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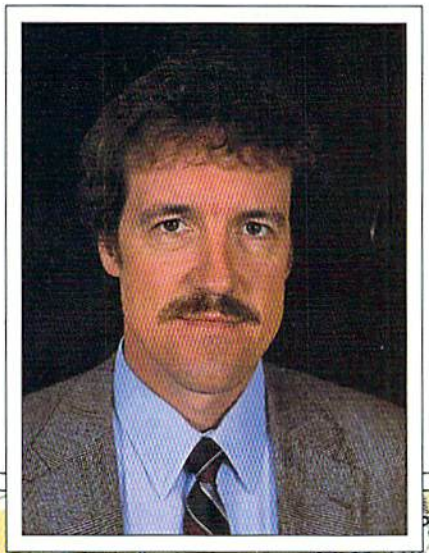

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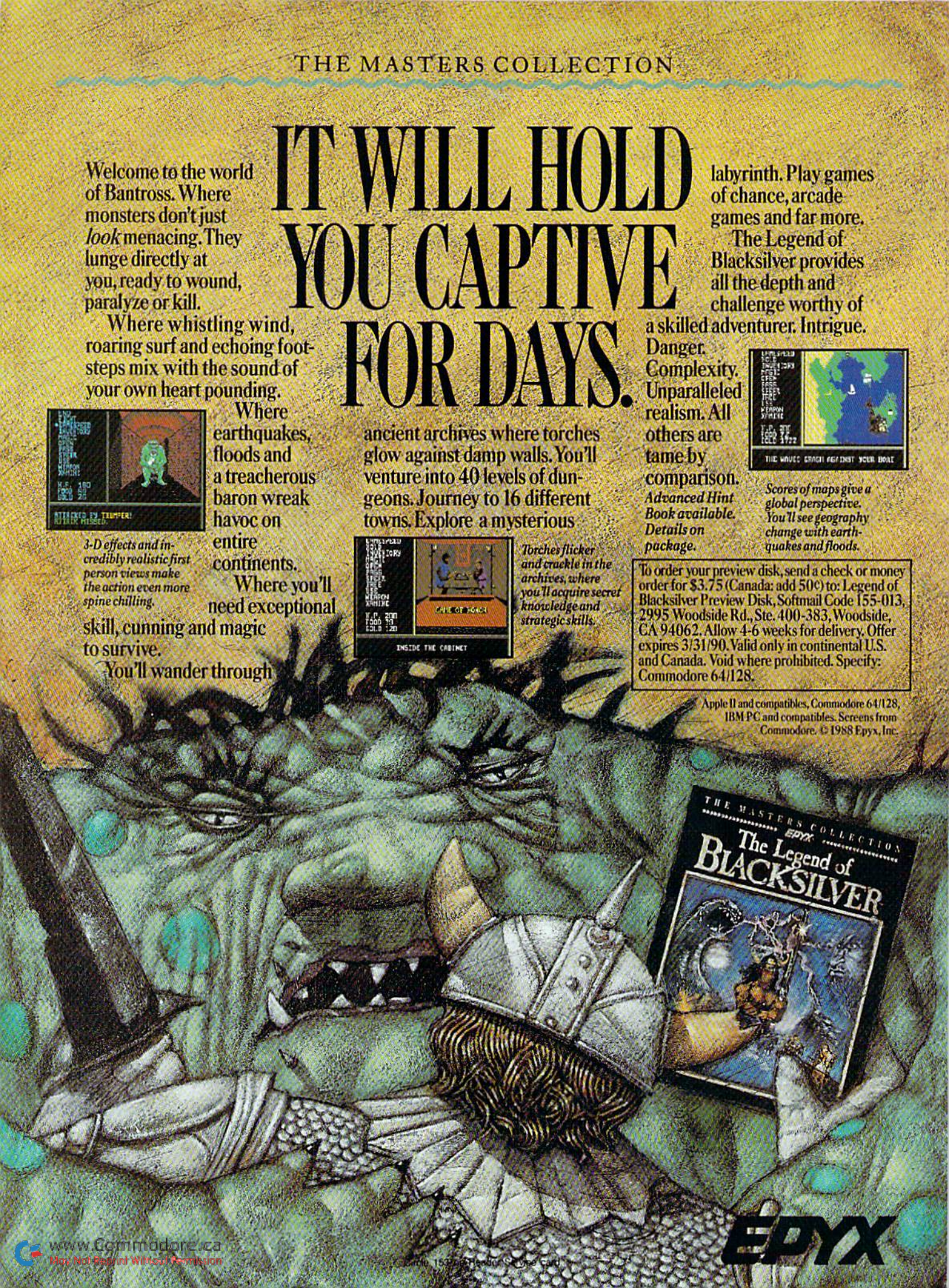

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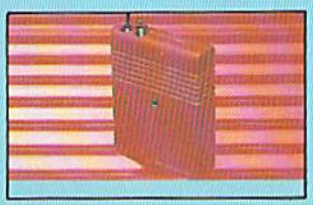

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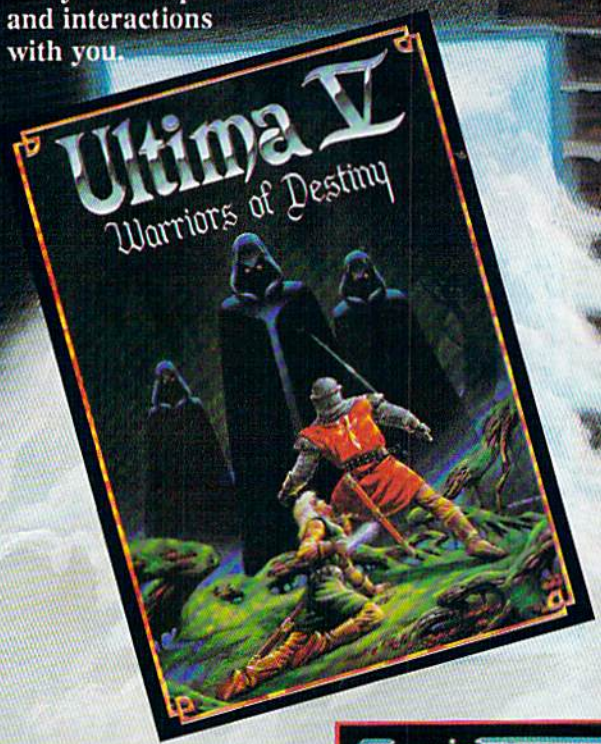

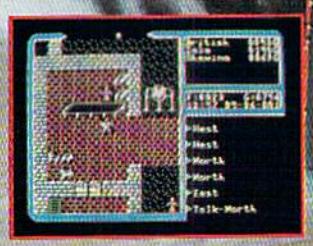

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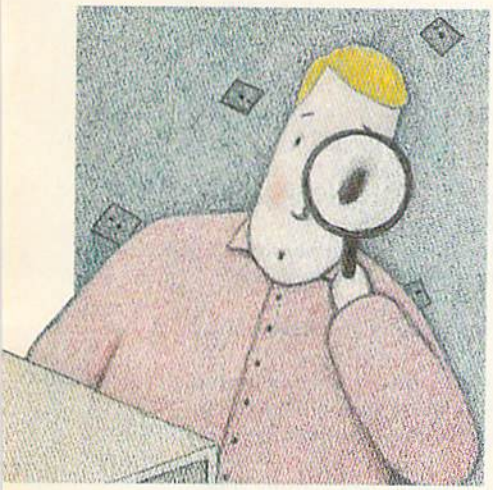
C O N T E N T S

VOLUME 6, NUMBER 1 JANUARY 1989

PAGE 37

PAGE 35



PAGE 50

FEATURES

34 WHAT DO YOU DO WITH A DEAD C-64. . . *by Dennis Brisson*
. . . and 29 other intriguing fun facts about Commodore computing.

40 2001: A CALENDAR PROGRAM* *by Ken Huebner*
Keep track of your appointments and important dates right into the 21st century. For the C-64.

50 DEMYSTIFYING DOS *by John Ryan*
Get on the right track with this disk drive tutorial.

56 MULTITASKING COMES TO THE C-64* *by Michael Ingrassia*
Juggle up to three Basic programs at once.

66 RAISING RAINBOWS* *by Mary Wilson*
Cultivate the exotic and beautiful Amazonian rainbow plant. A C-128 game.

72 SCREEN BASIC* *by John Ryan*
Add 13 video programming commands to your C-64.

DEPARTMENTS

6 RUNNING RUMINATIONS
Commodore's long sleep through 1988.

8 MAGIC *by Tim Walsh*
The original column of hints and tips for performing Commodore computing wizardry.

12 MAIL RUN
Input from our readers.

14 NEWS AND NEW PRODUCTS
Recent developments and releases in the world of Commodore computing.

20 SOFTWARE GALLERY *Reviews of:*

- Red Storm Rising
- Infocomics
- The Write Stuff, C-128 Version
- Where in Europe is Carmen Sandiego?
- Monopoly
- Napoleon in Russia—Borodino 1812
- Stocker
- The Friendly Computer
- Rush 'N Attack/Yie Ar Kung-Fu
- Sons of Liberty
- Deep Space
- The Bard's Tale III: Thief of Fate
- Questron II
- Battle Droidz

65 LEARN TO WALK BEFORE YOU RUN
First steps for new Commodore owners.

76 COMMODORE CLINIC *by Lou Wallace*
Answers to your questions about Commodore computing.

78 GAMES GALLERY *by Lou Wallace*
RUN's new column covers reviews, game-playing hints and insight into games for the C-64 and C-128.

82 GEOWATCH *by Tim Walsh*
inGEniOuS hints and advice for GEOS users.

84 TELECOMPUTING WORKSHOP *by Loren Lovhaug*
RUN's columnist rubs his magic lamp to take a look at GEnie.

86 INDEX TO *RUN*'S 1988 ARTICLES AND REVIEWS

91 *RUN*'S CHECKSUM PROGRAM
Run it right the first time.

96 COMING ATTRACTIONS; LIST OF ADVERTISERS

* The listings for these articles are also available on the January–February 1989 ReRUN disk. To order, see page 64D.

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RUNning Ruminations

In the Commodore eight-bit market, 1988 was a non-year.

Year in Review

It's been a long, hard year—elections, Olympics, America's return to space. So much happened, and yet, in the Commodore computing industry, 1988 may be best remembered not for its interesting developments, but for what didn't happen.

*The president of Commodore was *not* canned. No heads rolled, no major management shakeups occurred, no major layoffs transpired at Commodore this year, as Gould, Toy, et al, continue with their successful turnaround strategy.

*Commodore did *not* introduce any new products in 1988 for the multitude of eight-bit Commodore users. Their definition of an innovative technological breakthrough for this market is changing the color of the C-64 to match that of the C-128.

*Commodore also appears oblivious to the threat from video game manufacturers. We thought that 1988 would be the year Commodore would introduce new pricing and/or software bundling for the C-64 to make it an attractive alternative to the video game machines. Instead, they are contentedly letting that market slip away.

*Even existing products weren't really there. Forget about products that weren't developed in 1988. The 1670 modem was virtually non-existent in mid-year, and the 1750 RAM expander, due to the scarcity of memory chips, was hard to come by at year's end.

Thanks, Commodore, for your non-support.

Other 1988 high(low)lights:

*Nineteen eighty-eight will be remembered as the year of the games—for 64 owners, that is. On the 64 productivity side, GEOS remains the dominant force.

*Greetings to several new software developers, including video game manufacturers who have converted their software to the C-64. Welcome aboard!

*It was a year in which many users experienced laser printer envy. Although prices are coming down, they remain just out of the reach of the average Commodore user's budget.

*It was a year when computer viruses, of all things, made the cover of *TIME* magazine.

**RUN* quietly celebrated its fifth anniversary (but we promise a noisy bash for our ten-year celebration, to which you will be invited).

*It was a year in which Commodore owners were asked to trade in their pitiful, decrepit 64s, 128s or 128Ds for a whopping $100 allowance towards the purchase of an Amiga 500 or 2000. Any takers?

*This was a year in which, if you needed your computer serviced, your patience and faith in the American enterprise system were severely tested.

*This year saw Commodore discontinue manufacturing the standard 128 in favor of the 128D.

*Any support for Commodore eight-bit users comes from some online networks, BBSs, magazines, computer shows, some software developers and, of course, the user groups, the backbone of the Commodore computing industry.

*It was a year in which smoker-bashing stooped to new depths. The National Center for Health Statistics discovered that, among their other despicable habits, smokers are less active physically and apt to get less sleep. This probably describes 90 percent of the computer users I know. (Other bad habits include tendencies to pick up hitchhikers and to drive without a seat belt. How disgusting!)

As I gaze into my murky crystal ball, I predict more of the same in store for Commodore owners in 1989. Sorry, folks.

Dennis Brisson
Editor-in-Chief

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MAGIC

Need better control over your cursor? Want to highlight menu options on both the 64 and 128? These and other tricks will help you get more use out of your computer.

Compiled by TIM WALSH

$4F8 64 WINDOWS

Programmers have been writing window utilities for the C-64 since the first one rolled off the assembly line. Now there's a machine language windowing system for the C-64 entitled 64 Windows. It's short, easy to use and simple to incorporate into your own programs.

I've included a demonstration program that creates two windows and shows how windows are created. Although the program is fully relocatable in memory, its default location is 49152. Consequently, SYS 49152 will copy screen memory, SYS 49263 will create a window and SYS 49335 will replace screen memory. After activating 64 Windows, poke the following locations with their respective values to color and position windows on the screen:

Left side:	Poke 251,	(0–38)
Right side:	Poke 252,	(1–39)
Bottom:	Poke 253,	(1–24)
Character color:	Poke 254,	(0–15)

```
Ø REM C-64 WINDOW - TODD NEUMILLER :REM*26
1Ø J=49152:FORA=JTOJ+253:READD:CK=CK+D:POK
   E A, D:NEXT                    :REM*176
2Ø IFCK<>35641THENPRINT"ERROR IN DATA.":EN
   D                               :REM*7
3Ø POKE251,9:POKE252,29:POKE253,1Ø:POKE254
   ,14                            :REM*238
4Ø SYS49152:SYS49263              :REM*189
5Ø PRINTCHR$(19)SPC(5Ø)"TO SAVE THE SCREEN
   !"                             :REM*199
6Ø PRINTSPC(16)"SYS49152"          :REM*84
7Ø PRINTSPC(54)"FOR WINDOWS"      :REM*168
8Ø PRINTSPC(16)"SYS49263"         :REM*145
9Ø PRINTSPC(55)"HIT A KEY!"        :REM*11
1ØØ GETK$:IFK$=""THEN1ØØ          :REM*28
11Ø POKE251,11:POKE252,27:POKE253,8:SYS492
   63                             :REM*14
12Ø PRINTCHR$(19)SPC(52)"RESTORE SCREEN!"
                                  :REM*252
13Ø PRINTSPC(16)"SYS49335"        :REM*166
14Ø PRINTSPC(55)"HIT A KEY!"      :REM*121
15Ø GETK$:IFK$=""THEN15Ø          :REM*1Ø5
16Ø SYS49335                       :REM*95
17Ø END                            :REM*43
18Ø DATA 162,216,134,188,169,Ø,133,187,162
   ,Ø,16Ø,Ø,173,254,Ø,145,187,2ØØ:REM*174
19Ø DATA 192,4Ø,144,246,24,165,187,1Ø5,4Ø,
   133,187,165,188,1Ø5,Ø,133,188 :REM*165
2ØØ DATA 232,224,25,2Ø8,226,162,Ø,189,Ø,4,
   157,Ø,6Ø,232,224,255,2Ø8,245  :REM*132
21Ø DATA 173,255,4,141,255,6Ø,162,Ø,189,Ø,
   5,157,Ø,61,232,224,255,2Ø8,245  :REM*1
22Ø DATA 173,255,5,141,255,61,162,Ø,189,Ø,
   6,157,Ø,62,232,224,255,2Ø8,245:REM*154
23Ø DATA 173,255,6,141,255,62,162,Ø,189,Ø,
   7,157,Ø,63,232,224,255,2Ø8,245 :REM*18
24Ø DATA 96,162,4,134,188,169,Ø,133,187,16
   2,Ø,172,251,Ø,169,117,145,187 :REM*151
25Ø DATA 2ØØ,169,32,145,187,2ØØ,2Ø4,252,Ø,
   144,246,172,252,Ø,169,118,145 :REM*15Ø
26Ø DATA 187,24,165,187,1Ø5,4Ø,133,187,165
   ,188,1Ø5,Ø,133,188,232,236,253:REM*23Ø
27Ø DATA Ø,2Ø8,212,172,251,Ø,169,12Ø,145,1
   87,2ØØ,2Ø4,252,Ø,144,246,169  :REM*19Ø
28Ø DATA 12Ø,145,187,96,162,Ø,189,Ø,6Ø,157
   ,Ø,4,232,224,255,2Ø8,245,173   :REM*12
29Ø DATA 255,6Ø,141,255,4,162,Ø,189,Ø,61,1
   57,Ø,5,232,224,255,2Ø8,245,173:REM*242
3ØØ DATA 255,61,141,255,5,162,Ø,189,Ø,62,1
   57,Ø,6,232,224,255,2Ø8,245,173 :REM*88
31Ø DATA 255,62,141,255,6,162,Ø,189,Ø,63,1
   57,Ø,7,232,224,255,2Ø8,245,96 :REM*173
```

—TODD NEUMILLER, SPOKANE, WA

$4F9 128 WINDOWS

This trick shows a few shortcuts for making windows on the C-128 in both 40- and 80-Column modes. Because the syntax of the Window command is so confusing and difficult to remember, I've simplified it here by listing the four easily remembered Poke commands you'll need in order to create windows:

POKE 228,	(0–24)	Bottom of window
POKE 229,	(0–24)	Top of window
POKE 230,	(0–79)	Left margin of window*
POKE 231,	(0–79)	Right margin of window*

*Note: A maximum value of 39 can be used with the 40-column screen.

After you've created a window using any of the above Pokes, you can deactivate it by pressing run-stop/restore or by pressing the home key twice.

—JOHN COLGAN, RAYTOWN, MO

$4FA 64 MEMORY SAVER

While the C-64 lacks a BSave (binary save) command for saving areas of memory to disk, this shortcoming can be overcome with only six lines of Basic code. The listing, 64 Memory Saver, saves a section of memory containing a machine language routine to disk as a fast loading machine language file.

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As an example, let's say you have a utility that resides in locations 49152 to 49252 and is activated with SYS 49152. Just load and run the utility, then load and run 64 Memory Saver. Enter a starting address of 49152, an ending address of 49252 and a filename, such as "49152 UTILITY".

After you've saved the utility to disk with 64 Memory Saver, you can load it with LOAD "49152 UTILITY",8,1 and activate it with SYS 49152.

```
Ø REM 64 MEMORY SAVER - JOE CHARNETSKI
                                        :REM*71
1Ø INPUT"STARTING ADDRESS :";S          :REM*235
2Ø INPUT"ENDING ADDRESS :";E:E=E+1:REM*1Ø3
3Ø INPUT"FILENAME : ";F$:SYS 57812F$,8
                                        :REM*175
4Ø POKE 173,S/256:POKE 172,S-256*PEEK(173)
                                        :REM*28
5Ø POKE 78Ø,172:POKE 782,E/256          :REM*73
6Ø POKE 781,E-256*PEEK(782):SYS 65496
                                        :REM*95
```

—Joseph Charnetski, Plains, PA

$4FB Joystick-Controlled Cursor

If you've ever wanted to move the C-64's cursor with something other than the cursor keys, then 64 Cursor Joystick is for you. Once typed in and enabled with SYS 49152, a joystick in port 2 lets you move the cursor anywhere around the screen.

You'll find that this program will never interfere with other program operations. It can be disabled with run-stop/restore, and the cursor speed can be adjusted by entering POKE 49174, X, where X is a value between 3 (fastest) and 15 (slowest).

```
Ø REM CURSOR JOYSTICK - LEONARDO PAKMAN
                                        :REM*63
1Ø FOR T= 49152 TO 49249:READD:POKET,D:CK=
   CK+D:NEXT                            :REM*187
2Ø IF CK<> 12Ø25 THENPRINT"ERROR IN DATA S
   TATEMENTS...":END                    :REM*151
3Ø SYS 49152:PRINT"CURSOR JOYSTICK ACTIVAT
   ED"                                  :REM*116
4Ø DATA 12Ø,169,13,141,2Ø,3,169,192,141,21
   ,3,88,96,234,234,234,2Ø6,97          :REM*187
5Ø DATA 192,2Ø8,73,169,4,141,97,192,173,Ø,
   22Ø,2Ø1,127,24Ø,61,169,1,133         :REM*195
6Ø DATA 198,173,Ø,22Ø,2Ø1,126,2Ø8,8,169,14
   5,141,119,2,76,49,234,173,Ø          :REM*229
7Ø DATA 22Ø,2Ø1,125,2Ø8,8,169,17,141,119,2
   ,76,49,234,173,Ø,22Ø,2Ø1,119         :REM*78
8Ø DATA 2Ø8,8,169,29,141,119,2,76,94,192,1
```

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```
   73,Ø,22Ø,2Ø1,123,2Ø8,5,169        :REM*97
9Ø DATA 157,141,119,2,76,49,234,4 :REM*156
```

—LEONARDO PAKMAN, BUENOS AIRES, ARGENTINA

$4FC 64 DISK DRIVE LIGHTSHOW

Use this C-64 bit of magic to add mystery to your programs. 64 Disk Drive Lightshow makes your 1541 or 1571 disk drive's light gradually fade off and on after you've executed the SYS 49152 command. It also suspends access to the drive until you deactivate it with run-stop/restore and turn off the disk drive.

```
Ø REM 64 DISK DRIVE LIGHT SHOW - JEREMIAH
  MANN                                :REM*157
1Ø FOR T=49152 TO 49286:READD:POKET,D:CK=C
   K+D:NEXT                           :REM*161
2Ø IF CK<> 194Ø7 THENPRINT"ERROR IN DATA S
   TATEMENTS..."                      :REM*7
3Ø PRINTCHR$(147)"TO ACTIVATE THE DISK DRI
   VE LIGHT, ENTER SYS 49152"         :REM*86
4Ø DATA 169,1,162,8,16Ø,15,32,186,255,169,
   Ø,32,189,255,32,192,255,162        :REM*173
5Ø DATA 1,32,2Ø1,255,162,Ø,169,77,32,21Ø,2
   55,169,45,32,21Ø,255,169,87        :REM*237
6Ø DATA 32,21Ø,255,138,32,21Ø,255,169,5,32
   ,21Ø,255,169,1,32,21Ø,255          :REM*168
7Ø DATA 189,9Ø,192,32,21Ø,255,138,72,32,2Ø
   4,255,162,1,32,2Ø1,255,1Ø4         :REM*89
8Ø DATA 17Ø,232,224,45,2Ø8,2Ø4,169,85,32,2
   1Ø,255,169,67,32,21Ø,255,32        :REM*164
9Ø DATA 2Ø4,255,96,169,254,17Ø,32,21,5,2Ø2
   ,224,1,2Ø8,248,32,21,5,232         :REM*1ØØ
1ØØ DATA 224,255,2Ø8,248,24Ø,235,138,72,73
    ,255,168,169,248,141,Ø,28         :REM*121
11Ø DATA 2Ø2,2Ø8,248,169,24Ø,141,Ø,28,136,
    2Ø8,248,1Ø4,17Ø,96                :REM*234
```

—JEREMIAH MANN, VISALIA, CA

$4FD 64/128 HIGHLIGHTED MENU ROUTINE

While there are programs for creating menu systems for both the C-64 and C-128, most have some limitations, and that's usually a lack of compatibility with both computers. You'll find my 64/128 Highlighted Menu Routine has virtually no limitations and is completely compatible with both the C-64 and the C-128.

The 64/128 Highlighted Menu Routine highlights and selects menu options as you scroll through them with the up-down cursor key. Configuring this routine for your own programs is remarkably easy—just substitute your own menu options in the Data statements at the beginning of the routine and change the variable NI to one less than the number of items in the menu.

For added flexibility, you can change the variables X and Y at the beginning of the program to set the horizontal (X) and vertical (Y) locations of the menu.

```
Ø REM 64/128 HIGHLIGHTED MENU ROUTINE - RE
  X DAY                               :REM*12Ø
1Ø X=12:Y=8:Y$="{CTRL 9}":Z$="{CTRL Ø}":IF
    PEEK(65532)=61 THEN 3Ø            :REM*78
2Ø XR=781:YR=XR+1:SR=YR+1:GOTO 4Ø:REM USED
    BY C-64                           :REM*134
3Ø XR=7:YR=XR+1:SR=YR-3:REM USED BY C-128
                                      :REM*127
4Ø NI=4:FOR H=Ø TO NI:READ OP$(H):NEXT
                                      :REM*79
5Ø DATA "ADD TRANSACTIONS","VIEW TRANSACTI
   ONS","PAYMENT SUMMARY","BUDGET":REM*23Ø
6Ø DATA "EXIT"                        :REM*13Ø
7Ø PRINTCHR$(147):YY=Y:GOSUB18Ø       :REM*165
8Ø FORH= Ø TO NI:PRINTTAB(X)OP$(H):NEXT
                                      :REM*225
9Ø YY=Y+A:GOSUB 18Ø:PRINTY$;OP$(A);Z$
                                      :REM*2Ø1
1ØØ GETA$:IF A$=""THEN 1ØØ            :REM*173
11Ø GOSUB 18Ø:PRINTOP$(A)             :REM*162
12Ø IF A$="{CRSR DN}"THEN A=A+1:IF A>NI TH
    EN A=Ø                            :REM*28
13Ø IF A$="{CRSR UP}"THEN A=A-1:IF A=-1 TH
    EN A=NI                           :REM*154
14Ø IF A$<> CHR$(13) THEN 9Ø          :REM*33
15Ø PRINT:PRINTTAB(5)"{5 CRSR DNs}YOU SELE
    CTED ";Y$;OP$(A);Z$               :REM*127
16Ø IF OP$(A)="EXIT"THEN END          :REM*1Ø4
17Ø FORT=1TO1ØØØ:NEXT:GOTO 7Ø         :REM*196
18Ø POKE XR,YY:POKE YR,X:POKE SR,Ø:SYS 655
    2Ø:RETURN                         :REM*73
```

—REX DAY, MOUNTAIN HOME, ID

$4FE WHEN ALL ELSE FAILS. . .

It's Sunday night, and you need to print a report or paper due Monday morning just as your printer ribbon breaks. Magic can help. Remove the broken ribbon and, if needed, set the print head gap for three sheets of paper. Then put into the printer two sheets of paper with a sheet of carbon paper in between. The top sheet will be illegible, but the bottom sheet will print as a carbon copy. While this is a great trick in emergencies, it's still no substitute for having a second printer ribbon handy.

—KEN ASTON, L'AMABLE, ONTARIO, CANADA

$4FF THE OLD PROGRAM FILE DILEMMA

In the January 1988 issue of *RUN*, Magic trick $464, "Lou's Sequential Saga," showed how to convert a Basic program into a sequential file that could then be read by word processors and telecommunications programs. The code was a simple Direct Mode command as follows:

```
OPEN 8,8,8,"FILENAME,S,W":CMD8:LIST:PRINT#8:CLOSE 8:
```

While this is a handy bit of magic, if your word processor or terminal program can't read sequential files, novice computer users won't be able to load the sequential file. If you're one of the hapless souls whose word processor can't read sequential files, just substitute a ,P,W for the ,S,W that follows the word FILENAME in the above example. You'll then be able to read the file into your word processor. However, it won't be as "clean" and well-formatted as the sequential file versions.

A lowercase m will be substituted for all returns in your file. All you have to do is use your word processor's Search-with-Replace function to scan the document and replace the m's with returns.

—ANTHONY AGUIRRE, HAVERTOWN, PA

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$500 Detecting the Restore Key

Detecting most key presses on the C-64 is easily accomplished through the use of one or more Peek commands. However, detecting a restore key press is difficult. You can use my Restore Key Detection Routine in any program without affecting the run-stop/restore combination.

As written, the program monitors the RS-232 port for activity, and it pokes location 673 with a 0 to keep disk access normal. Just don't perform any RS-232 accesses when using this routine in your own programs.

```
Ø REM C-64 RESTORE KEYPRESS DETECTION - DE
  NNIS MAGAR                          :REM*187
1Ø PRINTCHR$(147):POKE 5659Ø,1:POKE 673,1
                                      :REM*1Ø1
2Ø PRINT"{HOME}PRESS RESTORE TO SEE MESSAG
  E"                                  :REM*215
3Ø IF PEEK (673)=128 THEN POKE 673,1:GOTO
  5Ø                                  :REM*114
4Ø GOTO 2Ø                            :REM*164
5Ø PRINT"PRESS RESTORE AGAIN TO END"
                                      :REM*99
6Ø IF PEEK (673)=128 THEN POKE 673,Ø:END
                                      :REM*9Ø
7Ø GOTO 6Ø                            :REM*2Ø2
```

—Dennis Magar, Wylie, TX

$501 1670 Auto-Answer Disable

My Commodore 1670 modem is great for 1200-baud telecomputing, except that it lacks a switch to disable auto-answering. 1670 users should keep the following program handy, which can be run when you're finished using the modem. It disables the auto-answer feature without disconnecting the modem.

```
10 OPEN 2,2,2, CHR$(6)+CHR$(10)
20 PRINT#2,"ATSO=0":CLOSE 2
```

—Craig Stern, Hartsdale, NY

$502 No-Nonsense 1670 Auto-Answer Disable

Fellow 1670 users should go to their nearest Radio Shack store and ask for part #43-127, which costs about $8. The part is a ring silencer, and you plug your incoming phone line into one end and the other end of the ring silencer into your 1670. Then you can plug a line to your telephone from the other telephone line port on the modem.

The silencer keeps the 1670 from answering incoming calls, yet allows outgoing calls. Best of all, the silencer has a light that comes on with each ring. You'll never have to run another auto-answer disable program or unplug the modem again.

—Fred J. Soderlund, Goleta, CA ■

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.*

Magic pays $10–$40 for each trick published in the column.

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MAIL RUN

Setting the record straight about geoWrite Workshop 128, 64- vs. 128-mode programs and Dark Castle.

A GOOD SCARE

The animated Pumpkin program in "Scared Silly!" (*RUN*, October 1988) is delightfully humorous and a terrific example of the graphics capabilities of the C-128. Hats off to programmer Joey Latimer!

—GEORGE J. CLARK
POINTE CLAIRE, QUEBEC, CANADA

TELL IT LIKE IT IS

When I see a commercial program disk with the legend, C-64/128, I expect the program to run in both 64 and 128 modes. However, such is not the case—it runs on the C-64 and on the C-128 in 64 mode. This is misleading. Software publishers should recognize this and tell it like it is.

—ELMER ROTHFUS
SUN CITY, AZ

We agree that it is a misleading practice. You'll note that RUN *was one of the early pioneers in clearly distinguishing between programs that run in the 64 vs. the 128 mode.*

—EDITORS

FAULTY TOWERS

In the Software Gallery of the September 1988 issue of *RUN*, reviewer Tim Walsh stated there was a problem loading Dark Castle in the 1571 disk drive. Of the thousands of copies of the game sold so far, only two were returned with that problem. One was badly scratched; the other disk was fine—the user's 1571 drive heads were out of alignment.

We'll be happy to run a diagnostic test on any disk an owner experiences as faulty, including Tim's, and we'll gladly replace any disk found faulty as a result of manufacturing.

—ANN FELTES
PUBLIC RELATIONS SPECIALIST
THREE-SIXTY, INC.
CAMPBELL, CA

IS THAT WRITE?

Regarding Marte Brengle's two-part review of geoWrite Workshop 128 (*RUN*, August and September 1988, geoWatch), I have some points and some complaints to make.

Brengle can't understand why Berkeley Softworks' applications all require 1541-mode installment. Would she prefer being restricted to 1571-mode installment? Many 128 owners I know up-graded from the 64 and kept their 1541 drives, so such a scheme would leave them out in the cold.

I'd like to clarify the confusion surrounding 60-dpi printers. No matter what printer driver you use, the first thing you should do is move the right margin to the 6 on the Ruler when printing at 60 dpi. Anything beyond that won't work. Also, when using Paint Overlay to make a multicolumn geoPaint document, keep all the margins no greater than 6. Otherwise, you'll lose a piece of the right-hand column.

I was shocked to read that the Text Grabber converts the original word processor file and leaves it incomprehensible to its creator. If that were true, would Text Grabber ask for a new filename for geoWrite to create? Take a look at the deskTop after grabbing some text and you'll see what I mean.

Marte also neglected to mention an odd feature of gWW 128: There's a little "P" indicator on the Ruler that you can use to set automatic indents at the beginning of paragraphs. There's a good reason for this: though the manual neglects to mention it, regular tabs don't work in Full Justification mode.

A question: Where can someone without a modem get the double- and quad-strike print drivers that she mentioned?

—AARON PEROMSIK
WORCESTER, MA

Marte Brengle states: "First of all, in the matter of 1541/1571 installation, there are many 128 owners who continue to use their 1541s (in fact, I'm still using mine). However, the installation procedure should work regardless of which drive is used.

"The Text Grabber information was indeed a mistake. I don't use that feature very often, since I generally stick to one word processor, and I neglected to check on this because I thought I remembered how it worked. Obviously, I shouldn't take my memory for granted!

"I talked a bit about the P for paragraph-indent marker in the original text of the article, but didn't go into detail. It's interesting to learn about all these little goodies that have been left out of the manual.

"Serious GEOS users should consider getting a modem and a subscription to QuantumLink, whose collection of software for the operating system is second to none. To find the print drivers you need, a good place to start would be Berkeley Softworks or a local users group."

—EDITORS

KNOCK ON WOOD

The game Cards-31 ("Knock!" *RUN*, September 1988) can be made more realistic and colorful by incorporating the following changes (changing the colors in the original line 20 makes the background more compatible with the red suits):

```
20 POKE53280,12:POKE53281,15
610 PRINT"{9 CRSR DNs}"TAB(18)"(4)"
1330 S$(1)="{SHFT/A}":S$(2)="{CTRL/3}{SHFT/S}{CTRL/1}"
1335 S$(3)="{CTRL/3}{SHFT/Z}{CTRL/1}":S$(4)="{SHFT/X}"
1372 BZ=(I-1)—10+5
1375 PRINTTAB(BZ)"{1 SPACE}{7 CMDR/@s}"
1380 PRINTTAB(BZ)"{SHFT/N}{7 SPACEs}{SHFT/M}"
1390 PRINTTAB(BZ)"{CMDR/G}"C$"{5 SPACEs}{CMDR/M}"
1400 PRINTTAB(BZ)"{CMDR/G}{7 SPACEs}{CMDR/M}"
1410 PRINTTAB(BZ)"{CMDR/G}{3 SPACEs}"S$"{3 SPACEs}
     {CMDR/M}"
1420 PRINTTAB(BZ)"{CMDR/G}{7 SPACEs}{CMDR/M}"
1430 PRINTTAB(BZ)"{CMDR/G}{5 SPACEs}"C$"{CMDR/M}"
```

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```
1440 PRINTTAB(BZ)"{SHFT/M}{7 SPACEs}{SHFT/N}"
1445 PRINTTAB(BZ)"{1 SPACE}{7 CMDR/Ts}"
1450 PRINT"{10 CRSR UPs}"
```

—Charles W. Haynes
Beatrice, NE

Printer Perfect

Thank you for author Tim Walsh's article, "Printers on Parade," which appeared in the October 1988 issue of *RUN*.

I know it's impractical to include all the latest printers in one short article, but I believe Mr. Walsh should have included the new Star NX-1000C, made exclusively for use with Commodore computers.

Almost every attractive feature mentioned in your article is incorporated into this printer, which lists for $299.

—Donald W. Rose
Yucca Valley, CA

Thanks for the compliment. Stay tuned to RUN *for a roundup of Star printers in our Hardware Gallery column.*

—Editors

Oops!

We appreciated the vote of confidence in our product, the Epyx FastLoad Cartridge ("Rapid Transit Systems," *RUN*, August 1988). However, FastLoad actually retails for $39.95.

—Debra Simshauser,
Public Relations, Epyx, Inc.
Redwood City, CA

In Defense of C-128 Software

This is in response to the three Mail RUN letters ("Why So Little C-128 Support?", "My 40/80 Key Stays Down!" and "Come Down From Your Mountain, Commodore!") in the September 1988 issue of *RUN*.

First, for each C-128 sold, a C-64 is also sold. As there are now some eight million C-64s and only two million C-128s, the 64 market is actually ten million units strong (since you can run any 64 program on the 128), and any software company is going to sell to the largest market.

Second, have any of these readers checked their local users groups for C-128 software? And how about Q-Link, whose 1988 Public Domain Software Directory has *37 pages* of 128 software, covering applications, CP/M, graphics, games, music, telecommunications, programmer's tools, and on and on.

Third, if all else fails, learn to write your own programs. That's the single most important factor about personal computers, that you're not at the mercy of software developers' whims—you can produce your own software.

—L. R. Hollis
Ridgecrest, CA ■

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NEWS AND NEW PRODUCTS

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Compiled by HAROLD R. BJORNSEN

BAUD-Y MODEM

CAMARILLO, CA—MiniModem-C is a direct-connect Hayes- and 1670-compatible 300/1200-baud modem for Commodore computers. It comes with a complete set of indicator lights that tells you its status at all times. The complete Hayes AT command set is supported and software-selectable. Default settings are switchable, using internal DIP switches. A built-in speaker lets you hear line responses. MiniModem, which can run any Commodore terminal program, is available for $74.95. Aprotek, 1071-A Avenida Acaso, Camarillo, CA 93010.

Check Reader Service number 400.

POWER DRESSING

HONOLULU—Computer Lust (PO Box 61734, Honolulu, HI 96839) has released silk-screen T-shirts with humorous computer themes, including Good to the Last Byte, Getting Loaded, Basic Training, RAM-Bo, Miss DOS and Transformer. Prices not available at press time. T-Shirts, which are available in several sizes, can be ordered directly from Computer Lust.

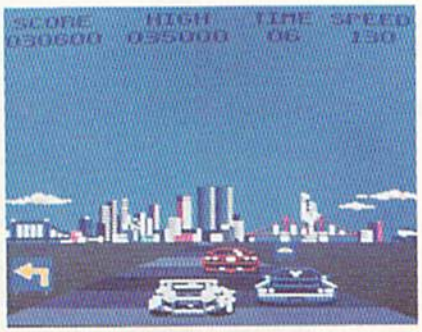
Check Reader Service number 401.

SPEC-IAL SPECS

CARROLLTON, TX—A Carrollton, Texas, company is developing stereoscopic 3-D glasses to be used with the C-64. Haitex Resources says the X-Specs 3-D glasses, which are cabled to the computer, control what each eye sees independently by closing and opening an optical shutter at 60 frames per second, using a high-speed liquid crystal. The glasses, when available, will not come cheap—the Amiga version costs $124.95.

NOT FAST ENOUGH FOR YOU?

CHATSWORTH, CA—Imagine racing a Mercedes 560 SEC at speeds of up to 160 mph. Too slow for you? How about a Porsche 911 Turbo? Still too slow? Maybe a Lamborghini Countach or a Ferrari GTO is more up to par to your driving tastes. Crazy Cars lets players test their driving skills in some of the world's fastest cars on race courses in areas like Arizona, Florida and Malibu. As players successfully complete all the race courses, they'll graduate to the next level of driving skill, with 72 levels in all. Priced at $39.95 for the C-64, it's available from Titus Software, 20432 Corisco St., Chatsworth, CA 91311.



Burn rubber in the racing game, Crazy Cars, from Titus Software.

Check Reader Service number 407.

BACK TO THE FUTURE

LONDONDERRY, NH—In 2400 AD, the Robot Patrol has been given full authority over the city of Metropolis on the planet XK-129. Metropolis was once a flourishing city where intellectual, scientific and cultural growth was in abundance. It is now in a state of siege where research is prohibited and martial law prevails. As a new arrival on the planet, you are chosen by the underground resistance to lead the revolution and restore freedom to Metropolis. The game features futuristic weaponry and a holoprojector to create a duplicate image of yourself in order to divert robot attacks. For the C-64, it's available for $39.95. Origin Systems, 136 Harvey Rd., Bldg. B, Londonderry, NH 03053.

Check Reader Service number 404.

3½-INCH DISK HOLDERS

CHELTENHAM, PA—DisKeeper, a storage method for 3½-inch disks, uses a standard three-ring binder. The edged-tabbed, plastic page holds four disks locked in place while its design lets you remove a disk with one hand. The pages are light and durable, leaving labels and the write-protect switch accessible. DisKeeper is available in two packages: five pages, self-stick index labels and a black, padded, three-ring binder for $19.95; or three DisKeeper pages and self-stick index labels for $6.95; add $3 s/h. Cobar Inc., 301 Highland Rd., Cheltenham, PA 19012.

Check Reader Service number 406.

