Commodore MAGAZINE

▸ Rosy Future for C-128?

RUN

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March 1990
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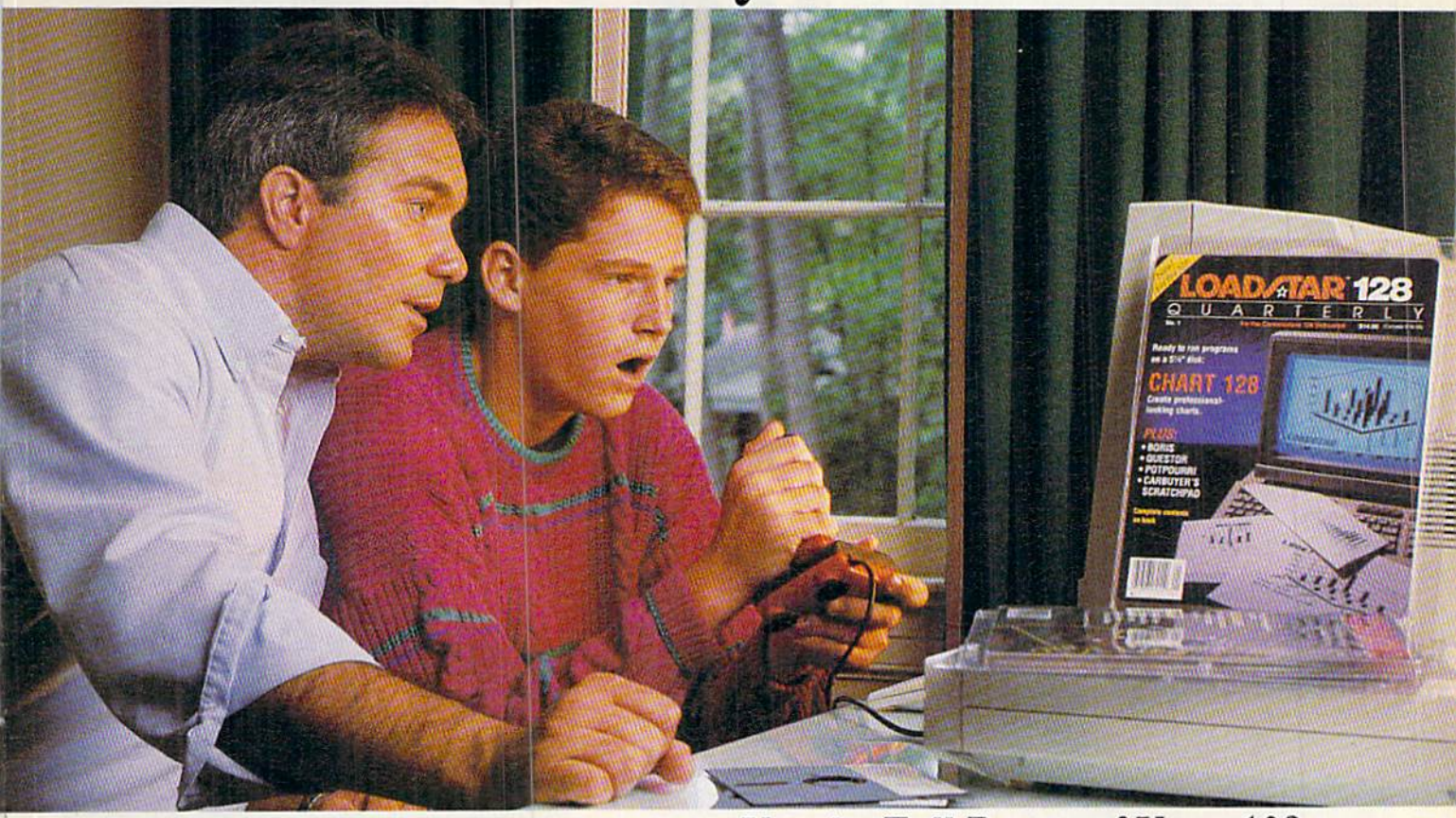

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*** Do you begin typing in listings like a lamb but finish like a lion? These programs are available on the March–April 1990 ReRUN disk. To order, see the card at page 32.**

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RUNning Ruminations

Are user groups in trouble?

I have to wonder as I witness one user group after another shifting focus to accommodate the growing number of members who prefer the Amiga or MS-DOS machines to the 64 or 128.

Too many user groups are dropping the Commodore from their title and substituting the word Computer. So, for example, the Smallville Commodore User's Group becomes the Smallville Computer User's Group.

User groups are obviously wrestling with the attempt to meet the interests of *all* members, including those former C-64/128 users who have upgraded to other machines.

User groups join the growing list of generic items.

This is a bad sign for the remaining faithful. Once a haven for Commodore computer users to gather and share information about computing, user groups are becoming meeting places for users with disparate interests.

Where club members used to experience a sense of belonging, many now feel a sense of loss. Users of the Commodore 8-bit machines attend monthly meetings to chat with people who share common interests. Now they're often confronted with unfamiliar hardware such as add-on boards and strange-sounding software and accessories. The 386 vs. 286 debate means very little to the C-64 user who needs help with his 1541 disk drive.

Whatever problems Commodore computerists had with their machines, other club members probably experienced a similar problem at one time or another and therefore could offer a solution. But is the Amiga 2000 owner who has just added a 40-meg hard drive to his system interested in how the C-64 owner can get his printer to underline, or vice versa?

And there's not much opportunity for software exchange among members whose systems are incompatible. How much interest does a C-64 user have in a software demo that requires 40 megabytes and something called a Hercules card?

At many user group meetings today, less than 50 percent of the programs, discussions and demonstrations apply to 64/128 users.

User groups today are taking their lead from Commodore, which is attempting to repair its badly damaged image by shifting its focus to the Amiga and MS-DOS lines. As Commodore continues to abandon the 8-bit market, it becomes imperative for existing clubs to redouble their efforts to support the loyal 8-bit users. Many first-time users need to turn to their group, one of the last remaining bastions of support for users. Without the continued support of user groups, the C-64/128 reaches orphan status very quickly.

User groups must address the problem of how to accommodate the rising interest in new machines, while at the same time continuing to serve the needs of the existing and potential 8-bit community. If you notice a shift of focus in your club, make sure that your interests are addressed at your club meetings. Don't let this valuable source of help and information dry up.

Dennis Brisson

Dennis Brisson
Editor-in-Chief

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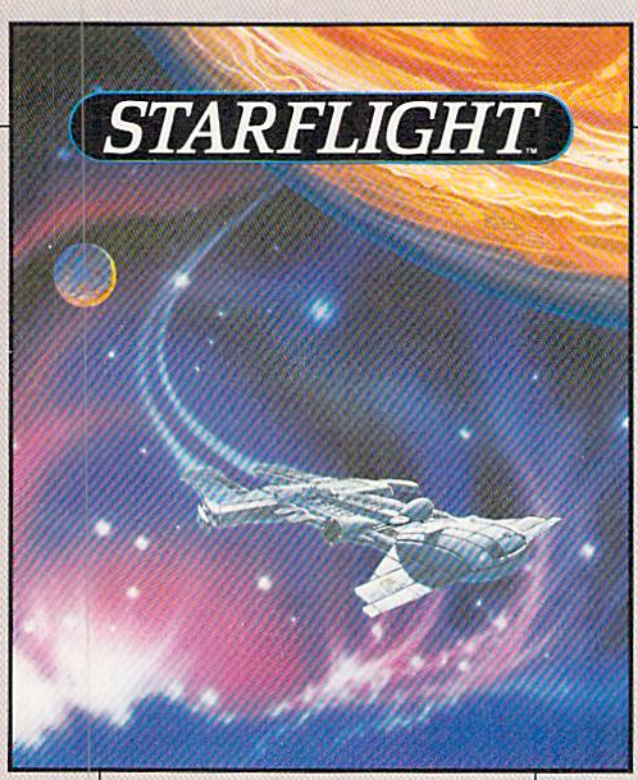
Boldly go where no game has gone before.



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MAGIC

Access Fast mode on your C-128—in C-64 mode; display all characters on the screen at once; put word wrap into your adventure game programs.

By TIM WALSH

$580 1764 RAM EXPANDER DISCOVERIES

As a Commodore Service Technician, my curiosity was piqued by stories of the C-64's 1764 RAM Expander usage in 128 mode. I plugged the unit into a C-128 to discover for myself if it would work. Lo and behold, all RAM expansion-compatible software worked fine with it, including GEOS!

My next step was to upgrade the 1764's stock 256K of RAM to the 512K offered by the hard-to-find Commodore 1750 RAM Expander. With eight low-profile 16-pin IC sockets and eight 41256-2 RAM chips in hand, I opened the 1764's case. First, I removed the solder in the 1764's empty circuit holes and soldered in the IC sockets. Next, I plugged the eight RAM chips into the sockets, carefully observing the proper position of pin 1.

With its new double-capacity RAM in place, my beefed-up 1764 passed all the 1750 diagnostic tests. After many months of use, GEOS 64 and 128 and Digital Solution's Pocket Series software still work fine on it. Any C-128 owner with a steady soldering hand can do the same to a 1764.

—SCOTT SUMIDA, KAILUA, HI

$581 RELOCATABLE RAM ENHANCER

Many Commodore computerists want to know how to access their 1700, 1750 or 1764 REU from outside of programs such as GEOS. Well, look no further. Relocatable 64 RAM Enhancer can be placed virtually anywhere in free memory.

Designed to help programmers access the REU more easily, Relocatable 64 RAM Enhancer provides the C-64 with an elaborate SYS command. By changing the values associated with the SYS command, this program provides the functional equivalent of the C-128's Basic 7.0 Stash, Fetch and Swap commands used to move data to and from the REU.

```
Ø REM RELOCATABLE C-64 RAM ENHANCER - MICH
  AEL MYERS                          :REM*235
1Ø AD=49152:SA=AD                    :REM*79
2Ø READQ:IF Q=256 THEN 4Ø            :REM*223
3Ø POKE AD,Q:AD=AD+1:GOTO 2Ø         :REM*1Ø
4Ø PRINTCHR$(147)"RAM ENHANCER SYNTAX:
                                     :REM*85
5Ø PRINT:PRINT"SYS"SA",A,B,C,D,E"    :REM*19Ø
6Ø PRINT"A = COMPUTER STARTING ADDRESS"
                                     :REM*161
7Ø PRINT"B = COMPUTER ENDING ADDRESS+1"
                                     :REM*24Ø
8Ø PRINT"C = REU STARTING ADDRESS":REM*181
9Ø PRINT"D = REU BANK, AS FOLLOWS:"
                                     :REM*249
1ØØ PRINTTAB(6)" 17ØØ = Ø-1"        :REM*31
11Ø PRINTTAB(6)" 1764 = Ø-3"        :REM*151
12Ø PRINTTAB(6)" 175Ø = Ø-7"        :REM*184
13Ø PRINT"E = OPERATION (Ø-2), AS FOLLOWS:
    "                                :REM*158
14Ø PRINTTAB(6)" Ø = STASH"         :REM*16Ø
15Ø PRINTTAB(6)" 1 = FETCH"         :REM*122
16Ø PRINTTAB(6)" 2 = SWAP"           :REM*94
17Ø DATA 32,253,174,32,138,173,32,247,183,
    14Ø,2,223,141,3,223,32,253,174,32
                                     :REM*213
18Ø DATA 138,173,32,247,183,56,165,2Ø,237,
    2,223,141,7,223,165,21,237,3     :REM*141
19Ø DATA 223,141,8,223,32,253,174,32,138,1
    73,32,247,183,14Ø,4,223,141,5    :REM*132
2ØØ DATA 223,32,253,174,32,158,183,138,41,
    7,141,6,223,32,253,174,32,158    :REM*243
21Ø DATA 183,12Ø,169,127,141,13,221,138,41
    ,3,9,128,141,1,223,165,1,41      :REM*156
22Ø DATA 252,133,1,141,Ø,255,165,1,9,3,133
    ,1,169,144,141,13,221,88,96,Ø    :REM*31
23Ø DATA 256                         :REM*71
```

—MICHAEL MYERS, BEARDSTOWN, IL

$582 SPRITE PULSATOR 64

Need to add a little flash to those dull pointers in your menu programs? Or maybe you just want an unusual sprite? Then use Sprite Pulsator 64! Activate this machine language program, and sprite 1 pulsates in shades of blue. It's attractive, short and lends variety to any program that utilizes sprites.

```
Ø REM SPRITE PULSATOR 64 - JEFFREY PANICI
                                     :REM*65
1Ø PRINTCHR$(147)"CHECKING";:CK=.    :REM*2Ø3
2Ø S=49152:FORX=STOS+58:READD:POKEX,D:CK=C
   K+D:PRINT"{HOME}"TAB(1Ø);CK:NEXT:REM*7Ø
3Ø IFCK<>5313THENPRINT"ERROR!":END   :REM*77
4Ø FORX=12288TO12288+64:POKEX,255:NEXT
                                     :REM*78
5Ø PRINT"{SHFT CLR}":POKE53248+21,1:POKE53
   248,17Ø:POKE53248+1,17Ø:POKE2Ø4Ø,192:SY
   S49152                             :REM*9
6Ø REM INTERRUPT DATA               :REM*187
7Ø DATA 12Ø,169,13,141,2Ø,3,169,192,141,21
   ,3,88,96,172,6Ø,3,136,14Ø,6Ø      :REM*183
8Ø DATA 3,2Ø8,24,16Ø,5,14Ø,6Ø,3,174,61,3,1
   89,49,192,141,39,2Ø8,232,224      :REM*227
9Ø DATA 6,2Ø8,2,162,Ø,142,61,3,76,49,234,1
   ,3,14,6,14,3,153,55,24Ø,19        :REM*213
```

—JEFFREY PANICI, SANDWICH, IL ►

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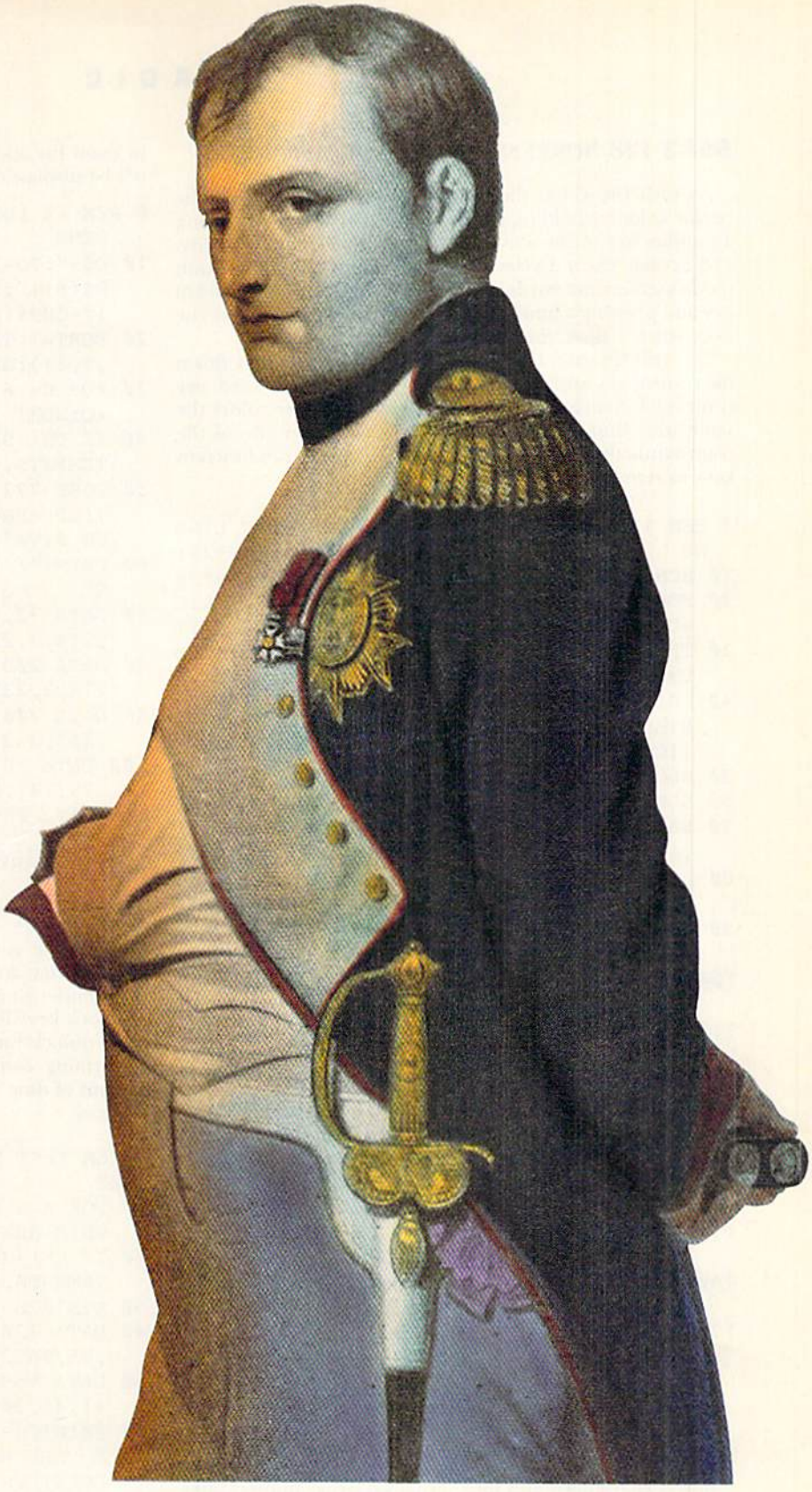

Napoleon Bonaparte

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$583 128 Screen Color Cycler

As with the C-64, the C-128 allows you to change the cursor color by holding down the control key and pressing a number key. After activating my machine language utility, 128 Screen Color Cycler, you can change the 40-Column mode's screen and border colors by holding down the control key and pressing a function key. The color changes will occur even when a Basic program is running!

To cycle forward through the screen colors, hold down the control key and press the F1 key. To cycle backward, use control/F3. Similarly, F5 and F7 cycle the border colors the same way. Best of all, 128 Screen Color Cycler use of the control/function key combinations allows the C-128 function keys to remain unaltered by this program.

```
Ø REM 128 SCREEN COLOR CYCLER - JAMES LIND
  LY                                  :REM*2Ø1
1Ø SCNCLR:TRAP6Ø:FAST                 :REM*38
2Ø FOR I = 3Ø74 TO 3257:READ ML:POKEI,ML:C
   =C+1:NEXT                          :REM*111
3Ø IF C<>184THENPRINT"ERROR IN DATA STATEM
   ENTS!!!":END                       :REM*168
4Ø PRINT"{CRSR DN}TYPE: SYS 3Ø74 TO {CTRL
   9}ENABLE{CTRL Ø} - SYS 3244 TO{2 SPACEs
   }{CTRL 9}DISABLE{CTRL Ø}"          :REM*78
5Ø SLOW:END                           :REM*46
6Ø SLOW:HELP                          :REM*217
7Ø DATA 12Ø,173,2Ø,3,141,Ø,12,173,21,3,141
   ,1,12,169,116,141,2Ø,3,169,12      :REM*188
8Ø DATA 141,21,3,169,Ø,133,17Ø,133,171,165
   ,17Ø,141,32,2Ø8,141,33,2Ø8         :REM*114
9Ø DATA 232,2Ø8,253,23Ø,17Ø,2Ø8,241,88,169
   ,251,141,33,2Ø8,133,17Ø,169        :REM*131
1ØØ DATA 253,141,32,2Ø8,133,171,96,234,165
    ,212,2Ø1,5,2Ø8,3,76,91,12,165     :REM*143
11Ø DATA 212,2Ø1,4,2Ø8,53,23Ø,17Ø,165,17Ø,
    141,33,2Ø8,76,1Ø4,12,234,234      :REM*31
12Ø DATA 234,198,17Ø,165,17Ø,141,33,2Ø8,23
    4,234,234,234,234,234,232,2Ø8     :REM*183
13Ø DATA 253,2ØØ,2Ø8,25Ø,1Ø8,Ø,12,234,234,
    234,165,211,2Ø1,4,2Ø8,244,76      :REM*2Ø5
14Ø DATA 63,12,1Ø8,128,Ø,234,234,234,165,2
    12,2Ø1,3,2Ø8,3,76,159,12,165      :REM*182
15Ø DATA 212,2Ø1,6,2Ø8,22Ø,23Ø,171,165,171
    ,141,32,2Ø8,76,1Ø4,12,234,234     :REM*247
16Ø DATA 234,198,171,165,171,141,32,2Ø8,76
    ,1Ø4,12,234,234,234,173,Ø,12      :REM*227
17Ø DATA 141,2Ø,3,173,1,12,141,21,3,88,96
                                      :REM*91
```

—James Lindly, Waynesville, MO

$584 Low/High Byte Converter 64

Both experienced and inexperienced programmers alike will find Low/High Byte Converter 64 an invaluable addition to their collection of programming utilities. This program adds two new Direct Mode commands that make working with two-byte values a breeze.

The first command, ↑ (followed by a number), instantly converts a number into low byte/high byte format. The second command, / (number), peeks a two-byte pointer (vector) and displays its address in memory. For example, if you want to know the address of the IRQ vector, just enter / 788, and it'll be displayed for you.

```
Ø REM 64 LOW/HIGH BYTE CONVERTER - RICHARD
   PENN                               :REM*234
1Ø D$=":?O-256*INT(O/256);:?INT(O/256)"+CH
   R$(Ø)+":?P{SHFT E}(O)+256*P{SHFT E}(O+1
   )"+CHR$(Ø)                         :REM*9Ø
2Ø FORT=1 TO LEN(D$):POKE819+T,ASC(MID$(D$
   ,T,1)):NEXT                        :REM*21
3Ø FOR U= 679 TO 756:READ Q:POKE U,Q:CK=CK
   +Q:NEXT                            :REM*115
4Ø IF CK<>9Ø12 THENPRINT"ERROR IN DATA STA
   TEMENTS...":END                    :REM*173
5Ø POKE 772,167:POKE 773,2:PRINT"{SHFT CLR
   }{UP ARROW} (NUMBER) CONVERTS TO LOW/HI
   GH BYTE"                           :REM*48
6Ø PRINT"/ (NUMBER) DISPLAYS VECTOR ADDRES
   S"                                 :REM*75
7Ø DATA 72,138,72,173,Ø,2,2Ø1,94,2Ø8,15,32
   ,214,2,232,189,52,3,157,7,2        :REM*2
8Ø DATA 2Ø8,247,76,2Ø8,2,2Ø1,47,2Ø8,12,32,
   214,2,232,189,84,3,157,7,2         :REM*193
9Ø DATA 2Ø8,247,1Ø4,17Ø,1Ø4,76,124,165,162
   ,255,232,189,Ø,2,2Ø8,25Ø,169       :REM*27
1ØØ DATA 58,157,Ø,2,232,224,8,144,248,169,
    79,141,Ø,2,169,61,141,1,2,162     :REM*11
11Ø DATA 255,96                       :REM*114
```

—Richard Penn, Montreal, Quebec, Canada

$585 Fast Mode via Caps Lock

If you use your C-128 a lot, you'll appreciate this short program that accesses the C-128's Fast mode while you're in C-64 mode! Simply run the program below and depress the caps-lock key. To return to Slow mode and get your screen back, unlock the caps-lock key. This program is great for performing complex math functions or for reducing the amount of time it takes to get lots of machine language into memory.

```
Ø REM FAST MODE VIA CAPS LOCK CHRIS REYNOL
  DS                                  :REM*81
1Ø FOR A = 828 TO 863:READ B :POKE A,B:CK=
   CK+B:NEXT                          :REM*1Ø3
2Ø IF CK<>3654 THENPRINT"ERROR IN DATA STA
   TEMENTS...":END                    :REM*129
3Ø SYS 828                            :REM*16Ø
4Ø DATA 12Ø,169,74,141,2Ø,3,169,3,141,21,3
   ,88,96,234,165,1,41,64,24Ø,8       :REM*6Ø
5Ø DATA 169,Ø,141,48,2Ø8,76,49,234,169,3,1
   41,48,2Ø8,76,49,234                :REM*131
6Ø PRINTCHR$(147)"PRESS CAPS LOCK TO ACCES
   S FAST MODE"                       :REM*122
7Ø PRINT"PRESS IT AGAIN TO DEACTIVATE."
                                      :REM*57
```

—Chris Reynolds, Lismore,
New South Wales, Australia

$586 Calling All Characters!

