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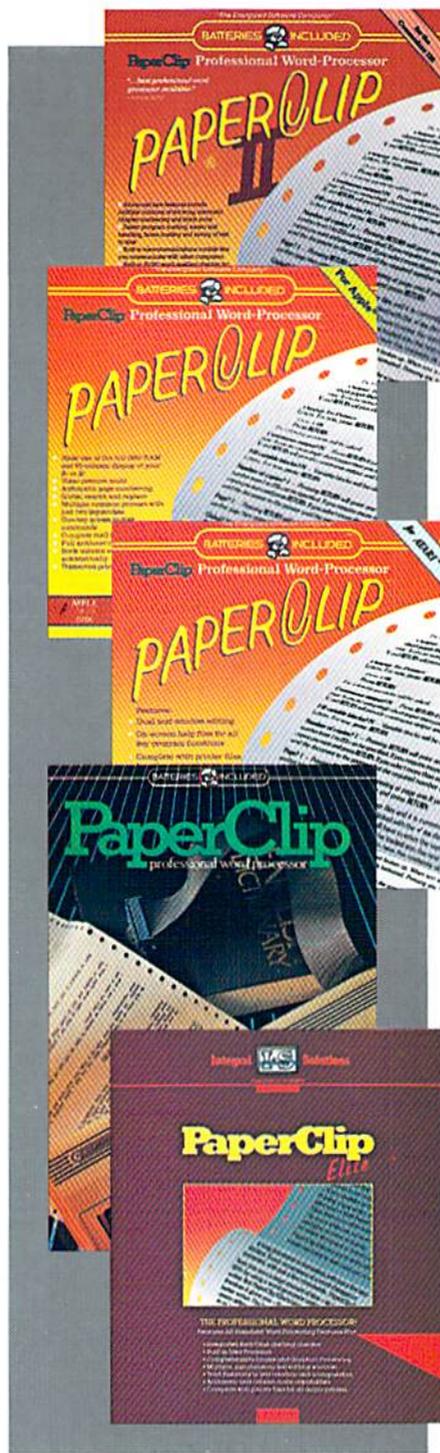
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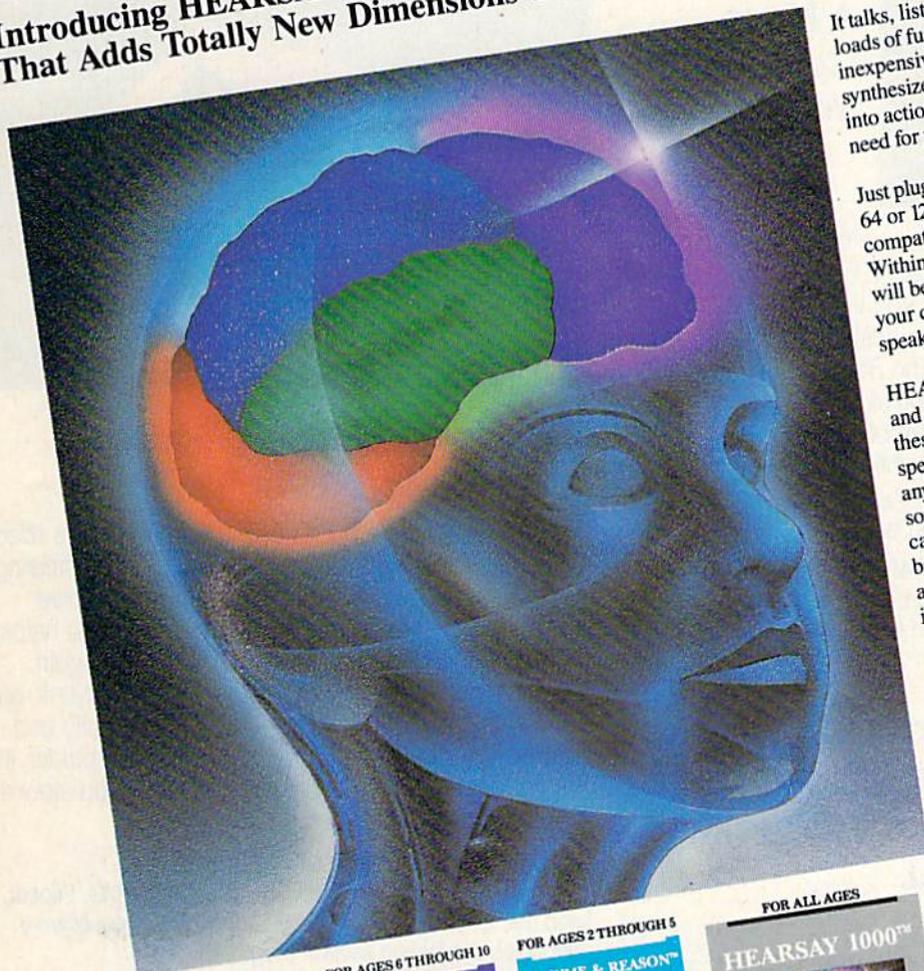
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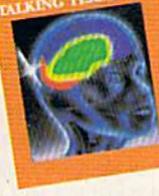
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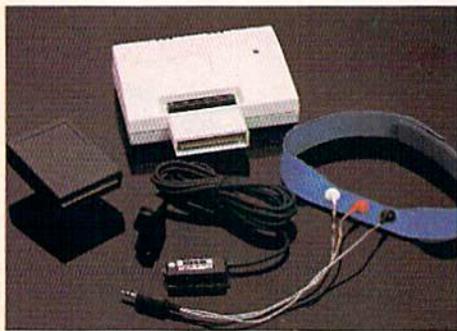
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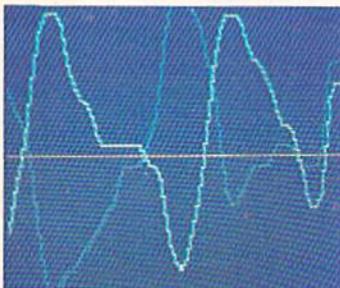


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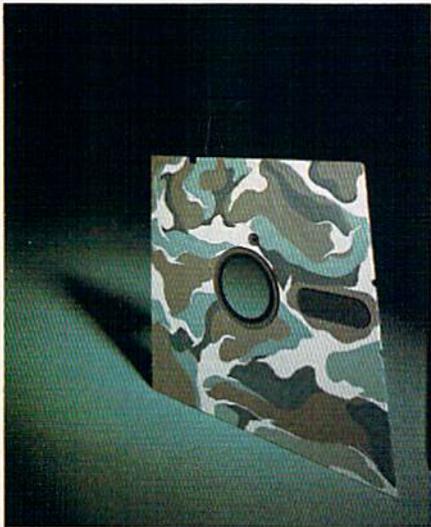
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COVER PHOTOGRAPHED
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PUBLISHER
STEPHEN TWOMBLY

EDITOR-IN-CHIEF
DENNIS BRISSON

TECHNICAL MANAGER
MARGARET MORABITO

MANAGING EDITOR/PRODUCTION
SWAIN PRATT

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SALES REPRESENTATIVES
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NANCY POTTER-THOMPSON

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GIORGIO SALUTI, MANAGER
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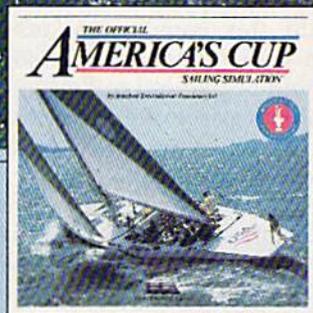
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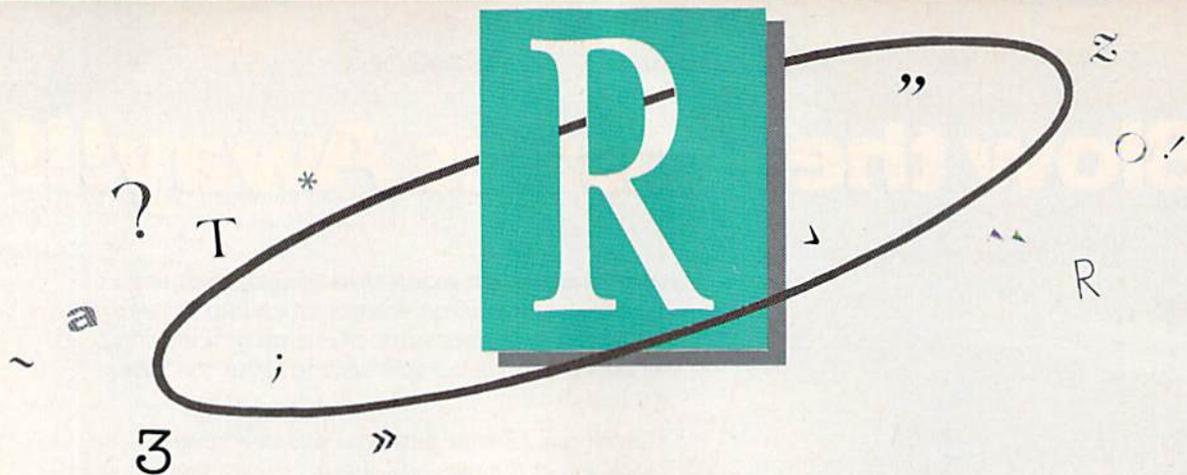


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THE COPY CONTROVERSY

When the subject of copying software whirs around, everyone has an opinion.

This month's cover story takes a hard look at the positions of user groups and software publishers with respect to the software copying controversy. Given a chance to air their concerns in this emotionally charged issue, both the user groups and developers had much of interest to say.

RUN commissioned *InfoWorld* reporter Scott Mace to wade through the rhetoric, rationalizations and misunderstandings to investigate this issue. His report, which begins on page 33, is based primarily on the comments of user groups and software developers who were queried in a *RUN* survey earlier this year.

TO BACK UP OR NOT

The right of computerists to make back-up copies for personal use is not an issue in this copy controversy. Both sides concur that the software owner should be allowed to do so.

The problem arises when abuses of this right occur and users distribute copies to other computerists.

To protect themselves from this abuse, software developers incorporated copy-protection schemes that make it difficult to duplicate software. Unfortunately, copy protection does not discriminate between legitimate and illegitimate use.

Copy protection can and has been broken, and has spawned the growth of a profit-making industry (program dissectors, nibblers and other copi-

ers) devoted to undoing the most airtight protection schemes.

Software developers maintain that with some of the sophisticated disk copiers available today, complex protection schemes are necessary to thwart piracy abuses.

This standoff between developers and code breakers has most often been compared to an escalating arms race, although other analogies have been used.

One user group president quipped, "Telling the average American that software cannot be copied is like waving a red flag in front of a bull."

Unfortunately, there can be no real winners in such antagonistic settings.

Software developers and authors may suffer financially as a result of unauthorized copying of their programs, but it is the entire computer industry, which could lose creative authors as a result, that could wind up as the big loser.

An Accolade company spokesman stated, "It [software copying] can damage the publishers and developers to the point that the consumers will eventually suffer an even greater loss in terms of a decline in both quality and quantity of available entertainment products on the market."

NO SIMPLE SOLUTIONS

One user group offered this assessment of the situation: "If software publishers and distributors would lower their prices, there would be little or no problem with piracy, and, resultingly, copy protection could be done away with."

Several companies in the Commo-

dore market are among those major developers who have abandoned the use of anti-copying devices on their software. It remains to be seen whether, as some industry analysts predict, this will result in lower software prices and stem the tide of piracy.

Lower prices are fine, but will they eliminate the problem? With the availability of copy programs, software piracy may always exist. One of those companies that has dropped copy protection is Batteries Included, which readily admits that the "casual copier" will continue to pass along programs to friends, and "it must be accepted that this casual copying can never be completely eradicated."

There is evidence of a growing awareness on the part of users about copying software. Just about every user group has a policy—some written into their bylaws—against illegal copying.

As Mace states in his article, "The vast majority of user groups recognize that illegal copying is a problem, and they are on the front lines of the battle, educating users about the law and about the realities of software publishing. Education is paying off."

Another viewpoint in this controversy is that of the Software Publisher's Association, whose ad, entitled "What's Wrong with Copying Software?", appears elsewhere in this issue.

We don't expect that the controversy will end with the publication of this article. Rather, we view this as a first step in the dialogue process between the two groups. As always, we invite your comments and reactions to this coverage. **db**

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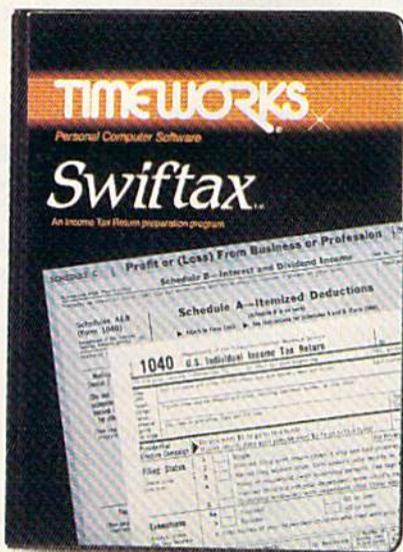
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By JIM BORDEN

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

Magic
RUN magazine
80 Elm St.
Peterborough, NH 03458

If your trick is accepted for publication in the column, you will receive a colorful RUN Magic T-shirt.

\$385 Musical staff modification—For those who use a non-Commodore printer, you might want to modify the Musical Staff Maker program (trick \$2FB, July 1986). Substitute a 95 for the CHR\$ value in line 120. This is the ASCII underline character. Or use a 45 (the minus sign), which will work on all printers, but with a small space between characters.

Peter J. Forgacs
Britton, MI

\$386 Christmas Magic—Season's Greetings! The holiday season is again upon us, and in keeping with the spirit of Christmas, here's a little Yuletide magic. Type in the program, place your monitor on the fireplace mantle or in the bay window, and settle back in your favorite recliner with a hot toddy to watch the action!

```
1 REM CHRISTMAS MAGIC - RICHARD PENN
5 POKE53280, . : POKE53281, . : PRINT "{SHFT CLR}"
  : FORT=1 TO 23 : PRINTTAB(RND(1)*39)" {CTRL 1} .
  " : NEXT
10 A$="*****": S=19 : PRINT "{HOME} {CRSR
  DN}" "TAB(12)" {CTRL 2} MERRY CHRISTMAS! {CRSR
  DN} {CTRL 6} " : FORT=1 TO 11 STEP 2
20 FOR L=1 TO 3 : PRINTTAB(S) LEFT$(A$, T) : NEXT : S=
  S-1 : NEXT : PRINTTAB(19)"*{CRSR DN}{CRSR LF
  }*{CRSR DN}{3 CRSR LFs}*****"
```

```
30 S=. : DIM F(138) : FORT=1 TO 24 TO 2023 : IF PEEK(T)=
  42 OR PEEK(T)=46 THEN F(S)=T+54272 : S=S+1
40 NEXT : S=139 : T=15 : L=1
50 POKE F(S*RND(L)), T*RND(L) + L : GOTO 50
```

Richard Penn
Montreal, Quebec, Canada

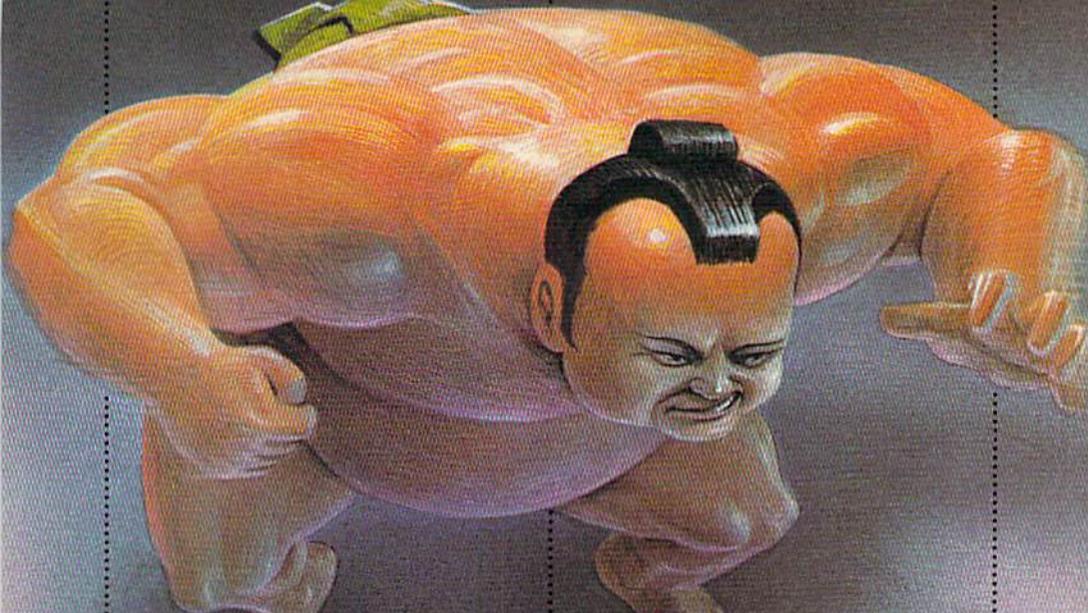
\$387 C-64 instant recall—The Screen Saver program listed below is useful for saving lo-res text screens (such as a note to yourself or a disk directory) to the C-64's memory for later recall, even while you're running another program. Type in the listing and make a copy before you run it. Save a screen to memory by entering SYS 49152. Recall the screen from memory with SYS 49184. Your screen will stay in memory until it is overwritten by another screen or until you turn off the power.

```
0 REM C-64 SCREEN SAVER - CHAD AMES
10 FOR I=49152 TO 49215 : READ A : POKE I, A : NEXT : N
  EW
20 DATA 169,0,162,0,189,0,4,157
30 DATA 80,195,189,255,4,157,79,196
40 DATA 189,254,5,157,78,197,189,253
50 DATA 6,157,77,198,232,208,229,96
60 DATA 169,0,162,0,189,80,195,157
70 DATA 0,4,189,79,196,157,255,4
80 DATA 189,78,197,157,254,5,189,77
90 DATA 198,157,253,6,232,208,229,96
```

Chad Ames
Essex Junction, VT

\$388 C-64 machine language saver—An important feature lacking in Basic 2.0 is the ability to save a block of memory directly to tape or disk. But, by using the built-in Save routine and changing the pointers that define its upper and lower limits, you can easily modify it to do this. The following program emulates the BSave command. It lets you save any section of memory to tape or disk and is usable independently or as a subroutine. Files saved in this manner must be loaded with the LOAD "filename", 8, 1 syntax. Remember to type NEW after loading to reset some memory locations if this form of load is used in Direct mode.

By using this technique, sprites, custom characters, hires screens and machine language programs can be saved



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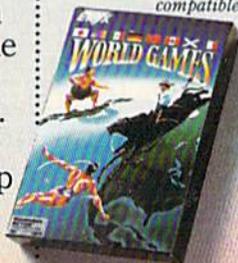
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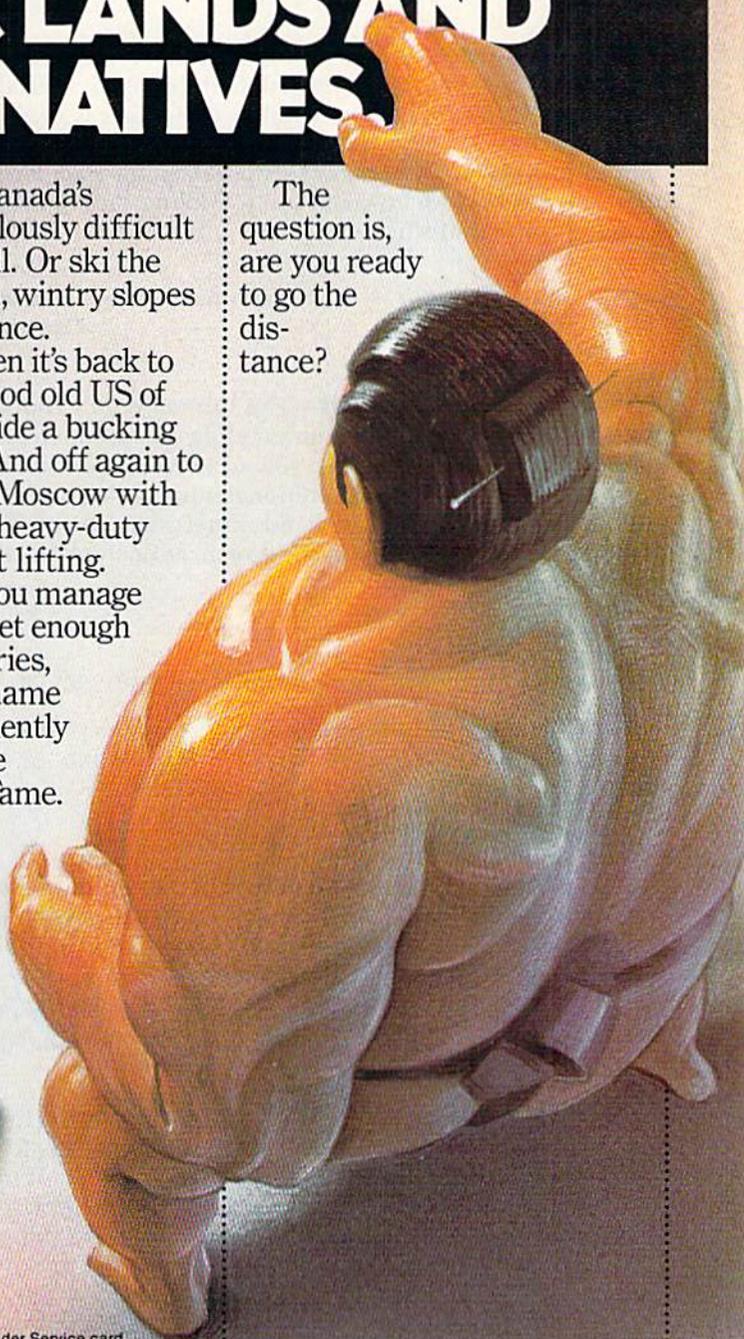
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Magic

directly from memory, eliminating the need for cumbersome Data statements. For example, to save the contents of the cassette buffer, you would use starting and ending addresses of 828 and 1019, respectively.

```
Ø REM C-64 ML SAVER - RICHARD PENN
1Ø INPUT "STARTING ADDRESS";SA
2Ø INPUT "ENDING ADDRESS";EA:EA=EA+1
3Ø INPUT "FILENAME";F$
4Ø INPUT "(T)APE OR (D)ISK";D$:D=8:IFD$="T"
  THEN D=1
5Ø SYS57812F$,D,1:HB=INT(SA/256):POKE193,SA
  -HB*256:POKE194,HB
6Ø HB=INT(EA/256):POKE174,EA-HB*256:POKE175
  ,HB:SYS62957
```

Richard Penn
Montreal, Quebec
Canada

\$389 Cheat sheets—Many programs have important key commands on the keyboard that perform special functions. A good way to remember these keys is to list them on an index card. This simple trick saves me both time and effort, and I can now spend time at the keyboard that would otherwise be taken up in fiddling through my manuals for the information.

Adam Jackson
Sault Ste. Marie, Ontario
Canada

\$38A C-128 input windows—The Commodore's Input routine can easily mess up your carefully planned screen format. How many times have you accidentally pressed a cursor key, only to send any additional input off to another part of the screen? You can avoid unnecessary delays by setting up a small window on the screen, as demonstrated in the following example:

```
1Ø REM WINDOW INPUT - LEE SEMEL
2Ø S=1Ø:REM WIDTH OF WINDOW
3Ø PRINT"{2 HOMES}":REM WINDOW=ENTIRE SCREE
  N
4Ø PRINT"{SHFT CLR}YOUR ANSWER"CHR$(27)"M"
5Ø WINDOW Ø,1,S+1,1:REM WINDOW ON SECOND LI
  NE
6Ø INPUT A$:PRINTCHR$(27)"L"
7Ø PRINT"{2 HOMES}"
```

The variable S establishes the width of the window, and the escape codes on lines 30 and 50 disable and enable the screen scroll, respectively. This will keep your text from going too far astray.

Lee Semel
Edison, NJ

\$38B Stuck on KoalaPad—I've got a simple solution for those of you who are tired of hunting down the stylus for your KoalaPad every time you need to use it—attach it to the pad with Velcro. Put the soft, furry part of the Velcro on the stylus and the hooked part on the pad, right behind

the buttons. The buttons provide additional protection for the stylus.

Chance Agrella
Prescott, AZ

\$38C C-128 key-repeat control—If you've upgraded to a C-128 from a C-64, you might prefer the keys on the C-128 to repeat as the C-64's keys do. Use POKE 2594,128 (the default) to make all the keys repeat; use POKE 2594,0 to make only the space bar, INST/DEL and cursor keys repeat; use POKE 2594,64 to prevent all keys from repeating.

David C. McKenzie
Charlotte, NC

\$38D Renumber with order—Programmers like to simplify the debugging-and-improving process they use when developing their programs by adding a "table of contents" in REM statements at the beginning of programs. The contents give the starting line number of each routine and subroutine, which they can refer to when necessary. However, when they use the Renumber command to renumber the listing, the numbers in the table of contents don't change; you need to go into the listing and renumber them yourself.

My way changes all that, by replacing the word REM each time it appears in the table of contents with IF TI < 0 GOTO X: Variable X represents the line number you want changed. This will save you a lot of time when changes need to be made after renumbering. For example, if your original REM statement was:

```
10 REM START OF SORT ROUTINE LINE 500
```

your revised line is:

```
10 IF TI < 0 GOTO 500:START OF SORT ROUTINE
```

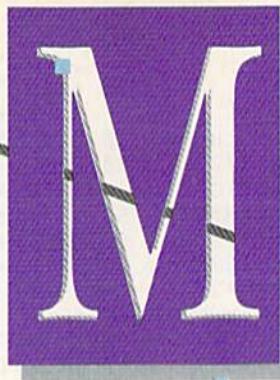
This line changes the part of the listing—the REMs—that doesn't affect the program's performance, by incorporating it into the executable part of the program, so that the references are changed when you use the Renumber command. It still won't affect your program's performance, and now you'll always know where the routines start, no matter how often you renumber your program.

Jack A. Ryan
El Dorado, AR

\$38E Number tutor—This simple program for the C-128 amazes children and helps them to think of a number in relation to another.

```
Ø REM NUMBER TUTOR - MARY HUBBARD
1Ø COLORØ,7:COLOR4,5:PRINT"{SHFT CLR}{3 CRS
  R DNS}THINK OF A NUMBER BETWEEN 1 AND 1Ø
  Ø"
2Ø PRINT"AND {SHFT I} WILL GUESS YOUR NUMBE
  R!" :H=1ØØ:L=1:T=Ø
3Ø DO:M=INT((H-L)/2)+L:T=T+1
4Ø PRINT"{3 CRSR DNS}IS IT"M"?CHR$(7):PRIN
  T"{2 CRSR DNS}MY GUESS IS (H)IGH, (L)OW
  OR (R)IGHT?"
5Ø GETKEY S$:IF S$="H"THEN H=M:ELSE IF S$="L"
  THEN L=M:ELSE IF S$="R"THEN EXIT:ELSE GO
  TO 5Ø
```

Continued on p. 104. →



EASY-TO-USE SUBROUTINES AND UTILITIES

Mega-Magic, an extension of the RUN Magic column, offers each month an interesting and useful subroutine or utility program. Although noticeably longer than those in the Magic column, these listings are still short enough to type in easily and quickly.

Magic trick \$30F (RUN, August 1986) was a Basic number sorter. It was a handy program, but I've re-written it into a powerful programmer's tool.

The original program simply uses an integer array to count each value. My revision scans the array to be sorted to find the maximum value. That value is found and stored in AX; then an extra array is dimensioned for the sort. A second pass through the original array increments the F% array element to equal the maximum value. This is the reason the array must be dimensioned to the maximum value in the original array. The sort is now finished, but before the job is complete, the data must be placed in an array that Basic can use.

Simple lists can use the original array as shown in Listing 1. Once the data is stored back in the original array *in order*, the sort is complete.

Listing 1 reveals several limits imposed by this sorting method. First, the values must be positive integers. Second, it's impractical to use this method to sort values larger than 1000, because a large amount of memory will be used in the sort array. For example, to sort an array with a maximum value of 10,000, you have to use DIM F%(10000). This requires 20,009 bytes of memory and adds considerably to the time needed to create the array of sorted values.

Since two-dimensional sorts are more valuable than simple lists, listings 2 and 3 are designed to print curves on printers that move paper in one direction. Listing 2 sorts curves in which both Y% and X increase—curves that travel right and down, never left or up. Listing 3

sorts by Y%, with X values going up or down, creating curves similar to a sine wave, for example.

Three extra arrays are used in Listing 3. The first is the F% array, used for the sort. The other two are for the sorted values of the Y and X coordinates. The Y% array is sorted and stored in the G% array; the X array in the H array. To speed the filling of the G% and H arrays, the last value in each original array is moved into the location of the last sorted element. This shortens the loop each time the subroutine at 160 is called, but the Y% and X arrays are scrambled during the sort. About 50 seconds is required to sort 100 pairs of data (range of 1 to 99 for Y) on a C-64.

The "read" in line 40 is used to read the Data statements. Simply change it to an input if you want to enter data from the keyboard.

Jim Borden
Carlisle, PA

Listing 1.

```

10 REM SHORTSORTER LISTING 1 - WILFRIED H P
   ROTIG                                     :REM*184
15 PRINT"{2 SPACES}THIS PROGRAM SORTS POSIT
   IVE INTEGERS; THE SMALLEST WILL BE FIRST
   ."                                       :REM*215
20 PRINT:INPUT"HOW MANY DATA POINTS{2 SPACE
   S}20{4 CRSR LFS}";N                     :REM*12
30 PRINT"{SHFT CLR}":DIM A%(N):AX=0:REM*236
40 FORI=1 TO N:READ A%(I):IFA%(I)>AXTHENAX=
   A%(I)                                     :REM*18
50 NEXT:DIMF%(AX):TIS$="000000"           :REM*196
60 FORI=1 TO N:A=A%(I):PRINTA%(I);         :REM*48
70 F%(A)=F%(A)+1:NEXT                       :REM*230
80 PRINT:PRINT:IT=TI:REM SORT DONE NOW PRIN
   T                                         :REM*148
90 K=1:FORI=1 TO AX:IFF%(I)THENFORI2=1 TO F%(I)
   :PRINT I, :A%(K)=I:K=K+1:NEXT           :REM*78

```

RUN It Right

Any Commodore computer

```

100 NEXT:PRINT:PRINT"SORT TIME =" ;IT/60:PRI
NT"TOTAL ="TI/60:END :REM*224
110 DATA 13,31,2,17,45,63,456,10,654,15,25,
95,27,62,145,28,36,145,280,54 :REM*86

```

Listing 2.

```

10 REM SHORTSORTER LISTING 2 - WILFRIED H P
ORTIG :REM*222
15 REM PAIRS OF MONOTONOUS NUMBERS (X=RIGHT
,Y=DOWN) :REM*63
20 INPUT"{SHFT CLR}HOW MANY DATA POINTS{2 S
PACEs}20{4 CRSR LFs}";N :REM*6
30 DIM Y%(N),G%(N),X(N),H(N) :REM*208
40 FOR I=1TON:READ Y%(I),X(I):IFY%(I)>AX TH
EN AX=Y%(I) :REM*242
50 NEXT:DIM F%(AX),E(AX):TI$="0000000":FORI=
1TON:A=Y%(I):B=X(I) :REM*30
60 F%(A)=F%(A)+1:E(A)=B:NEXT:PRINT:PRINT:IT
=TI :REM*202
70 : :REM*46
80 K=1:FORI=1 TO AX :REM*170
90 IFF%(I)THENFORI2=1TOF%(I):G%(K)=I:H(K)=E
(I):K=K+1:NEXT :REM*34
100 NEXT:PRINT:PRINT"SORT TIME ="IT/60:PRIN
T"TOTAL="TI/60 :REM*16
110 : :REM*86
120 PRINT"HIT ANY KEY FOR LIST" :REM*10
130 GETA$:IFA$=""THEN130 :REM*198
140 FORI=1TON:PRINTY%(I)X(I),G%(I)H(I):NEXT
:REM*68
150 DATA 50,10,18,6,40,9,13,5,1,1,24,7,8,4,
33,8,2,2,5,3 :REM*8
160 DATA 97,20,83,18,54,11,69,14,58,12,72,1
5,67,13,96,19,79,16,81,17 :REM*58

```

Listing 3.

```

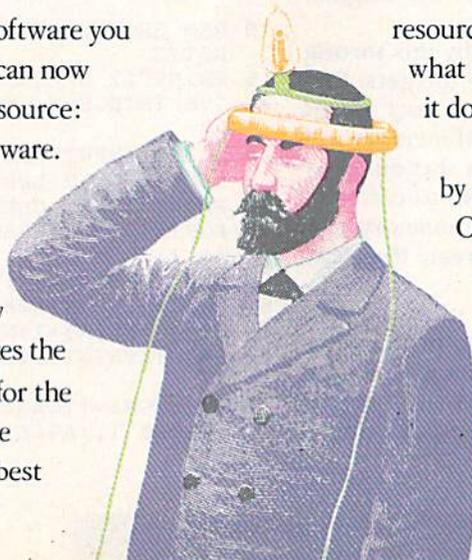
10 REM SHORTSORTER LISTING 3 - WILFRIED H P
ORTIG :REM*254
15 REM{3 SPACEs}ADAPTED FOR Y,X COORDINATES
:REM*135
20 INPUT"{SHFT CLR}HOW MANY DATA POINTS 10{
4 CRSR LFs}";N :REM*162
30 DIM Y%(N),G%(N),X(N),H(N) :REM*208
40 FOR I=1 TO N:READ Y%(I),X(I):IFY%(I)>AX
THEN AX=Y%(I) :REM*242
50 :NEXT:TI$="0000000" :REM*72
60 DIM F%(AX):FORI=1TON:A=Y%(I) :REM*124
70 F%(A)=F%(A)+1:NEXT:PRINT:PRINT:IT=TI
:REM*112
80 : :REM*56
90 K=1:FORI=1 TO AX :REM*180
100 IFF%(I)THENFORI2=1TOF%(I):GOSUB160:K=K+
1:NEXT :REM*8
110 NEXT:PRINT:PRINT"SORT TIME ="IT/60:PRIN
T"TOTAL="TI/60 :REM*26
120 : :REM*96
130 PRINT"HIT ANY KEY FOR LIST" :REM*20
140 GETA$:IFA$=""THEN140 :REM*18
150 FORI=1TON:PRINTG%(I),H(I):NEXT:END
:REM*22
160 X2=1E30:REM DUMMY :REM*214
170 FOR L=1 TO N-Q :REM*4
180 IF Y%(L)<>I GOTO 200 :REM*108
190 IF X2 > X(L)THEN X2=X(L):L2=L :REM*74
200 NEXT:REM FIND LOWEST X :REM*178
210 G%(K)=Y%(L2):H(K)=X(L2) :REM*40
220 Y%(L2)=Y%(N-Q):X(L2)=X(N-Q):Q=Q+1:RETU
R N :REM*204
230 DATA 99,10,64,8,67,9,64,-1.5,35,6,64,1.
7,35,7,16,-356,9,35.5,1,1 :REM*232

```

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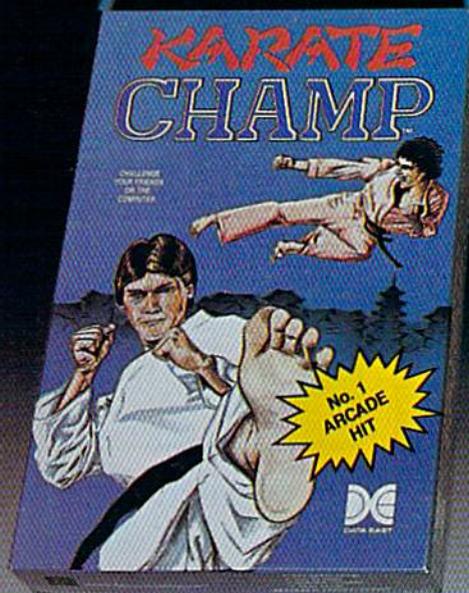
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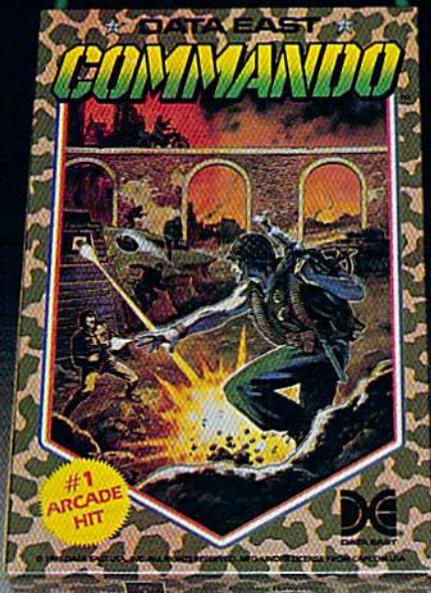


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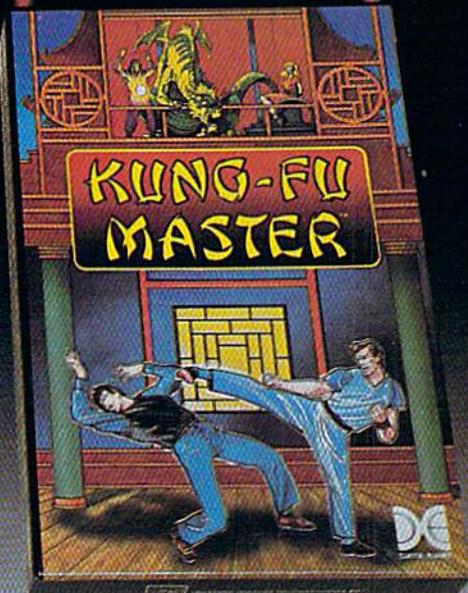
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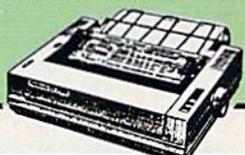
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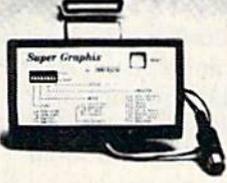
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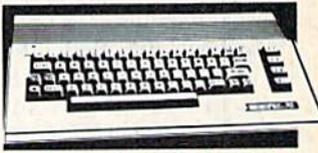
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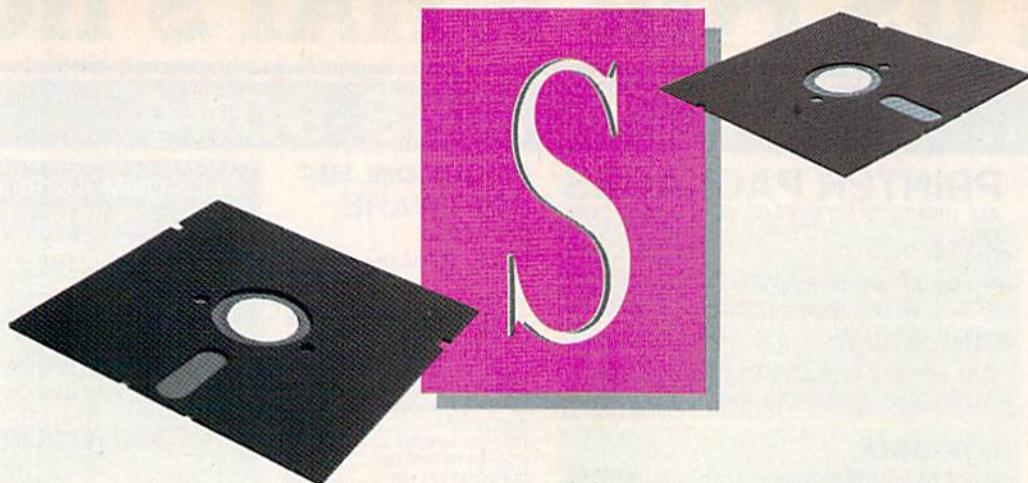


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Compiled By BETH S. JALA

Mind Pursuit

This Test of Your Trivia Knowledge Is No Mindless Pursuit

Modestly subtitled The Ultimate Test of Information and Knowledge, DataSoft's Mind Pursuit supplies thousands of questions that embrace the realms of science and nature, history and geography, sports, culture and entertainment.