BACK TO SCHOOL

SPRINGFIELD, MO—ACS Software (2135 E. Sunshine, Suite 106, Springfield, MO 65804) is offering Grade Manager, a grading management software package for teachers. The C-64 and C-128 versions provide automatic conversion of grades to 100-point scale, allow searching for students by name, I.D. number, assignment date and name, and auto-advancing through the roster starting at a desired roster number. It also has a generic search capability to allow searches based on partial names. A variety of reports can be printed out, including class and attendance rosters, gradebook sheets, grade lists with or without names, mid-term and final average sheets, and student grades sheets listing each student's grades, category averages and mid-term and final averages. It's available for $69.95.

Check Reader Service number 402.

HOLM, SWEET HOLM

GRANADA HILLS, CA—MicroIllusions (17408 Chatsworth St., Granada Hills, CA 91344) has released Faery Tale Adventure for the C-64. Fear and death have come to the once-peaceful land of Holm. Ogres plague the roads and wraiths walk the night. The Necromancer has stolen the Talisman that once kept the world safe. Yet not all hope is lost. With your help, brothers Philip, Julian and Kevin may venture forth into woods and mountains, across oceans and bogs in search of the Necromancer

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and a way to defeat him. The game features over 17,000 screens to make up a 3-D world full of castles, cities and dungeons, and talking turtles and magic swans can help you. $49.95.

Check Reader Service number 405.

Its Master's Voice

EUGENE, OR—In Escape from Planet X, a C-64 text adventure, a player uses voice commands to control his moves. You begin the game strapped to a table in the Human Research Lab of the noseless and mad Professor Schism. If you manage to escape, you may then explore planet X, confronting exotic ocelots in alien jungles, digging for treasure on far-off islands, co-existing with aliens or blasting them to pieces. The game is included with the Voice Master Jr. ($49.95) or the Covox Voice Master ($89.95). Or, players may obtain the game alone for $19.95 and use the keyboard in lieu of voice commands. Covox, Inc., 675-D Conger St., Eugene, OR 97402.

Check Reader Service number 409.

What a Gas!

REDWOOD CITY, CA—Space Station Oblivion, a science fiction thriller from Epyx (PO Box 8020, Redwood City, CA 94063) is set many millenia hence, when Earth has been destroyed and generations of innerspace immigrants have found a new home on the planet Evath. There, the felonious Ketars live a blue-collar life, mining for precious metals. But their mining has left pockets of gas that threaten to annihilate them and throw planet Evath out of orbit. Your mission is to place a drill in each of 18 different sectors to release the vapors and save Evath. Available for the C-64 for $39.95.

Check Reader Service number 408.

Music, Maestro

ST. PAUL, IN—The SID Symphony Stereo Cartridge from Dr. Evil Laboratories (PO Box 190, St. Paul, IN 47272) provides you with three additional voices over the C-64's three voices, along with true stereo sound capability. The cartridge is powered by a replaceable 9-volt alkaline battery. The only extra hardware required are two RCA male-to-male cables to connect the computer outputs to a stereo system. $34.95. Also available, for those who don't have access to SID music libraries, is the Stereo SID Music Collection Volume 1 disk. It includes public domain music for use with the cartridge. $1.

Check Reader Service number 410.

Jet Boys

SAN JOSE—In Jet Boys, a one- or two-player arcade-style action game for the C-64, you take the role of a jet pack-equipped commando whose mission is to enter and deactivate an enemy-controlled reactor room, all the while trying to survive waves of deadly galactic terrorist attacks. The game features four increasingly difficult levels of play, and at the end of each level you must destroy a megabeast that blocks the way before proceeding to the next level. Jet Boys is available from Accolade (550 S. Winchester Blvd., Suite 200, San Jose, CA 95128) for $14.95.

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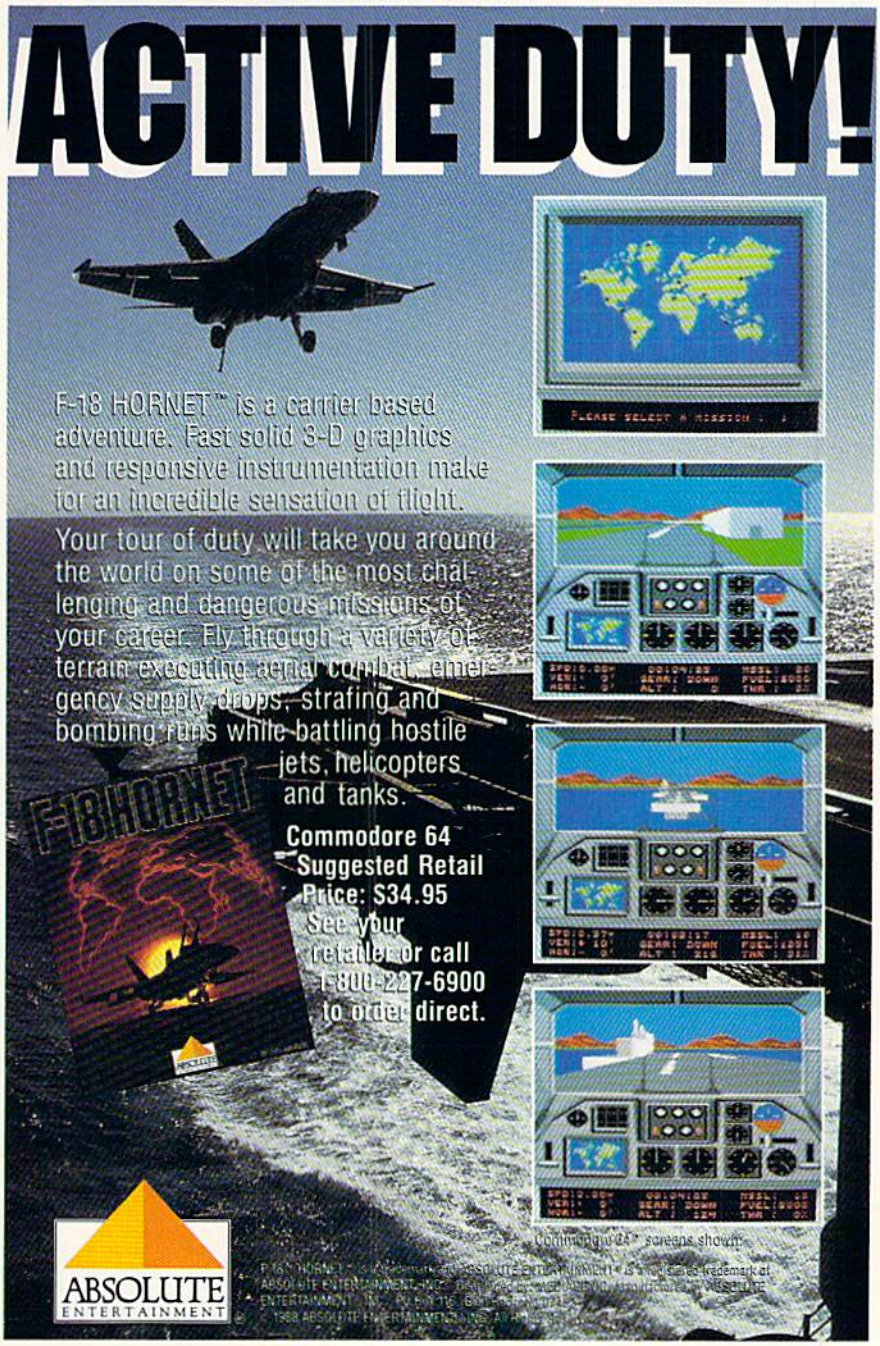

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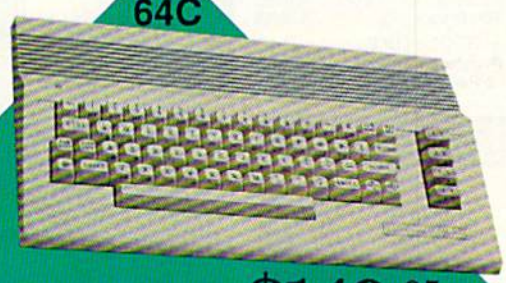

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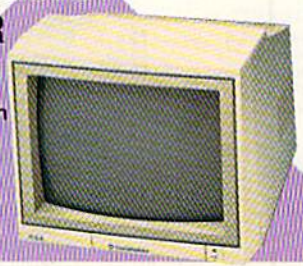

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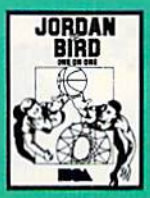

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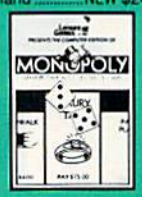

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SOFTWARE GALLERY

It's time to ring in the New Year with a look at word processing, submarine warfare, mystery and comics. Plus, start 1989 off right with RUN*'s new capsule-review section!*

Compiled by BETH S. JALA

RED STORM RISING ..... A+

This WW III Novel-to-Screen Transition Really Makes the Grade

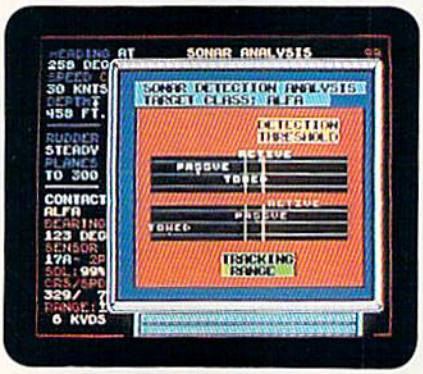
Give MicroProse credit. While some companies can't seem to resist the urge to branch out into new areas, MicroProse is a company that knows what it does best and, with few exceptions (Pirates!, Airborne Ranger), sticks to it. Quite simply, what MicroProse does best is creating sophisticated simulations that put the user in charge of his/her own piece of multi-million dollar military hardware.

In Red Storm Rising, you get to command any of five classes of modern nuclear attack submarines. Which classes you'll have to choose from depends on the time period (ranging from 1984 to 1996) you select for your mission. Sub classes and weapons systems available for scenarios set in the future are based on actual technologies that are either under development or soon to be deployed.

After choosing the level of challenge, you're ready to tackle either a training mission or the campaign. This is a multiple-mission game in which you command a nuclear attack submarine in the Norwegian Sea for the duration of World War III.

While each of the battle simulations begins with your sub already within sonar contact of the enemy forces, the campaign starts at your home port of Holy Loch, Scotland. As you sail northeastward to engage the Soviet naval forces, you must be careful to avoid discovery by Russian Tu-142 "Bears" and military reconnaissance satellites.

Fully monitoring and controlling your sub's various systems requires a thorough understanding of the boat's capabilities, and the use of nearly every key on the keyboard! Fortunately, as with most MicroProse simulations, the program is superbly documented and comes with a keyboard template that shows, both graphically and in text, the functions of most active keys. I must compliment the game's designers on a logical layout that groups related functions together.



In Red Storm Rising, just as in real submarine warfare, working with sonar analysis increases your chances for a successful mission.

Red Storm Rising is based on Tom Clancy's novel of the same name, which describes events leading up to, and the dramatic unfolding of, World War III. While both the simulation and the novel involve fictional scenarios, in both cases the weapons, strategy and tactics used are based firmly in reality. For players who've not read the book, an animated introduction showing the major events leading to the outbreak of the war sets the stage for the game.

What makes Red Storm Rising such a successful simulation, however, isn't the fact that it's based on a best-selling book. It's the care that was taken to ensure that things work in the game, just as they would in real submarine warfare. The realistic wargaming environment, combined with the wide variety of scenarios and play options, make Red Storm Rising the best military simulation to be released for the C-64 since Gunship. And while Red Storm Rising may not be the only submarine simulation to be based on a Clancy best-seller, there's little doubt that it's number one. *(MicroProse, 180 Lakefront Drive, Hunt Valley, MD 21030. C-64/$39.95.)*

—BOB GUERRA
SOUTH BOSTON, MA

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-sixed!

INFOCOMICS ..... A

Gadzooks! I Can't Wait to See What Happens Next!

Infocomics are not games. They are a line of computerized comic books that have a beginning, middle and ending that the reader/user cannot alter. The computer is supposed to be interactive, so why then, you ask, should I buy this product? Well, you may not be able to alter the outcome, but you can determine the path and pacing of an Infocomic.

Somewhat like a "living" play, the reader follows a particular individual, experiencing things from that person's standpoint. At certain times in the narrative, the user has the option of jumping to another character's point of view. This usually happens when a new character is introduced, or an on-screen character exits. A musical note ►

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YOUR BATTLESHIP JUST BIT THE BIG ONE.

Now, you're mad. Really flamed. So assess your losses, aim your guns and turn your enemy into fish food.

ONE OF THE MOST POPULAR GAMES OF ALL TIME COMES TO LIFE ON THE COMPUTER.

As commander of a powerful naval fleet, you'll see destroyers and carriers sinking in a cloud of smoke. Watch planes strafing by so low, you'll practically feel the pilots breathing.

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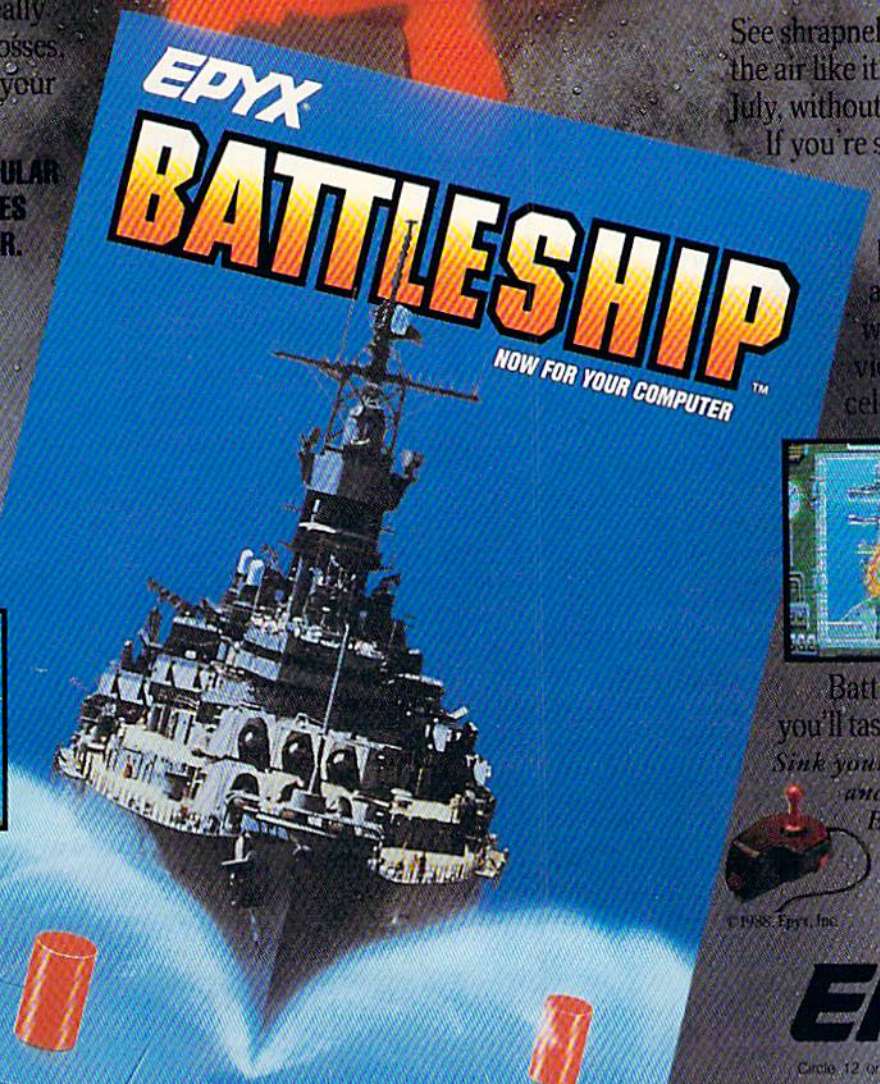

See shrapnel flying through the air like it's the 4th of July, without a picnic.

If you're still floating when it's all over, you'll be honored in a glorious, well-deserved victory celebration.

Battleship. So real, you'll taste the salt water.

Sink your opponent faster and easier using an EPYX high performance joystick.

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sounds and a visual cue appears, letting the reader either branch off to the new path or continue on the existing one. No matter what path is chosen, however, you eventually reach the same ending. If this sounds a little confusing, remember this sort of storytelling already exists, via flashbacks, in both written and visual fiction.

Infocomics successfully combine written words and visual images in much the same manner as printed comics. The actual on-screen image looks like a page of a book, with the pictures appearing above a caption. Whenever people speak, their words appear in a panel. The art comes alive through limited animation, zooms and pans as both the visual perspective and the characters move and change.

With virtually no written instructions, Infocomics are simply booted up and read on-screen. There is a short explanation of what an Infocomic is and how it works. You can then move right into the story and methodically advance to a conclusion.

However, so as not to miss out on some important details and relevant interrelationships, jump to another character whenever you're given the option. In addition to being able to move between characters, you can also fast-forward or rewind the story to watch something again or choose a different path.

One of the Infocomics I looked at, Gamma Force in Pit of a Thousand Screams, follows the interplanetary adventures of Ratchet, Eskobar and Elana as they oppose the forces of the evil Nast, who has overthrown King Franz and sentenced him to the pit of a thousand screams. Ratchet, Eskobar and Elana are chosen by fate to receive special powers and become the Gamma Force. Their first mission is to rescue King Franz, overthrow Nast and reunite the King with his long-lost daughter, Sambina. Without revealing the outcome, let me just say that, while good triumphs over evil (naturally), the way has been laid for sequels.

In Zorkquest: Assault on Egreth Castle, Gurthark the Stout, along with his small band of travelers, chance upon the dark Egreth Castle that's inhabited by the evil magician Radnor. When Radnor kidnaps Guthark's charge, a battle breaks out as the good magician, Frobnit, and his apprentice, Dirin, lock horns with Radnor. Here again, there's no real doubt about the outcome, but rest assured that a part two will probably follow.

Undoubtedly, Infocom has hit upon a new application. In their own way, they've redefined the parameters of what interactive fiction is and can do. Future products in this line can only hope to improve the genre and perhaps even lead to new and even more innovative applications. Still, possibly the most exciting aspect of this software is its low $12 price tag. With that figure, who will be able to resist trying this truly innovative piece of entertainment software? *(Infocom, Inc., 125 Cambridgepark Drive, Cambridge, MA 02140. C-64/$12.)*

An evil magician lurks beyond the walls of Infocomic's Zorkquest: Assault on Egreth Castle.

—ROBERT J. SODARO
FAIRFIELD, CT

THE WRITE STUFF, C-128 VERSION ..... A+

A Computing Phenomenon: Quality Plus Low Price!

Imagine using a word processor that indents each paragraph and capitalizes the first letter of new sentences... automatically! How about one that converts from Qwerty to Dvorak keyboard layout, offers optional Roman numeral page numbers, or pops the result of a mathematical calculation into your text, all at the touch of a key? Wouldn't it be nice if you could teach your word processor to spontaneously type the names, words, phrases and page layout commands you use all the time?

All of these conveniences and a host of other powerful features have been incorporated into the C-128 version of The Write Stuff, BB Writer. This word processing package has been drawing a lot of well-deserved attention since it was first released as "userware" for the C-64. (Editor's note: see the review of the C-64 version of The Write Stuff in *RUN*, June 1988.) An exceptionally versatile word processor, it's the most exciting piece of new software for the 128 that I've seen in a long time.

A complete list of BB Writer 128's capabilities would take pages. Whether it's the ability to support Commodore's RAM expansion units and the 1581 drive's sub-directory system, the double-column output, or mail merge to churn out form letters, this package has it all.

BB Writer 128 has all the right moves. Most word processors let you move the cursor in increments that relate to the computer screen—a space, a line or a screen at a time. BB Writer 128's function keys speed editing by moving the cursor logically—it takes you from one word, sentence or paragraph to the beginning of the next.

If your word processing chores involve more than an occasional letter, you'll love BB Writer 128's macrotyping feature. First you create a list of words or sentences that you frequently type and assign a one- or two-character abbreviation to each. Then, type the appropriate letter or number, hit the space bar and presto! Two keystrokes can replace 250 keystrokes, causing your name and address to appear, centered at the top of the page. You can also put your signature block at the end of a letter or pop in a word you always misspell with this remarkable feature.

Another way to make this feature work for you is to define frequently used words as macros. Co becomes Computer and yr becomes you're as soon as you hit the space bar. In addition to the typing macros, 60 definable keyboard macros let you create your own one-key shortcuts for entering formatting instructions and other operating commands.

Once you get acquainted with its many functions, you'll discover that BB Writer 128 is capable of almost any task. You can create outlines with up to seven levels of detail, print and preview documents up to 250 columns wide, work in ASCII or PETASCII, read and write sequential, program or user files, and translate files from many other popular word processors. You'll even find that BB Writer can integrate data from Superbase, the powerhouse database, into form letters.

If you aren't already convinced that BB Writer merits serious consideration, how about this? R. Eric Lee, The Write Stuff's author, has just completed a version which, when installed in a programmable plug-in cartridge, is ready to go ►

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JUDGE A GAME BY ITS COVER.

Licensed by The Major League Baseball Players Association.

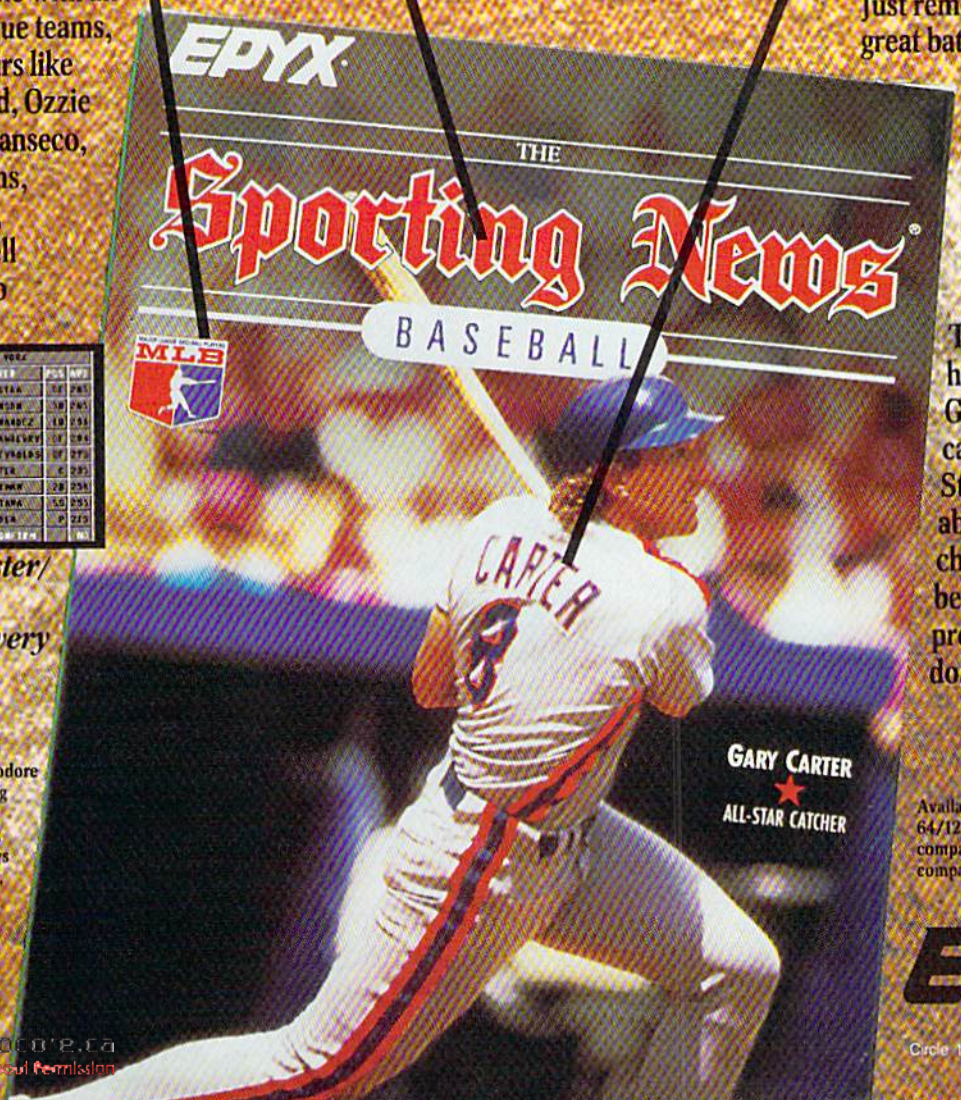
The action-packed statistically enhanced computer game with all 26 major league teams, and all the stars like Dave Winfield, Ozzie Smith, Jose Canseco, Roger Clemens, George Brett, Alan Trammell and Fernando Valenzuela.

Updated roster/ stat disks available every season.

"If it were any more realistic, you'd need a batting helmet."
Gary Carter

As the pitcher, you can throw the batter a curve, a high hard one. Pitch him inside, outside. Even brush him back if he's crowding the plate. Just remember, he's got great bat control. He might even drag a bunt on you.

Endorsed and developed in part by the "Bible of Baseball," The Sporting News®.



Throw it home or hit the cutoff man. Go for the great catch or play it safe. Steal a base? How about a pitching change? Just remember. Anything the pros can do, you can do. If you're good.

Available for Commodore 64/128, Apple II & compatibles, IBM & compatibles

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as soon as you turn your computer on.

The Quick Brown Box (QBB) permanent memory unit makes using this word processor so convenient that you'll find yourself switching on your 128 just to jot down a few notes. I only had the QBB version of BB Writer on my computer for a few days when it mysteriously disappeared, only to turn up in the user port of the machine my 10-year-old son usually uses for games. Fortunately, Busy Bee sells the QBB at a significant discount.

Speaking of discounts, while the mail order price for BB Writer 128 is certainly reasonable, Busy Bee also makes this software available through user groups for as little as $12. (Add $3 for the excellent 60-page manual.)

BB Writer 128 can't make your coffee (although it can time your eggs with its built-in alarm clock) or check your work for spelling errors. However, it certainly makes writing easier. Menu driven, with a pair of pop-up command reminder screens and several dozen easily accessed help files, BB Writer is a cinch to use. The thousands of C-128 owners who spend their workdays at the keyboard of a PC or mainframe computer will probably be wondering why their business software lacks some of BB Writer's capabilities.

BB Writer 128 reminds me of software that costs ten times as much. At $29.95, this feature-laden package is a great buy. At $12, it's a steal. You can't afford not to try it. *(Busy Bee Software, PO Box 2959, Lompoc, CA 93438. C-128/$29.95.)*

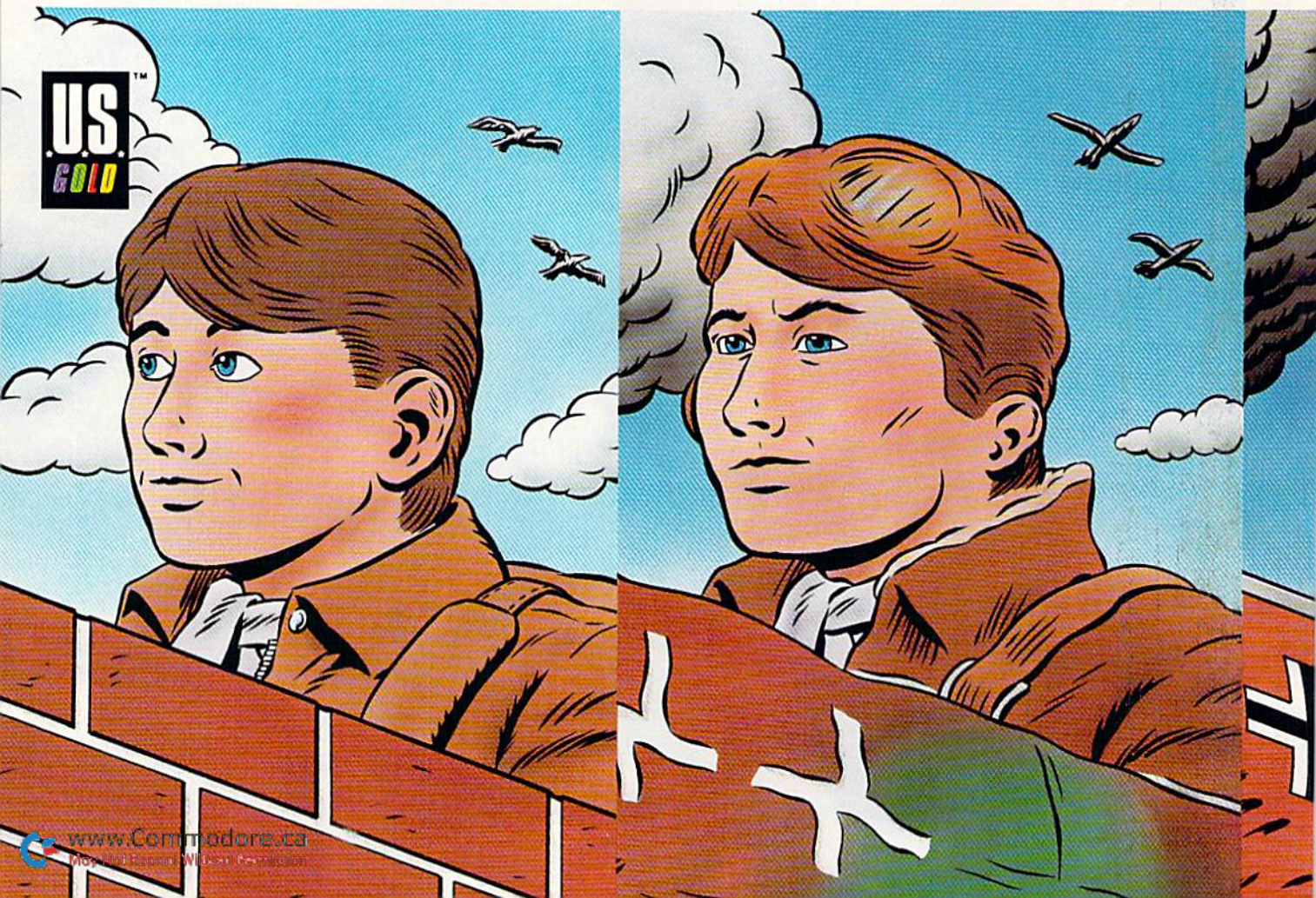
—JOHN PREMACK
LEXINGTON, MA

WHERE IN EUROPE IS CARMEN SANDIEGO? ... A *An On-Screen Version of "To Catch a Thief"*

Where in Europe is Carmen Sandiego? is a nearly perfect computer learning tool. Map reading, problem solving, research skills and geographic facts are taught within the confines of an enjoyable, fast-moving game. The sound effects are little more than adequate, but the graphics are colorful, distinctive and animated. Also, nearly 1000 clues to sift through, 16 possible villains to encounter and 34 countries to visit make each case different.

Somewhere in Europe, Ms. Sandiego or one of her criminal cronies is engaged in the theft of Ireland's Blarney Stone, Mozart's metronome, Good King Wenceslas's stocking cap or some other precious item from a European city. As an operative for the Acme Detective Agency, your assignment is to discover the identity of the culprit, to obtain a warrant for his or her arrest, and to track down the felon before time runs out.

Initially, your chief of detectives lets you know what was stolen, where the crime occurred, the sex of the criminal and your deadline. Intelligence per-



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taining to the suspect's hair and eye color and favorite types of books and movies appears on the screen periodically throughout the game. These should be entered into your electronic notebook. After three or more clues are obtained, feeding these into the crime lab computer might reward you with the name of the evil doer.

Unless you're better in geography than most Americans, following the suspect from country to country is not going to be an easy task. But, you can always refer to the *Rand McNally Concise Atlas of Europe*, which is included with the game. Some players might rely on the atlas more often, as on-screen hints use up precious time, while others might find the program more challenging by putting the book aside.

A concise, well-written user's manual provides essential instructions, as well as numerous hints on how to successfully complete the game.

The play system employs a series of menus easily accessed by either joystick

Where in Europe is Carmen Sandiego? Could it be Denmark?

or keyboard. While a seven-year-old should have little difficulty operating the program, it's best to have an adult on hand to monitor the youngster's learning and to help with the atlas and some of the trickier clues.

For anyone with school-age children, or for someone who thinks that Paris is around the corner from Poland, Where in Europe is Carmen Sandiego? offers solid value as an educational and entertaining program. *(Broderbund Software, Inc., 17 Paul Drive, San Rafael, CA 94903-2101. C-64/$39.95.)*

—LEN POGGIALI
SYRACUSE, NY

MONOPOLY ..... B

"Go Directly to Jail... Do Not Collect $200"

"The object of the game is to become the wealthiest player through buying, renting and selling property."

While that statement might sound like a philosophy for everyday life in a competitive marketplace, most people will recognize it as each player's objective in Monopoly.

Monopoly isn't new to the C-64. Considering the world's fascination ►

Fasten your seatbelt. You're in for the dogfight of your life.

IT'S WAR. And the fate of the free world rests in your capable hands. Take hold of the controls and your wits. Because 20,000 feet below you thunders the most feared battleship in all of Germany's fleet: The Bismarck. Enemy fighters zoom above you, anxious to turn you into fish food. And all around you lurk treacherous U-Boats, E-Boats and mine fields.

Steady, mate. Remember all those practice flights? Now it's for real. You've got position reports to monitor incoming intelligence. A fully detailed instrument panel. And you can fire from one of two gunnery positions. All of which'll come in mighty handy when you've got 42,000 tons of riveted killing machine in your sights.

With these details, it's no wonder we fly in the face of F-15 Strike Eagle.

WELL CAPTAIN, IT LOOKS LIKE F-15 STRIKE EAGLE™ ISN'T SO STRIKING, AFTER ALL.

	DIVE BOMBER	F-15 STRIKE EAGLE
Easy to use, fully detailed instrument panel	Of course	Nope
Look of enemy planes & ships	True to life	Stick figure
Pace of enemy attacks	Constant	Lagging
Takeoffs	Breathtaking	Nonexistent
Landings	Brace yourself	Limited

Note: Comparisons are based on current Apple, IBM, and Commodore 64/128 versions of the product.
Apple II Series & Compatibles, Atari ST, Commodore 64/128, IBM PC & Compatibles. Screens from Atari ST version of the game.
U.S. Gold is a trademark of GO America Ltd. Game program licensed from GO America Ltd. ©1987 Acme Animation/Gremlin Graphics Ltd. ©1988 Epyx, Inc.
F-15 Strike Eagle is a trademark of MicroProse Software.

DIVE BOMBER™ from U.S. GOLD™

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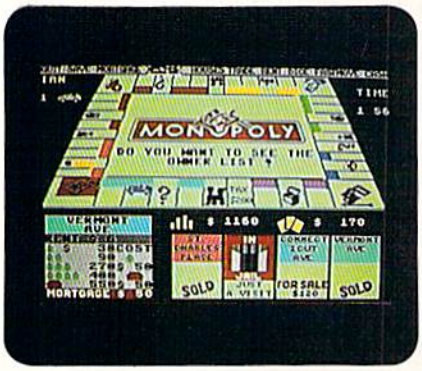
with this popular board game, it isn't surprising that a public domain version appeared almost as soon as home computers became popular. Now Leisure Genius has released a version licensed through Parker Brothers, the game's owner.

The computer Monopoly follows all the rules of the board game with the exception that from one to eight players can play, and that you can save a game and reload it to continue play at a later time.



You're currently positioned on Vermont Ave. in the on-screen version of Monopoly.

Knowing what the C-64 is capable of, I wasn't especially impressed by the graphics. The main board, shown in the center of the screen, is seen from above at about a 45-degree angle. None of the property names can be read, but the significant landmarks like Railroads, Jail, Free Parking, and Community Chest and Chance squares are easily recognizable.

Four cards, indicating the neighborhood in which the current player is traveling, are on the bottom right of the screen. On the bottom left is an enlarged representation of the square the player occupies, and it shows the pertinent facts about the property, including ownership, mortgage value, building prices and rent.

There's an option bar at the top of the screen that lets the player choose things like Quit, Mortgage, Owners (a list of all properties and their owners), Houses (to buy or sell), Trade and Rent. One interesting option, called Short Game, sets a time limit for the game.

My only real complaint about Monopoly is the absolutely agonizing amount of time it takes to load—almost three minutes. However, game play is smooth and fast moving. Monopoly is an enjoyable piece of software and one of those rare games that can be enjoyed by the whole family. *(Leisure Genius; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$29.95.)*

—ART LEWIS KIMBALL
TUSCOLA, IL

NAPOLEON IN RUSSIA—BORODINO 1812 ..... C–

You are Napoleon—
You Must Defeat
The Russian Army

Borodino is a military strategy game that recreates Napoleon's attempt to defeat the Russian army in September of 1812. You are in command of Napoleon's Grande Armee during one of seven variations on the three days at Borodino. Your ultimate goal is to completely destroy the Russian forces. Infantry, cavalry and artillery units with varying attributes are all at your disposal.

Once you've chosen the scenario, difficulty levels, speed, morale and fatigue effects, the screen shows a portion of the battlefield. You scroll around and issue orders via joystick.

In most strategy simulation games, commands are given, and after a series of move, combat, retreat and melee phases are carried out by the computer, everything stops. Borodino, however, is designed so that the action doesn't stop while you select units and give orders, which accords you a better sense of the realities of battle. You don't have time to constantly give orders; instead you tend to concentrate on one area of the battle and occasionally scroll to other sections.

Unfortunately, this constant-action game system is also the major drawback to Borodino. The manual warns you about falling into an "arcade game" mentality while playing. But even if you overcome the urge to fight the battle with fast joysticking, most of the subtleties are drowned out. While there are the usual dozen or so factors—terrain and fatigue, for example—that modify combat and movement, you almost never take the time to calculate them.

Other problems in the game include the lack of options in the actual manipulation of your forces. You move or you shoot and that's it: No changing modes, no evaluating the costs in movement points or calculating the arrival times of reinforcements.

There are so many units on the map at the same time that traffic tends to get jammed. Units that have been routed wander around of their own accord and it's hard to clear a path for them. It's also difficult to rotate fresh troops to replace weary ones.

Another flaw in the game is that artillery is effective only to a certain point—beyond that, you can shell a unit ten or 20 times with no more loss of men.

The scenario of Napoleon's battle at Borodino is an intriguing one that war gamers should enjoy. Napoleon made

It's September 5, 1812; do you know where your units are in Borodino?

some tactical and strategic mistakes while still winning. Trying to achieve the kind of victory that he needed could've been a fascinating challenge. Unfortunately, Napoleon in Russia—Borodino 1812 doesn't provide a playable simulation that lets you explore the nuances of battle. It isn't a strategic simulation—it's just a game and only a fair one at that. *(Datasoft; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$24.95.)*

—GUY WRIGHT
AMIGAWORLD STAFF

STOCKER ..... D+

Racing Runs
Rampant

I don't understand what Stocker's appeal is or why anyone would think it would make a good translation from the arcade to the home computer.

It bothers me to say that. Contrary to what some people think, good software reviewers don't enjoy ripping a program. Personally, I try to find something good to say about every program. But despite my best efforts, it was very difficult finding things to praise about Stocker.

The game's premise is interesting ►

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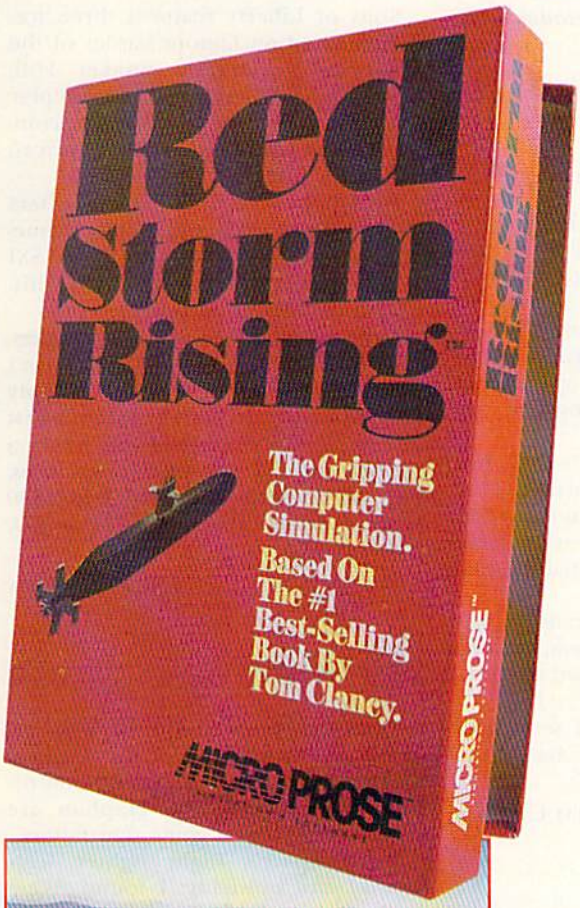

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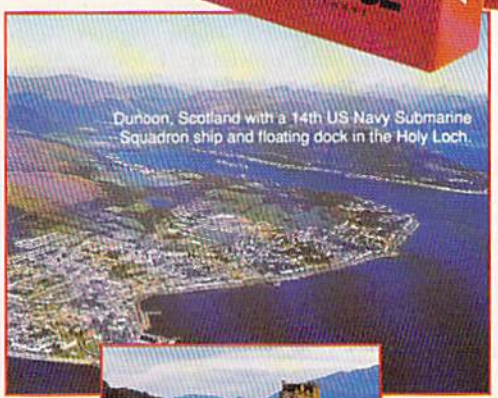
On the *Official Log Form* you will fill in the details of each of your most successful battles in your best campaign. The deadline for the Board of Naval Examiners to **receive** your entry — your completed *Official Log Form* and final game save disk — is March 31, 1989.