Getting all the upper- and lowercase letters and graphics characters displayed on the C-64 screen at the same time is ►

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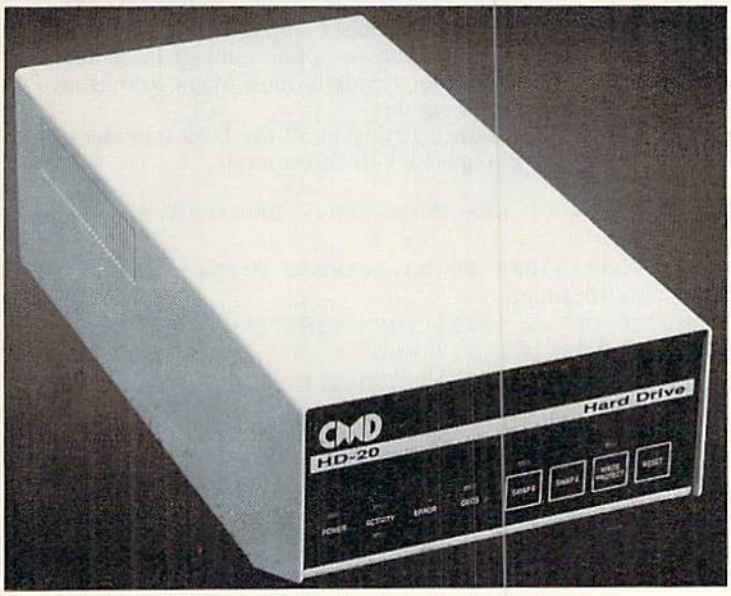

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no small feat. My C-64 program, Lowercase in Reverse Uppercase, lets you print lowercase letters along with the normal uppercase letters. It also displays on the screen characters produced by pressing the Commodore or shift key with any alphabet key.

When you run the program, press control/9 to access the lowercase characters. When this program is active, the cursor is invisible in Direct mode. Just press the Commodore and shift keys or enter PRINT CHR$(14) to display the cursor.

```
Ø REM C-64 LOWERCASE IN REVERSE UPPERCASE
  - CHRIS REYNOLDS                    :REM*72
1Ø FOR T=49152 TO 4922Ø:READ D:POKE T,D:CK
  =CK+D:NEXT                          :REM*192
2Ø IF CK<>9197 THEN PRINT"ERROR IN DATA ST
  ATEMENTS...":END                    :REM*77
3Ø SYS 49152                          :REM*2Ø4
4Ø DATA 12Ø,169,115,133,1,189,Ø,2Ø8,157,Ø,
  48,232,2Ø8,247,238,7,192,238        :REM*235
5Ø DATA 1Ø,192,173,1Ø,192,2Ø1,64,2Ø8,234,1
  69,2Ø8,141,7,192,169,48,141         :REM*181
6Ø DATA 1Ø,192,169,119,133,1,88,162,2Ø8,18
  9,7,56,157,7,52,2Ø2,2Ø8,247         :REM*25
7Ø DATA 169,Ø,162,8,157,255,52,2Ø2,2Ø8,25Ø
  ,169,28,141,24,2Ø8,96               :REM*88
```

—CHRIS REYNOLDS, LISMORE, NEW SOUTH WALES, AUSTRALIA

$587 WORD WRAP 64/128

As I was developing a text adventure, I realized that I needed to print rather long words (strings) to the screen without their breaking at the end of the line. I wrote this short word-wrap routine to solve this problem, and it works on both the 64 and 128. Just put your text after A$, as shown in the program. To use the program in 80-Column mode, change the value of C in line 30 to 79.

```
Ø REM WORDWRAP 64 & 128 - JEFF PANICI
                                      :REM*225
1Ø REM PASS STRING IN A$ TO SUBROUTINE
                                      :REM*226
2Ø PRINTCHR$(147):GOTO9Ø              :REM*222
3Ø L=LEN(A$):X=1:C=39:REM C=79 FOR 8Ø COLU
  MN                                  :REM*88
4Ø W$=""                              :REM*11
5Ø L$=MID$(A$,X,1):W$=W$+L$:X=X+1:IFL$=" "
  ORX>LTHENGOTO7Ø                     :REM*99
6Ø GOTO5Ø                             :REM*19Ø
7Ø PRINTCHR$((POS(.)+LEN(W$)>C)*-13);W$;:I
  FX>LTHENRETURN                      :REM*222
8Ø GOTO4Ø                             :REM*2Ø8
9Ø REM SAMPLE TEXT STRING             :REM*115
1ØØ A$="THIS IS A SAMPLE STRING OF TEXT TH
    AT WON'T BREAK ON THE BORDER WHEN"
                                      :REM*83
11Ø A$=A$+" PRINTED TO THE SCREEN WITH WOR
    DWRAP 64 & 128.":GOSUB3Ø          :REM*193
```

—JEFFREY PANICI, SANDWICH, IL

$588 DATA STATEMENTS MADE EASIER

To facilitate typing in Data statements on your C-64, I wrote F1 Key Enhancer. After you run the program, press the F1 key to print a line number followed by the word DATA; then type in the data for that line. When you reach the end of the line, don't press the return key. Instead, press F1 again, and it will automatically advance to the next line, complete with a new line number and the word DATA. As written, the program defaults to a line number increment of 10, which is perfect for typing in most Magic listings, as well as many other programs.

When you've finished typing in all the Data statements, just press return to get back to Direct mode.

```
Ø REM 64 F1 KEY ENHANCER - DAN GOODELL
                                      :REM*2Ø9
1Ø FORT=53ØØØ TO 53112:READ D:POKE T,D:CK=
  CK+D:NEXT                           :REM*89
2Ø IF CK <> 12436 THENPRINT"ERROR IN DATA
  STATEMENTS...":END                  :REM*194
3Ø PRINTCHR$(147)"TOGGLE F1 KEY WITH SYS 5
  3ØØØ"                               :REM*79
31 SYS 53ØØØ                          :REM*148
1ØØ DATA 24,144,16,1,Ø,1,Ø,Ø,13,48,49,48,4
    8,68,65,84,65,32,1,12Ø,174,2Ø     :REM*169
11Ø DATA 3,172,21,3,173,119,2Ø7,141,2Ø,3,1
    73,12Ø,2Ø7,141,21,3,142,119       :REM*1Ø6
12Ø DATA 2Ø7,14Ø,12Ø,2Ø7,88,96,165,197,2Ø5
    ,26,2Ø7,24Ø,57,141,26,2Ø7,2Ø1     :REM*6
13Ø DATA 4,2Ø8,5Ø,162,3,189,12,2Ø7,9,48,15
    7,17,2Ø7,2Ø2,16,245,16Ø,246       :REM*49
14Ø DATA 185,26,2Ø6,32,53,235,2ØØ,2Ø8,247,
    174,11,2Ø7,248,16Ø,2,185,12       :REM*23
15Ø DATA 2Ø7,24,1Ø5,1,41,15,153,12,2Ø7,2Ø8
    ,3,136,16,24Ø,216,2Ø2,2Ø8,233     :REM*238
16Ø DATA 76,54,2Ø7                    :REM*181
```

—DAN GOODELL, CONCORD, CA

$589 GET RID OF BORING GETS

Rather than staring at a dull screen while awaiting input, make the C-64's screen border come alive with colors! After running my program, simply put SYS 49152 before every Get statement in your own programs—your screens will never look dull again!

```
Ø REM BORING GET IS GONE - MICHEAL GRIMM
                                      :REM*79
1Ø FORT= 49152 TO 49167:READD:POKE T,D:NEX
  T                                   :REM*235
2Ø PRINTCHR$(147)"PRESS A KEY":SYS49152:GE
  TA$:IF A$=CHR$(32)THEN A$="SPACEBAR"
                                      :REM*65
3Ø IF A$=CHR$(13)THEN A$="RETURN"     :REM*9Ø
4Ø PRINTCHR$(147)"YOU PRESSED ";A$    :REM*97
5Ø DATA 169,Ø,141,198,Ø,238,32,2Ø8,173,198
  ,Ø,2Ø1,Ø,24Ø,246,96                 :REM*23Ø
```

—MICHAEL GRIMM, SANDWICH, IL

$58A C-128 GAME PROMPT

You may have admired games where words were displayed on the screen in quadruple-sized characters to draw attention. Here's an easy-to-learn technique for including similar prompts in your own C-128 games. Just use the Ready Routine in 40-Column mode. It prints the word READY and

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plays a little ditty. Try changing the prompt and music to suit your own games.

```
Ø REM C-128 READY! ROUTINE - JEFFREY PANIC
  I                                  :REM*175
1Ø GRAPHIC1,1:COLORØ,1:COLOR4,1:GRAPHICØ:S
   CNCLR:DIM CL(6),G$(8):COLOR5,1    :REM*47
2Ø GRAPHIC2,Ø,1:FORS=1TO8:BOXØ,Ø,Ø,24,21,Ø
   ,1:A$=MID$("READY!",S,1):CHARØ,1,1,A$:S
   SHAPE G$(S),1,1,24,21:SPRSAV G$(S),S:NE
   XT:GRAPHIC.                        :REM*98
3Ø A$="O2T1GABCDE#FGG#FEDCBAG":FORX=1TO5:S
   PRITEX,1,2,,1,1,Ø:NEXT             :REM*217
4Ø FORX=1TO5:MOVSPRX,2Ø*X+1Ø2,14Ø:NEXT:CHA
   R,16,15,"{CTRL 7}PLAYER 1":PLAYA$
                                      :REM*169
5Ø FORX=1TO5Ø:POKE53248+21,.:SLEEP.9999999
   99:POKE53248+21,255:NEXT           :REM*138
6Ø RESTORE6Ø:FORJ=1TO6:READCL(J):NEXT:DATA
    7,15,4,2,7,1                      :REM*67
7Ø J=1:DO:FORX=1TO5:SPRITEX,1,CL(J):NEXTX:
   J=J+1:LOOPUNTILJ=6:FORJ=1TO6:COLOR5,CL(
   J):CHAR,16,15,"PLAYER 1":SLEEP1:NEXT:CH
   AR,15,15,"{9 SPACEs}"              :REM*97
8Ø POKE53248+21,Ø:PRINT"{CTRL 2}"  :REM*158
```

—JEFFREY PANICI, SANDWICH, IL

$58B ACCESSING 1581 PARTITIONS

If you've tried accessing 1581 disk partitions from within applications software without success, try this. As a demonstration, I'll show you how it's done with *RUN*'s word processor, RUN Script. Select the Disk Command option (F1,>) and enter: /partition name. Accessing the directory will then reveal the partition's contents.

To return to the drive's root directory, select the Disk Command option again and enter /. The syntax is the same, whether you're using a C-64 or a C-128. Experiment for a while with this technique and a partitioned 3½-inch disk, and I think you'll find that it's a truly helpful trick to have on hand.

—TIM WALSH, MAGIC COLUMNIST ■

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

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

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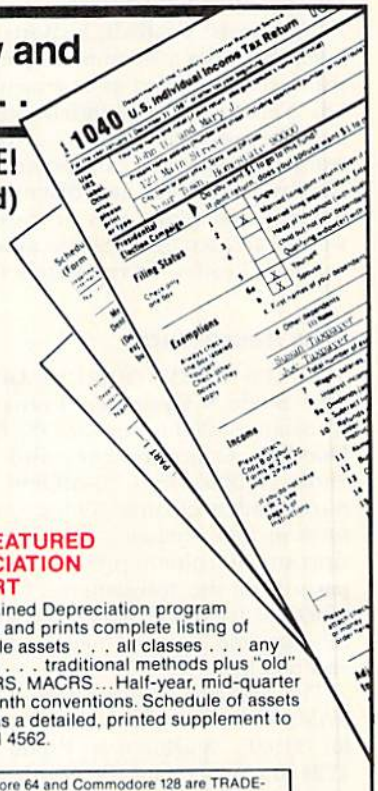

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News and New Products

Deliver hot pizza to a millionaire and avoid the Noid; QuantumLink elects new members to its board.

By HAROLD R. BJORNSEN

Be a Hero

WESTLAKE VILLAGE, CA—Cinemaware (4165 Thousand Oaks Blvd., Westlake Village, CA 91362) has released two games for the C-64 for $29.95 each.

Azazael the **DeathBringer** is alive and well, and he hungers for revenge against the peaceful inhabitants of Mezron. Players take on the role of a barbarian hero in a race against evil, as the Barbarian and DeathBringer vie for the five powerful gems of Zator. The game takes you beyond a dungeon universe, into a region where you explore dark castles, hidden forests, forbidding towers and secret temples.

TV Sports: Football, a sports simulation, includes a 28-team league, a 16-game schedule and post-season playoffs. Each team has different offensive and defensive tendencies, so no two teams are alike. You can choose from a variety of offensive and defensive formations and plays, and no two plays will be executed in exactly the same way.

Check Reader Service number 400.

How About That!

NORTH HOLLYWOOD, CA—**Ante Up, The Basic 8 Graphics Translator**, translates 40-column GEOS, Koala, Doodle!, ComputerEyes and Print Shop graphics into 80-column Basic 8-compatible pictures. On-screen features include changing 80-column cell sizes and 40-column preview and comparison of the translations. Basic 8's functions let you change the color and cell size and flip and negate pictures and brushes.

The package requires 64K of video RAM, and it's available for the C-128 for $19.95. Starfollower Productions, 4224 Bakman, Suite B, North Hollywood, CA 91602.

Check Reader Service number 404.

Stop Operation Big Brother

SAN MATEO, CA—**Empire**, a graphic war simulation for the C-64, has been released by Electronic Arts (1820 Gateway Drive, San Mateo, CA 94404). As William P. Brown, Captain of U.G.A.S. Britannia, you have been assigned to patrol the region of Alliance space and intercept as many Krellan vessels as possible. You must attempt to stop Operation Big Brother, a plan developed by the Krellan Empire to install its own generals as emperors on each of the planets of Alliance. The one- to three-player game between human and computer players has multiple difficulty levels and millions of different worlds. It's available for $39.95.

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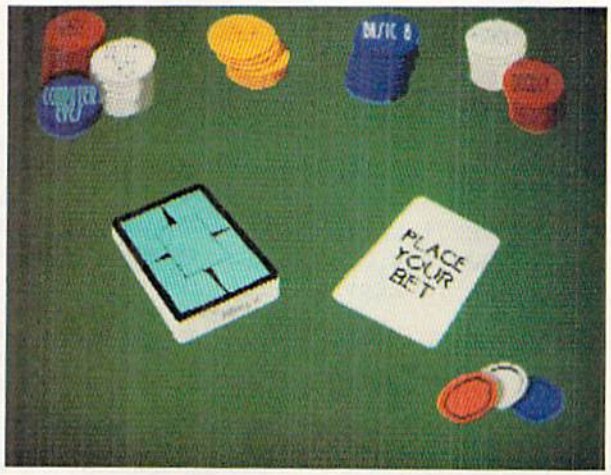

The graphics menu for Ante-Up lets you choose the 40-column graphics format pictures to convert into 80-column format.

Two Cartoon Games

GRANADA HILLS, CA—MicroIllusions (17408 Chatsworth St., Granada Hills, CA 91344) has released two Hanna-Barbera games for the C-64, priced at $34.95 each.

In **Jonny Quest and the Splinter of Heaven**, Jonny Quest and his team go to the jungles of Guatemala to investigate the mysterious disappearance of several Mayan artifacts.

Three mysteries are included in **Scooby Doo**: The Mystery of the Abominable Snowman, Aroka the Sea Monster and Daymen's Haunted Mansion. Played in a fully explorable 3-D world, evidence could be hidden anywhere, and your suspicions will be raised by talking with the many distinct characters. Some of the arcade sequences included in the game are downhill ski slalom, mountain climbing, cliff diving and snorkeling.

Check Reader Service number 402.

What, Me Worry?

CHICAGO—Americans worry more about their computers than they do about such social issues as AIDS, the homeless and child abuse, according to the findings reported by the Encyclopaedia Brittanica's Instant Research Service, which were based on an analysis of 172,000 inquiries received during 1989. Among the ten most requested reports were on selecting a personal computer, establishing a small business and ideas for making money at home.

Protect Your Pepperonis!

CHANDLER, AZ—In **Avoid the Noid**, an arcade game for the C-64, an eccentric millionaire has been waiting for years to get steaming hot pizza. But he won't budge from his home on the 30th floor of a dark, booby-trapped high-rise, infested with vicious Noids—beady-eyed creatures bred to search out and destroy pizzas. Your assignment, of

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course, is to deliver the pizza intact to the millionaire. There are 30 floors of traps and surprises and nasty Noids, and each level increases in difficulty, with new sets of obstacles requiring different strategies and gameplay. It's available for $14.99 from ShareData, Inc., 7400 W. Detroit St., C-170, Chandler, AZ 85226.

Check Reader Service number 403.

TRIUMVIRATE

VIENNA, VA—Quantum Computer Services, which provides the QuantumLink telecommunications service to C-64 and C-128 users, has announced the election of **Alexander M. Haig, Jr.**, **Mark M. Edmiston** and **Harold D. Copperman** to its board of directors.

Currently, Haig is President of Worldwide Associates, Inc., a Washington, DC-based organization that assists public and private corporations in developing and implementing marketing and acquisition strategies.

Mark Edmiston is the Chairman and Chief Executive Officer of *The Cable Guide* magazine and founder of *Hippocrates Magazine*.

Harold Copperman is President and Chief Operating Officer of Commodore Business Machines, Inc., and former Vice President and General Manager at Apple Computers.

GENIE ADDS TWO ROUNDTABLES

ROCKVILLE, MD—GEnie Information Services (401 North Washington St., Rockville, MD 20850) has added two RoundTables to its telecommunications services for C-64 and C-128 users. The RoundTables are available by subscribing to the online service.

The **Hobby RoundTable** serves as an online forum for the discussion of hobby-related topics and as a library of hobby-related text files and programs. Some of the hobbies discussed include model aviation, model boating, radio-controlled cars, games and collectibles.

In the **Show Biz RoundTable**, subjects discussed include movies, Hollywood, television, soap operas, videotapes and disks, the theatre, home entertainment, technology and music.

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A GEM OF A UTILITY DISK

MAITLAND, FL—JEM Software (1302 Druid Rd., Maitland, FL 32751) has released the **80-Column Application Program Disk** for the C-128. The package includes an income tracker to monitor your income and investments for preparation of estimated tax; a mortgage calculator that lists payments by month or year, in addition to payment number and loan status for each payment; Graphmaker 128, which lets you create bar graphs with up to 72 colored bars; and two disk utilities that let you examine disk files and lock or unlock disk files. The package is available on 3½- and 5¼-inch disks for $24.

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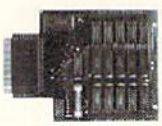

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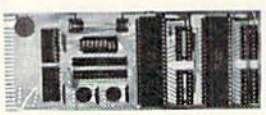

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MAIL RUN

Readers take issue with a former Commodore user, and RUN *shows how to stock your "Deep C-64 World" aquarium with exotic fish.*

How To Stock the Aquarium

I typed in the Aquarium program from the November 1989 issue of *RUN* (see "Deep C-64 World"). I used *RUN*'s Checksum program and got no errors, but when I ran the program, all I got on the screen was seaweed, water and sand—no fish! Did someone forget to stock the tank?

—Charles Bednarek
Elmira, NY

One look at the Aquarium listing you sent us revealed the problem. In the group of characters following DATA and the space after it in lines 1220–1620, you failed to include a space after the 20th character. Many readers called or wrote with the same problem, so you're not alone. To avoid confusion in future Data statements of this type, the two spaces between the 20-character groups will each be replaced with an asterisk.

—Editors

The Price Is Right

I have to agree with Gary Davidson's last statement. At your nearest clone dealer you can see a "whole new world of computing possibilities open before your eyes, with prices and features unmatched. . ." Yes, but they are twice the price of a complete C-64 system! By the way, many auto enthusiasts consider the Edsel, along with the Tucker and the DeLorean, as one of the best cars ever built.

—Roy L. Nash
Fort Meade, MD

Setting the Record Straight

It seems Gary Davidson has shown his total ignorance concerning the C-64/C-128 line. I suggest he look at your August 1989 issue for practical applications many Commodore users have for their machines (see "Sculptor, Lawyer, Editor-in-Chief"). As for productivity software, *RUN*'s article on the subject in the December 1989 issue (see "In Search of Productivity Software") shows once again that the C-64 and 128 are far more than machines for just playing games and turning on lawn sprinklers.

It's this closed-minded, misinformed thinking many IBM users like Mr. Davidson have that has turned me completely off on the whole IBM group. It seems that if you do not have one of "their" machines, you are not a serious user.

I do wonder if *they* drive Edsels!

—Scott Cheatham
Farmington, MO

Just a Kid at Heart

Mr. Davidson seems to be under the impression that computer games are played only by kids. On the contrary, many adults (myself included) play computer games for relaxation and enjoyment.

—Ben Vorhies
Vacaville, CA

So do we, Ben.

—Editors

He's Serious About Computing

In the Mail RUN department of the December issue of *RUN* (see "Commodore vs. The Clones," page 18), writer Gary Davidson says, "I've watched Commodore and magazines like yours constantly increase the promotion of games while the rest of the computer industry focused on more adult applications." In support of what Davidson wrote, I urge you to continue to devote an appreciable portion of your magazine to serious computing features.

—Loering M. Johnson
Tariffville, CT

Take a look at these serious computer applications from RUN*: "RUNbase 128," a database program, and "Money Manager" for the C-64 and C-128 (January 1990 issue); "Graphmaker," C-64 and C-128 (December 1989); "Label Base," a mailing label generator for the C-64/128 (August, 1989); plus over two dozen other application, graphics and utility programs published in* RUN *during 1989. And you can look forward to many more such programs in future issues in 1990.*

—Editors

Too Much Devoted to Games

I am not sure I understand Gary Davidson's reference to the Edsel, but I sure do understand his reasoning as to why Commodore is considered a lightweight. With so many articles and advertisements devoted to games, what other conclusion is possible?

—Richard L. West
Spring Valley, CA

As to advertising, we take all the appropriate ads we can get. It's unfortunately true that a great many of them are for games, but there's nothing we can do about that. As to articles, however, we wonder if you have us confused with some other magazine. In 1989, we published 71 feature articles. Of those, only 25 (35 percent) were games or game-related. Is that really out of proportion?

—Editors

Why, Indeed?

I couldn't believe what Gary Davidson wrote about Commodore computers and software in Mail RUN. He stated that he is an avid IBM PC user. Then why is he reading *RUN*?

—James Staff
Gray, GA

Guess he knows a good thing when he reads it.

—Editors

The Right Choice

Before I bought my C-64, I shopped around and found that it was the most affordable computer that did the things I needed of it. I currently run a small desktop publishing business and don't see the need for an upgrade in the foreseeable future. Sure, I play some games (as if IBM-cloners don't!), but I don't ►

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use my C-64 to turn on the lawn sprinklers. It's too serious a machine for that.

—ALEX TISCHENKO
MATTYDALE, NY

SHE MEANS BUSINESS

I want to see more business programs for the C-128 in 80-Column mode. I'm mainly interested in spreadsheets and databases. If you can recommend commercial or public domain packages that are easy to use and can hold their own against software for high-priced computers, I'd appreciate it.