If you've tried other computer knowledge games, Mind Pursuit's crisp setup menus and quick-access help screen are bound to come as pleasant surprises. Getting started is a snap, requiring only a few seconds to select the number of players or teams, time allowed for answering questions and game format. You can play to a preset point limit, a preset time limit or play on the game board.

Mind Pursuit is not limited to dry, text-only queries. Occasional music and picture clues help spice up the competition and contribute to the high-stakes game-show atmosphere.

In the point-limit and time-limit versions of the game, your goal is to bury the opposition beneath an avalanche of points. Each side selects one of five categories or the multicategory Grab Bag. Wrong-answer points are subtracted from your total, so anticipating category difficulty is an important part of a winning strategy.

Luck is more of a factor than may be immediately apparent. No matter how poorly things have gone in a game, a few successive Grab Bag rolls

A

and some correct answers can put you right back in the pack.

The board game launches you on a race to the finish, complete with shortcuts, free-move bonus squares and tokens that march to the accompaniment of tunes and sound effects. Play is similar to the text versions, except that point values shown on each square determine available choices of questions.

I've played Mind Pursuit with varying sizes of groups, and I've enjoyed it every time. The game comes with two sets of high school/college-level questions, and at least one additional set is available.

No questions were repeated in any one game, although you can expect around 10 percent to be repeated in successive games of each set. The only disappointment is that no rec-

ord of teams and scores is maintained on disk.

Nontrivial and wide-ranging, Mind Pursuit is highly entertaining fare for fact fanatics ready to get down to serious business. (DataSoft, 19808 Nordhoff Place, Chatsworth, CA 91311. C-64/\$29.95 disk.)

Jeff Hurlbert
Houston, TX

Pure-Stat Baseball

Bring Back the Boys Of Summers Past In This Sports Simulation

A

Pure-Stat Baseball is one of those rare games that also succeeds as a simulation. One disk holds the statistics for eight of the all-time best baseball teams, and a second disk contains the 1985 season records of every major league team.

Playing against the computer or against a friend, you can test your theories to the limit. You have at your disposal what could be considered a time machine: If you need the talents of Carl Erskine to bolster the 1927 Yankees, go ahead and make the trade; if you want to add George Brett's hitting power to the 1955 Dodgers... just imagine!

With Pure-Stat, it is also possible to build your own teams from scratch using the greatest players of all time. As manager, you have a chance to change probability during the game itself by, for example, employing dif-

Continued on p. 24.

Report Card

A

Superb!

An exceptional program that outshines all others.

B

Very Good.

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

C

Good.

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

D

Mediocre.

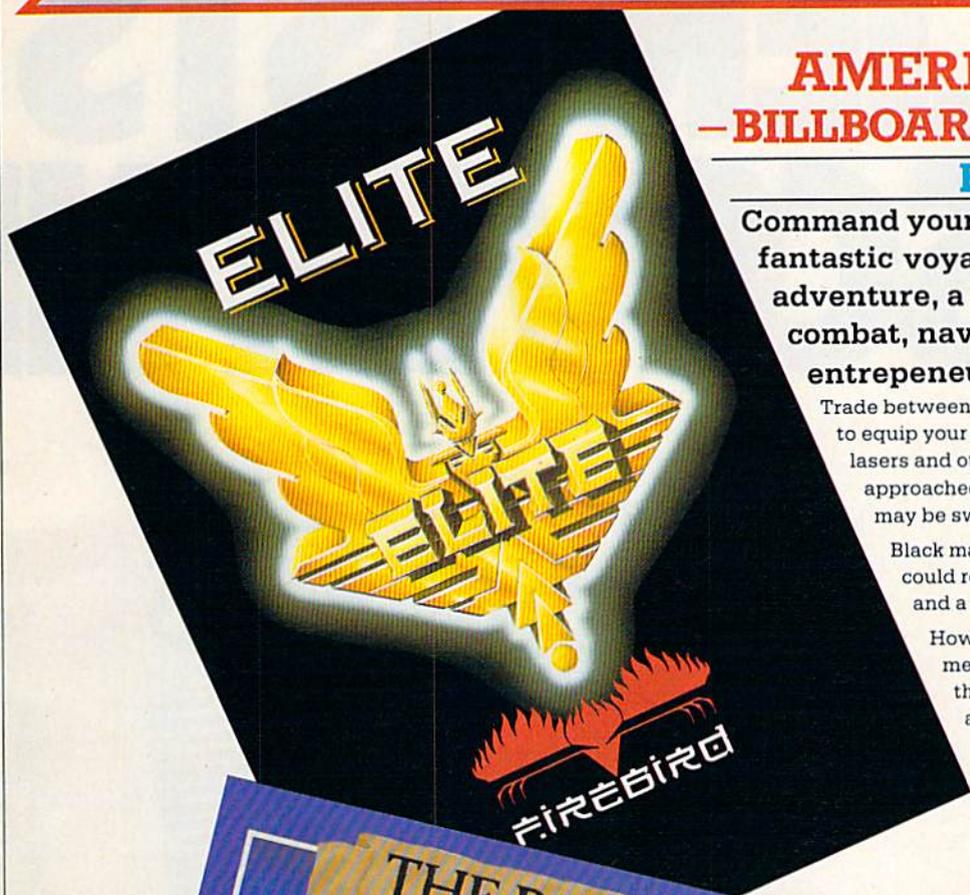
There are some problems with this program. There are better on the market.

E

Poor.

Substandard, with many problems. Should be deepsixed!

FROM AMERICA'S NO1 SOFTWARE HOUSE



**AMERICA'S NO1
-BILLBOARD MAGAZINE**

ELITE

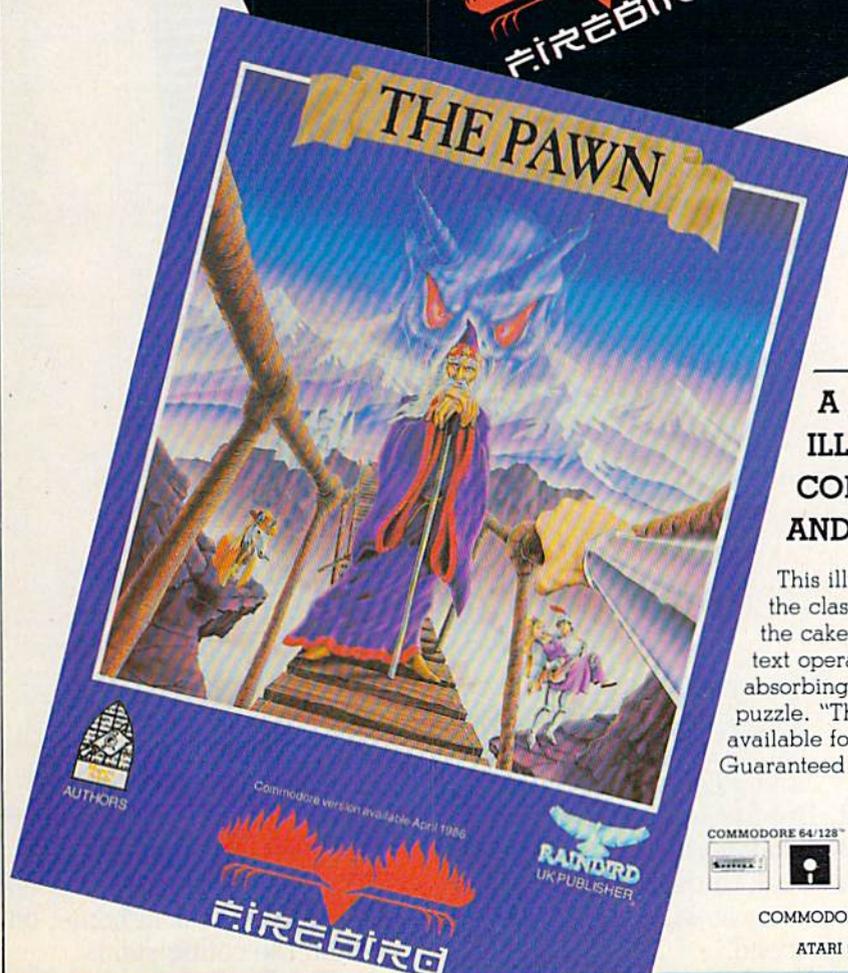
Command your Cobra space ship in a fantastic voyage of discovery and adventure, a supreme test of your combat, navigational and entrepreneurial skills.

Trade between countless planets, using the proceeds to equip your ship with heat-seeking missiles, beam lasers and other weapons - corporate states can be approached without risk, but unruly anarchies may be swarming with space pirates

Black market trading can be lucrative but could result in skirmishes with local police and a price on your head!

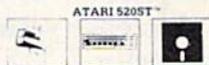
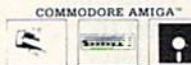
However you make your money, by fair means or foul, you must blast onwards through space annihilating pirate ships and hostile aliens as you strive to earn your reputation -

as one of the Elite!



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SCIENTISTS A DISCOVER NE

When we started our company on the west coast, people thought we were a little spaced out. So you can imagine their reactions when we announced we'd discovered a new universe.

People laughed. People scoffed. And they really freaked out when we told them where we'd found it:

Inside a Commodore 64.

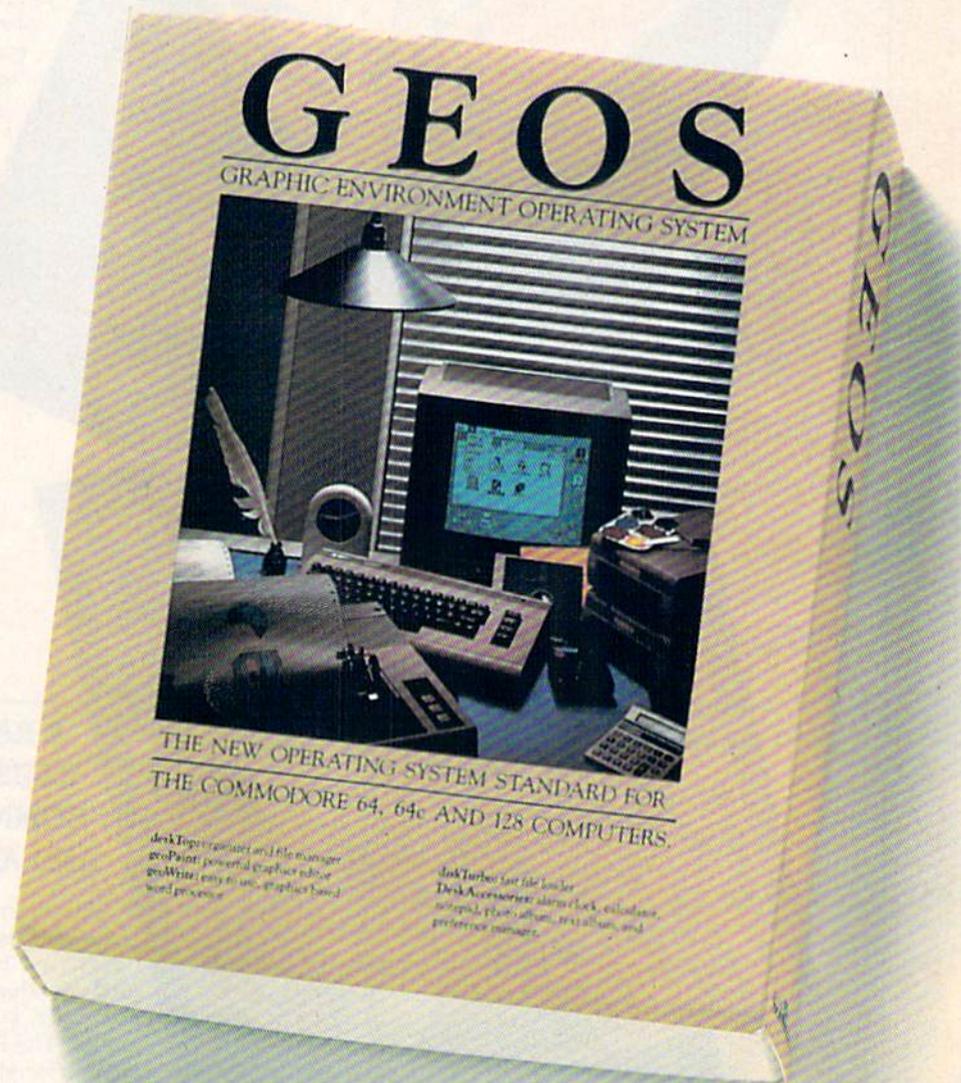
It's called GEOS. And it turns any Commodore into a powerful PC that holds its own against any computer, no matter what kind of fruit it was named after.

GEOS: The superior intelligence. Of course, we always knew Commodores possessed superior brains. It just took GEOS to discover them.

You see, GEOS opens your Commodore to a huge universe that can hold an infinite number of applications. Which means that GEOS can do just about anything the expensive PC's can do, including one thing they can't:

Add even more GEOS applications that are being developed even as you read this.

Increase your speed to warp factor 7. The first thing you notice with GEOS is how its diskTurbo speeds up your Commodore's disk loading and



Not twice or three times as fast. But five to seven times faster than normal. Which lets you streak through files and documents at what seems like warp speed.

And that saves you endless time.

Every universe comes complete with a desk. The way to keep order in our universe is with the GEOS Desktop. It's just like your desk at home, only without the coffee stains.

The Desktop keeps your art and documents filed, and comes

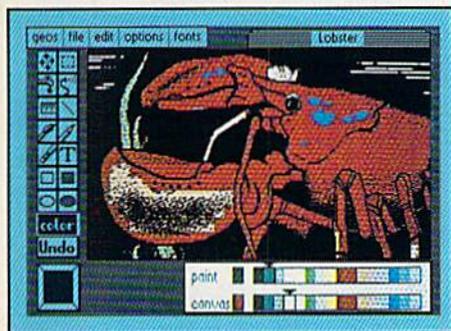
AT BERKELEY W UNIVERSE.

with all the accessories you need to keep you organized:

An alarm clock keeps you punctual. A notepad keeps your memos. And a calculator keeps your accountant honest.

How to communicate with a new universe. With geoWrite, you can rearrange your written words. Move blocks of copy. Cut and paste. And even display your text in fonts of different styles and sizes, right on the screen.

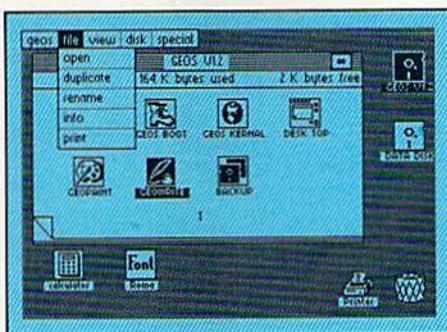
With geoPaint, you become a Michelangelo with a mouse.



Sketching and painting with all kinds of colors, textures and patterns.

You can invert, mirror and rotate images. Insert them into your geoWrite documents. And save them in your GEOS Photo Album for use later.

Finding your way through the universe. The most difficult



thing about a new universe is finding your way around. But with GEOS, you only need to remember two things:

Point and click.

When GEOS offers you options, you just point to your answers and click your mouse or joystick.

You want to draw? Point and click.

You want to write? Point and click.

You want to fill in that obtuse rhomboid with an air-brushed geometric pattern in a lighter shade of pink? Point and click.

Easy, huh? And in case you ever do make a mistake, GEOS backs you up with an "Undo" feature that undoes the very last command you entered.

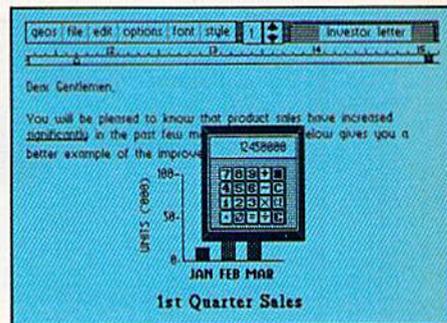
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Running out of space.

With GEOS, that's hardly likely. Because there's endless space in the universe for new applications.

Unfortunately, there's only so much space in this ad.

So zip down to your nearest software dealer. Tell him you want to explore the new universe in your Commodore.



And if he looks at you like you're some kind of alien, well, just tell him Berkeley Softworks sent you.

The name is universally known.

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GEOS is just \$59.95

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GEST CASES A WORKSHOP

THE EASTER BUNNY: Rodent of Reality or Man-Made Myth?

The conclusion is not certain, but mounting scientific evidence now indicates that the egg-bearing Easter Bunny¹ we all loved as children may indeed be as real as we had hoped.

Although traditionally reclusive, the bashful bunny has been sighted with increasing frequency₂ over the past five years. As illustrated in Figure 6, the annual number of sightings has steadily grown from a low of 1,876 in 1982 to over 5,346 so far this year.

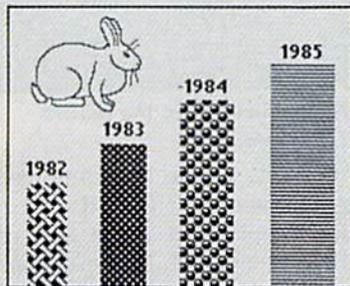


Figure 6: Increased sightings, 1982 to present.



Figure 4: Evidence submitted by Dr. Dougherty.



1. The Easter Bunny, depicted by composite sketch.

A+
EXCELLENT!!



"The problem isn't so much the bunny, as it is the eyewitnesses," adds Dr. Dougherty. "Many of them are unreliable, with nothing to show for their claims except for big baskets of chocolate eggs³, leading us to believe we're not dealing with a rabbit as such, but perhaps an Easter Chicken."

At first, the sightings were attributed to crackpots who saw The Easter Bunny as part of a religious ritual. However, since The Easter Bunny has been seen by adults as well as children, scientists have become less skeptical.

In fact, as Dr. Llevano points out, "The Easter Bunny must be taken seriously by everyone from school children to the President of the United States."

text, replacing worn-out words and phrases with your brand new ones.

For more serious cases, hand the job over to the Workshop's Text Grabber. It takes text from several word processors—like Paper Clip™—and lets you overhaul them with new GEOS fonts, formats and graphics.

A few more built-in features. Every project leaves the Workshop looking beautifully finished, too. Because it not only comes with LaserWriting compatibility, there's even a

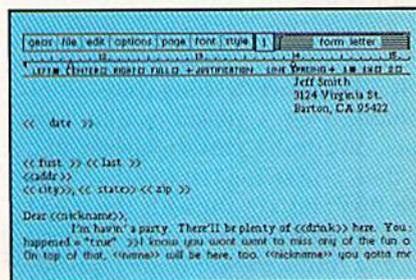
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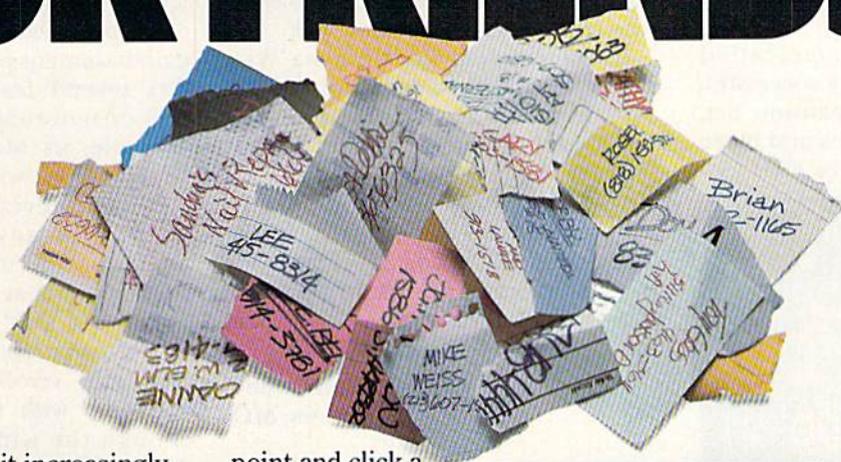
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**WRITER'S
WORKSHOP**



ARE YOU SEARCHING FOR FRIENDS?



If you're finding it increasingly difficult to find anything at all, maybe it's time you found out about geoDex. The GEOS-compatible directory that generates mailing lists. Prints address labels. And sorts out all sorts of things for your Commodore.

Try directory assistance.

With a little help from geoDex, you can call up a directory organized from any three categories you choose. Which means you can list your friends by name, telephone number or almost anything else that can be assigned its own three-character code.

Like "MEN" for guys you know. Or "GRL" for girls you know. Or "FOX" for girls or guys you'd like to know.

But no matter how you choose to categorize them, if you can

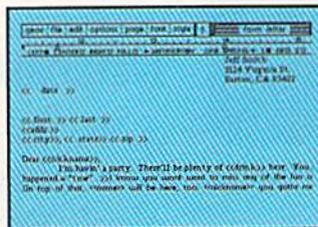
point and click a mouse, you can call up any list of friends with geoDex's easy-to-read graphics.

Our most inviting feature. Of course, once you've gotten your friends organized, the next thing we recommend you do with geoDex is really very simple.

Throw a party.

You see, geoDex comes with geoMerge, a mail merge program that customizes form letters, announcements — even party invitations — with the names and addresses stored in geoDex.

First you write the letter with geoWrite. Then you select a list from geoDex.



Put them both together with geoMerge and it's toga time!

The search is over. So if you're tired of looking for friends, waltz right down to your

software dealer and ask him for geoDex. We can't guarantee it'll win you more friends, but it'll certainly keep you from losing them.

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GEODEX 



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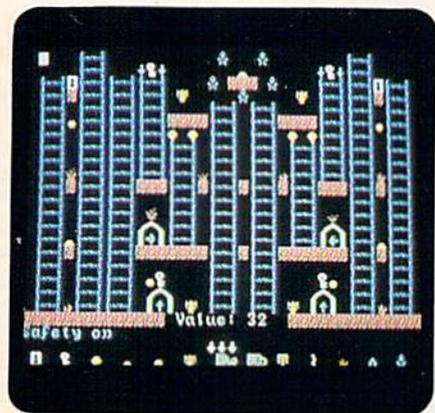
of card and board games, and results in a challenging sport of chance and skill for the whole family. (*Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/\$39.95 disk.*)

Bob Guerra
Charlestown, MA

Ultimate Wizard **B+**

This Expanded Maze Game Will Satisfy Your Taste For Adventure

Once there was a game called Wizard. Being reasonably successful, it generated Wizard Expansion Set, which added more screens and more levels of play for a total of 80 levels.



Try to get through this Ultimate Wizard maze!

Now we come to Ultimate Wizard, which might also be called the Wizard Expanded Expansion Set. Twenty new levels have been added and, if 100 frustrating challenges are not enough, you may design your own devious screens.

Ultimate Wizard is a cleverly disguised vertical maze game consisting of stairs, ladders, elevators and ropes, which must be successfully traversed in order to reach the next level.

Not only must you find the best path to run the maze, but along the way you must unlock each level by collecting keys, treasures and magic spells.

Impediments to your progress are in the form of pathway fires, pits, trapdoors, skull and crossbone signs and assorted nasty creatures.

Accumulating magic along the way is welcomed. There are also occa-

sional portals that let you teleport to another part of the screen—an especially nice feature when the invisibility spell wears off.

An information bar at the bottom of the screen will keep you apprised of the spells available, the speed and the dungeon (maze) level currently being played.

Each of the 100 screens has six difficulty levels and ten speed settings from which to choose so that the game can be as challenging as you desire.

Control of your running, jumping, leaping, sliding and climbing wizard is through a joystick. The game will support a tournament of up to six players who must all share the same stick.

Documentation for Ultimate Wizard is good, with several hints given as to strategy and tactics, although these won't be much help in the very high levels of the game.

Wizard is worth a second look. It will frustrate and beguile you and test every arcade skill you've ever learned: what more can you ask of a game? (*Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/\$29.95 disk.*)

Ervin Bobo
St. Peters, MO

Database Plus 128

For the Budget-Minded, This Database Program May Be the Answer

Database Plus 128 is a menu-driven database management system that allows you to easily store, update, sort, search and print all types of information. It features an 80-column display and takes advantage of the C-128's numeric keyboard and several special function keys such as ESC and TAB.

At \$19.95, this is one of the least expensive database management programs available for the 128. SPC Software has kept the cost down by not providing a user's manual. Instead, complete instructions are supplied through a series of text files on the program disk.

Unfortunately, there is no way to view these files on screen from within the program, so you must first print the instructions. Once printed, how-

ever, the 37-page manual does an adequate job explaining the program's features and operational techniques.

Included in the instructions is a three-part tutorial that takes you from the basics of searching and editing an existing file to creating your own database format and generating customized reports using the built-in report utility.

Field names (not the data you enter but the actual categories themselves) are limited to only five characters. A single record may contain up to 50 fields, however, and a small database with only four fields and field lengths totaling close to 100 characters will let you store around 500 records.

Despite Database Plus 128's bargain-basement price, the program offers several features usually found only on more expensive packages. For example, its Math option instantly provides you with the sum, average, standard deviation, low and high figures for any numeric field. In addition, you can graphically display numeric data as a bar chart.

You can also view your entire database using your monitor as a window and scrolling horizontally or vertically with the cursor keys. Although the window doesn't scroll smoothly over your records, it can be set to move from one row or column to an entire screen with each cursor stroke.

Some other nice touches include selectable screen and character colors, an easy-to-use mailing label option and 12 database templates.

For just \$19.95, you may not get a toll-free customer service hot line, but for data management on a budget, Database Plus 128 is a good deal. (*SPC Software, Ltd., PO Box 197, Thornhill, Ontario, Canada L3T 3N3. C-128/\$19.95 disk.*)

Bob Guerra
Charlestown, MA

Sixth Sense 128 **B+**

At Last! C-128 Telecomputing In 80 Columns

When I first obtained my C-128 last year, I was looking forward to genuine 80-column presentation for tele-

computing purposes, but my enthusiasm soon waned.

The problem was that a full-featured communications program for use in the 128 mode wasn't yet available. It was necessary to go back to 64 mode and use one of the old standbys to get the job done.

The search for a 128 program is now over. Microtechnic Solutions has introduced an excellent package called Sixth Sense 128.

It is far more than just a rework of existing C-64 software. Included are a huge, 800-line buffer that becomes even larger with a RAM expansion cartridge, and a built-in word processor that lets you create messages or files off-line for later uploading or lets you edit a file transmitted by modem.

The modem menu is well-rounded, and autodialing is supported, which makes connecting to your favorite services and boards a snap.

For the advanced user, the ability to define macros extends the versatility of Sixth Sense 128 even further: You can automate your bulletin board sessions through their proper use. For uploading and downloading, both

Xmodem and CompuServe B protocol are supported.

All of the standard features for setting speed, parity, stop bits and word length are available by menu. Output can be directed to a printer or disk drive, with a wide range of options allowing compatibility with almost all available units. The overall look of Sixth Sense, with its pull-down windows, is very appealing.

Unfortunately, the instruction manual is a massive 126 pages long. Everything is described fully, but finding the information and understanding it is somewhat difficult.

It seems that what is needed is more guidance with some very specific examples. It is obvious that the author and testers of Sixth Sense 128 know what they are talking about and have developed a top-notch product, but some additional help for the first-time user would be welcome.

Sixth Sense 128 is excellent in operation. It has taken its place as *the* communications program at my house. Be warned that you can expect to spend many restless hours learning its many features, but the effort will

be well rewarded. (*Microtechnic Solutions, Inc., PO Box 2940, New Haven, CT 06515. C-128/\$79.95 disk.*)

Jim Grubbs
Springfield, IL

The Ultimate Game Show



Here's What You Get When You Mix Wheel of Fortune And \$100,000 Pyramid!

Imagine all of the better TV word-game shows rolled into one program. The concept of The Ultimate Game Show is interesting, but not original.

The game is excellent for solo play: You can play a complete game within 30 minutes. As a multi-player game, it can be played quite easily in one hour's time.

The modes of play are smooth; the graphics are simple, yet attractive;

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Software Gallery

and the game is fun, for a little while. The biggest problem I found was that play was repetitive.

The first mode of play is similar to the old game of Hangman. Play is fast and there are enough possibilities available for you not to repeat words for some time.

The second mode of play contains a series of words, each with a choice of definitions. If you choose the correct one, you add to your score. This may seem simple, but the words are not common words, and it is challenging until you learn them all.

The third mode includes unscrambling words as you race against the clock. You set your time limit at the beginning of the game—60 to 180 seconds. This mode is tough. The words are usually six or seven letters long, so, unless you have an aptitude for extricating words from jumbled letters, you might have problems here.

The fourth and final mode is the Bandit Phase, which works much like a slot machine. You choose when the display stops, but if a bandit shows up, you lose all the points that you've accumulated.

I found *The Ultimate Game Show* enjoyable, but repetitious. It may give you hours of fun; once you get bored with it, however, it may sit around for a long time before you pick it up again. (*Superior Micro Systems, Inc., Box 713, Wheeling, IL 60090. C-64/\$29.95 disk.*)

Mike Hinshaw
Tulsa, OK

Hacker II: The Doomsday Papers

B+

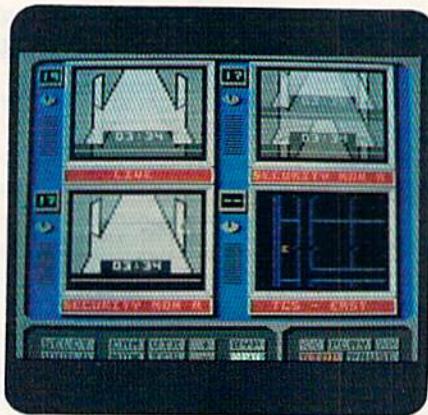
*Assist the CIA
In a Mission
Of Danger and Intrigue*

Hacker II presents an entirely new challenge to your hacking abilities—a challenge hinted at in the subtitle.

In this strategy game, a Russian sci-

entist has developed a plan that will assure domination of the world. This plan, known collectively as *The Doomsday Papers*, is hidden in several vaults located within a highly secure establishment in the Soviet Union.

Your mission, should you decide to accept it, is to link your computer to the CIA mainframe computer. This will allow you to control the Mobile Remote Units and complex video monitors already in place within the compound.



Hacker II: The Doomsday Papers.

In keeping with the spirit of the original, there are no instructions on how to proceed with the mission. There is, however, literature intended to be used as a manual for operating the video monitors. The inclusion of this detracts somewhat from the clean style of the original game, although the CIA guidance of *Hacker II* provides some justification for the existence of the document.

By having a definite mission, *Hacker II* loses some of the empirical quality of its namesake, and by solving problems in the manner of an expert burglar, the wheeling and dealing of an espionage mission is also lost.

However, if a sequel should bear too much resemblance to the original, there would be little point to its existence. *Hacker II* is not like *Hacker* and therefore has its own charm and its own puzzles to be solved.

If the original has not driven you completely mad, you'll want to try the sequel. And if you've never played *Hacker*, don't worry: *Hacker II* stands on its own. (*Activision, Inc., 2350 Bayshore Frontage Road, Mountain View, CA 94043. C-64/\$34.95 disk.*)

Ervin Bobo
St. Peters, MO

Breakers

B

*This Electronic Novel
May Be Broderbund's
Best Effort Yet*

Broderbund calls *Breakers* an electronic novel because the text adventure is an extension of a paperback novel included in the package. While retaining the exotic artwork characterizing earlier releases like *Mindwheel* and *Brimstone*, the book dispenses with the leisurely prose of its predecessors. Even so, there is barely enough space in more than 40 pages of text to acquaint the reader with one of computer gaming's more involved scenarios.

Much of the action takes place on *Nimbus*, an aging colony sphere orbiting *Borg*. As the adventure begins, you are part of a newly arrived *Lau* delegation seeking to resolve several outstanding grievances that threaten your quest for the sacred elements.

Naturally, your party is immediately mugged: You alone manage to escape into *Nimbus*'s labyrinthine corridors. You discover that *United Mining* hasn't shipped any ore for months. What's even worse are the space-going, hippie, motorcycle-mob types called *breakers*.

Evidently, a gang on *Borg* is working with a gang on *Nimbus* to snatch little golden guys like you and ship them off to wealthy society matrons as pets! Fortunately, a few neutral *breakers* may help, perhaps in return for your services as a guide to the fabled gems of the *Violet Sea*.

Intended or not, the electronic novel form has acquired a reputation for colorful scenarios where the player's productive options are somewhat constrained. Winning is more a matter of discovering and following a plot than it is of problem solving.

A welcome exception, *Breakers* plays more like a traditional text adventure and appears to incorporate improved parsing; that is, the program seems smarter. Unfortunately, *Broderbund* continues to require a time-consuming disk access for every response, and you must still hunt through the text for passwords to restore saved games.

Perhaps the best electronic novel yet, *Breakers* presents a moderately stiff challenge that rewards multi-

player participation, mapping and careful note-taking. For those willing to tolerate the game's built-in delays and inconveniences, this one is good for several evenings of mind-warping fun. (Broderbund Software, 17 Paul Drive, San Rafael, CA 94903. C-64/\$44.95 disk.)

Jeff Hurlburt
Houston, TX

Mission on Thunderhead

B

*This Sci-Fi Adventure
Offers a Variety
Of Challenges and Obstacles*

Mission on Thunderhead, a science-fiction adventure from Avalon Hill's Microcomputer Games Division, is made up of two scenarios—Operation Tempest and The Final

Appeal. It is a game that combines space-age fantasy with arcade action.

To survive the Mission, you must run, jump and maneuver your joystick-controlled agent through rooms and mazes. Every step of the way, there are dangers and obstacles that threaten the one life allotted to your on-screen emissary.

Fortunately, your agent is equipped with a protective Status Suit that helps to preserve his energy. Also, several objects scattered around the complex can help you complete your mission.

Mission on Thunderhead breaks no new ground: Everything from the raygun-equipped agent to the danger-filled mazes has already appeared in countless action/adventure games. Still, there is something intriguing about the massive complex of Thunderhead that will keep you coming back for more.

Perhaps it's the variety of challenges and obstacles Thunderhead has to offer. As you move from room to room, each with its own design, the screen scrolls to help create the

illusion of one large self-contained world.

Although the graphics aren't highly detailed, some of the visual effects created through the use of flashing colors and geometric designs are quite impressive. The game's use of sound ranges from the cliché to the novel.

Up to four separate games can be saved to disk and recalled at any time. You can also select any of 100 variations and ten skill levels for your mission. The variations differ only in the placement of the items you'll need to complete the quest, and the skill level affects the amount of energy you begin with as well as the speed of objects in the game.

Heed this word of warning, however. Even at the easiest level, Mission on Thunderhead is a fast-paced and challenging sci-fi adventure. (The Avalon Hill Game Company, Microcomputer Games Division, 4517 Hartford Road, Baltimore, MD 21214. C-64/\$25 disk.)

Bob Guerra
Charlestown, MA

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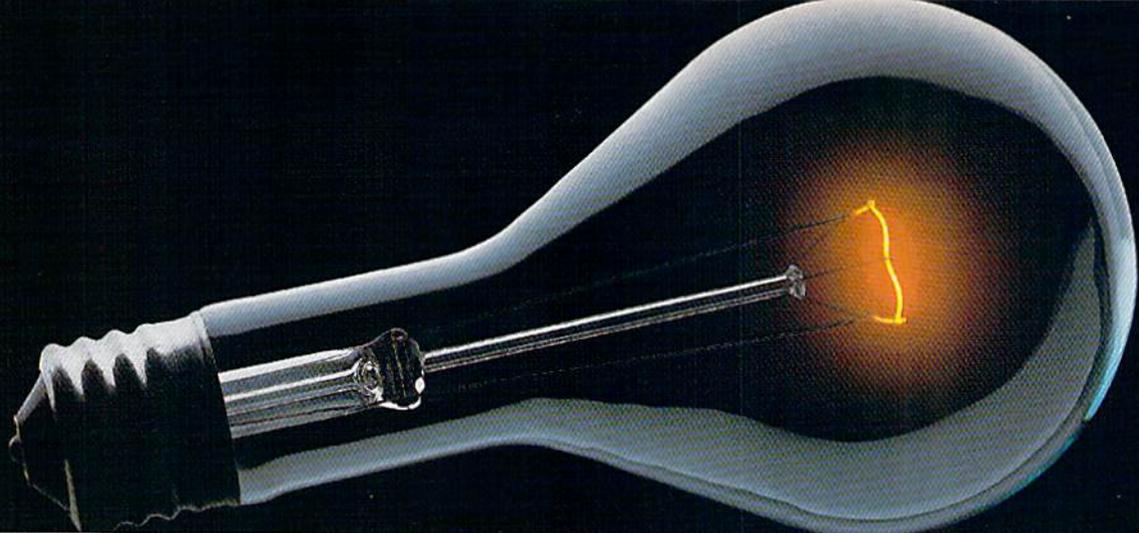


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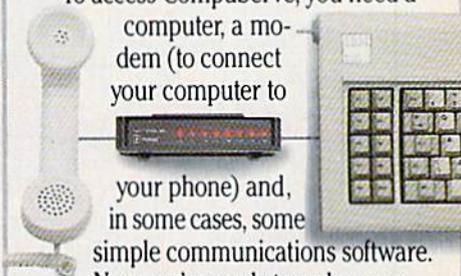
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THE SOFTWARE WAR

By SCOTT MACE

"Until we put some stronger teeth into our federal laws so that the motivation for 'creative piracy' will be overwhelmed by the penalties arising therefrom, I'm afraid that the only defense software publishers have is through copy protection."

Mark L. Goldberg, President, Timeworks

"If software publishers and distributors would lower their prices, there would be little or no problem with piracy, and . . . copy protection could be done away with."

Peter F. Greene, President
Stuttgart Local User's Group

" . . . it is a misconception in the industry . . . that publishers are making exorbitant profits on high-priced software. Very few are making a profit at all."

Dianne Littwin, Publisher
Wiley Professional Software

"Someone who copies a program without the permission of the author is a thief. How there can be any discussion or controversy is beyond me!"

Robert Cokel, President
Western Illinois Commodore Users Group ▶



◆

Earlier this year, RUN surveyed the Commodore industry and elicited responses such as those on the previous page regarding software copying and software protection. The comments we received (over 50 user groups and software developers were heard from) ranged from predictable to interesting to enlightening, and they form the basis for the article that follows. —Eds.

A floppy disk can hold thousands of pages of information, but it is also a frail piece of coated plastic and cardboard that can easily become bent, damaged or just worn out. So computerists, who would wish for a lifetime's use from their software, must make backup copies of their valuable programs and data.

