18 pages of documentation in sequential-file form, and a constantly available help screen. CompuServe users can enjoy CIS image file compatibility and high- and medium-resolution CIS graphics abilities. To top it all off, CBTERM can be customized by programmers who write their own assembly language overlays.

There are two minor omissions from this otherwise fantastic package: It supports only 300- and 1200-baud transmissions, and it lacks Punter protocol support, at least within the main program. (Since the original release, an assembly language overlay that includes Punter support has been written.)

CCGMS 6.01—This is a colorful, full-featured terminal program, written by Chris Smith and available on Q-Link (ccgmsv55, uploaded by Matt53) and on GEnie (#5973). Its main claim to fame is its support of Color Graphics mode, a feature that takes advantage of some of the power and flexibility hidden away in Commodore's non-standard PET ASCII character set. Fortunately, CCGMS also provides an ASCII mode for telecommunicating with non-Commodore color graphics-capable systems.

CCGMS features a 32959-byte capture buffer that supports saving and loading data to and from disk, the ability to transmit from the buffer to a printer or modem, and an option to read and transmit text data directly from disk. Since it provides a nifty screen snapshot feature, you can quickly transfer the entire contents of the screen directly to the capture buffer. CCGMS also supports a wide variety of modem types and transmission rates.

The program comes with a sophisticated Autodialer/Multidialer option that lets you select, from a predefined list, phone numbers you want to dial continuously until connection is made. For file transfers, CCGMS supports both Xmodem and Punter, as well as a special Punter batch protocol that lets you automate the sending and receiving of multiple files. Lastly, you can read and transmit disk directories as well as send DOS commands while online.

C-128 Terminal Software

Ultraterm 2.01 and 3.0—The demo by Steve Boerner is available on Q-Link (utermv201.sda uploaded by Meridian; utermv3/demo.sda uploaded by Meridian) and on GEnie (#5898). One word sums up Ultraterm: professional. In fact, after two years and numerous public domain and shareware versions, Steve Boerner has decided to go commercial with his product.

Version 2.01 (the last fully functional PD/shareware version) sports a truly elegant combination of pull-down menus (with keyboard and joystick/mouse support) and mnemonic keyboard commands, which make it easy to access any of the program's features. Add pop-up window requesters, and you start to feel as though you're telecommunicating on a Macintosh, Amiga or IBM PC.

Even with its posh screen display, Ultraterm is efficiently coded, leaving the user with a vast 64,000-byte capture buffer that includes support of loading and saving to disk and transmitting via modem. It gives you the ability to dump the data from the buffer to the printer and to type directly into the buffer, as well as upload and download directly to and from the buffer.

Besides the obligatory Xmodem and Punter protocols, Ultraterm also supports Xmodem CRC, Windowed Xmodem and a variety of modems with speeds from 300 to 2400 baud.

Two digital clocks are constantly on-screen—one keeping track of the time of day and the other of your time online. An 80-column screen displays text that has a good-looking custom font. Text ►

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and background colors, along with cursor type and blink rate, are user-definable, and almost all user options can be saved as defaults in a start-up file.

Ultraterm has a very flexible autodialer/multidialer (similar to that of CCGMS) with room for a whopping 63 entries. Each entry includes all of the parameter information for the system you call, with eight individual function-key definitions for each.

Lastly, version 2.01 includes the best documentation I've ever seen for a 64 or 128 PD program. The 28 pages are formatted in a sequential file and include a table of contents and sub-section numbers and headings, as well as intricate explanations of Ultraterm's numerous options.

The version 3.0 Ultraterm demo is a slightly crippled (the file transfer protocols have been removed) version of Boerner's latest commercial Ultraterm release. The demo gives you the opportunity to really "try before you buy!"