—JENNY ADAMS
HUNTSVILLE, AL

For a current roundup of productivity programs you can use, see the feature article in RUN's *December issue, "In Search of Productivity Software."*

—EDITORS

A GOOD THING TO HAVE

Steve Vander Ark's article on geoFont (geoWatch, *RUN*, November 1989) was very informative. However, the fact that his article doesn't include the Stash/Fetch option makes me wonder if his copy of FontPack Plus is an earlier version. Use of this option would eliminate one of the author's major complaints about the FontPack editor.

—ROBERT NELLIST
BROCKPORT, NY

You're right, Bob. Author Vander Ark's version does not include that option—something he told us he wished he'd had!

—EDITORS

CHANGE OF HEART

Until recently, I was considering letting my *RUN* subscription lapse. The magazine had lost 32 pages, and the columns I wanted to read were published only every other month. Combined with the amount of game-related content added over the last year, I felt that *RUN* was not the same magazine I had originally subscribed to.

I changed my mind when I received my "last" issue. I glanced through it, then started *reading*. I liked the 128 Mode column and intend to start typing in the RUNbase 128 database program (*RUN*, January 1990) as soon as I finish this letter. My renewal card will be mailed about the same time as this letter.

—MICHAEL D. MOFFIT
SWARTZ CREEK, MI

If you've read the editors' responses to other letters in this column, Michael, then you know the kinds of programs we have in store for 1990. Thanks for staying with RUN.

—EDITORS ■

A CALL TO READERS

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

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

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By BETH S. JALA

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The Transaction option of CMS Inventory Control is where the most activity occurs (if you're not using the Point-of-Sale system). Here you record your purchases, orders, sales and returns, and adjust your balances to reflect the amount found during a physical inventory. After entering transactions, you can print, update or erase.

With the Inventory Maintenance option, you can add up to 1500 inventory items. Fifteen different fields are available, including item number, description, number sold during month-, quarter- and year-to-date, number on hand, retail price and average cost. Three features—find, search and totalize—let you do customized sorts.

You're probably wondering what you're going to get out of all the work entailed in putting your complete inventory on disk. Well, CMS Inventory doesn't disappoint when it comes to providing reports. You can print out price and file lists and sales analyses, low quantity and on-order reports.

Probably the most complicated part of this program is the Point-of-Sale option, which, however, you can use only if you have the CMS General Accounting System software. I think this is worth the extra expense and effort if you're a large-volume retailer or shipper. The invoices that the Point-of-Sale system can produce compare favorably with those created by a large mainframe system. You can enter ship-to addresses, carriers, salesperson codes, FOBs, payment terms, order numbers, back-ordered items, and even charges for items, such as labor, that aren't considered part of an inventory. Different tax codes and general-ledger account codes can be entered for each line item. Freight expense and finance charge codes are added prior to saving and printing the invoice.

If you've been looking for the right software for your inventory, you won't be disappointed by the features in CMS Inventory Control. The software is complete, easy to use and expandable. The manual is comprehensive, although possibly difficult for a beginner.

If you already use the CMS General Accounting System, you'll be quickly up and running on this inventory system. If not, the final results will be worth the time and effort necessary to set up both the General Accounting and Inventory Control module. Even as a stand-alone program, CMS Inventory Control is definitely a good value. *(CMS Software Systems, Inc., 2204 Camp David, Mesquite, TX 75149. C-128/$79.95.)*

—SANDRA COOK JEROME
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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!

HOSTAGE ..... A–

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To Help the Hostages

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This software transforms you into the lieutenant leader of an elite assault force. By successfully completing the most difficult of five timed missions, you can earn a password that promotes you to captain. Success there brings the rank of commander and a chance to try the program's five hardest games.

Each mission has three stages. In the first, you guide three snipers to strategic locations overlooking a terrorist-occupied embassy. Your men must take evasive action to avoid hostile spotlights and gunfire.

The second stage begins with a helicopter dropping your other three team members on the embassy's roof. These men rappel down the side of the building and enter by crashing through windows.

The final stage of a mission takes place within the embassy, where you must search three floors and eliminate the constantly moving terrorists.

At the end of most games, the program displays a newspaper article that assesses your performance. A mission is successful if you kill all the terrorists or free all their captives without losing any assault team members.

Some elements of the software are less appealing than others. For instance, although it is beautifully programmed, a mission's first stage will probably be less entertaining than its later sections; however, an option that lets you replay ►

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3 & 4. Think you qualify for MENSA membership? Then **CUBIX 2*** and **CUBIX 3*** are ready for the test!

But beware, these twin teasers share only their name—and their neural nastiness!

5. Meanwhile, back in the outer reaches of the universe, load up for a couple rounds of **DEATH QUADRANT**. The blast-happy lover of Asteroids in you will never be busier!

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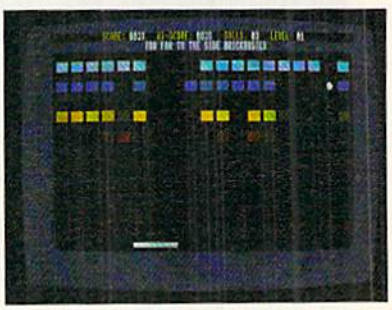

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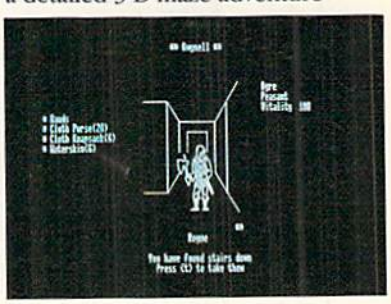

* Denotes a 40-column mode game.

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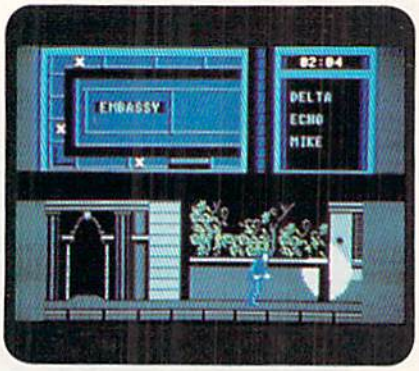
a game's end can make this potential shortcoming far less irksome.

The confusing up and down signs on certain stairways is a minor aggravation. In addition, you'll probably have trouble using your gun effectively during your first gaming sessions; but this difficulty should disappear with practice.

Nevertheless, the software's positive features more than make up for any potential problems. Its graphics, for example, are tremendous, as are the animation and sound.



You're a dead man if you get caught in Hostage's spotlight.

But as good as they are, these sensory effects take a back seat to the gameplay. The search of the embassy's corridors and rooms is filled with exhilarating tension. And learning the most effective use of all six members of your strike team challenges both arcade and tactical abilities.

Due to all its outstanding features, Hostage is highly recommended for those who are seeking a gaming experience that is both original and skillfully executed. *(Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062. C-64/$29.95.)*

—WALT LATOCHA
OAK PARK, IL

WINDWALKER ..... B+

Fantasy Role-Playing + Martial Arts + Combat Adventure = Challenge

This sequel to Origin's Moebius calls upon you to once again save the mystical realm of Khantun. The Emperor, Chao Ti, overthrown by his power-hungry warlord Zhurong, must be restored to his throne.

By talking to the villagers you meet, you'll learn most of what you need to know to start on your quest. You'll also find that if your honor becomes tainted, the villagers become less cooperative and even the merchants refuse to do business with you.

By no means is everyone in Khantun friendly—knife-wielding thieves and shuriken-throwing assassins lurk everywhere. Although it's damaging to your honor to attack first, you should be prepared to defend yourself when attacked. If you're successful, your enemy usually drops something of value (money or food) as he flees.

Windwalker's martial arts combat system is much better than that of Moebius. The figures are larger and the animation is faster and more life-like. A new range of movements, including cartwheels, handsprings and back kicks, have been added. Successfully landed blows are no longer "beeps"—they've been replaced by digitized screams and groans.

Windwalker's graphics are also much improved and give the game a unique look. Instead of numerical values for character traits, Windwalker displays an abacus with rows of sliding beads to represent Body, Spirit, Honor and Karma. Trees, boats and other graphic elements have been carefully drawn in an oriental style that maintains the Eastern flavor of the game. In addition, Windwalker's control system has been enhanced.

Although I recommend Windwalker, I must warn you that it gives disk drives quite a workout. One other positive note is that the game comes with a nicely designed manual that provides you with plenty of useful information—in particular, a bibliography of the books on Oriental culture and philosophy that the designers consulted during the creation of the game. *(Origin Systems, 136-B Harvey Rd., Londonderry, NH 03053. C-64/$39.95.)*

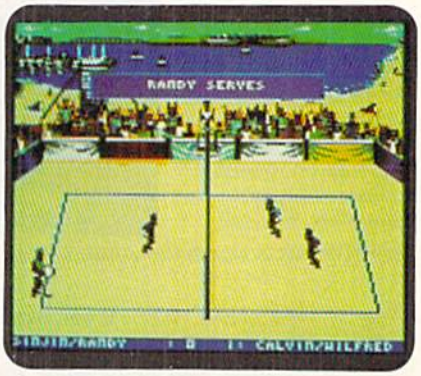
—BOB GUERRA
CHARLESTOWN, MA

KINGS OF THE BEACH ..... B

Practice Those Spikes Or You'll Have Sand Kicked in Your Face!

Kings of the Beach is a two-on-two volleyball simulation in which you can play against the computer or a friend, or by teaming up with a friend in a cooperative effort against the computer. Play consists mainly of moving your character into position and pressing the firebutton to hit the ball. Double-clicking the joystick button can be used to block your opponents' spikes at the net or to spike the ball yourself on the third hit.

You can choose from three different serves and three skill levels, even the simplest of which can be challenging, especially until you perfect your timing. One thing that makes the game easier is the way your player automatically moves toward the ball when it's nearby. He'll even dive on his own when its slightly out of reach. Another help is the way your player always hits the ball appropriately for the situation. For example, he'll always set teammates up for a spike on the second hit, and the third always heads over the net.



One, two and. . .spike it! in Kings of the Beach.

You can play Kings of the Beach one game at a time or in Tournament mode (several matches against increasingly difficult opponents in places like San Diego, Hawaii, Rio de Janeiro and Australia).

While the look and sound of the game probably won't win any awards, the designers did add some nice animated touches to liven it up, such as occasional high-fives after successful volleys, brushing off sand after a point-saving dive and arguing a close line call in hopes of intimidating the ref into changing his decision.

Like a lot of sports simulations, Kings of the Beach is most enjoyable when played against a friend. There's also something particularly rewarding about working together with someone to beat a tough team of computer challengers.

Although Kings of the Beach isn't the most exciting sports simulation I've ever played, beach volleyball fans will find that it accurately captures the spirit and action of the game. *(Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$29.95.)*

—BOB GUERRA
CHARLESTOWN, MA

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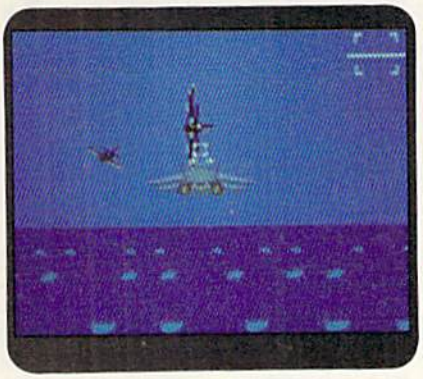
AFTER BURNER ..... B

Dip, Turn, Roll!
Take Control and Feel
The Power!

Experience the thrill of flight in this aerial combat game. Your screen reveals the backside of your supersonic jet, an F-14 Thunder Cat, as you maneuver it through the sky and attack the enemy. Wheeling and dipping over the ground like a crazed bat, you shoot down planes in a dogfight that lasts day and night.



Are you ready to attempt aerial stunts in After Burner?

The Thunder Cat's movement is joystick controlled: bank, dive, climb, fire lasers and launch heat-seeking missiles. For a dizzying effect, try nailing the enemy while flying upside down in a barrel roll—the sky spins around you like a ferris wheel. The graphics lack the airbrush detail of a Walt Disney film, but the program's smooth animation creates a strong feeling of forward movement.

After Burner's choreography of aerial events is vivid and convincing: Your laser fire converges in front of you, missiles grow larger as they approach, and the horizon tilts when you turn.

In spite of the good animation, there are several limitations. For instance, you can't flip over backwards or soar above a certain level. In addition, the program won't let you fly upside down continuously, although you can perform rollovers that are quite spectacular. Finally, ground markings appear bland and unchanging as they slip under you, lulling you into a stupor that could send you into a crash dive. (Take heart—the airborne pyrotechnics will wake you up!)

After Burner's plot can be summed up as "Go!! Dodge!! Shoot!!" You'll participate in breakneck action, increasing difficulty levels and refueling maneuvers.

You'd better lie down after the game, for motion sickness may persist. When you close your eyes, you'll "see" the airfield coming at you, topsy-turvy. Next time, carry an air-sickness bag! *(Sega; distributed by Mindscape, 3444 Dundee Rd., Northbrook, IL 60062. C-64/ $34.95.)*

—JOHN DIPRETE
CRANSTON, RI

DOWNHILL CHALLENGE ..... B–

Tuck, Turn, Swoosh and Fly—
The Powder's Great,
So Give It a Try

Downhill Challenge's packaging promises "the ultimate computer ski experience." However, like the sport it simulates, this software includes a few "bumps."

Three of the events in the program have beginning, advanced and expert difficulty levels. These contests reward speed and, to varying degrees, precise maneuvers. In the downhill event, you hurtle over a mountain course, whose widely scattered control gates discourage too high a velocity. In contrast, the slalom competition has many more gates and is the software's toughest test of agility. The giant slalom event is a hybrid of the first two contests, with fewer gates than the slalom and more than the downhill.

Differing markedly from the other events is ski jumping. This has you soar into space and score points both for distance and style.

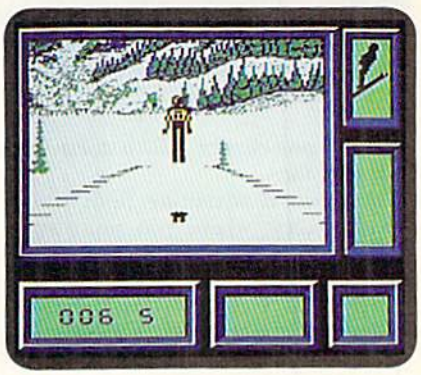
Downhill Challenge offers a Training option that lets one player practice any of the events. There's also a Competition mode where up to six players make two runs through all four contests, while the computer tracks each performance.

Unfortunately, some documentation problems mar the program. The package, for example, incorrectly indicates that the ski jump has multiple skill levels and that a joystick is unnecessary. Also, the skimpy two-page instruction manual doesn't describe the events and even lacks an explanation of how style points are earned.

In addition, the software suffers from some relatively long loading times, even when an accelerator cartridge is used. For instance, reaching the ski jump screen can take almost 40 seconds, which is more than twice the time needed for the event itself. However, the program lets you avoid some dead time in the Training mode by pressing the joystick forward at an event's end; this immediately brings you back to the beginning of the contest.

All of the software's shortcomings are largely offset by a fluid control system and excellent graphics. Together with some beautifully programmed animation, they create a convincing illusion of swooshing along at breakneck speeds.

All in all, Downhill Challenge has much to recommend it. Fans of winter sports who are willing to endure the "rough spots" should enjoy testing their mettle against the events in this program. *(Broderbund Software, Inc., 17 Paul Drive, San Rafael, CA 94903. C-64/ $19.95.)*



Are you prepared for landing in Downhill Challenge's ski jump event?

—WALT LATOCHA
OAK PARK, IL

SAVAGE ..... C+

Survive Demon Attacks
And Monster Traps

This three-part action game goes a long way toward disproving the axiom "the whole is equal to the sum of its parts." While each segment of Savage includes excellent features, two of which are moderately entertaining, the trio lacks cohesion.

The first game plays like a Barbarian clone. On the first leg of your journey to rescue a fair maiden, you, as the axe-hurling Savage, traverse horizontally scrolling castle dungeons. Survival requires defeating endless hordes of mutant monsters, evading traps and jumping over fire pits.

Contact with the enemy costs you energy, but you can acquire extra strength or special weapons by defeating certain assailants. After completing this part, you're provided with the password needed to begin the second challenge with the maximum number of lives (three). Otherwise, the program gives ►

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You must defeat those monsters to rescue the fair maiden in Savage.

you only one chance, which doesn't get you very far.

The second adventure finds you in Death Valley, where you must avoid waves of monoliths while you try to shoot flying ghosts and skulls. In this screen, you view your surroundings through Savage's eyes. The forward scrolling, 3-D visuals are reminiscent of older, first-person-perspective games—but without any noticeable improvement in graphics, sound quality or game play.

After inputting a second password, you gain full access to the last screen, which puts you back in a different section of the castle. As Savage's trusty eagle, your chore is to evade pitfalls, fly past evil creatures and eliminate enemies by firing shots from your beak.

Individually, parts one and three work well. In both cases, game play is fast and varied, joystick control responsive, graphics striking and special effects impressive. In addition, Savage boasts a relatively sophisticated, and appropriately eerie, musical score. After a few listenings, however, you'll probably find the music grating and opt to toggle the sound effects instead.

Although a detailed background narrative appears in the documentation, other essential information is missing. For example, there's no mention of many on-screen objects or descriptions of their uses.

The plot summary is the vehicle that links the games together—little else suggests unity among the three. Storylines differ dramatically, and the leading character appears only in the first segment. Each part has its own title screen, keyboard and joystick commands and scoring system.

As a single entity, Savage is a disappointment. Taken individually, games one and three are worth considering because of their technical excellence and non-stop action. *Medalist International, 180 Lakefront Drive, Hunt Valley, MD 21030. C-64/$29.95.)*

—LEN POGGIALI
SYRACUSE, NY

TANK ATTACK C

Battle Away on Screen or Board

The invasion is on! As Calderon's tank commander, you and your Sarapanian ally launch an assault upon the heavy armor of Kazaldis and Armania. Expert maneuvering of your forces and outgunning your opponents both help your cause, but they don't necessarily ensure victory. A third element—dumb luck—counts just as much in determining the outcome of this multi-player computer board game.

Each of the program's two to four players portrays a tank commander who represents at least one of four fictional countries. Either alone or with a neighboring ally, you must capture the headquarters of the one or two nations opposing you. There are five variations in all.

Much of the contest is planned and resolved on a game board on which you, your allies and foes maneuver three varieties of tanks and two types of armored cars. The computer screen is generally divided into three parts. Displayed in the status panel are the number of moves allotted your country during the current turn, and the number of units active, under repair or being rebuilt. From the communications and options panel, you receive messages and view tank battles. Decisions to move a unit or to fire upon an enemy are made from the command panel. Before each new day, weather forecasts, battle reports, loss and damage information and political news fill the screen.

To fire upon an enemy, your forces must be no more than four hexes away. After inputting the range and choosing the attacking and defending units, both vehicles appear on screen. Each unit fires, and then the results are calculated, based on distance, relative firepower, weather, and so on. The graphic portrayals of these one-on-one encounters lack variety, but are fun to watch.

Tank Attack is such a simple game, it's surprising that there isn't a single-player option, and that the game map and unit movement features aren't resident in memory. Conversely, the computer does so little that it could be quite easily replaced by dice, a pad and pencil and a statistical chart for determining battle results.

Lacking a computer opponent and relying heavily on board-game trappings, Tank Attack provides only moderate value for its price tag. *(Artworx, Inc., 1844 Penfield Rd., Penfield, NY 14526. C-64/$24.95.)*

—LEN POGGIALI
SYRACUSE, NY

RAMBO III ..... B+

Let's face it: Rambo's no slouch in the killing department. Not even Rocky Balboa could kayo this very Grim Reaper. Familiar with the silver-screen Rambo, I was fearful that the computer adaptation of his latest bloodbath would cause my Commodore to explode.

However, the plot is simple: Your macho warrior must rescue his buddy, Colonel Trautman, from Soviet torturers. (What happened to Perestroika?) To aid you on your mission, you must find and pick up various articles. You can also register such things on your inventory-panel display.

Your joystick controls Rambo's every action—passing through doors, shooting bullets and knocking down guards, for example. An overhead view shows a playing field many times larger than the computer screen, but Rambo moves smoothly into adjacent scenarios. However, you need to keep a map diary to avoid retracing your steps each time.

As Rambo, you pilot a helicopter and hijack a Soviet tank in your desperate bid for freedom. Being no stranger to violence, you kick and claw your way to victory, deposit bombs at enemy posts and defeat an army.

Graphics keep the action respectably crisp—no more shocking than your average on-screen bloodletting. Joystick jocks will love the game's easy handling and nonstop adventure. *(Taito Software, Inc., 267 West Esplanade, North Vancouver, British Columbia, Canada V7M 1A5. C-64/$29.95.)*

—JOHN DIPRETE

BATMAN ..... B+

While others have sought to combine the "feel" of comic books with the "look" of action/arcade games (e.g., Accolade's Comics and Paragon's Dr. Doom's Revenge), Data East's Batman completely sheds his comic book origins and jumps headlong into the fast-paced world of arcade gaming.

You can go up against the Penguin

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(who is plotting to take over the world) or tackle the Joker (who has kidnapped Bat's junior partner, Robin). The Penguin's trail takes you from the Batcave to the streets and rooftops of Gotham City, while the search for Robin and the Joker takes you into the bowels of the city's sewer system.

Along the way, Batman must locate various important items—a gas mask, flashlights, keys, food, batarangs, grenades and the like. Hint: if you attempt to access an item, and it doesn't work, you're in the wrong room. Another tip is to try each item in various places throughout the game. For example, the fake nose disguises Batman and makes him invisible to the thugs chasing him, while the sneakers make him run faster. Likewise, the bat ears augment hearing, and food increases strength.

This product should appeal to two sets of fans: arcaders who've never opened a comic, and comic fans who own a computer. Perhaps the only way in which Batman comes up short is that it doesn't include the comic book in the package. *(Data East USA, Inc., 470 Needles Drive, San Jose, CA 95112. C-64/$24.95.)*

—BOB SODARO

FIREPOWER ..... B

The name of this game is to penetrate enemy defenses, capture their flag and return it to home base. Firepower features a large scrollable map and player versus computer or player versus player matchups. You get a crisp spy satellite view of your tank, buildings, roads, walls, turret-mounted guns, trees, and so on, plus status data and a radar insert. Single players have just five tanks (i.e., lives) to complete the mission. In the two-person/two-joystick version, the screen is split to supply independent displays, and each player gets unlimited tanks.

Predictably (as an adaptation from the Amiga), the game includes some elements that have little or no impact upon play. For example, rescuing friendly troops, blasting enemy buildings and blowing away helicopters all boost your score—but scores aren't saved and don't determine who wins. You knock out enemy helicopters and turrets because they're shooting at you; you blow up fuel depots to get fuel; and you blast holes in walls and buildings because they're in your way. Finally, you play the game because, with smooth animation, decent sound and miles of hazard-packed real estate, it's loads of fun!