Here, the floppy disk drive comes to the rescue, with easy ways to make a perfect copy of an entire disk's contents within minutes.

But there is a dark side to this seemingly happy ending. Since the early days of personal computing, some users have distributed their perfectly copied disks containing copyrighted software to others—often for free, sometimes for profit.

In response, many software publishers “protect” their software, trying to confuse the disk drive. But they've also confused many users, who are wondering, “Why is there copy protection?”

The fact is, Commodore users *are* making backup copies of their important software.

“The buyer has a right to produce a backup copy for his own use in case of failure with the original,” says Donald Chriscoe, speaking for the Annapolis Commodore Users Group in Annapolis, Maryland.

“I, for one, cannot feel at ease without having at least one backup copy of the programs I use on a daily basis,” says Charlotte M. Holley, reporter for the Commodore User's Group/Odessa, in Odessa, Texas.

In the 200-member Spartanburg Commodore Users Group, one of the largest groups in South Carolina, three-fourths of all users make archival copies.

Who Are the Lawbreakers?

Who are the people who copy software illegally? You might be surprised.

“Not very long ago, I received a call from one of our dealers in Michigan,” says Mark L. Goldberg, president of Timeworks, a Deerfield, Illinois, software publisher. “He was kind enough to inform me that an engineer from a major automotive division bought a Timeworks Word Writer program, then blatantly informed the dealer that he was making 750 copies, which he would then distribute to other engineers at that company. And our programs are fairly well-protected.

“That gives you some idea of the extent to which even

supposedly honest, professional people can cause us and others like us to lose revenue.”

In some countries outside the U.S., illegal copying is an even bigger problem, and it may be partly legal due to inadequate laws.

One user group even gets occasional letters from overseas asking for copies of copyrighted software. “What have we done to make people around the world brazen enough to write a letter asking us to break the law?” asks Jim Norton, librarian of the Central Florida Commodore Users Club.

The problem is serious enough that the Department of Commerce is now trying to get tougher laws passed in many countries.

The vast majority of user groups recognize that illegal copying is a problem, and they are on the front lines of the battle, educating users about the law and about the realities of software publishing. Education is paying off.

The Spartanburg survey found 52 percent of users think copy protection is necessary for commercial software, and 58 percent think illegal copying is a real problem, one that threatens to discourage publishers from developing more software.

“We, the Commodore Users of Texas, advocate the prosecution of multiple copy makers who sell or trade software for profit in the absence of a distribution agreement with the originators of the software,” that group wrote, adding that backups should be available and should run “unhindered.”

Software Companies React

At first, the software companies reacted to illegal copying not with words, but with acts. They protected software programs from copying with various tricks, hiding some data between the regular tracks on a floppy disk, changing the speed at which the disk drive rotates and writing “bad” data (which would not show up on any copies) on parts of the disk. Many of these schemes are still in use today.

Cost to the Consumer

In response, clever users who were also programmers began to write special disk-backup programs to defeat the various protection schemes. A subindustry of “copy-cracking” software has made some of these programmers rich, since many users find these programs essential.

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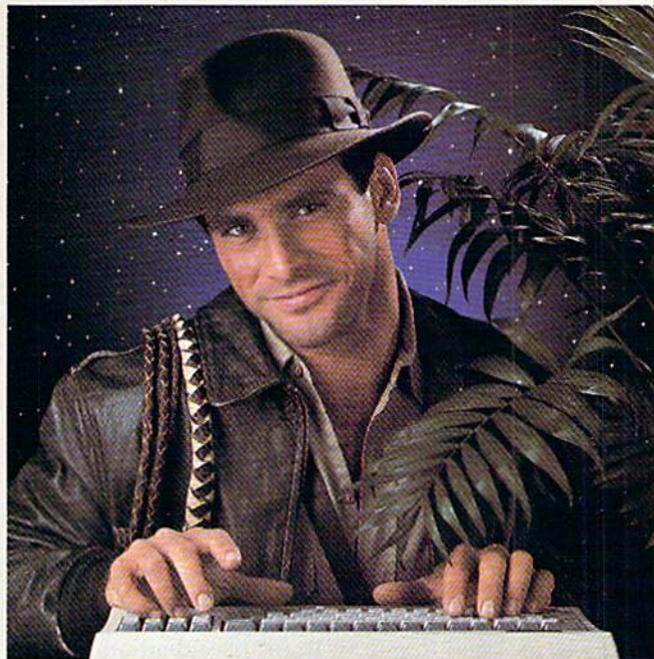
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GENie*	X	X	X	X	X	X	\$18.00	none	\$5.00	\$5.00

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Like an arms race in software, the two sides have been attacking and counterattacking each other's schemes. Each time publishers adopt new kinds of protection, someone defeats it and tells the rest of the user world how to do it.

Eventually, many users claim, the protection schemes got so complicated that they began to wear out Commodore 1541 disk drives after the software was loaded repeatedly. Six groups in the *RUN* survey complained about the cost and bother of fixing disk drives that were out of alignment due to copy-protected software.

"We resent any protection scheme that produces either potential misalignment or destruction to our disk drive units, harmful loading inconsistencies or computer lockup," says William J. Kolodner, president of Commodore User's Medium—Baltimore Area Computer Club, in Reisterstown, Maryland.

"I am very upset when I run a program and the disk drive bangs excessively," said Alice Shipley, secretary and founder of Commodore Home User's Group in Wheeling, West Virginia. "Realignment, when one can find a service center, is very expensive."

Some software publishers deny that protection schemes hurt hardware. "[It] has never been demonstrated convincingly to us," said Roger M. Buoy, president and CEO of Mindscape, Inc., in Northbrook, Illinois.

"Owners of personal computers," Buoy added, "should be encouraged to clean their disk drives and to speed-check and align heads as often as is necessary, depending on the frequency of use and on the environmental hazards to which the drive is subjected. . . . It does not seem likely that properly maintained equipment can be physically pushed out of specification by the nature of the software run, any more than it is possible to distort a turntable by playing a record album. . . . Hardware will perform well when it's maintained well."

But other publishers think protection may be a danger to hardware. "In my opinion, if a product causes damage or misalignment to a user's hardware, the manufacturer is lucky if he isn't in court," said David Barrett, president and CEO of Aegis Development, Inc., of Santa Monica, California.

One company, Accolade of Cupertino, California, was blunt: "We are sensitive to the problems of disk drive head alignment related to certain protection methods, but with some of the sophisticated disk copiers available today, complex protection methods are necessary to thwart piracy schemes," said Mike Craven, director of design and development.

Still others lay all the blame at Commodore's feet. Stuart J. Lyon, CEO of Integrated Software Systems in Ames, Iowa, said disk drive alignment problems were caused by "slipshod design on the part of Commodore. . . . We in the industry are just as frustrated as you are. Commodore won't even acknowledge it as a problem. They have made some necessary improvements in the 1571 disk drives,

but these changes make the 1571 incompatible with a lot of protected software for the C-64/1541."

Pranksters, Pirates and Program Collectors

To end copy protection, both users and publishers must understand why it is that so many users copy software illegally. The first reason, the one that occurs first and most naturally, is for fun. It is a technical challenge to many young users. Some do it out of anger, angry that software companies would protect their investment with a disk-based scheme.

In the subculture of illegal copying, copiers call themselves "pirates," self-styled Robin Hoods stealing from the "rich" software companies and giving to the user without asking for payment. But just like the pirates of the Caribbean at Disneyland, these individuals have been glamorized. Ask the pirate who's been caught if it's a glamorous life, and you'll hear a different story.

Some illegal copiers call themselves "collectors," accumulating copied programs like so many butterflies or stamps. They say they never use the software, but the temptation is there.

Some user groups justify the existence of collectors in other ways. "They are people who never would have bought the software they have, and they seldom, if ever, use it," said Danny Judd, president of the Commodore Users Club of Yokosuka in Seattle.

Getting Tough

Another, smaller group revolves around electronic bulletin boards. The Software Publishers Association is offering \$100 to anyone supplying information to them about bulletin boards that offer illegal copies of software. Already the offer has led to removal of software on some bulletin boards.

The operator of one said he had posted the copies to attract people to use his board, probably just so he could have some more friends, says SPA executive director Ken Wasch. But Wasch vows that the Washington-based group, which most Commodore software publishers belong to, will track such bulletin boards down and prosecute their operators if necessary.

Although software copying for profit is a smaller problem, it also exists. But most profiteers are fly-by-night, sending out fliers by mail. Users should be careful to scrutinize small mail-order software houses to make sure they're getting original disks, documentation and packaging.

Many users feel that no one is being hurt by illegal copying and question the seriousness of the offense. "Advertisements against piracy seem strange to me, even though we do have ads against drunk driving in most publications," says Carl H. Bogardus of the Aviation and Computer Enthusiasts of Las Cruces, New Mexico. "Perhaps there should be ads against murder, etc., if you get my point."

But many software publishers respond that while other

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Best-selling
Naval Simulation!

Captain's Log... War Date 10.01.44



"Captain's Log, October 1, 1944. 0250 Hours. Fleet submarine USS Hammerhead proceeding Southwest at cruising speed. Our mission: intercept enemy convoy off the coast of Borneo. Disperse and destroy."



"0300 Hours. Two hours until dawn. Radar picks up convoy, escorted by two destroyers. We believe that one of the enemy's valuable cargo ships is part of convoy formation."



"0400 Hours. Lookouts on the bridge. Target Identification party reports one cargo ship, 4,000 tons, troopship of 10,250 tons, with two *Kalbakan*-type escorts. Moving into attack position."

Tandy 1000/IBM PC Jr. screens shown



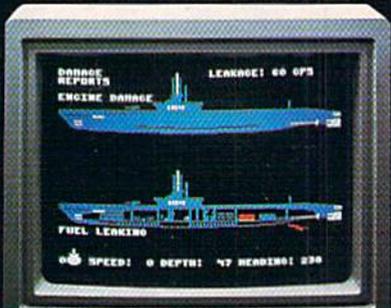
"0500 Hours. Sound General Quarters! Battle stations manned. Preparing for torpedo run. Gauge Panel OK. Periscope OK. Charts and Attack Plot Board OK. All mechanical systems OK."



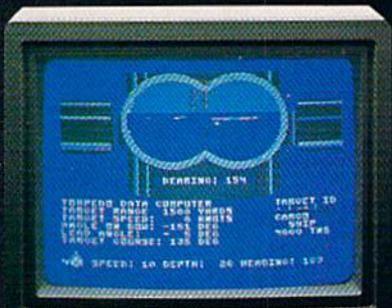
"0525 Hours. Torpedo rooms report full tubes forward and aft. Battery at full charge for silent running. We hope water temperature will provide thermal barrier to confuse enemy sonar."



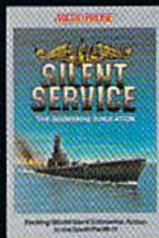
"0600 Hours. We are at final attack position. Convoy moving at 10 knots. Target distance decreasing rapidly... Crash Dive! Escorts have spotted us and are turning to attack! Rig to run silent."



"0700 Hours. Depth charged for one hour. Some minor damage, but repair parties at work. Destroyer propeller noises receding. We'll come to periscope depth for our return punch."



"0715 Hours. Torpedo tubes 1, 2, 3 fired. Two destroyers hit and sinking. One of the enemy's last cargo ships coming into 'scope view — an ideal target position. On my mark... Fire Tube #1 Fire 5!"



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laws are well-known, copying software is still the little-known crime.

A large number of user groups, while not condoning illegal copying, say it exists because software is too expensive. This may be the biggest challenge to software publishers today—to convince the public that the prices they are charging, often \$40 for a top-rate game and \$100 for a productivity product, are justified.

It will be hard to convince some users. "If software were free, or relatively inexpensive, illegal copying would not exist," said Peter F. Greene, president of the Stuttgart Local User's Group in West Germany. At the very least, Greene said, companies should make the "occasional" program available free, and request a few dollars for the instruction book. Greene also contends that companies spend too much money on software packaging.

"The root of the problem, I believe, is either there are too many middlemen between the programmer and end user, or someone is trying to make too much on each sale," said Tom Ladd, president of the Old Hickory Commodore Users Group, Inc. in Jackson, Tennessee. "If the record industry can produce albums so cheaply, why can't the computer software industry?"

One group that gave no city or state actually condones illegal copying based on price. "We believe the copying of disks should be allowed as long as the cost of a program is far above a reasonable amount. If the cost of computer software came down to below \$30 or so, we think there would be less pirating and more people buying programs."

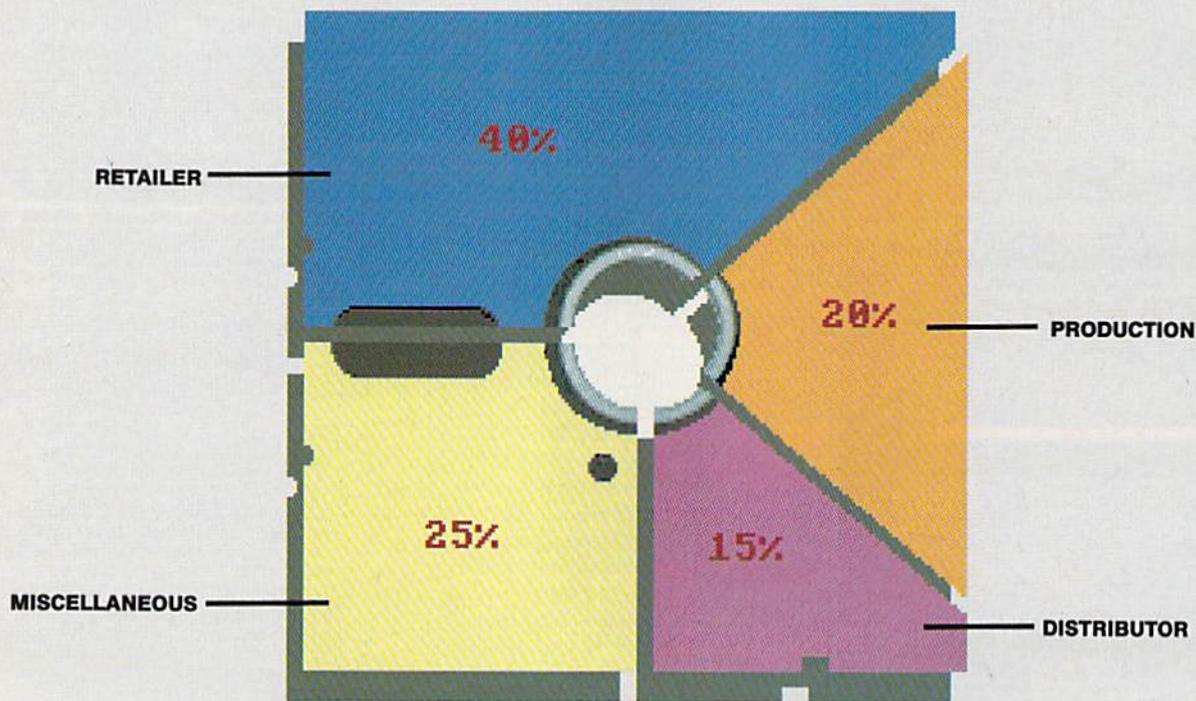
To all these complaints about software price, the publishers offer their data on just what it takes to run a software company.

Roger Buoy of Mindscape said that of the \$1 you spend on entertainment software, \$.40 goes to the retailer, \$.15 to the distributor, \$.20 for production and \$.25 for miscellaneous, which covers advertising, marketing and selling, promotional, editorial and creative staff costs, as well as financial overhead. It also includes the publisher's profit.

"In addition," said Buoy, "publishers like Mindscape support significant customer service activities and have increased their commitment to research and development of new hardware and new technologies. . . to provide the quality software which our customers expect of us."

"Users who feel software is overpriced should take into consideration that it is expensive to run a company!" said

Figure 1. Breakdown of software developer's costs.



You smirk. Your opponent winces.

You bow. So does he.

The *World Karate Championship™* begins.

Slowly, ever so slowly, you approach. He flinches, and you make a combination front punch and kick.

You spin, then do a



Practice long enough and your fingers will be registered as lethal weapons.

reverse kick. A forward flip. You kick again, only higher. Bang. It connects. Lights out.

This time, you survived in one piece.

You'll have 17 intricate moves to master.

As you progress, you'll fight your way from white to black belt in 8 deadly, international settings. With a final,

championship match at the base of Mt. Fuji. See you at the Dojo.



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Throw them from the ring. Crush their heads. Slam them to the mat. Pulverize their puny bones. You'll have over 25 moves to pin your man. You'll need over 250 stitches if you don't.

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Trip Hawkins, president of Electronic Arts in San Mateo, California. "Out of hundreds of firms, only a few, like Microsoft, are big and profitable. Overlooked items are returns from retailers, bad debt and company operating expenses—for most firms at present, these exceed revenues."

But even low prices may not solve the problem. Other users point out a fact of life: The copy-breaking programs are so accessible and easy to use that they become a temptation. "Most of the members of our club have been guilty of copying commercial as well as public domain disks," said Henry B. Lenhardt, secretary of the East Side Computer Club of Alton, Illinois. "With the multitude of 'cracker' programs on the market, almost everybody is willing to try them out."

Lost Profits

How much in profits does bootleg software cost software companies? Few can say. One research firm a few years ago estimated that one of two programs in use was bootleg. Bootleg programs are more prevalent today, according to Ken Wasch, who estimates that for every program purchased, at least one other bootleg program—or maybe more—exists. Verifying this, of course, is virtually impossible.

Would bootleg software owners buy the legitimate programs if they hadn't obtained copies illegally? Fred S. Dart, vice-president of the Payson Area Commodore User's Group in Salem, Utah, says few would. "It seems to be the majority belief that, since the program would not be purchased anyway, having a copy of a program does not deprive anyone of royalties."

Whatever the case, publishers maintain that lost profits result in fewer new programs. "Developers and programmers are paid for their creative efforts, usually on a royalty basis, which means they receive a percentage of each unit of their software sold," said Mindscape's Roger Buoy. "Therefore, if their product is stolen from them via unauthorized duplication, they are deprived of their rightful income."

"The economics of this process suggest that there is a point where developers will no longer find it worthwhile to continue to make their products commercially available to the consumer, and will redirect their skills to avenues which are more secure. When and if this happens, there may be no consumer software left to steal."

Mike Lorenzen, designer of Psi 5 Trading Company from Accolade, points out that these are not boom times for home computing, and many companies have lost money or gone out of business. Also, 2K-game programs have been replaced by simulations requiring 50K and up; Psi 5 has more than 250K of code and data.

"Companies are spending large sums on development just to survive competitively or grow modestly at best," he says. "The days of the quick, big profit for games are gone."

In short, publishers are looking for a reason to feel confident in the market and a reason to trust the users.

That will only happen when illegal copying is curbed.

Combating Illegal Copying

First and foremost, all users must be educated about what illegal software copying is and how to stop it. The Software Publishers Association, at 1111 19th Street, NW, Suite 1200, Washington, DC 20036, is a good place for anyone to write for information. The group has a full explanation of the copyright law, as well as ads in major computer magazines explaining the problem.

Some computer magazines have limited the advertising of copy backup programs. While this won't stop users from finding and using those programs, it makes the point that this software often is used for the wrong reasons and shouldn't be glamorized. "Magazines do a disservice to program authors, their readers and themselves by accepting advertisements for program dissectors, nibblers and other copiers," says Robert J. Cokel, president of Western Illinois Commodore Users Group of Monmouth, Illinois.

[As a service to its readers, *RUN* accepts advertising for backup programs. This does not mean, however, that we condone illegal copying. Backup programs are intended to make backup copies for personal use only, which, we feel, is well within the rights of the software purchaser. We refuse advertising that encourages the use of these programs for other than making archival copies.—eds.]

Many of the user groups who wrote to *RUN* have policies prohibiting illegal copying of software at their meetings. Only some of them will prohibit any such activity by their members, in or out of meetings.

"Pirating is not sanctioned by the club or allowed at our meetings," said Dallas Denny, secretary of the Nashville Commodore Users Group, Inc., in Tennessee.

On the other hand, groups such as the Silver State Computer Users Group in Las Vegas, Nevada, say that violation of copyright laws shall result in "immediate dismissal," according to Timm Martin, group president. It should be noted that even the most vigilant user group cannot police software copying out of existence; it's just too hard. Changing attitudes is a far more effective tactic.

Coping with Copy Protection

Software publishers are under more pressure than ever to drop copy protection. The movement gained real steam in corporate America, where the buying muscle of large firms forced IBM PC and Macintosh software publishers to drop most protection by the end of 1986. It is taking much longer for that pressure to filter down to the Commodore 64/128 world. Some publishers, though, are dropping protection across the board because users have complained one at a time in letters and phone calls.

Batteries Included in Toronto is not using copy protection in any new program developed, said Michael Reichmann, president and CEO of the firm. "We are encouraging the user to make the act of pirating obsolete." Sales of one unprotected program, HomePak, have been

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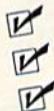
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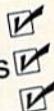
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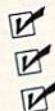
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outstanding; the program was on Billboard's Top Ten best seller list for most of 1985, Reichmann said.

Then there are publishers who are on the fence. "We evaluate each of our software products carefully to determine 1) whether it should be copy-protected at all and 2) the level of protection that's appropriate," said Mindscape's Roger Buoy.

Like other companies, Mindscape often allows users to "install" the software to run on a hard disk, which requires a bit less protection than usual. But in general, Mindscape "almost always copy-protects our game and entertainment products, since they are comparable to audio records and tapes," he said.

It's worth noting that record and radio taping has had quite a harmful impact on record sales and the price of records, according to record industry officials.

Trip Hawkins of Electronic Arts takes a position similar to Roger Buoy's. "For our productivity products we provide key disks (which must be loaded once when the program is started) and backups. We don't provide backups for our other products; the business risk of copyright violation is too great," Hawkins said. "Consumers can't 'back up' most of their other possessions (e.g., their cars)."

Prices of protected backup disks, from the companies themselves, are usually between \$5 and \$25. Users complain about the cost. "To send \$10 for a backup seems to me a rip-off of \$10, when one could buy a disk for \$1.50 and do a backup in five minutes," says A. L. Townsend, secretary of Commodore Computer Club of West Vancouver, BC.

"Backup copies of protected software should be available for \$5," says Steven S. Leven, president of Master Software of Randallstown, Maryland. Timeworks charges \$7.70 for its backup disks, and Accolade charges \$10. These disks are available to registered users only. Hidden costs of supplying backup disks, such as shipping, duplication, employee benefits, insurance and the risk of the backup being illegally copied, account for the price of backup disks being higher than \$1.50.

The Future

Copy protection appears to be here for a while.

Some publishers contacted suggest that eventually a new technology, such as CD-ROM, a compact disc storing floppy or hard disk-type data, will be built in such a way that the copying programs would not work. But that will require widespread use of the new technology in order to push software publishers to move to CD-ROM.

And even then, those ever-clever users/programmers may figure out a way around it. ■

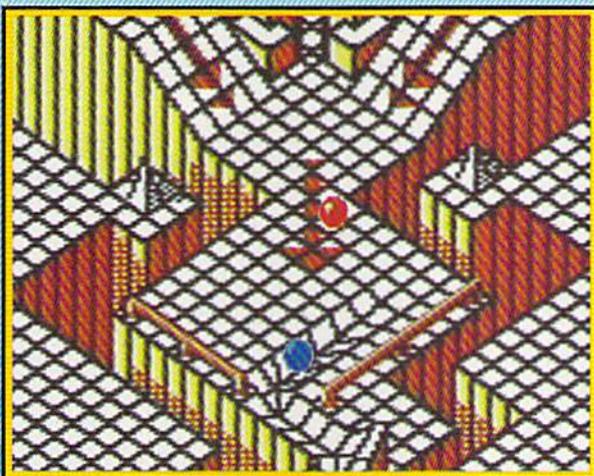
Scott Mace is Washington, DC, bureau chief at InfoWorld, the PC Newsweekly. A longtime C-64 user, Scott also authors an upcoming column on entertainment software for inCider magazine, and he publishes Microcosm, a monthly newsletter on entertainment software.

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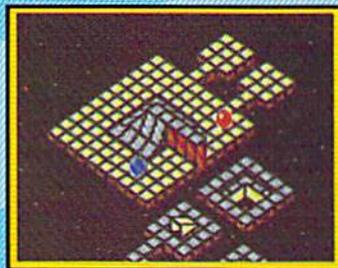
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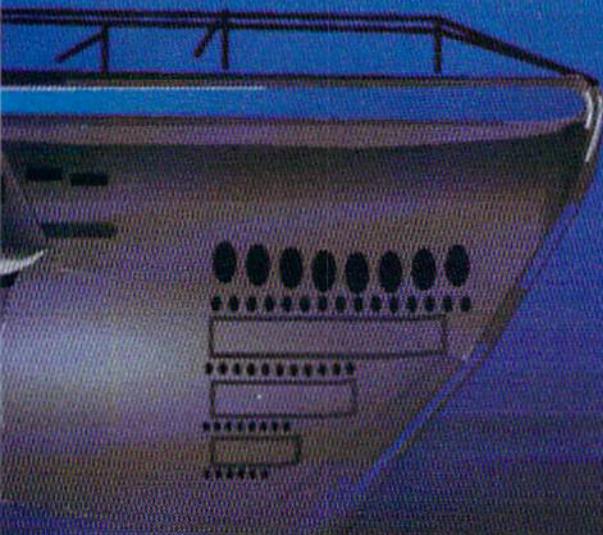
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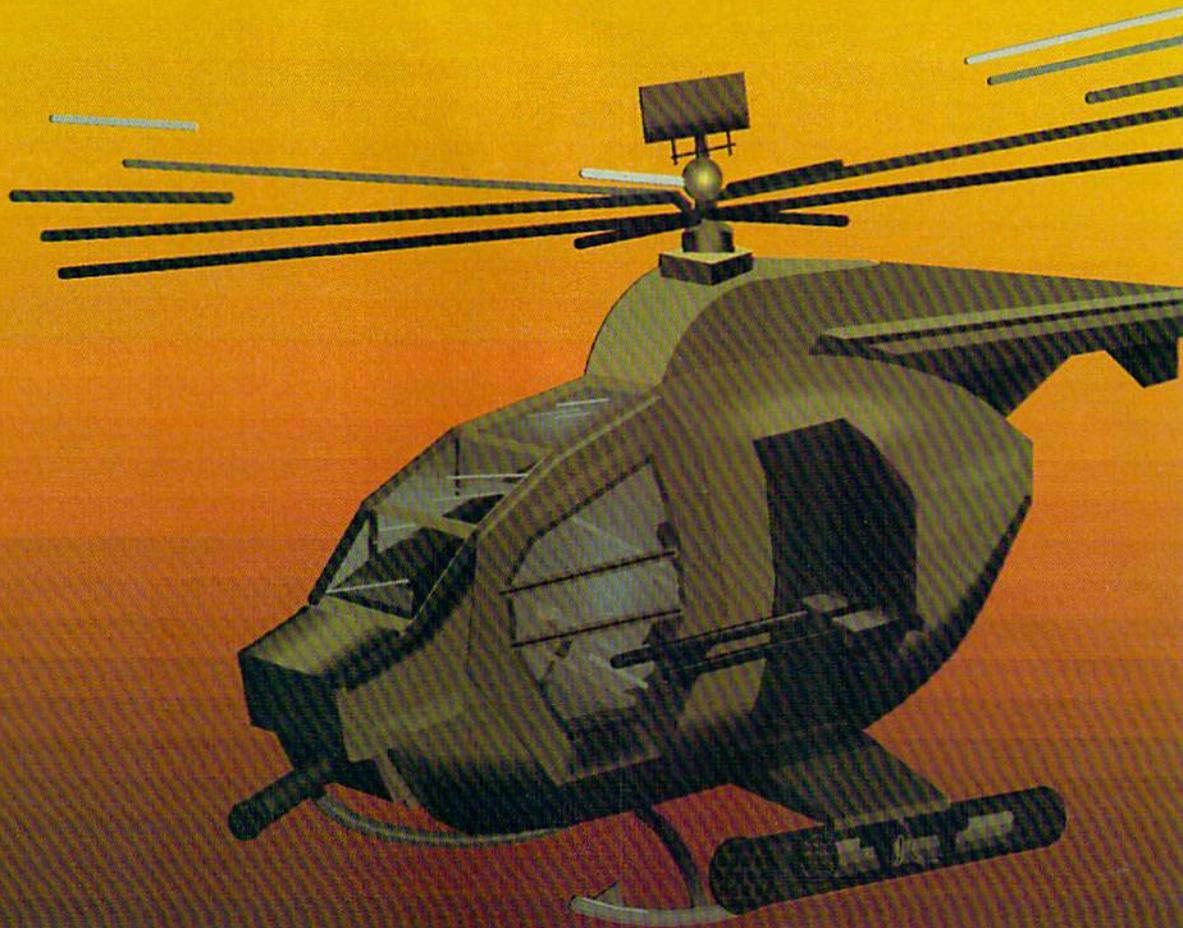
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Strategy

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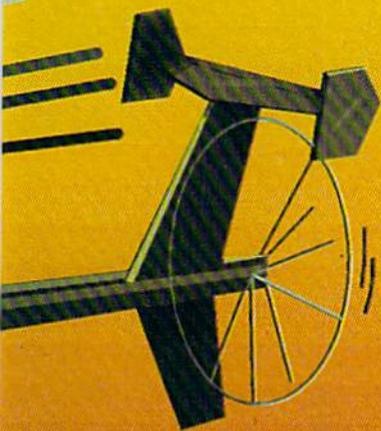
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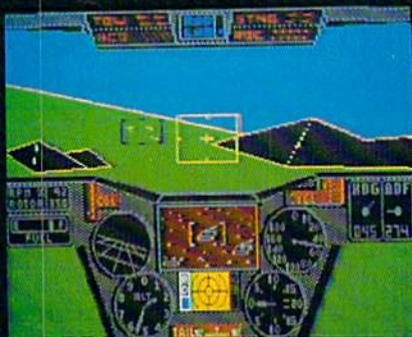
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ThunderChopper

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Colonel Jack Rosenow, USAF (Ret)

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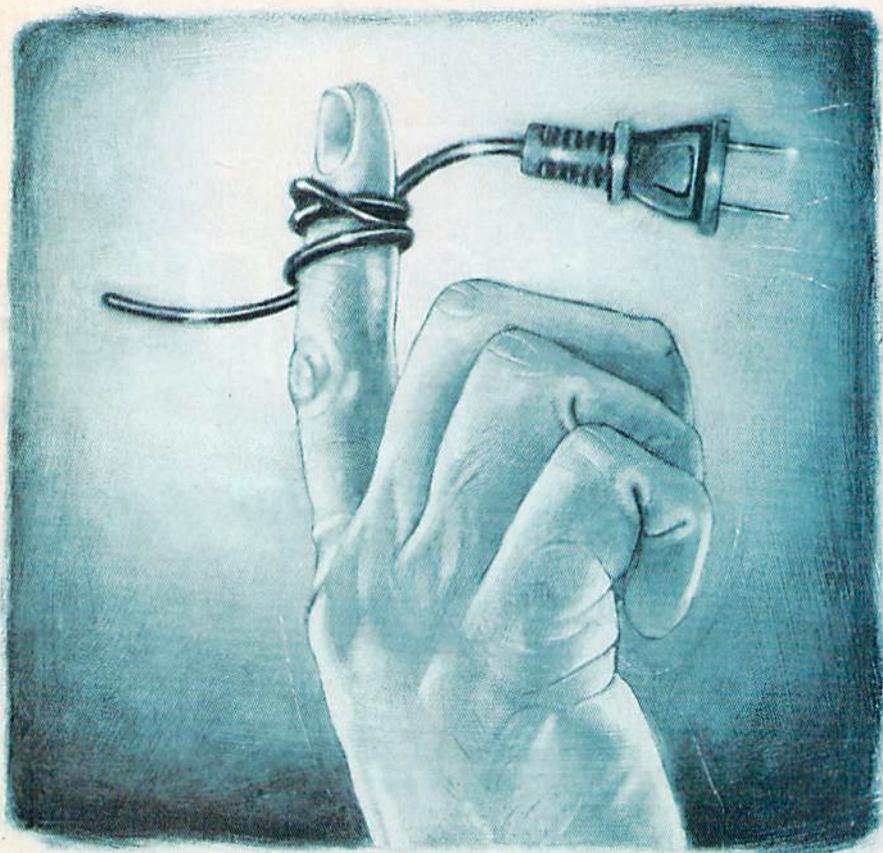
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REMINDER 128

This date book is all your C-128 needs to become your appointment secretary.

By *BOB GUERRA and JIM RICHARDS*



If you have a lot of important dates to remember, you know how useful a desk calendar or pocket date book can be. Reminder 128 is an electronic desk calendar that improves on the pencil-and-paper versions. It eliminates thumbing through pages by letting you store up to 100 dates and then search for upcoming events by typing in the current date.

The first time you boot Reminder 128 and type in the current date, the program automatically creates a rel-

ative file called REMFILE for storing your reminders. Once this has been done, you can press any key to access the main screen and search the file. Since the file will be new at this point, the program will say you have no messages. A menu above the message area will display your options: Add, Delete, View, Sort, Print and Exit.

To make a selection, use the left and right cursor keys to move the highlight onto the option you want and press the return key. The high-

light even wraps around from one side to the other.

Adding Reminders

The first thing you'll want to do is add some reminders to the file. Select Add from the menu and enter the event date at the prompt. To help prevent typing in invalid information, the program accepts at this point only numeric input and real dates. For example, you can't list the date of someone's birthday as 11/31/86, since November has only 30 days; or if you try to schedule an appointment for February 29, 1987, the program will remind you that February has only 28 days in 1987. Try making it 1988 (a leap year), however, and it'll work fine.

After you type in the event date, you must specify the number of days in advance that you want to be alerted to the event. Each time you use Reminder 128, the program retrieves only those events that are upcoming within the specified number of days.

Next, type in a message of up to 56 characters (with no commas or colons). Messages can be either one-time reminders that are automatically deleted once the date has passed, or annual reminders, for birthdays and such, that are automatically updated for the next year and written back onto the disk. To designate a reminder as annual, all you have to do is begin the message with an asterisk.

Once you've typed several reminders into your file, you can check to see if they're really there with the View option on the main menu. This displays all the reminders in your file along with their record numbers. It's

RUN It Right

C-128 (in 80-column mode); disk drive

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Circle 92 on Reader Service card.

a good idea to keep your reminder file on a backup disk.

Other Options

If you decide to eliminate a reminder, do it with the Delete option. Once you've typed in the record number to tell the program which reminder to erase, that reminder will appear on the command/menu line at the top of the screen. To proceed with the deletion, press the return key. However, if you have second thoughts, you can abort the operation by pressing the escape key. To use file space efficiently, record numbers that have been freed by the delete process

are the first ones filled when you add more reminders.

The Sort option arranges all the reminders in REMFILE in ascending chronological order. Although the program can find the reminders for any given day regardless of their order in the file, I find it reassuring to see them printed out in chronological order. If you don't care, you can forget about the Sort option.

If you want a hard copy of your reminders, select Print from the menu. A small pull-down menu will appear, offering the choice of "Today's," for a printout of today's reminders only, or "All" for a listing of

your complete reminder file. To move the highlight from one selection to the other, use the up-and-down cursor key, and then press the return key to begin printing.

When you're done using Reminder 128, leave the program by selecting Exit from the menu and answering Y to the prompt, "Leave Program, Are You Sure?" If, at the last instant, you remember an upcoming appointment you forgot to add, enter an N to return to the menu. **Ⓚ**

Address all author correspondence to Bob Guerra, 7 Russell St., Charlestown, MA 02129.