Pro 128 Term—Written by Paul Aidukas, this program is notable for supplying one feature that Ultraterm lacks: Commodore Color-Graphics mode support. Pro 128 Term, like CCGMS for the 64, gives you the ability to view colorful graphics and text combinations while still providing a standard ASCII mode for non-color graphics systems. You can download it from Q-Link (Pro128tm16.1.sda uploaded by RidgeRunr) or from GEnie (file #5758).

Like Ultraterm, Pro 128 is an 80-column program that uses an attractive custom character set and has an ample 53,000-byte buffer. It supports transmission speeds of 300 to 2400 baud, but only Hayes-compatible modems are supported.

Pro 128 Term is keyboard-command driven, but has two very nice drop-down help windows that can be constantly displayed while you're online. Also like CCGMS, it supports the Punter and Xmodem file-transfer protocols as well as the Punter multifile batch-transfer protocol.

One unique option that Pro Term provides is individual, pre-set log-in and password ID macros that you define in the Autodialer section. Once done, you can log on to any autodial system simply by pressing Commodore/N to send the appropriate log-in identifier and Commodore/P to send the password. Pro 128 also lets you define all eight function keys, and its split-screen Chat mode is useful for conferencing situations.

There you have it—a rundown on four exemplary public domain terminal packages. You might want to download these and compare them with the program(s) you currently use. Feel free to write and let me know how my choices stack up to yours. ■

In addition to being SYSOP of Q-Link's C-128 Special Interest Group and co-SYSOP of GEnie's Commodore Flagship, Loren Lovhaug publishes Twin Cities 128, *a newsletter for C-128 users. You can write to him care of Telecomputing Workshop, RUN Magazine, 80 Elm St., Peterborough, NH 03458.*

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2. Water can destroy data on your disk. Avoid storing your disks in excessively humid conditions. Also avoid extremes of hot and cold, which may distort or compromise the reliability of the data on your disk. Try to keep 'em at room temperature.

3. To keep your disk drive from overheating, raise it to allow air to circulate under and over it. To cool off their drives, computerists have devised many different methods—for example, spent bullet shells or sawed-off pencils in the drive's screw holes, fans directed at the unit or paper chimneys over the drive's vents!

4. If you spend a lot of time in front of your computer monitor, you run the risk of eyestrain. Get an anti-glare shield, which will also protect you from radiation and eliminate static shock. Staring at a computer screen a lot can also cause headaches, fatigue, irritability and facial twitches. Here are some things you can do:
—take a visual break every 20 minutes. Focus on different distances.
—if you don't have an anti-glare shield, make sure there are no bright lights reflecting off the screen and into your eyes. Also, don't locate your computer by, or directly in front of, a window. The contrast between the outside brightness and the low-level lighted screen can cause eyestrain.
—according to optometrists, green letters on a green screen is the worst combination for your eyes; amber screens are better; but black-and-white screens are best.

5. Sitting for long hours in front of your monitor can also cause back, neck and shoulder strain; slow blood circulation in the legs; and slacken muscle tone. An ergonomically designed chair can minimize these health hazards and muscular aches. Also, constantly changing your sitting position and good body posture with feet firmly on the floor can help. ■

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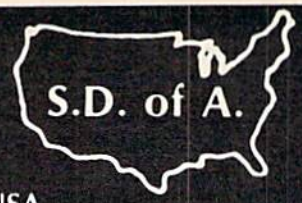

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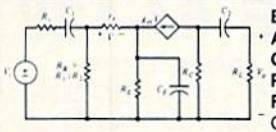

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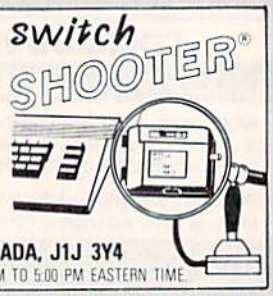

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RUN's Checksum

TYPE IN *RUN*'s CHECKSUM, which serves for both the C-64 and for the C-128 in either 40- or 80-Column mode, and save it to disk before running. When typing in a program from *RUN*, first load and run *RUN*'s Checksum. The screen will display a SYS number that deactivates and reactivates the Checksum. Always disable *RUN*'s Checksum before attempting to run another program. Note: You can abbreviate Basic keywords; spaces affect the checksum only when within quotes; and the order of characters affects the checksum.