For one player, Firepower represents a mediocre challenge. The game really crunches into high gear when it's one armored monster against another. Do you defend or "go all out" for the flag? Run or aim for a High Noon-style shootout? Factor in random home-base flag placement, and the scenario possibilities are endless. Grab someone, hand him the other stick, and get set for a strategy action-gaming feast! *(MicroIllusions; distributed by Mediagenic, 3885 Bohannon Drive, Menlo Park, CA 94025. C-64/$24.95.)*

—JEFF HURLBURT ■

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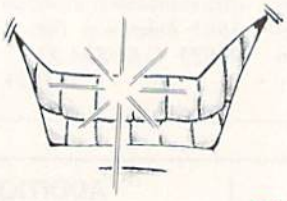

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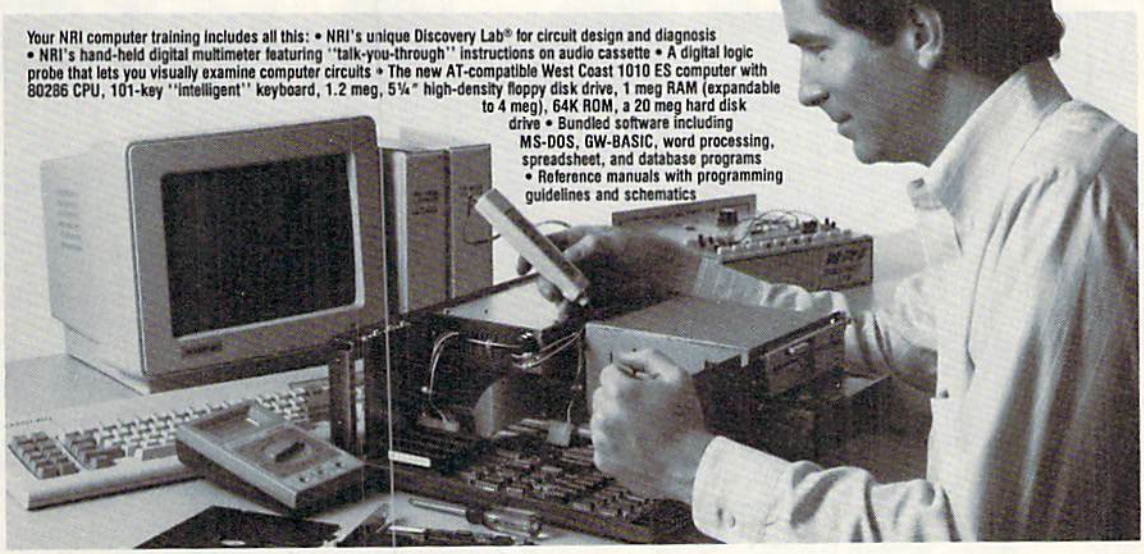

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Sailing the Commodore Seas

Whether you're a new hand or a seasoned salt, you can drop anchor to explore a variety of applications.

By ELLEN RULE

Your Commodore can do a lot more than play games. In addition to its entertainment value, your C-64 or C-128 can perform a wide variety of interesting and useful tasks—so many, in fact, that you may find the possibilities overwhelming. This article will help you decide which to pursue and how best to get started.

All Hands on Deck

The basis of a Commodore computing system is the C-64, C-128 or C-128D. You can get by with connecting your computer to a TV, but I recommend a monitor to best utilize the outstanding color and graphics capabilities that these computers offer. Two choices for the C-64 are the Commodore 1702 and the 1802, the latter with a monochrome option some users prefer for word processing. To take advantage of the C-128's 80-Column mode, there are the 1902, 1902A and 2002 monitors. Commodore's latest monitor, the 1084S, can accommodate both the C-64 and C-128.

To get started, you also need a disk drive—a 1541 for your C-64 or a 1571 for your C-128. The 128D comes with a built-in 1571 disk drive. If you plan on storing a lot of data with a word processor, spreadsheet or database, then consider adding a second drive. In this case, the 3½-inch 1581, with a storage capacity of over 800K per disk, is a good choice to increase speed and cut down on disk swapping.

If you intend to play games on your Commodore, a good joystick is also a virtual necessity. See the February 1989 issue of *RUN* for a roundup of the hottest joysticks available.

Rigging Your Ship

Many users soon find that they need a printer to print out the results of their work. You can purchase either a so-called Commodore-compatible machine, which connects directly to your computer, or a non-Commodore printer, which allows greater flexibility in output but requires a hardware accessory called a parallel interface. See "Making an Impression with Printers" in the November 1989 issue of *RUN* for a survey of the latest in low-end printers.

Other optional peripherals you may eventually consider are a modem, such as the Commodore 1670, for telecommunications, and a memory expander to add speed and storage capacity to your system. Commodore's memory expanders include the 256K-capacity 1764 for the C-64 and the 128K 1700 and 512K 1750 for the C-128.

Setting Sail

All this hardware is virtually useless without software. To get programs, you can purchase commercial software, type in program listings from *RUN* or other magazines, download them from telecommunications bulletin boards or services, or, once you develop the art of programming, write your own.

If you plan to buy, the sources are many. RUN Works and the RUN Starter Pak include excellent word proc- ►

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essing, database and spreadsheet software. You can also buy both individual programs and integrated packages (whose programs can swap data with one another without complicated conversion) from software stores and mail order houses. Public domain programs, released by the author for free copying and distribution, are available via modem from local bulletin board systems (BBSs) and the commercial telecommunication services such as QuantumLink, GEnie and American PeopleLink.

Now that you have an idea of *where* to find software, the next question is *which* programs should you get, and what can you accomplish with them?

Word Processors

With a word processor, such as Fontmaster from Xetec, The Write Stuff from Busy Bee and the venerable RUN Script that's available on the RUN Works and RUN Starter Pak disks, you can write letters home, compose term papers or produce articles for a club newsletter much more easily than on a typewriter. Use the cut-and-paste function to move sentences and whole paragraphs around, and the search-and-replace function to substitute one word or phrase for another throughout your document. Call on the spelling checker to proof your work, and the WYSIWYG (what you see is what you get) features to make your text bold, italic, underlined, centered or arranged in columns. Make changes and print your document as many times as needed to get it just right—without ever retyping the page!

Record your family history, keep a journal, publish your recipe collection or print out return-address labels or change-of-address cards. Or use a word processor to take the tedium out of menu planning or preparing grocery or chore lists. With an integrated package, such as the Digital Superpak from Digital Solutions or the GEOS line from Berkeley Softworks, you can "merge" data from the database into the word processor to churn out form letters or mailing labels.

Figure 1. Peripherals utilized by Commodore users.

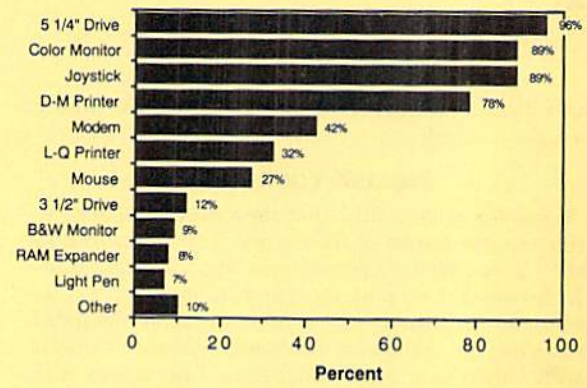
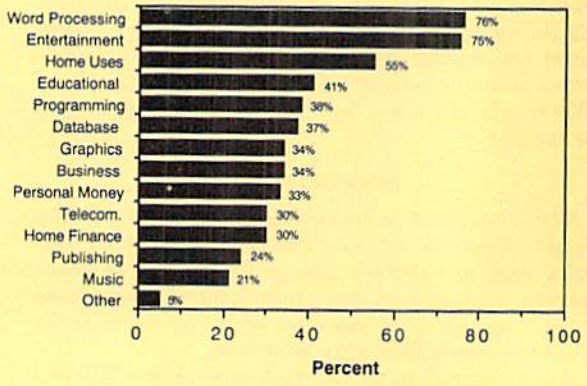
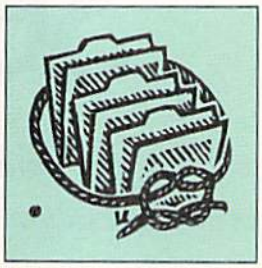


Figure 2. Applications employed by Commodore users.

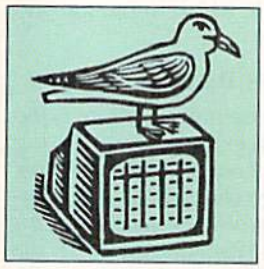


Source: *RUN* reader survey, May 1989.



Databases

Database programs such as Digital Solutions' Pocket Filer, Timeworks' Data Manager, Berkeley's geoFile and Datafile 3.6 from *RUN*'s Productivity Pak II are used to manage information, letting you store items, then search for and sort them at the press of a key. With a database, you can keep track of addresses and birthdays of friends and acquaintances, maintain health records for your family and pets, or print out phone lists. Use it to track your collection of video movies, stamps or baseball cards; then keep a second file of items that you don't yet have and carry a printout list with you, so that a fantastic opportunity doesn't slip by! Or employ the database's math functions to keep a household inventory for insurance purposes.



Spreadsheets

Berkeley Softworks' geoCalc and Timeworks' Swiftcalc are examples of spreadsheets that can help you manage your checkbook, budget and taxes. Think of a spreadsheet as an electronic page of columnar paper into which you can plug numbers, labels and formulas. With its extensive math capabilities, you can calculate team scores and averages, keep tabs on auto expenses and mileage, track your family's video game scores, manage your paper route, or keep a running average of school grades. With study, spreadsheet software can be used for small-business functions, such as keeping a general ledger and producing invoices.

Specialized financial packages, such as Sylvia Porter's Personal Finance, and Money Manager from RUN Works, make it easy to maintain budget or checkbook records, since the formulas and math functions are already worked out and built into the program. Other specialized financial packages for the Commodore include Abacus's Technical Analysis System for stock portfolio management; Great American Software's Dome Accounting by Computer; and Timeworks' Swiftax, which guides you through income tax preparation.

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Graphics

Among the top graphics programs for the Commodore are Rainbird's OCP Art Studio, Crystal Rose's Doodle! and the popular RUN Paint from RUN Works. Such art programs allow you a wide range of creativity, from splashy op-art fingerpainting to finely detailed masterpieces. Select your paint color or fill pattern, adjust your brush size, and create free-hand lines or fixed geometric shapes.

Your original art work can be added to video title displays, printed out on a color or black-and-white printer, transferred to T-shirts or uploaded by modem to a BBS for viewing by others. With specialized graphics software, such as Unison World's PrintMaster, you can create banners, cards, posters and calendars, while Springboard's Certificate Maker and its ilk will help you recognize the achievements of friends, fellow students or officemates.

Desktop Publishing

Desktop publishing programs combine text files from a word processor with computer graphics to produce illustrated documents. My favorites are Berkeley's geoPublish, Electronic Arts' PaperClip Publisher and Springboard's Newsroom, but any of these specialized tools will let you design and print out newsletters for your club or school, a business presentation, a membership directory for your professional association, and much more.

Use Digital Visions' ComputerEyes hardware with your desktop publisher to digitize photos or original art work to ►

Keeping the Wind in Your Sails

LIKE ANYTHING ELSE, the world of computing can get to be humdrum and routine if you let it. How can you keep the spark alive? Here are some suggestions.

- Getting the best return from your investment (the time, energy and money you've spent in building and learning about your system) may involve thinking creatively about using the computer as a tool. Sure, the spreadsheet does a great job tracking your checkbook, but what else might you do with it?
- Mix computing with your other hobbies. Your non-computing activities can be enhanced when you use your computer to track information, publish worksheets or spice up documents with graphics. Always think: "Could this be done better on my Commodore computer?"
- Join and *participate* in a local user's group. Use your word processing or desktop publishing skills to help with the newsletter, membership lists or publicity notices. Demonstrate your favorite software and hardware at club meetings. Share your knowledge with other members—you'll be amazed by how much you know and how much you can learn!
- No time to attend computer club meetings? Newsletters produced by "through the mail" user's groups let you swap information, sell or trade equipment, and get or give computing assistance.
- Get your group on other clubs' mailing lists and trade newsletters.
- Interact with other users on local BBSs or commercial networks. Telecommunicating is a great way to stimulate your mind and spark your interest on a wide variety of topics.
- Chat with the personnel at your local software/hardware store. Your Commodore retailer can be a source of up-to-date information on the market. Many vendors let you try before you buy, and some offer deals on used software and equipment.
- Attend computer shows held by local user's groups, or, if you're fortunate enough to live close by, check out bigger shows such as World of Commodore.
- Glean information from reference books on programming (try the guide that came bundled with your computer), languages (Jim Butterfield's *Machine Language for the Commodore 64, 128 and Other Commodore Computers*), GEOS, desktop publishing, computing hints (*Lou Sander's Tips and Tricks*), gaming (Shay Addams' *Quest for Clues*) and unusual computer uses (Dan Gutman's *I Didn't Know You Could Do That with a Computer!*).
- Reviews and articles in Commodore-specific magazines like *RUN* provide valuable information about software and computer use. Specialized publications like *Twin Cities 128*, *geoWorld* and your club's newsletter address particular Commodore-related topics.
- Volunteer! Support your favorite cause by printing mailing labels or by offering your word processing and desktop publishing services. Help children in local schools learn about computers or offer presentations to boys' and girls' clubs. Introduce the computer to handicapped people and expand their horizons. Arrange to take your C-64 to a local nursing home or adult day-care center to share the wonders of technology. Whatever you do, you'll get back more than you give in sheer satisfaction!—ER Ⓡ

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include in a family reunion newsletter or on greeting cards. Create ads or flyers for the school play or your commerce organization's trade fair. Business cards or graphic labels can be fashioned with a desktop publisher by carefully spacing and repeating a design.

Education

The C-64 has been used extensively in education, so there's a wealth of educational software available for it. For example, learn German, French, Russian, Italian or Spanish with Artworx's Linkwords. Then tour the world with Broderbund's Where in the World Is Carmen Sandiego? Conduct scientific investigations, without any danger or mess, with Simon and Schuster's Chem Lab, or practice to improve your typing skills with The Software Toolworks' Mavis Beacon Teaches Typing.

Spinnaker's Kids on Keys teaches typing to the younger set, and spelling and vocabulary drill are disguised as an adventure game in Timeworks' Cave of the Word Wizard. A favorite of mine, Weekly Reader's StickyBear Series, entertains while coaching math, reading and spelling.

Music

On your Commodore computer, you can compose, record and replay music for your own enjoyment or to share with friends. With software such as Electronic Arts' Instant Music or Music Construction Set, your computer becomes a keyboard on which to create your own tunes. You can also enjoy other people's digital compositions through software such as Strider's Computer Classics (Free Spirit) or by downloading them from an online service. Addition of a MIDI (*m*usical *i*nstrument-*di*gital) interface and accompanying software would let your Commodore communicate with MIDI-compatible musical instruments.

Telecommunications

With a modem and telecommunications software, you can access commercial online services and public bulletin board systems—gateways to encyclopedic databases, stock market information, airline reservations, contact with thousands of other Commodore users, and much more. You might find yourself discussing computing or noncomputing topics with experts in real-time forums. Depending on the bulletin board, there may be special sections for posting notices or downloading (receiving) and uploading (sending) public domain software.

Try uploading your own creations—programs, art, music—as long as you realize they'll be freely distributed. To do this, you need a terminal program, and there are excellent ones available, both commercially and in the public domain. Examples include BobsTerm Pro from Progressive Peripherals, RUN Term from RUN Works, geoTerm from RUN's GEOS Power Pak, and the specialized QuantumLink software. Just make sure that the software you get is compatible with your modem.

In Summary

You now have enough information, including product suggestions, to start exploring the Commodore seas. Keep in mind that your friends, computer club members and people you "chat" with over your modem will all have many opinions on what software and hardware is best to get. Proceed with good consumerism in mind, taking a look at the products in action if you can, and reading reviews in your favorite Commodore magazine.

Caveat

Not all the products mentioned in this article are available from the manufacturer. When they are not, check user's groups, used merchandise ads, software discount houses and mail order companies to find them. ■

Ellen Rule, one of RUN's *contributing editors, is an active user's group member who also operates a home-based business, Home Computer Resource. By profession, she is a psychiatric R.N.*

Table 1. A start-up hardware checklist for new hands.

✔ Computer: C-64
Monitor: Commodore 1702, 1802 or 1084S
Disk Drive: Commodore 1541 or compatible; 1581 optional
Printer: Commodore MPS 1000 or MPS 1200, Panasonic KX-P1180, Seikosha SP-1600AI or Okidata Microline 182 Turbo
Modem: Commodore 1670 or third-party Commodore-compatible
RAM expander: Commodore 1764

✔ Computer: C-128
Monitor: Commodore 1902, 1902A or 1084S
Disk Drive: Commodore 1571; 1581 optional
Printer: same as for C-64
Modem: same as for C-64
RAM expander: Commodore 1700 or 1750

✔ Computer: C-128D
Monitor: same as for C-128
Disk Drive: built-in 1571; 1581 optional as second drive
Printer: same as for C-64
Modem: same as for C-64
RAM expander: same as for C-128

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Colorout

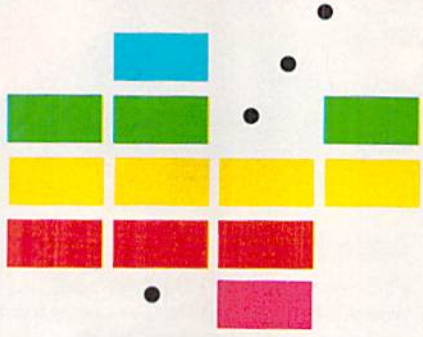
Fight the battle of the bricks, and the wall comes tumbling down.

By THOMAS CZARNECKI

Even if your name isn't Joshua, here's a chance to get rid of some frustration by knocking down some walls. Colorout is a fast-paced one-person game for the C-64 that challenges you to knock as many bricks as possible out of a brightly colored, six-course wall.

The missiles you use are ten high-speed balls, kept in play with a movable paddle you control with a joystick in port 2 or the comma and period keys on the keyboard. The wall stretches across the screen, the balls come at it from below, and the paddle moves back and forth along the bottom of the screen.

To serve a ball, press the joystick fire-button or the keyboard space bar. To double the speed of the paddle, hold the firebutton or space bar down. Try putting a little english on the ball or bouncing it off the end of the paddle to send it where you want. If you miss a



ball, you lose it off the bottom of the screen. Appropriate sound effects add to the fun of the game.

At first, action is slow, but it speeds up with each new screen of bricks. Also, a ball usually takes out only the first brick it hits on the way up, but if you break through the wall and bounce balls off the "ceiling," they take out every brick they pass coming down.

Each brick you knock out adds five times the number of its course (layer) to your score. In other words, bricks in the bottom course are worth 5 points, those in the second course 10 points, and so on. Your score so far in the game, your highest score for the session and the number of the current ball are shown at the top of the screen at all times.

A game is over when you've used up all ten balls. To play again, press the restore key.

Colorout is a combination Basic and machine language program. Type in Listing 1, using *RUN*'s Checksum program to catch typing errors, and then save it to disk. After saving it, run it to create Colorout. When you're ready to play, load and run Colorout like any Basic program. R

Thomas Czarnecki, a game-playing enthusiast, has been working with computers and programming for some dozen years.

Running Instructions: **Type in Listing 1, save it and run it to create Colorout. To play, load and run Colorout like any Basic program.**

Listing 1. Colorout creator program. (Available on March–April ReRUN disk. See binder card at page 32.)

```
Ø REM THIS LISTING CREATES (AND
   SHOULD NOT BE CALLED) COLORO
  UT                        :REM*149
5 OPEN 8,8,8,"COLOROUT,P,W"
                            :REM*85
6 CT=Ø:PRINT"{SHFT CLR}":REM*56
1Ø READ A$:IF A$="-1" THEN CLOS
   E8:PRINT:PRINT"ALL DONE!":EN
   D                        :REM*129
12 PRINT"{HOME}READING LINE "+S
   TR$(CT):CT=CT+1          :REM*141
15 IF LEN(A$)<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 COLOROUT 64 ML      :REM*184
1Ø1 DATA Ø1Ø8ØDØ8ØAØØ9E28323Ø*3
   63329ØØØØØ4C5311FE*C6DEDED
   ECØFEØØ7E6666            :REM*197
1Ø2 DATA 7EE6E6E6ØØFCCCCCFEC6*C
   6FEØØFECECECØCØC6FE*ØØFCE6E
   6E6E6E6FCØØFE            :REM*46
1Ø3 DATA CØCØFEFØFØFEØØFEEØEØ*F
   E6Ø6Ø6ØØØFECECØCØDE*C6FEØØC
```