The Board of Naval Examiners is making every effort to ensure that the *Red Storm Rising Ultimate Challenge* is a fair test. As you proceed into the higher levels of competition, the Board of Naval Examiners will advise you of specific examination procedures. If you intend to win you must be available for certain arrangements during the weeks of April 10 and 17, 1989, and on April 30 and May 1, 1989.

The *Rules*, included with your *Official Log Form*, explain the details.


Dunoon, Scotland with a 14th US Navy Submarine Squadron ship and floating dock in the Holy Loch.

Contact Screen

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Red Storm Rising by Tom Clancy © 1986 by Jack Ryan Enterprises Ltd. and Larry Bond.

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enough: you're in a coast-to-coast race against time, as measured by fuel consumption. You start in Florida with a full tank of gas that lasts 90 seconds. There are four gas stations on your trip to California, and pulling into any one of them refills your tank about 25 percent.

The farther you go without running out of gas, the more points you get. Hitting other vehicles slows you down and subtracts points from your score. Hitting a cop car gets you a ticket; three tickets ends the game.

The graphics are okay, but there's not much detail to them. In fact, about the only on-screen objects are the road, the tiny vehicles, a sprinkling of trees, a few lakes and the gas stations.

Game play is unexciting, despite the frenetic pace required to succeed. It's a bit of a challenge to avoid colliding with the other vehicles that sometimes clog the road.

But that challenge is greatly lessened by the fact that, contrary to what you might expect in a road-racing game, Stocker lets you drive your car anywhere on the screen. You can stray from the road and drive over lawns, shrubs and lakes; you can even drive right through houses! The only disadvantage to doing so is that it slows down your car.

I might be more willing to accept this off-road capability if Stocker required you to make some tough strategic decisions, but that's not the case. Once you have found the quickest way through a screen, all the decision-making is over.

Ironically, Stocker comes with an instruction manual that's as complete as any on the market. I commend Capcom for including a scene-setting prologue, thorough instructions and a place to write memos and record top scores. There's even a phone number where "game counselors" can be reached, although it's hard to imagine that anyone would really need much counseling to figure out this game.

In its defense, Stocker's simplicity might account for its popularity as an arcade game. The straightforward game play and lack of complexity are arcade-world characteristics, where game plays are limited to the number of quarters in your pocket.

But at home, where only boredom limits the number of times a game can be played, Stocker reaches that limit fairly quickly. So, unless you're someone who couldn't get enough of Stocker in the arcades, I'd recommend you save your software quarters for something else. *(Capcom, USA, Inc., 1283C Old Mountain View/Alviso Rd., Sunnyvale, CA 94089. C-64/$29.95.)*

—SCOTT WASSER
WILKES-BARRE, PA

Editor's Note: To give our readers more coverage of the many C-64/128 software products available, RUN *will broaden the scope of Software Gallery by presenting more reviews in capsule form.*

THE FRIENDLY COMPUTER ..... A–

The Friendly Computer is an entertaining way of getting children, ages five through eight, to know their computer. It's the type of disk I wish had been packaged with my Commodore.

The software is also appropriate for helping children to develop spelling skills and a sense of timing and distance on the screen.

The Friendly Computer contains five games, including an introduction to the keyboard, computer parts and graphics capabilities. All have different difficulty levels and various options that the parent/teacher can pre-set.

The sound effects are amusing, but there aren't enough of them; in fact, their absence is why I graded this program a minus. Otherwise, The Friendly Computer achieves what it set out to do. *(MECC, 3490 Lexington Ave. N., St. Paul, MN 55112. C-64/$19.95.)*

—EDITH CHASEN

RUSH 'N ATTACK/ YIE AR KUNG-FU ..... B

Yie Ar Kung-Fu is the lesser of these two programs. However, this series of martial arts battles is well done, with attractive graphics and fluid animation.

Rush 'N Attack is definitely the star attraction. There is a real problem, though, with its confusing documentation. Purchasers should be aware of that and also of Rush 'N Attack's high difficulty level. Furthermore, the absence of a pause button may frustrate some players.

Yet, veteran gamers will find much to like in the program. Graphics are colorful and crisp and sound effects nicely complement the action. The necessity of finding ways out of predicaments even provides some mental challenge.

Although not for everyone, many players will want to add this multi-game disk to their software libraries. *(Konami, Inc., 815 Mittel Drive, Wood Dale, IL 60191. C-64/$29.95.)*

—WALT LATOCHA

SONS OF LIBERTY ..... B

Sons of Liberty features three scenarios based on famous battles of the American Revolution: Bunker Hill, Monmouth and Saratoga. You can play against another person or the computer and control either the American or British forces.

Although Sons of Liberty offers gamers many user-adjustable parameters, you'll find that, like most SSI simulations, this one is built on historical detail and accuracy.

Unless you've had a lot of wargaming experience, Sons of Liberty isn't the type of game that you can simply load and play successfully without first giving the well-organized rule books a careful perusal. *(Strategic Simulations, Inc.; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$34.95.)*

—BOB GUERRA

DEEP SPACE C

I was disappointed with Deep Space. While it incorporates many features that are interesting and even noteworthy, and some of the graphics are nicely done, it is a game that falters.

Deep Space's flight fighter feels clumsy and unwieldy; I found flying in the fighter rather unsensational and unconvincing. Although the first person, "you are there" scheme has worked for a few space epics, I found the game's flight mechanics and subsequent graphic depictions to be below the C-64's capabilities. While there are many battles to endure and obstacles to overcome in Deep Space, some gamers might not feel like staying with it long enough to find out what they are. *(Sir-Tech Software, Inc., PO Box 245, Ogdensburg, NY 13669. C-64/$39.95.)*

—JOHN RYAN

THE BARD'S TALE III: THIEF OF FATE ..... A–

If you're a veteran of the first two Bard's Tales, you'll feel right at home with Thief of Fate. In III, however, ►

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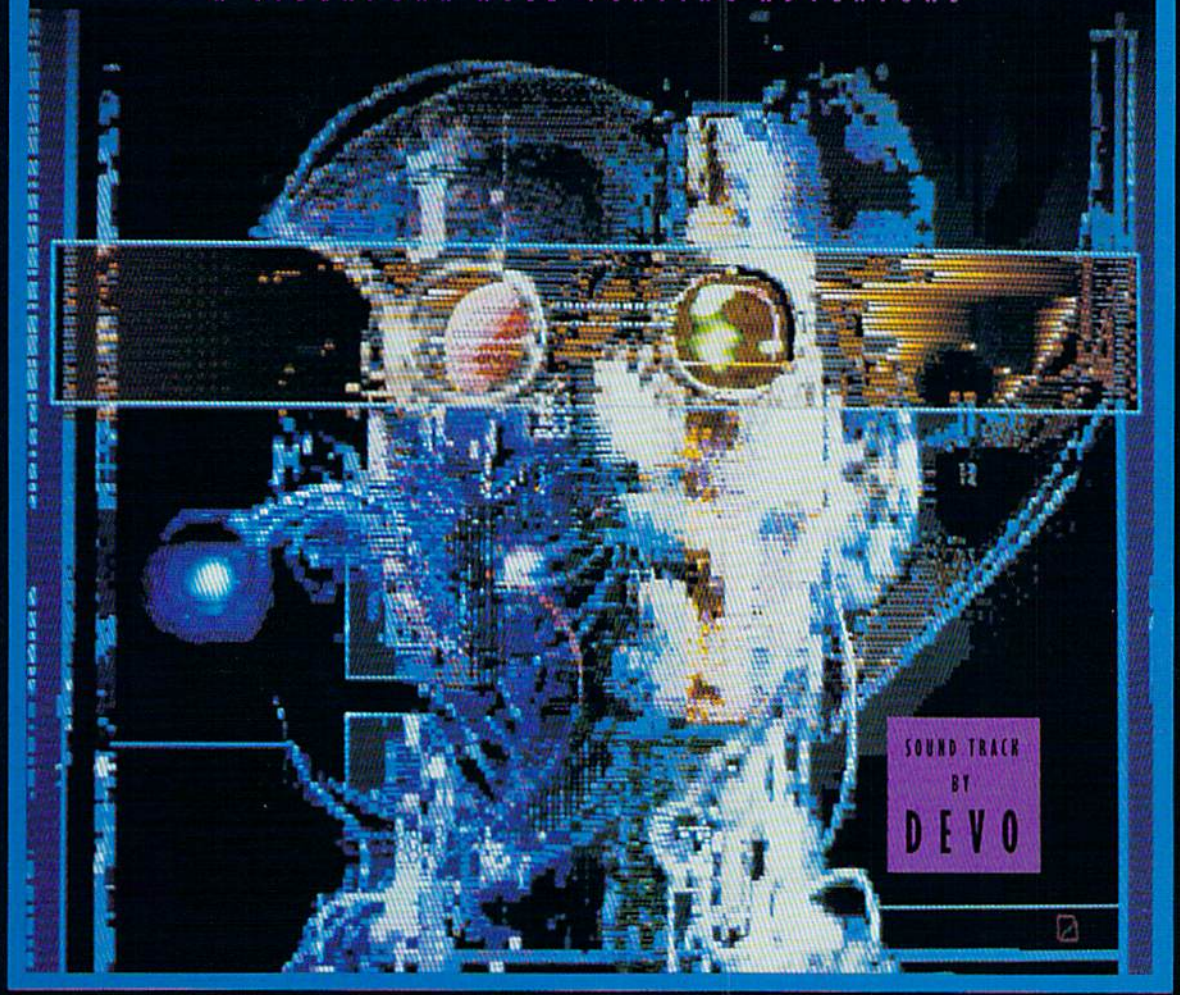

Actual C64 Screens

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exploring the game's seven dimensions will lead you to the items you'll need to prepare your adventurers to conquer the game's 84 dungeon levels.

Bard's Tale III features even better graphic animation of its various monsters, the option to save the game to disk and faster operation than its predecessors. Although the game's built-in back-up routines seem to take forever and require countless disk swaps, the entire game is not copy-protected. *(Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$39.95.)*

—BOB GUERRA

QUESTRON II ..... B+

The setting for Questron II is Landor, an outdoor world made up of several different types of terrain. Creature names like Slasher Boar, Stink Worm and Carrion Creeper are indicative of the kind of welcome you'll receive when you embark on your intrepid journey through their territories.

Unlike many role-playing games that overwhelm new players, Questron II only has four basic spells in its magic system.

This isn't the most complex role-playing game available, and some die-hard RPG fans may miss some of the more exotic spells like those available in the Ultima and Bard's Tale series. However, Questron II's menu-driven command structure and manageable magic make it an excellent choice for adventurers on their first or second quest. *(Strategic Simulations, Inc.; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$39.95.)*

—BOB GUERRA

BATTLE DROIDZ ..... B–

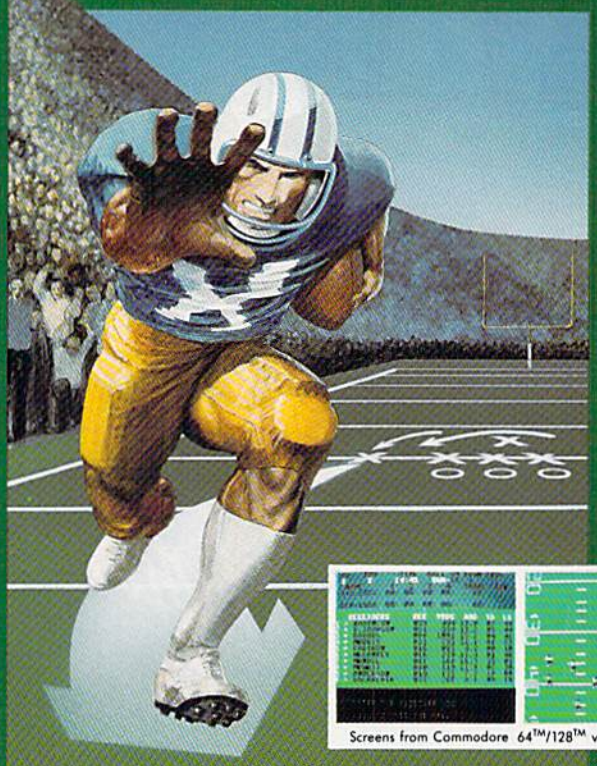
Imagine the curves, dips and precipices of a Marble Madness landscape and sprinkle in a few acid lakes. Populate it with nasty droid killers, set up some cyborite-spewing Generator Stations, and you've got a fair picture of the typical Battle Droidz warzone. The challenge here is to traverse a Chinese-checker grid of 37 war zones.

Beginning with the pick-your-own-battlefield idea, Battle Droidz offers numerous strategy options and cleverly contrived, smooth-scrolling, multi-screen gamescapes, along with good detail and lively sound.

Joystick response qualifies as barely adequate. With swarming cyborites and the diagonally oriented landscape (forward is toward the upper-right corner), the "realistically" slippery "remote droid guidance controls" add nothing. Fortunately, the fun still shines through, with lots of addictive, high-action entertainment, even for beginners. *(Datasoft; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$24.95.)*

—JEFF HURLBURT ■

PURE·STAT FOOTBALL



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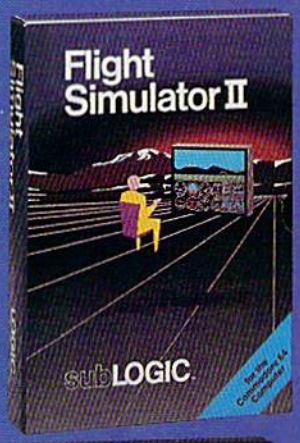

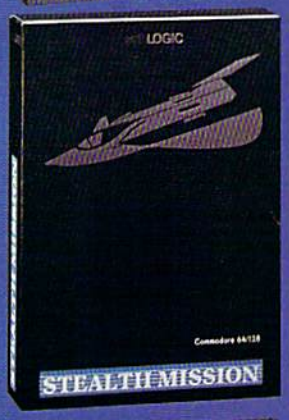

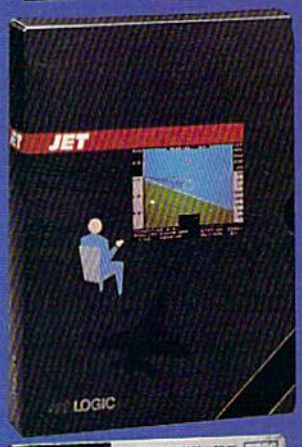

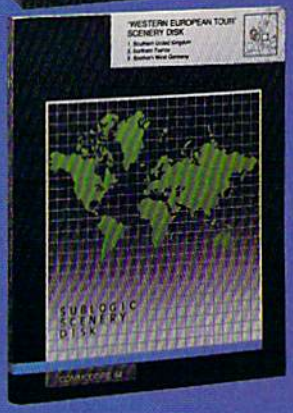

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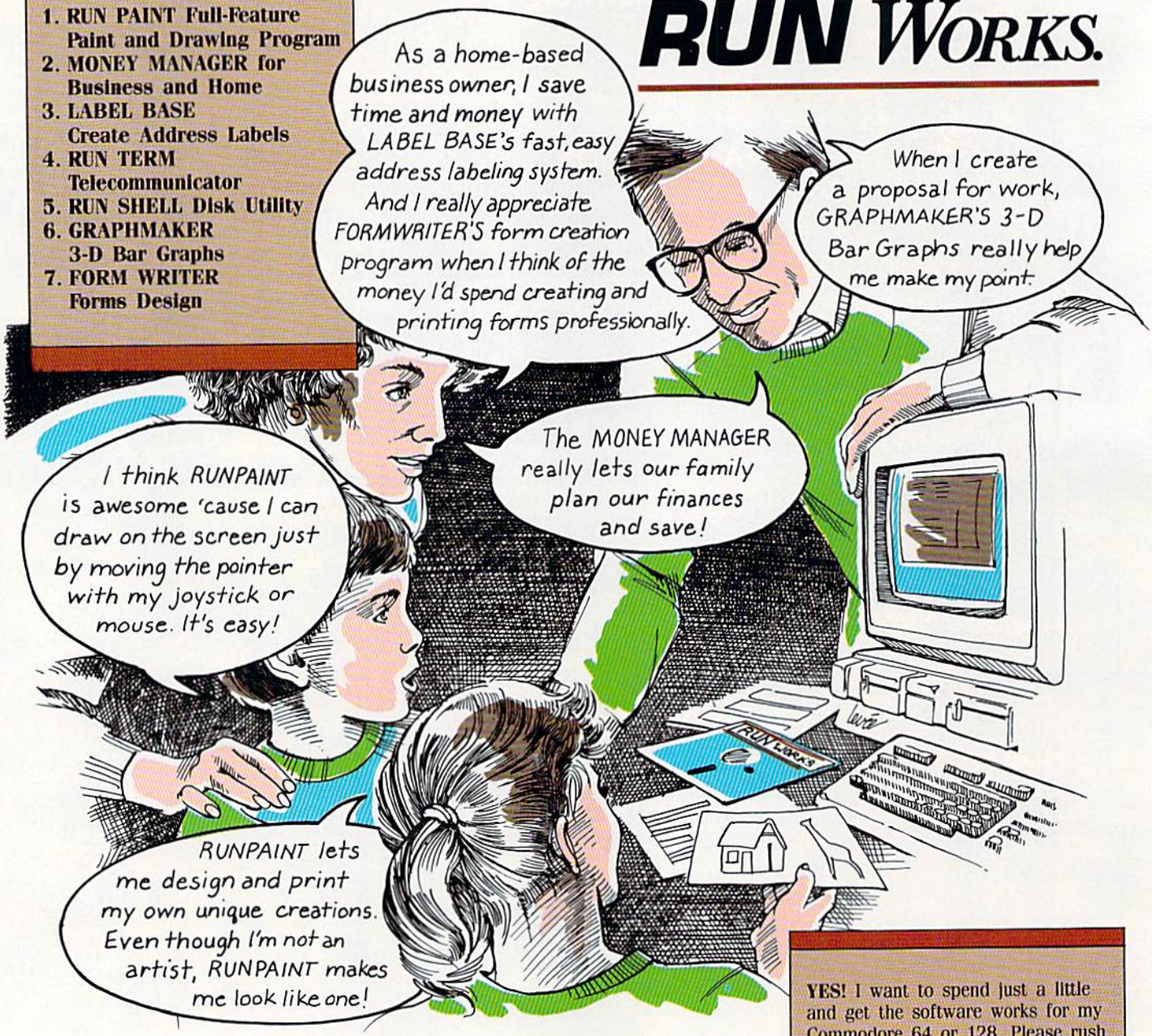

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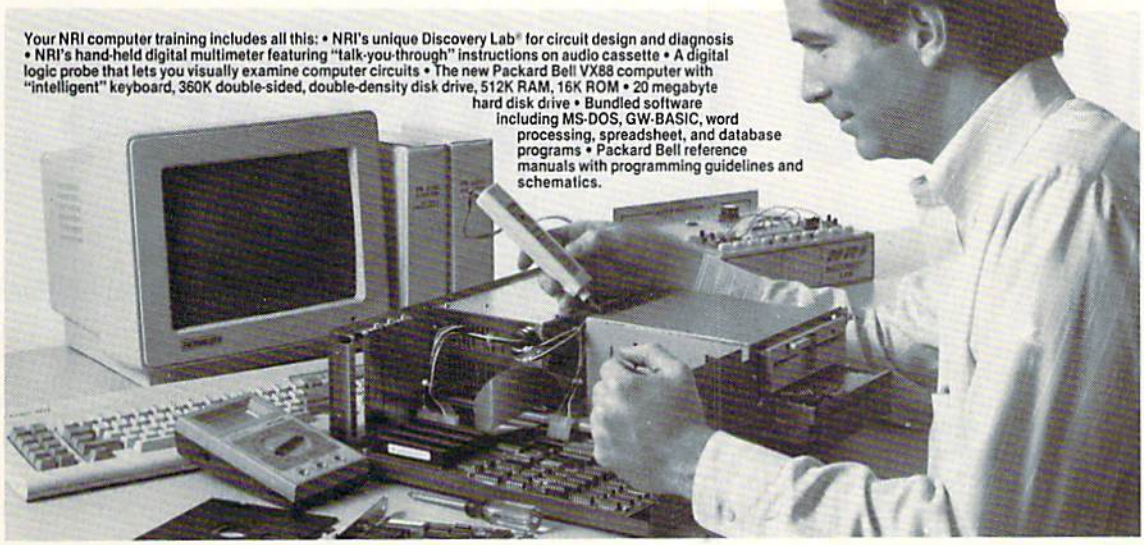

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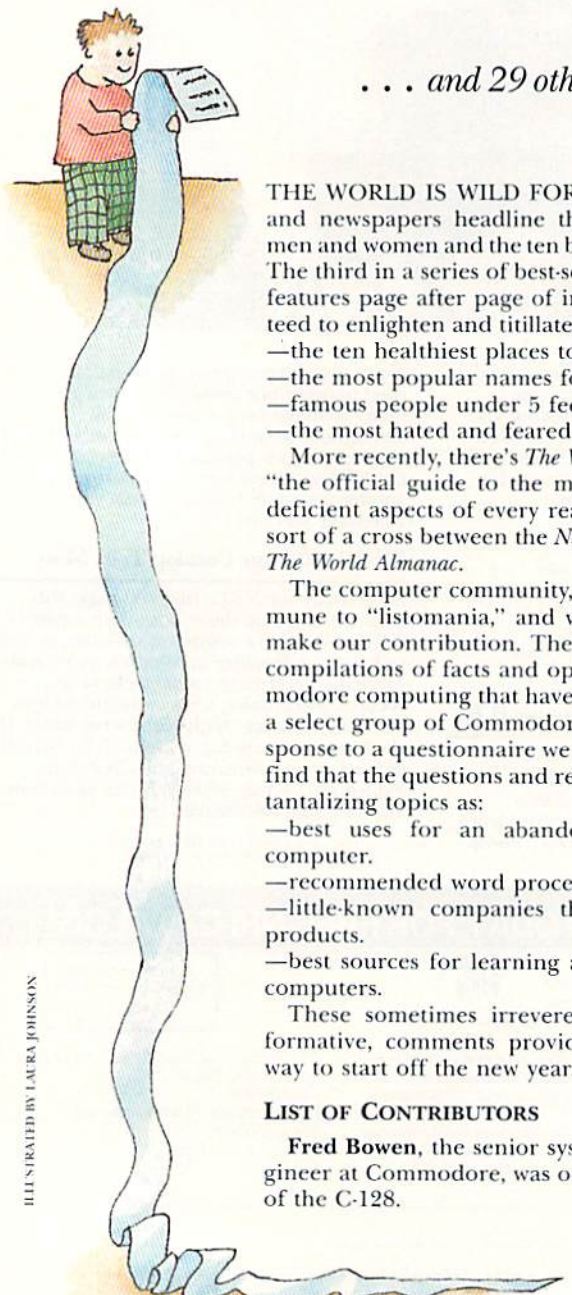

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—the most hated and feared persons in history.

More recently, there's *The Worst of Everything*—"the official guide to the most loathsome and deficient aspects of every realm of our lives"—sort of a cross between the *National Enquirer* and *The World Almanac*.

The computer community, of course, isn't immune to "listomania," and we at *RUN* want to make our contribution. The following lists are compilations of facts and opinions about Commodore computing that have been submitted by a select group of Commodore authorities in response to a questionnaire we sent them. You will find that the questions and responses cover such tantalizing topics as:

—best uses for an abandoned Commodore computer.
—recommended word processors.
—little-known companies that produce great products.
—best sources for learning about Commodore computers.

These sometimes irreverent, but always informative, comments provide an entertaining way to start off the new year.

List of Contributors

Fred Bowen, the senior systems hardware engineer at Commodore, was one of the designers of the C-128.

Tom Brown is a freelance programmer with public domain and commercial programs to his credit. He authored *RUN*'s telecommunications program, RUN Term 128.

Jim Grubbs, author of a half-dozen books (his latest, *APO San Francisco 96525*, about growing up in the military), operates inDependent Publishing of Springfield, Illinois, and produces his own magazine, *iD*. A longtime Commodore enthusiast, Jim uses a C-128 in running his business.

Peter and Paul Hughes, the ubiquitous twins who run a computer graphics business out of Canton, Massachusetts, are Commodore enthusiasts who frequent user's group meetings, computer shows and online networks to offer their insights about Commodore computing.

Loren Lovhaug is the author of *RUN*'s monthly telecommunications column. He also publishes the *Twin Cities 128* newsletter and is a SYSOP on QuantumLink and GEnie.

Margaret Morabito, former technical manager of *RUN*, publishes the CALC (Computer-Assisted Learning Center) newsletter and heads the Community College and Tutoring Center on QuantumLink.

William D. Pitts is one of the graphics SYSOPs on QuantumLink.

Ellen Rule, active in New England user's group activities, operates the Home Computer Resource out of her New Hampshire home.

John Ryan, a frequent contributor to *RUN*, is an advanced machine language programmer with expertise on a number of computers, including, of course, the C-64 and C-128.

Erin Wynn is president of the New Mexico Commodore Users Group.

As you dive into our lists, note that numbers in parentheses indicate the same response from more than one expert.

By DENNIS BRISSON

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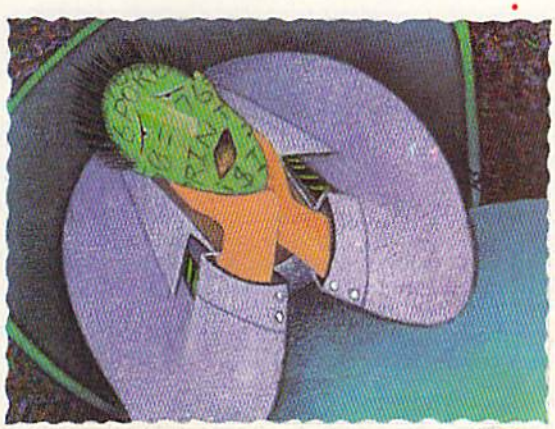
THE LISTS

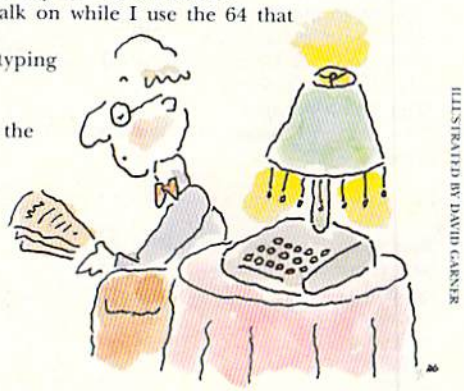


ILLUSTRATED BY KRIS STAVESON

It's time to quit computing when. . .
—your friends hire an interpreter so they can understand you.
—your programs make more sense than you do.
—you start talking to your computer.
—you're offered a job as editor-in-chief of *RUN*.
—the images are burned into your eyes as well as the screen.
—your family goes to the movies and doesn't invite you because they know you're working on the computer.
—you pirate software or feel destructive towards your computer.
—you toss and turn the whole night thinking of the same program line over and over.
—you dream about your computer every night.
—your wife walks into the computer room wearing a black teddy, silk stockings and a gleam in her eye.
—your husband walks into the computer room whispering sweet nothings and wearing a gleam in his eye.

Best sources for learning about Commodore computing:
—Online services (4)
—Magazines (4)
—User's groups (4)
—Yourself

Uses for a dead C-64:
—Door stop (3)
—Desk lamp—shift-lock key turns it on and off
—Decoy for cats to walk on while I use the 64 that works
—For kids to practice typing
—Send 'em to me
—Decoy to keep kids' attention away from the working computer



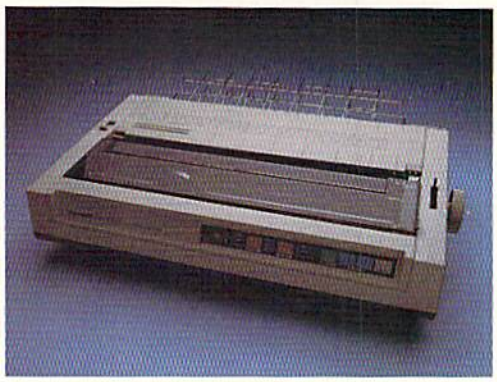
ILLUSTRATED BY DAVID GARNER

Best mail-order companies:
—Briwall (4)
—Tussey (2)

Best descriptions of GEOS:
—Innovative
—Arrrgh!
—Powerful
—Expensive
—Revitalizing
—Frustrating
—Poorly documented
—Okay
—Redundant

Best software publishers:
—Electronic Arts (3)
—Rainbird Software (2)
—Berkeley Softworks
—Origin
—Xetec
—Digital Solutions
—Precision Software
—Too many to list

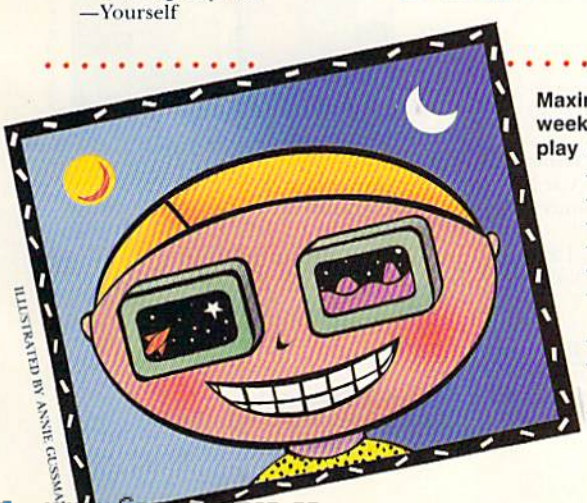
Recommended printers:
—Star Micronics NX1000 (4)
—Seikosha SP1000-A
—Epson, Panasonic and Star 24-pin printers
—Royal Alpha 620C
—Okidata 180
—Panasonic



Commodore products that should never have seen the light of day:
—Plus/4 (6)
—C-16 (2)
—1526 printer

Creative programmers:
—Bruce Carver (Access) (2)
—Sid Meier (MicroProse)
—Fred Bowen (Commodore)
—Brian Fargo (Electronic Arts)
—Eric Lee (Busy Bee)
—David Darus (Walrusoft)
—Jim Butterfield

Best computer shows to attend:
—World of Commodore, Toronto (5)
—Comdex
—Local shows
—Consumer Electronics Show



ILLUSTRATED BY ANNIE GUSSMAN

Maximum number of hours per week children should be allowed to play computer games:
—5 (2)
—7
—10
—14
—15
—1/2 hour per day, double on weekends
—Unlimited
—Depends on child and type of game
—Just enough so they'll leave me alone to work

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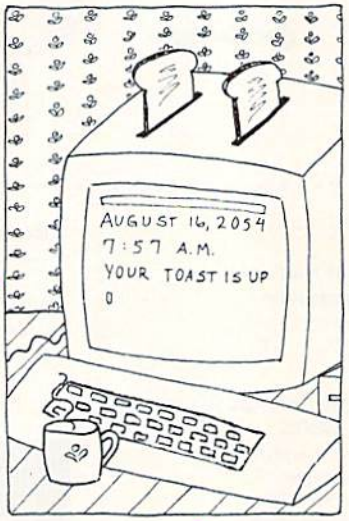
FUN FACTS AND OPINIONS 30

TV shows I'd like to see starring the Commodore computer:
—"C-64, Where Are You?" (2)
—"Sing Along with SID"
—"Voyage to the Bottom of the C"
—"The Comm-puter Show"
—"RAM-bo (This Time It's Personal)"
—"My Mother the Computer"
—"The Three Amigas"
—"The Morton Downey, Jr., Carl Sagan and Commodore Comedy Hour"

Recommended reading:
—*Mapping the Commodore 64*—Compute! Books
—*First and Second Books of Machine Language*
—*Commodore 64 Programmer's Reference Guide*
—*All About the Commodore 64 and Other Commodore Computers*, by Jim Butterfield
—*RUN*'s Special Issues
—The manual that accompanies your equipment
—Anything by Jim Butterfield
—*CAD-128*
—*Mapping the Commodore 128*, by Ottis Cowper

Year when the computer will be a common household appliance:
—August 16, 2054, at 3:47 PM
—2000 (3)
—1999
—1998
—1990
—It already is
—1986
—1984



ILLUSTRATED BY LAURA JOHNSON

Advice on buying Commodore equipment:
—Find a knowledgeable, supportive dealer. (3)
—Know what you really need and compare limitations of the various machines against that need.
—Determine needs before buying.
—Buy from a reputed, locally accessible firm.
—Look at software first, then decide on a machine.
—Shop around for good values.
—Determine your needs before buying and try out candidates.
—If you buy cheap, don't expect support.
—Follow every word I've ever written on this topic.

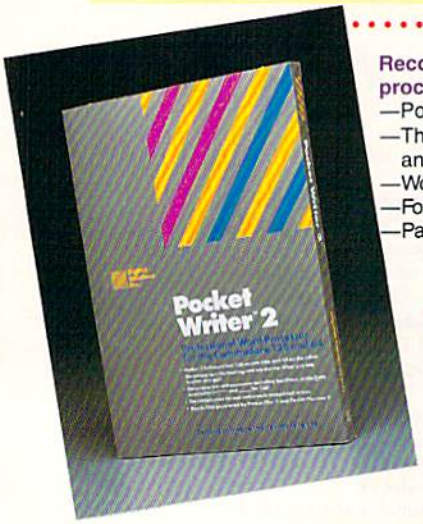
Best utility programs:
—Super Snapshot (2)
—Gnome Kit
—Partner 128
—Jim Klitzing's Wedge (public domain)
—Quick Brown Box
—Blitz compiler
—FastLoad
—Disk Whiz 128

Lesser-known companies that produce quality software:
—Patech
—Free Spirit
—Blue Lion
—First Row
—Storm Systems
—Kidsview, BobCo, Busy Bee
—Walrusoft

Biggest complaints about Commodore:
—Lack of customer support and consideration (4)
—90-day warranty on Amigas
—Lack of support for vendors
—Lack of follow-through in educational market
—Poor marketing
—Poorly run since Tramiel left
—Lack of support for the 8-bit line
—They never consult me on major decisions

Reasons a C-64 owner no longer uses his computer:
—Lack of interest (3)
—Undergoing psychiatric evaluation
—Death, divorce or blown-up power supply
—Child doesn't need or want a computer
—Seeking more professional software, more memory and speed, better display capability

ILLUSTRATED BY KURT VARGO



Recommended word processing packages:
—Pocket Writer 2 (4)
—The Write Stuff 64 and 128 (2)
—Word Writer 128
—FontMaster
—PaperClip

Magazine articles you'd like to see:
—"Best 64/128 Bridge Card for Your Amiga"
—"Commodore Announces Knowledgeable Customer Service Department"
—"Commodore's New Laptop"
—"Making a Million Dollars with Your C-64"
—"Briefcase Portable C-128 for Under $500"
—"C-64 Laptop"
—"How Commodore Toppled IBM"
—"GeoPublish to Postscript File Utility"
—"My Rise from Impoverished Computer Journalist to the Wealthy Head of Commodore International in One Week"

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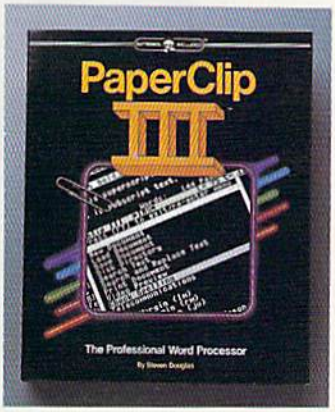

Software programs no user should be without:
—GEOS (2)
—Merlin Assembler
—Word Writer 128
—PaperClip
—Any backup program
—A word processor (e.g., The Write Stuff or RUN Script)
—Fast Hack 'Em backup utility
—Any telecommunications program
—Disk Doctor 64 or 128

Best integrated software packages:
—GEOS (4)
—Pocket (Writer, Planner, Filer) series (3)
—Better Working series
—Timeworks (Word Writer, Swift Calc, Data Manager)

Recommended graphics programs:
—OCP Advanced Art Studio (2)
—Basic 8 (2)
—Doodle!
—Color Me (Mindscape)
—Print Shop

Recommended brands of disk:
—Maxell (4)
—Generic
—Memorex
—Japanese 3½-inch
—Fuji
—Any brand

What I love about Commodore computing:
—Variety of low-cost software
—Some of the latest technology available for sound and graphics at reasonable cost
—Lots of power/performance for low cost
—Information services/telecommunications
—Just about any application possible with software currently available
—Price that can put a computer in almost every home; the great equalizer
—Versatility
—Everything
—Keeps me from having to get a real job

ILLUSTRATED BY JAN MULLER

What I hate about Commodore computing:
—Entering hex-type magazine program listings
—Working around bugs and lack of foresight in the design of the computer
—Entering program listings
—Lack of respect for Commodores in the business world
—Heavy reliance on machine language, which is discouraging to would-be programmers
—Slow disk access
—Power supply burnout rate
—Lack of reliability
—Lack of real C-128 programs
—Nothing
—Lack of an inexpensive, totally compatible hard drive

Favorite public domain programs:
—Fun Graphics Machine
—Chris Smeet's Self De-Arc program
—SWINTH
—SID Player
—Garry Label Maker
—Don Peterson's programs for the handicapped
—Grades, by T. Lynch
—A-Plus, by R. Croswell
—3-Minute Copier
—Disk Whiz (2)

Most active Commodore computing areas in North America:
—Toronto (6)
—West Chester, PA
—My living room
—My office

Most exciting future computer applications:
—CD ROM drives (2)
—Desktop publishing (2)
—Voice recognition (2)
—Plug-in UART chip (with ROM programs) for the C-64 and C-128
—Special user interfaces for the handicapped that don't require eye-hand coordination
—Telecommunications with drawing and text-to-speech capability
—Low-cost laser/copying/fax peripheral ■

Dennis Brisson is RUN*'s editor-in-chief and listomaniac par excellence.*

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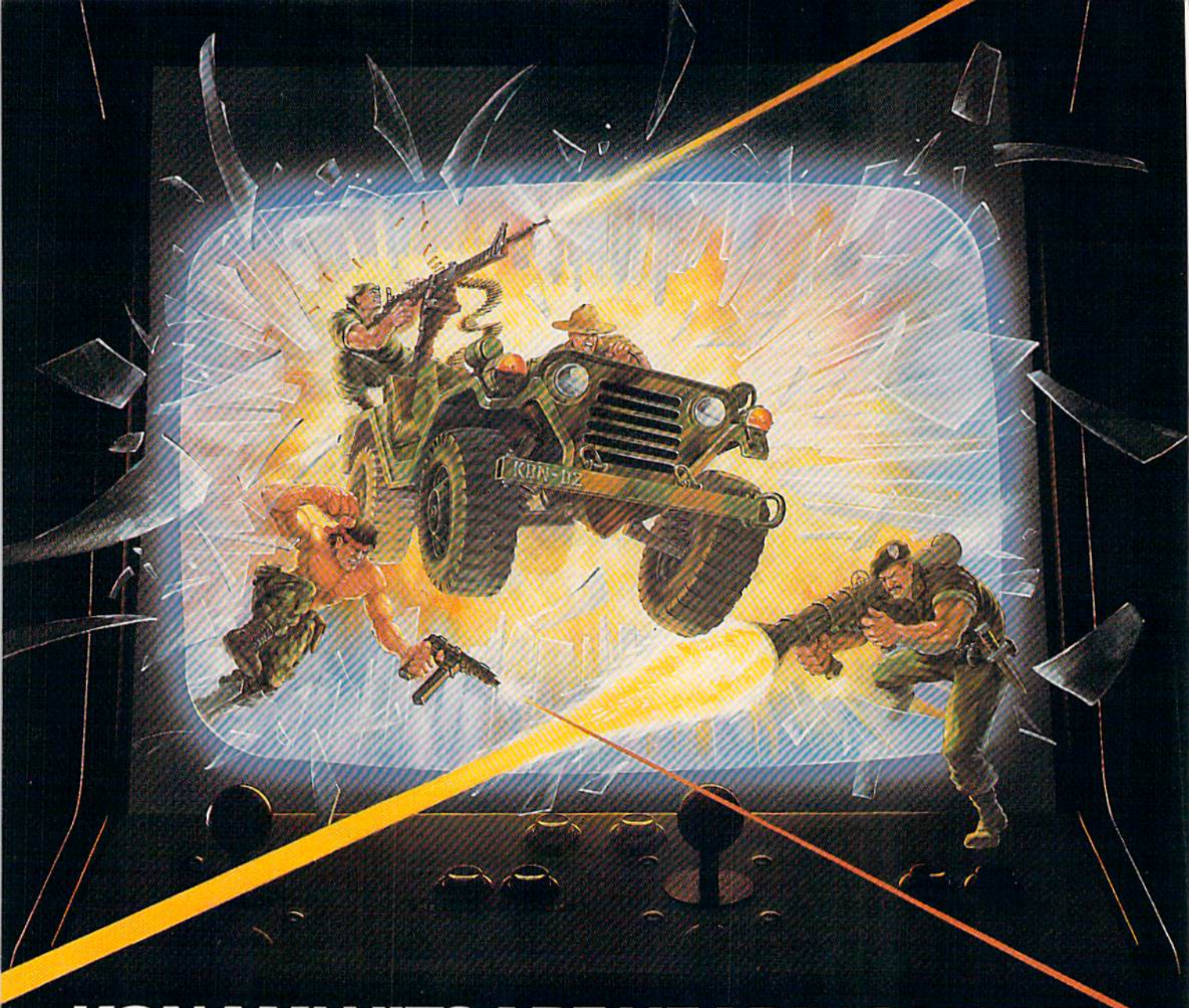