Listing 1. Reminder 128 program.

```

10 REM REMINDER 128          :REM*32
20 FAST:PRINT CHR$(142)    :REM*196
30 PRINTCHR$(27)"G"        :REM*36
40 SCNCLR                   :REM*204
50 PRINT"(CTRL 4)PLEASE ENTER TO
  DAY'S DATE(5 SPACES)/(2 SPACE
  S)":"T=1                 :REM*24
60 PRINT"(CTRL 8){80 COMD Ts}{CT
  RL 2}{2 CRSR UPs}"      :REM*140
70 GOSUB690                :REM*200
80 DATE=YE*10000+MO*100+DA
                          :REM*68
90 SCNCLR:PRINT"(CTRL 4){CTRL 9}
  ADD(CTRL 0)","DELETE","VIEW",
  "SORT","PRINT","EXIT" :REM*36
100 PRINT"(CTRL 8){66 COMD Ts}{C
  TRL 9} REMINDER 128 {CTRL 4}
  {2 CRSR UPs}"          :REM*120
110 DOPEN#1,"REMFILE":IFDS=62THE
  NCLOSE1:GOSUB1350      :REM*148
120 PRINT:PRINT:PRINT:PRINT{COM
  D 8}REC #"SPC(2)"DATE"SPC(7)
  "MESSAGE"              :REM*108
130 PRINT{COMD 7}{5 COMD Ys}{2
  SPACES}{8 COMD Ys}{3 SPACES}
  {62 COMD Ys}"          :REM*124
140 FORI=1TO16:PRINT:NEXT
                          :REM*250
150 PRINT"{80 COMD Ps}{CTRL 4}"
                          :REM*76
160 PRINT{COMD 3}{CTRL 9}{2 SPA
  CES}<CRSR> TO SELECT{2 SPACE
  S}<RETURN> TO EXECUTE{41 SPA
  CES}{CTRL 0}{CTRL 2}" :REM*22
170 WINDOW 1,6,79,21,1   :REM*134
180 PRINTCHR$(27)"M"      :REM*198
190 X=0:Y=0:Z=3          :REM*138
200 X=X+1:IFX>9THENZ=2:IFX>99THE
  NZ=1                   :REM*136
210 RECORD#1,X,1         :REM*124
220 INPUT#1,MSG$         :REM*128
230 BDATE=VAL(LEFT$(MSG$,6)):EDA
  TE=VAL(MID$(MSG$,18,6)):MESS
  AGE$=MID$(MSG$,34)     :REM*228
240 EDATE$=STR$(EDATE)   :REM*126
250 IFBDATE=0THEN350     :REM*2
260 IFV=1THEN310         :REM*77
270 IFDATE>EDATEANDLEFT$(MESSAGE
  $,1)=CHR$(42)THEN2980 :REM*85
290 IFBDATE>DATETHEN350  :REM*71
300 IFDATE<=EDATETHEN310:ELSE320
                          :REM*191
310 PRINT{CTRL 2}"XSPC(2)MIDS(E
  DATES,4,2)"/"MIDS(EDATES,6)"/
  "/MIDS(EDATE$,2,2)SPC(3)MESS
  AGE$:Y=Y+1:GOTO320     :REM*67
320 IFY=0ORINT(Y/14)*14-Y<>0THEN
  350                     :REM*133
330 WINDOW 2,23,79,24:PRINT"(COM
  D 3){CTRL 9}PRESS ANY KEY FO
  R MORE...{6 SPACES}{CTRL 2}"
  :GETKEYK$:PRINT{CRSR UP}{CO
  MD 3}{CTRL 9}<CRSR> TO SELEC
  T{2 SPACES}<RETURN> TO EXECU
  TE(CTRL 2)":WINDOW1,6,79,21:
  FORI=1TO14:PRINT:NEXT
                          :REM*171
340 PRINTCHR$(27)"L"     :REM*101
350 IFMSG$<>CHR$(255)THEN2000
                          :REM*215
360 PRINT                 :REM*207
370 IFY=0THENPRINT{CTRL G}SORRY
  , NO MESSAGES TODAY{CTRL 4}"
  :GOTO400                :REM*207
380 IFY=1THENPRINT{CTRL G}YOU H
  AVE JUST"Y"MESSAGE{CTRL 4}":
  GOTO400                 :REM*231
390 PRINT{CTRL G}YOU HAVE"Y"MES
  SAGES{CTRL 4}"         :REM*29
400 CLOSE 1              :REM*157
410 IFV=1THENWINDOW2,23,79,24:GO
  TO2960                  :REM*197
420 WINDOW 0,0,79,2     :REM*9
430 GETA$:IFA$=CHR$(29)THENPRINT
  "{CRSR UP}ADD","{CTRL 9}DELE
  TE":GOTO470            :REM*183
440 IFA$=CHR$(157)THENPRINT{CRS
  R UP}ADD"TAB(50)"{CTRL 9}EXI
  T(CTRL 0)":GOTO630     :REM*115
450 IFA$=CHR$(13)THENWINDOW2,23,
  79,24,1:PRINT{COMD 3}{CTRL
  9}<ESC> TO ESCAPE{63 SPACES}
  ":"GOTO670             :REM*135
460 GOTO430              :REM*207
470 GETA$:IFA$=CHR$(29)THENPRINT
  TAB(10)"{CRSR UP}DELETE","{C
  TRL 9}VIEW":GOTO510   :REM*11
480 IFA$=CHR$(157)THENPRINT{CRS
  R UP}{CTRL 9}ADD(CTRL 0)","D
  ELETE":GOTO430        :REM*201
490 IFA$=CHR$(13)THENWINDOW2,23,
  79,24,1:PRINT{COMD 3}{CTRL
  9}<ESC> TO ESCAPE{63 SPACES}
  ":"GOTO2310           :REM*41
500 GOTO470              :REM*55
510 GETA$:IFA$=CHR$(29)THENPRINT
  TAB(20)"{CRSR UP}VIEW","{CTR
  L 9}SORT":GOTO550     :REM*65
520 IFA$=CHR$(157)THENPRINTTAB(1
  0)"{CRSR UP}{CTRL 9}DELETE(C
  TRL 0)","VIEW":GOTO470
                          :REM*112
530 IFA$=CHR$(13)THENV=1:DOPEN#1
  ,"REMFILE":GOTO170   :REM*160
540 GOTO510              :REM*8
550 GETA$:IFA$=CHR$(29)THENPRINT
  TAB(30)"{CRSR UP}SORT","{CTR
  L 9}PRINT":GOTO590   :REM*248
560 IFA$=CHR$(157)THENPRINTTAB(2
  0)"{CRSR UP}{CTRL 9}VIEW{CTR
  L 0}","SORT":GOTO510 :REM*52
570 IFA$=CHR$(13)THEN2600
                          :REM*154
580 GOTO550              :REM*112
590 GETA$:IFA$=CHR$(29)THENPRINT
  TAB(40)"{CRSR UP}PRINT","{CT
  RL 9}EXIT":GOTO630   :REM*12
600 IFA$=CHR$(157)THENPRINTTAB(3
  0)"{CRSR UP}{CTRL 9}SORT{CTR
  L 0}","PRINT":GOTO550
                          :REM*254
610 IFA$=CHR$(13)THENWINDOW2,23,
  79,24:PRINTTAB(39)"{COMD 3}{
  CTRL 9}<ESC> TO ESCAPE{CTRL
  4}":GOTO1960         :REM*36
620 GOTO590              :REM*216
630 GETA$:IFA$=CHR$(29)THENPRINT
  "{CRSR UP}{CTRL 9}ADD(CTRL 0
  )"TAB(50)"{CRSR UP}EXIT":GOT
  O430                   :REM*174
640 IFA$=CHR$(157)THENPRINTTAB(4
  0)"{CRSR UP}{CTRL 9}PRINT{CTR
  L 0}","EXIT":GOTO590
                          :REM*138
650 IFA$=CHR$(13)THEN2270 :REM*44
660 GOTO630              :REM*168
670 WINDOW 0,0,79,3:PRINT{CTRL
  4}PLEASE ENTER THE EVENT DAT
  E{3 SPACES}/{2 SPACES}/"CHR$
  (27)"Q":PRINTTAB(62)"{CTRL 8
  }{CTRL 9} ADDING REMINDERS(2
  CRSR UPs)"           :REM*148
680 T=2:GOSUB690:GOTO1440 :REM*12
690 M=0:D=0              :REM*104
700 GETM$:IFASC(M$)=27ANDT=2THEN
  WINDOW2,23,79,24:GOTO2960
                          :REM*212
710 IFASC(M$)<48ORASC(M$)>49THEN
  700                    :REM*252
720 PRINTTAB(28)"{CTRL 4}{CRSR U
  P}"M$                  :REM*214
730 IFASC(M$)=49THEN790 :REM*238
740 M=1                   :REM*198
750 GETO$:IFASC(O$)=27ANDT=2THEN
  WINDOW2,23,79,24:GOTO2960
                          :REM*26
760 IFASC(O$)=20THENPRINTTAB(28)
  "{CRSR UP}{CRSR LF}":GOTO700
                          :REM*176
770 IFASC(O$)<49ORASC(O$)>57THEN
  →

```

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- Supports same modems as Dataquick 64
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version 2.0 by Marty Franz & Joe Peter

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Listing 1 continued.

```

NWINDO2,23,79,24:GOTO2960      1430 RETURN                      :REM*213
                                :REM*252
1440 EDATE=YE*10000+MO*100+DA   :REM*159
                                :REM*159
1450 PRINT"{CRSR UP}{16 SPACES}" CHR$(19)"(CTRL 4){2 CRSR UP s}HOW MANY DAYS IN ADVANCE WOULD YOU LIKE TO BE WARNED ? (1-28)" :REM*27
1460 GETN$:IFASC(N$)=27THENWINDO W2,23,79,24:GOTO2960:REM*81
1470 IFASC(N$)<49ORASC(N$)>57THE N1460 :REM*197
1480 PRINTTAB(62)"(CRSR UP)"N$ :REM*137
1490 IFASC(N$)=50THEN1540:REM*31
1500 GETU$:IFASC(U$)=27THENWINDO W2,23,79,24:GOTO2960 :REM*191
1510 IFASC(U$)=13ORASC(N$)>50THE NNUM=VAL(N$):GOTO1580 :REM*195
1515 IFASC(U$)=20THENPRINTTAB(62 )" (CRSR UP) ":GOTO1460 :REM*98
1520 IFASC(U$)<48ORASC(U$)>57THE N1500 :REM*209
1530 PRINTTAB(63)"(CRSR UP)"U$:N UM=VAL(N$)*10+VAL(U$):GOTO 1580 :REM*133
1540 GETU$:IFASC(U$)=27THENWINDO W2,23,79,24:GOTO2960 :REM*232
1550 IFASC(U$)=13THENUM=VAL(N$) :GOTO1580 :REM*72
1555 IFASC(U$)=20THENPRINTTAB(62 )" (CRSR UP) ":GOTO1460 :REM*139
1560 IFASC(U$)<48ORASC(U$)>56THE N1540 :REM*244
1570 PRINTTAB(63)"(CRSR UP)"U$:N UM=VAL(N$)*10+VAL(U$) :REM*10
1580 N=YE-INT(YE/4)*4 :REM*18
1590 R=DA-NUM :REM*138
1600 IFMO=5ORMO=7ORMO=10ORMO=12T HEN1650 :REM*32
1610 IFMO=3ANDN<>0THEN1660 :REM*78
1620 IFMO=3ANDN=0THEN1670:REM*82
1630 IFMO=1THEN1680 :REM*102
1640 IFNUM>DATHENBDATE=EDATE-(69 +DA)+R:GOTO1700:REM 31-DAY LAST MONTH :REM*20
1650 IFNUM>DATHENBDATE=EDATE-(70 +DA)+R:GOTO1700:REM 30-DAY LAST MONTH :REM*146
1660 IFNUM>DATHENBDATE=EDATE-(72 +DA)+R:GOTO1700:REM LAST MO NTH FEB NOT LEAP :REM*122
1670 IFNUM>DATHENBDATE=EDATE-(71 +DA)+R:GOTO1700:REM LAST MO NTH FEB LEAP :REM*238
1680 IFNUM>DATHENBDATE=(EDATE-88 00)-(69+DA)+R:GOTO1700:REM LAST MONTH = LAST YEAR :REM*78
1690 BDATE=EDATE-NUM :REM*226
1700 WINDOW 0,0,79,1:PRINT"(CTRL 4)WHAT IS YOUR MESSAGE?(CR SR UP)"CHR$(27)"Q":P=23:MSG $="" :REM*180
1710 GETM$:IFP<23THENP=23 :REM*220
1720 IFM$=""THEN1710 :REM*252
1730 IFM$=CHR$(20)ANDP>23THENP=P -1:MSG$=LEFT$(MSG$,P-23):P INTTAB(P)"(CRSR UP) (CRSR L F)":GOTO1710 :REM*178
1740 IFM$=CHR$(20)ANDP=23THENMSG $=LEFT$(MSG$,P-23):PRINTTAB (P)"(CRSR UP) (CRSR LF)":GO TO1710 :REM*110

```



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Listing 1 continued.

```

175Ø IFM$=CHR$(27)THENWINDOW2,23
,79,24:GOTO296Ø :REM*118
176Ø IFM$=CHR$(13)THEN183Ø
:REM*15Ø
177Ø PRINTTAB(P)"(CRSR UP)"M$:MS
G$=MSG$+M$ :REM*2
178Ø P=P+1 :REM*122
179Ø IFP<79THEN171Ø :REM*222
18ØØ GETM$:IFM$=CHR$(2Ø)THENP=P-
1:MSG$=LEFT$(MSG$,P-23):PRI
NTTAB(P)"(CRSR UP) (CRSR LF
)":GOTO171Ø :REM*2Ø3
181Ø IFM$=CHR$(27)THENWINDOW2,23
,79,24:GOTO296Ø :REM*179
182Ø IFM$<>CHR$(13)THEN18ØØ
:REM*89
183Ø BDATE$=STR$(BDATE) :REM*151
184Ø EDATE$=STR$(EDATE) :REM*197
185Ø DOPEN#1,"REMPFILE" :REM*225
186Ø X=1 :REM*87
187Ø RECORD#1,X,1 :REM*255
188Ø INPUT#1,RM$:IFLEFT$(RM$,1)=
CHR$(42)ORRM$=CHR$(255)THEN
189Ø:ELSEX=X+1:GOTO187Ø
:REM*111
189Ø RECORD#1,X,1:PRINT#1,BDATE$
,EDATE$,MSG$ :REM*59
19ØØ WINDOW Ø,Ø,79,1:PRINT"(CTRL
4)ANOTHER MESSAGE?"CHR$(27
)"Q" :REM*11
191Ø GETA$ :REM*79
192Ø IFA$="Y"THEN67Ø :REM*147
193Ø IFA$<>"N"THEN191Ø :REM*127
194Ø CLOSE 1:WINDOW Ø,Ø,79,2:PRI
NT"(CTRL 4){CTRL 9}ADD{CTRL
Ø}";"{7 SPACES}DELETE";"{4
SPACES}VIEW";"{6 SPACES}SO
RT";"{6 SPACES}PRINT";"{5 S
PACES}EXIT"CHR$(27)"Q"CHR$(
27)"M" :REM*65
195Ø PRINTTAB(59)"(CTRL 8){7 COM
D Ts}{CTRL 9} REMINDER 128
{CTRL 4}{2 CRSR UPs}":GOTO4
3Ø :REM*127
196Ø WINDOW4Ø,1,48,4:PRINT"(CTRL
9){1Ø SPACES}{CTRL Ø)TODAY
'S{CTRL 9){2 SPACES}ALL{14
SPACES}" :REM*187
197Ø GETX$:IFX$=CHR$(13)THEN2Ø5Ø
:REM*5
198Ø IFX$=CHR$(27)THENSCLR:PRI
NT"(CTRL 8){9 COMD Ts}":WIN
DOW2,23,79,24:GOTO296Ø
:REM*67
199Ø IFX$<>CHR$(145)ANDX$<>CHR$(
17)THEN197Ø :REM*113
2ØØØ PRINTCHR$(19)"(CRSR DN){CTR
L 9} TODAY'S{2 SPACES}{CTRL
Ø)ALL " :REM*75
2Ø1Ø GETX$:IFX$=CHR$(13)THENV=2:
GOTO2Ø5Ø :REM*79
2Ø2Ø IFX$=CHR$(27)THENSCLR:PRI
NT"(CTRL 8){9 COMD Ts}":WIN
DOW2,23,79,24:GOTO296Ø
:REM*1Ø7
2Ø3Ø IFX$<>CHR$(145)ANDX$<>CHR$(
17)THEN2Ø1Ø :REM*11
2Ø4Ø PRINTCHR$(19)"(CRSR DN){CRS
R RT)TODAY'S{2 CRSR RTs}{CT
RL 9)ALL " :GOTO197Ø:REM*1Ø3
2Ø5Ø SCLR:PRINT"(CTRL 8){9 COM
D Ts}":WINDOWØ,Ø,79,2:PRINT
TAB(66)"(CTRL 8){CTRL 9){CR
SR DN) PRINTING ... {CTRL 2
}":OPEN7,4:PRINT#7 :REM*254
2Ø6Ø PRINT#7,SPC(34)"REMINDER 12
8"CHR$(1Ø) :REM*98
2Ø7Ø PRINT#7,SPC(5)"DATE"SPC(14)
"MESSAGE":PRINT#7,SPC(5)"{7
5 COMD Ts}" :REM*232
2Ø8Ø X=Ø:Y=Ø :REM*76
2Ø9Ø X=X+1 :REM*82

```

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```

2100 DOPEN#1,"REMFIL" :REM*220
2110 RECORD#1,X,1 :REM*240
2120 INPUT#1,MSG$ :REM*244
2130 BDATE=VAL(LEFT$(MSG$,6)):ED
ATE=VAL(MID$(MSG$,18,6)):ME
SSAGE$=MID$(MSG$,34):REM*88
2140 EDATE$=STR$(EDATE) :REM*242
2150 IFBDATE=0THEN2200 :REM*74
2160 IFV=2THEN2190 :REM*50
2170 IFBDATE>DATETHEN2200:REM*70
2180 IFDATE<=EDATETHEN2190:ELSE2
200 :REM*158
2190 PRINT#7,SPC(5)MID$(EDATE$,4
,2)"/MID$(EDATE$,6)"/MID$(
EDATE$,2,2),MESSAGE$:Y=Y+1
:REM*230
2200 IFMSG$<>CHR$(255)THEN2090
:REM*190
2210 PRINT#7 :REM*198
2220 IFY=0THENPRINT#7,SPC(5)"SOR
RY, NO MESSAGES TODAY":GOTO
2250 :REM*210
2230 IFY=1THENPRINT#7,SPC(5)"YOU
HAVE JUST"Y"MESSAGE":GOTO2
250 :REM*36
2240 PRINT#7,SPC(5)"YOU HAVE"Y"M
ESSAGES" :REM*62
2250 CLOSE 1:CLOSE 7:V=0:PRINT{(
CTRL G)" :REM*130
2260 PRINTCHR$(27)"{CTRL G}":WIN
DOW2,23,79,24:GOTO2960
:REM*22
2270 PRINT"{CTRL 4}{CRSR UP}LEAV
E PROGRAM?(2 SPACES)ARE YOU
SURE?"CHR$(27)"Q" :REM*42
2280 GETX$:IFX$="N"THENWINDOW2,2
3,79,24:GOTO2960 :REM*240
2290 IFX$<>"Y"THEN2280 :REM*38
2300 BANK15:SYS65341 :REM*202
2310 WINDOW 0,0,79,2:PRINT"{CTRL
4)ENTER THE NUMBER OF THE
RECORD YOU WANT TO DELETE (
1-100) {CTRL 9}{CTRL 0}"CHR
$(27)"Q":PRINTTAB(60)"{CTRL
8}{CTRL 9} DELETING REMIND
ERS {CTRL 2}" :REM*227
2320 GETR$:IFASC(R$)=27THENWINDO
W2,23,79,24:GOTO2960
:REM*217
2330 IFASC(R$)<49ORASC(R$)>57THE
N2320 :REM*129
2340 PRINTTAB(58)"{CTRL 4}{2 CRS
R UPs}"R$ :REM*47
2350 GETE$:IFASC(E$)=27THENWINDO
W2,23,79,24:GOTO2960
:REM*117
2360 IFASC(E$)=20THENPRINTTAB(58
)"{CRSR UP}{CRSR LF}":GOTO
2320 :REM*1
2370 IFE$=CHR$(13)THENRE=VAL(R$)
:GOTO2460 :REM*207
2380 IFASC(E$)<48ORASC(E$)>57THE
N2350 :REM*75
2390 PRINTTAB(59)"{CRSR UP}"E$
:REM*201
2400 RE=VAL(R$)*10+VAL(E$):IFRE<
>10THEN2460 :REM*27
2410 GETM$:IFASC(M$)=27THENWINDO
W2,23,79,24:GOTO2960 :REM*1
2420 IFM$=CHR$(13)THEN2460
:REM*125
2430 IFASC(M$)=20THENPRINTTAB(59
)"{CRSR UP}{CRSR LF}":GOTO
2350 :REM*213
2440 IFASC(M$)<>48THEN2410
:REM*255
2450 PRINTTAB(60)"{CRSR UP}"M$:R
E=100 :REM*255
2460 DOPEN#1,"REMFIL" :REM*69
2470 RECORD#1,RE,1 :REM*43
2480 INPUT#1,MSG$ :REM*93
2490 BDATE=VAL(LEFT$(MSG$,6)):ED
ATE=VAL(MID$(MSG$,18,6)):ME
SSAGE$=MID$(MSG$,34)

```

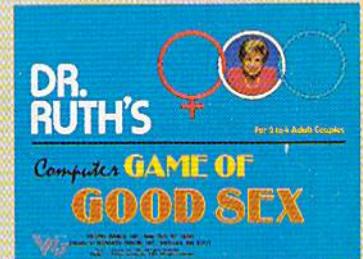
```

:REM*193
EDATE$=STR$(EDATE) :REM*91
2510 PRINT"{CRSR UP}"CHR$(27)"QR
EC # "RE;"{2 SPACES}"MID$(E
DATES,4,2)"/MID$(EDATE$,6)
"/MID$(EDATE$,2,2)">{2 SPAC
Es}"MESSAGE$ :REM*159
2520 WINDOW 2,23,79,24:PRINT"{CR
SR UP}{COMD 3}{CTRL 9}<ESC>
TO ESCAPE {2 SPACES}<RETURN
> TO DELETE {2 SPACES}{CTRL
2}" :REM*9
2530 GETX$:IFX$<>CHR$(27)ANDX$<>
CHR$(13)THEN2530 :REM*69
2540 IFX$=CHR$(27)THENWINDOW2,23
,79,24:GOTO2960 :REM*231
2550 RECORD#1,RE,1:PRINT#1,CHR$(
42) :REM*143
2560 WINDOW 0,0,79,2:PRINT"{CTRL
4)DELETE ANOTHER?"CHR$(27)
"Q" :REM*52
2570 GETX$:IFX$<>"Y"ANDX$<>"N"TH
EN2570 :REM*62
2580 IFX$="N"THENWINDOW2,23,79,2
4:GOTO2960 :REM*62
2590 GOTO2310 :REM*70
2600 DIMST$(100) :REM*134
2610 PRINTTAB(67)"{CTRL 8}{CTRL
9} SORTING ... {CTRL 2}"
:REM*92
2620 DOPEN#1,"REMFIL" :REM*230
2630 X=0:Y=0:Z=0 :REM*236
2640 DO:X=X+1 :REM*86
2650 RECORD#1,X,1 :REM*14
2660 INPUT#1,MSG$ :REM*18
2670 IFMSG$=CHR$(42)THENY=Y+1:GO
TO2640 :REM*62
2680 Z=Z+1 :REM*202
2690 ST$(Z)=MSG$ :REM*4
2700 LOOPUNTILMSG$=CHR$(255)
:REM*12
2710 PASS=Z-2 :REM*118
2720 FORLO=1TOPASS :REM*180
2730 F=0 :REM*104
2740 FORLI=1TOPASS :REM*104
2750 ADATE=VAL(MID$(ST$(LI),18,6
)) :REM*64
2760 BDATE=VAL(MID$(ST$(LI+1),18
,6)) :REM*194
2770 HOLD$=ST$(LI) :REM*46
2780 IFBDATE<ADATETHENST$(LI)=ST
$(LI+1):ST$(LI+1)=HOLD$:F=F
+1 :REM*0
2790 NEXTLI :REM*240
2800 IFF=0THENLO=PASS :REM*62
2810 NEXTLO :REM*100
2820 Z=Z-1 :REM*119
2830 FORW=1TOZ :REM*131
2840 RECORD#1,W,1 :REM*77
2850 PRINT#1,ST$(W) :REM*231
2860 NEXTW :REM*251
2870 Z=Z+1 :REM*137
2880 FORW=ZTOX :REM*217
2890 RECORD#1,W,1 :REM*127
2900 PRINT#1,CHR$(255) :REM*109
2910 NEXTW :REM*45
2920 CLOSE1:CLR :REM*183
2930 PRINTTAB(66)"{CRSR UP}{CTRL
8}{CTRL 9} REMINDER 128 (C
TRL 0)" :REM*131
2940 WINDOW2,23,79,24:PRINT"{CTR
L G}{COMD 3}{CTRL 9}SORT CO
MPLETE ...{2 SPACES}PRESS A
NY KEY TO CONTINUE":REM*137
2950 GETKEYX$ :REM*241
2960 PRINT"{CRSR UP}{COMD 3}{CTR
L 9}<CRSR> TO SELECT{2 SPAC
Es}<RETURN> TO EXECUTE{17 S
PACES}" :REM*67
2970 GOTO 1940 :REM*123
2980 BDATE=BDATE+10000:EDATE=EDA
TE+100000:RECORD#1,X,1:PRINT
#1,STR$(BDATE),STR$(EDATE),
MESSAGE$:GOTO350 :REM*141

```

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64 NOTEPAD UPDATE

Add Save, Load and Print routines to RUN's popular desktop accessory.

By BOB KODADEK



In my article, "Programmers, Take Note!" (*RUN*, September 1986), I introduced the 64 Notepad program, a desktop accessory that provides an instant-access text window for typing in and recalling programming (or other) notes without affecting the screen display. Notepad is RAM-resident, interrupt-based and transparent to most programs. When you access 64 Notepad, it "freezes" the program so you can enter notes.

Now I've added two routines to the program. Patch 1 saves and loads any Notepad window. Special file identifiers are appended to all filenames, a fresh workscreen is provided, and the error channel is read and displayed after each disk operation.

An accurate digital time display is also included, using one of the 64's time-of-day clocks. Patch 2 prints out Notepad windows (while ignoring text outside windows) and full screens. These commands are available at the touch of a key whenever the Notepad is open, even while another program is running.

I've supplied the patches in the form of Basic loader programs, which you can append to the base 64 Notepad with the accompanying program, C-64 Simple Append.

Entering the New Routines

To use the new Notepad patches, you need a working copy of 64 Notepad. First, type in and save Patch 1 (Listing 1), which contains the machine language for the Save, Load and Digital Clock routines. Next, type in and save Patch 2 (Listing 2), which contains the printer routines. Keep in mind that these are temporary files used to create one large Notepad program. Though they do not perform any function until they're appended to the main 64 Notepad program, you must test them to ensure that you have made no typing errors, particularly in the Data statements. Once you've tested and saved working copies of these two programs, you're ready to move on.

Finally, type in and save the C-64 Append program (Listing 3). You can

use C-64 Append to attach one or more Basic programs from a disk to a program in Basic memory. Just be sure that the programs you want to append to the resident program have higher line numbers. Remember to save the program before executing it, since it erases itself when run.

The proper syntax for an append is: SYS (SA),"FILENAME". The variable SA is the starting address of the Append routine. The machine language code is completely relocatable; to place it into a different memory location, change the value of variable ML in line 10 of Listing 3. You'll be using it at the present default location of 828, which is located in the cassette buffer.

Now you're ready to append patches 1 and 2 to 64 Notepad. Load and run the Append program. During the next sequence of commands, always check to see that you have the correct disk, with the necessary program, in drive A (device number 8), before pressing return. In Direct mode, type in the following commands:

```
LOAD"64 NOTEPAD",8
SYS 828,"PATCH1"
SYS 828,"PATCH2"
SAVE"64 NOTEPAD II",8
```

If all goes well, the OK message will be displayed after each append, and you'll now have a finished copy of the expanded Notepad program.

Using the New Routines

Shortly after running the new program, you'll be asked to enter the correct time. The first input prompt will

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C-64; printer optional

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request hours, and a second prompt, minutes. Since this is a time-of-day clock, the hours must be any number from 1 through 12. By pressing only the return key in response to these two prompts, the internal clock will start at zero and may be used as a timer. The current time is always displayed in the lower-right corner of the text window. Although the digital time display stops during printing, the clock will still keep the correct time. Consequently, the display is updated automatically when the printing operation is complete.

After the Ready prompt appears, you can use the Notepad. Press the CTRL-O combination to open the window. The new routines will take over the function keys whenever the window is open, and they will perform the following functions:

F1: Saves a Notepad window.

F3: Prints the window currently in memory.

F5: Prints a full screen.

F7: Loads a Notepad window.

Press CTRL-C to close the window, and the keys should revert to their original functions.

When you wish to save (F1) or load (F7) a window, one of the prompts, SAVE: N. or LOAD: N., will appear. Now give the program a filename. Your notes will be safely stored, and you'll have a fresh workscreen to write in. To abort at any time, either press the stop key or press return without entering a filename. The N. in the prompts is a Notepad file identifier, and it automatically becomes part of the filename. There's no need to type in this prefix; it is done for you. Remember that you are limited to 14 characters in the filename because of the prefix. The Custom Input

routine, complete with cursor and delete functions, also limits your input to 14 characters.

Each time you save or load a window, the error channel is read and displayed. Press return, and your text will appear. These added commands also make it possible to use the 64 Notepad as a simple index card file. A single-sided disk can hold up to 144 Notepad files and is only limited by the directory.

I'd like to thank those of you who have expressed an interest in my 64 Notepad. And to those who have had some difficulty in entering the program, I was glad to be of help. Your suggestions, criticisms and questions are welcome. ☐

Address all author correspondence to Bob Kodadek, 3164 Surrey Lane, Aston, PA 19014.

Listing 1. Patch 1.

```

72 REM 64 NOTEPAD PATCH #1           :REM*138
73 REM SAVE AND LOAD WINDOWS        :REM*141
74 REM DIGITAL TIME DISPLAY         :REM*16
75 REM                               :REM*137
76 PRINT"WAIT...":MEM=50636:A=51268:FORI=0T
O419:READ BY                       :REM*56
77 IF BY >255 THEN PRINT"ERROR IN LINE:"PEE
K(63)+PEEK(64)*256:END              :REM*71
78 POKE MEM+I,BY:CS=CS+BY:NEXT      :REM*168
79 IF CS <> 49979 THEN PRINT"CHECKSUM BAD,
CHECK ALL DATA.":END              :REM*143
80 POKE A,76:POKE A+1,0:POKE A+2,198:POKE 5
1287,236                            :REM*46
81 PRINT:PRINT"OK, SET THE TIME."   :REM*133
82 INPUT"{2 SPACES}HOURS";T(1):IFT(1)>12THE
N82                                  :REM*198
83 INPUT"MINUTES";T(2):IFT(2)>59THEN83
:REM*235
84 FORI=1TO3:H=INT(T(I)/10):L=T(I)-10*H:T(I
)=16*H+L:NEXT                      :REM*34
85 C=56587:POKEC+4,PEEK(C+4)AND127 :REM*95
86 FORI=0TO3:POKEC-I,T(I+1):NEXT    :REM*88
87 DATA 173,11,221,162,0,72,41,16,160,2,208
,12,169,186                          :REM*167
88 DATA 157,182,7,185,9,221,232,72,41,240,7
4,74,74,74                          :REM*112
89 DATA 24,105,176,157,182,7,232,104,41,15,
24,105,176,157                      :REM*221
90 DATA 182,7,232,136,16,220,173,8,221,96,3
2,204,197,32                         :REM*90
91 DATA 11,202,165,197,201,3,240,7,201,4,24
0,3,76,71                            :REM*57
92 DATA 200,72,169,0,133,253,133,198,133,15
7,141,109,199,169                   :REM*54
93 DATA 54,133,1,32,59,201,32,117,201,32,16
,201,162,35                          :REM*185
94 DATA 32,23,199,104,201,4,240,17,162,0,32
,152,198,169                         :REM*30
95 DATA 1,133,185,169,0,32,213,255,76,89,19
8,162,10,32                          :REM*209
96 DATA 152,198,169,0,32,213,255,76,110,198,32,171,255,
162,20,32,23                        :REM*103
100 DATA 199,32,228,255,240,251,201,13,208,
247,32,204,255,32                   :REM*136
101 DATA 16,201,32,141,201,76,49,200,32,23,
199,164,204,240                     :REM*149
102 DATA 8,164,211,177,209,9,128,145,209,32
,225,255,208,5                      :REM*168
103 DATA 104,104,76,143,198,32,228,255,240,
229,201,13,240,41                   :REM*111
104 DATA 201,20,240,70,174,109,199,224,14,2
40,214,201,127,176                  :REM*122
105 DATA 210,201,32,144,206,201,34,240,202,
172,109,199,153,112                 :REM*165
106 DATA 199,238,109,199,32,210,255,32,59,2
01,76,155,198,173                   :REM*178
107 DATA 109,199,240,196,24,105,2,162,110,1
60,199,32,189,255                   :REM*153
108 DATA 169,8,133,186,32,59,201,169,13,32,
210,255,169,29                      :REM*2
109 DATA 32,210,255,96,174,109,199,240,146,
206,109,199,162,70                  :REM*253
110 DATA 32,59,201,32,23,199,76,155,198,189
,35,199,240,6                       :REM*218
111 DATA 32,210,255,232,208,245,96,29,76,79
,65,68,58,32                        :REM*81
112 DATA 78,46,0,29,83,65,86,69,58,32,78,46
,0,13                                 :REM*204
113 DATA 29,80,82,69,83,83,32,82,69,84,85,8
2,78,0                                :REM*111
114 DATA 13,29,32,32,32,32,32,32,32,32,1
8,78,79                              :REM*162
115 DATA 84,69,80,65,68,32,87,79,82,75,32,8
3,67,82                              :REM*193
116 DATA 69,69,78,146,13,13,0,157,32,157,0,
0,78,46                              :REM*144

```

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Listing 2. Patch 2.

```
117 REM :REM*179
118 REM 64 NOTEPAD PATCH #2 :REM*188
119 REM PRINT NOTEPAD <F3> :REM*175
120 REM FULL SCREEN DUMP <F5> :REM*134
121 REM :REM*183
122 PRINT"WAIT..." :MEM=50448:A=50704:FORI=0
TO185:READ BY :REM*156
123 IF BY >255 THEN PRINT"ERROR IN LINE:"PE
EK(63)+PEEK(64)*256:END :REM*117
124 POKE MEM+I, BY:CT=CT+BY:NEXT :REM*246
125 IF CT <> 23649 THEN PRINT"CHECKSUM BAD,
CHECK ALL DATA.":END :REM*181
126 POKE A,76:POKE A+1,16:POKE A+2,197
:REM*68
127 REM :REM*189
128 DATA 32,11,202,169,54,133,1,165,197,201
,5,208,8,162 :REM*224
129 DATA 64,160,5,169,17,208,19,201,6,208,1
8,162,0,160 :REM*9
130 DATA 4,169,8,32,66,197,162,64,160,177,1
69,17,32,66 :REM*90
131 DATA 197,234,234,234,234,76,71,200,234,
134,170,132,171,141 :REM*225
132 DATA 201,197,169,4,32,195,255,160,255,1
73,24,208,201,21 :REM*84
133 DATA 240,2,160,7,169,4,170,32,186,255,1
69,0,32,189 :REM*149
134 DATA 255,32,192,255,176,43,162,4,32,201
,255,176,36,160 :REM*140
135 DATA 0,177,170,170,170,32,158,197,200,192,4
0,208,245,169,13 :REM*175
136 DATA 32,210,255,160,0,165,170,24,105,40
,133,170,144,2 :REM*220
```

```
137 DATA 230,171,206,201,197,208,222,32,204
,255,169,4,32,195 :REM*67
138 DATA 255,96,192,0,208,15,169,16,32,210,
255,169,50,32 :REM*176
139 DATA 210,255,169,48,32,210,255,138,41,1
27,201,32,144,9 :REM*19
140 DATA 201,64,144,9,201,96,144,3,24,105,3
2,105,32,32 :REM*192
141 DATA 210,255,96,0 :REM*125
```

Listing 3. C-64 Append program.