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

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```
    6C6C6FEE6E6E6      :REM*87
104 DATA ØØ1818183838383ØØØC*Ø
    CØCØECECEFEØØC6CCD8*FEE6E6E
    6ØØ6Ø6Ø6ØEØEØ      :REM*114
105 DATA EØFEØØC6EEFED6C6C6C6*Ø
    ØE6F6DECEE6E6E6ØØFE*C6C6CEC
    ECEFEØØFEC6C6      :REM*129
106 DATA FEEØEØEØØØFEC6C6C6C6*F
    6FE18FCE6E6FCCECECE*ØØFEC6C
    ØFEØ6E6FEØØFE      :REM*233
107 DATA 3838383838383ØØC6C6C6*C
    ECECEFEØØC6C6C6C6C6*6C38ØØC
    6C6C6D6FEEEC6      :REM*57
108 DATA ØØC6C66C386CC6C6ØØC6*C
    66C38383838ØØFECC18*3Ø6ØC6F
    EØØ7C6Ø6Ø6Ø6Ø      :REM*229
109 DATA 6Ø7CØØØØCØ6Ø3Ø18ØCØ6*Ø
    Ø7CØCØCØCØCØC7CØØØØ*183C66Ø
    ØØØØØØØØØØØØ      :REM*52
110 DATA ØØØØØØFEFEØØØØØØØØØ*Ø
    ØØØØØ38383838ØØ3838*ØØ66666
    6ØØØØØØØØØ6C      :REM*236
111 DATA FE6C6CFE6CØØØØ3ØFCDØ*F
    C2CFC3ØØØ6Ø66ØC183Ø*66Ø6ØØF
    8D8D876DCDCF6      :REM*133
112 DATA ØØ1818180000000000000C*1
    83Ø3Ø3Ø18ØCØØ3Ø18ØC*ØCØC183
    ØØØØØ6C38FE38      :REM*84
113 DATA 6CØØØØØØ18187E1818ØØ*Ø
    ØØØØØØØØØ38381838ØØ*ØØØØ7E7
    EØØØØØØØØØØØ      :REM*174
114 DATA ØØ383838ØØØØ6ØC183Ø*6
    ØCØØØFEC6C6CECECEFE*ØØ38381
    8183C3C3CØØFE      :REM*127
115 DATA Ø6Ø6FECØCØFEØØFCØCØC*F
    EØEØEFEØØCØCØC6C6FE*Ø6Ø6ØØF
    ECØCØFEØ6Ø6FE      :REM*99
116 DATA ØØFCCCCØFEC6C6FEØØFE*C
    6ØC18383838ØØ7E6666*FEE6E6F
    EØØFEC6C6FEØE      :REM*15
117 DATA ØEØEØØØ3838ØØ3838ØØ*Ø
    ØØØ3838ØØ38381838ØC*183Ø6Ø3
    Ø18ØCØØØØØ7E      :REM*4Ø
118 DATA ØØ7EØØØØØ6Ø3Ø18ØC18*3
    Ø6ØØØFEC61E18ØØ1818*ØØ381Ø9
    2FE921Ø38ØØØØ      :REM*129
119 DATA ØØFEØ6FEC6FEØØEØEØFE*C
    6C6C6FEØØØØØFEC6CØ*CØFEØØØ
    EØEFEC6C6C6FE      :REM*16
120 DATA ØØØØØØFEC6FECØFEØØ3C*3
    Ø3Ø7C3Ø3Ø3ØØØØØØFE*CECEFEØ
    6FEEØEØFEC6C6      :REM*2ØØ
121 DATA C6C6ØØ38ØØ1818383838*Ø
    ØØ6ØØØ6Ø6Ø6E6FEØØCØ*CØC6CCF
    EC6C6ØØ381818      :REM*228
122 DATA 1818183CØØØØØØC6EEFE*D
    6C6ØØØØØØFEC6C6C6C6*ØØØØØØF
    EC6E6E6FEØØØØ      :REM*176
123 DATA ØØFEC6C6FEEØEØØØØFE*C
    6C6FEØEØEØØØØFEE6EØ*EØEØØØØ
    ØØØFECØFEØ6FE      :REM*191
124 DATA ØØ18187E1818181818ØØØØ*Ø
    ØC6C6CECEFEØØØØØØC6*C6C66C3
    8ØØØØØØC6D6FE      :REM*186
125 DATA EEC6ØØØØØØEE7C387CEE*Ø
    ØØØØØC6C6C6FEØ6FEØØ*ØØFE1C3
    87ØFEØØ1Ø5438      :REM*Ø
126 DATA FE38541ØØØ3878CECCCE*7
    838ØØØ4Ø86CFEFE7C7C*28ØØØØ1
    83Ø3Ø3Ø18ØØØØ      :REM*194
127 DATA ØØ18ØCØCØC18ØØ7F7F7F*7
    F7F7F7FØØFFFFFFFFFF*FFFFØØF
    FFFFFFFFFFFF      :REM*71
128 DATA FF7F7F7F7F7F7F7FØF*Ø
    FØFØFØFØFØFØFF8F8F8*F8F8F8F
    8F8ØØFEC6CECE      :REM*94
129 DATA CEFEØØØØ381818183C3C*Ø
    ØØØFEØ6FECØCØFEØØØØ*FCØCFEØ
    EØEFEØØØØCØC6      :REM*22
130 DATA C6FEØ6Ø6ØØØØFECØFEØ6*Ø
    6FEØØØØFCCCCØFEC6FE*ØØØØFEC
    E1C383838ØØØØ      :REM*85
131 DATA 7E66FEE6E6FEØØØØFEC6*F
    EØEØEØEØØFFFØFØFØFØ*FØFFFFF
    ØFØFØØØØØF8F8      :REM*67
132 DATA F8FFFØFØFØF1F1FFFFFØ*F
    ØFØFØFØFØFØFØ3C3C3C*3C7C7F7
    F7FØØØØØØØØØØ      :REM*174
133 DATA FØFØFØFFFØFØFØF1F1FF*F
    FFØFØFØFØFØFØFØFØFF*F8F8FFF
    1F1F1F1EØFØFØ      :REM*49
134 DATA EØFØFØFØFØFFE1E1E3E3*E
    3FFFFFØFØFØFØFØFØFØ*FØF8F8F
    8F8F8F8FFFF78      :REM*154
135 DATA 7878F8F8F8F8F8FFFFØF*Ø
    FØFØFØFØFFØFØØØØØØØ*ØØØØØØØ
    1392121213FØ1      :REM*232
136 DATA FF81999981191919FFØ3*3
    333Ø13939Ø1FFØ13131*3F3F39Ø
    1FFØ319191919      :REM*2Ø
137 DATA 19Ø3FFØ13F3FØ1ØFØFØ1*F
    FØ11F1FØ19F9F9FFFØ1*313F3F2
    139Ø1FF393939      :REM*146
138 DATA Ø1191919FFE7E7E7C7C7*C
    7C7FFF3F3F3F13131Ø1*FF39332
    7Ø1191919FF9F      :REM*182
139 DATA 9F9F1F1F1FØ1FF3911Ø1*2
    9393939FF19Ø9213119*1919FFØ
    1393931313101      :REM*84
140 DATA FFØ13939Ø11F1F1FFFØ1*3
    939393Ø9Ø1E7Ø31919*Ø331313
    1FFØ1393FØ1F9      :REM*114
141 DATA 19Ø1FFØ1C7C7C7C7C7C7*F
    F3939393131310FF39*3939393
    993C7FF393939      :REM*56
142 DATA 29Ø11139FF393993C793*3
    939FF393993C7C7C7C7*FFØ133E
    7CF9F39Ø1FF83      :REM*214
143 DATA 9F9F9F9F9F83FFFF3F9F*C
    FE7F3F9FF83F3F3F3F3*F383FFF
    FE7C399FFFFFF      :REM*3Ø
144 DATA FFFFFFFFFFFFFFØ1Ø1FF*F
    FFFFFFFFFFFFC7C7C7*C7FFC7C
    7FF999999FFFF      :REM*189
145 DATA FFFFFF93Ø193930193FF*F
    FCFØ32FØ3D3Ø3CFFF9F*99F3E7C
    F99F9FFØ72727      :REM*112
146 DATA 892323Ø9FFE7E7E7FFFF*F
    FFFFFF3E7CFCFCFE7F3*FFCFE7F
    3F3F3E7CFFFFF      :REM*162
147 DATA 93C7Ø1C793FFFFFFE7E7*8
    1E7E7FFFFFFFFFFFC7*C7E7C7F
    FFFFF8181FFFF      :REM*2
148 DATA FFFFFFFFFFC7C7C7FFFF*F
    9F3E7CF9F3FFFØ13939*313131Ø
    1FFC7C7E7E7C3      :REM*242
149 DATA C3C3FFØ1F9F9Ø13F3FØ1*F
    FØ3F3F3Ø1F1F1Ø1FF3F*3F3939Ø
    1F9F9FFØ13F3F      :REM*66
15Ø DATA Ø1F9F9Ø1FFØ3333FØ139*3
    9Ø1FFØ139F3E7C7C7C7*FF81999
    9Ø11919Ø1FFØ1      :REM*68
151 DATA 3939Ø1F1F1F1FFFFC7C7*F
    FC7C7FFFFFFC7C7FFC7*C7E7C7F
    3E7CF9FCFE7F3      :REM*146
152 DATA FFFFFF81FF81FFFFFF9F*C
    FE7F3E7CF9FFFØ139E1*E7FFE7E
    7FFC7EF6DØ16D      :REM*123
153 DATA EFC7FFFFFFØ1F9Ø139Ø1*F
    F1F1FØ13939390Ø1FFFF*FFØ1393
    F3FØ1FFF1F1Ø1      :REM*141
154 DATA 393939Ø1FFFFFFØ139Ø1*3
    FØ1FFC3CFCF83CFCFCF*FFFFFFØ
    1313101F9Ø11F      :REM*224
155 DATA 1FØ139393939FFC7FFE7*E
    7C7C7C7FFF9FFF9F9F9*19Ø1FF3
    F3F3933Ø13939      :REM*192
156 DATA FFC7E7E7E7E7C3FFFF*F
    F3911Ø12939FFFFFFØ1*3939393
    9FFFFFFØ13919      :REM*88
157 DATA 19Ø1FFFFFFØ13939Ø11F*1
    FFFFFØ1393Ø1F1F1FF*FFØ1191
    F1F1FFFFFFFØ1      :REM*178
158 DATA 3FØ1F9Ø1FFE7E781E7E7*E
    7E7FFFFFF3939313101*FFFFFF3
    9393993C7FFFF      :REM*226
159 DATA FF3929Ø11139FFFFFF11*8
    3C78311FFFFFF393939*Ø1F9Ø1F
    FFFØ1E3C78FØ1      :REM*2Ø6
16Ø DATA FFEFABC7Ø1C7ABEFFFC7*8
    731333187C7FFFBF793*Ø1Ø1838
    3D7FFFFE7CFCF      :REM*139
161 DATA CFE7FFFFFFE7F3F3F3E7*F
    F8Ø8Ø8Ø8Ø8Ø8Ø8Ø8ØFFØØ*ØØØØØØØ
    ØØØØØFFØØØØØØ      :REM*234
162 DATA ØØØØØØØØØØ8Ø8Ø8Ø8Ø8Ø*8
    Ø8Ø8ØFØFØFØFØFØFØFØ*FØØ7Ø7Ø
    7Ø7Ø7Ø7Ø7Ø7FF      :REM*6
163 DATA Ø139313131Ø1FFFFC7E7*E
    7E7C3C3FFFFØ1F9Ø13F*3FØ1FFF
    FØ3F3Ø1F1F1Ø1      :REM*13Ø
164 DATA FFFF3F3939Ø1F9F9FFFF*Ø
    13FØ1F9F9Ø1FFFFØ333*3FØ139Ø ►
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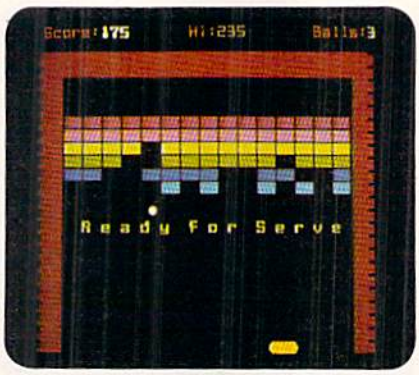
```
    1FFFFØ131E3C7          :REM*172
165 DATA C7C7FFFF8199Ø1191Ø1*F
    FFFØ139Ø1F1F1F1FFØØ*ØFØFØFØ
    FØFØØØØFØFØF           :REM*57
166 DATA FFFFØ7Ø7Ø7ØØØFØFØFØE*Ø
    EØØØØFØFØFØFØFØFØF*ØFC3C3C
    3C3838Ø8Ø8ØFF          :REM*164
167 DATA FFFFFFFFØFØFØFØØØFØF*Ø
    FØEØEØØØØFØFØFØFØF*ØFØFØFØ
    ØØ7Ø7ØØØEØEØE          :REM*85
168 DATA ØE1FØFØF1FØFØFØFØFØØ*1
    E1E1C1C1CØØØØFØFØF*ØFØFØFØ
    FØFØ7Ø7Ø7Ø7Ø7          :REM*116
169 DATA Ø7ØØØØ878787Ø7Ø7Ø7Ø7*Ø
    7ØØØØFØFØFØFØFØFØØF*ØFFFFFF
    FFFFF4478ØØØØ          :REM*91
17Ø DATA FCØØØFCØØØFCØØØ78*Ø
    ØØØØØØØØØØØØØØØØØ*ØØØØØØ
    ØØØØØØØØØØØ           :REM*194
171 DATA ØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØ*ØØØØØØ
    ØØØØØØØØØØØ           :REM*1
172 DATA 223FFFFC7FFFFEFFFFFF*F
    FFFFFFFFFFF7FFFFE3F*FFFCØØØ
    ØØØØØØØØØØØØ          :REM*77
173 DATA ØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØ*ØØØØØØ
    ØØØØØØØØØØØ           :REM*3
174 DATA ØØØØØØØ135AØ8DØBDAC*5
    AØ8A9ØØ8D5AØ8AA2Ø68*1B4CØ31
    ØAC5AØ8A9Ø74C          :REM*141
175 DATA C8152ØD115BØØ34CC415*A
    E69Ø8A9Ø38D56Ø82Ø8F*16BØØ34
    CA115A96C85Ø8          :REM*225
176 DATA A92Ø85Ø9A2ØC4C17ØF29*7
    F2CØ98Ø2CØ94Ø2C29BF*2C29DF2
    CØ92Ø2CØ91Ø2C          :REM*149
177 DATA 29EF2CØ9Ø82C29F72CØ9*Ø
    42C29FB8D74Ø82Ø3516*BØØ34CC
    B15BD8ØØ8C92C          :REM*212
178 DATA FØØ34CCB15E88E6EØ84C*A
    D1Ø2Ø2E2E2E434F2E53*2Ø31323
    Ø3638382F3Ø33          :REM*166
179 DATA 313638392D2Ø434F4C4F*5
    24F55542Ø2843293139*38392Ø4
    2593A2Ø54484F          :REM*91
18Ø DATA 4D41532Ø4A2Ø435A4152*4
    E45434B492E2E2E78D8*A2FE9A2
    Ø78132ØDA112Ø          :REM*5
181 DATA 85142ØE4132Ø7817A54E*8
    54D8DØ4DDA9Ø1855CAD*1EDØAD1
    FDØ2ØC6122ØDB          :REM*183
182 DATA 12465C465Ø9ØØFAØ322Ø*E
    418C65D1ØDA2Ø2F134C*53112Ø6
    815A55EDØØ62Ø          :REM*188
183 DATA C1112Ø781746519ØØ5AØ*1
    E2ØE4182ØAB17A9Ø1A2*Ø9AØØØ2
    ØC51746569ØC7          :REM*2Ø3
184 DATA AØØØ2ØE4184C8Ø11A54E*3
    8E9Ø2C92ØBØØ2A92Ø85*4EA64FC
    AEØ15BØØ2A215          :REM*148
185 DATA 864F6ØA9ØØ8D2ØDØ8D21*D
    ØA9ØF8D86Ø2A92Ø2ØD1*17A91F2
    ØA912A21ØAØØ5          :REM*156
186 DATA 2ØØ5182ØE31712Ø2Ø2Ø*1
    52Ø2Ø2ØØEØØA92F2ØA9*12A9ØB8
    D86Ø2A2ØDAØØ9          :REM*114
187 DATA 2ØØ5182ØE3171Ø2Ø522Ø*4
    52Ø532Ø452Ø4E2Ø542Ø*53ØØA91
    F2ØA912AØ282Ø          :REM*213
188 DATA E418A9Ø18D86Ø2A2Ø9AØ*Ø
    E2ØØ5182ØE3177Ø712Ø*72732Ø7
    4752Ø76772Ø78          :REM*27
189 DATA 792Ø7A7B2Ø7C7D2Ø7E7F*Ø
    ØA93F2ØA912A9ØC8D86*Ø2A2Ø4A
    Ø152ØØ5182ØE3          :REM*99
19Ø DATA 171Ø524F4752414D4544*2
    ØØ2593A2Ø14484F4D41*532ØØA2
    E2ØØ35A41524E          :REM*227
191 DATA 45434B49ØØA21ØAØ172Ø*Ø
    5182ØE3175E435F2Ø67*6F6E6FØ
    ØA97F2ØA9126Ø          :REM*82
192 DATA A2ØØAØ11CADØFD88DØFA*3
    8E9Ø1DØF36ØA64DE44F*9ØØ6CA8
    64D8E04DD6ØA2          :REM*32
193 DATA 25AØØ2ØØ518A9ØF8D86*Ø
    2A55D18693Ø2Ø2B186Ø*A9ØØ854
    CA94F8DEB192Ø          :REM*186
194 DATA 3F16A9Ø58D86Ø22ØØ813*A
    D86Ø249Ø88D86Ø22Ø64*13FØFØA
    92Ø2Ø24182ØØ8          :REM*24
195 DATA 132Ø1B186ØA2Ø7AØØF2Ø*Ø
    5182ØE317122Ø452Ø41*2Ø442Ø5
    92Ø2ØØ62Ø4F2Ø          :REM*234
196 DATA 522Ø2Ø132Ø452Ø522Ø56*2
    Ø45ØØ6ØA9ØF8D86Ø2A2*ØCAØØF2
    ØØ5182ØE317Ø7          :REM*6Ø
197 DATA 2Ø412Ø4D2Ø452Ø2ØØF2Ø*5
    62Ø452Ø52ØØA9Ø42ØA9*12CE86Ø
    2DØDBAØ282Ø8E4         :REM*63
198 DATA 18A99F2ØA9126ØA97F8D*Ø
    ØDCADØ1DC2DØØDC291Ø*FØØ2854
    C454C6Ø2Ø4914          :REM*1Ø8
199 DATA 2Ø1B182ØA813A9ØØ855F*8
    55Ø855E8556A9Ø1855C*A927854
    EA91D854FA919          :REM*17
2ØØ DATA 857ØA9CC856FAD18D4Ø9*Ø
    F8D18D46ØA2ØØBD12Ø8*9DØØ38B
    D12Ø99DØØ39BD          :REM*16
2Ø1 DATA 12ØA9DØØ3ABD12ØB9DØØ*3
    BBD12ØC9DØØ3CBD12ØD*9DØØ3DB
    D12ØE9DØØ3EBD          :REM*1Ø5
2Ø2 DATA 12ØF9DØØ3FBD121Ø9DØØ*3
    ØE8DØC76ØA9Ø88D86Ø2*A92Ø2ØD
    117A2Ø3AØØØ2Ø          :REM*129
2Ø3 DATA Ø5182ØE31713434F5245*3
    A2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø*Ø8493A2
    Ø2Ø2Ø2Ø2Ø2Ø2Ø           :REM*218
2Ø4 DATA 2Ø2Ø2ØØ2414C4C533A39*Ø
    Ø2Ø1717A9198565A9C7*8564A21
    5AØØØA9ØC2ØC5          :REM*158
2Ø5 DATA 17A9198565A9C285642Ø*9
    118A9Ø9855D2Ø4314 6Ø*A9Ø38D1
    5DØ6ØA9ØØ8D15          :REM*3Ø
2Ø6 DATA DØAD18DØ29FØØ9ØE8D18*D
    ØA9ØØ8D2ØDØ8D21DØA9*CØ8DF8Ø
    7A9C18DF9Ø7A9          :REM*123
2Ø7 DATA ØØ8D17DØ8D1DDØ8D1CDØ*A
    9Ø78D28DØA9Ø18D27DØ*A9F38DØ
    3DØ6Ø78AD15Ø3          :REM*234
2Ø8 DATA C914FØ138DE814AD14Ø3*8
    DE714A214AØDF8C14Ø3*8E15Ø3A
    215AØA58C18Ø3          :REM*42
2Ø9 DATA 8E19Ø3A97F8DØDDDA982*8
    DØDDDA9ØB8DØ4DDA9ØØ*8DØ5DDA
    9Ø18DØ6DD8DØ7          :REM*18
21Ø DATA DDADØEDD29CØØ9118DØE*D
    DADØFDD298ØØ9518DØF*DD58ADØ
    DDD6ØD82ØE914          :REM*32
211 DATA 2Ø52154C31EAA9ØØ854B*A
    22ØA97F8DØØDCADØ1DC*291ØFØØ
    9ADØØDC291ØFØ          :REM*178
212 DATA Ø2A24Ø8E Ø5DCADØØDC29*Ø
    4FØ34ADØØDC29Ø8FØ1B*A9DF8DØ
    ØDCADØ1DCA27F          :REM*21
213 DATA 8EØØDC499Ø299ØFØ29C9*9
    ØF025C91ØDØ12ADE919*C9D8FØ1
    AEEE919EEE919          :REM*29
214 DATA A9Ø1854B6ØADE919FØØA*C
    EE919CEE919A9FF854B*6ØADE91
    91869Ø8DØ2DØ           :REM*157
215 DATA AD1ØDØ29FD9ØØ2Ø9Ø28D*1
    ØDØ6Ø465C9Ø38ADED19*3Ø04A55
    FFØ2F2ØØB16AØ          :REM*115
216 DATA ØØB16DC96ØFØ112ØE915*2
    ØØB162ØE915AØØØB16D*C96ØDØ1
    32Ø116C65E2Ø           :REM*49
217 DATA F5152ØDF152ØB912AØØA*2
    ØE4186ØD848ADØDDD29*Ø2DØØ34
    C53118A489848          :REM*1ØØ
218 DATA A55CDØ2ØAD1FDØ29Ø1C9*Ø
    1DØØE4DEE198DEE19DØ*Ø6A9Ø18
    55CDØØ92Ø5D16          :REM*1Ø2
219 DATA 2ØCC162Ø3F1668A868AA*6
    84ØA9Ø838E563A82ØC6*186ØA9F
    F4DEC191869Ø1          :REM*243
22Ø DATA 8DEC196ØA9FF4DED1918*6
    9Ø18DED196ØAØØØA92Ø*916DC89
    16D6ØAEED19E8          :REM*2Ø2
221 DATA BDE319186DEB194A4A4A*8
    5631869Ø4A8AEEC19E8*BDE6191
    86DEA194A4A4A          :REM*58
222 DATA 29FE1869Ø579Ø81A856D*A
    9Ø479EF19856E6ØADEA*1918694
    Ø8DØØDØAD1ØDØ          :REM*32
223 DATA 29FE9ØØ2Ø9Ø18D1ØDØAD*E
    B1969528DØ1DØ6ØAD1E*DØ49Ø3D
    Ø4FADED193Ø4A          :REM*84
224 DATA A2ØØADE919186 9Ø9CDEA*1
    99ØØ2A2Ø68A186DEA19*38EDE91
    91ØØ2A9ØØC918          :REM*72
225 DATA 9ØØ2A9174AA64BFØØ318*6
    9ØCAABDB416FØØ38DEC*19A9Ø18
    5512ØF515A9ØØ          :REM*1Ø2
226 DATA 855FA54DC919BØØ61869*1
    94A854D6ØFFFFØØØØØØ*ØØØØØØØ
    ØØØØ1Ø1FFFFFF          :REM*177
227 DATA FFFFØØØØØ1Ø1Ø1Ø1Ø1AD*E
    C193Ø12186DEA19C9EB*9Ø1Ø2ØE
    915A9Ø185564C          :REM*43
```



The action speeds up with each level.

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```
228 DATA EC16186DEA199ØFØ8DEA*1
    9ADED193Ø16186DEB19*C9AB9Ø1
    AA9Ø1855Ø855C          :REM*54
229 DATA 6ØA9Ø185564CF515186D*E
    B19BØØ6A9Ø1855F9ØED*8DEB196
    ØA9Ø98D86Ø2AØ          :REM*6Ø
23Ø DATA Ø22Ø3517AØØ32Ø3517AØ*Ø
    4846A2Ø4C17A46AC8CØ*19DØF46
    ØA2Ø22ØØ518A9          :REM*164
231 DATA 642Ø2B18A2222Ø7317CA*D
    ØFAA9654C2B18A2Ø22Ø*Ø518A96
    42Ø2B182Ø7317          :REM*62
232 DATA 2Ø7317A21EA92Ø2Ø2B18*C
    ADØF8A9632Ø2B182Ø73*17A9654
    C2B18A9624C2B          :REM*89
233 DATA 18AØ142ØE418A95A855E*A
    ØØ7846AB9B1192Ø9317*A46AC8C
    ØØDDØF16Ø8D86          :REM*95
234 DATA Ø2A2Ø52ØØ518A2ØFA96Ø*2
    Ø2B18A9612Ø2B18CADØ*F36ØA91
    98567A9C78566          :REM*243
235 DATA 2Ø73189ØØC2Ø6918A9ØF*A
    215AØØØ2ØC5176Ø8D86*Ø22ØØ51
    82Ø43184CAC18          :REM*7Ø
236 DATA AØØØ99ØØØ499ØØØ599ØØ*Ø
    699F8Ø6C8DØF16Ø6885*6Ø68856
    12ØFC17A56148          :REM*226
237 DATA A56Ø486ØAØØØB16ØFØØB*2
    Ø2B18E66ØDØF3E661DØ*EF6Ø8A1
    879Ø81A856885          :REM*232
238 DATA 6BA9Ø479EF1985691869*D
    4856C6ØA9FF8552A9ØØ*8553Ø8
    553A9ØØ85526Ø          :REM*142
239 DATA AØØØ2552Ø5539168AD86*Ø
    2916BE66BE668DØØ4E6*6CE6696
    ØAØØØ984AA8B1          :REM*171
24Ø DATA 644898ØAA868484A4A4A*4
    A2Ø63186829ØF2Ø6318*CØØ79ØE
    4A9CF493Ø916F          :REM*2Ø
241 DATA C86ØAØØ3B164916688DØ*F
    96ØAØØØA2Ø4B164D166*DØØ4C8C
    ADØF66ØF818AØ          :REM*1Ø1
242 DATA Ø3B1647166916488 1ØF7*D
    86ØAØØ4A9ØØ9164881Ø*FB6ØAØØ
    4B164FØØAA9ØØ          :REM*2Ø1
243 DATA 91642Ø43182ØAC186ØAØ*Ø
    ØB16F3Ø13C8C93ØFØF7*84712Ø2
    B18A471B16F3Ø          :REM*227
244 DATA Ø3C8DØF26ØB9D5198DC1*1
    9B9DC198DCØ19A91985*67A9BE8
    5662Ø8218A98Ø          :REM*51
245 DATA AØØ491646ØE654A654EØ*Ø
    29ØØ4A2ØØ8654BD7919*8555AAA
    9ØØ9DØ4D49DØ6          :REM*245
246 DATA D4855BEAEAEAC65BDØF9*B
    97D198557B97C198558*B983198
    559B97E199DØ5          :REM*75
247 DATA D4B97F199DØ6D4A98ØØ9D*Ø
    ØD49DØ2D4B98Ø19855A*9DØ1D4B
    981199DØ3D4B9          :REM*21
248 DATA 84199DØ4D4B98219A21Ø*C
    ADØFD38E9Ø1DØF6A657*A558855
    7865818655A85          :REM*61
249 DATA 5AA6559DØ1D4C659DØDD*B
    98519FØØA855BB98419*29FE855
    A6ØB9841929FE          :REM*21Ø
25Ø DATA 9DØ4D46ØØØØ7ØEØØØFØ*1
    124ØØØ1Ø111ØØØØØØFØ*1834ØØØ
    1Ø111ØØØ7EØ1F          :REM*121
251 DATA 5754ØØ135Ø81ØØØØØØF2*1
    317ØØØ1Ø111ØØØØØØF2*3AØ7ØØØ
    1Ø181ØØØØØØFØ          :REM*39
252 DATA ØØ5ØØØ1Ø121ØØØ2ØAØD*Ø
    5Ø6ØEØØØØØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØ3Ø3Ø3Ø          :REM*58
253 DATA 3Ø3Ø3Ø3Ø3ØFFØ51Ø152Ø*2
    53ØØ1ØØØØØØØØØØØØØ*FFØØØ5F
    FØØØ61Ø3Ø88Ø1          :REM*94
254 DATA Ø1ØØØØØØØØØØØØØØØØØ1*Ø
    1Ø1Ø1Ø1Ø1Ø2Ø2Ø2Ø2Ø2*Ø2Ø2Ø3Ø
    3Ø3Ø3Ø3ØØ285Ø          :REM*215
255 DATA 78AØC8FØ184Ø689ØB8EØ*Ø
    83Ø588ØA8DØF82Ø487Ø*98CØØØØ
    ØØØØØ                 :REM*19Ø
256 DATA -1                :REM*114
```

■

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Speedy Viewer

Call on this quick and easy utility to check the contents of files on a disk.

By HOWARD I. GOLDMAN

Like most Commodore users, you probably have several disks filled with text files that you need to view from time to time. Of course, it's easy to access sequential files from Basic with that quick-and-dirty one-liner:

```
10 OPEN 5,8,5,"0:filename":FOR J=0 TO
   1:GET#5,A$:PRINT A$;:J=ST:
   NEXT:CLOSE 5
```

But Basic is slow and doesn't word-wrap at the end of lines.

SpeedViewer is a small machine language utility that overcomes these limitations and allows you to examine both sequential and program text files quickly and with the convenience of word-wrap. It's menu-driven and can be loaded and saved like a Basic program.

Type in Listing 1, using *RUN*'s Checksum program to catch any typing errors, and save it to disk with the name SPEEDVIEWER.GEN. Then run it to generate the actual SpeedViewer program on your disk. Finally, to use SpeedViewer, just load and run it.

SpeedViewer's menu provides five options, the first two of which let you choose program or sequential file format, respectively. All word processors save text files in one of these formats. After pressing 1 or 2, enter the name of the file you want, and it will start scrolling on the screen. If you decide not to view a file, press the return key at the filename prompt, and the menu will reappear.

SpeedViewer scrolls files too fast to read, but you can press the space bar to pause the display, then press it again to continue. You can also abort the display and return to the menu by pressing the run-stop key.

Note that some word processors achieve their word-wrapping by padding out lines with extra spaces. If these spaces have been saved to disk with the file, they won't confuse SpeedViewer, but they may result in a strange-looking display.

Option 3 displays a disk directory. As in the viewer modes, pressing the space bar toggles the pause feature, while pressing run-stop brings back the menu.

Option 4 lets you delete a file from the disk. Just enter the filename at the prompt, or, to abort the operation, press return without entering a filename.

Use option 5 to exit SpeedViewer and return to Basic. R

Howard Goldman has been programming on the C-64 for five years, having taught himself both Basic and assembly language.

Running Instructions: **Type in Listing 1 and save it to disk with the filename "SPEEDVIEWER.GEN". Run it to create the SpeedViewer program on disk. Then load and run SpeedViewer.**

Listing 1. SpeedViewer.Gen program. (Available on March–April ReRUN disk. See binder card at page 32.)

```
Ø REM THIS PROGRAM CREATES (AND
   SHOULD NOT BE CALLED) SPEEDV
  IEWER                    :REM*35
5 OPEN 8,8,8,"SPEEDVIEWER,P,W"
                           :REM*4Ø
1Ø CT=Ø:PRINT"{SHFT CLR}"
                           :REM*52
15 READ A$:IF A$="-1" THEN CLOS
   E8:PRINT:PRINT"ALL DONE!":EN
   D                       :REM*132
2Ø PRINT"{HOME}READING LINE "+S
   TR$(CT):CT=CT+1         :REM*149
25 IF LEN(A$)<62 THEN 65
                           :REM*227
3Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
   2Ø)+MID$(A$,43,2Ø)      :REM*252
35 FOR I=1 TO 3Ø           :REM*2Ø7
4Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                           :REM*171
45 H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55               :REM*91
5Ø L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55               :REM*113
55 BY=H*16+L:PRINT#8,CHR$(BY);
                           :REM*185
6Ø NEXT:GOTO 15            :REM*158
65 IF LEN(A$)<21 THEN B$=A$:GOT
   O 8Ø                    :REM*164
7Ø IF LEN(A$)<42 THEN B$=LEFT$(
   A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
   )):GOTO 8Ø              :REM*239
75 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
   Ø)+RIGHT$(A$,LEN(A$)-42)
                           :REM*182
8Ø FOR I=1 TO LEN(B$)/2:REM*2Ø3 ►
```


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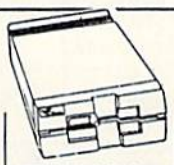

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SPEEDY VIEWER

```
85 C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                        :REM*134
9Ø H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55            :REM*46
95 L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55            :REM*78
96 BY=H*16+L:PRINT#8,CHR$(BY);
                        :REM*142
98 NEXT:GOTO 15         :REM*196
1ØØ REM MACHINE LANGUAGE FOR SP
   EEDVIEWER            :REM*87
1Ø1 DATA Ø1Ø8FFFF64ØØ9E323Ø36*3
   1ØØØØØ2Ø84FFA94Ø8D*8AØ2A95
   38D5CØ3A93Ø8D        :REM*98
1Ø2 DATA 5DØ3A93A8D5EØ3A9ØØ8D*2
   1DØ8D2ØDØ85C6A964AØ*Ø82Ø1EA
   B2Ø7FØ9C931FØ        :REM*22
1Ø3 DATA 18C932FØ17C933FØ1AC9*3
   4FØ19C935DØE9A9ØØ8D*8AØ24C8
   AØ2A9Ø12CA9ØØ        :REM*86
1Ø4 DATA 853C4C43ØA4CB5Ø94C1D*Ø
   A939BØEØ88D8DD35Ø45*4544D64
   945574552202Ø        :REM*43
1Ø5 DATA 56312E3Ø328D8D8D8D31*2
   92ØD64945572ØDØD2C7*2Ø54455
   8542Ø46494C45        :REM*1Ø6
1Ø6 DATA 8D32292ØD64945572ØD3*C
   5D12Ø544558542Ø4649*4C458D3
   3292ØD6494557        :REM*85
1Ø7 DATA 2Ø4449534B2Ø44495245*4
   3544F52598D34292ØD3*4352415
   443482Ø46494C        :REM*25Ø
1Ø8 DATA 458D35292ØC55849542Ø*5
   44F2ØC2C1D3C9C38D8D*C54E544
   5522Ø4F5Ø5449        :REM*6
1Ø9 DATA 4F4E2Ø4E554D4245523A*1
   22Ø92ØØ243Ø8D2Ø2Ø2Ø*2Ø2Ø2ØD
   Ø524553532Ø12        :REM*2Ø9
11Ø DATA D2C5D4D5D2CE92ØØ938D*8
   DC6494C452Ø544F2Ø53*4352415
   443483A2ØØØ93        :REM*82
111 DATA 8D8DC6494C452Ø544F2Ø*5
   64945573A2ØØØ869E84*9FAØØØ2
   ØCFFF919EC8C9        :REM*246
112 DATA ØDDØF68884BE6Ø48A5BE*2
   ØBDFF68A8A9Ø2A2Ø82Ø*BAFF4CC
   ØFF2ØCCFFA9Ø2        :REM*236
113 DATA 4CC3FF2ØCFFF48A59Ø29*B
   FFØØ96868682Ø62Ø94C*2EØ8686
   Ø2ØE4FFFØFB6Ø        :REM*12
114 DATA 2ØCCFF2ØE4FFC92ØDØØ3*2
   Ø7FØ92ØE1FFDØØ86868*2Ø62Ø94
   C2EØ8A2Ø24CC6        :REM*221
115 DATA FF85BF293FØ6BF24BF1Ø*Ø
   2Ø98Ø7ØØ2Ø94Ø6ØA993*2ØD2FFA
   98D2ØD2FFA9Ø2        :REM*252
116 DATA 85BEA96ØA2FDAØØ82Ø5Ø*Ø
   9BØ49A2Ø22ØC6FF2Ø6A*Ø92Ø6AØ
   92Ø6AØ92Ø6AØ9        :REM*116
117 DATA FØ292Ø85Ø92Ø6AØ9482Ø*6
   AØ9A868AA982ØCDBDA9*2Ø2ØD2F
   F2Ø6AØ9FØØ62Ø        :REM*163
118 DATA D2FF4CF7Ø9A98D2ØD2FF*4
   CD9Ø92Ø62Ø9A9FFAØØ8*2Ø1EAB4
   CDBØA2Ø62Ø94C        :REM*35
119 DATA 2EØ8A915AØØ92Ø1EABA2*5
   FAØØ32Ø3CØ9FØ13A6BE*E8E8E88
   6BEA96FA25CAØ        :REM*126
12Ø DATA Ø32Ø5ØØ92Ø62Ø94C2EØ8*A
   92AAØØ92Ø1EABA23EAØ*Ø32Ø3CØ
   9A965A23EAØØ3        :REM*67
121 DATA 2Ø5ØØ9BØBBA9932ØD2FF*A
   2Ø22ØC6FFA53CFØØ62Ø*6AØ92Ø6
   AØ9AØØØ2Ø6AØ9        :REM*2Ø
122 DATA 997AØ3C848A59Ø294ØDØ*1
   368C92ØDØEDCØ27BØØ4*84B59ØE
   52ØA3ØA4C72ØA        :REM*32
123 DATA 68CØ279ØØ32ØA3ØA84B5*2
   ØA3ØA4CØAØA84B4AØØØ*B97AØ3A
   63CFØØ32ØA4Ø9        :REM*2Ø2
124 DATA 2ØD2FFC8C4B5DØEEA98D*2
   ØD2FFA2FF88C8E8B97A*Ø39D7AØ
   3C4B4DØF438A5        :REM*46
125 DATA B4E5B585B52Ø85Ø9A4B5*6
   ØØØ2Ø7FØ9C9ØDDØF94C*2EØ8
                        :REM*8Ø
126 DATA -1             :REM*239
```

■

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Print a Month!

Get yourself organized in 1990 with monthly calendar printouts filled with your own important reminders.

By JARED REYNOLDS

If your family or organization plans activities well in advance, you can save time and frustration in scheduling by using Print-a-Month, a C-64 program that prints out monthly calendars filled in with your own reminders. I wrote the program to help my soccer coach keep track of two teams he was coaching at one time, and now my Scout troop is using it to schedule outings and other events.

Print-a-Month provides space for six entries for every date in the month. By saving your calendars to disk, you can use them as planning guides for the following year's activities.

Type in the program from Listing 1, using *RUN*'s Checksum program to catch any typing errors. You also need to customize line 1360 to work with your printer. Variables CPI17$, FFEED$ and RESET$ in that line specify Condensed mode (17 characters per inch), form feed and printer reset (initialize), respectively. Place the appropriate numbers from your printer manual into these variables using CHR$ codes.

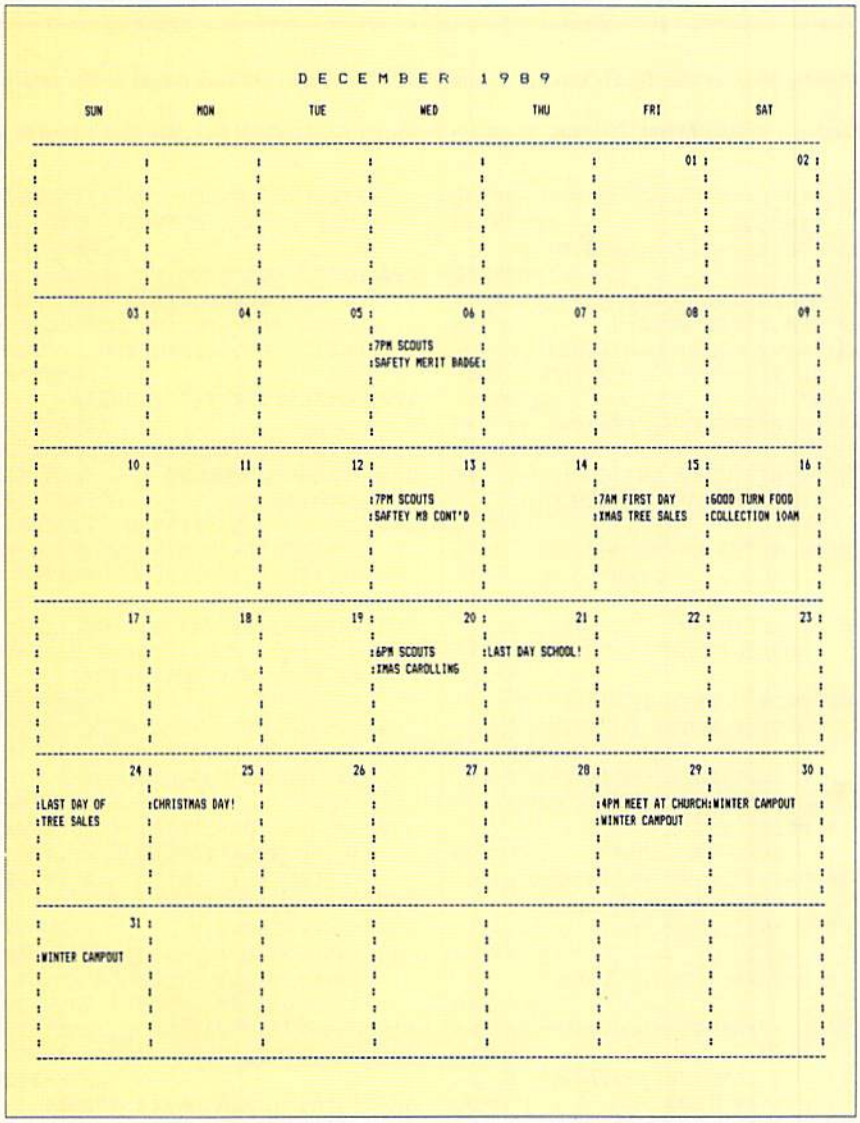
In addition, you may need to precede some commands with the escape code CHR$(27) and place your printer interface in Transparent mode. When you've finished customizing Print-a-Month, save it to disk.

Creating and Editing

Print-a-Month works through the menu shown in Table 1. When you select Option 1 to start a new calendar, the program displays a message telling you that if you continue, all of the notes in memory will be erased. If you wish to proceed anyway, enter Y at the prompt; otherwise, enter N, which will return you to the menu.

Assuming that you proceed, the program asks you to enter a month and year separated by a comma, such as 1,1990. The calendar display that appears is headed by the month and year, so you can make sure you entered the numbers correctly. If everything's okay, enter Y to return to the menu.

Option 2 lets you add and edit up to six notes for individual days. Enter the ►



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

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day you want, then enter up to 18 characters into the first note line for the date, omitting colons, commas and quotes. After you're done, press the return key to move to the next line. Pressing return at the sixth line brings you back to the calendar to choose another date. Pressing return at the calendar without entering a new date brings you back to the menu.

To view your notes without editing them, select Option 3 and press the cursor-right and -left keys to scroll from date to date.

To print out your calendar, select Option 4. The program then checks to make sure you want to continue, and, if you press Y, it proceeds to send the calendar to your printer.

Option 5 lets you load a previously saved calendar so you can update or print it.

Table 1. The Print-a-Month menu.

Start a New Calendar
Add/Edit Notes on Calendar
View Notes on Calendar
Print Calendar
Load Calendar
Save Calendar
Quit

Save your calendar to disk with Option 6. The notes currently in memory will be saved in a format that Print-a-Month recognizes, so you can load the calendar by merely entering the month and year. You should be aware that saving a calendar will replace one that may have been previously saved for the same month; so if you want to save a second calendar for any month, you must use a second disk.

Print-a-Month is written completely in Basic, so you can see how it works. Lines 1460–1480 calculate the day of the week on which the selected month begins.

Lines 840–860 and 1210–1230 set up the notes in memory in a format the program can use for printing and saving. The Save and Load options both check the drive for any errors that may occur during data transfer. Ⓡ

Jared Reynolds is currently a junior in high school, where he's involved in a course that teaches C and Pascal. He began to teach himself Basic on a C-64 in 1982.

Running Instructions: **Type in Listing 1, using *RUN*'s Checksum, and save a copy to disk before running it.**

Listing 1. Print-a-Month program. (Available on March–April ReRUN disk. See binder card at page 32.)

```
10 REM PRINT-A-MONTH BY JARED R
   EYNOLDS                :REM*133
20 POKE53280,9:POKE53281,0
                          :REM*140
30 GOSUB1350:GOSUB1450    :REM*15
40 REM TITLE SCREEN       :REM*35
50 PRINT"{SHFT CLR}{CRSR DN}{CT
   RL 2}";SPC(13);"PRINT-A-MONT
   H"                     :REM*166
60 PRINTSPC(13);"**********"
                          :REM*100
70 PRINT"{CRSR DN}{COMD 5}";SPC
   (11);"BY JARED REYNOLDS"
                          :REM*77
80 PRINT"{2 CRSR DNs}{CTRL 4}{5
    SPACEs}1 - START A NEW CALE
   NDAR"                  :REM*195
90 PRINT"{CRSR DN}{5 SPACEs}2 -
    ADD/EDIT NOTES ON CALENDAR"
                          :REM*227
100 PRINT"{CRSR DN}{5 SPACEs}3
    - VIEW NOTES ON CALENDAR"
                          :REM*167
110 PRINT"{CRSR DN}{5 SPACEs}4
    - PRINT CALENDAR"     :REM*127
120 PRINT"{CRSR DN}{5 SPACEs}5
    - LOAD CALENDAR"      :REM*224
130 PRINT"{CRSR DN}{5 SPACEs}6
    - SAVE CALENDAR"      :REM*244
140 PRINT"{CRSR DN}{5 SPACEs}7
    - QUIT"               :REM*166
150 GETZZ$:IFZZ$=""THEN150
                          :REM*148
160 ZZ=VAL(ZZ$):IFZZ<1ORZZ>7THE
   N150                   :REM*44
170 ONZZGOTO180,380,610,760,100
   0,1150,1290            :REM*39
180 PRINT"{SHFT CLR}* NEW CALEN
   DAR *":PRINT"{CRSR DN}{2 SP
   ACEs}YOU WILL {CTRL 9}LOSE{
   CTRL 0} ALL CURRENT NOTES O
   F"                     :REM*209
190 PRINT"{CRSR DN}{2 SPACEs}CU
   RRENT CALENDAR!!{2 SPACEs}D
   O YOU WANT TO":PRINT"{CRSR
   DN}{2 SPACEs}PROCEED [Y/N]?
   "                      :REM*16
200 GETZZ$:IFZZ$=""THEN200
                          :REM*155
210 IFZZ$="Y"THEN240      :REM*212
220 IFZZ$="N"THEN40       :REM*61
230 GOTO200               :REM*32
240 CLR:GOSUB1350:INPUT"{2 CRSR
    DNs}ENTER MONTH AND YEAR (
   MM,YYYY)";MO,YR:GOSUB1450
                          :REM*32
250 NS=0:CK=0:DY$="01":DY=1:PRI
   NT"{SHFT CLR}{CTRL 2}":CN=(
   40-(LEN(MO$(MO))+5))/2
                          :REM*58
260 PRINTSPC(CN);MO$(MO);YR;"{C
   RSR DN}":PRINT"{COMD 5} ";D
   S$;"{CRSR DN}{CTRL 4}"
                          :REM*84
270 FORCL=1TONW:PRINT"{4 SPACEs
   }";:FORV1=1TO7:NS=NS+1:IFNS
   >STHENCK=1             :REM*219
280 IFDY>ND(MO)THENCK=0:REM*142
290 IFCK=0THEN310         :REM*92
300 PRINTRIGHT$(DY$,2);"{3 SPAC
   Es}";:DY=DY+1:DY$="0"+MID$(
   STR$(DY),2):GOTO320    :REM*37
310 PRINT"{5 SPACEs}";    :REM*94
320 NEXTV1:PRINT"{CRSR DN}":NEX
   TCL                    :REM*222
330 PRINT"{CRSR DN}{4 SPACEs}IS
    EVERYTHING OK [Y/N]?"
                          :REM*88
340 GETZZ$:IFZZ$=""THEN340
                          :REM*162
350 IFZZ$="Y"THEN40       :REM*226
360 IFZZ$="N"THEN240      :REM*20
370 GOTO340               :REM*190
380 REM ADD/EDIT          :REM*4
390 NS=0:CK=0:DY$="01":DY=1:PRI
   NT"{SHFT CLR}{CTRL 2}";:CN=
   (40-(LEN(MO$(MO))+5))/2
                          :REM*205
400 PRINTSPC(CN);MO$(MO);YR;"{C
   RSR DN}":PRINT"{COMD 5} ";D
   S$;"{CRSR DN}{CTRL 4}"
                          :REM*199
410 FORCL=1TONW:PRINT"{4 SPACEs
   }";:FORV1=1TO7:NS=NS+1:IFNS
   >STHENCK=1             :REM*70
420 IFDY>ND(MO)THENCK=0   :REM*29
430 IFCK=0THEN450         :REM*22
440 PRINTRIGHT$(DY$,2);"{3 SPAC
   Es}";:DY=DY+1:DY$="0"+MID$(
   STR$(DY),2):GOTO460
                          :REM*176
450 PRINT"{5 SPACEs}";    :REM*234
460 NEXTV1:PRINT"{CRSR DN}":NEX
   TCL                    :REM*67
470 DT$="":INPUT"{COMD 5}{4 SPA
   CEs}DATE TO EDIT ({CTRL 6}R
   ET{COMD 5} TO EXIT)";DT$:DT
   =VAL(DT$)              :REM*135
480 IFDT=0THEN40          :REM*115
490 IFDT<0ORDT>ND(MO)THENPRINT"
   {CRSR UP}";:GOTO470:REM*223
500 QQ=0:DT=DT+S:PRINT:FORV2=1T
   O6:V3=V2+2:N=LEN(NO$(DT,V3)
   )                      :REM*16
510 PRINT"{4 SPACEs}NOTE";V2;"{
   CRSR LF}: ";NO$(DT,V3);"{CT
   RL 9}>{CTRL 0}{CRSR LF}";
```

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PRINT A MONTH!