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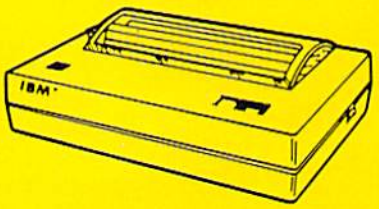

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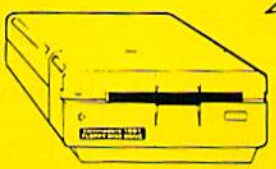

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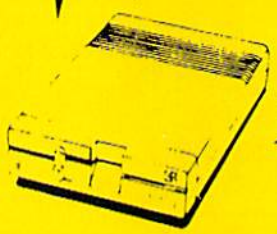

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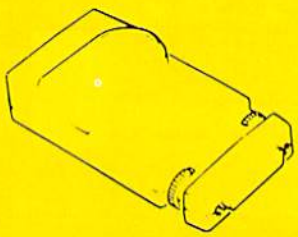

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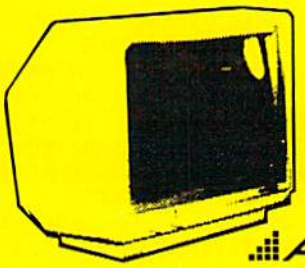

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```
252Ø SE=1                    :REM*13Ø
253Ø IF MF$(SE)="{PI}" THEN RET
     URN                     :REM*134
254Ø SE=SE+1:IF SE<=MT THEN 253
     Ø                       :REM*1
255Ø EM$="ERROR-FILE FULL":GOTO
      3Ø5Ø                   :REM*Ø
256Ø :                       :REM*48
257Ø REM READ MESSAGE        :REM*75
258Ø GOSUB 281Ø:REM OPEN
                             :REM*231
259Ø Y=1:SE=Ø                :REM*231
26ØØ RP=(DV-1)*MT+Y          :REM*113
261Ø GOSUB 294Ø:IF EN<>Ø THEN 3
     Ø1Ø                     :REM*247
262Ø INPUT#3,RF$:REM READ
                             :REM*229
263Ø GOSUB 294Ø:IF EN<>Ø THEN 3
     Ø1Ø                     :REM*227
264Ø IF RF$<>"{PI}" THEN SE=SE+
     1                       :REM*58
265Ø MF$(Y)=RF$              :REM*36
266Ø Y=Y+1:IF Y>MT THEN 3Ø1Ø
                             :REM*67
267Ø IF RF$="{PI}" THEN 265Ø
                             :REM*119
268Ø GOTO 26ØØ               :REM*186
269Ø :                       :REM*182
27ØØ REM SAVE MESS-DAY       :REM*14Ø
271Ø GOSUB 281Ø:Y=1:REM OPEN
                             :REM*77
272Ø RF$=MF$(Y)              :REM*214
273Ø RP=(DV-1)*MT+Y          :REM*243
274Ø GOSUB 294Ø:IF EN<>Ø THEN 2
     79Ø                     :REM*22
275Ø PRINT#3,RF$:REM WRITE
                             :REM*133
276Ø GOSUB 294Ø:IF EN<>Ø THEN 2
     79Ø                     :REM*2
277Ø IF RF$="{PI}" THEN 279Ø
                             :REM*214
278Ø Y=Y+1:IF Y<=MT THEN 272Ø
                             :REM*5Ø
279Ø GOTO 3Ø1Ø               :REM*23
28ØØ :                       :REM*33
281Ø REM OPEN FILE           :REM*57
282Ø OPEN 15,8,15:REM OPEN
                             :REM*213
283Ø F$=STR$(MV)+"."+STR$(YV)
                             :REM*241
284Ø OPEN3,8,3,F$+",L,"+CHR$(ML
     )                       :REM*3Ø
285Ø IH=INT((RT+1)/256):IL=RT+1
     -(IH*256)               :REM*32
286Ø PRINT#15,"P"+CHR$(96+3)+CH
     R$(IL)+CHR$(IH)+CHR$(1)
                             :REM*22
287Ø PRINT#15,"P"+CHR$(96+3)+CH
     R$(IL)+CHR$(IH)+CHR$(1)
                             :REM*44
288Ø GOSUB 297Ø              :REM*166
289Ø PRINT#3," "             :REM*2Ø6
29ØØ IF EN<>5Ø THEN 297Ø
                             :REM*2Ø8
291Ø PRINT#3,CHR$(255)       :REM*1Ø6
292Ø GOTO 297Ø               :REM*194
293Ø :                       :REM*167
294Ø REM SET RECORD POS      :REM*29
295Ø IH=INT(RP/256):IL=RP-(IH*2
     56)                     :REM*223
296Ø PRINT#15,"P"+CHR$(96+3)+CH
     R$(IL)+CHR$(IH)+CHR$(1)
                             :REM*139
297Ø REM CHEK ERROR          :REM*1Ø1
298Ø INPUT#15,EN,EM$,ET,E :REM
     GET ERRORS              :REM*127
299Ø RETURN                  :REM*48
3ØØØ :                       :REM*249
3Ø1Ø REM CLOSE FILE          :REM*223
3Ø2Ø CLOSE3:CLOSE15          :REM*33
3Ø3Ø IF EN=Ø THEN RETURN:REM*64
3Ø4Ø :                       :REM*22
3Ø5Ø REM PRINT ERROR         :REM*13Ø
3Ø6Ø PRINT:PRINT EM$         :REM*43
3Ø7Ø FOR X=1 TO 15ØØ:NEXT:EN=1
                             :REM*227
3Ø8Ø RETURN                  :REM*154 ■
```

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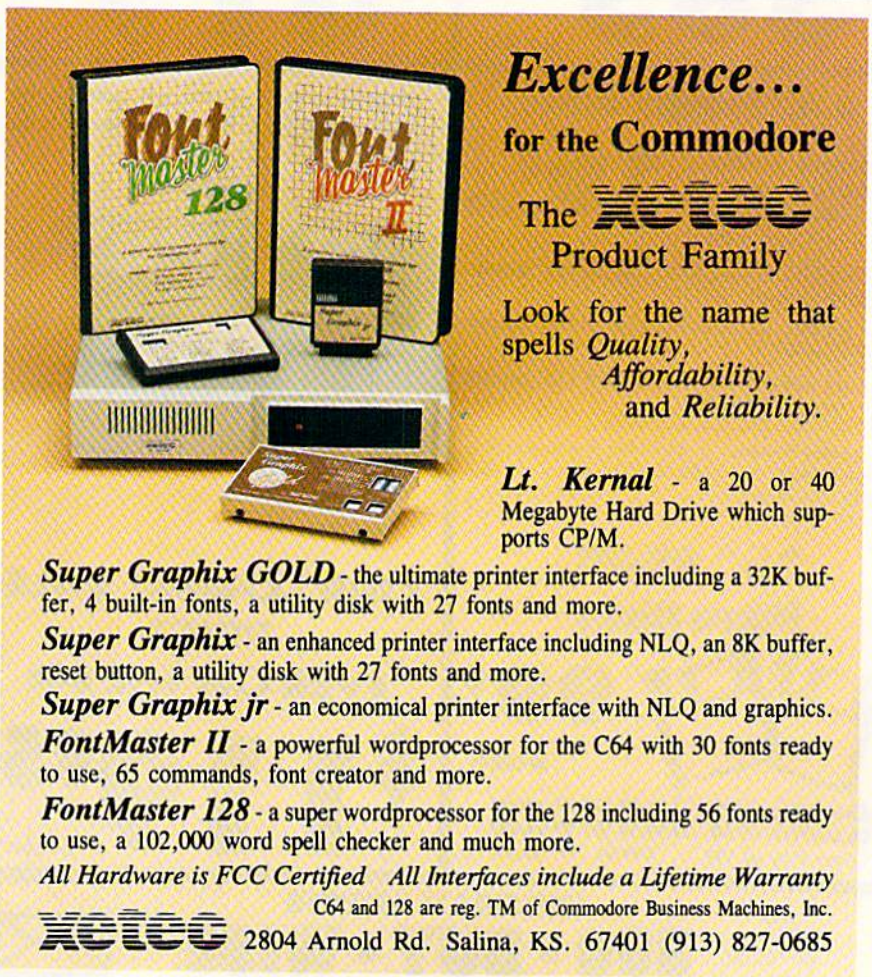

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CALENDAR 2001

```
124Ø REM INPUT DATE      :REM*91
125Ø GOSUB 145Ø:REM SHOW TODAY
                         :REM*93
126Ø PRINT               :REM*128
127Ø PRINT TAB(8)"WHAT'S THE DA
     TE?":PRINT          :REM*172
128Ø YV=Ø:INPUT "(MONTH,DAY,YEA
     R)";MV,DV,YV        :REM*24
129Ø MD(2)=28:IF YV/4=INT(YV/4)
      THEN MD(2)=29      :REM*174
13ØØ IF MV<1 OR MV>12 THEN 133Ø
                         :REM*121
131Ø IF DV<1 OR DV>MD(MV) THEN
     133Ø                :REM*62
132Ø IF YV>=YB AND YV<=YE THEN
     RETURN              :REM*51
133Ø PRINT "INCORRECT DATE...":
     GOTO127Ø            :REM*226
134Ø :                   :REM*115
135Ø REM PRINT CALENDAR:REM*184
136Ø GOSUB 147Ø:REM SHOW DATE
                         :REM*215
137Ø PRINT" SUN{2 SPACEs}MON{2
     SPACEs}TUES{2 SPACEs}WED{2
      SPACEs}THURS{2 SPACEs}FRI
     {2 SPACEs}SAT"      :REM*3Ø
138Ø PRINT"''''''''''''''''''''
     ''''''''''''''''''"
                         :REM*162
139Ø Y=D1*6-6            :REM*171
14ØØ FOR X=1 TO MD(MV) :REM*1Ø8
141Ø PRINT TAB(Y)X;:Y=Y+6
                         :REM*62
142Ø IF Y>4Ø THEN Y=Ø:PRINT "{2
      CRSR DNs}"         :REM*75
143Ø NEXT:RETURN         :REM*62
144Ø :                   :REM*223
145Ø REM SHOW TODAY      :REM*188
146Ø YV=YZ:MV=MZ:DV=DZ   :REM*248
147Ø REM SHOW DATE       :REM*53
148Ø WD=5:REM 1988 DAY1  :REM*93
149Ø FOR Y=1988 TO YV    :REM*1Ø4
15ØØ MD(2)=28:IF Y/4=INT(Y/4) T
     HEN MD(2)=29        :REM*98
151Ø M=1:ME=12:IF Y=YV THEN ME=
     MV                   :REM*1
152Ø FOR M=1TO ME        :REM*218
153Ø WD=WD+MD(M)         :REM*25
154Ø NEXT M:NEXT Y       :REM*152
155Ø WD=WD-MD(M-1)       :REM*48
156Ø D1=WD-(INT(WD/7)*7)+1:REM
     DAY1                :REM*12Ø
157Ø WD=WD+DV-1          :REM*32
158Ø WD=WD-(INT(WD/7)*7)+1:REM
     DAY1                :REM*45
159Ø IF P=1THEN PRINT "{SHFT CL
     R}{CRSR DN}"        :REM*159
16ØØ P$=STR$(MV)+"/"+STR$(DV)+"
     /"+STR$(YV):GOSUB 1Ø9Ø
                         :REM*92
161Ø Z$="{2 SPACEs}"+DN$(WD)+",
      "+MN$(MV)+STR$(DV):REM*93
162Ø PRINT#P,Z$;SPC(27-LEN(Z$))
     ;P$                 :REM*2
163Ø PRINT#P," ":RETURN  :REM*4
164Ø :                   :REM*164
165Ø REM DEC DATE        :REM*162
166Ø MD(2)=28:IFYV/4=INT(YV/4)T
     HENMD(2)=29         :REM*33
167Ø DV=DV-1:IF DV>Ø THEN RETUR
     N                   :REM*218
168Ø MV=MV-1:IF MV>Ø THEN 171Ø
                         :REM*79
169Ø MV=12:YV=YV-1       :REM*248
17ØØ IF YV<YB THEN YV=YB:MV=1:E
     N=1                 :REM*135
171Ø DV=MD(MV):RETURN    :REM*221
172Ø :                   :REM*244
173Ø REM INC DATE        :REM*54
174Ø MD(2)=28:IFYV/4=INT(YV/4)T
     HENMD(2)=29         :REM*81
175Ø DV=DV+1:IFDV<=MD(MV) THEN
     RETURN              :REM*98
176Ø DV=1:MV=MV+1:IF MV<=12 THE
     N RETURN            :REM*4
177Ø MV=1:YV=YV+1:IF YV<=YE THE
     N RETURN            :REM*31
178Ø YV=YE:MV=12:DV=MD(MV):RETU
     RN                  :REM*33
179Ø :                   :REM*63
18ØØ REM MAKE APPOINTMENT
                         :REM*43
181Ø MS$="":IF KI=4 THEN 195Ø
                         :REM*7
182Ø PRINT:PRINT "APPOINTMENT W
     ITH WHOM?"          :REM*97
183Ø INPUT MS$:IF MS$="" THEN R
     ETURN               :REM*68
184Ø IF LEN(MS$)>2Ø THEN PRINT"
     MESSAGE TOO LONG":GOTO 182
     Ø                   :REM*6Ø
185Ø PRINT               :REM*212
186Ø INPUT "WHAT HOUR IS IT (1-
     12)";HR             :REM*121
187Ø IF HR<1 OR HR>12 THEN 186Ø
                         :REM*175
188Ø INPUT "MINUTES AFTER THE H
     OUR (Ø-59)";MN      :REM*142
189Ø IF MN<Ø OR MN>59 THEN 188Ø
                         :REM*11
19ØØ INPUT "AM OR PM";K$
                         :REM*168
191Ø PM=Ø:IF K$="AM" THEN 193Ø
                         :REM*234
192Ø PM=1:IF K$<>"PM" THEN 19ØØ
                         :REM*213
193Ø GOTO 2Ø1Ø           :REM*177
194Ø :                   :REM*2Ø1
195Ø REM MAKE NOTE       :REM*12
196Ø INPUT "TYPE NOTE";MS$
                         :REM*21
197Ø IF MS$="" THEN EN=1:RETURN
                         :REM*195
198Ø IF LEN(MS$)>2Ø THEN PRINT
     "MESSAGE TOO LONG":GOTO 19
     6Ø                   :REM*5
199Ø HR=Ø:MN=Ø:PM=Ø      :REM*248
2ØØØ :                   :REM*2
2Ø1Ø REM SET REMINDER     :REM*224
2Ø2Ø K$="":INPUT"{CRSR DN}DO YO
     U WISH TO BE REMINDED (Y/N
     )";K$               :REM*25Ø
2Ø3Ø RV=Ø:IF K$<>"Y" THEN RETUR
     N                   :REM*97
2Ø4Ø INPUT "HOW MANY DAYS (1-14
     )";RV               :REM*199
2Ø5Ø IF RV>14 OR RV<Ø THEN 2Ø4Ø
                         :REM*151
2Ø6Ø RETURN              :REM*146
2Ø7Ø :                   :REM*88
2Ø8Ø REM ENCODE MESSAGE  :REM*96
2Ø9Ø M$=""               :REM*11
21ØØ S$=STR$(YV):GOSUB 218Ø
                         :REM*2Ø6
211Ø S$=STR$(MV):GOSUB 218Ø
                         :REM*136
212Ø S$=STR$(DV):GOSUB 218Ø
                         :REM*164
213Ø S$=STR$(PM):GOSUB 218Ø
                         :REM*177
214Ø S$=STR$(HR):GOSUB 218Ø
                         :REM*18Ø
215Ø S$=STR$(MN):GOSUB 218Ø
                         :REM*184
216Ø M$=M$+MS$           :REM*224
217Ø RETURN                :REM*1
218Ø IF LEFT$(S$,1)=" " THEN S$
     =MID$(S$,2)         :REM*13
219Ø IF LEN(S$)<2 THEN S$="Ø"+S
     $                   :REM*198
22ØØ M$=M$+S$:RETURN     :REM*62
221Ø :                   :REM*212
222Ø REM DECODE MESSAGE:REM*147
223Ø YV=VAL(LEFT$(M$,4)):REM*55
224Ø MV=VAL(MID$(M$,5,2))
                         :REM*79
225Ø DV=VAL(MID$(M$,7,2))
                         :REM*166
226Ø PM=VAL(MID$(M$,9,2))
                         :REM*188
227Ø PD$="AM":IF PM=1 THEN PD$=
     "PM"                :REM*18
228Ø HR=VAL(MID$(M$,11,2))
                         :REM*125
229Ø MN=VAL(MID$(M$,13,2))
                          :REM*9Ø
23ØØ MS$=MID$(M$,15)     :REM*245
231Ø RETURN              :REM*157
232Ø :                   :REM*67
233Ø REM SET MESSAGE     :REM*1Ø8
234Ø GOSUB 251Ø:IF EN<>Ø THEN R
     ETURN               :REM*184
235Ø DX=VAL(MID$(M$,1,8))
                         :REM*21Ø
236Ø TX=VAL(MID$(M$,8,6))
                         :REM*1Ø2
237Ø X=1                 :REM*154
238Ø F$=MF$(X)           :REM*183
239Ø IF F$="{PI}" THEN 248Ø
                         :REM*255
24ØØ D=VAL(MID$(F$,1,8)):REM*18
241Ø T=VAL(MID$(F$,8,6)):REM*9Ø
242Ø IF DX>D THEN 245Ø   :REM*86
243Ø IF DX<D THEN 246Ø  :REM*125
244Ø IF TX<T THEN 246Ø  :REM*251
245Ø X=X+1:GOTO 238Ø     :REM*181
246Ø FOR Y=MT-1 TO X STEP -1
                         :REM*16Ø
247Ø MF$(Y+1)=MF$(Y):NEXT
                         :REM*95
248Ø MF$(X)=M$:SE=SE+1   :REM*97
249Ø RETURN              :REM*66
25ØØ :                   :REM*247
251Ø REM OPEN RECORD     :REM*78
```

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Circle 133 on Reader Service card.

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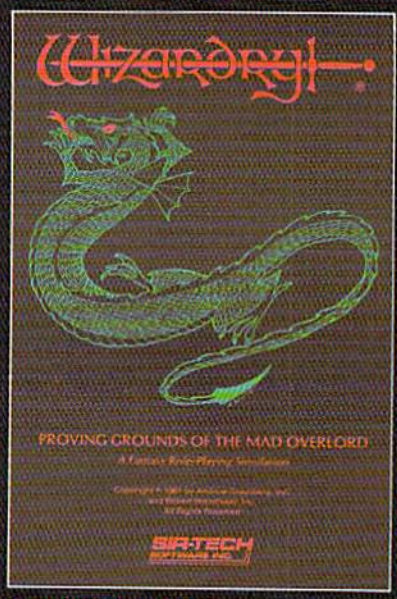

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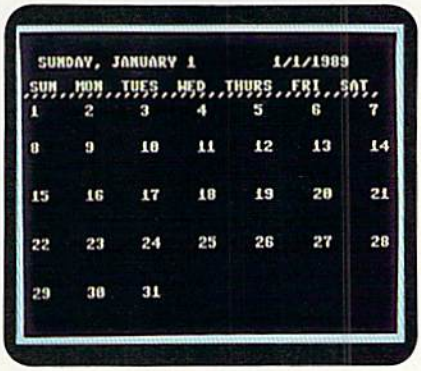
CALENDAR 2001

```
9Ø DIM DN$(7):DIM DC$(7):REM*88
1ØØ DIM MN$(12):DIM MD(12)
                          :REM*148
11Ø P=1:OPEN 1,3:OPEN 2,4
                          :REM*221
12Ø SP$="{17 SPACEs}"     :REM*49
13Ø :                     :REM*188
14Ø FOR X=1TO12:READN$,A
                          :REM*2Ø1
15Ø MN$(X)=N$:MD(X)=A:NEXT
                          :REM*196
16Ø FOR X=1 TO 7:READ N$:DN$(X)
    =N$:NEXT              :REM*24
17Ø DATA JANUARY,31,FEBRUARY,28
    ,MARCH,31,APRIL,3Ø,MAY,31
                          :REM*125
18Ø DATA JUNE,3Ø,JULY,31,AUGUST
    ,31,SEPTEMBER,3Ø      :REM*94
19Ø DATA OCTOBER,31,NOVEMBER,3Ø
    ,DECEMBER,31          :REM*154
2ØØ DATA SUNDAY,MONDAY,TUESDAY,
    WEDNESDAY             :REM*1Ø6
21Ø DATA THURSDAY,FRIDAY,SATURD
    AY                    :REM*12Ø
22Ø :                     :REM*23
23Ø REM INPUT DATE        :REM*77
24Ø POKE 53281,Ø          :REM*76
25Ø PRINT"{SHFT CLR}{4 CRSR DNs
    }"TAB(11)"CALENDAR 2ØØ1 AD"
                          :REM*82
26Ø PRINTTAB(12)"{CRSR DN}BY KE
    N HUEBNER{CRSR DN}"   :REM*85
27Ø GOSUB 126Ø :REM GET DATE
                          :REM*144
28Ø YZ=YV:MZ=MV:DZ=DV     :REM*6Ø
29Ø :                     :REM*93
3ØØ REM RUN MENU          :REM*115
31Ø GOSUB 145Ø:REM SHOW DATE
                          :REM*249
32Ø PRINT "{4 CRSR DNs}":EN=Ø
                          :REM*121
33Ø PRINT TAB(1Ø)"CALENDAR MENU
    ":PRINT               :REM*1Ø
34Ø PRINT TAB(12)"1-SEE CALENDA
    R"                    :REM*148
35Ø PRINT TAB(12)"2-READ CALEND
    AR"                   :REM*118
36Ø PRINT TAB(12)"3-APPOINTMENT
    "                     :REM*5
37Ø PRINT TAB(12)"4-NOTE"
                          :REM*1Ø4
38Ø PRINT TAB(12)"5-ERASE"
                          :REM*2Ø5
39Ø PRINT TAB(12)"6-EXIT"
                          :REM*242
4ØØ GETK$:KI=VAL(K$):IF KI<1 OR
     KI>6 THEN 4ØØ        :REM*31
41Ø ON KI GOSUB 48Ø,81Ø,56Ø,56Ø
    ,113Ø,44Ø             :REM*173
42Ø GOTO 3ØØ              :REM*224
43Ø :                     :REM*233
44Ø REM EXIT              :REM*167
45Ø PRINT#2:FORX=ØTO15:CLOSEX:N
    EXT                   :REM*225
46Ø PRINT "{SHFT CLR}":END
                          :REM*5
47Ø :                     :REM*18
48Ø REM LOOK CALENDAR     :REM*224
```



Sample Calendar 2001 screen display.

```
49Ø GOSUB 135Ø:REM DRAW CALENDA
    R                     :REM*76
5ØØ GETK$:IF K$="" THEN 5ØØ
                          :REM*227
51Ø IF K$=CHR$(145)THEN GOSUB 1
    76Ø                   :REM*45
52Ø IF K$=CHR$(17)THEN GOSUB 16
    8Ø                    :REM*8
53Ø IF K$=CHR$(13) THEN RETURN
                          :REM*38
54Ø GOTO 49Ø              :REM*124
55Ø :                     :REM*98
56Ø REM WRITE CALENDAR    :REM*119
57Ø GOSUB 124Ø:REM GET DATE
                          :REM*147
58Ø GOSUB 135Ø:REM DRAW CALENDA
    R                     :REM*246
59Ø GOSUB 257Ø            :REM*175
6ØØ GOSUB 251Ø            :REM*153
61Ø IF EN<>Ø THEN RETURN
                          :REM*215
62Ø GOSUB 147Ø:REM SHOW DATE
                          :REM*61
63Ø GOSUB 18ØØ:REM QUERY
                          :REM*241
64Ø GOSUB 2Ø8Ø:REM ENCODE
                          :REM*172
65Ø GOSUB 233Ø:REM SET MESSAGE
                          :REM*173
66Ø GOSUB 27ØØ:REM SAVE FILE
                          :REM*166
67Ø IF RV=Ø THEN RETURN :REM*67
68Ø GOSUB 165Ø:REM LESS DATE
                          :REM*219
69Ø IF EN<>Ø OR YV<YZ THEN RETU
    RN                    :REM*2Ø5
7ØØ IF YV>YZ THEN 74Ø     :REM*128
71Ø IF MV>MZ THEN 74Ø     :REM*94
72Ø IF MV<MZ THEN RETURN
                          :REM*117
73Ø IF DV<DZ THEN RETURN:REM*56
74Ø GOSUB 257Ø:REM LOAD MESSAGE
                          :REM*115
75Ø GOSUB 251Ø            :REM*52
76Ø IF EN<>Ø THEN RETURN:REM*76
77Ø GOSUB 233Ø            :REM*78
78Ø GOSUB 27ØØ:REM SAVE FILE
                          :REM*222
79Ø RV=RV-1:GOTO 67Ø      :REM*2ØØ
8ØØ :                     :REM*89
81Ø REM READ CALENDAR     :REM*196
82Ø GOSUB 124Ø:REM GET DATE
                          :REM*14Ø
83Ø YØ=YV:MØ=MV:DØ=DV     :REM*4
84Ø GOSUB 135Ø:REM DRAW CALENDA
    R                     :REM*235
85Ø GOSUB 257Ø:REM LOAD MESSAGE
                          :REM*129
86Ø IF EN<>Ø THEN RETURN:REM ER
    ROR                   :REM*71
87Ø :                     :REM*163
88Ø GOSUB 147Ø:C=1        :REM*8Ø
89Ø FOR X=1 TO MT         :REM*221
9ØØ M$=MF$(X)             :REM*236
91Ø IF M$="{PI}" THEN 1ØØØ
                          :REM*134
92Ø GOSUB 222Ø:REM DECODE
                          :REM*64
93Ø Z$=STR$(C):C=C+1      :REM*125
94Ø P$=STR$(MV)+"/"+STR$(DV)
                          :REM*42
95Ø GOSUB 1Ø9Ø:Z$=Z$+LEFT$(SP$,
    4-LEN(Z$))+P$         :REM*146
96Ø IF HR=Ø THEN 99Ø      :REM*1Ø4
97Ø P$=STR$(HR)+":"+MID$(M$,13,
    2)+PD$                :REM*15Ø
98Ø GOSUB 1Ø9Ø:Z$=Z$+LEFT$(SP$,
    1Ø-LEN(Z$))+P$        :REM*176
99Ø PRINT#P,Z$;SPC(18-LEN(Z$));
    MS$                   :REM*223
1ØØØ NEXT X               :REM*31
1Ø1Ø IF P=2 THENFORX=1TO3:PRINT
    #P," ":NEXT:P=1       :REM*35
1Ø2Ø YV=YØ:MV=MØ:DV=DØ :REM*147
1Ø3Ø PRINT "{CRSR DN} PRESS SPC
    -LIST, P-PRINT, OR RETURN.
    "                     :REM*4
1Ø4Ø GETK$:IFK$=" " THEN 88Ø
                          :REM*5Ø
1Ø5Ø IFK$="P"THEN P=2:GOTO 88Ø
                          :REM*62
1Ø6Ø IF K$<>CHR$(13)THEN 1Ø4Ø
                          :REM*26
1Ø7Ø RETURN               :REM*184
1Ø8Ø :                    :REM*118
1Ø9Ø FOR DX=1 TO LEN(P$):REM*98
11ØØ IF MID$(P$,DX,1)=" " THEN
    P$=LEFT$(P$,DX-1)+MID$(P$,
    DX+1)                 :REM*18Ø
111Ø NEXT:RETURN          :REM*24Ø
112Ø :                    :REM*158
113Ø REM ERASE MESSAGE    :REM*216
114Ø GOSUB 81Ø:REM READ CAL
                          :REM*126
115Ø IF EN<>Ø OR SE=Ø THEN RETU
    RN                    :REM*238
116Ø Y=Ø:PRINT:INPUT "{CRSR DN}
    ERASE WHICH MESSAGE (ID)";
    Y                     :REM*221
117Ø IF Y<1 OR Y>SE THEN RETURN
                          :REM*138
118Ø IF Y=SE THEN 121Ø    :REM*234
119Ø X=Y:FOR Y=X TO SE-1:REM*35
12ØØ MF$(Y)=MF$(Y+1):NEXT Y
                          :REM*177
121Ø MF$(Y)="{PI}"        :REM*146
122Ø GOTO 27ØØ:REM SAVE FILE
                          :REM*136
123Ø :                    :REM*13 ►
```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2001: A Calendar Program

When HAL isn't around to monitor your hectic schedule, consult this calendar program.

By KEN HUEBNER

Life in the fast lane is a hallmark of the twentieth century, and, as we approach the year 2000, the pace is getting even faster. If you're having trouble remembering special events, appointments and deadlines now, how will you cope in the years to come? Well, you should do just fine with the help of Calendar 2001, the twenty-first century calendar program for your twenty-first century lifestyle.

Written in Basic, Calendar 2001 uses relative files for instant reads and writes to its data files. Type in Listing 1, using *RUN*'s Checksum program. Variable MT at the beginning of the program has a default value of 12, which represents the maximum number of reminders you expect to input for each day. Do not change the value of MT once you've run the program and created a month file.

If you have a 1541 disk drive, 12 reminders per day will fill a disk in about one year; with a 1571, 25 per day will fill the disk in about the same period. Larger values will require scratching old reminders to make room for new ones from time to time, or will necessitate the use of a new reminder disk.

Once MT is set, save the program and a backup to disk. Then format a fresh disk to hold your reminders. You could also save a copy of the program to your data disk, so everything's together and easier to use; just be sure there's a backup elsewhere.

To use Calendar 2001, load it, insert the data disk if it's separate and type in RUN. When the program asks "What's the date?", enter today's date in numerical form, with the numbers separated by commas (12,20,1988), and press the return key (it is not necessary to type in leading zeroes with one-digit numbers).

Soon a menu will appear with the date you input at the top. There are six menu options:

1.— See the Calendar
2.— Read from Calendar
3.— Make an Appointment
4.— Save a Note
5.— Erase from Calendar
6.— Exit to Basic.

Option 1 displays a calendar showing the days of the current month. Press the cursor-up key to move forward to the next month or the cursor-down key to move back a month. When you've finished viewing the calendar, press return.

Option 2 lets you read a selected day's reminders. Just enter the date, again in numerical form, and the list will appear on-screen. On the left are numbers you'll need for identifying your reminders when using other options. On the right are the date, and perhaps a time, for each reminder, along with the contents of the reminder.

You can review the list any number of times by pressing the space bar. You can also make a hardcopy by just pressing P. Press the return key when you're finished.

Option 3 is for creating an appointment reminder and saving it to disk. At the query, enter the date of the appointment to load that day's file into the computer. This load will take longer when you're first using the program or starting a new month, because the program has to open a new file first. Once the file is available, Calendar 2001 will ask "Appointment with whom?" Reply with a name that's no more than 20 characters long. Then, at the queries for time, enter a number from 1 to 12 for the hour and a number from 0 to 59 for the minutes.

You also need to indicate whether you want to be reminded of the appointment in advance. If not, answer no or press return, and the reminder will be saved only to the date of the appointment. If you answer yes, you'll be asked how many days ahead of time you want the reminders to start. Enter a number from 1 to 14, and the reminder will be saved to the actual date, plus the specified number of days before.

Option 4 is for creating other types of reminders and saving them to disk. Except that there's no query for time, this option works just like option 3.

Option 5 erases reminders. Type in the date concerned, and, when the reminders appear on-screen, locate the one you want to erase, note its I.D. number and press return. Then, at the query, type in the I.D. number and press return again to erase the reminder from your data file.

When you're finished using Calendar 2001, press 6 to exit to Basic.

This program is most effective if used daily, so try to get into that habit. Then you'll be on a clear-charted course into the twenty-first century! R

Ken Huebner is a software designer who runs his own business, called Softrek, out of Watertown, WI.

Listing 1. Calendar 2001 program.

```
10 REM CALENDAR 2001 - KEN HUEB
   NER                    :REM*179
20 REM                    :REM*163
30 :                      :REM*88
40 MT=12:REM MESSAGES PER DAY
                          :REM*175
50 ML=14+20:REM MESSAGE LENGTH
                          :REM*242
60 RT=MT*31:REM REC/FILE:REM*48
70 YB=1988:YE=2001:REM YEAR RAN
   GE                     :REM*147
80 DIM MF$(MT)            :REM*244 ►
```

RUN it right: **C-64; printer optional**

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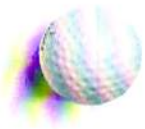

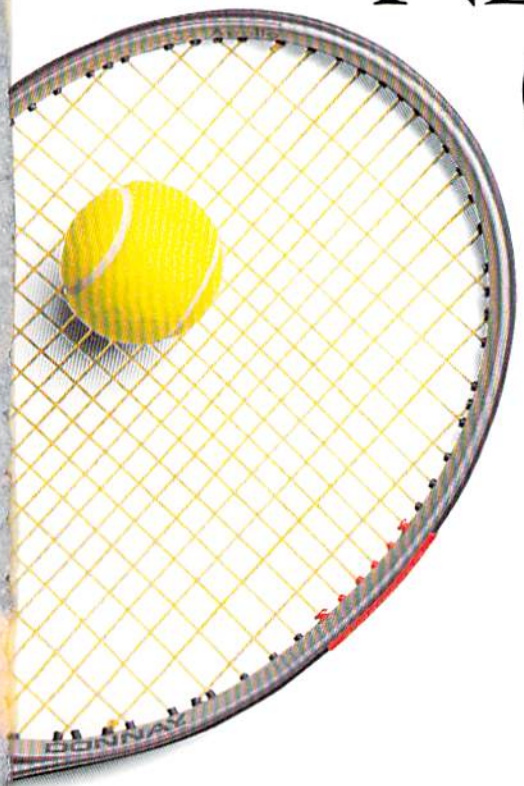

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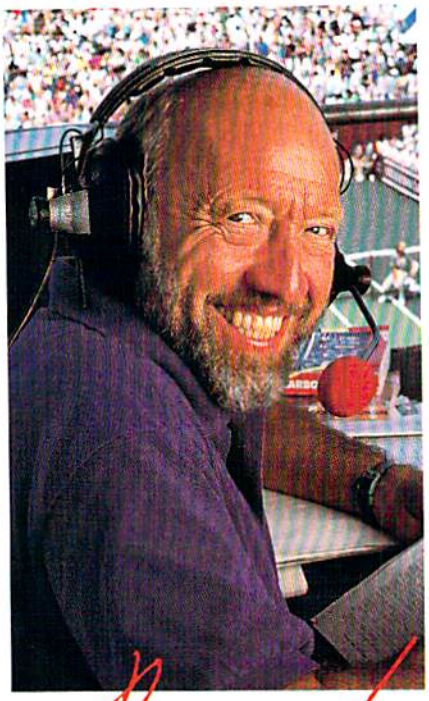

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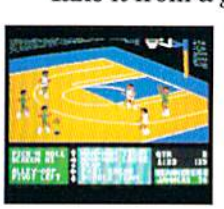

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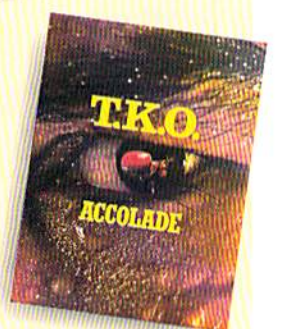

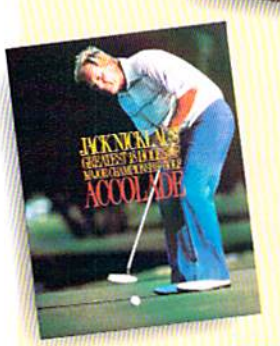

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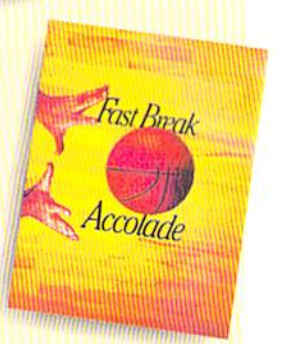

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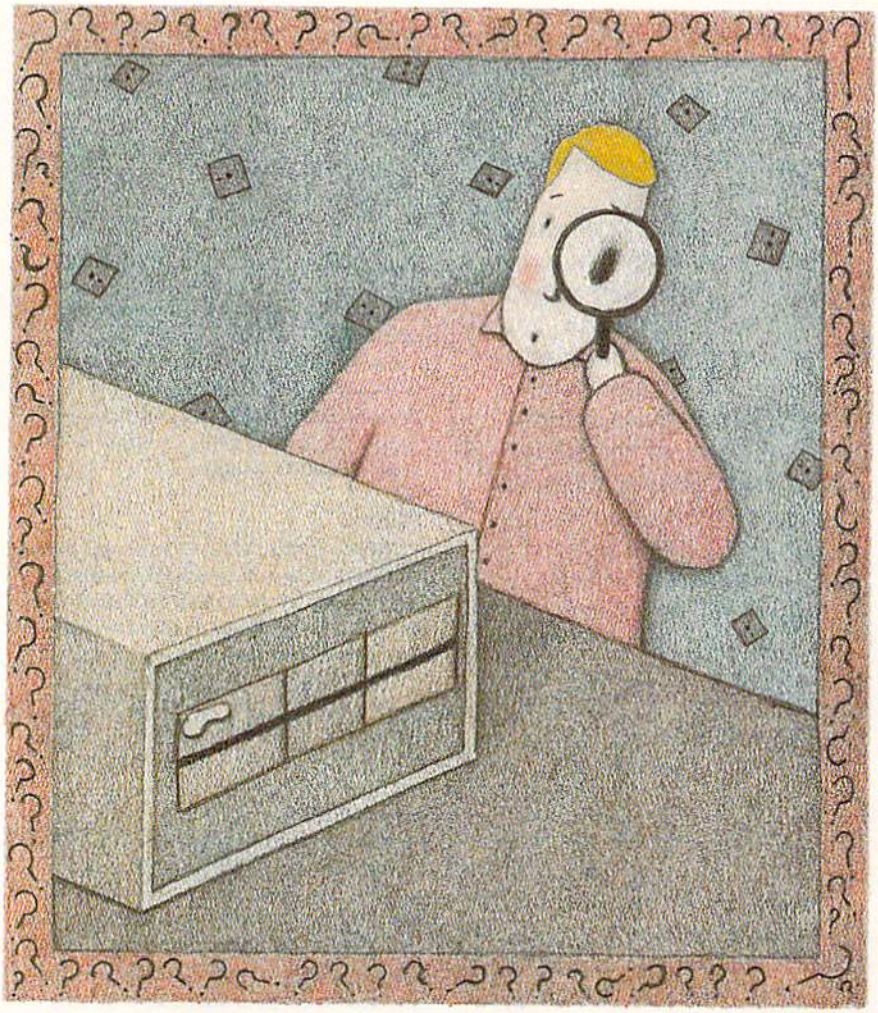
Demystifying DOS

Get on the right track with this disk drive tutorial.

By JOHN RYAN



I bought my first C-64 in early 1983 and, at the time, marveled at the power and versatility this machine offered in comparison with its little brother, the VIC-20. I also found the cassette recorder that used to be OK for the VIC totally unacceptable for my shiny new treasure. After several agonizing months, I finally bought the then new 1541 disk drive.

Dreaming of hyperspacing through data zones never traversed before, I was astonished when, as I tried to save a short three-line program, I was greeted by a Drive Not Ready error! Two hours later, a quick (and rather curt) phone call left me feeling a bit doltish...

"Well, did you format the disk?" the salesman asked.

"Format?" I replied.

"Yes, you know—did you "new" the disk from DOS?"

"Doss? Doss? What's a Doss?"

"Disk operating system," the salesman sighed impatiently. "The 1541 is an intelligent drive that possesses its own microprocessor."

"Well, it can't be that smart if it won't save anything!"

I think you get the picture. I suffered from a malady common to neophytes: ignorance. It comes from the exuberance of owning a new toy, coupled with reading only the first three pages of the manual. The 1541, 1571 and 1581 family of disk drives are indeed intelligent, but, like computers, only as intelligent as their owners.

Because a Commodore disk drive is equipped with a microprocessor of its own that runs DOS, you aren't required to "babysit" file operations as with many personal computer systems. For the most part, you can type a command and the drive will do all the work.

DOS is there as soon as you turn the disk drive on, and all you need to know to access its features is a handful of commands. Of course, as your computing savvy grows, you can use more advanced commands and programming tricks to delve into the heart of the disk drive's microprocessor and data storage areas. Here, I'll deal with the basics—simple commands that all new drive owners should know how to use.

Three Versions

To make using DOS a bit easier, Commodore includes a handy utility, called the DOS Wedge, on the Test/Demo disk that comes with the disk drive. This program is intended primarily for C-64 users, as Basic 2.0 has hardly any commands designed to handle DOS, unlike Basic 7.0 in the C-128. With the DOS Wedge, you'll find sending disk commands very simple—usually taking just a keypress or two.

For the purpose of comparison, I'll include the commands for the DOS ►

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Wedge (see Table 1), Basic 2.0 and Basic 7.0 in this tutorial. Any time that you're in doubt about a command, keep in mind that the Basic 2.0 DOS commands will work with any of the Commodore disk drives.

When using Basic 2.0, you must ensure that the command channel is open before sending a disk command. You accomplish this by entering:

```
OPEN 15,8,15
```

The first number, which specifies the channel through which your data will travel, could be any number from 1 to 255, but 15 has become standard. The second value is the device number. For a second or third disk drive, this would probably be 9 or 10. The third numeral specifies the secondary address, or channel, over which commands will travel.

You should be aware that the command sequence

```
OPEN 15,8,15
PRINT #15, "disk command"
CLOSE 15
```

can also be entered as:

```
OPEN 15,8,15,"disk command":CLOSE 15
```

Formatting a Disk

The following are the commands to format a disk:

```
Basic 2.0: OPEN 15,8,15,"N0:disk name,
  id":close15
Basic 7.0: HEADER "disk name,id"
DOS Wedge: @N0:disk name,id
```

Before anything can be stored on a disk, it must be formatted, or "newed." This procedure creates a pattern of tracks and sectors on the disk, as well as a fresh disk directory, which includes the drive's internal guide to the disk directory called the block availability map, or BAM (more on this later).

To format a disk, just enter a header name of 16 characters or less and a unique two-letter I.D. code. This I.D. is mandatory only when the disk you use is being formatted for the first time or has been erased using a magnetic eraser. If the disk has been used before and you don't mind using the same I.D. again, you can reformat it by entering only the header name.

This operation, commonly known as a short "new," just renames the disk header and clears the BAM. Unlike a full "new," which formats every track and creates a new BAM—and takes its own sweet time in doing so, I might add—a short "new" affects only two sectors on track 18 (sectors 0 and 1, which deal with the BAM and directory) and takes just a few seconds. Because of its more limited effect on the disk, you can recover lost files accidentally wiped out by a short "new" by using a disk utility designed for that purpose.

Initializing a Disk

Here is the command sequence for initializing a disk:

```
Basic 2.0: OPEN 15,8,15,"I0":CLOSE 15
Basic 7.0: DCLEAR
DOS Wedge: @I0
```

The Initialize command does not reset the disk drive, as is commonly believed. All it does is force the disk drive to read the BAM into the drive's random access memory. With Commodore disk drives, this normally happens automatically each time a disk is inserted (triggered by an optical write-protect switch within the drive).

To understand why the Initialize function is important, whether automatic or not, it's necessary to know how data storage is handled. The DOS would soon become hopelessly confused if it had no way to keep track of which sectors (blocks) have been used and which are available for storage. This is where the BAM comes in. It is simply a storage area on the disk filled with 1s and 0s for corresponding sectors—1 if the sector is used, 0 if it's free. The BAM is usually read into the drive's RAM only once and then updated to the disk when changed by a file write or erase operation. When this happens, DOS checks the disk I.D. prior to writing a new BAM. If the I.D. on the disk corresponds to the I.D. in the drive's memory, the BAM is rewritten and all is well—or is it?

This is why unique disk I.D.s are important. Suppose, for some reason, you possessed two disks with the same I.D., and, after you removed the first disk and inserted the second, the drive didn't initialize automatically. What would happen? As you tried to write new information to this second disk, the drive would assume, from the duplicate I.D., that everything was fine and use the BAM of the first disk to assign data blocks on the second. This, in effect, would allocate sectors already being used and vice-versa. Such scrambled directories aren't recoverable, unless you're really talented with a disk sector editor.

Although the chance of this happening (because of automatic initialization) is small, it's always a good idea to reinitialize a disk after a disk error or when you suspect that drive memory may be corrupted in some way. (A momentary power glitch comes to mind.)

Scratching a File

The commands for scratching any file are:

```
Basic 2.0: OPEN 15,8,15,"S0:filename":
  CLOSE 15
Basic 7.0: SCRATCH "filename"
DOS Wedge: @S0:filename
```

This DOS function eliminates a filename from the disk directory by "zeroing out" its file type and releasing to the BAM those sectors that were used by the file. In other words, the file isn't actually erased from the disk. Files that have been accidentally scratched can be restored by a restoring utility, as long as you don't write anything else to the disk beforehand. Some or all of the old ►

Table 1. DOS Wedge quick-reference chart.

Command	Function
@	Displays the current disk status
@$	Displays the directory
@# <device>	Sends DOS commands to this device
@Q	Quits the DOS Wedge
@C0:new file = old file	Copies a file to the same disk
@I0	Initializes the drive
@S0:filename	Scratches a file
@N0:disk name,id (optional)	Formats a disk
@R0:new name = old name	Renames a file
@V0	Validates a disk
@UI	Resets DOS
/filename	Loads a Basic file (same as LOAD "name",8)
%filename	Loads a binary file (same as LOAD "name",8,1)
↑filename	Loads and runs a file (from Basic)
←filename	Saves a file (from Basic)
←@0:filename	Saves-with-replace a file

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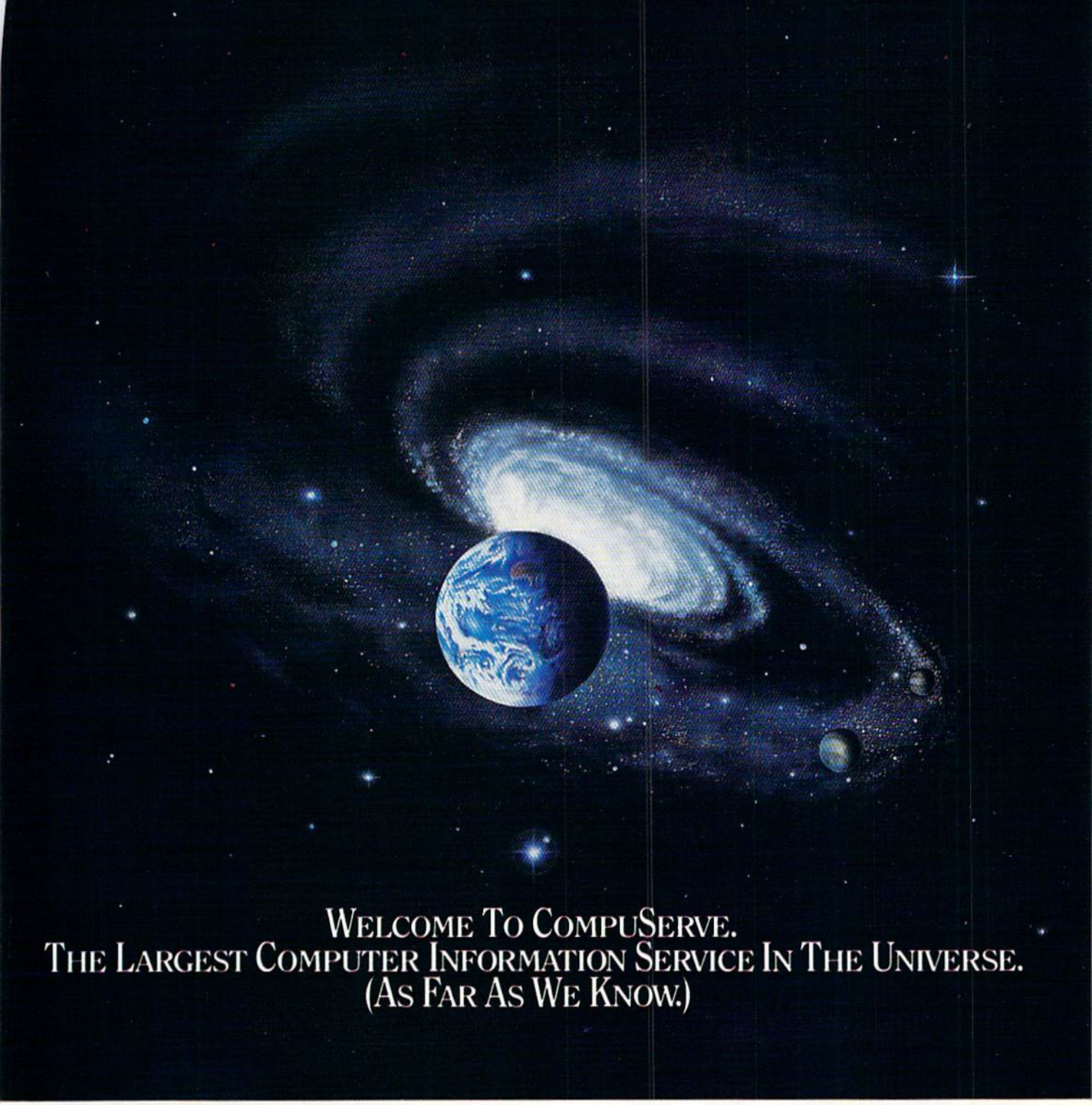

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file might get overwritten by the new. (Please, don't use the Validate command if you have hopes of ever seeing your scratched file alive again!)

You can use wild-card expressions to scratch a range of similarly named files. The * wild card instructs DOS to scratch files whose names begin with the same sequence of characters. For example:

```
@S0:TEST*
```

would scratch any filename starting with TEST, such as TESTING and TESTER.

Conversely, the ? wild card scratches files whose names end with the same sequence of characters *and* which contain the same number of characters. For example:

```
OPEN 15,8,15,"S0:?EST"
```

would scratch TEST, REST and NEST from a directory.

You can also mix the wild cards. For example:

```
SCRATCH "?RAM*"
```

would scratch any filename with RAM as the second through fourth letters, such as GRAMMY or DRAMA.

An asterisk next to a file type (*PRG, *SEQ) in the directory indicates an improperly closed, or "splatted," file, which you should not scratch. Since the file was improperly closed, and thus the BAM not correctly calculated, scratching it could release sectors being used by other programs. Instead, use the Validate command below.

Renaming a File

To rename a file, enter:

```
Basic 2.0: OPEN 15,8,15,"R0:new
  name = old name":CLOSE 15
Basic 7.0: RENAME "old name" to
  "new name"
DOS Wedge: @R0:new name = old name
```

This operation gives a file a new name in the directory. Except in Basic 7.0, you may enter a filename of any length, but only the first 16 characters will be used in the filename. Any characters except asterisks, commas, question marks, colons and quotation marks are acceptable. Using shifted characters (especially spaces) will result in unpredictable directory listings. Note that the Basic 2.0 and DOS Wedge commands are very similar, but the sequence of names is reversed.

Validating a Disk

Repeated scratch operations often fool the BAM into believing that certain disk sectors are being used, when, in fact, they are not. Since a scratch operation doesn't actually erase any file data, after a time you may have more blocks free on a disk than the directory indicates. Other causes of an incorrect BAM are scratching improperly closed files and using the Save-with-Replace command on a full disk. Occasionally, using Save-with-Replace creates a splatted file.

When you issue the powerful Validate command:

```
Basic 2.0: OPEN 15,8,15,"V0":CLOSE 15
Basic 7.0: COLLECT
DOS Wedge: @V0
```

the DOS reads through the files on the disk, determines which sectors are being

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used and frees the unused ones, thereby updating the BAM. It's interesting to note how this is accomplished. When the drive receives the command, it creates a blank BAM in its own memory, then begins to read the disk directory, tracing each entry's track and sector pointers. Every block that's part of a file is then marked, or allocated, in this new BAM. Splatted files aren't marked and are skipped over. Once all the directory files have been traced, this new BAM is written to track 18, sector 0.

Don't use the Validate command on commercial disks, which may have certain tracks allocated for specialized uses, such as copy-protection schemes. Likewise, there's no need to validate a write-protected disk. Finally, don't attempt to validate a disk containing random-access files (I'm not talking about relative files). Programs such as databases use this type of file most often.

Copying a File

The following Copy command duplicates files, including relative files, on the same disk:

Basic 2.0: OPEN 15,8,15,"C0:new filename = old filename":CLOSE 15
Basic 7.0: COPY "old filename" to "new filename"
DOS Wedge: @C0:new filename = old filename

It can also combine up to four files into a single file—most often sequential files, such as small word processing files. Copy will not merge two program files into one recognizable program, and don't attempt to combine relative files!

The syntax for combining two files is:

Basic 2.0: OPEN 15,8,15,"C0:new file = old file1,old file2":CLOSE 15
Basic 7.0: CONCAT "add file" to "master file"
DOS Wedge: @C0:new file = old file1, old file2

Tidying Up

Anyone who's owned a Commodore for a while probably knows how to load a directory by entering LOAD "$",8 (C-64) or DIRECTORY (C-128). DOS Wedge users can bring a nondestructible directory listing to the screen by entering @$. They can also slow the screen scrolling by pressing the control key, and stop and start it by pressing the space bar.

The DOS Wedge always assumes device #8 and directs all communication with it, but you can easily change the control device number by entering @#<device number>. Likewise, C-128 owners can access device 9 or higher by adding the suffix ",D0,U<device number>" to many disk commands.

Also note that the DOS Wedge can be disengaged by the command @Q, then reinitialized by the command string: SYS 52224:@#<device>. This is most useful to C-128 owners who love to push the reset button in C-64 mode!

The Commodore disk operating system is a very powerful and flexible computing environment, with ease-of-use its major strong point. Experiment with DOS, but use an expendable disk! You'll find it a ready friend in time of need. ■

John Ryan, one of RUN*'s contributing editors, sufficiently overcame his fear of DOS to share his hard-won knowledge.*

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Multitasking Comes To the C-64

This amazing program enables you to run three Basic programs at the same time.

By MICHAEL INGRASSIA

So, you thought your C-64 could never do multitasking! Well, think again. Now that capability of its more expensive big brother, the Amiga, is yours with MOS (multitasking operating system) 1.0, which lets you edit and run two or three Basic programs at the same time. As a bonus, MOS 1.0 is short and easy to type in. In fact, the code is amazingly compact for all that it does.

Possible applications of MOS are myriad and challenge the imagination. How about playing background music with one program while playing a game with another or printing a clock on one screen to keep track of your time running a program on another?

Maybe you'd like to display a document file while checking the code that accompanies it; compare two versions of a program by running them alternately; examine a disk directory without destroying the program in memory; or display variable values while a program is running? All are within easy reach once you start using MOS.

And even if you never use MOS for multitasking, its ability to load three programs at once so you can run or edit them in any order without accessing the disk drive makes it worthwhile to have on every disk you use.

To explain multitasking, here's an analogy from college life. If, as frequently happens, two adjunct professors share a desk, at the end of the first professor's office hours, he gathers up his materials from the desktop and puts them into his briefcase, leaving the desktop free for his colleague's use. Then the second professor comes in, removes the materials he needs from his briefcase and sets them out on the desk. Changing the contents of the desktop constitutes a context switch.

My desk, on the other hand, is single-tasking. I don't share it with anyone, and it's covered with all sorts of things—books, correspondence, a nameplate, my wedding picture. I couldn't possibly pop all those things into a briefcase to give someone else a place to work.

The MOS 1.0 start-up screen, showing the three spreads.

The Basic operating system that's built into the C-64 is like me. It "takes over the desk," getting out its wedding picture and nameplate and generally making itself at home in memory. Or, to be more exact, it fills memory with data, values and addresses of routines needed to run a program. To make Basic multitasking, so context switches can take place between Basic programs in the C-64's memory, these values and addresses must be saved and restored at each switch. That's what MOS does.

Program Overview

The C-64 provides only 38K of Basic workspace, but most Basic programs occupy only a fraction of that, so workspace is not a major limitation for MOS. (Divide the number of blocks a program fills by 4 to determine roughly how many K it fills. Most of my Basic programs are under 7K in length.) MOS chops the 38K into three areas called "spreads," plus an area for its own workings. Spread 1 can hold a 10K program, spread 2 a 12K program and spread 3 an 11K program.

To run three programs at once without becoming hopelessly confused, you need more than one screen. The Amiga, for example, "partitions" the screen into individual windows for the programs that need to display output. However, this would be difficult to accomplish on the C-64, so I've used "window shades" instead of windows. Pull the top shade all the way down and that's all you see. Raise it halfway and pull the second shade all the way down, and you see half of the first shade and half of the second. Lift both shade screens. and the third screen appears as a backdrop. (See below for information on the keys to manipulate these shaded areas.) The top shade shows spread 1's output, the second shade shows spread 2's output and the stationary backdrop shows spread 3's output.

You're probably wondering how the CPU can execute three programs at once. Well, of course, it can't really, but by dividing its processing time equally among the three programs, it gives that illusion. This division of effort is called time-slicing, because each program gets slices of the CPU's time in "round-robin" fashion. If one of the programs fin- ►

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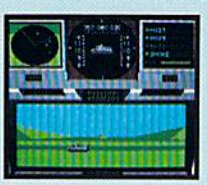
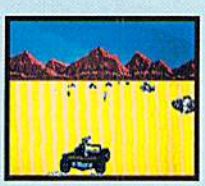

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ishes executing before the others, the CPU just shifts to dividing its time between the two still running.

You'll notice the time-slicing, because each of your programs will run about one-third slower than normal. Actually, it will run even a little slower than that, due to the complexity of context-switching. Still, MOS is cheaper than buying three computers!

Normally, only the current screen is affected by input and output, including input from the keyboard. Whichever program gets to the keyboard buffer first gets any input from the keyboard, so make sure you never have two programs wanting input at the same time. In Interactive mode, there's no problem, because you can specify which spread gets the input by using the Spread command (see below).

Using MOS

Listing 1 is the main MOS program in the form of Basic hex Data statements. Type it in, using *RUN*'s Checksum program, and save it to disk. Next, run it, and it'll write to disk a seven-block ML file named "+MOS ML". Then boot this ML file by entering:

```
LOAD "+MOS ML",8,1
SYS 37891
```

The second line directs the computer to load MOS at memory address 37891.

Portions of all three screens will appear, with green for the top shade, orange for the middle shade and purple for the backdrop. The cursor will be blinking on the green screen, indicating that you're ready to begin working with spread 1.

Use the following function keys to raise and lower the shades:

F1—Lowers the top shade.
F2—Raises the top shade.
F3—Lowers the second shade.
F4—Raises the second shade.

These keys operate in both Direct and Program modes, and they're also placed in the keyboard buffer for use by your programs. If you wish, you may write your programs in such a way as to ignore the function key input or disable shade-moving before your program executes by entering POKE 38226,0. To restore use of the function keys, enter POKE 38226,255. For now, hold down F1 until the top shade has descended completely.

To witness three programs running simultaneously, type in Listings 2 and 3 and save them to disk. Listing 2 is a Basic clock program, and Listing 3 is a program that displays the values of variables as they execute in spread 1. Load each into a spread as follows:

```
LOAD "LISTING 2",8
SPREAD 2
LOAD "LISTING 3",8
SPREAD 3
LOAD "LISTING 3",8
```

Naturally, you need to substitute whatever filenames you're using in place of "Listing 2" and "Listing 3." Next, type SRUN <return>, and all three will execute. This sequence assumes you're starting with spread 1, but you can change the order if you want. Also, if you're running only two programs, there's no need to load anything into an empty spread.

MOS Commands

SPREAD n (n *must* have the value 1, 2 or 3) lets you switch from one spread (spread 1, by default) to another.

SRUN actually runs the programs simultaneously. You can be in any spread when you enter this command. To stop one program from running, tap the run-stop key as usual, but to stop all the programs, you may need to hold the key down. Immediate mode is locked out until you get the message SRUN FINISHED.

To run a single program, just go to the desired spread and type RUN; SRUN is unnecessary.

Note that you may accidentally execute a SPREAD or an SRUN if you have a syntax error in a command with READ or RUN in it. That's how MOS characterizes the new commands.

Miscellaneous Notes

You'll notice that the separate screens have steady raster edges until you perform a disk operation. Because of the flickering during disk accesses, I recommend that you have only one screen visible at those times.

The background color of the spreads 1, 2 and 3 can be changed with a POKE 38213, POKE 38214 or POKE 38215, respectively. Avoid poking 53281, because you can't tell which screen will change color.

Should you accidentally press run-stop/restore while using MOS, reinitialize it by entering

```
SPREAD 1 <return>
SYS 37891 <return>
```

whether you can see your input on the screen or not.

You may experience some difficulties with program compatibility when using MOS. More than one program, including MOS, may need the same locations in memory. Also, the spread programs may want to divert some of the low-memory vectors that MOS has diverted for its own purposes.

Programs (even machine language programs!) that stick to Basic-style memory management are most likely to run with no problem. Your best bet is to run only programs that you thoroughly understand. And keep in mind that MOS doesn't use any of the 4K of memory from location 49152 up. R

Michael Ingrassia is a member of the mathematics and computer science faculty at the State University of New York, New Paltz.

Listing 1. MOS program.

```
Ø REM CREATE M.O.S. ML PROGRAM
                          :REM*158
5 OPEN 8,8,8,"+MOS ML,P,W"
                          :REM*116
1Ø READ A$:IF A$="-1" THEN CLOS
  E8:END                  :REM*78
15 IF LEN(A$)<62 THEN 55
                          :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
  2Ø)+MID$(A$,43,2Ø)      :REM*242
25 FOR I=1 TO 3Ø          :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                          :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55               :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55               :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*67
5Ø NEXT:GOTO 1Ø           :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
  O 7Ø                    :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
  A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
  )):GOTO 7Ø              :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
  Ø)+RIGHT$(A$,LEN(A$)-42)
                          :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                          :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55               :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55               :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*148
95 NEXT:GOTO 1Ø           :REM*16Ø
1ØØ REM HEX DATA FOR MULTI-TASK
    ING OPERATING SYSTEM (MOS) ►
```


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```
                                :REM*71
101 DATA 0394A94C8DA7028DAA02 8
    DAD028D399AAD02030C9 60D009A
    D03030C997D002          :REM*8
102 DATA F016AD02038DAB02AD03 0
    38DAC02A9608D02030A9 978D030
    3AD0003C9A0D0           :REM*126
103 DATA 09AD0103C995D002F016 A
    D00038DA802AD01038D A902A9A
    8D0003A9958D            :REM*4
104 DATA 0103AD1403C9EBD009AD 1
    503C998D002F012AD14 038DAE0
    28D3A9AAD1503           :REM*128
105 DATA 8D3B9A8DAF02A9008D00 1
    08D01108D02108D00038 8D01388
    D02388D00688D           :REM*158
106 DATA 01688D0268A9018DEB99 A
    9085FBA9A085FCA000 B1FB91F
    BC8D0F9E6FCD0           :REM*169
107 DATA F578A5129FD85158A9 0
    58D15EAA9008DEC99A9 10852CA
    9008537ADF799           :REM*186
108 DATA 8538A958D21DA988D 4
    695A948D4795A9FF8D 5295A90
    8D8602A940A0            :REM*65
109 DATA 9A201EAB78AD0DDCA97F 8
    D0DDCA9EB8D1403A998 8D1503A
    D11D0297F8D11           :REM*201
110 DATA D0A95A8D12D0A9818D1A D
    058A200A92090D0089D 0099D0
    0A9D0B9D00              :REM*119
111 DATA 0C9D0D9D0E9D0F E
    8D0E52044A64C74A401 0401010
    1058045C84FC            :REM*21
112 DATA 00000015253500FF9999 9
    9999999999999999999 9999999
    9999999999999           :REM*140
113 DATA 99999999999999999999 9
    99999999999999999999 9999999
    9999999999999           :REM*99
114 DATA 99999999999999999999 9
    99999999999999999999 4552524
    F52207900C987           :REM*4
115 DATA F00BC98AF00AC9CCF009 4
    CA7024CDA954C38964C A096534
    54D41ADEC99F0           :REM*5
116 DATA 0E782C3F9A1003583 0F7 A
    9FF8D3F9A5860535052 4541442
    011E2E67AD002           :REM*155
117 DATA E67B209EB78AD005A20E 4
    C37A4C904B0F7788EF3 99AEEB9
    9A52D9DEC99A5           :REM*214
118 DATA 2E9DEF99A5389DF699AE F
    3998EEB99BDF399852C BDF6998
    538BDEC99852D           :REM*189
119 DATA 852F8531BDEF99852E85 3
    085328A0A0A8D8802 58 4CAEA75
    352554EA9018D           :REM*118
120 DATA FA998DFB998DFC99A02D B
    9B9A994E9B9910C99 D29C881
    0F1A003B9AC00           :REM*85
121 DATA 99499B990B9C99CD9C88 1
    0F1A90B8D1B9CA90F8D DD9CAEE
    B99BDFC991869           :REM*99
122 DATA 9585FBBDFF9969005FC A
    02DB9C7091FB8810F8 A9038DE
    C99A9CC8DC097           :REM*50
123 DATA A9BB857AA997857B4CE4 A
    768686868A93A8DC097 BA8E3C9
    A8E3D9A8E3E9A           :REM*2
124 DATA BD000D009D9D009E9D 0
    09FE8D0F1A203BDFC99 85FBBDF
    F9985FCA08FB9           :REM*118
125 DATA 0000091FB88D0F8A02CBD F
    39991FBC8BDEC9991FB A02F91F
    BA03191FBC8BD           :REM*44
126 DATA EF9991FBA03091FBA02E 9
    1FBBDF699A03891FBA9 FFA03A9
    1FBCAD0B9A997           :REM*49
127 DATA 8DBF9A8D819B8D439CA9 5
    88DBE9AA9548D809BA9 498D429
    CA9008DBD9A8D           :REM*56
128 DATA 7F9B8D419C8DBB9A8D7D 9
    B8D3F9CEA206CE578A9 EF8D3A9
    AA9978D3B9A58           :REM*227
129 DATA A9BB857AA997857B4CE4 A
    7A9B2D0F3A9A9D0EF45 5849542
    0BF95D0034CAA           :REM*77
130 DATA 02ADEB9909308DCC97A9 C
    5A097201EAB78A9008D 3F9ACEE
    C99D017ADAE02           :REM*50
131 DATA 8D3A9AADAF028D3B9A58 A
    9D8A097201EAB4CAA02 AEEB99A
    9009DF99958A9           :REM*207
132 DATA 00F0FE4D455347535087 3
    13A8A3ACC0053508732 3A8A3AC
    C00535087333A           :REM*214
133 DATA 8A3ACC005350 52454144 2
    0232046494E49534845 44 0D005
    352554E202020           :REM*109
134 DATA 202046494E4953484544 0
    D0044495350 58A5FB8D 039AA5F
    C8D049AAEEB99           :REM*15
135 DATA BDFC9985FBBDFF9985FC A
    000C86891FBC006D0F8 C8B9000
    091FBC08FD0F6           :REM*93
136 DATA C8B91C0091FBC093D0F6 C
    8ADA50291FBC8B93200 91FBC0C
    2D0F6BD049A85           :REM*127
137 DATA FBBD079A85FCA5FF9DE0 9
    8AD92029DE398BA8AA8 B900019
    1FBC8C00BD0F6           :REM*99
138 DATA 8AAEEB999D3B9ACAD002 A
    203BDF999F0F68EEB99 BD049A8
    5FBBD079A85FC           :REM*145
139 DATA BD3B9AA8AA9AB1FB9900 0
    1C8C00BD0F6AEEB99BD FC9985F
    BBDFF9985FCBD           :REM*80
140 DATA E09885FFBDE3988D9202 A
    0C2B1FB99320088C094 D0F6B1F
    B8DA50288B1FB           :REM*24
141 DATA 991C0088C08FD0F6B1FB 9
    90000088C006D0F6A006 B1FB488
    8D0FAAD039A85           :REM*200
142 DATA FBAD049A85FCAEEB998A 0
    A0A8D8802 4C81EA0000 00000000
    048524153AE40           :REM*124
143 DATA 95AD21D09D4495BD4795 C
    9FCD0794C5799EA18A2 01BD419
    50AE87D41950A           :REM*189
144 DATA E87D41950A0A6D4095AA B
    D9A9AAA8E4095BC4495 EAEAEAB
    D4D95EAEAEA8D           :REM*236
145 DATA 18D08C21D0BD47958D12 D
    0A9018D19D068A868AA 6840 8A4
    89848A9408D3E           :REM*192
146 DATA 99AD5195D0034C399A4C A
    D0248564552A9488D3E 99A9FF4
    D51958D5195F0           :REM*54
147 DATA 0EAD5295F009A5C538E9 0
    3D005F0004CFE98C903 B0F9AE8
    E02F01E48A905           :REM*235
148 DATA 482868AAA8B94795C930 F
    0E5DE4795DE4795DE47 95DE479
    54CB99948A905           :REM*153
149 DATA 482868AAA8B94795C9FC F
    0C7FE4795FE4795FE47 95FE479
    5A000C8CC4195           :REM*39
150 DATA B02A901994195A200E8 8
    CE099ECE099B0EABD47 95D9479
    590EFA9009941           :REM*10
151 DATA 95F0DB00AE4195CA8E40 9
    54CFE9801000303031 3868001
    038683868940 0          :REM*2
152 DATA 0000B97B3D9A9B9C0000 0
    000009D9E9F00001901 4000142
    00100C007 0000          :REM*171
153 DATA 27182000800800800800 8
    0818181818181828282 8282828
    2838383838383           :REM*188
154 DATA C0DB4C31EAFFFFF00093 2
    02020202040D554C5449 5441534
    B45522020 4D4F          :REM*97
155 DATA 5320564552534 94F4E20 3
    12E303020202020202020 2843292
    0313938382042           :REM*36
156 DATA 5920 4D494348414 54C20 4
    12E20494E4752415353 4941202
    0202020202020           :REM*242
157 DATA 0D00454E444441544163 6
    3636363030303630202 0263020
    30263010101 63          :REM*131
158 DATA 0303016302010163020 3 0
    188C0                   :REM*190
159 DATA -1                 :REM*13
```

Listing 2. Basic Clock program.

```
100 REM A BASIC CLOCK PROGRAM
                            :REM*56
110 REM BY MICHAEL A. INGRASSIA
                            :REM*243
120 REM THIS ROUTINE PRINTS THE
    TIME                    :REM*171
130 REM AT THE BOTTOM OF THE SC
    REEN.                   :REM*54
140 REM THE CLOCK WILL RUN AT T
    HE                      :REM*241
150 REM PROPER SPEED WHETHER PR
    OGRAM                   :REM*107
160 REM IS RUN IN THE ORDINARY
    WAY                     :REM*144
170 REM OR IS "SRUN" (EXECUTED
                            :REM*35
175 REM SIMULTANEOUSLY WITH OTH
    ER                      :REM*151 ►
```


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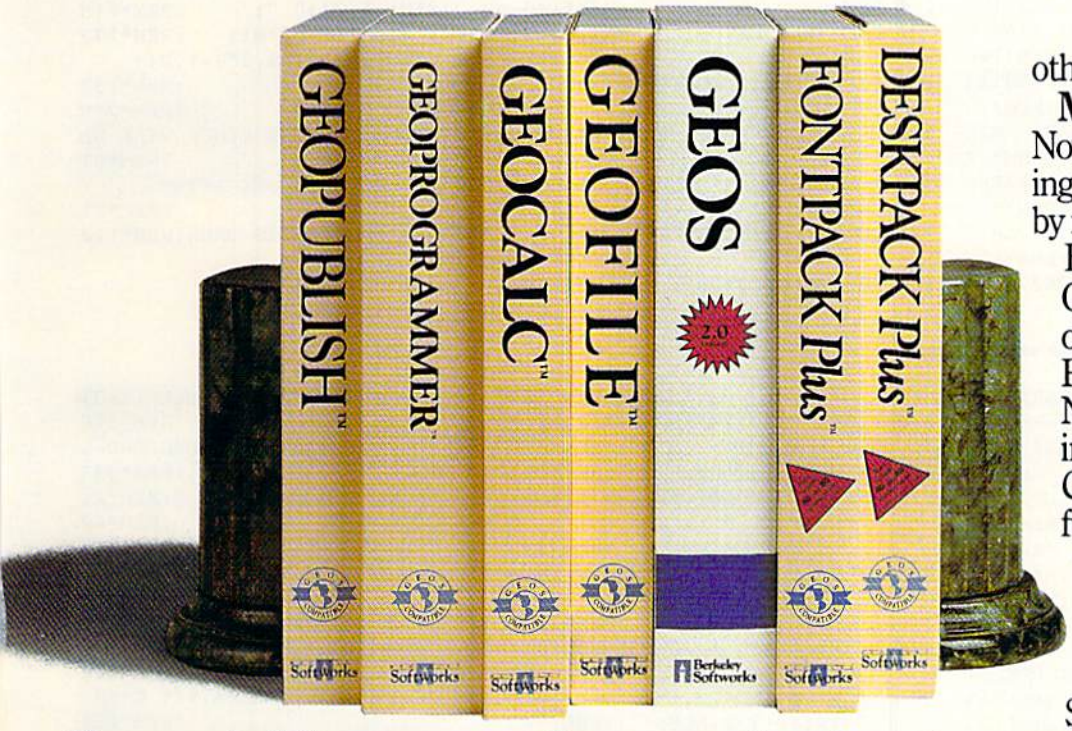

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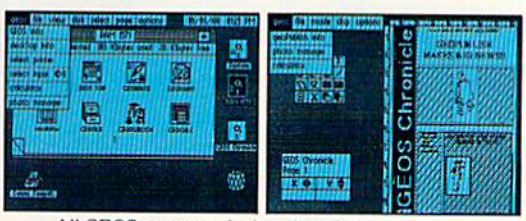

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```
18Ø REM PROGRAMS) UNDER MOS.
                        :REM*136
185 REM                 :REM*73
19Ø A$="":C=1:S=TI/6Ø:TI$="ØØØØ
    ØØ"                 :REM*52
195 IF PEEK(394Ø4)>Ø THEN C=2
                        :REM*128
196 IF PEEK(77Ø)<>96 OR PEEK(77
    1)<>151 OR PEEK(768)<>16Ø T
    HEN C=1             :REM*1Ø6
197 REM UNDER MOS, 394Ø4 CONTAI
    NS                  :REM*77
198 REM NUMBER OF PROGRAMS BEIN
    G SRUN              :REM*74
2ØØ A$={3 SPACEs}"ØØØ1Ø2Ø3Ø4Ø5Ø
    6Ø7Ø8Ø9"            :REM*169
21Ø A$=A$+"1Ø111213141516171819
    "                   :REM*183
22Ø A$=A$+"2Ø2122232425262728 29
    "                   :REM*2Ø4
23Ø A$=A$+"3Ø313233343536373839
    "                   :REM*25
24Ø A$=A$+"4Ø4142434445464748 49
    "                   :REM*86
25Ø A$=A$+"5Ø5152535455565758 59
    "                   :REM*226
26Ø REM                 :REM*146
27Ø REM THE NEXT STATEMENT MULT
    IPLIES              :REM*251
28Ø REM TI BY C TO COMPENSATE F
    OR THE              :REM*127
29Ø REM CLOCK WHICH RUNS TWICE
    AS SLOW             :REM*21Ø
3ØØ REM DURING SIMULTANEOUS EXE
    CUTION.             :REM*237
31Ø REM DIVIDING BY 6Ø CONVERTS
     T                  :REM*118
32Ø REM TO SECONDS.     :REM*195
33Ø T=C*TI/6Ø+S         :REM*57
34Ø PRINT "{HOME}{24 CRSR DNs}"
    ;                   :REM*16Ø
35Ø HO=INT(T/36ØØ):PRINT MID$(A
    $,2*HO+1,2);":";    :REM*9
36Ø T = T-36ØØ*HO       :REM*4
37Ø MI=INT(T/6Ø):PRINT MID$(A$,
    2*MI+1,2);" ";      :REM*118
38Ø T = INT(T-6Ø*MI)    :REM*172
39Ø PRINT MID$(A$,2*T+1,2);
                        :REM*138
4ØØ GOTO 33Ø            :REM*219
41Ø REM NOTE THAT CLOCK WILL NE
    ED                  :REM*81
42Ø REM TO BE RESET AFTER
                        :REM*21
43Ø REM PROGRAM IS SRUN:REM*12Ø
```

Listing 3. Executing Basic Variables program.