```
1 REM C-64 SIMPLE APPEND :REM*221
10 ML=828:Q$=CHR$(34) :REM*18
15 FOR I=0 TO 85:READ BY:POKE ML+I, BY:CK=CK
+BY:NEXT :REM*199
20 IF CK <> 10054 THEN PRINT"DATA ERROR!":S
TOP :REM*172
25 PRINT"SYNTAX: SYS" ML CHR$(157) CHR$(44)
Q$ "FILENAME" Q$ :REM*37
30 NEW :REM*168
35 DATA 32,253,174,32,115,0,166,122,164,123
,134,187,132,188 :REM*239
40 DATA 232,134,183,32,115,0,240,2,208,249,
165,122,56,229 :REM*192
45 DATA 183,133,183,169,8,133,186,32,51,165
,166,34,164,35 :REM*167
50 DATA 169,0,133,185,32,213,255,176,21,134
,45,132,46,134 :REM*192
55 DATA 47,132,48,134,49,132,50,32,51,165,1
60,106,32,47 :REM*33
60 DATA 241,96,72,160,0,32,47,241,104,24,10
5,48,32,210 :REM*198
65 DATA 255,96 :REM*185
```

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What a combination! Computers and baseball have teamed up to bring excitement to thousands of sports fans. Computerized baseball is more than just a game, though. It's responsible for the formation of leagues, interaction among team "managers" and a renewed interest in the grand old game.

By SCOTT WASSER

The chill in the air, the smoldering log in the fireplace or a simple glance at the calendar tells you that winter is here. But even in the frigid north, where snow is piling up higher than a pitcher's mound, baseball's "Boys of Summer" are heating up the basepaths.

While Boston residents were shivering at their bus stops yesterday, Red Sox pitcher Roger Clemens was tossing a no-hitter. And as hundreds of folks were enjoying the ice skating at New York's Rockefeller Center, Don Mattingly knocked two out of the park.

Baseball is hotter than ever—even in the middle of winter—with the growing number of computerized baseball games, which let you experience baseball action year-round.

With its many stats and strategies, baseball is an ideal game to simulate on the computer. Baseball simulation programs equip the computer with the stats for either current major leaguers or for some of the greatest teams in baseball history to determine how two teams would make out against one another.

But this is not just passive entertainment. As a player, or "manager," you take an active role in determining the game's outcome by employing different defensive and offensive strategies, juggling your lineup or trading for ball players to strengthen your team. You can play either against the computer or against another player.

One of the most popular baseball simulations available for Commodore and other computers is MicroLeague Baseball from the MicroLeague Sports Association (MLSA). The program was first introduced in late 1984 and has since captured the imaginations of literally thousands of appreciative baseball and computer fans alike. Its popularity is due to its



Barry Morstain (sans baseball cap) is captured in a reflective moment in his Newark, Delaware, office.

realistic action, but, in greater part, it's due to the fact that it was one of the first baseball strategy games on the market.

Otherwise known as MLB, MicroLeague Baseball has become much more than just another computer game. While it hasn't yet reached the epidemic proportions of past crazes, such as hula-hoops and pet rocks, it nevertheless has spawned an army of MLB fanatics.

Consider this:

—MLB enthusiasts have created leagues in which participants play by telephone, mail or at computer "ballparks."

—Sportswriters and editors have used MLB to predict the outcome of actual major league baseball Playoff and World Series contests for major daily newspapers.

—MLSA has organized support to help MLB fans learn more about the game and get in touch with others who share their interest.

The creator of MLB and president

of the multi-million dollar company that produces it is Barry Morstain, a college professor who teaches public policy courses to graduate students at the University of Delaware. Morstain, 42, has a PhD in educational research from the University of California-Berkeley. But more important to MLB fans, he has a love of baseball whose roots go back to his childhood.

"I'm a romantic about baseball," he said during an interview at MLSA's headquarters in Newark, Delaware. "I was raised in Toledo, Ohio, and grew up with this love-hate relationship with the Toledo Mud Hens of the International League. I was also a big fan of the Detroit Tigers.

"I remember in 1968, I had to be at Berkeley for the start of a semester, just when Detroit was in the middle of a pennant race. I drove all the way to Denver one time just so I could listen to one of the games on a Detroit radio station that could be received there."

While that anecdote reveals a lot about the kind of guy Morstain is, it also tells you something about the kind of game MLB is. There's no way a guy who loves baseball so much he'd drive ten hours just to hear a game on the radio could produce a baseball simulation that didn't do justice to the sport.

Morstain said that MicroLeague Baseball was created as a means to fulfill his and other baseball fans' dreams of managing their own major league teams. He said the program was designed for real baseball lovers, "the kind of people who grew up following a team every day and sleeping with their statistics under the pillow."

Fan Profile

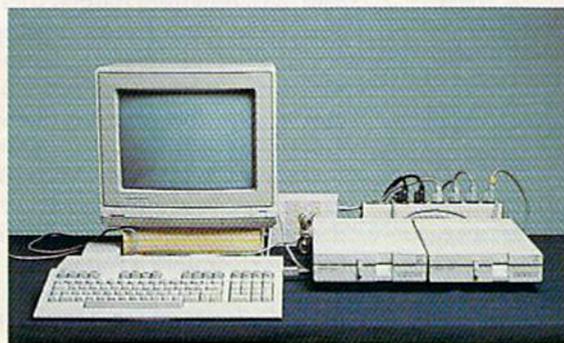
"I'm a fanatic about baseball, the Mets and MLB," said Alan Lefton, a

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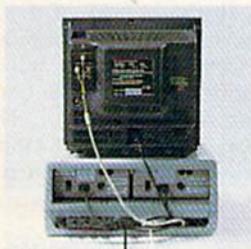
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33-year-old New York businessman who has been playing MLB for nearly two years.

Terry Jostes, a 43-year-old policeman from Munster, Indiana, echoes those thoughts. For years, Jostes played dice baseball board games before buying a C-64 and getting a copy of MLB.

He said, "I was very involved in the board game for 15 or 20 years, and was skeptical about going toward anything else. I didn't think anything else would be as realistic. But MLB converted me."

Morstain estimates that there are 150,000 people who have purchased the program. He has no idea how many more people play it without actually owning it. It's quite easy to do that, because MLB has spawned a nationwide network of people who enjoy playing the game with others. If the stereotypical computer user is a person who sits alone in his room pecking away at a keyboard, the typ-

ical MLBer (as players are known) is quite the contrary. Jeff Furman has seen this first hand. Furman, a 36-year-old free-lance paralegal who lives in Newark, Delaware, is a part-time consultant for MLSA. He handles much of the company's correspondence with MLBers.

"There are lots and lots of people who love baseball, and MicroLeague Baseball has given them a reason to get together with somebody else who also loves the sport. . . . With MLB you have a common ground on which people can meet. They can find other people right off the bat—excuse the pun—who share the same interest. It's very similar to the way dating services match people with the same interests."

League Play

Furman said he finds it fascinating to see how social relationships develop through MLB. He recalled how

two people who live in different states, Jay Weinstein of Jesup, Georgia, and Kevin Burton of Bedford, Indiana, built up a long-distance friendship around MLB.

Weinstein and Burton have a league in which they play the game by mail. That may sound strange, but it's really not much different than playing chess through the mail. Players can be drafted and teams formed, managerial decisions made and game results discussed by letter or postcard. Their view of the action may vary depending on what type of computer and monitor each is using, but both players become really involved in the game.

There are other MLBers who play long-distance games by telephone in much the same fashion. And QuantumLink is implementing a system that will enable users to play MicroLeague Baseball with someone clear across the country.

By far the most popular way to play MLB, however, is face to face with an opponent. MLB leagues have been popping up all around the country. Once or twice a week, at prearranged times and sites, a group of MLBers will get together at a "ballpark" in someone's home or a local community center, and try to manage their teams to victory over their opponents.

Typical of such leagues is the one organized by 20-year-old Vince Pfeifer of Chesterfield, Missouri. Pfeifer's league comprises 12 managers, ranging in age from 12 to 38. The managers got together, named their teams and spent eight hours drafting players to fill their rosters. Team names vary from the predictable (L.A. Dodgers) to the imaginative (New Jersey Turnpikes and River City Rambos).

Games in Pfeifer's MLB of Saint Louis league are played every Thursday at a local library. It doesn't take long to complete a full night's slate of games since the group plays on more than one computer at a time. If a manager can't make it on a given Thursday, he simply submits his lineup and lets the computer direct his team against one of his fellow managers.

Managerial Styles

Of course, there are other MLBers, such as Lefton, whose lifestyles prevent them from playing the game in such a communal fashion. They play most of their games against the computer, which is referred to in MLSA literature as "Baseball Buddha."

What Would Happen If. . . ?

Results of some games played using MLB (excerpted from the *MicroLeague Baseball Manager's Club Newsletter*).

—[This] game. . . pitted the '69 Mets (managed by former Met Ed Kranepool) against the '84 Mets (handled by Davey Johnson, current Mets manager). . . . It was a classic duel between the '69 Mets' Jerry Koosman and the current fireballing Dwight Gooden, who worked seven innings with 10 Ks. The '69 Mets clung to a 4-3 lead going into the bottom of the ninth, when run-scoring RBI hits by Staub and Chapman (off McGraw) pulled out a 5-4 come-from-behind victory for the current-day Mets.

—From Dan Metallo of Tuscon, Arizona: ". . . the 1980 Astros faced the 1984 Astros, handled by my arch-rival, the 'Baseball Buddha' inside my computer. I went with J. R. 'High-Rise' Richard (10-4, 1.89 ERA, 119 Ks), while Joe Niekro (16-12) was selected for the '84 squad. After five scoreless innings, Cesar Cedeno and Jose Cruz stroked back-to-back doubles in the top of the sixth to give Richard and my '80 Astros a 1-0 lead. . . . In the eighth, Terry Puhl homered to add a run to Richard's lead. . . . In the bottom of the ninth, Richard was still holding on to his no-hitter (a perfect game was negated by two walks and a batter hit by a pitch). A base hit seemed inevitable, but Richard retired the side. . . . and a no-hitter went down in the MicroLeague books!"

—Several reports of no-hitters were filed with us. . . . The one to mention specifically is a double no-hitter tossed by Guidry and Gooden. The Mets won in the tenth on a double by Strawberry followed by a single by Carter. Les Moore of Walla Walla, Washington, turned in this report, including a photo of his TV screen at the conclusion of the ninth.

—Mick Cornet (Oklahoma City) decided to pit his '27 Yanks against the great teams of the game disk. After 154 games their 64-90 record showed that if you want the '27 Yanks to play like the old Murderer's Row, you better put them in a league with a balanced number of patsies. The '63 Dodgers no-hit them, but in another game Babe Ruth poled three homers against them. In all, the Bambino hit 48 taters in Mick's replay.

—Scott Koltz (Chicago) reports that his '61 Yanks went 115-47 in a replay that included 72 home runs by Roger Maris. Mickey Mantle's 48 dingers gave the M-boys 120 for the season. The staff was paced by Ford (25-6) and Arroyo (18-5, 24 saves).

—John Craig and Russell Parella (Secaucus, NJ) finished a 16-team great teams league. The '68 Tigers (19-2) bested the '82 Brewers (14-7) 4 games to 1 in the league world series, as Denny McLain won games 2 and 5.

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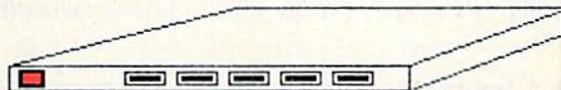
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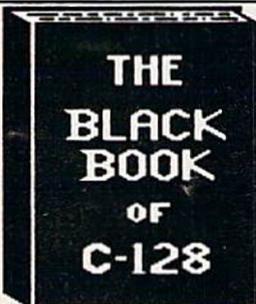


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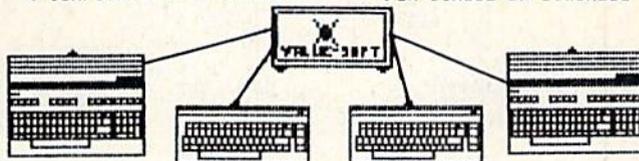
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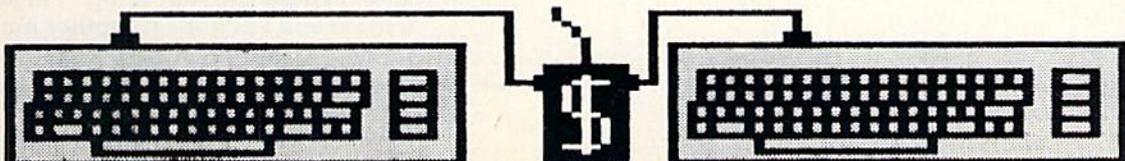
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NEW METAL BOX

"Because of my business and because I'm engaged, I can't make the kind of commitment to a league where I can say I'll be there every Tuesday at 10 PM to play a game," said Lefton. "So most of the time I play by myself. There are some weeks when I don't play at all, but then there are others when I'll play four or five times a day every day."

Lefton plays often enough to have recreated the entire 1984 Mets season. He used the same lineups and pitching rotation Mets manager Davey Johnson used during the actual baseball season. And he even kept track of every player's at-bats to make sure

the players in his computer league went to the plate the same number of times as their real-life counterparts did in 1984.

Using MLB's box score/stat compiler disk (which enables MLBers to compile box scores complete with pitching statistics from the games they play), Lefton kept track of his players' batting averages and pitching performances. "The guys' stats were really in line with what they were in real life," he said. "Out of 15 batters that I used, 11 finished with batting averages that were within seven percentage points—that's around two hits—of what they batted in real life."

That kind of statistical accuracy has prompted newspaper sportswriters to contact Paul Kelly, who helped Morstain create MLB and who is now in charge of marketing for the MLSA, and request computer-generated previews of major league Play-off and World Series games. Kelly points out that MLB is not designed as a tool for predicting the outcome of such games, and, like real baseball, the outcome of any two games—even when played with identical lineups and managerial strategy—will never be the same. But he also admits that the program's statistical accuracy generates realistic results, even when the program is used to play games before they occur in real life.

Lefton's own experience replaying the 1984 Mets season convinced him how realistic the game is and had a strange side effect on him. He said, "After seeing how accurate the game is, strange things start to happen. Even though the players all look the same on the screen, when you know a certain guy is coming up to bat, you start thinking it's the real guy. You actually imagine the real guy batting. You start cheering if it's a good hitter or moaning if it's a bum. It's scary."

Morstain admits that one of MLB's biggest assets is that it permits players to become as involved in the game as they want to. "One of the most interesting things about MLB is that it can be played on any level," he said. "You have people out there like Alan Lefton who will get very involved and replay whole seasons as accurately as they can. And you have others like Everett Erlich of Silver Springs, Maryland, who started a lunch league at work. But then you have people who just play it like they would any other computer game."

Some even enjoy letting the game play itself. Paul Kelly said, "I know one regular caller who says he likes nothing better than to come home from a hard day at work, grab a couple of beers, boot up the game disk and then sit back and watch the computer manage both teams. He says it's a way for him to enjoy baseball when the real season isn't going on."

Jostes, the Indiana cop, said he has at times done the same thing. "I'm not a brain and I'm not a computer nut," he said, "and I don't have time to sit down and learn the computer the way I'd like to. But there are times I'll come off a 3-11 PM shift and sit there

Figure 1. Koufax went the distance in this MLB replay of a game between the '81 Dodgers vs. the '65 Dodgers.

1981 DODGERS		AB	R	H	RBI
LOPES	2B	5	0	1	0
RUSSELL	SS	5	0	0	0
BAKER	LF	4	1	2	1
GARVEY	1B	4	1	1	0
CEY	3B	4	0	1	0
GUERRERO	CF	3	0	1	0
MONDAY	RF	3	0	1	1
SCIOSCIA	C	4	0	0	0
VALENZUELA	P	4	0	0	0
TOTALS		36	2	7	2

1965 DODGERS		AB	R	H	RBI
WILLS	SS	5	1	2	0
GILLIAM	3B	3	0	2	1
W DAVIS	CF	3	0	1	1
FAIRLY	RF	4	0	1	0
PARKER	1B	3	0	0	0
JOHNSON	LF	3	1	0	0
ROSEBORD	C	2	1	1	0
LEFEBVRE	2B	3	0	0	0
KOUFAX	P	3	0	0	0
TORBORG	PH	0	0	0	1
TOTALS		29	3	7	3

1981 DODGERS		IP	H	R	ER	BB	SO
VALENZUELA	L	8.2	7	3	3	5	4

1965 DODGERS		IP	H	R	ER	BB	SO
KOUFAX	W	9.0	7	2	2	2	10

E: RUSSELL, LEFEBVRE, WILLS, W DAVIS
 2B: GILLIAM
 HR: BAKER
 SB: CEY, WILLS
 SH: GILLIAM
 SF: W DAVIS, TORBORG, GILLIAM

Table 1. Programs that will let you manage your own baseball team.

—**Computer Statis-Pro Baseball** from Avalon Hill, 4517 Harford Road, Baltimore, MD 21214.

—**Computer Baseball** from Strategic Simulations, Inc., 1046 N. Rengstorff Ave., Mountain View, CA 94043.

—**MicroLeague Baseball** from MicroLeague Sports Association, 2201 Drummond Plaza, Newark, DE 19711 (see the review in the September 1986 issue of *RUN*).

—**Pure-Stat Baseball** from SubLOGIC Corp., 713 Edgebrook Drive, Champaign, IL 61820 (see the review in this issue of *RUN*).

—**World's Greatest Baseball Game** from Epyx, 600 Galveston Drive, Redwood City, CA 94063 (see the review in the July 1985 issue of *RUN*).

four months. It features profiles of MLSA employees, information about current and future programs and a list of hundreds of MLBers around the country who run leagues.

Another avenue through which MLBers can talk about their favorite program is the telecommunications forums hosted each month on QuantumLink. Kelly is on-line each month to answer questions from diehard MLBers or those who are simply curious about the game. The response, according to Kelly and QuantumLink, has been tremendous.

MLSA officials are obviously not content to rest. They have recently

introduced an enhanced version of the game for the Amiga and other computers, and the program's impact on the computer world will likely grow. Two years after its introduction, MicroLeague Baseball has become a social phenomenon that, unlike hula-hoops and pet rocks, shows no sign of fading. ■

Scott Wasser (15 North Main St., Wilkes-Barre, PA 18711) is a sports editor for The Times Leader, a daily newspaper in northeastern Pennsylvania. He has written columns on computers and home electronics for three daily newspapers.

playing until one o'clock in the morning. Sometimes I just watch the computer play itself."

But Jostes also admits that he's a statistics "nut" and a big fan of Walter Johnson, so he decided to replay a version of the 1919 baseball season. Since he also enjoys hobbies such as camping with his family and making his own beer and holds a part-time job besides, it could take him a couple of years to re-create that season.

"That doesn't bother me," he said. "I've done the same sort of thing with APBA, a baseball board game. It's much quicker and easier using a computer and MicroLeague Baseball."

Seventh-Inning Stretch

While the ways in which people play MLB may differ dramatically, the result seems to be the same: "It leaves the path open for human interaction. It is more people-oriented than most other computer games," as Jeff Furman puts it.

Morstain and Kelly have worked hard to ensure that the lines of communication are open between MLSA and its customers. In September of 1985 they published the first *MicroLeague Baseball Manager's Club Newsletter*, which now appears every three or



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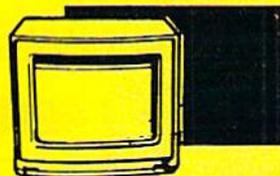
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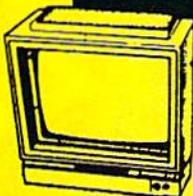
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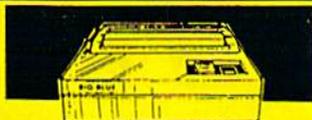
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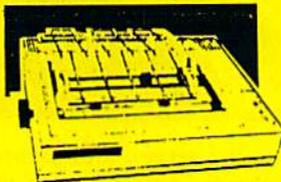
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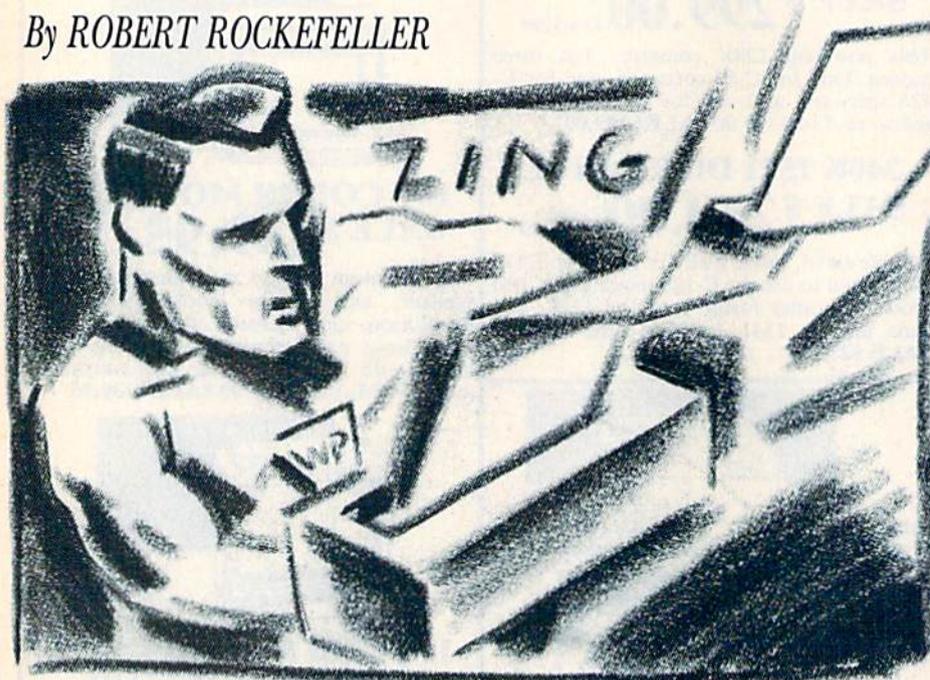
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RUN SCRIPT 128, PART 2

DEFINING PRINTER MACROS

Take full advantage of your printer's capabilities with RUN Script's macro feature.

By ROBERT ROCKEFELLER



Define Macros, the C-64-mode program that accompanies this article, cannot itself be run in C-128 mode. However, the printer macro table that the program creates can be used with RUN Script 128 2.40.—Eds.

Many Commodore owners use non-Commodore printers such as the Okimate 10 or Epson MX-80. These printers often have desirable features, like italic character sets and the ability to do underlining. The printer-macro feature of RUN Script enables you to customize your copy of this word processor so you can take full advantage of whatever capabilities your printer may possess.

Printer macro character strings are always sent to the printer when output is to the screen. This is necessary when output is being switched be-

tween the screen and printer. An idiosyncrasy of RUN Script 128 2.40 is that the printer must be turned on when output to the screen is taking place, because a file is always opened to the printer when you select output to the screen. If RUN Script ever seems to "hang up" mysteriously during a printout, check your printer.

Defining Printer Macros

You may select any upper- or lowercase alphabetic character to be a macro character. You then create a table of printer macros with the Define Macros program. Each macro character represents a string of user-defined characters. When a macro character is encountered during printing, this string, rather than the macro character itself, will be sent to the output device.

For example, let's say you own a printer that requires the sequence ESC X (decimal values 27 and 88) to start printing double-width characters. With Define Macros, you can select a character—D, for instance—to represent this two-character string. Then, when D is encountered during printing, the decimal sequence 27,88 will be sent to the printer to produce double-width characters. You could define another character, perhaps d, to represent the sequence to stop printing double-width characters.

This macro feature is most useful for printing titles and subheadings. To create a double-width heading, first place the cursor in front of the heading, then press the F3 key. A "*mac*" message will appear on the status line. Next, press the upper- or lowercase alphabetic character you've chosen to activate the double-width capability (in my example, D). Finally, move the cursor to the end of the heading, press F3 again, and press the key you've chosen to deactivate the double-width feature (d, in my example). That's all there is to it! If you press any nonalphabetic character, the operation will abort.

Your table can consist of 52 different macro definitions, each of which can be from one to 20 characters long. I've allocated exactly 500 bytes in memory for the complete macro table.

Customizing Macros

Before running Define Macros, make a list of the alphabetic characters you want to represent the various functions your printer can handle. These will be your macro characters. Beside

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C-64 or C-128 in C-64 mode; disk drive; printer

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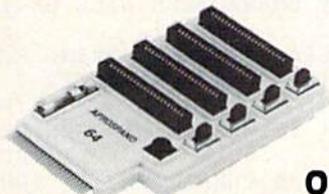
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each macro character, write the decimal values of the character sequence that must be sent to your printer to implement the function each individual macro character represents. Then run the Define Macros program.

First you'll be prompted to select a macro character. Enter any upper- or lowercase character from A to Z. (If you make a mistake and wish to cancel a macro definition, use the * key.) You'll then be asked how many characters will be represented by the mac-

ro character you've entered. Count them from your list and enter the total.

Next, enter the decimal value of each character in the string, starting with the first and continuing until all have been entered. Once you've done this, you'll have defined one macro. The prompt, "finished all definitions (y/n)?" will then appear. If you have more macro definitions to enter, type n and press the return key.

After you've entered your list of

macro definitions, press the y key at the prompt. Within seconds, the program will create the table of macro definitions, then prompt you to save the table to disk and provide the proper device number.

When you're in RUN Script 128 2.40, you can easily load in your macro set by pressing F1, followed by m. [R]

Address all author correspondence to Robert Rockefeller, R.R. #4, Langton, Ontario, Canada NOE 1G0.

Listing 1. Define Macros program.

```

10 REM DEFINE MACROS BY ROBERT ROCKEFELLER
                                     :REM*144
90 DIM FLAG%(51) : REM FLAG ARRAY INDICATES
   IF A CERTAIN MACRO IS DEFINED :REM*160
100 DIM MACRO$(51) : REM HOLDS MACRO STRING
   S                                     :REM*146
110 M1$="THIS CHARACTER HAS BEEN USED. WOULD
   YOU LIKE TO SELECT ANOTHER (Y/N)?"
                                     :REM*34
120 M2$="HOW MANY CHARACTERS WILL BE IN THE
   "                                     :REM*6
130 M2$=M2$+"(6 SPACES)MACRO STRING REPRESENTED
   BY THIS(8 SPACES)CHARACTER ? "
                                     :REM*88
140 A=780 : X=781 : Y=782 : REM SYS REGISTER
   RS                                     :REM*174
180 REM SELECT MACRO CHARACTER
200 PRINT"{SHFT CLR}{CRSR DN}SELECT A MACRO
   CHARACTER."                             :REM*216
210 GOSUB 1130                             :REM*24
230 IF A$<>"*" THEN 300                   :REM*4
240 PRINT"WHICH MACRO DEFINITION DO YOU WISH
   TO(3 SPACES)CANCEL ?"                   :REM*82
250 GOSUB 1130                             :REM*64
260 IF A$="*" THEN 240                     :REM*83
270 FLAG%(MACNUM)=0 : REM CANCEL DEFINITION
280 GOTO 470                               :REM*91
300 IF FLAG%(MACNUM)<>0 THEN PRINT M1$ :
   INPUT B$ : IF LEFT$(B$,1)="Y" THEN 200
                                     :REM*91
320 FLAG%(MACNUM)=1                       :REM*61
330 MACRO$(MACNUM)=" "                   :REM*197
370 REM DEFINE MACRO STRING
390 PRINTM2$: INPUT COUNT                 :REM*63
400 IF COUNT>20 THEN 390                  :REM*177
420 FOR LOOP=1 TO COUNT                   :REM*147
430 INPUT"DECIMAL VALUE ";DEC             :REM*43
440 MACRO$(MACNUM)=MACRO$(MACNUM)+CHR$(DEC)
                                     :REM*237
450 NEXT LOOP                             :REM*33
470 INPUT"FINISHED ALL DEFINITIONS (Y/N) ";
   B$                                     :REM*249
480 IF LEFT$(B$,1)<>"Y" THEN 200           :REM*27
520 REM CREATE MACRO TABLE
540 PTR=4*4096 : REM CREATE MACRO TABLE
   AT THIS ADDRESS                       :REM*130
550 FOR ENTRY=0 TO 51                     :REM*104
560 IF FLAG%(ENTRY)=0 THEN 750           :REM*112
580 REM CONVERT TO REVERSED SCREEN CODE
   VALUE                                  :REM*252
590 IF ENTRY<26 THEN CODE=ENTRY+1+128
                                     :REM*152
600 IF ENTRY>25 THEN CODE=ENTRY+39+128
                                     :REM*114
620 POKE PTR,CODE : REM 1ST BYTE OF 1 MACRO

```

```

ENTRY IS SCREEN CODE VALUE :REM*94
630 PTR=PTR+1 : REM NEXT TABLE BYTE :REM*46
650 POKE PTR,LEN(MACRO$(ENTRY))+2 : REM 2ND
   BYTE IS ENTRY LENGTH :REM*192
660 PTR=PTR+1 : REM NEXT TABLE BYTE :REM*76
680 FOR ILOOP=1 TO LEN(MACRO$(ENTRY)) : REM
   REST OF 1 ENTRY IS MACRO STRING
                                     :REM*178
690 POKE PTR,ASC(MID$(MACRO$(ENTRY),ILOOP,1
   ))                                     :REM*18
700 PTR=PTR+1                             :REM*200
710 NEXT ILOOP                             :REM*198
730 IF PTR>4*4096+500 THEN PRINT"{CRSR DN}
   MACRO TABLE TOO LARGE !!!" : STOP
                                     :REM*126
750 NEXT ENTRY                             :REM*210
790 REM SAVE MACRO TABLE
820 PRINT"{SHFT CLR}{2 CRSR DNs}8 - DISK
   "                                     :REM*87
830 PRINT"9 - DISK                       :REM*43
840 INPUT"SAVE TO DEVICE NUMBER ";DEV
                                     :REM*159
850 IF DEV<>1 AND DEV<>8 AND DEV<>9 THEN 84
   0                                     :REM*173
870 REM USE THE KERNAL SETLFS           :REM*63
880 POKE A,0 : POKE X,DEV : POKE Y,0
                                     :REM*181
890 SYS 65466                             :REM*45
910 REM SETUP FILENAME                   :REM*251
920 B$="RUNSCRIPT MACROS"                 :REM*35
930 FOR LOOP=1 TO LEN(B$)                 :REM*25
940 POKE 849+LOOP,ASC(MID$(B$,LOOP,1))
                                     :REM*161
950 NEXT LOOP                             :REM*23
970 REM USE KERNAL SETNAM                 :REM*85
980 POKE A,LEN(B$) : POKE X,850AND255 :
   POKE Y,850/256                       :REM*31
990 SYS 65469                             :REM*17
1010 REM USE KERNAL SAVE                  :REM*27
1020 POKE 253,0 : POKE 254,4*16           :REM*117
1030 POKE A,253 : POKE X,PTRAND255 :
   POKE Y,PTR/256                       :REM*2
1040 SYS 65496                             :REM*132
1070 END                                  :REM*52
1110 REM INPUT SUBROUTINE                 :REM*26
1130 INPUT A$ : A$=LEFT$(A$,1)           :REM*16
1150 IF A$="*" THEN RETURN                :REM*156
1160 IF A$<"A" THEN 1130                 :REM*158
1170 IF A$>"{SHFT Z}" THEN 1130          :REM*54
1180 IF A$>"Z" AND A$<"{SHFT A}" THEN 1130
   :REM*30
1200 IF A$<="Z" THEN MACNUM=ASC(A$)-65
   :REM*44
1210 IF A$>="{SHFT A}" THEN MACNUM=ASC(A$)-
   167                                   :REM*56
1230 RETURN                               :REM*12

```

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The game starts with a flashing introduction accompanied by random music, then a short pause while the program reads letters into an array and mixes them. Next the program asks for the number of players, their names and, if there's more than one player, a two-key code for each. Finally, it asks how many rounds the game will have. The preliminaries over, just press any key to start play.

Building Words

As play opens, Crosswords randomly selects and assigns to each player eight letters from the mixed-letter array. Then a display appears, consisting of a blank crossword grid with a large, white cursor in the center. The upper-right section of the screen displays the active player's name, letter assortment and current score; the middle-right section reveals the current high score, the number of the round and the game prompts; and the lower-right section shows the name of the next player (if there is more than one player) and his or her letter assortment.

The first set of game prompts (in a white background) are for moving the large, white cursor. Decide what word



you want to build out of your eight letters, employing as many of them as you wish. Then use the cursor keys to place the cursor where you want your word to start and press H (horizontal) or V (vertical) to specify the direction in which the word will extend. Only in the first turn of the first round of play can the word start anywhere on the puzzle grid. Subsequent words must link to one already there. This is done by crossing them or by placing them adjacent to each other. A word can link to more than one existing word as long as all those involved are valid.

After you've selected H or V to specify the direction you want your word to run, a set of spelling prompts (on a blue background) will appear. Press the number keys 1-8 to designate, in order, the letters you want to place on the grid. As you place a letter, it will disappear from your assortment.

If you make a mistake, press D (delete) and a third set of prompts (in

light green) will appear. The W (word) option in this set of prompts erases all the letters you've just placed on the puzzle and returns you to the cursor-movement prompts. W is useful not only if you make a mistake, but also if you spot a better place to start your word. L (letter) erases the last letter you placed and returns the spelling prompts. The letters you erase with W or L reappear in your letter selection. If you decide you don't want to erase any letters after all, press N (none) to go directly back to the spelling prompts.

When you've finished building your word, press return. If you haven't linked your word to another one, a buzzer will sound at this point. If you have, the program will tell the next player to enter his or her two-key code and okay your word. (A single player must enter only the okay.)

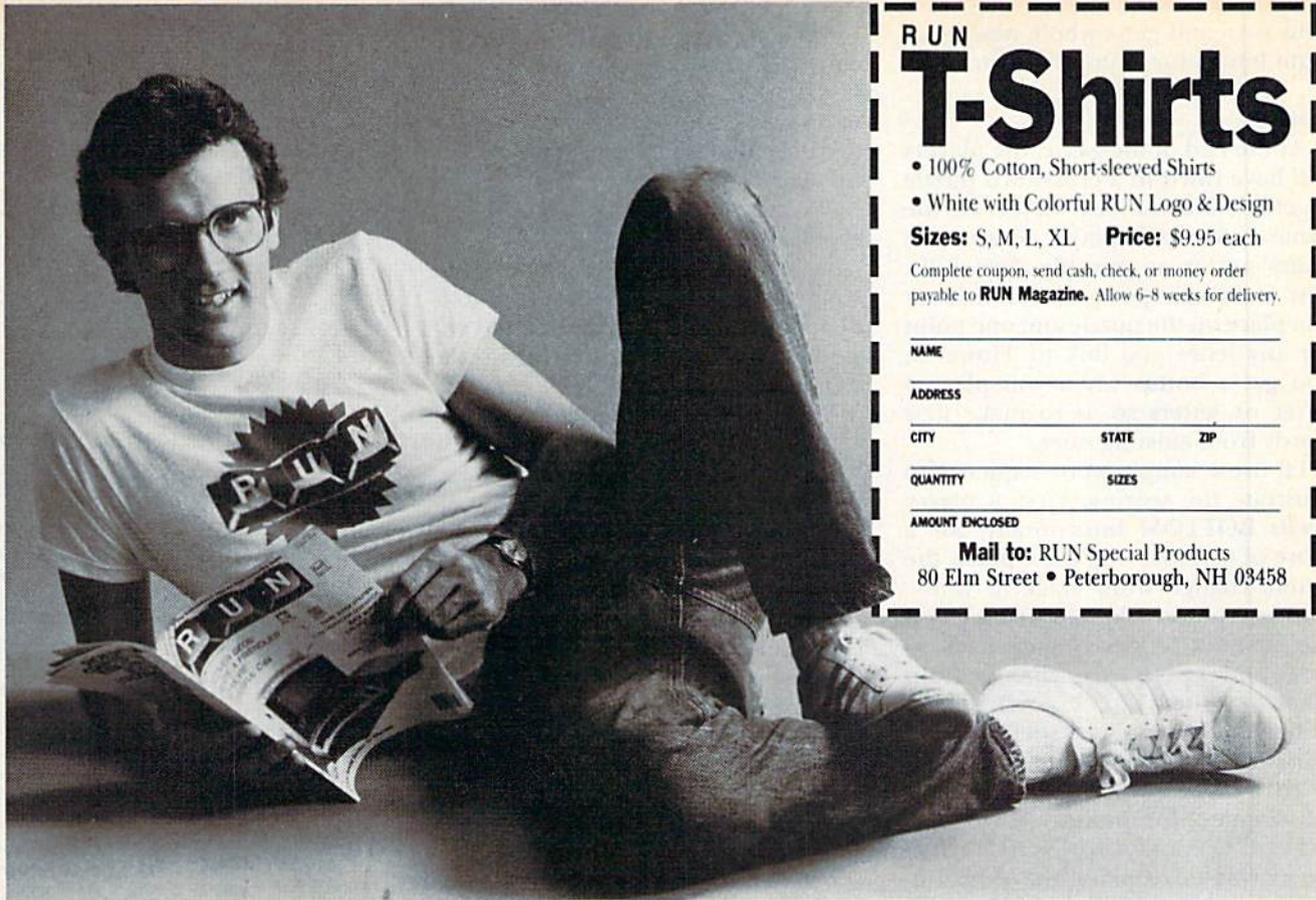
A word is not valid if it's not a real word, if it's misspelled or if it renders invalid the word or words it's linked with. If the next player thinks your word is invalid and presses N (no), your spelling prompts return so you can fix it. If the next player presses Y (yes), the scoring routine takes over.

As your letters are scored, their colors change depending on their value, a bell tone sounds and your cumulative score is updated. When the scoring routine is done, the puzzle reverts to its original color scheme, you get enough new letters to replace the ones you used, and the next player's turn begins.

If your assortment of letters or a crowded puzzle makes it impossible to spell a word, press P (pass) to skip

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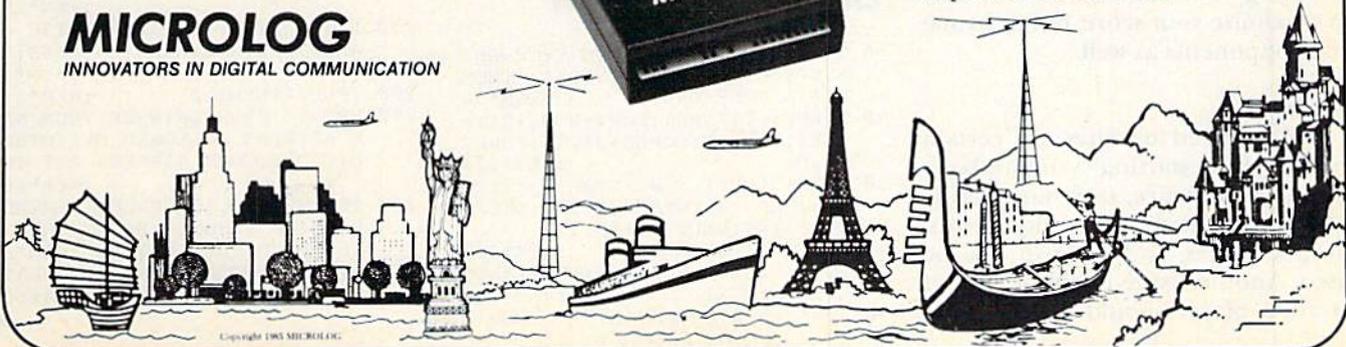
The "SWL" contains the program in ROM as well as radio interface circuit to copy

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

For about the price of another "Pac-Zapper" game, you can tie your Commodore 64, 128 or VIC-20 into the exciting world of digital communications with the Microlog SWL. \$64. Postpaid, U.S. MICROLOG CORPORATION, 18713 Mooney Drive, Gaithersburg, Maryland 20879. Telephone: 301 258-8400.



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your turn and get a whole new set of eight letters for your next turn.

Scoring

At the end of the game, the players will have filled in a crossword puzzle together, but the real object of the game is for each player to score as many points as possible. Generally, you score one point for each letter you place on the puzzle and one point for any letter you link to. However, you get a bonus when you place a letter or letters so as to make new words from existing ones.

I'll use a sample word sequence to illustrate the scoring. First, a player spells BOTTOM horizontally, for a score of 6. As scoring takes place, the letters change from black to white. The next player adds S, scoring 7, and the first six letters change back to black and the last letter changes from black to white.

The following player spells NOON horizontally, starting under the first O in BOTTOM. This player scores 12—2 apiece for the vertical ON, TO, TO and ON and 4 for NOON itself. As scoring takes place, the letters involved continue to change color, with red, cyan and so on indicating when letters are playing multiple roles.

If player 2 had spelled HERS vertically with the S at the end of BOTTOM, his or her score would have been 11—7 for BOTTOMS and 4 for HERS. The S would have become red, HER would have become white and BOTTOM would have become black. The S in this example does double duty.

When you add two or more letters to a word, they score double even if they can't stand alone as a word. The same is true if you place one letter at the beginning and one at the end of a word.

A high score doesn't depend as much on your letter selection or how many you use as on where you put them in relation to other words. In planning your strategy, try not only to maximize your score, but to stymie your opponents as well.

Flexibility

Players need to agree on certain rules before starting a multiplayer game. For instance, they must decide whether contractions, foreign words, proper names, and so forth, can be used. Another issue might be how, if at all, a player should be penalized

for placing an invalid word or for incorrectly challenging a valid word. Perhaps he or she could lose points or a turn. The group might also want to set a time limit for turns, or make up teams.

Program Notes

Line 20 of the listing disables the run/stop key so a player can't accidentally stop the program. The run/stop-restore combination still works, however.

You can make some easy modifications to the Crosswords program if you wish. For instance, you can change the maximum number of players by altering lines 180, 220 and 230. If the maximum number of turns is too great or too small, change the 40 in line 450. (The .7 is for rounding to give a better spread of turns.) If you're dissatisfied with the required length of a word addition before it earns a bonus, change the number in LU>1 in line 1170.

You can also alter the letter mix if it doesn't suit you. Data lines 2250 and 2260 contain the screen-Poke codes for the letters. The program reads them in pairs, the first number designating how many and the second the letter. With this arrangement, there are 100 letters in the array. If you want more or less, change the 100s in lines 30 and 130. (Don't remove the -1s in the Data statements.) The function formula in line 30 is involved in generating the random music in line 2060, so if you increase or decrease the number of letters by changing line 30, decrease or increase the 35 in line 2060 accordingly.

The letter array is mixed in lines 160 and 170. You can increase the upper limit of the loop if you want more mixing. ☐

Address all author correspondence to John M. Smyczynski, 3548 Newton-Tomlinson Road, Warren, OH 44481.

Listing 1. Crosswords program.

```
10 SC=1024:V=53248:S=SC+V:CC=SC+
S:SP$="{10 SPACES}":DN$="{HOM
E}{13 CRSR DNs}" :REM*34
20 A=RND(-TI/100):FORI=STOS+24:P
OKEI,0:NEXT:POKES+24,15:POKE7
88,52 :REM*224
30 PRINT"{SHFT CLR}{CTRL 1}";:PO
KE53280,14:POKE53281,14:DEFFN
R(X)=INT(RND(1)*100)+1
:REM*218
40 FORI=828TO866:READA:POKEI,A:C
K=CK+A:NEXT :REM*146
50 IFCK>5301THENPRINT"{6 CRSR D
```

```
Ns}ERROR IN DATA (LINES 2200-
2240)":END :REM*236
60 I=2:GOSUB2090:FORI=0TO15
:REM*246
70 PRINT"{HOME}{CRSR DN}"SPC(11)
"{CTRL 2}C{CRSR RT}R{CRSR RT}
O{CRSR RT}S{CRSR RT}S{CRSR RT
}W{CRSR RT}O{CRSR RT}R{CRSR R
T}D{CRSR RT}S" :REM*140
80 PRINT"{HOME}{CRSR DN}"SPC(11)
"{CTRL 7}C{2 CRSR DNs}{CRSR L
F}R{2 CRSR DNs}{CRSR LF}O{2 C
RSR DNs}{CRSR LF}S{2 CRSR DNs
}{CRSR LF}S{2 CRSR DNs}{CRSR
LF}W{2 CRSR DNs}{CRSR LF}O{2
CRSR DNs}{CRSR LF}R{2 CRSR DN
s}{CRSR LF}D{2 CRSR DNs}{CRSR
LF}S" :REM*214
90 PRINTDN$SPC(7)"{CTRL 4}C{CRSR
RT}R{CRSR RT}O{CRSR RT}S{CRS
R RT}S{CRSR RT}W{CRSR RT}O{CR
SR RT}R{CRSR RT}D{CRSR RT}S"
:REM*60
100 PRINTLEFT$(DN$,6)SPC(25)"{CT
RL 8}C{2 CRSR DNs}{CRSR LF}R
{2 CRSR DNs}{CRSR LF}O{2 CRS
R DNs}{CRSR LF}S{2 CRSR DNs}
{CRSR LF}S{2 CRSR DNs}{CRSR
LF}W{2 CRSR DNs}{CRSR LF}O{2
CRSR DNs}{CRSR LF}R{2 CRSR
Dns}{CRSR LF}D{2 CRSR DNs}{C
RSR LF}S{HOME}"; :REM*48
110 GOSUB2050:POKE828,I:SYS829:G
OSUB2050:NEXT :REM*42
120 FORI=1TO11:GOSUB2050:POKE828
,I:SYS829:NEXT:FORI=STOS+6:P
OKEI,0:NEXT :REM*234
130 DIMLA%(100):Y=0 :REM*86
140 READI,A:IFI<0THEN160:REM*200
150 FORJ=1TOI:Y=Y+1:LA%(Y)=A:NEX
T:GOTO140 :REM*78
160 FORI=1TO75:X=FNR(0):Y=FNR(0)
:REM*250
170 LA%(0)=LA%(X):LA%(X)=LA%(Y):
LA%(Y)=LA%(0):NEXT :REM*216
180 POKE198,0:PRINT"{SHFT CLR}{4
CRSR DNs}{CTRL 1}THIS GAME
CAN BE PLAYED BY{CTRL 2} ONE
TO EIGHT{CTRL 1} PLAYERS."
:REM*132
190 PRINT"{2 CRSR DNs}HOW MANY W
ILL BE PLAYING THIS GAME?(2
SPACES){CTRL 2}"; :REM*188
200 GETA$:IFAS$=""THEN200:REM*108
210 PRINTA$:NP=VAL(A$) :REM*216
220 IFNP>0ANDNP<9THEN240 :REM*8
230 GOSUB2140:PRINTSPC(10)"{CTRL
9} NOT 1 TO 8 - TRY AGAIN.{
2 SPACES}{CTRL 0} {UP ARROW}
{2 CRSR UPs}"SPC(39);:GOTO200
0 :REM*216
240 DIMPN$(NP),LL$(NP,8) :REM*70
250 FORI=0TO63:READA:POKE896+I,A
:NEXT :REM*226
260 FORI=1TONP:PRINT"{SHFT CLR}{
CRSR DN}{COMD 4}WHEN PLAYER
PROMPT APPEARS ENTER YOUR{3
SPACES}NAME.{2 SPACES}";
:REM*205
270 PRINT"EIGHT(8) ALPHABETIC CH
ARACTERS{3 SPACES}OR LESS."
:REM*11
280 IFNP=1THEN310 :REM*139
290 PRINT"{CRSR DN}WHEN YOUR NAM
E APPEARS FOLLOWED BY {CTRL
8}CODE?(COMD 4)PRESS ANY TWO
"; :REM*165
300 PRINT"KEYS.{2 SPACES}REMEMBE
R WHICH KEYSYOU PRESS THEY W
ILL BE NEEDED LATER." :REM*81
310 OPEN1,0:PRINT"{CRSR DN}PLAYE
R #\"I\"NAME? ";:INPUT#1,A$:CL
```

Listing 1 continued.