With this new version, when you press return after typing in a program line, a one-, two-, or three-digit number from 0 to 255 appears in the home position. If this number matches the checksum value in the program listing, the line is correct. If the number that appears *doesn't* match the checksum value, compare the line with the magazine listing to find your error. Then move the cursor back up to the line and make your corrections. Now, after you press return, the correct checksum value should appear. Continue entering the listing until all the lines have been correctly typed. Then deactivate *RUN*'s Checksum, using the SYS number. Save the finished program.

All the graphics and control characters in the listings in *RUN* have been translated into understandable key combinations. They are the instructions you see inside the curly braces. For example, {SHIFT L} means you hold down the shift key while you press the L key. You do *not* type in the curly braces. What appears on the screen will look quite different from what is designated inside the braces. Here are some more examples:

{22 SPACEs}—press the space bar 22 times
{SHIFT CLR}—hold down the shift key and press the clr-home key
{2 CRSR DNs}—press the cursor-down key twice
{CTRL 1}—hold down the control key and press the 1 key
{COMD T}—hold down the Commodore logo key and press the T key
{FUNCT 1}—press the F1 key
{5 LB.s}—press the British pound key (*not* #) five times

Listing 1. *RUN*'s Checksum program. This program is available on *RUN*'s BBS for users to download.

```
10 REM RUN'S CHECKSUM 64/128 - BOB KODADEK
20 MO=128:SA=3328:IF PEEK(4096)THEN MO=64:SA=4
   9152
30 FOR I=0TO169:READB:CK=CK+B:POKE SA+I,B:NEXT
40 IFCK<>20651 THENPRINT"DATA ERROR!":END
50 POKESA+110,240:POKESA+111,38:POKESA+140,234
60 PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":PRINT
70 PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO=128
   THEN 100
80 POKESA+13,124:POKESA+15,165:POKESA+25,124:PO
   KESA+26,165
90 POKESA+39,20:POKESA+41,21:POKESA+123,205:POK
   ESA+124,189
100 POKESA+4,INT(SA/256):SYS SA:NEW
110 DATA 120,162,24,160,13,173,4,3,201,24,208,4
    ,162,13,160,67,142,4,3,140
120 DATA 5,3,88,96,32,13,67,152,72,169,0,141,0,
    255,133,176,133,180,166,22
130 DATA 164,23,134,167,132,168,170,189,0,2,240
    ,58,201,48,144,7,201,58,176
140 DATA 3,232,208,240,189,0,2,240,42,201,32,20
    8,4,164,180,240,31,201,34
150 DATA 208,6,165,180,73,1,133,180,230,176,164
    ,176,165,167,24,125,0,2,133
160 DATA 167,165,168,105,0,133,168,136,208,239,
    232,208,209,169,42,32,210
170 DATA 255,165,167,69,168,170,169,0,32,50,142
    ,169,32,32,210,255,32,210
180 DATA 255,169,13,32,210,255,104,168,96,104,1
    70,24,32,240,255,104,168
190 DATA 96,56,32,240,255,138,72,152,72,24,162,
    0,160,0,32,240,255,169
200 DATA 42,208,198
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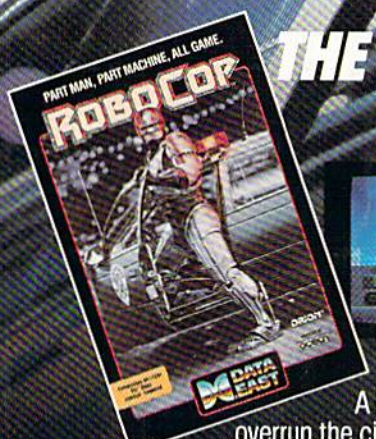

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