```
1ØØ REM WATCH BASIC VARIABLES E
    XECUTE              :REM*18
1Ø2 REM BY MICHAEL INGRASSIA
                        :REM*66
1Ø3 REM USE WITH MOS IN SPREAD
    2 OR 3              :REM*191
1Ø4 REM TO OBSERVE      :REM*62
1Ø5 REM VARIABLES IN SPREAD 1
                        :REM*13Ø
1Ø6 DUD=1ØØ:REM DUD IS FIRST VA
    RIABLE              :REM*53
11Ø REM FIRST CHECK THAT MOS IS
     RUNNING            :REM*44
12Ø IF PEEK(77Ø)=96 AND PEEK(77
    1)=151 AND PEEK(768)=16Ø TH
    EN GOTO 135         :REM*25
125 PRINT "ACTIVATE MOS BEFORE
    RUNNING THIS PROGRAM."
                        :REM*62
13Ø END                 :REM*3
135 IF PEEK(394Ø4)<>Ø THEN GOTO
     15Ø                :REM*245
14Ø PRINT "YOU MUST <SRUN> THIS
     PROGRAM."          :REM*18Ø
145 END                 :REM*16
15Ø REM ARY IS END OF VARIABLE
    STORAGE             :REM*167
152 REM WHILE X, INITIALLY. IS
    START               :REM*2ØØ
153 PRINT "{SHFT CLR}";:REM*218
154 DUD=1ØØ:REM DUD IS FIRST VA
    RIABLE              :REM*5
155 ARY=256*PEEK(39657)+PEEK(39
    656)                :REM*7Ø
157 VAR=256*PEEK(46)+PEEK(45)
                        :REM*221
16Ø X=256*PEEK(39655)+PEEK(3965
    4)                  :REM*61
162 DEF FN QT(X)=X*X    :REM*255
163 I%=112:P%=99        :REM*176
164 S$="-->"+CHR$(13)+"<--"
                        :REM*9Ø
2ØØ REM X IS THE ADDRESS OF
                        :REM*213
21Ø REM A VARIABLE ENTRY:REM*33
22Ø REM                 :REM*1Ø6
23Ø Y1=PEEK(X):Y2=PEEK(X+1)
                        :REM*2ØØ
24Ø B1=INT(Y1/128):B2=INT(Y2/12
    8)                  :REM*8Ø
245 PRINT X;TAB(8);     :REM*47
25Ø IF B1=Ø AND B2=Ø THEN PRINT
     "FLOATING-PT{2 SPACEs}";
                        :REM*82
26Ø IF B1=1 AND B2=1 THEN PRINT
     "INTEGER{6 SPACEs}";
                        :REM*2Ø2
27Ø IF B1=1 AND B2=Ø THEN PRINT
     "FUNCTION DEF ";   :REM*23Ø
275 IF B1=Ø AND B2=1 THEN PRINT
     "STRING{7 SPACEs}";:REM*28
28Ø Y1=Y1 AND 127:Y2=Y2 AND 127
                        :REM*127
29Ø PRINT CHR$(Y1);     :REM*165
3ØØ IF Y2=Ø THEN PRINT " ";
                        :REM*2Ø1
31Ø IF Y2<>Ø THEN PRINT CHR$(Y2
    );                  :REM*235
32Ø IF B1<>Ø OR B2<>Ø THEN GOTO
     42Ø                :REM*46
33Ø REM FLOATING-POINT  :REM*95
34Ø POKE VAR+2,PEEK(X+2)
                        :REM*215
35Ø POKE VAR+3,PEEK(X+3):REM*5Ø
36Ø POKE VAR+4,PEEK(X+4):REM*14
37Ø POKE VAR+5,PEEK(X+5)
                        :REM*1Ø6
38Ø POKE VAR+6,PEEK(X+6):REM*7Ø
385 REM PRINT 15 BLANKS THEN BA
    CKTRACK             :REM*124
386 REM DON'T LEAVE DATA ON SCR
    EEN                 :REM*114
39Ø PRINT "{15 SPACEs}{15 CRSR
    LFs}";              :REM*81
4ØØ PRINT DUD           :REM*196
41Ø GOTO 63Ø            :REM*235
415 REM ******          :REM*154
42Ø REM WASN'T FLOATING POINT
                        :REM*118
43Ø IF B1<>1 OR B2<>1 THEN GOTO
     5ØØ                :REM*191
44Ø REM INTEGER         :REM*133
45Ø PRINT "{15 SPACEs}{15 CRSR
    LFs}";              :REM*149
46Ø DUD=256*PEEK(X+2)+PEEK(X+3)
                        :REM*116
47Ø IF DUD>32767 THEN DUD=DUD-6
    5536                :REM*232
48Ø PRINT DUD           :REM*21
49Ø GOTO 63Ø            :REM*6Ø
5ØØ REM ******          :REM*247
51Ø REM WASN'T INTEGER EITHER
                        :REM*93
52Ø IF B1<>1 OR B2<>Ø THEN GOTO
     55Ø                :REM*3Ø
53Ø REM FUNCTION DEF    :REM*223
535 PRINT "{15 SPACEs}{15 CRSR
    LFs}";              :REM*224
54Ø PRINT:GOTO 63Ø      :REM*188
545 REM ******          :REM*25
55Ø REM MUST BE STRING :REM*2Ø6
551 PRINT " ";          :REM*22
555 PRINT "{15 SPACEs}{15 CRSR
    LFs}";              :REM*252
558 COUNT=PEEK(X+2):ISIT=Ø
                        :REM*5Ø
56Ø SA=256*PEEK(X+4)+PEEK(X+3)
                        :REM*193
565 IF COUNT > 15 THEN ISIT=1:C
    OUNT=13             :REM*169
57Ø PRINT "{CTRL 9}";   :REM*248
575 FOR DX=1 TO COUNT   :REM*2Ø6
58Ø CH=PEEK(SA+DX-1)    :REM*183
59Ø IF CH<32 OR ((127<CH)AND(CH
    <16Ø)) THEN PRINT "{CTRL Ø}
    ?{CTRL 9}";         :REM*24
592 IF ((31<CH)AND(CH<128))OR(C
    H>159) THEN PRINT CHR$(CH);
                        :REM*168
593 NEXT                :REM*2Ø9
595 IF ISIT=1 THEN PRINT "{CTRL
     Ø}..";             :REM*158
596 PRINT               :REM*239
63Ø X=X+7               :REM*253
635 ARY=256*PEEK(39657)+PEEK(39
    656)                :REM*167
64Ø IF X<ARY THEN GOTO 23Ø
                        :REM*4Ø
65Ø PRINT "{HOME}";:GOTO 155
                        :REM*238
```

■

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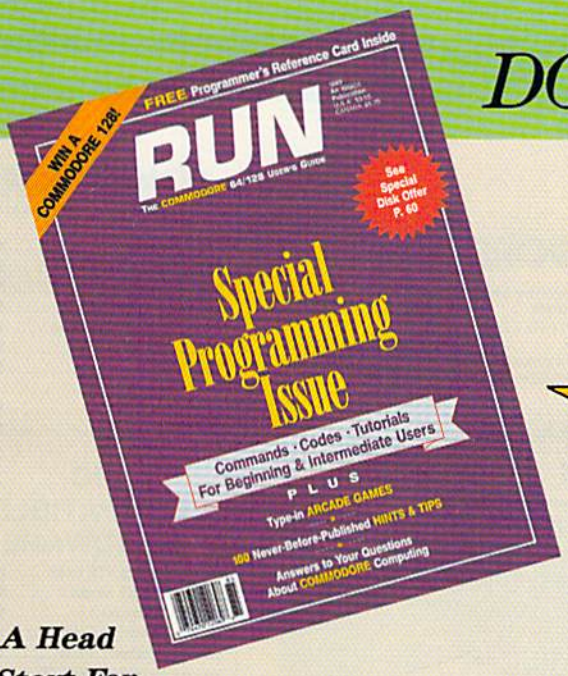

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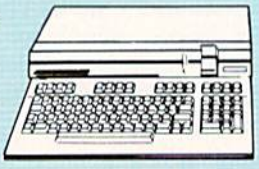

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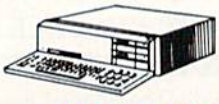

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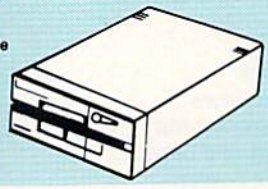

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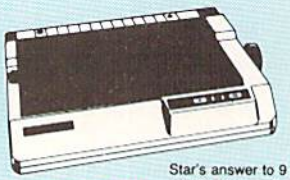

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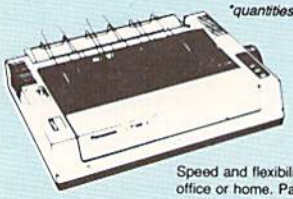

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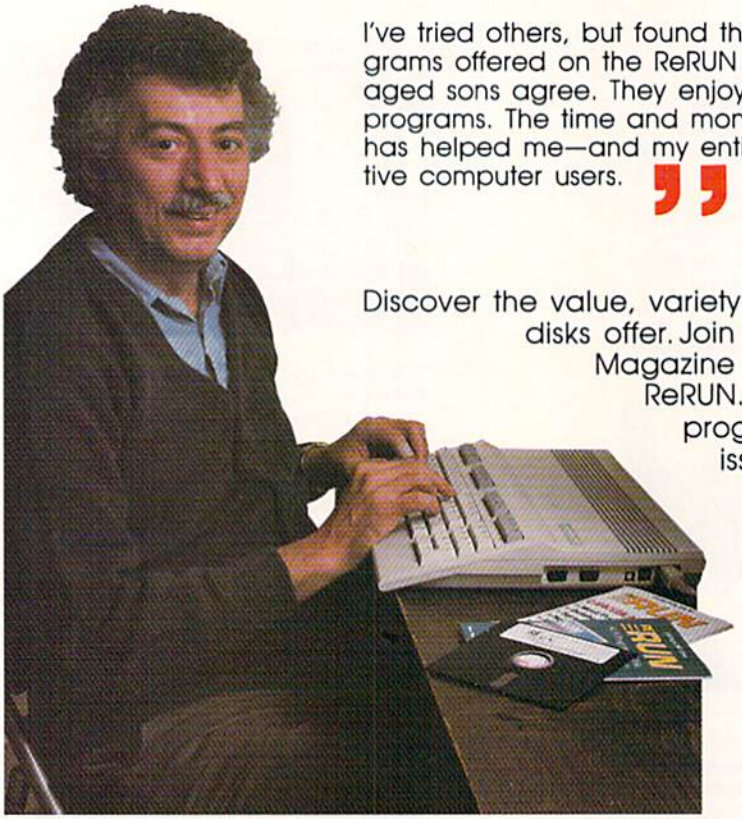

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Learn To Walk Before You RUN

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

1. First, keep in mind that as a beginner you should enter only short Basic programs. Avoid machine language listings and lengthy Basic programs until you get the hang of what you're doing.

2. To help you catch mistakes in typing in listings, we publish *RUN*'s Checksum program elsewhere in this issue.

3. If you intend to save the program you're typing in on a brand new disk, you must format that disk. To do this, insert the disk in your drive and type:

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

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

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

```
CLOSE15 <press return>
```

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

```
HEADER "NAME,##" <press return>
```

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

4. Before you start typing in a program listing, your computer's memory needs to be empty. To make sure it is, turn the computer off, wait a few seconds, and turn it on again.

5. As you type in the listing, remember to press the return key after typing each line. This enters the line into memory.

6. If you want to review what you've entered, type LIST and press the return key; all the lines you've entered will scroll by. You can slow the scrolling on the C-64 by holding down the control key, and on the C-128 by pressing the no-scroll key. To view certain specific lines, type LIST, followed by the line numbers you want; then press the return key. For example, LIST 10-50 displays lines 10 through 50, and LIST 20 displays only line 20.

7. If you find an error in a line, delete the incorrect characters with the insert-delete key, then retype that portion and press return to enter the new line in memory.

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

```
SAVE "NAME",8 <press return>
```

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

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

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

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

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

```
SCRATCH "NAME" <press return>
```

Be sure not to erase the final version!

10. Always save the final version of a program to two disks, so you have a backup copy in case one of the disks gets damaged. When saving to two different disks, you can use the same program name in each case.

11. To view a complete list of the filenames on a disk (i.e., read the disk directory), type:

```
LOAD "$",8 <press return>
LIST <press return>
```

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

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

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

```
LOAD "NAME",8 <press return>
```

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

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

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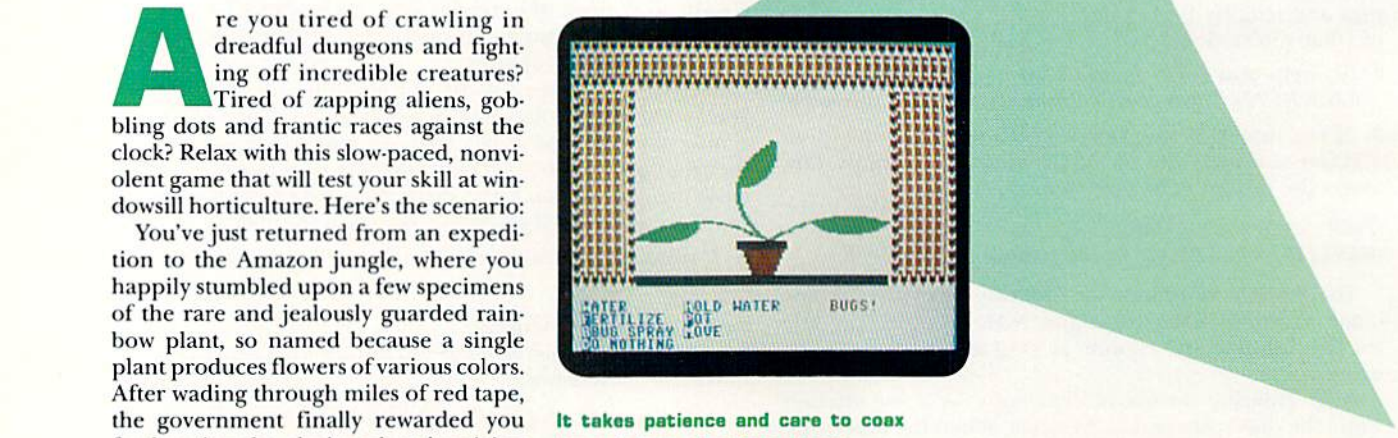
Raising Rainbows

Mary, Mary, quite contrary,
see how her garden grows.



By MARY WILSON

It takes patience and care to coax the rainbow plant into bloom.

Are you tired of crawling in dreadful dungeons and fighting off incredible creatures? Tired of zapping aliens, gobbling dots and frantic races against the clock? Relax with this slow-paced, nonviolent game that will test your skill at windowsill horticulture. Here's the scenario:

You've just returned from an expedition to the Amazon jungle, where you happily stumbled upon a few specimens of the rare and jealously guarded rainbow plant, so named because a single plant produces flowers of various colors. After wading through miles of red tape, the government finally rewarded you for locating the elusive plant by giving you permission to take one small specimen out of the country.

Now that you have your plant safely at home, your top priority is to carefully nurture it and coax it to bloom, so you can gather seeds to start more plants to sell. Success in this venture will assure your fortune, as flower growers around the world will pay fabulous sums for even two or three seeds. So, grab your watering can and box of fertilizer, and let's see if your thumb is green.

How Much Water?

Rainbow Plant for the C-128 is written entirely in Basic 7.0. Type in Listing 1, using *RUN*'s Checksum program, and save a copy to disk. Then enter RUN to play.

Since you're a horticulturist, it's assumed that you've potted your plant in the proper soil with the proper drainage. Now you must maintain a delicate balance of light, water, fertilizer and pot size. Your first decision is in which window to place the plant. After you choose, a window will be drawn, with your plant on the sill and the plant's condition printed in red in the lower-right corner of the screen. At the lower left you'll see a menu of things the plant might need. You can select one or just leave the plant alone for a while.

As your rainbow plant grows, more decisions will be necessary. For example, it will occasionally need a larger pot so it doesn't get rootbound and die. Be careful, though: If you choose a pot that's too large, the plant won't be able to absorb the water in so much soil and will, in effect, die from overwatering. If the plant does die, the program will tell you why, so you can avoid the same situation the next time.

You can move your plant from window to window to get the best exposure. As you do so, the color of the curtains will change to help you remember from which direction the light is coming.

You may notice some unusual screen characters in the curtains. These are standard keyboard graphics, but some of them look strange because of the distortion that occurs when printing to a hi-res screen. In this case, the distortion is an advantage.

If all its needs are met, your plant will grow ten leaves, and then flower stalks and buds will appear. Finally, if it's still in good condition, it will burst into bloom. Your C-128 screen will be full of color, and your thumb will be green! R

Mary Wilson is a great-grandmother who formerly worked for the Florida State Health Services, so she knows a lot about nurturing living things.

Listing 1. The Rainbow Plant program.

```
Ø REM FLOWER PROGRAM - MARY WIL
  SON                          :REM*248
1Ø GOSUB128Ø                   :REM*92
2Ø FAST:FORI=3584TO3839:READSP:
   POKEI,SP:NEXT               :REM*168
3Ø GRAPHIC 4,1,21 :COLORØ,2:COL
   OR1,6:COLOR2,1Ø:COLOR3,7
                               :REM*136
4Ø P=Ø:M=Ø:FL=Ø:N=Ø:S=Ø:R=RND(-
   TI)                         :REM*116
5Ø B$="{15 SPACEs}":SLOW
```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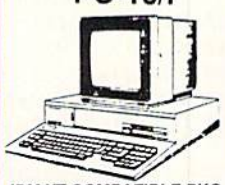

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Circle 98 on Reader Service card.

```
                              :REM*184
6Ø GOSUB63Ø:GOSUB72Ø:GR=1
                              :REM*128
7Ø DO UNTIL FL=11              :REM*41
8Ø PRINTB$:PRINTB$            :REM*78
9Ø PRINT"{2 CRSR UPs} {CTRL 7}{
   CTRL 9}W{CTRL Ø}ATER"SPC(6)"
   {CTRL 9}H{CTRL Ø}OLD WATER"
                              :REM*113
1ØØ PRINT" {CTRL 9}F{CTRL Ø}ERT
   ILIZE{2 SPACEs}{CTRL 9}P{CT
   RL Ø}OT"                   :REM*197
11Ø PRINT" {CTRL 9}B{CTRL Ø}UG
   SPRAY{2 SPACEs}{CTRL 9}M{CT
   RL Ø}OVE"                  :REM*199
12Ø PRINT" {CTRL 9}D{CTRL Ø}O N
   OTHING{3 CRSR UPs}"        :REM*3
13Ø R=INT(RND(1)*5)+1         :REM*163
14Ø CD$(1)=" WILTING"         :REM*211
15Ø CD$(2)=" SPINDLY"         :REM*8Ø
16Ø CD$(3)=" GROWING"         :REM*14
17Ø CD$(4)="{3 SPACEs}BROWN"
                              :REM*221
18Ø CD$(5)="{3 SPACEs}BUGS!"
                              :REM*144
19Ø PRINT"{CRSR UP}"TAB(24)"{CT
   RL 3}"CD$(R):GETKEYA$:REM*3
2ØØ PRINTTAB(28)A$:SLEEP1
                              :REM*167
21Ø PRINT"{CRSR UP}";:PRINTTAB(
   24)B$                      :REM*55
22Ø IFA$="M"THENGOSUB63Ø:M=M+1:
   IFM>2THEN5ØØ               :REM*213
23Ø IFA$="P"THENP=P+1         :REM*165
24Ø ONPGOSUB115Ø,116Ø:IFP<=2THE
   NGR=GR+1                   :REM*133
25Ø IFR=1ANDA$="W"THENGR=GR+1:E
   LSE IF R=1ANDA$<>"W"THENGR=
   GR-1:IFGR=ØTHEN41Ø         :REM*138
26Ø IFR=2ANDA$="F"ORA$="M"THENG
   R=GR+1:ELSE IFR=2AND A$<>"F
   "ORA$<>"M"THENGR=GR-1:IFGR=
   ØTHEN42Ø                   :REM*181
27Ø IFR=3 ANDA$="D"THENGR=GR+1:
   ELSE IF R=3ANDA$<>"D"THENGR
   =GR-1:IFGR=ØTHEN43Ø:REM*224
28Ø IFR=4 ANDA$="H"THENGR=GR+1:
   ELSE IFR=4ANDA$<>"H"THENGR=
   GR-1:IFGR=ØTHEN44Ø         :REM*32
29Ø IFR=5 ANDA$="B"THENGR=GR+1:
   ELSE IFR=5ANDA$<>"B"THENGR=
   GR-1:IFGR=ØTHEN45Ø         :REM*13Ø
3ØØ IFGR=>1ØTHENGOSUB1Ø5Ø:GR=1:
   FL=FL+1                    :REM*123
31Ø ON FL GOSUB79Ø,81Ø,83Ø,85Ø,
   87Ø,89Ø,91Ø,93Ø,97Ø,1ØØØ
                              :REM*212
32Ø IF FL>6ANDP<1 THEN46Ø
                               :REM*64
33Ø IF FL>9ANDP<2THEN46Ø
                              :REM*166
34Ø IF FL<5ANDP>Ø THEN47Ø
                               :REM*78
35Ø IF FL<7ANDP=>2THEN47Ø
                              :REM*1Ø9
36Ø IF FL>6 AND W$="S"AND M=Ø T
   HEN 48Ø                    :REM*241
37Ø IF FL>6 AND W$="N"AND M=Ø T
   HEN 49Ø                    :REM*239
38Ø LOOP                      :REM*1Ø6
39Ø GOSUB1Ø3Ø                 :REM*197
4ØØ GOTO58Ø                   :REM*232
41Ø D$="INSUFFICIENT WATER":GOT
   O52Ø                       :REM*186
42Ø D$="UNDERNOURISHED":GOTO52Ø
                              :REM*3
43Ø D$="TOO MUCH FUSSING":GOTO5
   2Ø                         :REM*8Ø
44Ø D$="OVERWATERED":GOTO52Ø
                              :REM*228
45Ø D$="EATEN BY BUGS":GOTO52Ø
                              :REM*141
46Ø D$="ROOTBOUND":GOTO52Ø
                              :REM*252
47Ø D$="POT TOO LARGE":GOTO52Ø
                              :REM*119
48Ø D$="TOO MUCH SUN":GOTO52Ø
                              :REM*153
49Ø D$="INSUFFICIENT LIGHT":GOT
   O52Ø                       :REM*49
5ØØ D$="MOVED TOO OFTEN":GOTO52
   Ø                          :REM*1Ø2
51Ø END                       :REM*124
52Ø FORI=1TO8:SPRITEI,Ø:NEXT
                              :REM*111
53Ø FORI=1ØØØØ TO 15Ø STEP-15Ø
                               :REM*8Ø
54Ø SOUND1,I,1,Ø,Ø,1,1:NEXT
                              :REM*227
55Ø GRAPHICØ,1:COLORØ,2:PRINTTA
   B(8)"{4 CRSR DNs}{CTRL 3}SO
   RRY! PLANT DIED":PRINTTAB(8
   )"{2 CRSR DNs}REASON: "D$:S
   LEEP8                      :REM*181
56Ø FORI=1TO8:SPRITEI,Ø:NEXT:GR
   APHICØ,1:PRINTTAB(8)"{4 CRS
   R DNs}{CTRL 7}PLAY AGAIN? (
   Y/N)": GETKEYP$:IFP$="Y"THE
   N RUN3Ø                    :REM*252
57Ø FOR I=1 TO 8:SPRITE 1,Ø:NEX
   T:END                      :REM*221
58Ø GOSUB1Ø7Ø:FORI=1TO4:PRINTB$
   B$:NEXT:PRINTTAB(1)"{2 CRSR
    UPs}{CTRL 3}CONGRATULATION
   S!! YOU ARE NOW A MEMBER"
                              :REM*164
59Ø PRINTTAB(4)"OF THE {CTRL 6}
   GREEN THUMB {CTRL 3}SOCIETY
    AND"                      :REM*2
6ØØ PRINTTAB(1Ø)"{COMD 7}YOUR F
   ORTUNE IS MADE!":SLEEP8:FOR
   I=1TO4:PRINTB$;B$:NEXT
                              :REM*58
61Ø PRINTTAB(1Ø)"PLAY AGAIN? (Y
   /N)":GETKEYP$:IFP$="Y"THEN
   FORI=1TO8:SPRITEI,Ø:NEXT:RU
   N3Ø                        :REM*197
62Ø END                       :REM*238
63Ø FORI=1TO4:PRINTB$;B$:NEXT:P
   RINT"{CRSR UP}"            :REM*25Ø
64Ø PRINT"{CTRL 7}WHICH WINDOW?
   ":PRINT"{2 SPACEs}{COMD 2}N
    {COMD 7}S {COMD 3}E {CTRL
   4}W"                       :REM*223
65Ø GETKEYW$                  :REM*18Ø
66Ø IFW$="N"THENCOLOR2,9:COLOR3
   ,8:COLOR4,6:F$="{SHFT Q}":C
   $="{COMD B}":GOSUB119Ø:RETU
   RN                         :REM*155
67Ø IFW$="S"THENCOLOR2,7:COLOR3
   ,15:COLOR4,8:F$="{SHFT Z}":
   C$="{SHFT B}":GOSUB119Ø:RET
   URN                        :REM*241
68Ø IFW$="W"THENCOLOR2,5:COLOR3
   ,4:COLOR4,14:F$="{SHFT V}":
   C$="{SHFT +}":GOSUB119Ø:RET
   URN                        :REM*219
69Ø IFW$="E"THENCOLOR2,3:COLOR3
   ,11:COLOR4,4:F$="{SHFT S}":
   C$="{COMD W}":GOSUB119Ø:RET
   URN                        :REM*232
7ØØ END                       :REM*63
71Ø REM FIRST POT             :REM*38
72Ø COLORØ,2:COLOR1,6:COLOR2,3:
   COLOR3,1Ø:WIDTH2: BOX3,7Ø,1
   3Ø,9Ø,135,,1               :REM*255
73Ø DRAW2,72,135TO76,151TO84,15
   1TO88,135:PAINT2,8Ø,14Ø,1
                              :REM*238
74Ø REM FIRST 3 LEAVES        :REM*135
75Ø CIRCLE1,1Ø5,15Ø,3Ø,4Ø,272,3
   54,42,1:CIRCLE1,115,115,15,
   1Ø,1ØØ,26Ø,,1:PAINT1,12Ø,12
   Ø                          :REM*69
76Ø CIRCLE1,1ØØ,99,3Ø,38,217,33
   Ø,,1:CIRCLE1,71,72,14,23,72
   ,175,,1:PAINT1,78,78:REM*15
77Ø CIRCLE1,5Ø,149,3Ø,35,254,35
   2,6Ø,1:CIRCLE1,38,12Ø,15,1Ø
   ,87,21Ø,,1:PAINT1,45,125,1:
   GOSUB1Ø5Ø:RETURN           :REM*126
78Ø REM LEAF 4                :REM*148
79Ø COLOR1,6:CIRCLE1,1ØØ,83,25,
   3Ø,11Ø,177,,1:CIRCLE1,11Ø,1
   14,Ø8,22,253,36Ø,32,1:PAINT
   1,112,1Ø5,1:RETURN         :REM*145
8ØØ REM LEAF 5                :REM*19Ø
81Ø COLOR1,6:CIRCLE1,45,78,3Ø,4
   Ø,16Ø,21Ø,,1:CIRCLE1,4Ø,12Ø
   ,15,12,3ØØ,7Ø,,1:PAINT1,42,
   11Ø,1:RETURN               :REM*239
82Ø REM LEAF 6                :REM*216
83Ø COLOR1,6:CIRCLE1,56,8Ø,15,2
   3,3Ø,119,,1:CIRCLE1,68,75,4
   ,17,15Ø,325,,1:COLOR3,14:PA
   INT3,67,7Ø,1:RETURN:REM*2Ø1
84Ø REM LEAF 7                :REM*226
85Ø COLOR1,6:CIRCLE1,115,13Ø,3Ø
   ,5Ø,273,16 ,,1:CIRCLE1,1Ø9,
   76,18,15,112,219,,1:PAINT1,
   11Ø,86,1:RETURN            :REM*115
86Ø REM LEAF 8                :REM*13
87Ø CIRCLE1,42,158,4Ø,66,345,61
   ,,1:CIRCLE1,47,9Ø,15,13,125
   ,25Ø,,1:COLOR3,14:PAINT3,5Ø
   ,1ØØ,1:RETURN              :REM*191
88Ø REM LEAF 9                :REM*23
89Ø CIRCLE1,1ØØ,68,15,15,9Ø,17Ø
   ,,1:CIRCLE1,112,83,15,15,25
   Ø,1Ø,,1:COLOR3,14:PAINT3,1Ø
   5,75,1:RETURN              :REM*1ØØ
9ØØ REM LEAF 1Ø               :REM*88
91Ø COLOR1,6:CIRCLE1,25,88,35,2
   Ø,25,1ØØ,1Ø,1:CIRCLE1,49,74
   ,6 ,2Ø,178,27Ø,,1:PAINT1,55
   ,9Ø:RETURN                 :REM*163
92Ø REM FIRST 3 FLOWER STALKS A
```

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```
    ND BUDS                 :REM*89
93Ø CIRCLE1,5Ø,122,3Ø,65,24,93,
    ,1:POKE 8184,56:SPRITE1,1,9
    ,Ø,1,1,Ø:MOVSPR1,116,92
                            :REM*121
94Ø CIRCLE1,122,152,5Ø,4Ø,3Ø8,3
    38,,1:POKE8185,57:SPRITE2,1
    ,3,Ø,1,1,Ø:MOVSPR2,215,144
                            :REM*251
95Ø DRAW1,8Ø,124TO9Ø,54:POKE818
    6,58:SPRITE3,1,5,1,1,1,Ø:MO
    VSPR3,183,85:RETURN:REM*173
96Ø REM BUDS 4 AND 5    :REM*116
97Ø CIRCLE1,2Ø,13Ø,6Ø,5Ø,19,87,
    ,1:POKE8187,56:SPRITE4,1,11
    ,Ø,1,1,Ø:MOVSPR4,87,117
                            :REM*9
98Ø CIRCLE1,13Ø,14Ø,5Ø,6Ø,284,3
    28:POKE8188,57:SPRITE5,1,15
    ,Ø,1,1,Ø:MOVSPR5,235,1Ø9:RE
    TURN                    :REM*1Ø8
99Ø REM BUDS 6,7 AND 8 :REM*167
1ØØØ POKE8189,58:SPRITE6,1,8,Ø,
    1,1,Ø:MOVSPR6,184,126
                            :REM*8Ø
1Ø1Ø CIRCLE1,28,14Ø,6Ø,22,3Ø,55
    :POKE819Ø,56:SPRITE7,1,4,Ø
    ,1,1,Ø:MOVSPR7,11Ø,15Ø
                            :REM*55
1Ø2Ø POKE8191,58:SPRITE8,1,7,1,
    1,1,Ø:MOVSPR8,159,143:RETU
    RN                      :REM*25
1Ø3Ø FOR I=8184TO8191:POKEI,59:
    NEXT                    :REM*248
1Ø4Ø SLEEP2:RETURN      :REM*97
1Ø5Ø FORI=1TO 5ØØØØ STEP 24ØØ
                            :REM*172
1Ø6Ø SOUND1,I,1,Ø,Ø,Ø,Ø,Ø:NEXT:
    RETURN                  :REM*24
1Ø7Ø TEMPO 12           :REM*151
1Ø8Ø ENVELOPE 8,8,9,8,4,2,5ØØ
                            :REM*2Ø3
1Ø9Ø FILTER 9ØØ,1,Ø,Ø,6:REM*179
11ØØ PLAY "V1 O4 T8 U8 X1"
                            :REM*1Ø9
111Ø PLAY"V1.IGSGO5.ICO4SGO5.IC
    SE QC .ICSC .IESC.IESG QE.
    ICSE QG .IE SCO4QG.IGSG"
                            :REM*254
112Ø PLAY"O5QC .ICSCQCQRM"
                            :REM*11
113Ø RETURN             :REM*252
114Ø REM POTS 1 AND 2 *******
                            :REM*1Ø7
115Ø COLOR2,3:COLOR3,1Ø:BOX3,65
    ,128,95,135,,1:DRAW2,67,13
    5TO71,151TO89,151TO93,135:
    PAINT2,69,136,1:PAINT2,91,
    136,1:RETURN            :REM*22
116Ø COLOR2,3:COLOR3,1Ø:BOX3,6Ø
    ,128,1ØØ,135,,1:DRAW2,62,1
    35TO66,151TO94,151TO98,135
    :PAINT2,64,136,1:PAINT2,95
    ,136,1                  :REM*127
117Ø RETURN             :REM*37
118Ø REM DRAW CURTAINS :REM*117
119Ø FAST:FORI=ØTO39:CHAR2,I,Ø,
    F$:NEXT                 :REM*146
12ØØ FORJ=1TO2          :REM*243
121Ø FORI=ØTO39:CHAR3,I,J,C$,1:
    NEXT:NEXT               :REM*2ØØ
122Ø FORI=ØTO39:CHAR2,I,3,F$:NE
    XT                      :REM*149
123Ø FORJ=4TO18         :REM*165
124Ø CHAR2,Ø,J,F$:FORI=1TO5:CHA
    R3,I,J,C$,1:NEXT:CHAR2,6,J
    ,F$:CHAR2,33,J,F$:FORI=34T
    O39:CHAR3,I,J,C$,1:NEXT:CH
    AR2,39,J,F$:NEXT        :REM*14
125Ø FORI=ØTO6:CHAR2,I,19,F$:NE
    XT:FORI=33TO39:CHAR2,I,19,
    F$:NEXT                 :REM*23
126Ø COLOR2,1Ø:BOX2,28,152,131,
    158,,1                  :REM*59
127Ø SLOW:RETURN        :REM*47
128Ø COLORØ,2:COLOR4,5:COLOR1,7
                            :REM*165
129Ø GRAPHIC1,1         :REM*149
13ØØ WIDTH 2            :REM*23Ø
131Ø COLOR1,7           :REM*192
132Ø DRAW 1,3Ø,4ØTO3Ø,7Ø:DRAW1,
    25,4ØTO45,4Ø TO46,42TO46,5
    ØTO 46,52TO44,54 TO 3Ø,54:
    DRAW1,4Ø,54TO45,72TO47,74T
    O29Ø,74                 :REM*152
133Ø COLOR1,6: DRAW1,6Ø,7ØTO75,
    4ØTO85,7Ø:DRAW1,68,54TO78,
    54                      :REM*4
134Ø COLOR1,8:DRAW1,1Ø5,4ØTO1Ø5
    ,7Ø                     :REM*87
135Ø COLOR1,9:DRAW1,125,7ØTO125
    ,4ØTO145,7ØTO145,4Ø
                            :REM*174
136Ø COLOR1,3:DRAW 1,165,4ØTO16
    5,7Ø:DRAW1,16Ø,4ØTO18Ø,4Ø
    TO181,42TO181,5ØTO181,52TO
    179,54 TO165,54         :REM*35
137Ø DRAW1,175,54TO177,56TO181,
    6ØTO181,68TO181,7ØTO16Ø,7Ø
                            :REM*227
138Ø COLOR1,3:DRAW 1,165,4ØTO16
    5,7Ø:DRAW1,16Ø,4ØTO18Ø,4Ø
    TO181,42TO181,5ØTO181,52TO
    179,54 TO165,54         :REM*31
139Ø COLOR1,5:CIRCLE1,212,55,12
    ,15                     :REM*176
14ØØ COLOR1,4:DRAW1,24Ø,4ØTO248
    ,7ØTO255,54TO262,7ØTO27Ø,4
    Ø                       :REM*216
141Ø COLOR1,3:DRAW1,6Ø,12ØTO6Ø,
    15Ø:DRAW 1,55,12ØTO65,12Ø:
    DRAW1,6Ø,12ØTO8Ø,12Ø TO81,
    122TO81,13ØTO 81,132TO79,1
    34TO61,134              :REM*145
142Ø COLOR1,5:DRAW1,1ØØ,12ØTO1Ø
    Ø,15ØTO12Ø,15Ø      :REM*224
143Ø COLOR1,4:DRAW1,135,15ØTO15
    Ø,12ØTO165,15Ø:DRAW1,143,1
    34TO155,134             :REM*7Ø
144Ø COLOR1,7:DRAW1,185,15ØTO18
    5,12ØTO2Ø5,15ØTO2Ø5,12Ø
                            :REM*211
145Ø COLOR1,6:DRAW1,222,12ØTO24
    8,12Ø:DRAW1,235,12ØTO235,1
    5Ø                      :REM*159
146Ø COLOR1,6:BOX1,5,4,314,195:
    PAINT1,Ø,Ø              :REM*25
147Ø WIDTH2             :REM*141
148Ø COLOR1,11:BOX1,94,175,224,
    184                     :REM*41
149Ø COLOR1,4:CHAR1,12,22," MAR
    Y E. WILSON ",1     :REM*16Ø
15ØØ SLEEP4:RETURN      :REM*49
151Ø END                :REM*96
152Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
                            :REM*217
153Ø DATA Ø,Ø,Ø,Ø,15,24Ø,Ø,63
                            :REM*251
154Ø DATA 252,Ø,63,254,Ø,31,255
    ,Ø                      :REM*112
155Ø DATA 15,255,128,3,255,128,
    Ø,254                   :REM*4Ø
156Ø DATA 64,Ø,Ø,Ø,Ø,Ø,Ø,Ø
                            :REM*57
157Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
                            :REM*231
158Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
                            :REM*28
159Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
                            :REM*18
16ØØ DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø:REM*8
161Ø DATA Ø,Ø,15,24Ø,Ø,127,248,
    1                       :REM*1Ø4
162Ø DATA 255,248,3,255,224,3,2
    55,192                  :REM*196
163Ø DATA 7,255,Ø,7,252,Ø,4,Ø
                            :REM*51
164Ø DATA Ø,8,Ø,Ø,Ø,Ø,Ø,Ø
                            :REM*64
165Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
                            :REM*86
166Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
                            :REM*76
167Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
                            :REM*66
168Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
                            :REM*12Ø
169Ø DATA Ø,Ø,Ø,Ø,Ø,192,Ø,1
                            :REM*134
17ØØ DATA 224,Ø,3,24Ø,Ø,3,248,Ø
                            :REM*139
171Ø DATA 3,248,Ø,3,248,Ø,3,248
                            :REM*14Ø
172Ø DATA Ø,1,248,Ø,Ø,248,Ø,Ø
                            :REM*85
173Ø DATA 112,Ø,Ø,32,Ø,Ø,Ø,Ø
                            :REM*155
174Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
                            :REM*188
175Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
                            :REM*178
176Ø DATA Ø,16,Ø,Ø,56,Ø,3Ø,124
                            :REM*141
177Ø DATA 24Ø,63,125,248,55,239
    ,184,59                 :REM*1Ø8
178Ø DATA 239,12Ø,29,238,24Ø,63
    ,255,252                :REM*236
179Ø DATA 127,215,254,241,239,3
    1,127,215               :REM*65
18ØØ DATA 254,63,255,252,15,1Ø9
    ,24Ø,3Ø                 :REM*239
181Ø DATA 238,248,29,239,12Ø,27
    ,239,184                :REM*228
182Ø DATA 31,125,248,14,124,24Ø
    ,Ø,56                   :REM*154
183Ø DATA Ø,Ø,16,Ø,Ø,Ø,Ø,136
                        :REM*216 ■
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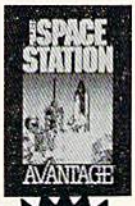

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Screen Basic

If you've had a hard time programming video screens, here's a pleasant surprise!

By JOHN RYAN

Normally, video programming on the C-64 entails a myriad of Peeks and Pokes to accomplish the simplest task, and multiple-screen processing can be a daunting challenge to even the most seasoned programmer. Screen Basic alleviates this problem by adding 13 video programming commands to Basic 2.0. These commands provide an easy-to-use programming environment that even includes multiple screens and raster interrupts.

Screen Basic runs in both Program and, to a limited degree, Direct modes. It features three separate video screens, each with semi-independent color RAM, as well as separate background and border colors, and, by setting up raster interrupts, you can display two of the screens simultaneously. The program also provides a command to copy the Commodore character set from ROM into bank 0 or 2. This, used with the Raster command, will display two full custom character sets at once. You can save, load, "grab" and "call" video screens with Screen Basic, as well as read the error channel of your disk drive—without a line full of cryptic commands.

The program in Listing 1 creates the machine language program you actually use. Type in Listing 1, using *RUN*'s Checksum program, and save it under any filename. Then run it to generate the executable machine language object code.

To load Screen Basic, enter LOAD "SB+",<device number>,1. Then enter NEW and SYS 50176 to install it in the C-64's operating system.

The Commands

Below are explanations of all the new commands Screen Basic provides. Each command must be preceded by an @ symbol, or a syntax error will result. Also note that most of the commands require one or more parameters.

@VIDEO <screen number>. As I mentioned, Screen Basic provides three separate video screens. Video 1 starts at memory location 1024 ($0400), video 2 at 32768 ($8000) and video 3 at 33792 ($8400). These addresses must be used when poking information to the various screens. Print operations to the screens are handled automatically by the program.

Since there's only one memory area for color RAM information, each time you switch from one screen to another, the current color RAM is stored in memory before the switch is made. When you return to the first screen, the color is restored. This scheme ensures the integrity of your color display, regardless of the screen you're on. (See the @Type command, below, for special considerations.)

@HUE <screen number, color number>. The Hue command changes the background color of any video area. The colors are numbered 1–16, just as they're listed on the C-64 keyboard. If the screen specified is the current video area, the change is immediate; if not, it becomes apparent when you bank to the specified screen. (Screen Basic remembers the color of each screen.)

@BRDER <screen number, color number>. Use the Brder command to change the border of a screen to a specified color. The rules are the same as for the @Hue command.

@TYPE <screen number>. This handy command lets you print to any of the screens, regardless of which one is currently displayed. For example, by entering @TYPE 2 you can send information being printed to the video matrix starting at 32768, even if video 1 is on the screen.

Note that even though the characters are being printed to a different area of memory, color RAM for both video areas is the same. Whenever possible, you should do your printing in the same foreground color as your current screen, or use the @Raster command (below) to "hide" the color changes.

You can return to your current screen only by issuing another @Type command. @Video won't work in this instance, since your original video area won't have changed.

@ERASE <screen number>. The Erase command clears a specified video area without clearing the color RAM of your current screen. It's a good idea to use this command during program initialization, as the video areas may be filled with random data. It works for all video areas, regardless of the one you're currently in.

@GRAB <screen number>. Grab stores the screen and color information for the current video area in memory. Three distinct storage areas are set aside for this purpose, so all three screens can be stored at once. Note that the screen number must be the same as your current video area for this command to work properly, and @Grab won't store hi-res screens. (Also see @Call, next.)

@CALL <source screen number, target screen number>. This versatile command lets you move previously grabbed screens to any video area. By calling two or more screens in succession, you can even achieve "page flipping" animation effects. Be careful of the syntax for this command: The source number is the number of the area previously grabbed, and the target number is the screen you're calling it to (your current screen, if color RAM preservation is important—this is not a swap command).

@RASTER <beginning scan line, ending scan line>. This powerful com-

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mand displays two screens simultaneously. The two parameters, which can range from 1 to 254, tell the program where the division between the screens should be and where to restore the first screen. For instance, @RASTER 100, 254 will display video area 1 up to scan line 100, then video area 2 to scan line 254. When the screen is divided, the background and border colors of both video areas are displayed at once.

Note that only scan lines 40–253 are visible, so anytime you use parameters 1–39 or 254, the interrupt will take place off the visible screen. Keep in mind, too, that this command can be used only while you're on video screen 1 or 2, because those are the screens the raster interrupt displays.

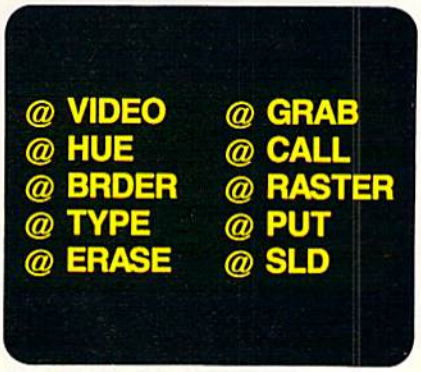
To achieve a rock-solid division, don't specify a scan line that will cut through the middle of printed screen characters. Also, if you wish to move sprites across the raster "seam," remember that two individual banks of memory are being displayed. In order to display a sprite in video bank 2, the sprite definition must also be stored in video memory from 33784, for sprite 1, to 33791, for sprite 8.

The formula for finding the sprite pointer is (storage address – 32768)/64. Thus, a sprite image stored at 40960 ($A000) would have a pointer of 128—(40960 – 32768)/64. The best place to store sprite images in bank 2 is from 40960 to 45056, if a full alternate character set is not being used, or at 33792, if video screen 3 is not being used.

Don't reinitialize Screen Basic with the Raster command activated.

@OFF. This command turns off the raster interrupt.

@MEM <1 or 2>. The @Mem command makes it easy to use custom character sets. (In fact, it's the only way you can use custom character sets with Screen Basic.) If 1 is the parameter, the character set will be copied from ROM into RAM, starting in bank 0 at location 12288 ($3000). If the parameter is 2, the set will be copied into memory starting at 40960 ($A000). With an @Raster command, you can display both sets simultaneously, as demonstrated by the program in Listing 2. Just remember to protect the bank 0 character set from Basic by lowering or raising Basic memory, if your own program is very big.



Examples of the commands used in Screen Basic.

To return to the standard character set, just reinitialize Screen Basic with SYS 50176.

@PUT <"filename">. The @Put command saves the video area you're viewing to a special disk file denoted by the suffix .scn. Both screen RAM and color RAM information is saved. Don't include the .scn in the command, because the program supplies it automatically. The device number is also supplied automaticaliy. To change it from default 8, see Program Notes, below.

@SLD <"filename", screen number>. This screen loading command reads a previously saved screen file from disk. With @Sld, it's easy to load several files at once when a lot of information must be presented and color RAM preservation is important. The file can be read into any video area specified after the filename, regardless of which screen was saved with the @Put command. If you specify the video area you're currently viewing, you'll see the loaded screen immediately; if not, the screen and color information will appear when you bank to the video area the screen was loaded to. As with the @Put command, don't include the .scn filename suffix in an @Sld command.

@DISK. Use this to view the error status of the last device accessed.

Program Notes

Screen Basic occupies memory locations 50176–52162 ($C400–$CBC2) and uses locations 32768–50175, so both areas are unavailable for your use. The program protects these memory areas by lowering the top of Basic to 32768, which chops about 8000 bytes off the top of free Basic memory.

You can change the disk drive device number for screen loads and saves by poking 1 into location 52126.

If you use the run-stop/restore key combination on any screen but video area 1, you won't be able to see what you're typing, and the computer will seem locked up. You can get out of this by entering @TYPE 1, thus returning the screen editor to video area 1; but, better yet, disable run-stop/restore with POKE 808, 239: POKE 792, 193.

You can't use variables as parameters for any of the Screen Basic commands.

To include Screen Basic commands in a Basic program you're writing, place the following three-line routine at the beginning of your listing:

```
10 IF FLAG = 1 THEN 30
20 FLAG = 1:LOAD"SB + ",<device
   number>,1
30 SYS 50176
```

Due to the nature of video programming, I originally wrote Screen Basic to operate in Program mode only. However, after realizing that some of the commands (@Hue, @Brder) could be useful in Direct mode, I added a limited Direct Mode option. In this option, only one Screen Basic command is permitted per line, and it must be first. You can still have multiple Basic 2.0 commands in a line, as long as they follow the Screen Basic command. For example, @RASTER 1,100: PRINT "test" is legal, while PRINT "test":@HUE 1,1 and @RASTER 1,100:@HUE 1,1: @BRDER 1,1 are not. In Program mode, any combination of commands may be used. R

John Ryan, an air traffic control instructor by profession, is a freelance computer programmer in his spare time.

Listing 1. Screen Basic program.