```

OSE1:PRINT :REM*197
320 X=ASC(LEFT$(A$,1)+CHR$(0)):I
FX<65ORX>90THENGOSUB2140:GOT
O310 :REM*137
330 IFLEN(A$)>8THENPRINTAS$, IS
MORE THAN EIGHT LETTERS.:GO
SUB2140:GOTO310 :REM*97
340 FORJ=1TOLEN(A$):IFMIDS(A$,J,
1)=CHR$(32)THEN360 :REM*151
350 IFMIDS(A$,J,1)>CHR$(64)ANDMI
D$(A$,J,1)<CHR$(91)THEN370
:REM*187
360 A$=LEFT$(A$,J-1)+CHR$(96)+MI
D$(A$,J+1) :REM*237
370 NEXTJ :REM*207
380 IFLEN(A$)<8THENAS$=A$+CHR$(96
):GOTO380 :REM*187
390 P$(I)=A$:IFNP=1THEN450
:REM*239
400 POKE198,0:PRINT" {3 SPACES}"P
N$(I)"(CTRL 8)CODE? (CTRL 9)
--(CTRL 0){2 CRSR LFs}{COMD
4}" :REM*31
410 GETA$:IFAS$=""THEN410:REM*191
420 PRINT" "; :REM*49
430 GETB$:IFB$=""THEN430:REM*221
440 PRINT" ":PN$(I)=PN$(I)+A$+B$
:NEXTI :REM*1
450 NT=INT(40/NP+.7):PRINT" {SHFT
CLR}{CTRL 2}"RIGHT$(DN$,9)"
ENTER NUMBER OF TURNS 1 TO"N
T"(CTRL 1)"; :REM*127
460 OPEN1,0:INPUT#1,A$:CLOSE1:A$
=A$+CHR$(0):X=VAL(A$)
:REM*109
470 IFX<1ORX>NTTHENGOSUB2140:PRI
NTLEFT$(DN$,10)SPC(30):GOTO
460 :REM*205
480 NT=X:PRINT:PRINT" {3 CRSR DNs
}{COMD 4}PRESS ANY KEY TO ST
ART.":POKE198,0 :REM*241
490 GETA$:IFAS$=""THEN490 :REM*17
500 FORI=1TONP:FORJ=1TO8:LL%(I,J
)=LA%(FNR(0)):NEXTJ,I
:REM*189
510 PRINT" {SHFT CLR}";I=0:GOSUB
2090:POKE828,15:SYS829
:REM*175
520 POKE2040,14:POKEV+39,1:POKEV
,138:POKEV+1,134:POKEV+21,1:
A$="" :REM*14
530 FORI=1TO5:GOSUB2160:NEXT:FOR
I=1TO8:A$=A$+RIGHT$(STR$(I),
1)+"-{2 CRSR LFs}{CRSR DN}"
:REM*230
540 NEXT:PRINT" {HOME}{CTRL 7}"SP
C(36)A$" {HOME}"; :REM*52
550 PRINTLEFT$(DN$,9)SPC(33)" {CT
RL 8}SCORE{2 SPACES}{CTRL 7}
"SPC(33)" {CRSR DN}RND(4 SPAC
Es)"SPC(33)"H/SCORE";
:REM*108
560 FORJ=1TONT:FORJ1=1TONP:A=1
:REM*136
570 FORI=0TO280STEP40:POKESC+33+
I,ASC(MIDS(PN$(J1),A,1))-64:
POKECC+33+I,6 :REM*86
580 POKESC+38+I,LL%(J1,A):POKECC
+38+I,6 :REM*102
590 IFNP=1THEN650 :REM*204
600 J2=J1+1:IFJ2>NPTHENJ2=1
:REM*24
610 POKESC+713+I,ASC(MIDS(PN$(J2
),A,1))-64:POKECC+713+I,0
:REM*108
620 CK=0:IFJ=NTTHENIFJ2=1THENCK=
14:GOTO640 :REM*136
630 POKESC+716+I,LL%(J2,A)
:REM*26
640 POKECC+716+I,CK :REM*156

```

```

650 A=A+1:NEXTI :REM*16
660 PRINTLEFT$(DN$,10)SPC(33)" {C
TRL 7}"LEFT$(STR$(LL%(J1,0))
+SP$,7); :REM*170
670 PRINTSPC(36)" {CTRL 8}"LEFT$(
STR$(J)+SP$,4); :REM*54
680 PRINTSPC(33)" {CRSR DN}{CTRL
8}"LEFT$(STR$(LL%(0,0)))+SP$,
7); :REM*70
690 GOSUB1320:IFAS$<"P"THEN720
:REM*58
700 IFNP>1THENGOSUB840 :REM*10
710 GOTO800 :REM*186
720 GOSUB1480:IFAS$="P"THEN700
:REM*28
730 IFNP>1THENGOSUB840 :REM*40
740 PRINTDN$SPC(33)" {CRSR DN}{CT
RL 1}OKAY{3 SPACES}"SPC(33)"
[Y/N]? {HOME}"; :REM*144
750 GETA$:IFAS$="N"THEN720:REM*62
760 IFAS$<"Y"THEN750 :REM*184
770 IFLK=-1THEN800 :REM*123
780 GOSUB1030:FORD=STOS+6:POKED,
0:NEXT:FORD=1TO2000:NEXT:SYS
829 :REM*223
790 IFL%(J1,0)>LL%(0,0)THENLL%(
0,0)=LL%(J1,0) :REM*241
800 FORI=0TO7:CK=PEEK(CC+38+I*40
)AND15 :REM*33
810 IFCK=14THENLL%(J1,I+1)=LA%(F
NR(0)) :REM*105
820 NEXT :REM*65
830 LK=-1:NEXTJ1,J:GOTO930
:REM*147
840 PRINTLEFT$(DN$,13)SPC(33)" {C
RSR DN}{CTRL 1}ENTER{2 SPACE
s}"SPC(33)"CODE.{2 SPACES}";
:REM*131
850 PRINTSPC(33)" {CTRL 9}--(CTRL
0){5 SPACES}{7 CRSR LFs}";
:REM*211
860 GETA$:IFAS$=""THEN860 :REM*71
870 PRINT" "; :REM*245
880 GETB$:IFB$=""THEN880:REM*101
890 PRINT" "; :REM*9
900 A$=A$+B$ :REM*237
910 IFAS$<>RIGHT$(PN$(J2),2)THENG
OSUB2140:PRINTDN$" {2 CRSR DN
s}":GOTO850 :REM*149
920 PRINTDN$SPC(33)" {7 SPACES}";
SPC(33)" {7 SPACES}";:RETURN
:REM*229
930 POKEV+21,0:POKEV+16,0:REM*95
940 PRINT" {HOME}";:FORI=1TO24:PR
INTSPC(33)LEFT$(SP$,7);:NEXT
:PRINTSPC(33)" {4 SPACES}";
:REM*97
950 PRINTLEFT$(DN$,11)SPC(33)" {C
TRL 2} PRESS "SPC(33)"ANY KE
Y"SPC(33)"TO{2 SPACES}SEE";
:REM*253
960 PRINTSPC(33)"SCORES{HOME}";:
POKE198,0 :REM*235
970 GETA$:IFAS$=""THEN970 :REM*21
980 PRINT" {SHFT CLR}{2 CRSR DNs}
":FORI=1TONP:PRINTLEFT$(PN$(
I),8)">"LL%(I,0):PRINT:NEXT
:REM*133
990 PRINT" {3 CRSR DNs}ANOTHER GA
ME [Y/N]?" :POKE198,0:REM*209
1000 GETA$:IFAS$="Y"THENRUN
:REM*27
1010 IFAS$<"N"THEN1000 :REM*51
1020 SYS2048 :REM*163
1030 GOSUB1290:IFPEEK(SL)=32THEN
SL=SL-D1 :REM*20
1040 IFPEEK(P1-D1/2)<>C1ANDPEEK(
P1-D1)<>32THENFL=FL+.5
:REM*118
1050 IFPEEK(P1+D1/2)<>C1ANDPEEK(
P1+D1)<>32THENFL=FL+.5
:REM*192

```

```

1060 IFFL>0THENFL=0:GOTO1080
:REM*94
1070 FL=DX:DX=DY:DY=FL:GOSUB1290
:REM*170
1080 IFPEEK(P1-D1/2)<>C1ANDPEEK(
P1-D1)<>32THENP1=P1-D1:FL=F
L+.5:GOTO1080 :REM*254
1090 FORI=P1TOSL-D1STEPD1:REM*26
1100 IF(PEEK(I+S)AND15)+(PEEK(I+
S+D1)AND15)=30THENFL=FL+1:G
OTO1120 :REM*58
1110 NEXT :REM*100
1120 FORI=P1TOSLSTEPD1 :REM*80
1130 IF(PEEK(I+S)AND15)=15THEN11
60 :REM*162
1140 IFPEEK(I-D2/2)<>C2ANDPEEK(I
-D2)<>32THEND2=-D2:GOTO1190
:REM*244
1150 IFPEEK(I+D2/2)<>C2ANDPEEK(I
+D2)<>32THEN1190 :REM*218
1160 GOSUB1260 :REM*66
1170 NEXT:IFFL>.5ANDLU>1THENFORI
=SPOTOSLSTEPD1:GOSUB1250:NEX
T :REM*232
1180 FL=0:RETURN :REM*36
1190 P2=I:IFD2>0THEN1230 :REM*14
1200 IFPEEK(I+D2/2)<>C2ANDPEEK(I
+D2)<>32THENI=I+D2:GOTO1200
:REM*166
1210 IFI<P2THENGOSUB1260:I=I-D2:
GOTO1210 :REM*82
1220 D2=-D2 :REM*58
1230 IFPEEK(I)<>32THENGOSUB1260:
IFPEEK(I+D2/2)<>C2THENI=I+D
2:GOTO1230 :REM*130
1240 I=P2:GOTO1160 :REM*36
1250 IF(PEEK(I+S)AND15)=15OR(PEE
K(I+S)AND15)=0THENRETURN
:REM*120
1260 LL%(J1,0)=LL%(J1,0)+1:POKEI
+S,(PEEK(I+S)AND15)+1
:REM*232
1270 PRINTLEFT$(DN$,10)SPC(33)" {
CTRL 7}"LEFT$(STR$(LL%(J1,0)
)+SP$,7); :REM*14
1280 GOSUB180:RETURN :REM*161
1290 C1=64:C2=93:D1=80:D2=2:P1=S
P:FL=0 :REM*195
1300 IFDXTHENC1=93:C2=64:D1=2:D2
=80 :REM*175
1310 RETURN :REM*93
1320 POKE198,0:PRINTDN$SPC(33)" {
CTRL 2}{CTRL 9}CURSOR "SPC(
33)" KEYS. "; :REM*21
1330 PRINTSPC(33)" {CTRL 9}DIR H/
V{CTRL 0}"SPC(33)" {CTRL 9}P
=PASS {CTRL 0}{HOME}";:GOTO
1350 :REM*135
1340 GOSUB1930:IFFL=1THENGOSUB21
40:FL=0 :REM*105
1350 GETA$:IFAS$=""THEN1350
:REM*65
1360 DX=16*(A$="{CRSR LF}")-16*(
A$="{CRSR RT}"):DY=16*(A$="{
CRSR UP}")-16*(A$="{CRSR D
N}"):IFDXORDYTHEN1340
:REM*205
1370 IFAS$="P"THENFORI=0TO7:POKEC
+38+I*40,14:NEXT:GOTO1470
:REM*133
1380 IFAS$<>"H"ANDAS$<>"V"THENGOSU
B2140:GOTO1350 :REM*123
1390 GOSUB2010:IFPEEK(SL)<>32THE
NGOSUB2140:GOTO1350:REM*161
1400 DX=-16*(A$="H"):DY=-16*(A$=
"V"):SP=SL:IFLL%(0,0)=0THEN
LK=0:GOTO1470 :REM*227
1410 IFDXTHEN1450 :REM*77
1420 IFPEEK(SP-40)=64THEN1470
:REM*71
1430 IFPEEK(SP-80)<>32THENLK=0

```

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Listing 1 continued.

```

1440 GOTO1470 :REM*159
1450 IFPEEK(SP-1)=93THEN1470 :REM*139
:REM*7
1460 IFPEEK(SP-2)<>32THENLK=0 :REM*175
:REM*175
1470 FL=0:PRINTDN$SPC(33)LEFT$(S :REM*159
P$,7)SPC(33)"(2 CRSR DNs)"L :REM*125
EFT$(SP$,7);:RETURN:REM*187
1480 LU=0:POKE198,0:PRINTDN$SPC( :REM*249
33)"(CTRL 7)(CTRL 9)SPELL(2 :REM*217
SPACES)"SPC(33)" [1-8]";: :REM*217
:REM*159
1490 PRINTSPC(33)"(CTRL 9)D(CTRL :REM*53
0)ELETE "SPC(33)"(CTRL 9)R :REM*188
ETURN (CTRL 0){HOME}";: :REM*188
:REM*125
1500 GETA$:IFA$=""THEN1500 :REM*92
:REM*215
1510 IFA$=CHR$(13)THEN1630 :REM*92
:REM*249
1520 IFA$="D"THEN1770 :REM*217
1530 IFVAL(A$)<1ORVAL(A$)>8ORFL= :REM*134
1THENGOSUB2140:GOTO1500 :REM*120
:REM*53
1540 CK=PEEK(CC+38+40*(VAL(A$)- :REM*248
1))AND15 :REM*188
1550 IFCK=14THENGOSUB2140:GOTO15 :REM*120
00 :REM*248
:REM*92
1560 POKESL,PEEK(SC+38+40*(VAL(A :REM*134
$)-1)):POKESL+S,0:LU=LU+1 :REM*120
:REM*134
1570 POKECC+38+40*(VAL(A$)-1),14 :REM*120
:IFLK=-1THENGOSUB1660 :REM*248
:REM*120
1580 GOSUB1930 :REM*248
1590 IFFL=1THEN1500 :REM*180
1600 IFPEEK(SL)=32THEN1500 :REM*26
:REM*46
1610 IFLK=-1THENLK=SL-SP+1 :REM*114
:REM*114
1620 GOTO1580 :REM*16
1630 IFLK=-1THENGOSUB2140:GOTO15 :REM*128
00 :REM*112
1640 IFSP=SLANDPEEK(SL)=32THENGO :REM*198
SUB2140:GOTO1500 :REM*232
1650 FL=0:PRINTDN$SPC(33)LEFT$(S :REM*166
P$,7)SPC(33)"(2 CRSR DNs)"L :REM*166
EFT$(SP$,7);:RETURN:REM*112
1660 IFDXTHEN1720 :REM*170
1670 IFPEEK(SL-1)=93THEN1690 :REM*246
:REM*246
1680 IFPEEK(SL-2)<>32THENLK=SL-S :REM*208
P+1:GOTO1760 :REM*114
1690 IFPEEK(SL+1)=93THEN1740 :REM*250
:REM*114
1700 IFPEEK(SL+2)<>32THENLK=SL-S :REM*250
P+1 :REM*170
1710 GOTO1760 :REM*114
1720 IFPEEK(SL-40)=64THEN1740 :REM*250
:REM*114
1730 IFPEEK(SL-80)<>32THENLK=SL- :REM*186
SP+1:GOTO1760 :REM*32
1740 IFPEEK(SL+40)=64THEN1760 :REM*32
:REM*186
1750 IFPEEK(SL+80)<>32THENLK=SL- :REM*52
SP+1 :REM*52
1760 RETURN :REM*52
1770 POKE198,0:PRINTDN$SPC(33)"( :REM*52
COMD 6){CTRL 9}W(CTRL 0)ORD :REM*52
{3 SPACES}"SPC(33)"(CTRL 9) :REM*52
L(CTRL 0)ETER ";:REM*52
1780 PRINTSPC(33)"(CTRL 9)N(CTRL :REM*52
0)ONE(3 SPACES)"SPC(33)"(C
TRL 9){7 SPACES}{CTRL 0){HO :REM*164
ME}";:REM*164
1790 DX=-DX:DY=-DY:LU=LU-1 :REM*102
:REM*102
1800 GETA$:IFA$=""THEN1800 :REM*197
:REM*197
1810 IFA$="N"THEN1910 :REM*179
1820 IFA$<>"W"ANDA$<>"L"THENGOSU :REM*19
B2140:GOTO1800 :REM*117
1830 IFPEEK(SL)<>32THEN1860 :REM*145
:REM*145
1840 IFSL=SPTHEN1910 :REM*7
1850 GOSUB1930 :REM*35
1860 CK=PEEK(SL+S)AND15:IFCK=15T :REM*213
HEN1840 :REM*123
1870 A=PEEK(SL):POKESL,32:IFSL-S :REM*103
P+1=LKTHENLK=-1 :REM*211
1880 FORI=1062TO1342STEP40:CK=PE :REM*211
EK(I+S)AND15 :REM*123
1890 IFPEEK(I)=AANDCK=14THENPOKE :REM*201
I+S,6:POKESL+S,14:I=1342 :REM*143
:REM*103
1900 NEXT:IFA$="W"THENLK=-1:LU=0 :REM*217
:GOTO1840 :REM*217
1910 FL=0:DX=-DX:DY=-DY:IFA$="W" :REM*201
THENGOSUB1320:IFA$="P"THEN1 :REM*217
650 :REM*143
1920 GOTO1480 :REM*217
1930 IFDXTHEN1960 :REM*113
1940 Y=PEEK(V+1)+DY:IFY<50ORY>24 :REM*223
5THENFL=1:RETURN :REM*223
1950 POKEV+1,Y:GOTO2000 :REM*35
1960 X=PEEK(V)+DX-255*(PEEK(V+16 :REM*35
)=1):IFX<24ORX>266THENFL=1: :REM*35
RETURN :REM*35
1970 IFX>255ANDPEEK(V+16)=0THENX :REM*35
=X-255:POKEV,X:POKEV+16,1:G

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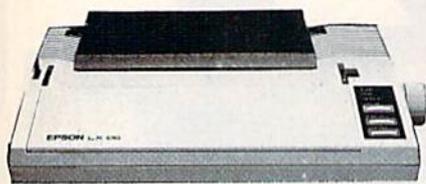
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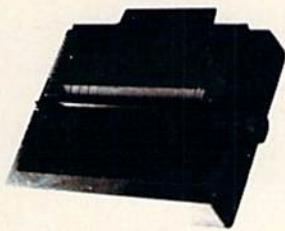
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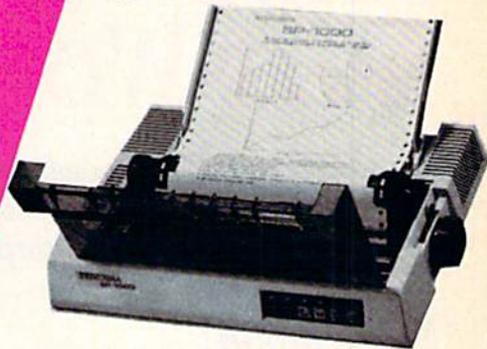
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SOLVING THE SPLIT-WORD PROBLEM

Did you ever wonder how software developers implemented word wrap into word processors? This easy-to-use program shows you how it's done and lets you incorporate it into your own programs.

By **RAY WRIGHT**

Most word processors have a feature called word wrap. This prevents words that appear at the end of a line from being split and continued on to the next line. Instead, the program carries over the entire word and begins the next line with it. This makes the text much easier to read, especially for someone who is unfamiliar with a computer's tendency to split words at the end of a line.

Unfortunately, this word-wrap feature is difficult to incorporate into a Basic program. Using a simple Print statement, you can make sure no words are split by properly placing extra spaces within the statement to be printed. But this will only work if the statement contains no string variables that may be assigned values with different lengths.

Consider, for example, the following simple program:

```
100 PRINT"{SHFT CLR}"
110 INPUT"NAME";N$
120 PRINT"{SHFT CLR}HELLO THERE, "
    N$," HOW ARE YOU TODAY? FINE, I
    HOPE! NOW LOOK ";
130 PRINT"CAREFULLY, "N$", AT THIS
    TEXT, AND SEE WHETHER ANY OF
    THE WORDS ";
140 PRINT"HAVE BEEN SPLIT ACROSS A
    MARGIN.":GOTO110
```

No matter what name is input in this program, there will be at least one line with a word cut off at the end.

This article's accompanying machine language subroutine, which you can easily include and use in any Basic program, solves the split-word

problem. It uses memory in the range 51968 to 53236 (\$CB00 to \$CFF4). Type in the Basic loader (Listing 1) and save it on tape or disk. You can then include it at the beginning of your Basic programs.

Now to use the subroutine in your program. Type in the accompanying demonstration program (Listing 2) along with the Basic loader, and refer to this demo program as you read the following instructions.

1. At the beginning of the statement to be printed, right after the first quotation mark, but before the first word to be printed, place a left arrow (←). (This arrow will not be visible on the screen; the subroutine will print over it.)

2. At the end of the statement to be printed, after the closing quotation mark and colon, type SYSL. (L represents the beginning address of the machine language subroutine; set it equal to 52992 in the beginning of your program.)

That's all there is to it! The computer instantly takes care of everything else involved in properly formatting the line. (There is an added bit of instruction that will make things happen more smoothly, but I'll get to that a little later.)

To see the subroutine in action, type in RUN and press return, so that the Basic loader will load the subroutine into its memory location. Then, to enter the demonstration program, type in RUN 100 and press the return key. When the program asks for a name, type in names of

various lengths, pressing the return key after each one. Notice that words are never cut off at the end of a line, no matter how long they are.

If you look carefully, you may be able to see the subroutine reprinting the text; it happens in a fraction of a second. In case you're curious, here's how it works.

First, you'll find that your Basic program prints the left arrow at the beginning of the text as a marker to show the subroutine where to begin. Then, when the subroutine takes over, it begins by printing an invisible marker (a reversed left arrow, which is the same color as the background screen color) to show the subroutine where the text ends.

It then searches through the screen memory (bytes 1024 to 2023) for the first left arrow. When it finds the arrow, it transfers to a block of memory beginning at 51968 (\$CB00) the CHR\$ value of each character of text to be reprinted (the block of memory is below the location where the subroutine itself resides).

Next, it reprints back onto the screen, one line at a time, the text from the memory block, deciding for each line which word should be the last one. When the entire text has been reprinted in this way, the subroutine returns control to your Basic program.

Limitations

As you incorporate this subroutine into your programs, you must keep in mind a few of its limitations.

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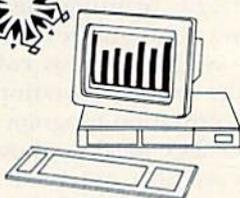


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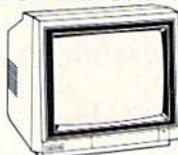
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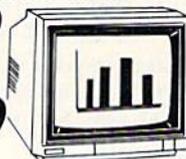


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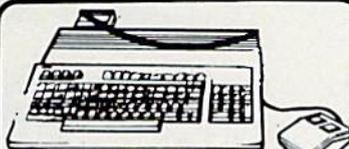
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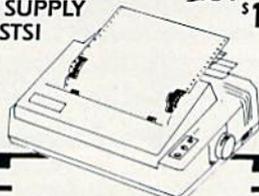
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*There is a way,
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1. Since the left arrow and reversed left arrow are used as markers in this subroutine, you should not include these characters in your text (or allow left arrows to appear anywhere on the screen), except for the one used as a beginning marker. Any other character may be included in the text.

2. The subroutine does not reprint text in multicolor. It will reprint everything using whatever color was last being printed before the subroutine was called.

3. The subroutine will not print reversed characters.

4. The subroutine will not print blank lines. If your Basic program prints two lines separated by a blank line, and the subroutine is applied to both lines at once, it will move the second line up so that it's right below the first. Therefore, if you need a blank line between two parts of your text, you must use the subroutine twice, separately for each part.

5. Make sure you do not include a SYSL in your program if you did not insert a left arrow in the text; if you do, the results are messy and could cause a program crash. Also, make sure that L (or whatever variable you choose to use after the SYS) is kept equal to 52992 throughout the program.

6. There may be rare cases in which, as the subroutine reprints the text, it does not completely print over the end of the old text that was on the screen before the subroutine was called. This is unusual, since the word-wrap process almost always makes the text *longer* than it was orig-

inally. It makes it shorter only if you use the subroutine on a part of the text that includes a blank line or many adjacent spaces.

There is a way, however, to prevent the "old text" from being visible, even if part of it does remain on the screen. Simply have your Basic program print the text using the screen color (include the symbol for this color between the beginning quotation mark and the left arrow), and then, before calling the subroutine, have it begin printing the color in which you want the text to appear (put the symbol for this color right before the ending quotation mark). The demonstration program includes lines 200-245 to show how this is done; to see how, enter RUN 200.

Notice that when you use the same color for both text and screen, the transition from being printed by Basic to being printed by this program is very smooth. ☐

Address all author correspondence to Ray Wright, 4 Finch Place, Huntington, NY 11743.

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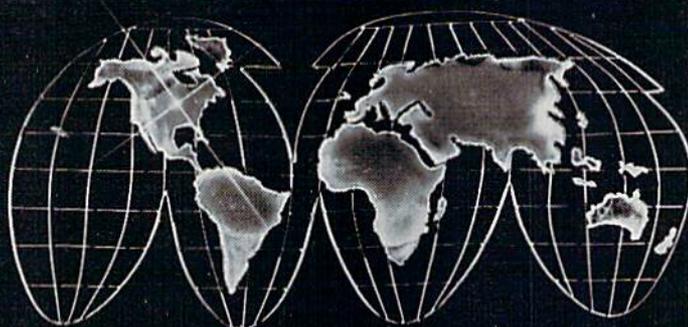
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Listing 1. Basic loader.

```

5 FORB=52992TO53236:READP:CK=CK+P:POKEB,P:N
  EXT:L=52992:END :REM*87
6 IFCK<>36969THENPRINT"ERROR IN DATA STATEM
  ENTS":STOP :REM*104
7 DATA216,173,134,2,133,2,173,33,208,141,13
  4,2,160,5,185,234 :REM*51
8 DATA 207,32,210,255,136,208,247,165,2,141
  ,134,2,169,0,133,251 :REM*154
9 DATA169,4,133,252,169,31,209,251,240,17,1
  69,29,32,210,255,200 :REM*81
10 DATA208,242,230,252,169,8,197,252,208,23
  4,96,132,204,169,0,133 :REM*74
11 DATA253,169,203,133,254,177,251,201,159,
  240,39,201,31,240,18,144 :REM*115
12 DATA16,201,64,144,18,201,96,144,12,201,1
  28,144,4,233,128,176 :REM*100
13 DATA234,105,64,208,2,105,32,145,253,200,
  208,217,230,254,230,252 :REM*229
14 DATA208,211,145,253,165,204,133,253,169,
  203,133,254,230,253,208,2 :REM*190
15 DATA230,254,169,39,197,211,144,4,229,211
  ,176,5,169,79,56,229 :REM*151
16 DATA211,105,0,133,2,160,0,177,253,201,32
  ,240,7,200,196,2 :REM*158
17 DATA240,6,208,243,132,204,240,245,160,0,
  177,253,201,159,208,12 :REM*25
18 DATA160,5,185,239,207,32,210,255,136,208
  ,247,96,196,204,144,12 :REM*0
19 DATA169,32,196,2,240,12,32,210,255,200,2
  08,246,32,210,255,200 :REM*49
20 DATA208,216,164,204,177,253,201,32,208,3
  ,200,208,247,24,152,101 :REM*180
  
```

```

21 DATA253,133,253,169,0,101,254,133,254,20
  8,151,19,146,95,18,32 :REM*21
22 DATA13,157,157,32,32 :REM*134
  
```

Listing 2. Demonstration program.

```

100 L=52992:PRINT"{SHFT CLR}" :REM*76
110 INPUT"NAME";N$ :REM*140
120 PRINT"{SHFT CLR}{LEFT ARROW}HELLO THERE
  , "N$", HOW ARE YOU TODAY?(2 SPACES)FIN
  E, "":REM*78
130 PRINT"I HOPE!(2 SPACES)NOW LOOK CAREFUL
  LY, "N$", AT THIS TEXT, AND SEE WHETHER
  "":REM*34
140 PRINT"ANY OF THE WORDS HAVE BEEN SPLIT
  ACROSS A MARGIN.":SYSL:GOTO110 :REM*4
200 L=52992:PRINT"{SHFT CLR}":POKE53281,1:R
  EM WHITE SCREEN COLOR :REM*210
210 INPUT"NAME";N$ :REM*240
220 PRINT"{SHFT CLR}{CTRL 2}{LEFT ARROW}HEL
  LO THERE, "N$", HOW ARE YOU TODAY?(2 SP
  ACES)FINE,":REM WHT CHARACTERS:REM*222
230 PRINT"I HOPE!(2 SPACES)NOW LOOK CAREFUL
  LY, "N$", AT THIS TEXT, AND SEE WHETHER
  "":REM*134
240 PRINT"ANY OF THE WORDS HAVE BEEN SPLIT
  ACROSS A MARGIN.{COMD 7}":REM BLUE CHAR
  .S :REM*16
245 SYSL:GOTO210 :REM*251
  
```

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KEEPING UP TO DATE

Need help scheduling or keeping appointments for the coming year? Print out a calendar for 1987—or for any month in any year—with Calendar Generator.

By MICHAEL MARTONE

Welcome to *Easy Applications*, the first in a series of monthly columns that will feature short, but useful, applications programs that you can use every day—around the home, in the small-business office or in the classroom. These programs are easy for anyone to type in, save and add to his or her library.

In coming months, we'll feature applications for both the 64 and 128. If you have any comments or suggestions about this column, or if you would like to share one of your own applications, write to *Easy Applications*, RUN magazine, 80 Elm St., Peterborough, NH 03458.

Whether you need to organize your schedule or just want a calendar to tack onto the wall, Calendar Generator (Listing 1) will provide one in a matter of minutes. In fact, it will print out a calendar for any month in any year that fact or fancy might dictate. You could use it to plan a vacation in 1988, as a study aid in a history course or to find out on which day of the week New Year's Day 2000 will occur.

To use Calendar Generator, type in Listing 1 and save it to disk. Use 64 Perfect Typist (see "How To Type in Listings" in this magazine) for typing it in, because spacing inside the quotes in the Print statements is critical. If, after running the program, you notice that some columns aren't aligned or there's some other format problem, check your typing.

Calendar Generator will work with any printer that emulates a Commodore 1525 or 1526. It sends only a few control characters to the printer, and all of them are standard for most printers. Note that the CHR\$(14) in line 300 turns on the enhanced (double-width) characters, and the statement PRINT CHR\$(12) in line 385 is the Top of the Page command.

How the Program Works

The program uses a two-line public domain subroutine, starting at line 120, to convert the day of the week to a number from 0 to 6. A 0 represents Sunday, a 1 represents Monday, and so forth. The variable NU contains the number of rows the month will occupy in the printout: four, five or six.

If the year is a leap year, the number of days in February

Figure 1. Sample Calendar Generator printout.

JANUARY 1987						
SUN	MON	TUE	WED	THU	FRI	SAT
				01	02	03
04	05	06	07	08	09	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

is changed to 29. The variable SR holds the number of the column where the first day of the month will be printed.

Making a Calendar

With the program still in memory, type RUN, then press the return key, and the title screen will appear. Now load your printer with paper and turn on the power. Set the printhead at the top of the page and hit any key to get the Input prompt.

RUN It Right

C-64; printer

Now enter the month and year you want to print out. The month must be in two-digit format, and the year must be in four-digit format. If you want a calendar for June 1987, for example, enter 06,1987. Don't enter 06,87, or you'll get a calendar for June in the year 87—1900 years ago!

The printer will now turn out a calendar for the month you've specified. When it's finished, the program will ask if you want to print another calendar. If you respond Y, a new prompt for a month and year will appear; otherwise, execution will end.

Happy New Year! ☐

Address all author correspondence to Michael J. Martone,
123 Jacksonville Drive, Parsippany, NJ 07054.

Listing 1.