```
                              :REM*24
52Ø GETZZ$:IFZZ$=""THEN52Ø
                              :REM*17
53Ø ZZ=ASC(ZZ$)               :REM*41
54Ø IFZZ=13THENPRINT:NEXTV2:GOT
    O39Ø                      :REM*5Ø
55Ø IFZZ=2ØTHEN59Ø            :REM*124
56Ø IFZZ<32ORZZ=34ORZZ=44ORZZ=5
    8ORZZ>94THEN52Ø           :REM*133
57Ø IFN=18THEN52Ø             :REM*255
58Ø N=N+1:PRINTZZ$;"{CTRL 9}>{C
    TRL Ø}{CRSR LF}";:NO$(DT,V3
    )=NO$(DT,V3)+ZZ$:GOTO52Ø
                              :REM*34
59Ø IFN=ØTHEN52Ø              :REM*167
6ØØ N=N-1:NO$(DT,V3)=LEFT$(NO$(
    DT,V3),N):PRINT" {2 CRSR LF
    s}{CTRL 9}>{CTRL Ø}{CRSR LF
    }";:GOTO52Ø               :REM*48
61Ø REM VIEW                  :REM*56
62Ø V1=1                      :REM*251
63Ø PRINT"{SHFT CLR}{CTRL 4}* V
    IEW *":PRINT"{CRSR DN}{CTRL
     2}{4 SPACEs}";V1;MO$(MO);Y
    R;"{2 CRSR DNs}{CTRL 4}":DT
    =V1+S                     :REM*156
64Ø FORV2=1TO6:V3=V2+2:PRINT"{4
     SPACEs}";V2;"- ";NO$(DT,V3
    );"{CRSR DN}":NEXTV2
                              :REM*2Ø7
65Ø PRINT"{2 CRSR DNs}{CTRL 6}{
    2 SPACEs}<=CRSR=> {COMD 5}T
    O VIEW DATES ({CTRL 6}RET{C
    OMD 5} TO EXIT)"          :REM*249
66Ø GETZZ$:IFZZ$=""THEN66Ø
                              :REM*6Ø
67Ø ZZ=ASC(ZZ$)               :REM*213
68Ø IFZZ=157THEN72Ø           :REM*138
69Ø IFZZ=29THEN74Ø             :REM*Ø
7ØØ IFZZ=13THEN4Ø             :REM*2ØØ
71Ø GOTO66Ø                   :REM*24
72Ø V1=V1-1:IFV1=ØTHENV1=ND(MO)
                              :REM*233
73Ø GOTO63Ø                   :REM*45
74Ø V1=V1+1:IFV1=ND(MO)+1THENV1
    =1                        :REM*76
75Ø GOTO63Ø                   :REM*57
76Ø REM PRINT                 :REM*182
77Ø PRINT"{SHFT CLR}* PRINT CAL
    ENDAR *":PRINT"{CRSR DN}PRI
    NT CURRENT CALENDAR [Y/N]?"
                              :REM*17Ø
78Ø GETZZ$:IFZZ$=""THEN78Ø
                              :REM*152
79Ø IFZZ$="Y"THEN82Ø          :REM*55
8ØØ IFZZ$="N"THEN4Ø           :REM*123
81Ø GOTO78Ø                   :REM*14Ø
82Ø IFQQ=1THEN88Ø             :REM*226
83Ø PRINT"{CRSR DN}WORKING...";
                              :REM*221
84Ø FORV1=1TOND(MO)+12:FORV2=2T
    O8                        :REM*142
85Ø NT$(V1,V2)=LEFT$(":"+NO$(V1
    ,V2)+SP$,19)              :REM*175
86Ø NEXTV2:PRINT".";:NEXTV1:PRI
    NT                        :REM*144
87Ø YR$=STR$(YR):X$=MO$(MO)+YR$
    :FORI=1TOLEN(X$):XX$=XX$+MI
    D$(X$,I,1)+" ":NEXTI
                              :REM*225
88Ø PRINT"{CRSR DN}PRINTING..."
                              :REM*99
89Ø QQ=1:NC=Ø:NS=Ø:CK=Ø:DY$="Ø1
    ":DY=1:V1=Ø:CN=(8Ø-LEN(XX$)
    )/2:OPEN4,4,Ø             :REM*5
9ØØ PRINT#4,RE$;SPC(CN);XX$:PRI
    NT#4,CP$:PRINT#4,D1$:PRINT#
    4,T$                      :REM*145
91Ø FORCL=1TONW:PRINT#4," ";:FO
    RV1=1TO7:NS=NS+1:IFNS>STHEN
    CK=1                      :REM*174
92Ø IFDY>ND(MO)THENCK=Ø       :REM*11
93Ø IFCK=ØTHEN96Ø             :REM*55
94Ø PRINT#4,LEFT$(S$,16);RIGHT$
    (DY$,2);" ";:DY=DY+1:DY$="Ø
    "+MID$(STR$(DY),2)        :REM*212
95Ø GOTO97Ø                   :REM*16
96Ø PRINT#4,S$;               :REM*174
97Ø NEXTV1:PRINT#4,":":FORV2=2T
    O8:PRINT#4," ";:FORV1=1TO7:
    NC=NC+1                   :REM*1Ø4
98Ø PRINT#4,NT$(NC,V2);:NEXTV1:
    PRINT#4,":":NC=NC-7:NEXTV2:
    PRINT#4,T$:NC=NC+7        :REM*57
99Ø NEXTCL:PRINT#4,FF$:CLOSE4:G
    OTO4Ø                     :REM*89
1ØØØ REM **LOAD**             :REM*62
1Ø1Ø PRINT"{SHFT CLR}* LOAD CAL
    ENDAR *":PRINT"{CRSR DN}LO
    AD NEW CALENDAR [Y/N]?"
                              :REM*2Ø6
1Ø2Ø GETZZ$:IFZZ$=""THEN1Ø2Ø
                              :REM*24
1Ø3Ø IFZZ$="Y"THEN1Ø6Ø         :REM*1ØØ
1Ø4Ø IFZZ$="N"THEN4Ø           :REM*68
1Ø5Ø GOTO1Ø2Ø                  :REM*74
1Ø6Ø INPUT"{CRSR DN}ENTER MONTH
     AND YEAR (MM,YYYY)";MO,YR
    :GOSUB145Ø                :REM*225
1Ø7Ø PRINT"{CRSR DN}LOADING..."
                              :REM*96
1Ø8Ø OPEN15,8,15:OPEN2,8,2,"Ø:C
    AL."+STR$(MO)+"/"+STR$(YR)
    +",S,R"                   :REM*199
1Ø9Ø GOSUB113Ø:IFER<>ØTHEN112Ø
                              :REM*21Ø
11ØØ FORV1=1TOND(MO):DT=V1+S:FO
    RV2=3TO8:INPUT#2,NO$(DT,V2
    ):NEXTV2:NEXTV1           :REM*1Ø5
111Ø GOSUB113Ø                :REM*147
112Ø CLOSE2:CLOSE15:GOTO4Ø
                              :REM*67
113Ø INPUT#15,ER,ER$,TR,SE:IFER
    <>ØTHENPRINT"{CRSR DN}";ER
    ;ER$;TR;SE:FORX=1TO15ØØ:NE
    XTX                       :REM*161
114Ø RETURN                    :REM*7
115Ø REM SAVE                 :REM*46
116Ø PRINT"{SHFT CLR}* SAVE *":
    PRINT"{CRSR DN}SAVE CURREN
    T CALENDAR [Y/N]?":REM*242
117Ø GETZZ$:IFZZ$=""THEN117Ø
                              :REM*44
118Ø IFZZ$="Y"THEN121Ø        :REM*244
119Ø IFZZ$="N"THEN4Ø          :REM*234
12ØØ GOTO117Ø                 :REM*253
121Ø PRINT"{CRSR DN}WORKING..."
    ;:FORV1=1TOND(MO):DT=V1+S:
    FORV2=2TO8                :REM*132
122Ø IFNO$(DT,V2)=""THENNO$(DT,
    V2)=" "                   :REM*132
123Ø NEXTV2:PRINT".";:NEXTV1:PR
    INT:PRINT"{CRSR DN}SAVING.
    .."                       :REM*115
124Ø OPEN15,8,15:OPEN2,8,2,"@Ø:
    CAL."+STR$(MO)+"/"+STR$(YR
    )+",S,W"                  :REM*148
125Ø GOSUB113Ø:IFER<>ØTHEN128Ø
                              :REM*196
126Ø FORV1=1TOND(MO):DT=V1+S:FO
    RV2=3TO8:PRINT#2,NO$(DT,V2
    ):NEXTV2:NEXTV1           :REM*1Ø8
127Ø GOSUB113Ø                :REM*6Ø
128Ø CLOSE15:CLOSE2:GOTO4Ø
                              :REM*114
129Ø PRINT"{SHFT CLR}* QUIT *":
    PRINT"{CRSR DN}DO YOU WANT
     TO QUIT NOW [Y/N]?"
                              :REM*1Ø5
13ØØ GETZZ$:IFZZ$=""THEN13ØØ
                              :REM*124
131Ø IFZZ$="Y"THEN134Ø        :REM*132
132Ø IFZZ$="N"THEN4Ø          :REM*1Ø9
133Ø GOTO13ØØ                 :REM*11Ø
134Ø POKE53281,6:POKE5328Ø,14:P
    RINT"{SHFT CLR}{COMD 7}{5
    SPACEs}PRINT-A-MONTH STILL
     IN MEMORY.":END          :REM*197
135Ø REM INITIALIZE VARIABLES
                              :REM*61
136Ø CPI17$=CHR$(2Ø):FFEED$=CHR
    $(12):RESET$=CHR$(27)+CHR$
    (64)                      :REM*25
137Ø DIMND(12),MO$(12),NT$(43,8
    ),NO$(43,8):RESTORE:REM*29
138Ø FORD=1TO12:READMO$(D),ND(D
    ):NEXTD:D1$="{1Ø SPACEs}"
                              :REM*98
139Ø FORD=1TO7:READDN$:DS$=DS$+
    "{2 SPACEs}"+DN$:D1$=D1$+D
    N$+"{16 SPACEs}":NEXTD
                              :REM*16
14ØØ MO=1:YR=2ØØØ:SP$="{18 SPAC
    Es}":S$=":{18 SPACEs}"
                              :REM*242
141Ø T$=" ":FORD=1TO134:T$=T$+"
    -":NEXTD:RETURN           :REM*191
142Ø DATAJANUARY,31,FEBRUARY,28
    ,MARCH,31,APRIL,3Ø,MAY,31,
    JUNE,3Ø,JULY,31           :REM*147
143Ø DATAAUGUST,31,SEPTEMBER,3Ø
    ,OCTOBER,31,NOVEMBER,3Ø,DE
    CEMBER,31                 :REM*234
144Ø DATASUN,MON,TUE,WED,THU,FR
    I,SAT                     :REM*218
145Ø REM CALENDAR INITIALIZATIO
    N                         :REM*56
146Ø X=YR+(MO<3):S=INT(275*MO/9
    )-INT((7*X+7)/4)+367*YR+1-
    INT((INT(X/1ØØ)+1)*3/4)
                              :REM*229
147Ø S=S-4-7*INT((S-4)/7):QQ=Ø:
    X1=(ND(MO)+S)/7:NW=INT(X1)
    :IFX1>NWTHENNW=NW+1
                              :REM*129
148Ø IF(YR/4)-INT(YR/4)=ØANDMO=
    2THENND(2)=29             :REM*119
149Ø RETURN                   :REM*1Ø2
```

■

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Color Me Quick

With this ingenious little program in memory, you can make screen-color changes by tapping one key.

By STEVEN GREGG

A friend of mine, who programs strictly in Basic, once asked me to write a routine that would give him instantaneous control over the screen, border and text colors of his monitor display. The program had to use only three keys, be totally compatible with Basic and not slow down a running program. As if that weren't enough, it needed to be a short routine. Seems like a pretty tall order? Not really—not for machine language, anyway. That's exactly the type of job machine language does best.

Sixty times per second the C-64 interrupts a running program to check for keypresses, update the system clock, and do other "housekeeping" chores. Screen Color Interrupt (SCI, for short) works by diverting the interrupt routine slightly. If, during the interrupt, the computer detects that F3, F5 or F7 has been pressed, it changes the background, border or text color, respectively, to the next color on the C-64 palette. Press the key again, and the color changes again with nary a hint of hesitation in the program that's running.

The program in Listing 1 is actually a Basic loader that pokes the machine language SCI into memory beginning at 49152 ($C000). The program then remains active until the computer is turned off. It will deactivate if you press run-stop/restore, but can be reactivated with SYS 49152. The machine language is a scant 131 bytes long, leaving ample room for other programs.

SCI can run as a stand-alone program, but it's really meant to be incorporated into other programs. To use SCI with your own program, include a Gosub to SCI's first line in your code. Then, to return execution to your program, replace the END in SCI's third line with RETURN. The Gosub call to SCI should be located at the beginning of your program, where it will be run only once.

If you need the F3, F5 and F7 keys for other functions in your program, you can alter SCI by pressing another key in conjunction with a function key. Just replace the last 0 in line 60 with the value you want from Table 1 in SCI's REM statements. For example, if you replaced the 0 with 2, the screen would change color when you pressed F3, F5 or F7 along with the Commodore logo key.

The values in the second REM statement table assign the function keys to SCI use. A value is given for F1, in case you'd like to use F1, F3 and F5 instead of F3, F5 and F7. By all means, leave the REM statements in the program.

When you type in Screen Color Interrupt, be sure to use *RUN*'s Checksum program to detect any typing errors. Once it's on disk, you can slip it into your own programs for the screen colors you want—when you want them! Ⓡ

Steven Gregg's primary interest in programming on the C-64 is "unraveling the mysteries of machine language."

Running Instructions: **Type in Listing 1, using *RUN*'s Checksum, save it to disk and run it to activate Screen Color Interrupt.**

Listing 1. Screen Color Interrupt program. (Available on March–April ReRUN disk. See binder card at page 32.)