```
Ø REM SCREEN BASIC ML DATA LIST
  ING #1 - JOHN RYAN      :REM*23
1Ø REM CHANGE DEVICE # IN LINE
   7Ø IF OTHER THAN 8   :REM*1Ø9
2Ø PRINT CHR$(147)TAB(13)"PLEAS
   E WAIT"                 :REM*12
3Ø I=5Ø176:X=Ø             :REM*219
4Ø READ A:IF A=256 THEN 6Ø
                           :REM*153
5Ø POKE I,A:I=I+1:X=X+A:GOTO 4Ø
                           :REM*23
```

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```
6Ø IF X<>255987 THEN PRINT CHR$
   (18)CHR$(19)TAB(8)"ERROR IN
   DATA STATEMENTS":END:REM*168
7Ø SYS 57812"SB+",8,1:POKE 193,
   Ø:POKE 194,196:POKE 174,195:
   POKE 175,2Ø3          :REM*158
8Ø SYS 62957:PRINT" SAVE COMPLE
   TE. CHECK DRIVE FOR ERRORS":
   END                   :REM*159
9Ø DATA 76,121,197,2Ø1,254,24Ø,
   4,32,26,196,96,32,17,196,169
   ,3,96,173,17          :REM*2
1ØØ DATA 2Ø8,9,128,141,17,2Ø8,9
   6,72,173,17,2Ø8,41,127,141,
   17,2Ø8,1Ø4,96         :REM*126
11Ø DATA 162,Ø,32,115,Ø,2Ø1,34,
   24Ø,11,157,16Ø,2Ø3,232,224,
   13,176,4,76,39        :REM*49
12Ø DATA 196,96,162,23,1Ø4,1Ø4,
   76,55,164,169,Ø,174,158,2Ø3
   ,16Ø,Ø,32,186         :REM*2
13Ø DATA 255,174,159,2Ø3,16Ø,Ø,
   185,154,2Ø3,157,16Ø,2Ø3,232
   ,2ØØ,192,5,2Ø8        :REM*23
14Ø DATA 244,2Ø2,138,162,16Ø,16
   Ø,2Ø3,32,189,255,96,32,89,1
   97,173,187,2Ø3        :REM*225
15Ø DATA 2Ø8,3,76,134,196,32,23
   6,2Ø1,173,123,2Ø3,24Ø,3,76,
   144,196,162,Ø         :REM*219
16Ø DATA 16Ø,4,32,165,196,176,1
   1,96,1Ø4,1Ø4,169,4,141,127,
   196,76,8Ø,198         :REM*49
17Ø DATA 1Ø4,1Ø4,169,4,141,127,
   196,76,83,198,32,121,Ø,2Ø1,
   44,2Ø8,2,24,96        :REM*76
18Ø DATA 56,96,142,188,2Ø3,14Ø,
   189,2Ø3,173,188,2Ø3,2Ø5,122
   ,2Ø3,176,1Ø,173       :REM*37
19Ø DATA 122,2Ø3,2Ø5,189,2Ø3,17
   6,2,24,96,56,96,174,1Ø6,2Ø3
   ,173,2,221,9,3        :REM*89
2ØØ DATA 141,2,221,173,24,2Ø8,4
   1,24Ø,29,132,2Ø3,141,24,2Ø8
   ,173,Ø,221,41         :REM*146
21Ø DATA 252,29,129,2Ø3,141,Ø,2
   21,173,24,2Ø8,41,15,29,135,
   2Ø3,141,24,2Ø8        :REM*212
22Ø DATA 173,183,2Ø3,24Ø,1,96,1
   89,138,2Ø3,141,136,2,96,174
   ,1Ø6,2Ø3,189,141      :REM*65
23Ø DATA 2Ø3,133,252,169,Ø,133,
   251,32,26,197,162,4,16Ø,Ø,1
   77,253,145,251        :REM*1Ø8
24Ø DATA 2ØØ,2Ø8,249,23Ø,252,23
   Ø,254,2Ø2,2Ø8,24Ø,96,169,Ø,
   133,253,169,216       :REM*238
25Ø DATA 133,254,96,165,1,9,1,1
   33,1,96,165,1,41,254,133,1,
   96,174,1Ø6,2Ø3        :REM*122
26Ø DATA 189,141,2Ø3,133,252,16
   9,Ø,133,251,32,26,197,32,42
   ,197,162,4,16Ø,Ø      :REM*66
27Ø DATA 177,251,145,253,2ØØ,2Ø
   8,249,23Ø,252,23Ø,254,2Ø2,2
   Ø8,24Ø,32,35,197      :REM*151
28Ø DATA 96,162,Ø,142,187,2Ø3,3
   2,115,Ø,2Ø1,48,144,14,2Ø1,5
   8,176,1Ø,157,113      :REM*171
29Ø DATA 2Ø3,232,238,187,2Ø3,76
   ,94,197,169,Ø,157,113,2Ø3,9
   6,169,76,133,124      :REM*189
3ØØ DATA 169,17Ø,133,125,169,19
   7,133,126,169,4,141,133,2Ø3
   ,169,Ø,141,176        :REM*152
31Ø DATA 2Ø3,32,218,2Ø1,169,4,1
   41,132,2Ø3,141,133,2Ø3,169,
   Ø,133,51,133,55       :REM*55
32Ø DATA 169,128,133,52,133,56,
   32,94,166,96,141,52,3,165,5
   8,2Ø1,255,2Ø8,15      :REM*229
33Ø DATA 173,52,3,2Ø1,64,2Ø8,18
   ,2Ø5,Ø,2,2Ø8,13,76,2Ø1,197,
   173,52,3,2Ø1,64       :REM*11Ø
34Ø DATA 2Ø8,3,76,227,197,173,5
   2,3,2Ø1,58,176,15,2Ø1,32,2Ø
   8,5,173,1Ø5,2Ø3       :REM*132
35Ø DATA 2Ø8,6,173,52,3,76,128,
   Ø,96,142,53,3,14Ø,54,3,16Ø,
   Ø,14Ø,187,2Ø3,32       :REM*92
36Ø DATA 115,Ø,32,121,Ø,56,249,
   237,2Ø2,24Ø,6,2ØØ,192,13,2Ø
   8,242,96,185,46       :REM*197
37Ø DATA 2Ø3,14Ø,187,2Ø3,168,18
   5,25Ø,2Ø2,141,1Ø4,2Ø3,162,Ø
   ,238,1Ø5,2Ø3,2ØØ      :REM*195
38Ø DATA 32,115,Ø,56,249,25Ø,2Ø
   2,24Ø,4,2Ø6,1Ø5,2Ø3,96,232,
   236,1Ø4,2Ø3,2Ø8        :REM*91
39Ø DATA 236,169,Ø,141,1Ø5,2Ø3,
   173,187,2Ø3,17Ø,189,59,2Ø3,
   17Ø,189,72,2Ø3        :REM*217
4ØØ DATA 133,253,232,189,72,2Ø3
   ,133,254,1Ø8,253,Ø,174,53,3
   ,172,54,3,76,115      :REM*4
41Ø DATA Ø,32,1Ø2,196,76,88,198
   ,76,8,175,162,14,76,55,164,
   2Ø6,122,2Ø3,173       :REM*89
42Ø DATA 122,2Ø3,2Ø5,1Ø6,2Ø3,2Ø
   8,3,76,121,Ø,173,122,2Ø3,2Ø
   1,2,2Ø8,8,173         :REM*26
43Ø DATA 176,2Ø3,16,3,76,83,198
   ,32,248,196,173,122,2Ø3,141
   ,1Ø6,2Ø3,32,191       :REM*57
44Ø DATA 196,12Ø,165,1,41,253,1
   33,1,32,49,197,165,1,9,2,13
   3,1,88,174,1Ø6        :REM*1Ø1
45Ø DATA 2Ø3,189,1Ø7,2Ø3,141,33
   ,2Ø8,189,11Ø,2Ø3,141,32,2Ø8
   ,169,13,32,21Ø        :REM*119
46Ø DATA 255,76,121,Ø,169,33,13
   3,253,169,1Ø7,133,247,169,2
   Ø3,133,248,76         :REM*2Ø7
47Ø DATA 196,198,169,32,133,253
   ,169,11Ø,133,247,169,2Ø3,13
   3,248,169,2Ø8         :REM*247
48Ø DATA 133,254,32,1Ø2,196,173
   ,122,2Ø3,141,19Ø,2Ø3,32,154
   ,196,144,3,76,8Ø      :REM*214
49Ø DATA 198,32,89,197,173,187,
   2Ø3,2Ø8,3,76,8Ø,198,32,236,
   2Ø1,173,123,2Ø3       :REM*187
5ØØ DATA 24Ø,3,76,83,198,162,Ø,
   16Ø,17,32,165,196,144,3,76,
   83,198,172,19Ø        :REM*85
51Ø DATA 2Ø3,136,2Ø6,122,2Ø3,17
   3,122,2Ø3,145,247,2Ø4,1Ø6,2
   Ø3,2Ø8,4,16Ø,Ø        :REM*23
52Ø DATA 145,253,76,121,Ø,32,1Ø
   2,196,174,122,2Ø3,2Ø2,189,1
   38,2Ø3,141,136,2      :REM*151
53Ø DATA 169,13,32,21Ø,255,76,1
   21,Ø,32,1Ø2,196,174,122,2Ø3
   ,2Ø2,189,59,2Ø3       :REM*215
54Ø DATA 17Ø,189,98,2Ø3,133,253
   ,232,189,98,2Ø3,133,254,162
   ,4,16Ø,Ø,169,32       :REM*241
55Ø DATA 145,253,23Ø,253,2Ø8,25
   Ø,23Ø,254,2Ø2,2Ø8,243,76,12
   1,Ø,32,1Ø2,196        :REM*77
56Ø DATA 174,122,2Ø3,2Ø2,189,13
   8,2Ø3,133,168,169,Ø,133,167
   ,133,249,133,251      :REM*14Ø
57Ø DATA 189,59,2Ø3,17Ø,189,144
   ,2Ø3,133,25Ø,232,189,144,2Ø
   3,133,252,32,191      :REM*244
58Ø DATA 199,32,4,197,76,121,Ø,
   32,1Ø2,196,174,122,2Ø3,2Ø2,
   142,185,2Ø3,32        :REM*227
59Ø DATA 154,196,144,3,76,8Ø,19
   8,32,1Ø2,196,174,122,2Ø3,2Ø
   2,189,138,2Ø3         :REM*149
6ØØ DATA 133,25Ø,174,185,2Ø3,18
   9,59,2Ø3,17Ø,189,144,2Ø3,13
   3,168,232,189         :REM*241
61Ø DATA 144,2Ø3,133,252,169,Ø,
   133,249,133,167,133,251,32,
   191,199,32,61         :REM*91
62Ø DATA 197,76,121,Ø,32,42,197
   ,162,4,16Ø,Ø,177,167,145,24
   9,2ØØ,2Ø8,249         :REM*212
63Ø DATA 23Ø,25Ø,23Ø,168,2Ø2,2Ø
   8,24Ø,32,35,197,96,32,115,Ø
   ,2Ø1,34,24Ø,3,76      :REM*8
64Ø DATA 8Ø,198,32,37,196,142,1
   59,2Ø3,32,65,196,32,7,2ØØ,1
   69,136,133,168        :REM*7
65Ø DATA 169,Ø,133,167,169,Ø,32
   ,144,255,16Ø,144,162,Ø,169,
   167,32,216,255        :REM*177
66Ø DATA 76,115,Ø,174,1Ø6,2Ø3,1
   89,138,2Ø3,133,168,169,216,
   133,252,169,136       :REM*93
67Ø DATA 133,25Ø,169,Ø,133,249,
   133,251,133,167,162,4,16Ø,Ø
   ,177,167,145,249      :REM*49
68Ø DATA 2ØØ,2Ø8,249,23Ø,25Ø,23
   Ø,168,2Ø2,2Ø8,24Ø,162,4,16Ø
   ,Ø,177,251,145        :REM*168
69Ø DATA 249,2ØØ,2Ø8,249,23Ø,25
   Ø,23Ø,252,2Ø2,2Ø8,24Ø,96,32
   ,115,Ø,2Ø1,34         :REM*21Ø
7ØØ DATA 24Ø,3,76,8Ø,198,32,37,
   196,142,159,2Ø3,32,115,Ø,32
   ,154,196,144,3        :REM*49
71Ø DATA 76,8Ø,198,32,1Ø2,196,1
   74,122,2Ø3,2Ø2,189,138,2Ø3,
   133,25Ø,169,136       :REM*65
72Ø DATA 133,168,174,122,2Ø3,2Ø
   2,236,1Ø6,2Ø3,24Ø,8,189,141
   ,2Ø3,133,252,76       :REM*138
73Ø DATA 132,2ØØ,169,216,133,25
   2,169,Ø,133,249,133,167,133
   ,251,32,65,196        :REM*16
74Ø DATA 169,Ø,32,144,255,169,Ø
   ,162,Ø,16Ø,136,32,213,255,1
   62,4,16Ø,Ø,177        :REM*127
```

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```
75Ø DATA 167,145,249,2ØØ,2Ø8,24
    9,23Ø,168,23Ø,25Ø,2Ø2,2Ø8,2
    4Ø,162,4,16Ø,Ø          :REM*218
76Ø DATA 177,167,145,251,2ØØ,2Ø
    8,249,23Ø,168,23Ø,252,2Ø2,2
    Ø8,24Ø,169,13,32        :REM*238
77Ø DATA 21Ø,255,76,121,Ø,169,2
    55,141,127,196,32,1Ø2,196,1
    74,122,2Ø3,142          :REM*9
78Ø DATA 18Ø,2Ø3,32,154,196,144
    ,3,76,8Ø,198,32,1Ø2,196,174
    ,122,2Ø3,142,179        :REM*54
79Ø DATA 2Ø3,169,4,141,127,196,
    169,255,141,176,2Ø3,12Ø,169
    ,28,141,2Ø,3,169        :REM*5Ø
8ØØ DATA 2Ø1,141,21,3,169,27,14
    1,17,2Ø8,173,179,2Ø3,32,3,1
    96,141,18,2Ø8           :REM*1Ø3
81Ø DATA 169,1,141,26,2Ø8,141,2
    5,2Ø8,169,127,141,13,22Ø,88
    ,76,121,Ø,173,25        :REM*96
82Ø DATA 2Ø8,141,25,2Ø8,173,184
    ,2Ø3,73,1,141,184,2Ø3,17Ø,1
    89,179,2Ø3,32,3         :REM*94
83Ø DATA 196,141,18,2Ø8,224,1,2
    Ø8,23,238,183,2Ø3,162,Ø,32,
    2Ø2,196,189,1Ø7         :REM*214
84Ø DATA 2Ø3,141,33,2Ø8,189,11Ø
    ,2Ø3,141,32,2Ø8,76,99,2Ø1,2
    38,183,2Ø3,162,1        :REM*236
85Ø DATA 32,2Ø2,196,189,1Ø7,2Ø3
    ,141,33,2Ø8,189,11Ø,2Ø3,141
    ,32,2Ø8,169,Ø           :REM*69
86Ø DATA 141,183,2Ø3,173,13,22Ø
    ,41,1,24Ø,3,76,49,234,76,18
    8,254,12Ø,169,49        :REM*39
87Ø DATA 141,2Ø,3,169,234,141,2
    1,3,173,26,2Ø8,41,254,141,2
    6,2Ø8,169,129           :REM*51
88Ø DATA 141,13,22Ø,88,169,Ø,14
    1,176,2Ø3,32,115,Ø,76,126,1
    98,169;Ø,32,189         :REM*26
89Ø DATA 255,169,15,166,186,16Ø
    ,15,32,186,255,32,192,255,1
    62,15,32,198,255        :REM*87
9ØØ DATA 32,2Ø7,255,2Ø1,2Ø,144,
    2Ø,32,21Ø,255,32,2Ø7,255,2Ø
    1,Ø,24Ø,1Ø,2Ø1          :REM*95
91Ø DATA 13,24Ø,6,32,21Ø,255,76
    ,185,2Ø1,32,2Ø4,255,169,15,
    32,195,255,169          :REM*236
92Ø DATA 13,32,21Ø,255,76,115,Ø
    ,162,Ø,169,1,157,Ø,224,157,
    Ø,228,157,Ø,232         :REM*13
93Ø DATA 96,232,2Ø8,243,96,16Ø,
    Ø,169,113,133,251,169,2Ø3,1
    33,252,177,251          :REM*39
94Ø DATA 24Ø,4,2ØØ,76,246,2Ø1,1
    4Ø,121,2Ø3,136,169,Ø,141,12
    2,2Ø3,141,123           :REM*218
95Ø DATA 2Ø3,162,1,142,126,2Ø3,
    177,251,41,15,141,124,2Ø3,1
    41,127,2Ø3,169,Ø        :REM*53
96Ø DATA 141,125,2Ø3,141,128,2Ø
    3,2Ø2,24Ø,18,32,7Ø,2Ø2,173,
    124,2Ø3,141,127         :REM*241
97Ø DATA 2Ø3,173,125,2Ø3,141,12
    8,2Ø3,76,33,2Ø2,238,126,2Ø3
    ,174,126,2Ø3,32         :REM*252
98Ø DATA 1Ø9,2Ø2,136,2Ø6,121,2Ø
    3,2Ø8,2Ø2,96,24,14,124,2Ø3,
    46,125,2Ø3,14           :REM*193
99Ø DATA 124,2Ø3,46,125,2Ø3,24,
    173,127,2Ø3,1Ø9,124,2Ø3,141
    ,124,2Ø3,173            :REM*2Ø5
1ØØØ DATA 128,2Ø3,1Ø9,125,2Ø3,1
    41,125,2Ø3,14,124,2Ø3,46,1
    25,2Ø3,96,24,173        :REM*33
1Ø1Ø DATA 124,2Ø3,1Ø9,122,2Ø3,1
    41,122,2Ø3,173,125,2Ø3,1Ø9
    ,123,2Ø3,141,123        :REM*16Ø
1Ø2Ø DATA 2Ø3,96,169,3,141,127,
    196,32,1Ø2,196,169,4,141,1
    27,196,174,122          :REM*11Ø
1Ø3Ø DATA 2Ø3,2Ø2,189,59,2Ø3,17
    Ø,189,15Ø,2Ø3,133,249,232,
    189,15Ø,2Ø3,133         :REM*192
1Ø4Ø DATA 25Ø,169,Ø,133,167,169
    ,2Ø8,133,168,12Ø,165,1,41,
    251,133,1,162,16        :REM*113
1Ø5Ø DATA 16Ø,Ø,177,167,145,249
    ,2ØØ,2Ø8,249,23Ø,168,23Ø,2
    5Ø,2Ø2,2Ø8,24Ø          :REM*19Ø
1Ø6Ø DATA 165,1,9,4,133,1,174,1
    22,2Ø3,2Ø2,189,177,2Ø3,157
    ,132,2Ø3,173,122        :REM*98
1Ø7Ø DATA 2Ø3,2Ø1,2,2Ø8,5,173,1
    Ø6,2Ø3,24Ø,11,173,24,2Ø8,4
    1,24Ø,29,132,2Ø3        :REM*236
1Ø8Ø DATA 141,24,2Ø8,88,76,121,
    Ø,86,72,66,84,69,71,67,8Ø,
    83,82,79,68,77,4        :REM*176
1Ø9Ø DATA 73,68,69,79,2,85,69,4
    ,82,68,69,82,3,89,8Ø,69,4,
    82,65,83,69,3,82        :REM*2Ø
11ØØ DATA 65,66,3,65,76,76,2,85
    ,84,2,76,68,5,65,83,84,69,
    82,2,7Ø,7Ø,3,73         :REM*114
111Ø DATA 83,75,2,69,77,Ø,5,8,1
    3,17,22,26,3Ø,33,36,42,45,
    49,Ø,2,4,6,8,1Ø         :REM*63
112Ø DATA 12,14,16,18,2Ø,22,24,
    74,198,169,198,184,198,19,
    199,4Ø,199,82           :REM*47
113Ø DATA 199,126,199,216,199,6
    8,2ØØ,2Ø1,2ØØ,117,2Ø1,153,
    2Ø1,129,2Ø2,Ø,4         :REM*146
114Ø DATA Ø,128,Ø,132,Ø,Ø,Ø,6,1
    ,Ø,14,1,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,
    Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø       :REM*Ø
115Ø DATA 3,1,1,4,4,4,16,Ø,16,4
    ,128,132,224,228,232,144,1
    48,152,176,18Ø          :REM*237
116Ø DATA 184,Ø,48,Ø,16Ø,46,83,
    67,78,8,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,
    Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø       :REM*251
117Ø DATA Ø,12,8,Ø,Ø,Ø,Ø,Ø,Ø,Ø,
    Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,256
                            :REM*159
```

Listing 2. Demo program.

```
1Ø REM SCREEN BASIC DEMO
                            :REM*21Ø
2Ø SYS 5Ø176:@OFF:@VIDEO1:@MEM2
   :@MEM1:@ERASE 1:@ERASE2:PRIN
   T CHR$(154)              :REM*4Ø
3Ø FOR A=12288 TO 12288+512:POK
   E A,PEEK(A+2Ø48):NEXT
                            :REM*212
4Ø @HUE 1,2:@HUE 2,2:@BRDER 1,7
   :@BRDER 2,7:@RASTER 1,145:@T
   YPE2                     :REM*72
5Ø X=9:Y=2:GOSUB 29Ø:PRINT"THIS
    IS A RASTER INTERRUPT USING
    TWO"                    :REM*224
6Ø PRINT TAB(3)"CHARACTER SETS.
    THIS IS SET #1"         :REM*124
7Ø @TYPE1:X=13:Y=8:GOSUB 29Ø:PR
   INT"THIS IS CHARACTER SET #2
   "                        :REM*24
8Ø GOSUB 28Ø                :REM*171
9Ø @OFF:@HUE 1,1:@HUE 2,7:@BRDE
   R 2,7:SYS 5Ø176:@RASTER 1Ø4,
   2ØØ:@ERASE 2             :REM*177
1ØØ @BRDER 1,1:@TYPE2       :REM*196
11Ø X=1Ø:Y=3:GOSUB 29Ø:PRINT"TH
   IS IS A NORMAL RASTER INTER
   RUPT":GOSUB 28Ø          :REM*254
12Ø @HUE 2,7:@BRDER 1,7:@RASTER
    56,254:@TYPE1           :REM*42
13Ø PRINTCHR$(19)CHR$(5)"THIS I
   S YET ANOTHER INTERRUPT USE
   .":GOSUB 28Ø             :REM*134
14Ø @OFF:@ERASE1            :REM*38
15Ø OPEN 15,8,15,"S0:TEST.SCN"
                            :REM*61
16Ø CLOSE15                 :REM*67
17Ø M=55296:I=1Ø24:J=1Ø:C=1:
                            :REM*244
18Ø FOR A=Ø TO 39:POKE I+A,16Ø:
   POKE M+A,C:NEXT          :REM*2ØØ
19Ø I=I+4Ø:M=M+4Ø:C=C+1:J=J-1:I
   F J<>ØTHEN 18Ø           :REM*6Ø
2ØØ @GRAB1:X=13:Y=1:GOSUB 29Ø:P
   RINT"THIS IS VIDEO SCREEN #
   1, WHICH CAN BE"         :REM*186
21Ø PRINT" GRABBED AND BROUGHT
   TO ..."                  :REM*112
22Ø GOSUB 28Ø:@VIDEO2:@CALL 1,2
                            :REM*117
23Ø X=12:Y=12:GOSUB 29Ø:PRINTCH
   R$(18)"VIDEO SCREEN #2":GOS
   UB 28Ø                   :REM*82
24Ø PRINT:PRINT TAB(6)" SAVING
   VIDEO SCREEN TWO...":REM*27
25Ø @PUT"TEST":@ERASE3:@HUE 3,1
   4                        :REM*42
26Ø @VIDEO3:X=2:Y=3:GOSUB 29Ø:P
   RINT"NOW LOADING SCREEN #2
   TO SCREEN #3"            :REM*173
27Ø @SLD"TEST",3:X=19:Y=Ø:GOSUB
    29Ø:GOSUB 28Ø:@VIDEO1:PRIN
   T CHR$(147):END          :REM*6
28Ø PRINT:PRINT TAB(13)"PRESS A
   NY KEY":POKE 198,Ø:WAIT 198
   ,1:RETURN                :REM*65
29Ø POKE 781,X:POKE 782,Y:POKE
   783,Ø:SYS 6552Ø:RETURN
                            :REM*44
```

■

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COMMODORE CLINIC

Discover how you can access the 80-column chip through Basic, connect a 1702 monitor to a VCR or copy single programs from ReRUN disks.

By LOU WALLACE

Q *You mentioned in your July Clinic that the 1702 makes an excellent monitor for a VCR system. Exactly how would one connect them together? Also, how can I copy single programs from the ReRUN disk to another disk, so I can have all games on one disk, utilities on another, etc?*

—GEORGE GOODWIN
COCOA BEACH, FL

A Exactly how to connect them will depend on your particular system. On mine, I connected the two (using a pair of gold-plated shielded RCA cables) from the video-out plugs on the VCR to the front (not the back) connections on the 1702. In this way, I can use the 1702 as a TV, with the VCR supplying the tuner.

As for copying files, no problem. On the 1541/1571 Test Demo disk is a two-drive copy program by Jim Butterfield that will do the job for you. The 1571 Test Demo (for C-128 owners) has the DOS Shell program, which will make single-drive file-copying a snap. If you have a C-64 with a single 1541, you'll need to get another single-drive file copier, many of which are available in the public domain.

RUN published a C-64 version of the DOS Shell (November 1987), and our recently released RUN Works disk contains a version called RUN Shell, which works on a 64 or 128 (40- or 80-Column mode), and will work with one or more drives, including the 1541, 1571 and 1581. It also supports the 1700, 1750 and 1764 RAM Expansion Units as RAM drives. It's a program I recommend.

Q *As I understand it, the VIC-II chip occupies 1048 bytes of the C-64 memory map and consists of 47 registers each. What are the remaining 1001 bytes for? Also, is the VIC-II a ROM or RAM chip?*

—S. E. FELLERMAN
KENSINGTON, MD

A You are correct. The VIC-II chip consists of 47 registers, no more. And yes, it does have an extended addressing space (53248–54271). But the way the computer hardware mapping is set up, addresses of 53295 ($D02F) and above are just duplicates of the original 47 registers. Writing to them has the same effect as would writing to the first 47 registers. The VIC is neither RAM nor ROM. It's a controller device designed to create the various video displays the C-64 (or C-128) can produce.

Q *I want to program my C-128's 80-column screen. I can handle Basic 7.0, but machine language is beyond me. Is there any way to access the 80-column chip through Basic?*

—TED KROLL
SPRINGFIELD, MA

A There are several ways. While Basic 7.0 does not support the 80-column display with its graphics commands, you can still use the Print command combined with the Window command, character graphics, embedded color and cursor quote-mode commands and the extra 80-column character attributes of underlining (CHR$(2) or CTRL/B) and flashing (CHR$(15) or CTRL/O) to generate a wide variety of 80-column displays.

Also, even if you aren't a machine language programmer, you can still access the 8563 VDC chip (the 80-column chip) from Basic, using some of the built-in ROM routines (make sure BANK 15 is in context with the BANK command). The most important routine for this can be found at $CDCC. This routine will let you store a number (0–255) into any of the VDC's registers. The syntax is:

```
SYS DEC("CDCC"),Value,Register
```

If you want to read the contents of a VDC register, use this command:

```
SYS DEC("CDDA"),0,REGISTER NUMBER:
  RREG A
```

With these two commands, you can return the contents of any of the registers to a variable (I used A in this case). The zero in the first part is a dummy variable, which can be any value.

You can use these to experiment with the C-128's 80-column display. For example, if you wanted to turn on Bit-mapped Graphics mode, you'd set bit 7 of register 25 like this:

```
SYS DEC("CDCC"),128,25
```

You can return to Text mode with:

```
SYS DEC("CDCC"),64,25
```

The 8563 VDC has 37 registers for you to play with, so there are a lot of new things to discover about it. Have fun!

Q *I typed in RUN Copy, (*RUN, *February 1988) using* RUN's *Checksum program, and everything checked out okay. But whenever I try to run the program, my disk light blinks and the computer locks up. Am I doing something wrong?*

—ERNEST WILSON
LANTZ, NOVA SCOTIA, CANADA

A The RUN Copy listing is a form of Basic loader that uses hexadecimal Data statements. The listing you typed in was not RUN Copy, but rather a program that *created* a file called RUN Copy on your disk. From your description, my guess is that you saved the first program you typed in with the filename RUNCOPY. So, when you ran the listing, it tried to create the real RUN Copy file. Instead, it encountered the Basic listing you named RUNCOPY, and it generated a File Exists error.

If that's the case, the simplest way to correct the problem is to rename the Basic loader you typed in, using, for example, RUNCOPY.BAS. Assuming the disk is in drive 8, use this command to rename the file:

```
OPEN 15,8,15,"R0:RUNCOPY.BAS = 0:
  RUNCOPY":CLOSE 15
```

This will change the filename to something other than RUNCOPY. Now load and run RUNCOPY.BAS. If you typed it in correctly, your drive should run for a time while the new file is being generated on your disk. When it finishes, you can then load and run the real RUN Copy program. ■

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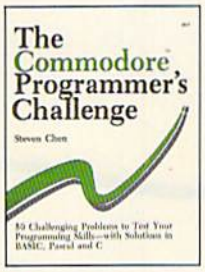

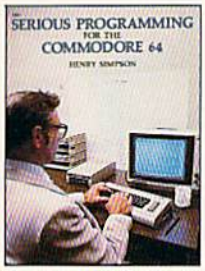

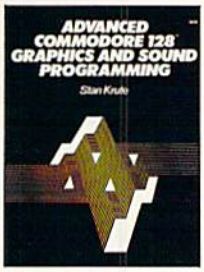

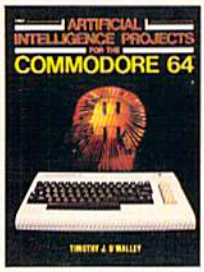

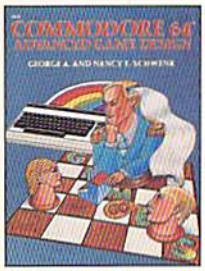

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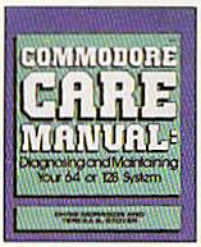

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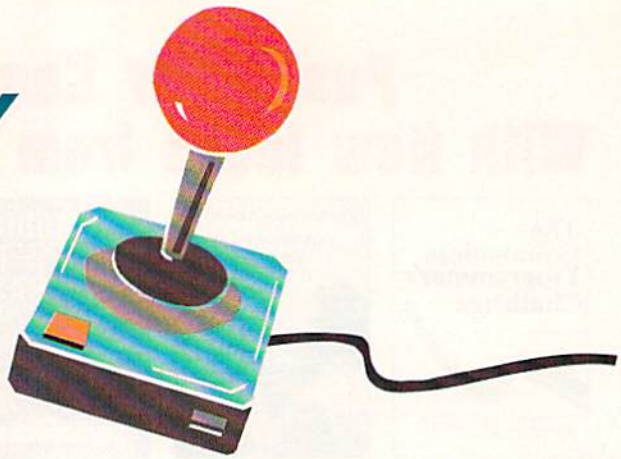
GAMES GALLERY

By LOU WALLACE



Let the games begin!

Whether you're into arcade games, adventure games, strategies or simulations, tune in each month to this column for reviews, game-playing hints and insights into the companies and programmers who bring you some of the hottest entertainment in the games market. We kick off our column with a look at a genre of fast-action games that provide an up-to-date twist on an old theme.

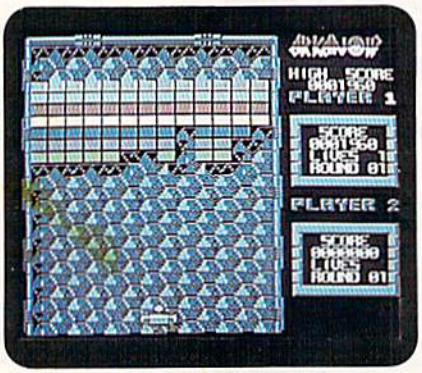
If you stretch your memory back to the prehistoric days before personal computers, you might remember a game called Breakout. Created for the cartridge-based game machines of the 1970s, it was an exceptionally successful game idea. The object was to keep a bouncing ball in motion while it slowly chipped away at layers of little blocks, eventually to "break out" and get behind them, whereupon you could rack up huge numbers of points in a few seconds. While it's basically a simple concept, somehow it hit a nerve with arcade gamers, and we played it over and over.

I remember saving the money my wife graciously allowed me for lunch so I could finally buy one of those game machines. Finally, I had enough money. The machine I selected came from Sears, and, incredibly, had built into it a total of seven variations of Breakout. I played those games for months, until I was recognized (in my household, at least) as the greatest Breakout player in all the known universe.

A lot of time and electronic evolution has gone by since then, so I have to admit that I was surprised by the wide current interest in Breakout-style games. Taito's Arkanoid was a huge commercial success as a stand-alone arcade game, and it's no wonder they've transported it to the C-64 (and other personal computers).

Mindscape subsequently released Blockbuster, another game in the Breakout tradition, and this month I'll take a quick, comparative look at these two games. Just for fun, I'll also look at two Breakout clones that are in the public domain, which means you're free to copy and distribute them to your friends. The results might surprise you.

Arkanoid has received rave reviews all year, and with good reason. The game is a great example of what can be done on a C-64 when you put talented



With its high quality of graphics and sound, Arkanoid is the clear winner.

programmers and artists on a project. The graphics are colorful, the sounds are excellent, and the speed of the animation is fast and fluid. It also has 33 different levels, enough to keep you busy for quite a while. Most important, it supports a variety of controllers, including the keyboard, joystick, paddles and the 1351 mouse. It's a pleasure to use, especially when played with the mouse, and I wish more companies would support it.

Arkanoid offers the same basic game idea as traditional Breakout games, but the layout used for the bricks is different with each level. It also offers a couple of new twists.

One is that "energy blocks" drop at certain times in the game. There are seven types of these blocks, which you must collect with your paddle to produce different results. For example, one makes your paddle longer; another slows the speed of the ball; still another gives you a laser you can use to destroy more blocks. There's a fourth that gives you three balls, which allows you to hit more bricks; but of course it's tougher to follow all three.

The other twist is that odd-shaped creatures appear and work down toward you. If these are hit by your ball, they will deflect it in another direction.

Blockbuster has even more levels than Arkanoid. It starts off with 80 different screens, and has an additional option for you to create 48 custom screens. You can use either the keyboard or joystick, but unfortunately there is no option for either mouse or paddle. That's too bad, for I found the joystick unwieldy and difficult to use.

Blockbuster's graphics are good, but they're not as high in quality as those of Arkanoid. The background is quite dynamic, sporting a fast-moving starfield. While they're novel, I quickly began to dislike those moving stars as unnecessary distractions. Again, while the sound effects are adequate, they're not as good as Arkanoid's.

Blockbuster doesn't have energy blocks, but it does have something similar. When you shoot some bricks, they drop little U-shaped tokens that you can catch and use to "purchase" one or more of the nine weapons and enhancements available. Some of these, such as paddle elongation, lasers and ball slowdown, are similar to those in Arkanoid, but others are entirely different. These include a Torch option, which shows hidden bricks, smart bombs that zap ►

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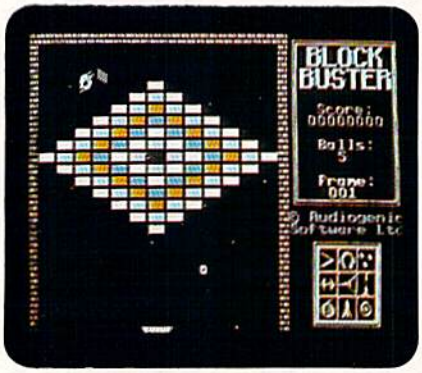
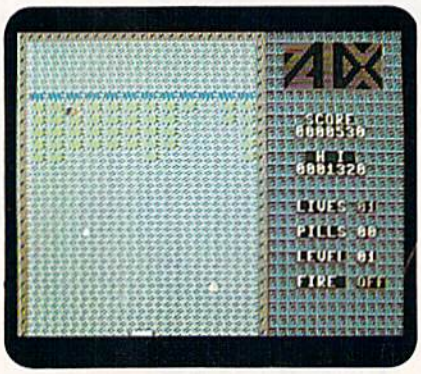


Blockbuster has a great variety of game options and levels.

aliens, and force fields that protect you from the ever-present aliens.

Now, while both of these games are fun, there are, as I mentioned above, public domain games that offer many of the same features. You can find one of these, called Zix, on QuantumLink. It was programmed by Pierre Messier, and is practically a clone of Arkanoid in terms of game play and options, but it does have unique game screens. The graphics are surprisingly good, the sound is adequate, and, considering the price, it's really an excellent game. It requires a joystick and does not support the mouse. Zix can be downloaded from QuantumLink's C-64 arcade-game software library. Its access number is S# 2583.

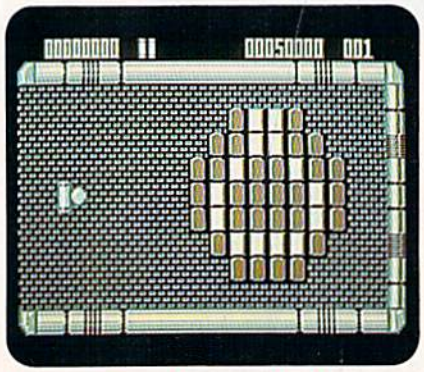
Another public domain Breakout-style game that is well worth your attention is Krackout. I haven't been able to find out who programmed it, but the uploader's name on GEnie is Jeeper. Krackout is a big game with lots of options. It has sound effects, music, scrolling backgrounds, aliens and many levels, but its orientation is somewhat different from the others, as the paddle is on the left or right side of the screen instead of at the bottom. Like Zix, it is joystick-controlled only. You can find Krackout in the Commodore libraries on GEnie; its reference number is 6045. Both these public domain programs are also available on *RUN*'s BBS, The RUNning Board (phone 603-924-9704) and you can download them at any time.



Zix, a public domain game, is of nearly commercial quality.

As you can see, there is a wide variety of good Breakout games to be had. If pressed to pick the best, I would say that it's Arkanoid. But, frankly, I like both Zix and Krackout better than Blockbuster. Before you spend any money on the commercial games, I suggest you try the freebies. You might decide to keep your money!

One final note. I thought it might be fun to have game-playing tricks and hints from the companies that produce Arkanoid and Blockbuster. When I called, however, neither one was forthcoming, saying they thought no one would be interested in tricks and programmers' backdoor secrets. Do you agree with those marketing types? If not, and you've discovered some super-secret gaming trick for these or other popular games, write in and tell me, and I will pass them on to the world! ■



Krackout is another example of an excellent public domain game.

Lou Wallace, RUN*'s technical manager, is the author of Commodore Clinic. Address your game tricks or comments to Games Gallery,* RUN *Magazine, 80 Elm St., Peterborough, NH 03458.*

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GEOWATCH

geoTips returns with some inGEniOuS hints and advice on the care and feeding of GEOS.

By TIM WALSH

AS PROMISED THE LAST TIME I authored this column (May 1988), I'm including a handful of geoTips that have been submitted by *RUN* readers. More importantly, I'm giving you a sneak peek at Berkeley Softworks' new products, along with some geoAdvice answers to questions posed by GEOS-using readers. Since I've earned the dubious distinction of being both *RUN*'s geoWatch columnist *and* printer expert, this gives me the opportunity to address a few queries concerning the use of printers with GEOS.

FIRST, THE NEW STUFF

The latest version of GEOS, 2.0 (reviewed in this column, November 1988), has largely met with approval from the folks who use it. Now, there is more news from Berkeley in the release of geoChart, a chart-making application that's compatible with nearly all of the other GEOS applications. GeoChart is designed to let users create a wide variety of charts and graphs by incorporating the data created with the other applications. With a suggested retail price of $29.95, geoChart is sure to be a hot-selling item. *RUN* will feature a full review in next month's column.

Q *I use GEOS primarily for word processing, therefore, I'm in the market for a letter-quality or NLQ printer to replace my now defunct Commodore MPS-801. Which GEOS-compatible printers represent the best dollar value?*

—DAVID W. BROWN
TALLADEGA, AL

A To the newcomer, it would appear that few things in the world of computers are more mysterious than the relationship between GEOS and printers. In reality, GEOS is fairly flexible within a wide range of printers. It does have its limitations, however. Because GEOS prints by employing your printer's graphics capabilities, it can't be used with a letter-quality daisy wheel printer, but it will work with a letter-quality dot matrix printer.

While I can't list all the printers that are GEOS-compatible, suffice it to say that virtually all Centronics-parallel and Commodore-compatible printers currently on the market work well with GEOS. To determine whether or not the printer you're planning to buy is compatible with GEOS, check your GEOS disk to see which printer drivers exist on it. If the printer is not listed, try a local user's group, BBS or Q-Link for hard-to-find GEOS printer drivers.

Finally, in my opinion, many of the popular dot matrix printers marketed today are excellent values for the myriad of features they possess. A few of my lower-priced favorites are the Star Micronics NX-1000, Okidata 180, Panasonic KX-P1092 and Epson FX-850, all of which offer varying degrees of GEOS compatibility.

Q *Why does the pointer disappear from the screen when I'm printing with GEOS 64 and my Seikosha SP-1000VC? Sometimes I can turn off the printer to get the pointer back, but at other times GEOS crashes and has to be re-booted.*

—BERNIE WILES
ALLISON PARK, PA

A Unfortunately, I'm not aware of a simple solution that would alleviate the disappearing pointer problem. The Seikosha SP-1000VC is designed to be totally 64/128-compatible and so has a built-in, 6-pin, DIN serial port that negates the need for a parallel interface. While this situation might sound and look good on paper, in reality, it's far from ideal, as I'll explain.

Like you, I've experienced problems with third-party Commodore-compatible printers misbehaving while performing even the simplest of printing chores with GEOS and other software packages. Thorough investigation on my part revealed that the SP-1000VC, like a few older models of Commmodore-compatible printers (such as the Star Micronics SG-10C), have a tendency to lock up the computer or disk drive when they finish printing a document or are switched from online to off. According to expert sources at Commodore, this occurs because their design does not ground them properly to the computer.

Although electricity is not my forte, I am knowledgeable on the printing limitations imposed by Commodore-compatible printers (and parallel interfaces set to Commodore 1525/MPS-803 emulation) when using GEOS. These limitations exist because most Commodore-compatible printers equipped with serial port interfaces are limited to maximum dot densities of 60 dots per inch. This means that the right-hand portion of your GEOS screen image won't be printed. (I've included Jon Allen's geoTip, below, to help anyone who is experiencing problems printing with 60 dpi printers.)

It's easy to circumvent this problem by replacing your existing printer with a parallel interface and a new Epson-code-compatible dot matrix printer. While this is expensive, a new, high-density printer will produce documents of higher quality, and will print them faster and in their entirety.

Q *As a GEOS 128 user, I'd like to use my printer's default characters when I create documents with geoWrite and geoPaint. Unfortunately, no matter what I do, I can't get those characters to print. Instead, the characters that appear on the output look the same as those displayed on the screen. How do I get around this problem?*

—DAVID R. MEDERT
ALBANY, OH

A A problem really doesn't exist. As I explained in my reply to David Brown, above, GEOS is designed to print using the graphics capabilities of your printer. GEOS fonts are actually bit-mapped images on the screen, so your printer processes them in a completely different way than it processes the input from a conventional word processing program (which uses the printer's character sets to produce a printed page). While this process is no-

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ticeably slower than even NLQ printing, it permits the use of a wide range of fonts in various sizes.

GEOS isn't unique in not using your printer's character sets to print text. For example, Newsroom, Outrageous Pages, The Print Shop and a host of other graphics programs also print text without using the printer's characters.

Q *I've recently upgraded to a C-128, two 1571 disk drives, an RGB monitor, 1351 mouse and 1750 RAM expander. I was almost convinced to invest in GEOS, but the fact that it's copy protected makes me re-think the possibility. I never knowingly invest in copy-protected software, not because of problems making archival copies, but rather to protect my disk drives from potential head-rattling problems.*

—THOMAS D. JOHNSON
SAUCIER, MS

A There was a time when I, too, worried about using copy-protected software for fear of damaging my disk drives. After thousands of hours of such use, however, and after many conversations with Commodore service-center technicians, I'm convinced that heat build-up in disk drives is far more likely than copy-protection schemes to cause head-alignment problems. The presence of copy protection should not deter anyone from investing in software, because even the most intensive head-rattling schemes are virtually harmless to disk drives.

If you want complete insurance from disk drive head rattling when loading software, just enter the following command before booting GEOS or any other copy-protected disk:

```
OPEN15,8,15,"M-W";CHR$(106)CHR$(0)
CHR$(1)CHR$(133):CLOSE15
```

GEOTIPS

60-DPI Printers

My Commodore-compatible Okidata 120 has a maximum dot density of 60 dots per inch, which means it will only print a maximum of 480 horizontal dots when printing geoPaint screen images. This leaves over 160 dots on the right side of the page that are unprintable. To circumvent this, I draw a border 168 pixels to the left of the right-hand screen border and save this as a geoPaint file.

Whenever I want to create a new geoPaint screen, I boot up and use one of these geoPaint borders. Consequently, I have no difficulty staying within the borders and never experience the problem of part of the screen not printing.

—JON ALLEN
NEWFANE, NY

GEOS and the SX-64

I couldn't figure out why GEOS wouldn't work with my SX-64 whenever the printer was on. At my wit's end, I finally connected my children's 1541 disk drive to my SX-64 and connected the printer to the remaining serial port, whereupon everything worked fine.

This experiment revealed that before I borrowed the 1541, the serial cable port on my SX-64 was used for my printer interface. GEOS, not differentiating between a C-64 and an SX-64, thought the printer interface cable was connected to a disk drive, which caused everything to lock up. This problem is significant because the C-128D, like the SX-64, also has a built-in disk drive and a similar problem might possibly occur if a parallel interface is plugged into the serial port.

The best solution to this problem, short of getting a second disk drive, is probably investing in Berkeley Softworks' geoCable, which would be ideal simply because it doesn't use the serial port on either your computer or disk drive.

—BILL CARR
HARRISBURG, IL ■

Tim Walsh, RUN's technical editor, requests that you send your questions on GEOS and related applications, along with any geoTips you may have, to geoWatch, RUN Magazine, 80 Elm St., Peterborough, NH 03458.

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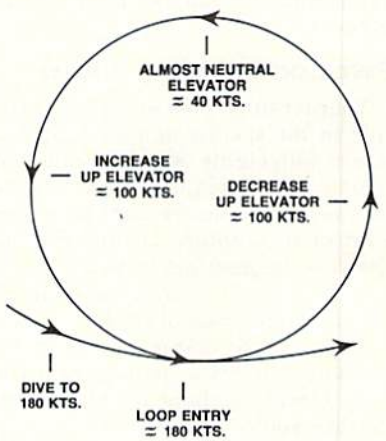
Flight notes # 3A

Better Loops with Flight Simulator - While the "Flight Physics" manual description is adequate for most, we get enough calls from frustrated computer pilots unable to perform a loop to warrant the following additional instructions. For those already successful at looping the aircraft, these instructions should help make your loops rounder and more satisfying.

After diving to the suggested looping airspeed (180 knots will do), add as much up elevator as possible without stalling the aircraft. As you pitch up and airspeed slows you will have to reduce some of this elevator pressure. Many people leave the elevator setting on high and become frustrated when the aircraft stalls before pointing straight up. In a perfectly round loop your elevator should be almost all the way back to neutral by the time you're upside down. Since airspeed is very slow at the top of the loop (and the portion of the circle traveled is small), your pitch attitude change should be gracefully slow as well. Start adding up elevator pressure again as airspeed increases. By the time you get to the bottom of the loop, the up elevator setting should be where it was when you began the maneuver and your airspeed should be adequate to begin another loop.



In summary, up elevator setting varies throughout the loop. The faster your airspeed, the greater the up elevator pressure. Flight Simulator is the only simulation on the market that accurately portrays the flight characteristics of a light aircraft when performing this maneuver. In reality there's little room for error in the amount of up elevator you can use, and meeting the challenge of performing a perfectly round loop can be a very satisfying experience. You may even find yourself more knowledgable about loops than many non-aerobatic pilots who fly real airplanes. Happy trails!

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TELECOMPUTING WORKSHOP

Continuing his series on networks, the author rubs his magic lamp to take a look at GEnie.

By LOREN LOVHAUG

IN THIS MONTH'S COLUMN, I'll examine Commodore 64 and 128 support and services on the GEnie telecommunications network. Unlike Quantum-Link, which was the subject of last month's column, GEnie is *not* Commodore exclusive. In fact, the majority of GEnie subscribers use other types of computers. This means that only a small portion of GEnie's services is targeted directly at Commodore owners.

However, there are a variety of reasons that might prompt Commodore users to go online with GEnie. I will focus on the GEnie support areas that are specific to C-64 and C-128 owners, along with the generic aspects of the network.

FAST LANE OR SCENIC ROUTE?

Your terminal package plays a major role in the success of your online sojourns with GEnie. At an absolute minimum, your program should support Xmodem file transfers and have some kind of text-capture facility. (For suggestions on terminal software characteristics, refer to this column in the October 1988 issue of *RUN*.)

To log on to GEnie, you must first call a local access node in or near your area. Once you have made that connection, you're prompted for your user I.D. (a string of letters and numbers) and a password. Those two steps are easily automated with a sophisticated terminal program. Without any kind of "cruise control," however, recalling, redialing and re-entering can be tedious.

Once online, you're presented with various system announcements and a main menu. You can navigate around GEnie by menu or command, which is a big plus for experienced users or for people who know exactly where in the system they want to go.

For example, suppose you want to check out the most recent public domain uploads in the Commodore eight-bit area. You could simply type "move 625;3". Menu #625 is the Commodore eight-bit area and submenu #3 is the software libraries area.

However, if you're new to the system, or if you're not sure of the various menu numbers, you could reach the same destination by moving from the Main menu to the Computing menu, then to the Commodore and Amiga Roundtables menu, and finally to the Commodore Flagship Roundtable menu, where you can select the Software Libraries menu.

As you might imagine, you can save time and money by knowing and using circumventions. Thankfully, though, GEnie's system provides good support for both the neophyte and the telecommunications pro.

Another aspect of GEnie that's difficult, but worth taking the time to learn, is the message-editing system. The editor is line based, but uses a series of commands prefixed with an asterisk to perform functions similar to those found in most good post-formatted word processors—search and replace, block delete, and so forth.

In addition, you can easily compose your electronic mail offline and upload it to the GEnie text editor by dumping it directly from your terminal program's text buffer or by uploading it via Xmodem. This option can really save you a lot of money, especially if you're a slow typist.

The electronic mail system also lets you forward your mail to one person or send multiple copies. You can even review your Email at a later time, making it easier for those who don't always have the time to reply or the proper answer ready in mind.

The public message editor is similar in operation and function to the Email system, giving GEnie a consistent nature as far as text editing is concerned.

THE FLAGSHIP

Commodore 64 and 128 support on GEnie can be found in an area called the Commodore Flagship Roundtable, which contains both the public domain libraries and public message bases.

The public domain software libraries are well-organized and provide excellent file and topic search capabilities. Looking for a specific file or type of file from among over 5000 in the Commodore Flagship is simple because you can search by filename, topic, uploader, date or even sublibrary.

Downloading public domain software is generally error-free. However, some files, particularly Basic programs that've been compiled, suffer from Xmodem padding. Fortunately, some extremely well-written and detailed online tutorials and "stripping" programs deal with that problem.

Once you learn how to use GEnie's sophisticated search capabilities and master the infrequent, but nagging, Xmodem padding problem, downloading public domain software from GEnie is a pleasure.

The public message base, which is subdivided into a variety of special sections such as music, graphics, disk drives and rumors, provides interaction and help from other Commodore owners. For the most part, the discussions on GEnie are dominated by a core group of intermediate users and SYSOPs who are helpful, friendly and quite willing to offer assistance and advice.

Rounding out GEnie's Commodore Flagship support are its conference areas, which facilitate many live online discussions among Commodore users around the country. Sometimes, these rooms are also used for special guest conferences, with personalities from around the Commodore world.

The real-time conferencing areas are very good, but you need terminal software with some kind of "chat window" to use them effectively; otherwise, incoming text from others in the conference will disturb your typing and make it virtually impossible to communicate.

A SINKING SHIP?

Unfortunately, the level of support in the Commodore Flagship area on GEnie has slipped a great deal over the past few months. This is reflected in the fact that there are fewer and fewer special guest conferences and a general slowdown in answering questions on the public message bases and in processing files uploaded to the software

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libraries. I identify two reasons for this deterioration.

The first is the fact that GEnie relies on volunteer SYSOPs to staff the Commodore Flagship area; only the primary Commodore SYSOP is paid, and her duties are divided between the Flagship and two Amiga-related areas. This means that the men and women who validate and maintain the public domain software libraries, host and arrange the online conferences and field the majority of questions in the public message areas do so only because they enjoy their Commodores and telecommunications in general. It takes a great deal of time and effort to be a SYSOP on a national telecommunications network, and over the past year these demands have caused a large staff turnover in the Flagship area.

I think the other reason for the slippage of Commodore eight-bit support on GEnie is that many of the SYSOPs now own Amigas, thereby further tending to erode their already limited volunteer time.

You'll probably never see the kind of energy and Commodore talent on GEnie's Commodore eight-bit areas that can be found on Q-link. However, what support GEnie has to offer is good, and, combined with the sophistication of its network software, it's an excellent alternative for C-64/128 owners to consider. ■

Loren Lovhaug is a programmer and writer with lots of telecommunications experience. Along with being SYSOP of Q-Link's C-128 Special Interest Group and co-SYSOP of GEnie's Commodore Flagship, he publishes Twin Cities, *a newsletter for C-128 users. You can write to him care of Telecomputing Workshop,* RUN *Magazine, 80 Elm St., Peterborough, NH 03458. You can also send him electronic mail on QuantumLink (LOVHAUG) or GEnie (Sparrow.J).*

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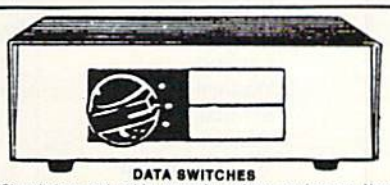

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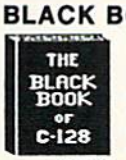

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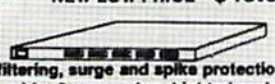

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1988 INDEX

TITLE	AUTHOR	ISSUE	PAGE	COMPUTER
APPLICATIONS				
RUN's Memo Book	Mintz	Jan	60	C-64
Calendar Maker	Kodadek	Jan	68	C-64, C-128
Time-Keeper 64	Kodadek	Feb	78	C-64
Home Inventory	Adam	Mar	74	C-64, C-128
Time-Keeper 128	Kodadek	Mar	92	C-128
Creating Windows	Vollmer	Apr	64	C-128
Cursor Commotion 128	Borden	Apr	92	C-128
Moving Messages	Richardson	May	60	C-64
Tick-Tock 128	Sherwood	May	68	C-128
Form Writer	Brown, T.	Jun *	46	C-64, C-128
Bill Minder	Reuter	Jul	66	C-128
Travel Tally	Lawson	Jul *	70	C-64
Loan Analysis	Wallace	Jul	77	C-64, C-128
Net Worth Calculator	Schulak	Aug	42	C-128
Mom's Kitchen Aid	Olson	Aug	77	C-64, C-128
Vacation Checklist Generator	Wallace, Walsh	Sep	72	C-64, C-128
Easy Banners	Ryan	Oct	64	C-64, C-128
Joystick Mouse Emulator	Lawson	Oct	90	C-64
Savings Forecaster	Gallagher	Nov	53	C-128
For Good Measure	Broussard	Nov	56	C-64
Finance 128	Wickes	Dec	52	C-128
Instant Address Book	Lovhaug	Dec	94	C-128
DESKTOP PUBLISHING				
Desktop Publishing with the C-64	Lamb	Mar	60	C-64
Club Chronicles	Procise	Apr	45	
EDUCATION				
Instant Test-Maker	McMenamin	Oct	54	C-64, C-128
Tool for Teachers	Kephart	Oct	78	C-64
EDUCATIONAL GAMES				
Affairs of State	Wilson	Mar	84	C-64, C-128
Alphabet Cadet	Ryan	Jul	49	C-64
Try to Remember	DeGroff	Sep	60	C-64
Hail to the Chief	Wallace	Nov	44	C-64
Mystery Match	Ryan	Nov	68	C-64
Math Match	Schneider	Dec	86	C-64
GAMES				
Commodore Lanes	Fedor	Mar *	88	C-64
Drip-Drop	Fedor	May	56	C-64

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1988 INDEX

TITLE	AUTHOR	ISSUE	PAGE	COMPUTER
Special Delivery	Hurley	Jun	56	C-64
Now You See It. . .	DeGroff	Jun	60	C-64
Evel's Revenge	Kaylor	Jul	74	C-64
Islands	Ryan	Aug	36	C-64
Video Poker	Brantner	Aug	48	C-64
Inertia Mania	Orcutt	Sep	46	C-64
Knock!	Fedor	Sep	68	C-64, C-128
Monkey See. . .	Reuter	Oct	68	C-128
Scared Silly!	Latimer	Oct	72	C-64, C-128
No Quarters Required	Latocha, W.	Nov	40	
Crazy Caverns	Ryan	Dec	48	C-64
GENERAL INTEREST				
Index to *RUN*'s 1987 Articles and Reviews		Feb	104	
Computer Camaraderie	Brown, L.	Apr	38	
Starting a User's Group	Wallace	Apr	40	
Troubleshooting Tips	Wendt	Apr	58	
Newcomer's Guide	Rule	Sep	41	C-64, C-128
Who's Number One?		Dec	42	
Journey to the Center of Your Commodore	Rule	Dec	76	
Fighting Diabetes with a Commodore	McLain	Dec	90	
GEOS				
geoNewsletter	Lamb	Mar	68	
GEOS Contest Winners		Dec	58	
Icon Editer (geoWatch)	Dempsey	Dec	102	C-64
GRAPHICS				
Graphix to the Max	Wallace	May	50	C-128
Pixel Perfection	Walsh	Jul	46	
The Amazing Sixteen-Color Print Machine	Davis	Jul	54	C-64
Color Cornucopia	Walsh	Jul	59	C-128
Medium Resolution Graphics and Character Enlarger	Moore	Aug	82	C-64
HARDWARE REVIEWS				
Sprinter Printer	Walsh	Jan	56	
Hearsay 1000	Eldridge	Apr	76	C-64, C-128
Serial Data Link Cable	Premack	Apr	78	C-64, C-128
Hot Shot Plus	Walsh	Jul	86	C-64, C-128
Personal Musician	Guerra	Jul	87	C-64
Warp Speed	Walsh	Aug	90	C-64, C-128
So. . .You Want to Be a Power User?	Kevelson	Sep *	36	C-64, C-128
Printers on Parade	Walsh	Oct	40	
Super Graphix Gold	Brown, L.	Dec	38	C-64, 128
Lt. Kernal	Premack	Dec	39	C-64, C-128
MUSIC/SOUND				
Songs in the Key of C-128	Schulak	Oct	49	C-128
PROGRAMMING				
Your Basic Mouse Editor	Lovhaug, Kress	Feb	66	C-128
Display Frame Animation	Charnetski	Mar	22	C-64, C-128
Window Construction Set	Ryan	Apr	50	C-64

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1988 INDEX

TITLE	AUTHOR	ISSUE	PAGE	COMPUTER
Fontastic 64	Lawson	Apr	62	C-64
GOTO Programming	Butterfield	May	36	
A Basic Adventure	Hurley	May	39	
Programmer's Pager	Ryan	Sep	64	C-64
Panel Maker	Wallace	Nov	50	C-64
Scroll, Scroll, Scroll Your Background Gently up the Screen	Wallace	Dec	16	C-128
SOFTWARE REVIEWS				
Guild of Thieves	Ryan	Jan	28	C-64
Maniac Mansion	Ryan	Jan	28	C-64
Bop'n Rumble	Latocha, W.	Jan	30	C-64
Pirates!	Guerra	Jan	32	C-64
The Graphics Transformer	Grubbs	Jan	32	C-64
Defender of the Crown	Guerra	Jan	34	C-64
President Elect	Weiner	Jan	34	C-64
1541/1571 Drive Alignment	Grubbs	Jan	36	C-64, C-128
A Happy New You!	Brown, L.	Jan	42	
Rebel Charge at Chickamauga	Wright	Feb	24	C-64
Alternate Reality: The Dungeon	Hurlburt	Feb	26	C-64
Power C	Broussard	Feb	26	C-64, C-128
The Advanced OCP Art Studio	Grubbs	Feb	28	C-64
The Accelerated Reader	Latocha, M.	Feb	28	C-64
Express Raider	Wasser	Feb	30	C-64
Plundered Hearts	Ryan	Feb	32	C-64
C-More	Broussard	Feb	32	C-64
Simulating Real-Life Action	Walsh, et al	Feb	38	
Take Stock of Investment Software	King	Feb	51	
Airborne Ranger	Wasser	Mar	40	C-64
B-24	Wright	Mar	43	C-64
Ladders to Learning: Sorting, Triangles, Bones and Joints	Chasen	Mar	45	C-64
Thoughtform, Version 1.81	Cohen	Mar	47	C-64
Vegas Gambler	Brown, L.	Mar	49	C-64
Paperboy	Wasser	Mar	51	C-64
Rainy Day Games	Latocha, M.	Mar	53	C-64
Sanxion	Hurlburt	Mar	53	C-64
Wargame Construction Set	Wright	Mar	55	C-64
Watch Out, Mac!	Begley	Mar	64	C-64, C-128
The Last Ninja	Walsh	Apr	24	C-64
Test Drive	Wasser	Apr	26	C-64
Aqua's Circus; Think Bank	Eldridge	Apr	26	C-64
Rad Warrior; Spy vs. Spy III; Boulder Dash Construction Kit	Brown, L.	Apr	28	C-64
Nord and Bert Couldn't Make Head or Tail of It	Brown, L.	Apr	30	C-64
Micro Detective	Walsh	Apr	30	C-64, C-128
GeeBee Air Rally	Brown, L.	Apr	32	C-64
Deja Vu	Hurlburt	May	26	C-64
Instant Music	Guerra	May	26	C-64
Apollo 18	Hurlburt	May	28	C-64
Darkhorn	Ryan	May	28	C-64
Halls of Montezuma	Guerra	May	30	C-64
Cholo	Kimball	May	30	C-64
Dark Lord	Latocha, W.	May	32	C-64
Strategist	King	May	32	C-128
The Assembly Line	Broussard	May	45	C-64, C-128
And the Latest...	Wallace	May	47	C-64, C-128
Infiltrator II	Wasser	Jun	30	C-64
The Train: Escape to Normandy	Walsh	Jun	30	C-64
High Seas	Wright	Jun	32	C-64
Knight Orc	Kimball	Jun	34	C-64

►

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1988 INDEX

TITLE	AUTHOR	ISSUE	PAGE	COMPUTER
Magnetron	Ryan	Jun	34	C-64
The Latest Word	Cavanaugh	Jun	40	C-64, C-128
Chernobyl	Ryan	Jul	28	C-64
Demon Stalkers	Guerra	Jul	30	C-64
Mini-Putt	Guerra	Jul	30	C-64
Soko-Ban	Latocha, W.	Jul	30	C-64
Screen F/X	Brown, L.	Jul	32	C-64
Commando	Wasser	Jul	34	C-64
Border Zone	Kimball	Jul	34	C-64
Project: Space Station	Hurlburt	Jul	35	C-64
Graphics Galore	Wallace	Jul	40	C-64, C-128
Ready. . .Set. . .Compile!	Wallace	Jul	60	C-64, C-128
Sherlock: The Riddle of the Crown Jewels	Kimball	Aug	22	C-64
Stealth Mission	Walsh	Aug	22	C-64
MISL Soccer	Wasser	Aug	24	C-64
Q*Bert	DiPrete	Aug	25	C-64
Kid Niki	Latocha, W.	Aug	26	C-64
Steve Garvey vs. Jose Canseco in Grand Slam Baseball	Wasser	Aug	27	C-64
Skyfox II	Guerra	Aug	27	C-64
Tetris	Hurlburt	Aug	28	C-64
Zig-Zag	Latocha, W.	Aug	28	C-64
Speed Buggy	Wasser	Aug	29	C-64
PrintPower	Chasen	Aug	30	C-64
Card Sharks	Brown, L.	Aug	30	C-64
WordPro 128 with FilePro 128	Premack	Aug	31	C-128
Rapid Transit Systems	Roberts	Aug *	60	C-64, C-128
The Three Stooges	Latocha, W.	Sep	24	C-64
PaperClip Publisher	Lamb	Sep	24	C-64
The President is Missing	Ryan	Sep	26	C-64
Skate or Die	Wasser	Sep	28	C-64
The Lurking Horror	Ryan	Sep	29	C-64
Strike Fleet	Guerra	Sep	30	C-64
Black Jack Academy	Guerra	Sep	30	C-64
Dark Castle	Walsh	Sep	31	C-64
Winter Challenge	Wasser	Sep	31	C-64
BetterWorking Word Publisher	Premack	Sep	32	C-64
Forward into Battle!	McLain	Sep	54	C-64
Bank Street School Filer	Weiner	Oct	24	C-64
Pre-Reading	DiPrete	Oct	26	C-64
Number Farm	Jerome	Oct	26	C-64
The Electronic Writing Lab	Eldridge	Oct	26	C-64
Dragon Game Series	Eldridge	Oct	28	C-64
Math Power	Pratt	Oct	30	C-64
Adventures with Fractions	Jerome	Oct	30	C-64
Spelling Bee	DiPrete	Oct	32	C-64
Building Perspective	DiPrete	Oct	32	C-64
Tiger's Tales	Latocha, M.	Oct	34	C-64
Alphabet Circus	Latocha, M.	Oct	34	C-64
Regions of the United States	Pratt	Oct	35	C-64
Path Tactics	Chasen	Oct	35	C-64
Simon Says	Latocha, M.	Oct	36	C-64
Wizardry: Proving Grounds of the Mad Overlord	Weiner	Nov	22	C-64
Impossible Mission II	Wasser	Nov	22	C-64
Award Maker Plus	Fishbein	Nov	24	C-64
Street Sports Soccer	Wasser	Nov	24	C-64
Vampire's Empire	Cavanaugh	Nov	26	C-64
Roadwars	Cavanaugh	Nov	26	C-64
Blockbuster	Latocha, W.	Nov	28	C-64
BeckerBasic	Winchester	Nov	28	C-64
Sky Travel	Chasen	Nov	30	C-64
Tobruk	Wasser	Nov	30	C-64

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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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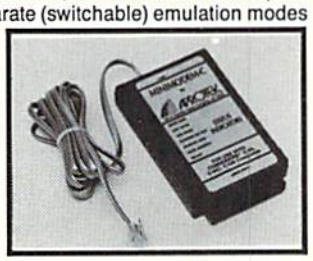

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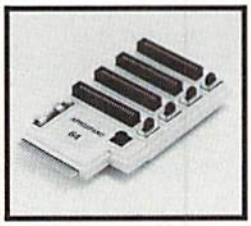

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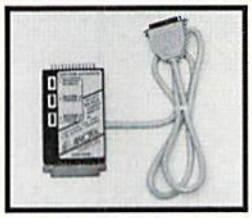

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1988 INDEX

TITLE	AUTHOR	ISSUE	PAGE	COMPUTER
Coming to a Screen Near You!	Guerra	Nov	36	C-64
Wasteland	Ryan	Dec	28	C-64
Letters for You; Numbers Count; Opposites Attract	Latocha, M.	Dec	28	C-64
Arkanoid	Latocha, W.	Dec	30	C-64
MainFrame	DiPrete	Dec	32	C-64
Jinxter	Kimball	Dec	32	C-64
The Hunt for Red October	Guerra	Dec	32	C-64
Star Empire	Ryan	Dec	34	C-64
MAE, Version 5.1	Broussard	Dec	34	C-64
4×4 Off-Road Racing	Wasser	Dec	35	C-64
The Shadows of Mordor	Kimball	Dec	36	C-64
Dear Santa	Mintz	Dec	66	C-64, C-128
TELECOMMUNICATIONS				
RUN Term 128	Brown, T.	Jan	50	C-128
Get Your Club Online	Roberts	Apr *	43	
UTILITIES				
RUN's Checksum Program	Kodadek	Jan–Dec		C-64, C-128
Blank-It! 64	Davis	Jan	115	C-64
RUN Copy 64	Martin, Patel	Feb	58	C-64
Blank-It! 128	Elliot	Feb	98	C-128
Scratch and Save	Archibald	May	90	C-64
Unlockup	Host	Jun	66	C-64
Disk Restorer	Lawson	Jul	88	C-64
Disk File Helper	Kodadek	Aug	56	C-64, C-128
Sequential File Design	Rogers	Aug	66	C-64, C-128
The Remarkable Disk Directory	Hoffer	Aug	72	C-64
Kracking the Kernal	Ryan	Sep	90	C-64
Mass File Deleter	Lawson	Nov	96	C-64, C-128

Note: An asterisk (*) denotes that the printed article contained some error that was later corrected in a RUN Amok item. See the RUN Amok section, below, for the issue containing the correction.

Index of 1988 RUN AMOK Corrections

TITLE OF CORRECTED ARTICLE	PUBLISHED	PAGE	—CORRECTION PUBLISHED— MONTH	PAGE
Magic Trick $43E	Nov '87	12	Apr	87
Magic Trick $44D	Nov '87	124	Apr	87
Software Gallery	Dec '87	32	Apr	87
Commodore Clinic	Feb '88	86	Apr	87
Commodore Lanes	Mar '88	88	Aug	93
Get Your Club Online	Apr '88	44	Aug	93
Form Writer	Jun '88	46	Aug	93
Commodore Clinic	Jun '88	76	Sep	86
Travel Tally	Jul '88	70	Sep	86
Rapid Transit Systems	Aug '88	63	Nov	19
So. . .You Want to Be a Power User?	Sep '88	36	Nov	19

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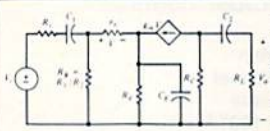

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MARKETING MACHINATIONS—

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THE TALE OF THE MOUSE AND THE RAM—

With the increased popularity of the mouse and RAM expander for the Commodore computers, it's become more and more important for Basic programmers to create programs that utilize these peripherals. Find out how next month.

A RAINBOW OF ARTICLES—

Next month you'll also be treated to some useful applications and entertaining programs, including a kinetic art program that will mesmerize you with colorful, undulating shapes and designs. We'll also present our regular features and columns, including reviews, news, hints and tips, answers to readers' questions and much, much more to help you get the most out of your Commodore computing system. Don't miss it!

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Reader Service		Page
49	Absolute Entertainment	15
7	Access Software	57
108	Accolade	48
40	ActionSoft	55
231	Advanced Solutions	93
79	Aprotek	91
241	Arcadia	51
134	Berkeley Softworks	61
81	Central Point Software	80
*	Cinemaware Corp.	41
64	CompuServe	53
226	Computer Repeats	54
166	Creative Micro Design	87
*	Crown Custom Covers	87
50	Data East USA, Inc.	CIII
154	Datel Computers	2, 3
235	Demonware	59
46	Digital Solutions	9
27	Digital Solutions	11
97	Digital Solutions	13
153	EPYX	CII
12	EPYX	21
105	EPYX	23
85	EPYX	24, 25
158	Entertainment On-Line	87
248	Interplay	29
227	Konami	38, 39
66	Loadstar	1

Reader Service		Page
*	Lyco Computer	64
68	MicroProse Software	CIV
103	MicroProse Software	27
98	Montgomery Grant	67
*	NRI Schools	33
58	Origin Systems	4
15	Protecto's Computer Direct.	46, 47
224	Rainbird	7
232	Renco Computer	93
*	*RUN*	
	RUN Subscription	16
	RUN Works	32
	GEOS	49
	ReRUN Subscription	64D
	Class Ads	94–95
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245	Software Discounters of America	70, 71
111	Software Simulations	30
26	SubLogic Corp.	31
87	SubLogic Corp.	83
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155	Tenex Computer	81
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209	Tussey Computer	17–19
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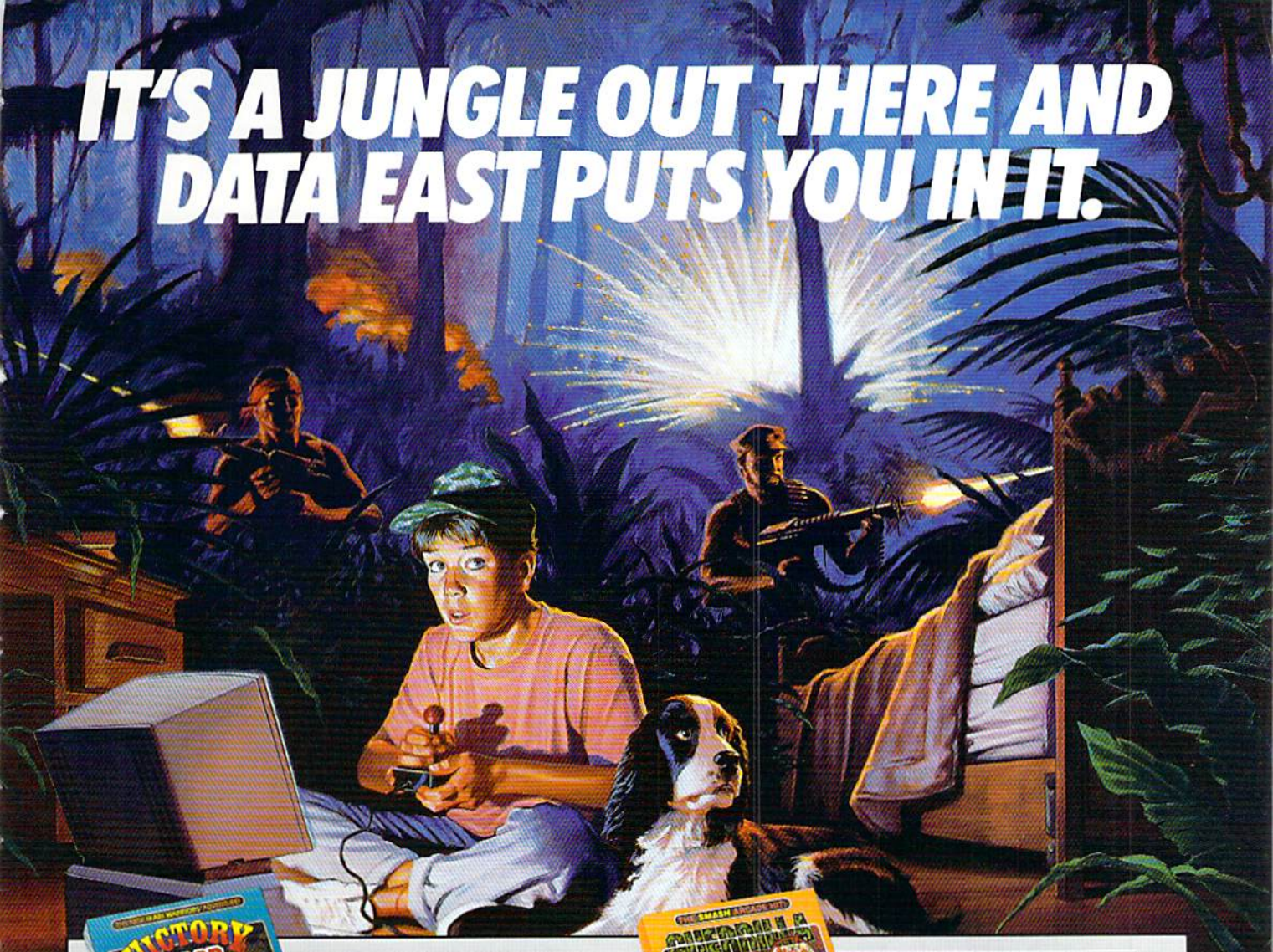

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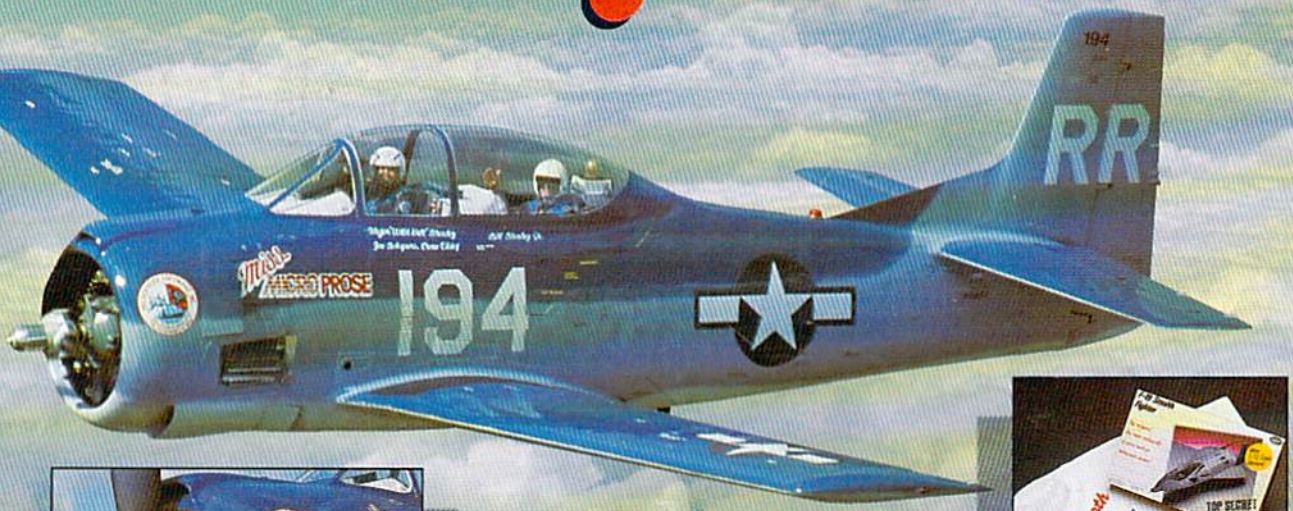

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