Calendar Generator program.

```
5 POKE53280,0:POKE53281,0:PRINT"{COMD 8}{SH
  FT CLR}" :REM*11
10 DIMND(12),MO$(12):OPEN4,4 :REM*44
15 T$="{4 SPACES}-----{3
  SPACES}" :REM*51
20 C$="{SHFT H}{8 SPACES}":T$="{5 SPACES}"+
  T$ :REM*70
```

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```
25 FORLO=1TO12:READND(LO),MO$(LO):NEXTLO
  :REM*111
30 FORLL=1TO7:READDY$:AA$=AA$+"{6 SPACES}"+
  DY$:NEXT :REM*106
35 D=1:MO=1:YR=2000 :REM*153
40 GOSUB200 :REM*250
45 INPUT"MONTH & YEAR (MM,YYYY)";MO,YR
  :REM*129
50 GOSUB120 :REM*28
55 XX=(ND(MO)+J)/7:NU=INT(XX):IFXX>NUTHENNU
  =NU+1 :REM*187
60 IF (YR/4)-INT(YR/4)=0 THEN ND(2)=29
  :REM*82
65 SR=(J*10)+4 :REM*11
70 GOSUB300 :REM*32
75 CLR:INPUT"AGAIN (Y/N)";XZ$:IFXZ$="Y"THEN
  RUN :REM*209
80 CLOSE4 :REM*116
85 END :REM*87
90 GOSUB300 :REM*52
95 END :REM*97
99 REM DAY# :REM*203
100 DATA 31,JANUARY,28,FEBRUARY,31,MARCH,30
  ,APRIL,31,MAY,30,JUNE,31,JULY,31:REM*64
105 DATA AUGUST,30,SEPTEMBER,31,OCTOBER,30,
  NOVEMBER,31,DECEMBER :REM*27
110 DATA SUN,MON,TUE,WED,THU,FRI,SAT:REM*38
120 Q=YR+(MO<3):J=INT(275*MO/9)-INT((7*Q+7)
  /4)+367*YR+D-INT((INT(Q/100)+1)*3/4)
  :REM*118
125 J=J-4-7*INT((J-4)/7):RETURN :REM*215
130 RETURN :REM*188
135 DATA SUN,MON,TUE,WED,THU,FRI,SAT:REM*63
200 PRINT"{SHFT CLR}":PRINTSPC(10)*CALEND
  AR GENERATOR *":PRINT :REM*200
210 PRINT"{3 SPACES}INPUT ANY MONTH IN TWO
  (2) DIGIT FORM AND ANY YEAR IN FOUR (4)
  "; :REM*26
215 PRINT" DIGIT FORM. A{2 SPACES}CALENDAR
  FOR THAT MONTH AND YEAR WILL{3 SPACES}B
  E DUMPED"; :REM*115
220 PRINT" TO THE PRINTER." :REM*70
225 PRINT:PRINT:PRINT"{4 SPACES}{CTRL 8}TUR
  N ON PRINTER NOW!{COMD 8}" :REM*161
230 PRINT:PRINT:PRINT"{4 SPACES}HIT ANY KEY
  TO CONTINUE" :REM*90
235 GETG$:IFG$=""THEN235 :REM*5
240 RETURN :REM*42
300 CE=(64-LEN(MO$(MO))*2-12)/2+9:PRINT#4:P
  RINT#4,SPC(CE)CHR$(14);MO$(MO)+" ";YR
  :REM*15
305 PRINT#4,CHR$(15):PRINT#4 :REM*10
310 IN=4:GU=0:N9$="01":N9=1 :REM*17
315 PRINT#4,SPC(7)AA$ :REM*140
320 PRINT#4,T$ :REM*155
325 FORLO=1TONU :REM*142
330 PRINT#4,"{9 SPACES}"; :REM*171
335 FORL3=1TO7 :REM*24
340 IN=IN+9:IFIN>=SRTHENGU=1 :REM*127
345 IFN9>ND(MO)THENGU=0 :REM*6
350 IFGU=0THEN360 :REM*179
355 PRINT#4,LEFT$(C$,7);RIGHT$(N9$,2);:N9=N
  9+1:N9$="0"+MID$(STR$(N9),2):GOTO365
  :REM*18
360 PRINT#4,C$; :REM*63
365 NEXTL3:PRINT#4,"{SHFT H}" :REM*60
370 FORL2=2TO8 :REM*107
375 PRINT#4,"{9 SPACES}";C$;C$;C$;C$;C$;C$;
  C$;"{SHFT H}":NEXTL2 :REM*204
380 PRINT#4,T$ :REM*215
385 NEXTLO:PRINT#4,CHR$(12) :REM*154
390 RETURN :REM*193
```

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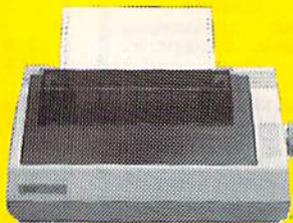
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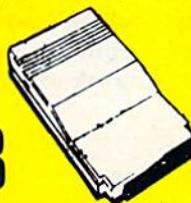


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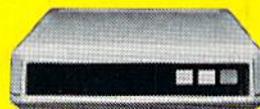
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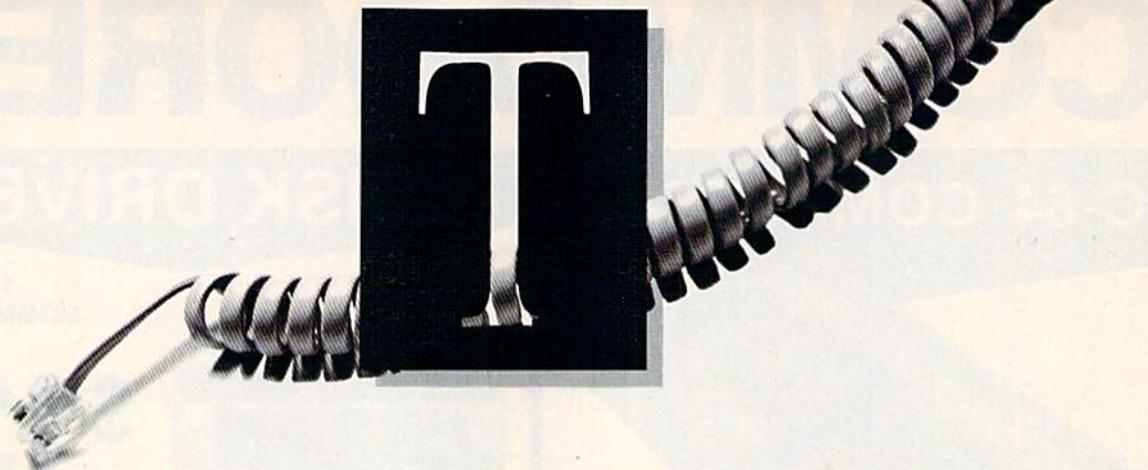


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By DAVID BRADLEY

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

David Bradley
Telecomputing Workshop
c/o RUN magazine
80 Elm St.
Peterborough, NH 03458

There aren't many Commodore fans here in Indonesia and no bulletin board systems or information services, but I want a modem, just to upload and download programs with my friend and to communicate with him.

The electricity here is 220 volts, 50 cycles, and the telecommunication system is CCITT/V.24 instead of Bell. Can I buy a Mitey Mo modem and ask the manufacturer for instructions on how to modify it so that I can use it here? I'm quite sure that the telephone-line standards here are identical to those in Europe.

M. A. Sutandar
Jakarta, Indonesia

Before you buy any modem, you must be 100 percent certain that your telephone-line standards are the same as those in Europe. Don't take chances!

If I were you, I'd buy a more expensive modem that doesn't need modifying, because, should you ruin the one you are modifying, you'll wind up paying more anyway.

I'm thinking of putting my own BBS on-line during the daytime, when I also use my answering machine. Can I set up my answering machine and my BBS so that both will work when necessary?

Charlie Ippolito
Astoria, NY

I've run across only one BBS that ever attempted to tackle this problem. The system wasn't perfect, but it did work.

The computer and the answering machine were both connected to the phone line. After the telephone rang four times, only the answering machine would respond. If someone wanted to call the BBS, he'd let the phone ring twice, hang up, then call again within one minute. The only reason the system operator didn't experience a lot of difficulty getting callers to play by the rules was because it was a private system, and the number was not publicized.

This setup was active only during the day; at night the BBS would answer after one ring. With the BBS program I have in mind (a message-based system for the C-64), you could add this feature to it. For more information about this program, or if you have any questions, write to: Williams Computer Services, PO Box 174, Station Z, Toronto, Ontario, Canada M5N 2Z4.

If you're planning to run a public BBS, then you may be setting yourself up for some major headaches. Once a number has been published as

being home for a BBS, nothing will stop people from calling that number, not even if it's changed. During four months in the summer of 1982, my brother and I ran a BBS at home, and that telephone number still gets calls from people looking for a BBS.

If you decide to run a private system, you probably won't have any problems, but if you go with a public system, you'd be better off to get a phone line just for the BBS.

I have a Commodore 64, a 1541 and a couple of printers. I run a BBS, and I'm thinking about getting a separate disk drive for it. A 1541 will do, but could I get a drive that'll hold more information and yet work with the C-64?

Michael Hole
Hanford, CA

There are many drives to choose from, but most are IEEE drives (Commodore models 2031, 4040, 8050, 8250, 9060 and 9090) for the PET series of computers. You'll need an IEEE interface and an IEEE cable to connect them to your 64. Also keep in mind that most of these disk drives have been out of production for a number of years and are no longer available new from Commodore. If you buy one of these drives, it will probably be a used one.

You might also consider buying two smaller-capacity drives. Should the drive you use to run your BBS break down, you'd still be able to stay on-line while it's being fixed. ■

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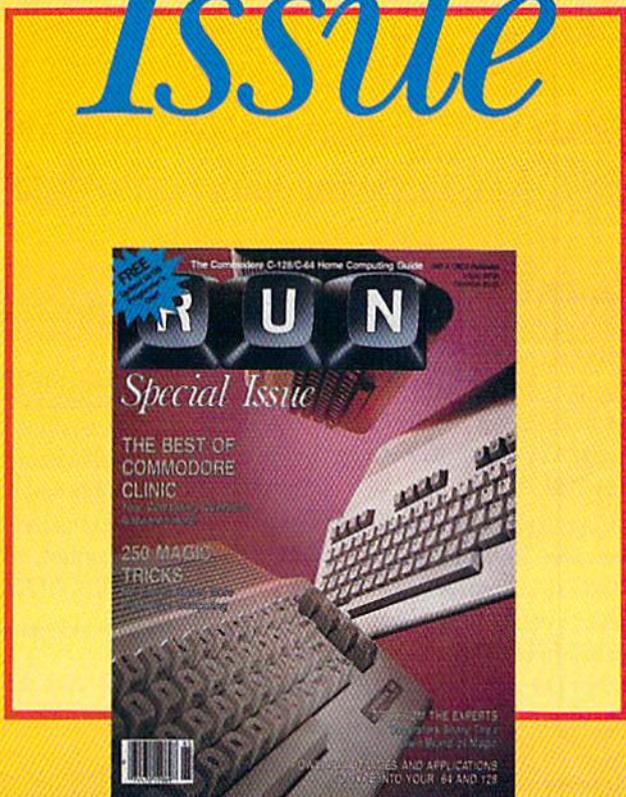
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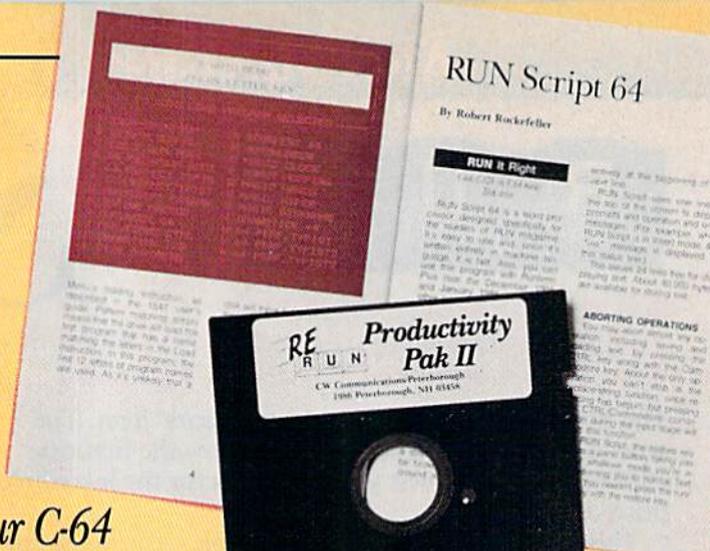
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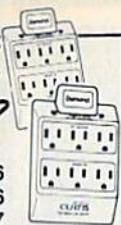
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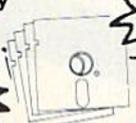


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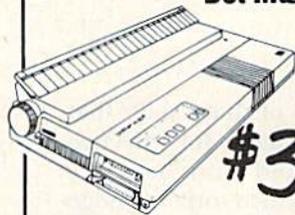
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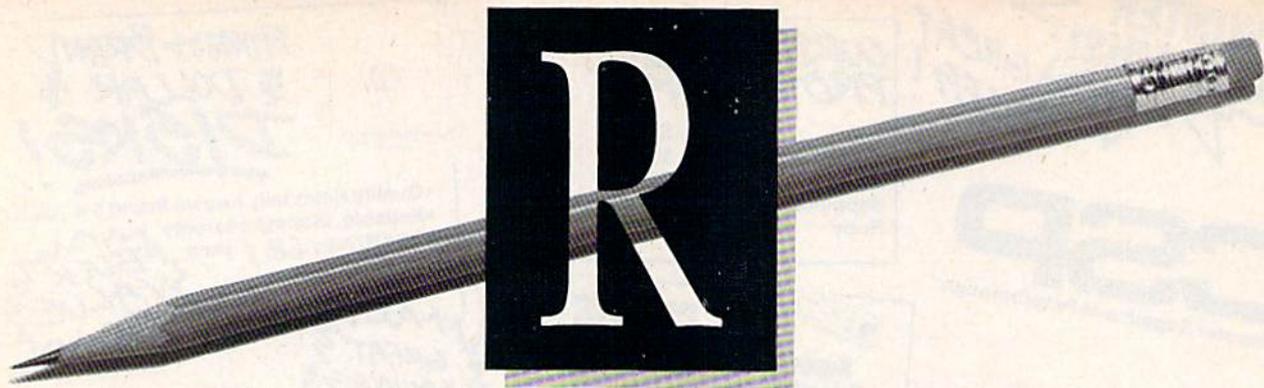
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By MARGARET MORABITO

Spelling is one of those skills that is a basic requirement for effective communication, and it can be a very telling sign by which others judge you. In business, in school, and even at home, your bad spelling can stereotype you.

Computers can help to improve spelling skills. The problem for the user is to decide what kind of spelling program is needed and which one will be most effective in a given case. There are programs for all ages, using a wide range of methods. Some provide instruction and advice on how to learn to spell better, while others only provide practice.

I recently evaluated six different spelling programs for the C-64: Stickybear Spellgrabber, AEC Spelling Grade 2, Whole Brain Spelling, Word Scrambler/Spelling Tutor, SPELLBOUND and MECC's Spelling Bee.

Word Lists

The best way to make your investment count is to get a program that has a large built-in vocabulary, but also lets you add or change words. Of the six programs I tested, the number of built-in words ranged from a dozen (in SPELLBOUND) to 4233 (in AEC).

Because there are always some words your child is learning at school that are not already built into the program, you'll want to be able to customize the program yourself. You can add or change words in all of the tested programs except AEC and Whole Brain. These two have large, built-in vocabularies, however. AEC has an entire series of programs for grades 2-8, each of which has over 4000

Put your children on a bee-line to spelling improvement with the many Commodore tutorial programs available.

words. Whole Brain offers a six-part series, with 2000 words each.

Stickybear gives you the best of both worlds by providing over 4000 words in one program (for grades 1-4) and by letting you add your own.

Do They Teach?

The spelling programs on the market fall into three general categories: those that teach, those that drill, and those that do both.

The majority of the programs tested give you practice in spelling but don't teach you how to spell better. Memory skills are utilized, the premise being that practice makes perfect. The lack of instruction may or may not be important to you. If your child is in school and already receiving spelling instruction, then the computer is best used as a practice tool to supplement the formal teaching. This is what most users probably need.

Computer-Based Instruction

Someone who is not in school would probably benefit most from getting computer-based instruction, such as that offered in AEC and, to a certain degree, in Whole Brain.

AEC provides programs that really teach, employing the traditional "test/teach/test" approach. This means that it gives a pretest to diagnose problem areas, then provides a variety of study

activities and ends with a posttest to measure the extent of learning.

The program tells the student general rules for spelling. For example, it will provide a generalization stating that the short *a* sound is found in the word *man*. Then, it will test the student on short *a* words.

Testing is closely tied in with word meaning. A sentence with a word missing appears on the screen, and the student has to type in the correctly spelled word that completes the thought. Help is given in the form of a correct answer quickly flashed upon the screen before and after the sentence appears.

AEC provides an eight-step study guide, which tells students how to go about learning a new word. It also provides four different word activities, involving sentence completion (both fill-in and multiple choice), alphabetizing and memorization.

There's only one other program in the test group that utilizes sentences. MECC uses sentence completion with multiple choice answers as its method of practice. Out of three shown, students must be able to recognize the correctly spelled word. Then they have to type in the word correctly before proceeding.

Of all the spelling programs tested, only MECC, AEC and Stickybear tie the meanings of words to their spelling activities. The others require only that the student spell out the words correctly.

Flash the Word

Flashing the word is a predominant method used for providing practice

Table 1. Names, prices and sources of spelling programs.

Wizard of Words (grade 1 and up)
Addison-Wesley; available from J. L. Hammett Co.
Hammett Place, Box 545
Braintree, MA 02184
\$34.95.

AEC Spelling (grades 2-8)
American Educational Computer, Inc.
801 Northwest 63rd St.
Oklahoma City, OK 73116
\$39.95.

Word Scrambler/Spelling Tutor (K-12)
Avant-Garde Publishing Corporation;
available from J. L. Hammett Co.
Hammett Place, Box 545
Braintree, MA 02184
\$34.95.

Spellers Duel (grades 5-8)
Bobco (distributor)
200 7th Ave., Suite 111
Santa Cruz, CA 95063
\$19.95.

Flash Spell Helicopter (grades K-6)
Wordfinder (grades 5-12)
CBS Interactive Learning
One Fawcett Place
Greenwich, CT 06836
\$39.95 and \$34.95, respectively.

Spell It! (grade 5 and up)
Davidson & Associates; available
from J. L. Hammett Co.
Hammett Place, Box 545
Braintree, MA 02184
\$49.95.

Spellagraph (grades 2-9)
Spellakazam (grades 2-8)
Spellicopter (grade 6 and up)
Designware; available
from J. L. Hammett Co.

Hammett Place, Box 545
Braintree, MA 02184
\$39.95, \$29.95 and \$39.95, respectively.

Spelling Wiz (grades 1-6)
DLM
One DLM Park
Allen, TX 75002
\$44 (school version).

Sea Speller (ages 7-12)
Fisher-Price Learning Software
PO Box 1327
Cambridge, MA 02238
\$19.95.

Magic Spells: Spelling/Reading (grades 1-5)
The Learning Company, available
from J. L. Hammett Co.
Hammett Place, Box 545
Braintree, MA 02184
\$34.95.

Words in Context Spelling Series
(grades 2-6)
MicroEd
PO Box 444005
Eden Prairie, MN 55344
\$49.95.

MECC Spelling Bee (ages 8-13)
Minnesota Educational Computing
Corporation
3490 Lexington Ave. North
St. Paul, MN 55126
\$39.

Also available by mail order from:
Commodore Business Machines
1200 Wilson Drive, C2655
West Chester, PA 19380
\$19.95.

SPELLBOUND (all ages)
Roberts Information Systems, Inc.
PO Box 666, 152 W. 4th
Prineville, OR 97754
\$15.

Spell Diver (grade 1 and up)
Scholastic Software
730 Broadway
New York, NY 10003
\$29.95 (consumer version)
\$49.95 (school version).

Whole Brain Spelling (age 5 and up)
SubLOGIC Corp.
713 Edgebrook Drive
Champaign, IL 61820
\$29.95.

Cave of the Word Wizard (grade 1 and up)
Timeworks
444 Lake Cook Road
Deerfield, IL 60015
\$49.95.

Stickybear Spellgrabber (grades 1-4)
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Middletown, CT 06457
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in all these programs. The only one that doesn't use some sort of flash method is MECC.

Flashing the word on the computer's screen is one way to overcome the problem of not being able to vocalize the words. Traditional testing methodology involves a teacher saying the word, using it in a sentence and then repeating the word. Computer programs flash the word rather than say it.

Of the flash-type programs, Whole Brain is the most developed. In fact, Whole Brain teaches spelling by focusing on the visual aspects of words. It provides instruction in accord with research findings that claim that good

spellers use a mental image to see if a word they've spelled "looks right."

On the other hand, this program totally bypasses the need for a student to understand word meanings, and it classifies words according to levels of actual spelling difficulty.

The flash method is used with a new twist in Whole Brain. Words are displayed in varying colors and sizes, in upper- and lowercase, and with highlighting of double letters. This makes the exercise more interesting, prolonging the user's attention span and creating a vivid image in his mind.

For practice, a word is displayed, then erased, and you have to type in

the correct spelling. If you make a mistake, the computer analyzes your error and then redisplayes the word with the wrong letters highlighted. If you've omitted a letter, the program places an arrow where the missing letter should be.

Other programs use the flash method only for presenting the word to the user. AEC uses this in conjunction with sentence completion and as a stand-alone activity. Word Scrambler, SPELLBOUND and Stickybear also offer flash words, but they're used in conjunction with word-unscrambling activities.

A good example of the flash approach is the accompanying program, Spelling, by Don Ferguson.

Unscrambling Words

Of the three programs that offer word-unscrambling, Stickybear is by far the most imaginative and captivating, especially for younger students. It offers two such activities. The first provides a picture to convey the meaning of the word. Students then use the joystick to select the correct sequence of letters, which are scattered throughout a maze. The second game is a combination of flashing the word and then unscrambling the letters in the maze. A third Stickybear activity is a game modeled on "hangman."

SPELLBOUND and Word Scrambler have unscramble word activities that are keyboard-controlled and more appropriate for older students.

Table 2. Index to 1986 Resource Center articles.

January	—Introduction to column
February	—Computer networking; 3 multiuser systems reviewed
March	—Shopping for educational software; table of sources
April	—Word processing in education
May	—Computers for music instruction; table of music software and hardware
June	—Commodore's support services for schools; list of education dealers
July	—Parent volunteers in schools; list of recommended educational software
August	—Telecommunications in schools
September	—New educational products for Commodore computers
October	—Public library uses Commodore
November	—Traveling computer lab
December	—Questions and answers; more sources of educational software

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Graphics and Sound

On the C-64, color, graphics, movement and sound are natural features to capitalize upon. These features take advantage of the computer's power to capture attention and keep the activities lively. This is particularly important for students in the lower grades.

In many instances, graphics, color and sound are merely frills that really do not add to the activity. Still, they do tend to brighten up a learning experience. In other cases, these features are essential to the effectiveness of the program.

Of the six programs, Stickybear is the only one that uses sound effectively. Most don't even have sound routines. Stickybear and Whole Brain do the best job of incorporating graphics into their learning activities.

AEC and MECC also use graphics and animation as lively enhancements, but these are not crucial to the effectiveness of the programs. SPELLBOUND and Word Scrambler are strictly no-frills programs, offering no color, graphics or sound.

Wrap It Up

As I mentioned before, there's a wide range of methods and features used in these spelling programs. You might find that younger students will respond better to the more lively programs that have a variety of activities. Older students with longer attention spans can better handle a no-frills, practice type of program.

For a secondary school or adult remedial skills teacher who already has word lists and instructional materials, programs such as SPELLBOUND and Word Scrambler could be good supplemental activities. SPELLBOUND, in particular, costs only \$15 and is available for unlimited copying per school for an extra \$10. However, I'd recommend that schools invest in a more comprehensive package, such as the AEC series, if they have the funds to purchase it.

For the parent who doesn't have the time to do outside research into

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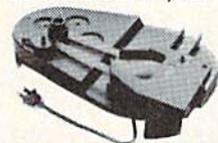
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word lists, I recommend getting the broader programs that provide large word lists and a combination of activities. Of the programs I tested, AEC, Stickybear, Whole Brain and MECC meet these criteria. 

If you're using Commodore computers for educational purposes (at home or in school) and would like to share your expe-

riences through The Resource Center, write me a letter detailing the equipment you're using, subject areas being taught, grade level or age of your students, software that you're using, and any other information you feel like including.

Also, if you'd like to donate public domain educational programs to The Resource Center for sharing with other educators and parents, please send along a disk

with a brief description of the program. Send correspondence and disks to:

*Margaret Morabito
The Resource Center
c/o RUN magazine
80 Elm St.*

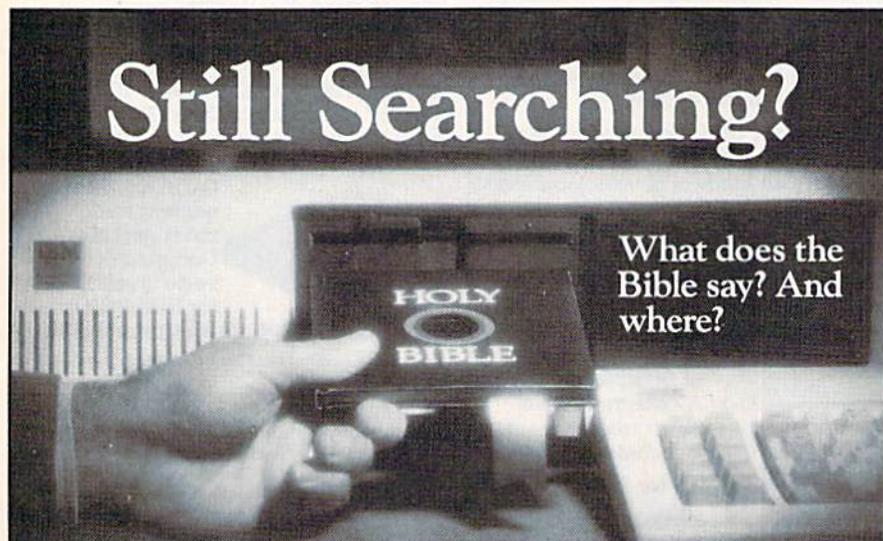
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You can also leave mail in my on-line mailboxes: CompuServe (70616,714) or QuantumLink (MARGM).

Listing 1. Spelling program for the C-64.

```
1 REM PROGRAMMER: DON FERGUSON      :REM*155
2 REM{13 SPACEs}901 HACKNEY         :REM*186
3 REM{13 SPACEs}ST.MARYS, OHIO 45885:REM*27
5 REM{2 SPACEs}WORDS ENTERED INTO DATA STAT
  EMENTS BEGINNING WITH LINE 100000 :REM*209
6 REM{2 SPACEs}BE SURE TO END DATA STATEMEN
  TS WITH *                          :REM*54
7 REM PUBLIC DOMAIN PROGRAM         :REM*233
10 POKE53280,2:POKE53281,1:POKE53272,23
                                     :REM*128
100 PRINT"{SHFT CLR}"                :REM*90
200 PRINT"{8 CRSR RTs}{8 CRSR DNs}{8 SPACEs
  }{CTRL 9}{CTRL 1}{SHFT S}{CTRL 3}{SHFT
  P}{CTRL 4}{SHFT E}{CTRL 5}{SHFT L}{CTRL
  6}{SHFT L}{CTRL 8}{SHFT I}{SHFT N}{CTR
  L 6}{SHFT G}"                      :REM*214
225 FORI=1TO2000:NEXT:PRINT"{SHFT CLR}"
                                     :REM*169
261 PRINT"{SHFT CLR}"                :REM*252
```

```
262 RESTORE                          :REM*57
265 REM: MENU ROUTINE                 :REM*108
267 PRINT"{7 CRSR RTs}{8 CRSR DNs}{SHFT S}{
  SHFT T}{SHFT U}{SHFT D}{SHFT Y}{SHFT SP
  ACE}{SHFT W}{SHFT O}{SHFT R}{SHFT D}{SH
  FT S} (1)"                          :REM*116
268 PRINT:PRINT"{8 CRSR RTs} {SHFT T}{SHFT
  A}{SHFT K}{SHFT E} {SHFT T}{SHFT E}{SHF
  T S}{SHFT T} (2)"                  :REM*17
270 GETCHOICE$:IFCHOICE$=""THEN GOTO 270
                                     :REM*1
275 IF CHOICE$="1"THEN GO TO 2000      :REM*158
276 IFCHOICE$="2" THEN GOTO2500       :REM*29
277 IFCHOICE$<>"1"ANDCHOICE$<>"2"THENGOTO27
  0                                    :REM*66
279 PRINT"{SHFT CLR}"                :REM*14
280 PRINT"{SHFT CLR}":PRINTTAB(12)"{6 CRSR
  DNs}{SHFT T}{SHFT E}{SHFT S}{SHFT T} {S
  HFT B}{SHFT E}{SHFT G}{SHFT I}{SHFT N}{
  SHFT S}"                             :REM*117
```



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```

281 FOR X=1TO2500:NEXT          :REM*200
290 SUM=0                       :REM*81
300 READ A$                     :REM*151
310 COUNT=0                     :REM*127
350 IF A$=""*THEN GOTO 10050    :REM*95
395 PRINT"{SHFT CLR}":FORZ=1TO500:NEXT
                                :REM*128
396 FORI=1 TO 10                :REM*33
397 PRINT"{15 CRSR RTs}{10 CRSR DNs}";A$
                                :REM*142
398 PRINT"{SHFT CLR}"          :REM*133
400 NEXT                        :REM*155
500 PRINT"{SHFT CLR}":FORI=1TO 300:NEXT
                                :REM*185
610 INPUT "{CTRL 9}{CTRL 6}{SHFT C}{SHFT O}
    {2 SHFT Rs}{SHFT E}{SHFT C}{SHFT T}{SHF
    T SPACE}{SHFT S}{SHFT P}{SHFT E}{2 SHFT
    Ls}{SHFT I}{SHFT N}{SHFT G}";B$:REM*44
650 COUNT=COUNT+1            :REM*54
700 IF B$=A$ THEN SUM=SUM+5:GOSUB5000:GOTO3
    00                          :REM*30
705 IF B$>A$THENGOSUB 6000    :REM*57
710 SUM=SUM-1                  :REM*210
750 IF COUNT=3 THEN 950       :REM*110
800 GOTO 395                   :REM*29
925 PRINT"{SHFT CLR}"        :REM*150
930 GOTO261                    :REM*231
940 PRINT"{SHFT CLR}"        :REM*165
950 PRINT "{6 CRSR DNs}{4 CRSR RTs}{SHFT C}
    {SHFT O}{2 SHFT Rs}{SHFT E}{SHFT C}{SHF
    T T}{SHFT SPACE}{SHFT S}{SHFT P}{SHFT E
    }{2 SHFT Ls}{SHFT I}{SHFT N}{SHFT G}{SH
    FT SPACE}{SHFT I}{SHFT S}":A$:REM*191
955 INPUT"{5 CRSR RTs}{2 CRSR DNs}{SHFT T}{
    SHFT Y}{SHFT P}{SHFT E}{SHFT SPACE}{SHF
    T C}{SHFT O}{2 SHFT Rs}{SHFT E}{SHFT C}
    {SHFT T}{SHFT SPACE}{SHFT W}{SHFT O}{SH
    FT R}{SHFT D}":B$:REM*92
956 IF B$>A$THEN GOTO940      :REM*113
960 PRINT"{5 CRSR RTs}{7 CRSR DNs}{SHFT P}R
    ESS ANY KEY TO CONTINUE"   :REM*65
980 GET Q$:IFQ$=""THEN GOTO980 :REM*101
990 PRINT"{SHFT CLR}"        :REM*215
1000 GOTO300                   :REM*181
1200 PRINT"{8 CRSR RTs}{2 CRSR DNs}{SHFT T}
    {SHFT A}{SHFT K}{SHFT E}{SHFT T}{SHFT
    E}{SHFT S}{SHFT T}{SHFT SPACE}{SHFT A
    }{SHFT G}{SHFT A}{SHFT I}{SHFT N}; {SH
    FT Y}/{SHFT N}"           :REM*150
2000 REM: STUDY WORD ROUTINE   :REM*77
2050 PRINT"{SHFT CLR}"        :REM*0
2100 READA$                   :REM*166
2200 PRINT"{15 CRSR RTs}{8 CRSR DNs}";A$
                                :REM*40
2250 IF A$=""*THEN GOTO261    :REM*244
2300 PRINT:PRINT:PRINT:PRINT"{5 CRSR RTs}{S
    HFT P}{SHFT R}{SHFT E}{2 SHFT Ss}{SHFT
    SPACE}{SHFT A}{SHFT N}{SHFT Y}{SHFT S
    PACE}{SHFT K}{SHFT E}{SHFT Y}{SHFT SPA
    CE}{SHFT T}{SHFT O}{SHFT SPACE}{SHFT S
    }{2 SHFT Es}{SHFT SPACE}{SHFT N}{SHFT
    E}{SHFT X}{SHFT T}{SHFT SPACE}{SHFT W}
    {SHFT O}{SHFT R}{SHFT D}" :REM*174
2310 GETL$:IFL$=""THEN GOTO2310 :REM*17
2312 PRINT"{SHFT CLR}"        :REM*7
2400 GO TO 2100               :REM*45
2500 PRINT"{SHFT CLR}":PRINT"{11 CRSR RTs}{
    6 CRSR DNs}{SHFT P}{SHFT O}{SHFT I}{SH
    FT N}{SHFT T}{SHFT A}{SHFT W}{SHFT A}
    {SHFT R}{SHFT D}{SHFT S}" :REM*229
2510 PRINT:PRINT:PRINT"{7 CRSR RTs}{SHFT C}
    {SHFT O}{2 SHFT Rs}{SHFT E}{SHFT C}{SH
    FT T}{SHFT SPACE}{SHFT F}{SHFT I}{SHFT
    T}{SHFT S}{SHFT T}{SHFT SPACE}{SHFT T
    }{SHFT I}{SHFT M}{SHFT E
    }{SHFT SPACE}=- 1 {SHFT P}{SHFT O}{SHF
    T I}{SHFT N}{SHFT T}"    :REM*41
2530 PRINT:PRINT"{8 CRSR RTs}{5 CRSR DNs}
    {SHFT P}{SHFT R}{SHFT E}{2 SHFT Ss}{SH
    FT SPACE}{SHFT A}{SHFT N}{SHFT Y}{SHF
    T K}{SHFT E}{SHFT Y}{SHFT SPACE}{SHFT
    T}{SHFT O}{SHFT SPACE}{SHFT B}{SHFT E}
    {SHFT G}{SHFT I}{SHFT N}" :REM*89
2540 GET A$:IF A$=""THEN2540  :REM*13
2610 PRINT"{SHFT CLR}":GOTO279 :REM*8
5000 REM{2 SPACES}BELL SOUND :REM*221
5010 POKE54296,15:POKE54277,0:POKE54278,247
    :REM*77
5020 POKE54276,17:POKE54273,40:POKE54272,0
    :REM*57
5030 FOR T=1TO500:NEXT:POKE54276,6 :REM*63
5040 PRINT"{SHFT CLR}":FORX=1TO6:PRINTTAB(1
    7)"{10 CRSR DNs}{SHFT R}{SHFT I}{SHFT
    G}{SHFT H}{SHFT T}!":FORY=1TO80:NEXT:P
    RINT"{SHFT CLR}"        :REM*147
5050 FORZ=1TO80:NEXT:NEXT:RETURN :REM*209
6000 REM BUZZER               :REM*3
6010 POKE54296,15:POKE54277,45:POKE54268,16
    5 :REM*95
6020 POKE54276,33:POKE54273,6:POKE54272,5
    :REM*171
6030 FORT=1TO500:NEXT:POKE54276,32:POKE5427
    3,0:POKE54272,0 :REM*225
6040 PRINT"{SHFT CLR}":FORX=1TO6:PRINTTAB(1
    7)"{10 CRSR DNs}{SHFT W}{SHFT R}{SHFT
    O}{SHFT N}{SHFT G}!":FORY=1TO80:NEXT:P
    RINT"{SHFT CLR}"        :REM*39
6050 FORZ=1TO80:NEXT:NEXT:RETURN :REM*189
10000 DATA ACCIDENTALLY,ATTENDANCE,BENEFIT,
    CHARACTERISTIC,DENY,DOUBLE,ELABORATE
                                :REM*1
10001 DATA MISSPELL,*       :REM*190
10020 REM*****MESSAGE ROUTINE*****
                                :REM*103
10050 IF SUM<75 THEN MSG$="{SHFT Y}OU NEED
    TO STUDY YOUR WORDS"     :REM*101
10051 IF SUM>75 AND SUM<84 THEN MSG$="{SHFT
    P}RETTY GOOD JOB"       :REM*222
10052 IF SUM>84 AND SUM<94 THEN MSG$="{SHFT
    R}EAL GOOD"            :REM*191
10053 IF SUM>94 AND SUM<100 THEN MSG$="{SHF
    T A}LMOSt PERFECT"     :REM*234
10054 IF SUM>99 THENMSG$="{SHFT P}ERFECT SC
    ORE!! {SHFT H}OORAY!!" :REM*239
10055 PRINT"{6 CRSR RTs}{6 CRSR DNs}";MSG$
    :REM*182
10058 PRINT:PRINT:PRINT"{2 CRSR RTs}{SHFT Y
    }{SHFT O}{SHFT U}{SHFT R}{SHFT SPACE}
    {SHFT S}{SHFT C}{SHFT O}{SHFT R}{SHFT
    E}{SHFT SPACE}{SHFT W}{SHFT A}{SHFT
    S}{SHFT SPACE}";SUM     :REM*177
10060 PRINT:PRINT:PRINT"{5 CRSR RTs}{4 CRSR
    DNs}{SHFT T}AKE TEST AGAIN? Y/N"
                                :REM*201
10350 GETZ$:IFZ$=""THEN 10350 :REM*136
10400 IF Z$="Y" THEN 261      :REM*148
10500 PRINT"{SHFT CLR}":PRINT"{15 CRSR RTs}
    {SHFT S}EE YOU LATER." :REM*155
10600 END                     :REM*147

```

Magic

From p. 12.

```
60 LOOP
70 SCNCLR:TEMPO15:PLAY"V106T9U15X005QCGO6IC
CCO5IGGGQEGECCEO6ICCO5IGGEEEGEGEC"
80 PRINT"I GUESS IT IN ONLY"TRIES!":PRINT
"WANT TO TRY AGAIN?":PRINT"(Y)ES OR (N)O
"
90 GETKEYS$:IFS$="Y"GOTO10:ELSE END
```

Mary Jo Hubbard
Carpentersville, IL

\$38F GEOS printer files—If you use GEOS, then you know that the Commodore MPS-801 printer is selected as the default printer driver when you boot up your original master GEOS disk. This is fine if you're using the 801, but if you use a different printer, then each time you boot up, you have to go through a printer-selection process with the mouse to access the correct printer driver.

You can forever rid yourself of this time-wasting routine by changing the order of the printer drivers on the master disk so that the driver pertaining to your printer is selected as the default. This is easy to do. Enter the desktop and turn to the page with the printer drivers. Click the arrow on the MPS-801 driver, wait a few seconds and click again. You should see a ghost image of the MPS-801 icon. Drag this ghost to the border of the directory pad and click the mouse to drop the icon on the border. Repeat the procedure with the printer of your choice.

You should now have both icons. Click on the icon of the driver you want first (the new default printer driver), and carry the ghost back to the directory notepad. Click the mouse, and the new driver will be placed in the first open spot on the directory. Then replace the 801 driver in the same way. Now *your* printer driver is the default driver. Take care, as you are working with the GEOS master disk!

John Plzak
Milwaukee, WI

\$390 Loading GEOS letters and pictures—I've discovered a quick way to load a geoWrite or geoPaint document. First I select the appropriate icon on the desktop notepad for the document I want. Then I double-click on the document file to load it. Of course, geoWrite or geoPaint must be on the disk, unless you have a multidrive system, in which case GEOS will automatically check both drives for geoWrite or geoPaint. This is much faster than opening geoWrite or geoPaint and then loading in your document.

John Plzak
Milwaukee, WI

\$391 Caps-lock-Q fix—Some of you have already discovered that you cannot get an uppercase Q with the caps lock key on the C-128. You can fix the bug by entering my one-line program.

```
10 REM CAPS-LOCK-Q FIX - JERRY KIRK
20 FAST:BANK15:FORJ=0TO88:POKE6333+J,PEEK(6
4484+J):NEXT:POKE840,189:POKE841,24:POKE
6395,209:SLOW
```

Jerry Kirk
Heiskell, TN

\$392 C-64 thinking sounds—You can enhance your games and other interactive programs with sound effects. My C-64 Thinking program will give you the impression that your computer is mulling over a strategic move or working with a command you've just entered. Try it also in a program as a subroutine immediately before output to the screen or following user input.

```
490 REM C-64 THINKING - JOSEPH CHARNETSKI
500 S=54272:POKE S+6,240:POKE S+5,34
510 POKE S+24,15:POKE S+4,21
520 FOR I=1TO30
530 POKES+1,RND(1)*180:POKE S,RND(1)*20
540 FOR J=1TO60:NEXT:NEXT
550 POKE S+4,0:REM RETURN
```

Joseph R. Charnetski
Dallas, PA

\$393 Make it easy on yourself—Make a hard copy of the different fonts and type styles available in GEOS. It's much easier to select the style and size this way.

Ada D. Kirkman
Mt. Pleasant, SC

\$394 Line marker—When I type in a program from *RUN*, I use a small sheet of Scotch Post-it pad to mark my place and to help my eyes follow the line I'm entering. This magic paper easily sticks to my magazine without damaging it, and I can restick the paper under the next line, then the next, and so on. Now I never skip lines while typing in a program.

John Kim
Spring Valley, NY

\$395 Economical printer stand and desktop space—If you need more desk space around your printer, place a low-cost letter tray upside down and set the printer atop it. Store the fanfold paper underneath the letter tray—you've just found yourself almost 100 square inches of additional desk space.

Michael Lenoski
Tucson, AZ

\$396 Lowercase CHARacters—Have you ever wanted to use lowercase text on-screen in the C-128's 40-column (hires) mode? Well, now you can, by simply including a CHR\$(14) before the text you want to type. Look at the example below: the line will print an uppercase "M" and lowercase "agic":

```
0 REM LOWER CASE CHAR - CARLOS CASTELLANOS
1 :
2 REM ----DELETE ALL BUT LINE 10 TEXT----
3 :
10 CHAR 1,0,0,CHR$(14)+"{SFT M}AGIC",1
```

Carlos A. Neri Castellanos
Guadalajara, Jalisco, Mexico

\$397 Mysterious errors revealed—For all of you who've ever gotten an error in a "perfectly good" line containing a Read statement (and who hasn't?), here's some magic for

you. These errors usually result from poking a value greater than 255 (an Illegal Quantity error) or typing the letter O for a 0 in a data line (a Type Mismatch error). To ferret out the culprit, type in the appropriate line below:

For the C-64, VIC-20, Plus/4 and C-16: PRINT PEEK(63)+PEEK(64)*256
For the C-128: PRINT PEEK(65)+PEEK(66)*256

Now list the line number printed on the screen; you'll find the error in that line.