```
Ø REM SCREEN COLOR INTERRUPT 64
                          :REM*241
1Ø FOR I=49152 TO 49283: READ A
                          :REM*13Ø
2Ø POKE I,A: NEXT: SYS 49152
                          :REM*176
3Ø END :REM REMOVE END AND REPL
   ACE WITH RETURN IF USING AS
   A SUBROUTINE           :REM*25
4Ø DATA 169,13,162,192,12Ø,141,
   2Ø                     :REM*122
5Ø DATA 3,142,21,3,88,96,173,14
   1                      :REM*134
6Ø DATA 2,2Ø1,Ø:REM CHANGE HERE
    FOR COMBINATIONS FROM TABLE
    1 BELOW               :REM*92
7Ø DATA 2Ø8,32,165,2Ø3,2Ø1
                          :REM*245
8Ø DATA 5: REM SCREEN KEY
                          :REM*45
9Ø DATA 2Ø8,6,32,55,192,32,121
                          :REM*174
1ØØ DATA 192,2Ø1,6: REM BORDER
    KEY                   :REM*138
11Ø DATA 2Ø8,6,32,67,192
                          :REM*1Ø5
12Ø DATA 32,121,192,2Ø1,3: REM
    TEXT KEY              :REM*247
13Ø DATA 2Ø8,6,32,79,192,32,121
    ,192,76,49,234,168,174,33,2
    Ø8,32,1Ø9,192         :REM*28
14Ø DATA 142,33,2Ø8,152,96,168,
    174,32,2Ø8,32,1Ø9,192,142,3
    2,2Ø8,152,96          :REM*4
15Ø DATA 168,174,134,2,32,1Ø9,1
    92,142,134,2,138,162,Ø,157,
    Ø,216,157,Ø           :REM*212
16Ø DATA 217,157,Ø,218,157,Ø,21
    9,232,2Ø8,241,152,96,138,41
    ,15,17Ø,232           :REM*92
17Ø DATA 224,16,2Ø8,2,162,Ø,96,
    16Ø,Ø,162,Ø,2Ø2,2Ø8,253,136
    ,2Ø8,248,96           :REM*233
18Ø REM TABLE 1           :REM*47
19Ø REM 1=SHIFT :2=LOGO :3=SHIF
    T/LOGO                :REM*219
2ØØ REM 4=CTRL :5=SHIFT/CTRL
                          :REM*215
21Ø REM 6=CTRL/LOGO :7=SHIFT/CT
    RL/LOGO               :REM*16
22Ø REM TABLE 2           :REM*94
23Ø REM F1=4 :F3=5: F5=6: F7=3
                          :REM*14
```

■

RUN it right: **C-64**

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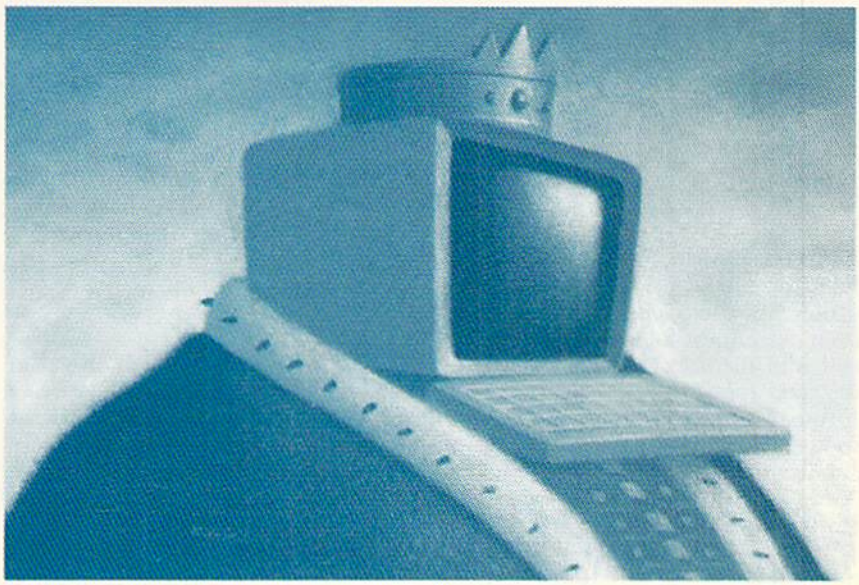
128 Mode

The C-128 is no longer in production, but the king of Commodore computing lives on.

By MARK JORDAN



COMMODORE'S DECISION TO stop making the C-128 has certainly seemed like bad news for us 128 users. After all, over the past decade most computers that have been discontinued have slipped out of the limelight. I'm thinking of the diminutive Timex Sinclair, the Bill Cosby-promoted TI/99-4A, the hacker-friendly Atari 400/800 series, the techie crowd's TRS-80, and even great IBM's colossal mistake, the PC jr. If you were watching, shortly after manufacture stopped on those machines, they lost coverage in the computing press, software manufacturers fled from them, and eventually they started appearing at porch sales, alongside Nehru jackets and old Gary Lewis and the Playboys albums.

That's bad! And if I were the worrying type, I'd be worried now. But I'm not the worrying type, at least when it comes to the C-128, and neither should you be. The C-128 is not ready for porch sales, and I guarantee it—for several reasons.

First, the C-128 is two computers, not one. Never forget that inside your 128's housing lives a C-64, and Commodore is *not* stopping production on the C-64. That means at least half (and some would say far more) of the machine you own is still active in the marketplace. That's not just good—it's excellent!

Just consider, more than seven million C-64s have been sold, a good percentage of those are still in daily use, and software companies continue to make C-64 programs. Rare is the game that doesn't appear in a 64 version, and many games are released *first* for the 64. Also, magazines devoted to the C-64 (and C-128) are still alive and kicking.

I can hear the wails already: "But we want C-128 programs!" So do I. But it's important for C-128 owners to remember the primary reason for choosing a 128 over a 64 in the first place: to run 80-column productivity programs while retaining compatibility with the wealth of software available for the 64. Those 80-column spreadsheets, databases and word processors arrived almost immediately after the 128 came out, and they're good. Meanwhile, entertainment and education programs have continued to flourish for 64 mode. Even if not a single new title is released for 128 mode, the C-128 is still a hard deal to beat, because it does everything it's supposed to.

The second reason not to worry is a happy parallel in the computer industry: the Apple II family. Although certain members of that family are no longer being made, the fact that the IIgs and IIc are still coming off the line keeps the Apple II family intact. Believe me, as a schoolteacher I know that many of those early, primitive Apples are still burning up electrons. Shouldn't the C-128, which is more, rather than less, powerful than its still-being-made brother, follow suit? You bet!

Want a third reason? How about the fact that over four million C-128's have been sold, and to active users. C-128 owners are the cream of the Commodore computing crop. They've written hundreds of public domain programs, and, by sheer nagging force, they got Berkeley Softworks to put out a C-128 version of GEOS. They also support a grassroots 128-specific magazine, *Twin Cities 128*, a 128-specific disk magazine, *LoadStar 128*, and *RUN*'s own 128 programs, both in the magazine and on the ReRUN disks. This is not a dying crowd of people.

Finally, the C-128 is simply a marvelous machine. It has Basic 7.0, a tinkerer's—as well as a pro's—delight. It has a built-in machine language monitor for tweaking at an even more advanced level. It can run CP/M, something I still haven't had time to play with. It has a video display chip with still-untapped potential. The keyboard is excellent, the operating system works like a charm, and the hardware is very reliable. In fact, one of the main reasons Commodore elected to stop production on the C-128 instead of the C-64 is that the 128 is more expensive to make; it's a loaded piece of equipment.

Someday the C-128 will meet its Celestial Maker, but that day hasn't come. Until the advent of the next quantum leap in computer technology (I'm talking laser-everything), your venerable, friendly, all-purpose C-128 will serve you well. Long live the king! ■

Mark Jordan, a high school English teacher by profession, has been programming Commodore computers since 1983.

ILLUSTRATED BY ROB COLVIN

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GOLD MINE

Here are the keys to unlock the secrets in your games.

By LOUIS F. SANDER

4 × 4 OFF ROAD RACING: On the four courses where you must concern yourself with fuel, it's best to carry seven extra cans of gas. You won't run out of fuel while you're still on the course.

—VICTOR R. HEREDIA
EL PASO, TX

ARCADE GAME CONSTRUCTION KIT: I like to keep a little scrapbook of sprites taped to paper. I get the sprites from magazines and various programs, and with them I can make sequels to the game they originated in.

Also, I like to combine one game's scenery blocks and environment with another game's sprites. Once I made "Gerg's Quest" by combining Labyrinth Master and Gerg's game.

—JEFF LUNGER
LANSDALE, PA

ARKANOID II: Are you a frustrated "Arkaholic"? Well, here's a way to get an infinite number of paddles to juggle balls with. First, load and play a game. When it ends, enter DEBBIE S into the high score table. (Don't forget the space before the S). The border will turn blue, and you will have your infinitude of paddles.

—RANDY MURPHY
BRONX, NY

THE BARD'S TALE III: To beat Lucencia, gather one of each kind of rose located outside the city, then go to Violet Mountain and kill the rainbow dragon. Get the crystal key and gather some of the dragon's blood in a wineskin.

Next, go to Cyanis's Tower and get the magic triangle from Cyanis. Go to the bush that doesn't have any roses, and dump the dragon's blood on the bush. Get the rainbow rose from this bush.

Go to Alliria's Tomb. Find your way to 16 North and 7 East, and ring the triangle to crumble the wall. On the second level, give each of the guardians the rose that she wants. After all the roses have been given out, including the rainbow rose, seek out Alliria, the Belt of Alliria, and the Crown of Truth.

—BRIAN STEPHENS
MOGADORE, OH

BUBBLE BOBBLE: On level 13, use the water to wipe out the sharks in the heart. You'll get a very good score.

—ALVIN MAH
MAPLE RIDGE, B.C., CANADA

CARD SHARKS: When you have read a question and have to guess how many people gave the same answer to that question, the instructions tell you to use the up-and-down cursor key to change the numbers by one. You can also use the left-and-right cursor key to change the numbers by ten.

—DAVID M. JORDAN
BUDINGEN, WEST GERMANY

CONTRA: When you get to the waterfall, bend down and start shooting. There's a machine gun nest on the other side of it. Blow it up, then flip up the waterfall's cliffs two times. Wait until the man on the bridge passes, then flip three times and wait for the next man to pass. Flip some more and fire your weapon to destroy the gun nest above.

In the Alien's Lair, destroy the two side guns, then destroy the huge gun by firing at its corner. The next level's easy, so you'll soon be on the last one.

Defeat all the men and the guns, but watch out for electric shocks. Get the Barrier and run as fast as you can. When you get to the heart, fire straight up to destroy it and win the game.

—JON BELOF
POMPTON PLAINS, NJ

THE GAMES: SUMMER EDITION: To get the maximum score in Diving takes three different maneuvers, each perfectly executed. Five 10s are possible if you do it right. It's important to move the diving wheel as close to the diver (far right) as possible.

To get the most points in Springboard Diving, do as many back somersaults as you can before entering the water. My best score is 294.

When competing against the computer in Velodrome Cycling, draft behind the computer cyclist. Use as little energy as possible in the early stages of the race. Begin your sprint after the final corner before the bell lap. If you follow this method and have fast hands, you might beat my record of 7.25 seconds.

—RICK HUBERT
TELL CITY, IN

INDIANA JONES AND THE LAST CRUSADE: When you are on the last level, memorize the first set of letters you jump across. When you get to the next set of letters, jump onto those letters you memorized from the first set. Otherwise, you'll fall off.

—CLAY MCNICHOLS
METROPOLIS, IL

JORDAN VS. BIRD: Before the computer makes his move on offense, get directly in front of him. If he charges straight into you, pull back on your joystick. He'll be called for a charging foul, and you'll get the ball.

When the computer has scored and the screen is changing to give you the ball, push your joystick to the right. After you start to run and get to the curve in the three-point line, push diagonally up to the right. When you're almost to the end of the three-point line, drive on the computer. You will beat him to the basket and get an easy slam.

In the three-point contest, you can shoot from anywhere on the court, as long as it's behind the three-point line. After you shoot, keep pressing your button while the ball is in the air. As soon as it hits or misses, you can shoot again.

Finally, to see a demonstration game, just put both men on Computer mode and the computer will play itself.

—BILLY FRASER
DAMARISCOTTA, ME

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NEUROMANCER: You can get your UXB for free by going to Shin's Pawn Shop and telling him that you have no money. Shin really doesn't want the deck lying around, so he will give it to you for free, without even taking your pawn ticket.

At Asano Computing, you can get Asano to lower his prices by as much as $8000. Ask him why Crazy Edo calls him a pig, then insult Crazy Edo.

To get into Freeside's Bank of Gemeinschaft, use the security code BG1066. The only thing in there is a cyberspace jack that will jack you into sector 5.

To get Comlink 6.0, enter Toxoku Imports with 5.0, link code YAKUZA and password YAK. You can then upload 6.0 to Hosaka for $7500.

Here's how to open an account with the Bank of Zurich: Link up with 6.0 using BOZOBANK as the link code. Use the sequencer to gain access to level one. Open an account and deposit the minimum amount. Write down your account number, since you'll need it later.

You can avoid paying high jail fines by depositing all your money in the PAX machine. The next time you're arrested, tell the lawyer to "Put a sock on it." When the judge asks how you plea, ask "Does it matter?" He will sentence you to death, and you'll be resurrected at the Body Shop. Since resurrection costs whatever cash you have on hand, which is none at this point, your resurrection will be free.

To obtain CyberEyes, break into Maas Biolabs in cyberspace and defeat Sangfroid, its AI. From inside the database, turn off the Lawbot security system and unlock the door. Next, jack out of cyberspace and go to Julius Deane. Ask him what he knows about hardware. He'll sell you a gas mask. Put it on by operating it, then go into Maas Biolabs. The gas mask will protect you from the virus security system. The security camera will mistake you for the doctor, and will ask if you would like to test CyberEyes. Say yes and tell the camera that you will test it on yourself. CyberEyes and its 32 program storage capacity is now yours.

After defeating the World Chess AI, download BattleChess 4.0. When you get to sector 7, you can use this program to get into Phantom. After breaking the ICE, use BattleChess 4.0 on the Phantom instead of battling him. He will give you instant access. You'll get the software to beat Musabori's AI, which in turn will give you the software to help beat Neuromancer and the game.

—CONTRIBUTOR UNKNOWN

OPERATION WOLF: When you are close to being killed, hold down the trigger or firebutton and stay on full auto. If a helicopter or gunboat appears, use any remaining grenades. This is an effective way to kill enemy soldiers and stay alive longer.

Often, near the end of a stage, I will be one or two blocks away from death. I use this method to remain alive until the end of the stage.

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no good if you're dead, and you will usually have an enormous supply.

—MICHAEL MAZZONI
BOCA RATON, FL

PLATOON: In the jungle, look for trip wires just behind bushes that go across the trail. Shoot just before you jump them, and you won't have to worry about enemies on the other side.

In the village, you'll find what you need at the last three huts.

Try not to use flares in the bunker. If you watch the darkness, you'll see the VC shadows covering the blue. Don't take too many shots, or they'll zero in on your muzzle flash.

—MIKE LANCASTER
ADDRESS UNKNOWN

POOL OF RADIANCE: Before entering the Kobald's cave, be sure to have at least two fireballs.

Before entering Mantor's library, have some magical weapons with you, or you'll never make it out.

—ADAM CROSBY
WEST SPRINGFIELD, MA

SPORTING NEWS BASEBALL: Here's a way to improve your chances of striking out the computer at bat. When he hits the ball to the outfield, resist the temptation to throw the ball to the base the computer is running for. Instead, pick up the ball and start running for the base he's coming up on. That puts you closer to the base, where you can throw him out much faster.

Try it; it works for us.

—BART WARD & TONY HARDEY
VERSAILLES, MO

STAR WARS: If you're still trying to destroy Darth Vader's ship, forget it. When Vader appears, shoot him repeatedly until his ship turns white. This makes it impossible for the ship to shoot back until he leaves.

The best way to get through the corridors with the catwalks is to go to the extreme upper left- or right-hand corner. Most fireballs won't shoot there, and, when a catwalk comes, you can just go under it.

To destroy the Death Star, go to the bottom of the corridor, near the middle, and continually fire down.

—DAVE BOYLE
SEVERNA PARK, MD

TECHNOCOP: Having trouble killing the third-level wastedump violator? Try this: Move slowly toward him. When he appears, back him up until he is on the edge of the screen. Wait for the waste barrel to come at you, and jump over it just as it is about to hit you. You should land right in front of the violator, where, if you're very fast, you can shoot him.

If you don't back him up to the edge of the screen, you'll probably land right on top of him. If that happens, he'll waste you and escape as well.

Don't get depressed if this method doesn't work right the first few times you try it. It has to be flawlessly performed to work.

—CONTRIBUTOR UNKNOWN

THE THREE STOOGES: In the Boxing Match, the pattern of obstacles is always the same. Here it is: Trash, Hydrant, Light Pole, Dog, Package, Door, Box, Ladder, Trash, Hydrant, Box, Package, Dog, Box, Light Pole, Trash, Dog, Package, Door, Light Pole, Box, Hydrant, Package, Box, Dog, Light Pole, Trash, Box, Package, Hydrant, Trash, Ladder, Box, Door, Light Pole, Box, Box, Hydrant, Trash, Ladder, Door, Trash, Hodges Radio.

Because they come so close together, it's easier to dodge rather than jump over objects that don't take up the whole sidewalk, such as hydrants, packages and boxes. Larry jumps best at higher speeds.

—JOHN SHULL
FAYETTEVILLE, NC ■

To submit your own C-64 or C-128 game tips for consideration, send them to Gold Mine, PO Box 101011, Pittsburgh, PA 15237. Put your name and address on every piece of paper you send, and be sure to state which Commodore computer your tip is for, or we cannot publish it. Neatness and clarity will be very much appreciated, too. RUN *will pay $5 per submission upon publication, provided you also include your social security number.*

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COMMODORE CLINIC

Answers to your questions about RAM expansion, hard disk drives, and Datafile, RUN*'s own database.*

By ELLEN RULE

Q *I'd like to exchange my library of GEOS 1.2 geoPaint files with my friend's library of GEOS 2.0 geoPaint files, but it seems these versions of GEOS aren't compatible. Is there any way to translate or exchange such files?*

—ROWLAND MEDLER
GAINESVILLE, FL

A According to GEOS experts Peter and Paul Hughes (GEOLIB PH and SYSOP PH on QuantumLink), you shouldn't be experiencing any data transfer problems with geoPaint. They recommend two programs to resolve other compatibility problems: Wrong Is Write, for converting geoWrite documents, and Album Reverter, which strips page names from Version 2.1 photo albums for use with earlier versions of GEOS. You can get these two programs by sending a disk with return postage to the author, Joe Buckley, 464 Beale St., West Quincy, MA 02169.

GEOS 2.0 is a major upgrade to the GEOS operating system. It not only has fixed bugs in earlier versions of GEOS, but it also features color and a RAM drive on the deskTop, batch operations and recognition of two disk drives. If you use GEOS extensively, as it seems you do, I urge you to update your operating system in order to take advantage of the many new features of GEOS 2.0.

Q *Your interview with the folks at Berkeley Softworks ("geoFolks," RUN, September 1989) mentions that Commodore has sold the rights to the 1750 REU to another company, which plans to market it. How and where can I get one of these units?*

—BUTCH HOOVER
KOKOMO, IN

Q *In the November 1987 issue of* RUN *(see "The Tale of the RAM and the Mouse"), author Barbara Mintz states that it is possible to use a 512K 1750 RAM expansion unit with the C-64, if you clip out resistor R-4. She also states that you must have a "beefed up" power supply. How do I know if my new power supply qualifies as "beefed up"? Its output is 5 volts dc (8.5 volt-amps) and 9 volts ac (9.0 volt-amps). I would also like to know if the resulting "souped-up" REU would work correctly with GEOS 2.0.*

—ADAM KROPELIN
JEFFERSONVILLE, VT

Q *Is it possible to modify the 1700 REU to create a 1750? I obtained a 1700 before local support of the 128/64 died, but now I need a 1750 for programs such as Spectrum 128. There are no REUs to be found in this country, and the cost of importing them is prohibitive.*

—LEONARD SMITH
MEREDALE, SOUTH AFRICA

A There are several options for Commodore owners looking for 512K RAM expansion. Berkeley Softworks recently announced geoRAM, which plugs into the cartridge port on either the C-64 or C-128 and provides 512K of RAM exclusively for use with GEOS. The standard C-64 power supply is adequate to power this unit, since the device uses low-power-demand chips. Order from Berkeley Softworks by calling 1-800-888-0848, extension 1741.

For those seeking a more fully compatible 512K, a qualified technician can upgrade the 1764 REU to 512K, or modify the 1750 REU for use with the C-64, with no loss of compatibility. The 1750 Clone is a 1764-to-1750 RAM upgrade offered by Software Support International (2700 NE Andresen Rd., Vancouver, WA 98661; phone 1-800-356-1179) for either customer-supplied 1764s or for those provided by SSI itself. This upgrade requires the use of the Commodore heavy-duty power supply, also available from SSI. This power supply is identical in output to that of the C-128: 4.3 amps at 5 volts dc and 1.1 amps at 9 volts ac. Since volt-amps equals volts times amps, Adam Kropelin's 8.5 volt-amp power supply is only equal to 1.7 amps at 5 volts and is not sufficient power to meet this standard.

I understand that the later 1700 REUs contain the same RAM controller chip as the 1750 and 1764, and that the 64K RAM chips in these 1700 REUs can be replaced with two banks of socketed 256-by-1 RAM chips for a total of 512K. (Unfortunately, this means desoldering and resoldering almost 300 connections.) In addition, a minor modification to the circuit board must be made. One last caveat: I know of no way to determine whether a 1700 REU has the right controller chip without opening it—a process that can damage the hardware inside if not done properly. One Commodore-authorized repair service that will perform the upgrade on qualifying 1700 REUs is D-5 Associates, 100 Ashburton Ave., Woburn, MA 01801; phone 617-937-8086.

As many REU owners have discovered, not all software recognizes the presence of added RAM. To resolve this, Creative Micro Designs (PO Box 646, East Longmeadow, MA 01028) is currently developing RAMLink, a device that will allow commercial software to access the 1700, 1764 or 1750 REU as a RAM disk. This unit, slated for release this spring, will be priced at under $100.

Q *Is it possible to merge two files created with Datafile? My only alternative would be to retype several hundred records. Perish the thought! Can you help me?*

—JIM TIMBERLAKE
FORT MYERS, FL

A Your word processor can be used to merge data files created by any database (including Datafile) that saves data as ASCII text files. Load the first ASCII datafile into your word processor, then append the second file to the first. After making sure that the data within the combined files is consistent—that is, that the same number of fields exist in each imported segment and that they are of compatible size and type—save the file as ASCII text. A database program like Datafile, with the proper fields configured, can then import the merged files. ■

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GEOWATCH

More geoNews and geoTips to keep the geoFans happy!

By TIM WALSH

LAST MONTH, I MENTIONED Berkeley Softworks' promise of a 512K RAM expansion unit (REU) for both the C-64 and C-128. The latest word from BSW is that GEORAM 512 will include a revamped boot disk for both the 64 and 128 versions of GEOS 2.0.

According to a BSW spokesperson, the boot disk, entitled GEOS 2.0r, will contain new deskTop and Configure files. Lacking the 2.0 versions of geoPaint, geoWrite and less significant files, this new GEOS will be helpful to users who have yet to upgrade to 2.0, but want to sample the advantages 2.0 offers over older versions of GEOS. While the need for a modified version of GEOS 2.0 might come as unfavorable news to some GEOS afficionados, it's undoubtedly worth the added speed and overall improvement in versatility.

We're also pleased to report that *RUN*'s GEOS Companion disk will make its appearance by the time you read this. It is scheduled for a January 1990 release. For this disk, we've assembled ten all-new utilities and applications.

One of my favorites is geoMusician, the best 8-bit sound editor I've heard yet. The sounds you can create with this program very nearly equal those created by Amiga sound editors. Along with geoMusician, there's geoAnimator, geoMusic Player, clip art and a long list of other useful and creative files. I'm certain the GEOS Companion will prove to be one of our most popular GEOS-compatible disks ever.

A while back, I called upon GEOS users from across the land to contribute their finest geoTips for making life with GEOS a little easier. Here are the fruits of their labors.

GEOWRITE FONT PRESERVATION

Like most conscientious geoWrite users, I always save my documents to a dedicated geoWrite file disk. However, I experienced a recurring problem whenever I referenced a previously written geoWrite document. In seeking additional disk-storage space, I would erase the font or fonts the document was created with and leave a 9-point BSW font throughout.

My trick to circumvent this problem is to save the font information in the file's dialog box, which is accessed through the Info menu option on the deskTop. Keeping font information there is an excellent reference for loading the original fonts from another disk, should they be deleted from the geoWrite file disk.

—MARCK C. ABBOTT
LONDON, KY

GEOTERM TIP

GeoTerm 64 and 128 (on both *RUN*'s Power Paks I and II) offer a distinct advantage over traditional 64 and 128 telecommunication programs when the computer "locks up" while online. Nearly every telecommunications computerist has experienced a frozen keyboard when too many users log on to a multi-line BBS. ►

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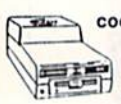

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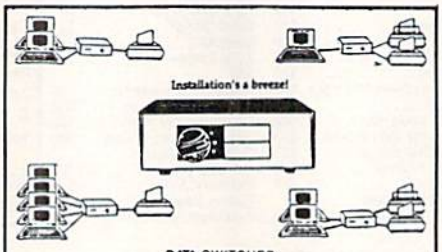

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When using conventional 64/128 terminal software, geoTerm's pointer can save the day. Even if the keyboard is locked up, you can usually move the mouse to position the pointer to the top of the screen, and select the Full Duplex mode to instantly revive your system. You can then issue any commands, typically without the loss of a single byte of data.

—Ben Wildasin
Bloomington, IN

Squeezing Basic into geoWrite

If you've been looking for an easy way to get a Basic 2.0 or 7.0 listing into geoWrite, you can stop your search. Just load the Basic program into memory and enter the following commands in Direct mode:

```
OPEN 2,8,2,"0:filename,S,W"
CMD 2:LIST:PRINT#2:CLOSE2
```

When the drive light goes out, the file will be on disk. Boot up GEOS, place a copy of Text Grabber in the drive and activate it from the deskTop. Select either "C128 Generic II" or "C64 Generic II" and enter a filename for the destination file.

Place the source disk in the drive and let Text Grabber do its conversion. You can then load the converted file into geoWrite.

—Jason Truesdell
Exton, PA

geoPaint Clip Art

When I tried to share with a friend some clip art I created using geoPaint 2.0, I quickly discovered that my friend's older version (1.3) of Photo Manager would not recognize my Photo Album scrap from GEOS 2.0. To solve this problem, I developed the following method for sharing Photo Albums among various versions of GEOS.

For demonstration purposes, let's assume you want to share clip art with someone who's using GEOS 1.3. The first step is to boot the copy of GEOS 1.3 with which you want to use the GEOS 2.0 Photo Album scrap. Then, create a work disk that contains the 1.3 deskTop and both the 1.3 and 2.0 versions of Photo Manager. (You'll have to use the Rename File option from the deskTop before copying one of them over to the work disk, because they both have the same filename.) Next, place two Photo Albums on the work disk, one created with the 1.3 version, and the other created with the 2.0 version of Photo Manager.

Now, activate the 2.0 version of Photo Manager (answer No to the prompt asking if you want to upgrade an older Photo Album) and copy the 2.0 clip art to a Scrap file. Then, exit the 2.0 version and activate the 1.3 version of Photo Manager. Paste the scrap that you just moved with the 2.0 version. Repeat this process until you have all the desired clip art copied over to the 1.3 work disk.

—C. Douglas Wilcox
Martinsville, VA ■

Tim Walsh, in addition to being RUN's *technical manager, printer expert and Magic columnist, is a GEOS enthusiast of long standing.*

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RUN's Checksum & Program Typing Hints

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 it. When typing in a program from *RUN*, first load and run *RUN*'s latest version of the Checksum program, which contains a new feature explained below. The screen will display a SYS number (49152 for the C-64; 3328 for the C-128) 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.

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 as you typed it 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 appropriate SYS number, and save the finished program.

We sometimes get letters and phone calls from new readers who have typed in the Checksum program for the first time. They are confused by the "Out of Data Error in Line 30" message that appears when they try to run the Checksum program. Understandably, they compare line 30 of the listing with line 30 as they typed it in, and cannot find anything wrong. The message unintentionally misleads them into thinking the error is in line 30, whereas the typing mistake is actually somewhere in one of the Data statements in lines 190–350.

So, we've added a new feature to the Checksum program that alerts readers to the number of the Data statement line in the Checksum program where an error has actually been made. **Note that this feature works *only* on the Checksum program itself, and not on any other program listing in *RUN*.**

After you've entered and saved the Checksum program to disk, run it. If you've made any errors in any of the Data statements, the program will give you a specific line number. Find the mistake, correct it, press return, save the program and run it again. Repeat this procedure until the Checksum program runs flawlessly.

Control Characters Demystified

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 once. 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 once.

{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.

{5 LB.s}—press the British pound key (£, *not* #) five times.

Refer to the following paragraphs for any other Error messages you get from running any program listing in *RUN*.

Other Error Messages

Having heard from many users over the years about their difficulties with typing in listings, we've identified a few recurring problems that plague many people but are easy to fix. So read on and see if your problem is one of these.

- You get an "Out of Data in Line xxx" message. This means that a program line was reading from Data statements and reached the end of the data before it was done reading. There are two possible problems.

One might be with the program line that reads the data, usually a For-Next loop. Make sure you have the proper values for the loop, because if, for example, the listing has a loop of 0 to 150, and you've typed 0 to 160, you'll get the Out of Data message. If the loop is correct, then the problem lies in the Data statements themselves. One possibility is that you omitted a whole line of data. That's easy enough to find and correct. It's more likely that you've skipped one or more individual data items or typed in a period instead of a comma, which causes two data values to be read as one number. Check your typing carefully against the listing. Using *RUN*'s Checksum program when you type in listings from the magazine should help in this case.

- You get an "Illegal Quantity Error in Line xxx" message. This means you've read a number from a Data statement and tried to poke it into a memory address. The error occurs because the number is larger than 255 (the largest value a memory address can contain), which means that somewhere in your Data statements you've made an error by typing in a number larger than 255. Again, this is easy to check for and correct. First look in your Data statements for a number larger than 255. You might have added an extra digit, or perhaps you ran two numbers together (23456 instead of 234,56).
- You get a "Syntax Error in Line xxx" message. This could be almost anything. What it tells you is that there is something wrong in the indicated line. Usually you've misspelled a Basic keyword or omitted some required character. List the line and examine it carefully.
- You get an "Error in Data" message. This occurs in programs that add up all the data as read, and, when finished, compares that sum with what it should be if the data were typed in correctly. If it isn't the same, it means an error somewhere in typing the Data statements. Go back and check the data carefully. Correct the mistake(s), save the new version and try again.
- Finally, we urge everyone who intends to type in one of our listings to use *RUN*'s Checksum program, which will help you avoid every mistake we've mentioned above, except that it won't detect the omission of a line. Ⓡ

Listing. *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=49152
30 I=0:CK=0:CH=0:LN=190
40 FOR K=0 TO 16
50 FOR J=1 TO 10:READ B:IF B>255 THEN GOTO 170
60 CH=CH+B:POKE SA+I,B:I=I+1:NEXT
70 READ LC
80 IF LC<>CH THEN GOTO 170
90 CH=0:LN=LN+10
100 NEXT K
110 POKESA+110,240:POKESA+111,38:POKESA+140,234
120 PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":PRINT
130 PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO=128 THEN 1
    60
140 POKESA+13,124:POKESA+15,165:POKESA+25,124:POKESA+2
    6,165
150 POKESA+39,20:POKESA+41,21:POKESA+123,205:POKESA+12
    4,189
160 POKESA+4,INT(SA/256):SYS SA:NEW
170 PRINT"YOU HAVE A DATA ERROR IN LINE ";LN;"!":END
180 REM DO NOT CHANGE THESE DATA STATEMENTS!
190 DATA 120,162,24,160,13,173,4,3,201,24,884
200 DATA 208,4,162,13,160,67,142,4,3,140,903
210 DATA 5,3,88,96,32,13,67,152,72,169,697
220 DATA 0,141,0,255,133,176,133,180,166,22,1206
230 DATA 164,23,134,167,132,168,170,189,0,2,1149
240 DATA 240,58,201,48,144,7,201,58,176,3,1136
250 DATA 232,208,240,189,0,2,240,42,201,32,1386
260 DATA 208,4,164,180,240,31,201,34,208,6,1276
270 DATA 165,180,73,1,133,180,230,176,164,176,1478
280 DATA 165,167,24,125,0,2,133,167,165,168,1116
290 DATA 105,0,133,168,136,208,239,232,208,209,1638
300 DATA 169,42,32,210,255,165,167,69,168,170,1447
310 DATA 169,0,32,50,142,169,32,32,210,255,1091
320 DATA 32,210,255,169,13,32,210,255,104,168,1448
330 DATA 96,104,170,24,32,240,255,104,168,96,1289
340 DATA 56,32,240,255,138,72,152,72,24,162,1203
350 DATA 0,160,0,32,240,255,169,42,208,198,1304
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RUN AMOK

Item: In "Money Manager" (January 1990), line 180 of the listing contains a Basic 7.0 Fast command that results in C-64 users getting a checksum different from the one in the listing. C-64 users should leave out the last statement in that line, and it will then read as follows:

```
180 FOR I=1TO40:LINE$=LINE$+
    "[COMD @]":NEXT   :REM*135 ■
```


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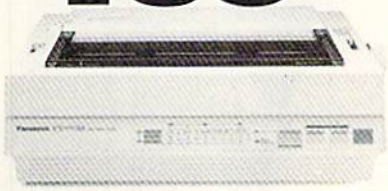

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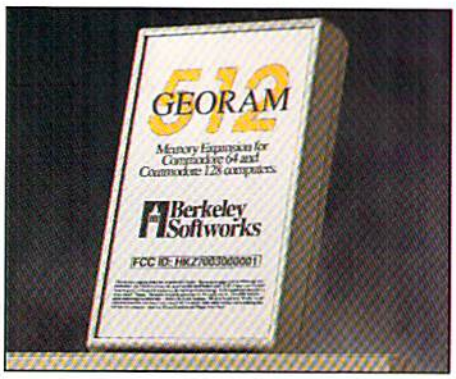

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