**Jim Borden
Carlisle, PA**

\$398 Basic directory—There will be times when you'll need to call up the disk directory while your program's running. Include this short subroutine in your programs, and you'll have instant access to the directory.

```
1Ø REM BASIC DIRECTORY - LUTHER W BRISKY
9ØØ OPEN5,8,Ø,"$:GET#5,A$,A$
91Ø GET#5,A$,A$:IFA$=""THENCLOSE5:GOTO96Ø
92Ø GET#5,B$,L$
93Ø LN$=STR$(ASC(B$+CHR$(Ø))+ASC(L$+CHR$(Ø)
)*256):PRINTLN$ " ";
94Ø GET#5,A$:PRINTL$;A$;:IFA$=""THENPRINT:G
OTO91Ø
95Ø GOTO94Ø
96Ø END : REM OR RETURN FOR SUB
```

**Luther W. Brisky
Vancouver, WA**

\$399 A safe Save and Replace routine—Whenever I type in a long Basic program, I always begin the listing with this time-saving routine. Then, when I'm ready to update the program on disk or quit for the day, I just enter RUN 2. The routine will scratch the previously saved version and save the latest version. When the entire program is entered and tested, I add :STOP to the end of line 2, then I run line 2 one last time. Finally, I delete lines 1-3 and save the finished program in the usual way.

```
Ø REM SAFE SAVE+REPLACE - CHRISTINE N CHARN
ETSKI
1 GOTO [FIRST LINE #]
2 N$="PROGRAM NAME":PRINT"SCRATCH";:OPEN1,8
,15,"SØ:"+N$:CLOSE1
3 PRINT" AND SAVE.":SAVE N$,8:END
```

**Christine N. Charnetski
Plains, PA**

\$39A Extra F keys—Did you know that you can add two function keys to the eight already on the C-128? The help key and the shift/run-stop combination can be redefined as function keys with the SYS commands in the listing below.

```
Ø REM EXTRA F-KEYS - SHAWN K SMITH
1Ø BANK15:SYS DEC("6ØEC"),,8,,,"NO RUN *"
2Ø BANK15:SYS DEC("6ØEC"),,9,,,"DON'T HELP"
```

You can substitute anything you wish between the quotes, including CHR\$, in place of the strings given in these examples.

**Shawn K. Smith
The Bronx, NY**



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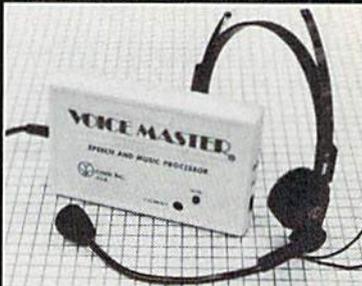
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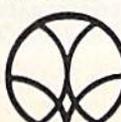
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C

By **JIM STRASMA**

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

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Only queries submitted on postcards will be answered through this column, and, due to the available space and the volume of mail, we select for publication only those questions that are likely to appeal to the majority of our readers.

HARDWARE

Q: *I recently purchased an MPS-1000 printer for my C-64. Now I'm having problems with crooked printing on the hard copy. I've tried adjusting the paper setting, but that doesn't work. What should I do?*

Mike Meyn
Bayside, NY

A: Aligning paper on friction-feed printers like the MPS-1000 can be a problem. Although the first few sheets seem to be aligned, the misalignment becomes more apparent with each advance of a sheet. I've been told the reason is because the left side of the sheets receive more characters, and thus more pounding from the printhead, than the right side.

Years ago when I had the same problem with a printer, I fixed it by taping two pencils vertically to the back of the printer as paper guides, putting one on each side of the paper supply. It didn't solve the problem

completely, but it did help.

Be sure to place your paper supply directly behind the printer and level with or above the top of the platen, so that the paper feeds into the printer without making the printer mechanism work so hard.

The best solution, of course, is to use a tractor-feed printer.

Q: *I have a C-64 and a 1541 disk drive, and I'll be purchasing a C-128 for office use. I want the 128 to be able to read 1541 program disks. The 1571 seems to provide the 1541 readability, faster loading and double side/double capacity. Will the 1572 disk drive provide these features, and does it compare favorably with the 1541 as far as my purposes go? Can the C-128 operate the 1541 drive without special tricks?*

Roger Stokes
Park Forest, IL

A: Sorry, but Commodore cancelled the 1572 drive. The 1571, however, is still readily available, and it reads 1541 disks quite well. Going the other way, yes, a C-128 will happily operate your 1541 disk drive, but you won't get faster loading speeds in 1541 mode.

Q: *I use a 1525E printer with my VIC. I know I can use printers such as the Epsoms and C. Itohs with the VIC by connecting an interface, but can I somehow use my VIC printer with other computers, such as Sanyo and NEC?*

Haruo Hiramatsu
Livonia, MI

A: No. Although the basic mechanism is nearly identical to printer models once sold under other brand names for non-Commodore computers, some of the electronics in the 1525 are incompatible with anything but Commodore computers.

Your best bet is to get another printer for the other computer. If the new printer has a Centronics parallel port (most do), and it's compatible with the Epson command set, you can then buy a printer interface and also connect it to your VIC.

Q: *Would I have any problems (in either 40- or 80-column mode) if I replaced my C-128's Z80A chip with a faster version (such as the 8MHz Z80H), and rigged a switch to toggle between normal 4MHz speed and a new 8MHz time base provided by a separate crystal?*

Lonnie McClure
Memphis, TN

A: At a bare minimum, I would expect problems with support or problems with memory chips not being able to operate at twice the usual speed. The best way to speed up CP/M applications on your C-128 is by adding Commodore's 1700 or 1750 RAM cartridge to your system and moving program overlays and data to its RAM disk. Usually CP/M is disk-bound, rather than CPU-bound, and the RAM disk will correct that.

Q: *I bought my C-128 back in July 1985, and I would like to know if the new 1700*

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and 1750 RAM packets will work on my computer.

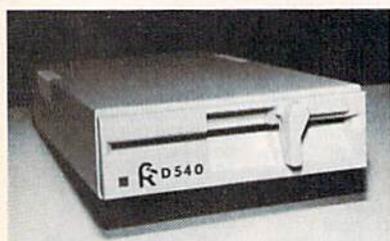
Wayne Aaron
Scott Hills, TN

A: Some early C-128's had defective cartridge ports and thus may not work with RAM cartridges. One quick way to find out whether your cartridge port is defective is by trying out the Ranch cartridge from Spinaker Software. If it runs, your cartridge port is good, and should also work with a RAM cartridge.

SOFTWARE

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A: Believe it or not, one of the most useful sections of a computer magazine is its advertisements. You can keep up with the latest products for your particular computer set-up by reading the reviews and ads in *RUN*, and sending in the Reader Service card in the back of the magazine to request more information on products that interest you. Depending on where your ship calls, there may also be a Commodore user group nearby.

Q: A few years ago I was introduced to *Archon*, an off-beat version of Chess with a medieval setting. Since I'm getting a C-128, I'd like to buy this game, but I can't remember who makes it.

Brian T. Burns
Cortland, NY

A: *Archon* and *Archon II* are products of Electronic Arts (1820 Gateway Drive, San Mateo, CA 94404), and they should be available through most Commodore dealers.

Q: I have been searching diligently for a golf program. The only one I know of doesn't seem to take full advantage of the graphics capabilities of the C-64. Could you suggest some others?

David Sharp
Address unknown

A: Friend Jim Oldfield has been searching for the ultimate computer golf game for years. His current favorite is *Leader Board* from Access Software. Others are also good, but he likes *Leader Board* because of the small hardware key (dongle) included with the game that allows him to make a backup copy for his own use.

Q: Besides the *Word Lifeware* programs, do you know of any Christian education software available for the C-64? My church is ready to buy a C-64 for the Sunday School and the pastor's use, but I need to know if there will be enough such software available to make it worth the expenditure.

Glen Haworth
[72676,2015] on *CompuServe*

A: The Baker Book House has just announced a second series of four Christian Education titles for the C-64. I tested their "Early Heroes of the Bi-

ble" in the first series last year, and found it to be one of the most professional programs I've ever tested.

Q: Last month I purchased a C-128 and two 1571 disk drives. I don't understand why it's so difficult to copy programs to the second side of my new disks. The first side copies fine, but when it's full and the drives are writing onto the second side, the copying drive chatters with each block that's written and takes about two seconds per block.

I've tried the *Uni-Copy* and *Copy File* programs that came with the demo disk, using both the single- and two-drive methods, with the same results. I've also tried using some of the C-64 copy programs, but they, of course, give me an *Illegal Block* error when they attempt to copy beyond about block 35. The only way I can copy to the second side without this problem is to load and save each program separately. I have approximately 100 double-sided disks I would like to transfer.

G. W. Howlett
Trenton, Ontario, Canada

A: According to my sources, there is a bug in the 1571 related to copying on the second side that will be fixed by a revised ROM. However, when I asked Commodore about new ROMs, I was told only that "... there may be different versions of the 1571 disk drive currently on the market, but we do not have any written or public release information on the changes or differences at this time."

Meanwhile, I am assured by friends who use it that the program *Fast Hack Em*, by Michael J. Henry, copies both sides of a 1571 disk quickly.

Q: I recently got *Epyx's Fast Load* cartridge for my C-64. A friend has one, also. When I tried mine, I got a lot of garbage. When we used his, it was fine. What's wrong?

Jared Shockley
Renton, WA

A: Assuming you used the same C-64 system both times, your *Fast Load* cartridge is probably defective. This sometimes happens with all products. If possible, take it back to the dealer and swap it for another.

On the other hand, if you didn't use the same C-64 both times, do that first, because it's also possible that there is something wrong with your computer itself instead of the cartridge.

Circle 4 on Reader Service card.

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PROGRAMMING

Q: Whenever I type in a C-64 program that contains negative numbers in the Data statements, I get a Syntax error when I try to run the program. How can I correct this?

**M. Newberg
Braham, MN**

A: Most programs containing Data statements are Basic loader programs. The loader pokes the data values into memory as it runs. Your problem is in trying to poke a negative number into a memory location. You can't. Only positive integers from 0-255 may be poked into memory.

Normally, when a program contains a negative number in Data statements, it's trapped by the loader program and used another way, such as, for example, when a -1 is used to mark the end of data. You can correct the problem by checking the statements between the Read and Poke commands. Most likely you'll find that you're missing a line—such as IF T = -1 THEN 2000—that normally handles the negative numbers.

Q: The Commodore 128 System Guide describes the Header command format as HEADER "diskname", lid. My C-128 just loves HEADER "diskname, id", however. The "id" can be any number of characters, with or without the "I". The first two are

used as the ID. I like my version better; it's easier to type. I also saw that version mentioned in a recent RUN article. Am I crazy, or are there more implementations of the Header command in the C-128 that I'm not aware of?

**Jack Beggs
Tipp City, OH**

A: There's nothing crazy about the command variation you discovered. You've combined part of the new Basic 7 Header command with part of the old Basic 2 disk New command. This works because, at heart, the disk drive only understands the Basic 2 version, so Basic 7 simply translates Header commands into equivalent

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Basic 2 disk New commands before sending them on to the disk.

Q: I don't completely understand the decimal values used in ASCII code. When I use a machine language monitor to view the decimal value of the equals sign, it displays a value of 178, while the actual ASCII code value is 61. What's going on?

**Owen Hixon
Manzanola, CO**

A: Actually, there are two equals signs in Basic. One is the normal ASCII character, which you'll see if you view a literal string containing one. The other code is actually the Basic

token (key word) for the operation of assigning a value to a variable, or making a comparison within an If statement. You can see both uses of the equals sign at once by using the monitor to view this line:

```
1 A$ = "A = B"
```

The first equals sign will have the decimal value 178 (\$B2 hexadecimal), and the second sign will have the value 61 (\$3D hex).

Q: Thanks heaps for answering my question in September's Commodore Clinic. I purchased the 6502 reference card you suggested. It's a great source of information, but I still can't figure out how to clear the screen in machine language. Could you give a routine that does this?

**Jim Smith
Sterling, KS**

A: To clear the screen in machine language, I simply print a CHR\$(143), the clear-screen character. Load the value \$8F (the hexadecimal equivalent of 143) into the accumulator and then call the Kernal BSOOut routine at location \$FFD2. Here are the needed assembler commands:

```
LDA #$8F
JSR $FFD2
RTS
```

They are relocatable, so you can put them in memory any way you like. ■

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CHECKSUMS FOR *RUN* 1985 PROGRAMS

Last February, in response to many reader inquiries, we began a series of checksum listings for programs published in 1985 before our C-64 checksum program, *64 Perfect Typist*, appeared in September '85. Working backwards, we have so far covered August, July, June, May and April. Below, you will find the March programs' checksum listings.

To use the checksums, you must first load and run *64 Perfect Typist* (see *How to Type Listings*, on page 110); then get out your March issue and begin typing in any program you find in the listings below. Every time you hit the return key, a number

from 0 to 255 will appear. If you enter a line correctly, the number following the ":REM*" next to the line number will appear.

If you have already entered one of the programs and desire to check it for accuracy, simply enter *64 Perfect Typist*, list lines individually or in small groups and position the cursor on the line you want to check. Next, press the return key, and, if you've entered the line correctly, the number that appears below the line will match the number following the ":REM*" in the listings.

You can look forward to seeing more of these listings of 1985 programs in subsequent issues of *RUN*.

Money Manager, by Robert Baker; March, p. 26.

100	:REM*162	380	:REM*85	660	:REM*68	940	:REM*89	1220	:REM*136
110	:REM*172	390	:REM*183	670	:REM*2	950	:REM*189	1230	:REM*56
120	:REM*6	400	:REM*231	680	:REM*250	960	:REM*253	1240	:REM*52
130	:REM*192	410	:REM*197	690	:REM*226	970	:REM*161	1250	:REM*242
140	:REM*162	420	:REM*77	700	:REM*74	980	:REM*85	1260	:REM*222
150	:REM*170	430	:REM*255	710	:REM*214	990	:REM*35	1270	:REM*130
160	:REM*204	440	:REM*33	720	:REM*208	1000	:REM*81	1280	:REM*83
170	:REM*232	450	:REM*113	730	:REM*22	1010	:REM*77	1290	:REM*199
180	:REM*252	460	:REM*131	740	:REM*116	1020	:REM*231	1300	:REM*231
190	:REM*122	470	:REM*39	750	:REM*110	1030	:REM*100	1310	:REM*115
200	:REM*6	480	:REM*75	760	:REM*186	1040	:REM*20	1320	:REM*193
210	:REM*16	490	:REM*91	770	:REM*107	1050	:REM*66	1330	:REM*51
220	:REM*196	500	:REM*239	780	:REM*103	1060	:REM*50	1340	:REM*123
230	:REM*102	510	:REM*57	790	:REM*97	1070	:REM*108	1350	:REM*241
240	:REM*142	520	:REM*244	800	:REM*173	1080	:REM*14	1360	:REM*41
250	:REM*212	530	:REM*250	810	:REM*165	1090	:REM*196	1370	:REM*153
260	:REM*247	540	:REM*134	820	:REM*123	1100	:REM*146	1380	:REM*201
270	:REM*225	550	:REM*214	830	:REM*67	1110	:REM*192	1390	:REM*143
280	:REM*165	560	:REM*140	840	:REM*133	1120	:REM*188	1400	:REM*5
290	:REM*133	570	:REM*140	850	:REM*135	1130	:REM*24	1410	:REM*229
300	:REM*231	580	:REM*174	860	:REM*221	1140	:REM*240	1420	:REM*199
310	:REM*117	590	:REM*108	870	:REM*41	1150	:REM*242	1430	:REM*193
320	:REM*11	600	:REM*164	880	:REM*217	1160	:REM*196	1440	:REM*127
330	:REM*59	610	:REM*96	890	:REM*213	1170	:REM*158	1450	:REM*91
340	:REM*255	620	:REM*168	900	:REM*201	1180	:REM*54		
350	:REM*111	630	:REM*72	910	:REM*203	1190	:REM*228		
360	:REM*157	640	:REM*58	920	:REM*11	1200	:REM*186		
370	:REM*69	650	:REM*244	930	:REM*149	1210	:REM*60		

Easy Invoices, by Edward S. Wozniak; March, p. 40.

1	:REM*61	320	:REM*205	500	:REM*239	620	:REM*94	720	:REM*38
5	:REM*1	340	:REM*199	510	:REM*255	625	:REM*21	730	:REM*68
10	:REM*68	360	:REM*235	520	:REM*4	630	:REM*156	740	:REM*112
100	:REM*254	370	:REM*217	530	:REM*158	631	:REM*219	750	:REM*216
110	:REM*190	380	:REM*15	540	:REM*250	640	:REM*126	760	:REM*50
180	:REM*170	390	:REM*249	550	:REM*18	642	:REM*56	770	:REM*15
190	:REM*54	400	:REM*217	555	:REM*161	645	:REM*45	780	:REM*135
200	:REM*242	410	:REM*87	560	:REM*58	650	:REM*248	790	:REM*77
220	:REM*126	420	:REM*219	565	:REM*239	651	:REM*143	800	:REM*253
250	:REM*50	430	:REM*205	570	:REM*40	655	:REM*51	810	:REM*15
260	:REM*119	440	:REM*131	575	:REM*37	660	:REM*194	820	:REM*113
270	:REM*249	450	:REM*197	580	:REM*54	670	:REM*210	830	:REM*107
280	:REM*245	460	:REM*111	585	:REM*37	680	:REM*236	840	:REM*65
290	:REM*143	470	:REM*117	590	:REM*128	690	:REM*226	850	:REM*41
300	:REM*157	480	:REM*57	600	:REM*162	700	:REM*216	860	:REM*201
310	:REM*173	490	:REM*127	610	:REM*196	710	:REM*226		

Listing continued.

870	:REM*151	1007	:REM*148	1180	:REM*72	1348	:REM*53	1500	:REM*215
880	:REM*83	1020	:REM*215	1190	:REM*68	1350	:REM*97	1510	:REM*215
890	:REM*29	1030	:REM*0	1200	:REM*106	1360	:REM*111	1520	:REM*101
900	:REM*127	1040	:REM*176	1210	:REM*60	1370	:REM*125	1530	:REM*31
910	:REM*85	1050	:REM*32	1220	:REM*180	1380	:REM*95	1540	:REM*118
920	:REM*207	1060	:REM*64	1230	:REM*192	1390	:REM*65	1550	:REM*10
930	:REM*223	1070	:REM*146	1250	:REM*210	1400	:REM*183	1560	:REM*142
940	:REM*85	1080	:REM*64	1270	:REM*48	1405	:REM*208	1570	:REM*128
950	:REM*133	1090	:REM*16	1280	:REM*63	1410	:REM*153	1580	:REM*108
960	:REM*175	1100	:REM*170	1290	:REM*121	1420	:REM*161	1600	:REM*6
970	:REM*7	1105	:REM*251	1298	:REM*3	1430	:REM*229	2000	:REM*89
980	:REM*151	1110	:REM*74	1300	:REM*139	1440	:REM*179	2010	:REM*165
990	:REM*115	1120	:REM*230	1310	:REM*249	1450	:REM*171	2020	:REM*207
1000	:REM*209	1130	:REM*160	1320	:REM*109	1460	:REM*237	2030	:REM*117
1003	:REM*148	1150	:REM*212	1330	:REM*253	1470	:REM*173	2040	:REM*255
1005	:REM*138	1160	:REM*190	1340	:REM*131	1480	:REM*125	2050	:REM*134
1006	:REM*123	1170	:REM*0	1345	:REM*96	1490	:REM*29	2060	:REM*218

Mr. Computer Head, by George Decker; March, p. 60.

10	:REM*58	162	:REM*248	270	:REM*111	355	:REM*248	455	:REM*204
20	:REM*14	163	:REM*225	280	:REM*173	356	:REM*163	460	:REM*161
30	:REM*48	165	:REM*59	285	:REM*56	360	:REM*97	465	:REM*174
40	:REM*224	170	:REM*26	290	:REM*175	370	:REM*61	470	:REM*203
50	:REM*178	175	:REM*205	295	:REM*226	375	:REM*246	475	:REM*232
60	:REM*120	180	:REM*156	296	:REM*91	376	:REM*123	480	:REM*111
70	:REM*240	185	:REM*117	300	:REM*63	380	:REM*27	485	:REM*56
80	:REM*116	190	:REM*84	305	:REM*108	400	:REM*47	490	:REM*223
100	:REM*122	200	:REM*208	310	:REM*79	410	:REM*225	495	:REM*252
110	:REM*62	210	:REM*124	320	:REM*201	415	:REM*172	500	:REM*59
120	:REM*52	220	:REM*200	325	:REM*40	420	:REM*143	510	:REM*175
130	:REM*150	230	:REM*164	330	:REM*133	430	:REM*127	520	:REM*44
140	:REM*84	240	:REM*164	335	:REM*66	435	:REM*192	525	:REM*207
150	:REM*206	245	:REM*39	340	:REM*17	440	:REM*137	530	:REM*108
155	:REM*135	250	:REM*180	345	:REM*32	445	:REM*120	540	:REM*142
160	:REM*30	260	:REM*93	350	:REM*5	450	:REM*191	541	:REM*33

Renumberer, by Alejandro Kapauan; March, p. 104.

100	:REM*134	260	:REM*227	420	:REM*121	580	:REM*62	740	:REM*28
110	:REM*114	270	:REM*253	430	:REM*77	590	:REM*172	750	:REM*240
120	:REM*68	280	:REM*177	440	:REM*117	600	:REM*134	760	:REM*48
130	:REM*158	290	:REM*137	450	:REM*245	610	:REM*96	770	:REM*75
140	:REM*34	300	:REM*15	460	:REM*137	620	:REM*114	780	:REM*165
150	:REM*190	310	:REM*35	470	:REM*165	630	:REM*90	790	:REM*243
160	:REM*42	320	:REM*13	480	:REM*211	640	:REM*162	800	:REM*251
170	:REM*164	330	:REM*225	490	:REM*181	650	:REM*142	810	:REM*53
180	:REM*200	340	:REM*13	500	:REM*167	660	:REM*72	820	:REM*197
190	:REM*184	350	:REM*223	510	:REM*23	670	:REM*18	830	:REM*67
200	:REM*94	360	:REM*99	520	:REM*184	680	:REM*228	840	:REM*79
210	:REM*194	370	:REM*99	530	:REM*176	690	:REM*88	850	:REM*31
220	:REM*188	380	:REM*229	540	:REM*84	700	:REM*130		
230	:REM*50	390	:REM*133	550	:REM*18	710	:REM*136		
240	:REM*42	400	:REM*51	560	:REM*110	720	:REM*178		
250	:REM*232	410	:REM*167	570	:REM*138	730	:REM*36		

Landlord's Helper, by Wayne Arnett; March, p. 30.

100	:REM*236	275	:REM*252	400	:REM*115	570	:REM*252	740	:REM*198
110	:REM*246	280	:REM*141	410	:REM*231	580	:REM*92	750	:REM*142
120	:REM*182	285	:REM*6	420	:REM*65	590	:REM*86	760	:REM*28
130	:REM*214	290	:REM*133	430	:REM*233	600	:REM*74	770	:REM*243
140	:REM*86	295	:REM*16	440	:REM*125	610	:REM*94	780	:REM*27
150	:REM*86	300	:REM*149	450	:REM*253	620	:REM*132	790	:REM*195
160	:REM*74	305	:REM*26	455	:REM*176	630	:REM*38	800	:REM*105
170	:REM*98	310	:REM*173	460	:REM*233	640	:REM*206	810	:REM*219
180	:REM*180	315	:REM*36	465	:REM*186	645	:REM*111	820	:REM*107
190	:REM*254	320	:REM*213	470	:REM*1	650	:REM*164	830	:REM*29
200	:REM*200	330	:REM*233	480	:REM*201	655	:REM*121	840	:REM*95
210	:REM*10	340	:REM*19	490	:REM*7	660	:REM*120	850	:REM*181
220	:REM*200	350	:REM*255	500	:REM*83	670	:REM*60	855	:REM*66
230	:REM*98	360	:REM*105	510	:REM*47	680	:REM*158	860	:REM*93
240	:REM*84	365	:REM*86	520	:REM*230	690	:REM*174	870	:REM*95
250	:REM*50	370	:REM*217	530	:REM*74	700	:REM*230	880	:REM*81
260	:REM*151	375	:REM*96	540	:REM*230	710	:REM*254	890	:REM*177
265	:REM*242	380	:REM*115	550	:REM*214	720	:REM*200	900	:REM*23
270	:REM*27	390	:REM*89	560	:REM*54	730	:REM*118		

910	:REM*225	1240	:REM*156	1610	:REM*0	1975	:REM*166	2330	:REM*205
920	:REM*195	1250	:REM*126	1620	:REM*114	1980	:REM*145	2340	:REM*127
930	:REM*231	1260	:REM*80	1630	:REM*36	1985	:REM*176	2350	:REM*239
940	:REM*97	1270	:REM*196	1640	:REM*106	1990	:REM*199	2360	:REM*147
950	:REM*43	1280	:REM*217	1650	:REM*176	2000	:REM*29	2365	:REM*46
960	:REM*239	1290	:REM*107	1660	:REM*180	2010	:REM*9	2370	:REM*9
970	:REM*145	1300	:REM*171	1670	:REM*64	2020	:REM*203	2375	:REM*56
980	:REM*79	1310	:REM*191	1680	:REM*100	2030	:REM*37	2380	:REM*71
990	:REM*173	1320	:REM*51	1690	:REM*10	2040	:REM*189	2390	:REM*131
995	:REM*206	1330	:REM*221	1700	:REM*182	2050	:REM*160	2400	:REM*9
1000	:REM*135	1340	:REM*181	1710	:REM*226	2060	:REM*244	2410	:REM*173
1005	:REM*216	1350	:REM*11	1720	:REM*208	2070	:REM*88	2420	:REM*215
1010	:REM*55	1360	:REM*1	1730	:REM*72	2080	:REM*226	2430	:REM*67
1020	:REM*107	1370	:REM*187	1740	:REM*248	2090	:REM*130	2440	:REM*123
1030	:REM*242	1380	:REM*191	1750	:REM*52	2100	:REM*16	2450	:REM*35
1040	:REM*228	1390	:REM*253	1760	:REM*30	2110	:REM*104	2460	:REM*51
1050	:REM*232	1400	:REM*127	1770	:REM*196	2120	:REM*52	2470	:REM*17
1060	:REM*32	1410	:REM*241	1780	:REM*186	2130	:REM*132	2480	:REM*19
1070	:REM*172	1420	:REM*203	1790	:REM*196	2140	:REM*254	2490	:REM*47
1080	:REM*42	1430	:REM*145	1800	:REM*9	2150	:REM*20	2500	:REM*85
1090	:REM*178	1440	:REM*139	1810	:REM*59	2160	:REM*166	2510	:REM*125
1100	:REM*48	1450	:REM*11	1820	:REM*175	2170	:REM*82	2520	:REM*17
1110	:REM*102	1460	:REM*203	1830	:REM*115	2180	:REM*212	2530	:REM*133
1120	:REM*156	1470	:REM*93	1840	:REM*7	2190	:REM*104	2540	:REM*47
1130	:REM*122	1480	:REM*217	1850	:REM*91	2200	:REM*12	2550	:REM*101
1140	:REM*208	1490	:REM*183	1860	:REM*15	2210	:REM*0	2560	:REM*214
1150	:REM*22	1500	:REM*177	1870	:REM*99	2220	:REM*28	2570	:REM*74
1160	:REM*154	1510	:REM*39	1880	:REM*205	2230	:REM*142	2580	:REM*92
1170	:REM*166	1520	:REM*73	1890	:REM*187	2240	:REM*164	2590	:REM*120
1180	:REM*220	1530	:REM*97	1900	:REM*67	2250	:REM*222	2600	:REM*108
1190	:REM*164	1540	:REM*224	1910	:REM*73	2260	:REM*80	2610	:REM*252
1200	:REM*20	1550	:REM*236	1920	:REM*225	2270	:REM*154	2620	:REM*6
1205	:REM*161	1560	:REM*218	1930	:REM*191	2280	:REM*100	2630	:REM*198
1210	:REM*6	1570	:REM*252	1940	:REM*219	2290	:REM*186	2640	:REM*92
1215	:REM*171	1580	:REM*254	1950	:REM*51	2300	:REM*142		
1220	:REM*222	1590	:REM*28	1960	:REM*207	2310	:REM*71		
1230	:REM*56	1600	:REM*12	1970	:REM*195	2320	:REM*243		

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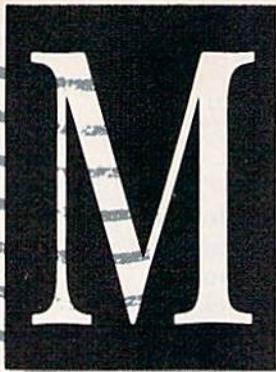
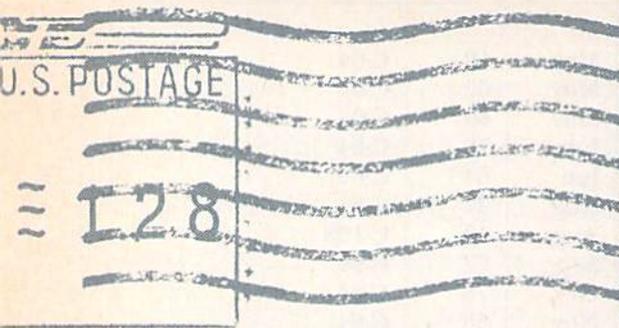
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Program Misnomer

Our company recently received the November 1986 issue of *RUN* and were very concerned when we read the article "Dashing Off the Dots."

Electronic Put-Ons has been developing and marketing computer software for amateur radio operators since 1983. In February 1984 we began offering a copyrighted program for the Commodore 64 and VIC-20 computers entitled Morse Code Tutor. Since that date, we have sold hundreds of copies of this program to customers around the world through direct, dealer and mail order sales.

Unfortunately, the program listed on page 74 of the November issue of *RUN* uses the same title—"Morse Code Tutor." This undoubtedly will result in confusion for your readers, as well as for our customers, since many will believe that by typing in your program or by purchasing your disk, they will be receiving our copyrighted software, which is an entirely different package.

John B. Mollan
Electronic Put-Ons
Vancouver, WA

We regret the inadvertent use of Electronic Put-On's copyrighted title. Thank you for calling this to our attention.

Editors

Nifty Notepad

It's not often that I get excited over programs in computer magazines, but 64 Notepad, which appeared in the September 1986 issue of *RUN*, was a welcome exception. It's an excellent

program! I've already used it to upgrade a rather amateurish program I wrote, merely by including 64 Notepad as a subroutine.

I'm a ham radio operator, and my program was designed to enable amateur radio net control stations to record the results of periodic rollcalls, to identify the operators in the rollcall by name and place of residence, to inform the net control operator of the hams' full call signs, and to update the roster and send it to the screen or printer as needed. All this information is accessed just by entering the suffix portion of a station's call sign.

After about two years of gradually working on the program, it was almost satisfactory. However, it lacked provision for the net control station to enter information and notes while the rollcall program was running, put the information into memory somewhere out of the way and then *retrieve it at a moment's notice*. Guess how I felt when I typed in your program and used it with mine! Hallelujah! 64 Notepad was perfect.

Lyon Lawrence
Lebanon, OR

*We're glad you've found the 64 Notepad so useful for your interesting application. As you've probably discovered by now, "64 Notepad Updated" in this issue of *RUN* includes two routines that augment the original 64 Notepad program.*

Editors

Phone Number Update

It's come to our attention that an incorrect phone number was listed

for the J. B. Horton Company, manufacturers of Stocktrender, in the "Computerize Your Finances" article in the September 1986 issue of *RUN*. The correct number is 215-691-1147.

Marion A. Horton
J. B. Horton Company
Bethlehem, PA

Objective Reviews

Thank you, thank you for the Software Gallery reviews in *RUN*. They're not sugar-coated, and they point out shortcomings with little concern for pleasing the manufacturers.

John F. Rajczewski
Ballston Lake, NY

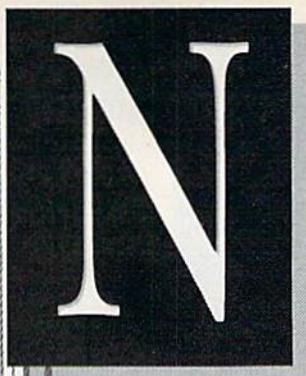
Index Interest

As a *RUN* subscriber for the past 18 months, I've enjoyed your publication a great deal and have kept all my copies for future reference. I've found only one major fault with *RUN*—the lack of an annual index to feature articles and reviews. How about publishing a three-year index of all the issues so far, then an annual index thereafter?

Jerry M. Bloomer
Shreveport, LA

*You apparently missed the index to 1985 that appeared in the January 1986 issue. It listed all the articles and reviews that were published in *RUN* in 1985. There was also an index to 1984 in the January 1985 issue, and, of course, there's an index to 1986 in this issue. We do it every year.*

Editors



74470 12069

Compiled by HAROLD R. BJORNSEN

Telegames

Bear Graphics Software (PO Box 12206, New Brighton, MN 55112) has released the first three titles in its new line of on-line games, called Telegames, for the C-64, which you play through your modem with another C-64 user. There are no connect charges, since no commercial on-line network is needed.

Trapdoor Checkers includes the traditional game of checkers, and you can also play it with trapdoors, which can be sprung any time during play. Radical Chess includes traditional chess and the radical version, in which a player's piece is randomly exchanged for a piece from the discard if he or she lands on a secret square. Baudleships is played like the board game Battleship, with added sound effects. Each game includes two disks so you can send one to a friend with whom you want to play. Each game costs \$24.95.

Check Reader Service number 411.

Excite Them with the Classics

Automated testing and record-keeping, a comprehensive book list, a motivational program and minimum teacher intervention are key features of the new Accelerated Reader package from Readup (PO Box 95, Port Edwards, WI 54469). Accelerated Reader is suitable for children ages 8-18 and can be used by children of different reading abilities.

To use the program, a student selects a book from among 150 titles, reads it and then tests his or her comprehension of the book on the

C-64. The complete \$300 Accelerated Reader package includes the teacher's master disk, a backup disk, four testing disks, a manual and registration and warranty cards.

Check Reader Service number 407.



The Accelerated Reader, from Readup.

Master the Possibilities

MicroMotion (8726 S. Sepulveda Blvd., #A171, Los Angeles, CA 90045) has released MasterForth for the C-64. Programs written for the C-64 will run unchanged on the IBM family of personal computers, the Apple Macintosh and Apple II series and the Z80s run in CPM. MasterForth provides a complete programming environment, including a macroassembler and a full file interface. Relocatable utilities and transient definitions make it possible to run lengthy programs even in a limited memory environment. MasterForth is available on disk for \$100.

Check Reader Service number 405.

Ed Grimley Heaven

Do you think Ed Grimley, star of Saturday Night Live and SCTV, could stand *not* playing The Ultimate Game Show? It combines features of the best TV game shows. He and up to three of his friends can play any of four phases, each depicting a different game show, in any combination, at their own skill levels. If you're reading this, Ed, you must calm down, I must say, and contact the game's manufacturer, Superior Micro Systems (PO Box 713, Wheeling, IL 60090) for more information. It's available on disk for the C-64 and the Plus/4 for \$29.95.

Check Reader Service number 403.

Image Creation

Perspectives II, a three-dimensional graphics design program for the C-64, lets you create and manipulate 3-D graphics images. An interactive menu guides you through all stages of image creation. A drawing screen provides a menu and three views of the image being created, and an Edit Data feature can duplicate or move complete or partial images. By manipulating objects and "photographing" the individual screens into frames, you can create a filmstrip that, when run, animates your objects.

Perspectives II is driven by joysticks, mice, sketchpads and most light pens, and it can exchange two-dimensional images with such graphics programs as Doodle!, KoalaPad and Flexidraw. Available on disk for \$59.95. Kira Corp., PO Box 129, Kutztown, PA 19530.

Check Reader Service number 406.

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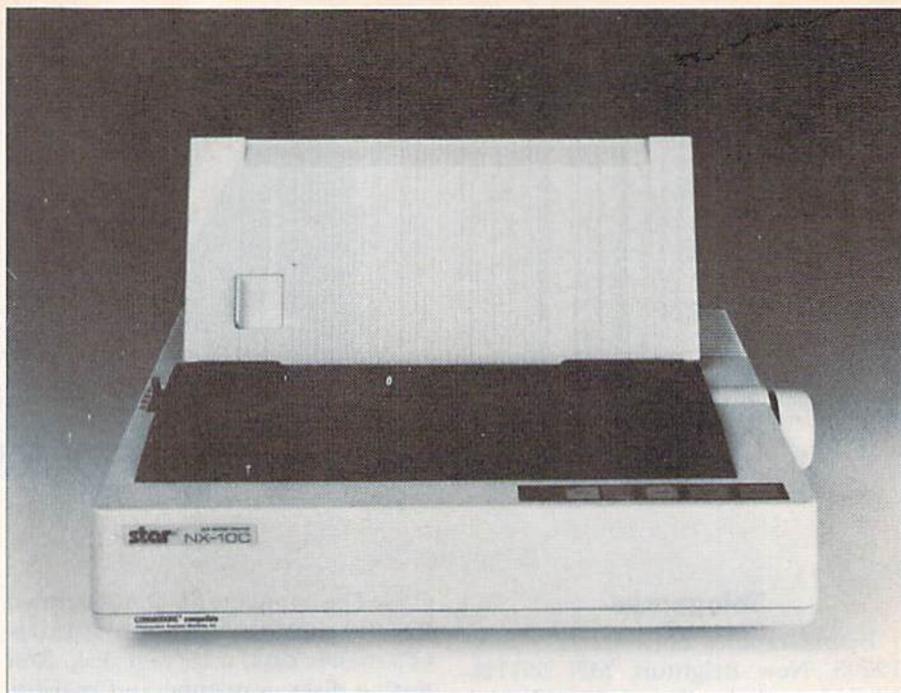
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Star Micronics (200 Park Ave., Suite 3510, New York, NY 10166) introduces the NX-10C, a near-letter quality dot-matrix printer. Print speeds range from 120 characters per second in Draft mode to 30 cps for Near-Letter Quality mode. Front-panel controls eliminate the need to adjust dip switches for the most commonly used printer functions. The printer has its own built-in character set, offering upper- and lowercase letters, numbers and symbols in NLQ mode, with the addition of block graphics in Draft mode. Available for the C-64 and C-128 for \$349.

Check Reader Service number 400.

Cybernation Animation

Cyber Video, a package of three machine language program modules for the C-64, lets you create animation with hi-res color graphics, sprites, text, music and sound effects, using either a KoalaPad, mouse or joystick. The Graphics module features zoom drawing and a sprite editor, the Music module uses standard music notation and includes a music editor, and the Animation module lets you create, edit and run animation lists. Cyber Video comes with a dongle, demo disk, 96-page manual and a master disk containing the modules. The package costs \$39.95. Touchstone, PO

Box 1378, Coeur d'Alene, ID 83814.
Check Reader Service number 404.

Fancy Fonts

Device One, a parallel printer interface from Progressive Peripherals & Software (464 Kalamath St., Denver, CO 80204), lets you create letterheads and banners, number pages, define margins and print high-resolution pictures along with text. Device One can mix up to four different font sizes and up to 13 different font styles in one sentence. It's available for the C-64 and C-128 for \$119.95.

Check Reader Service number 402.

Space or Race

Interstel (PO Box 57825, Webster, TX 77598) has released two games for the C-64. In Balakon Raiders, a space adventure, you must destroy the enemy's defenses to prevent them from conquering the galaxy. In Spin Out, an auto-racing game, you create your own tracks and challenge your friends to beat your best times. Balakon Raiders (\$29.95) and Spin Out (\$19.95) are available on disk.

Check Reader Service number 401.

Five from Mastertronic

Mastertronic (7311B Grove Road, Frederick, MD 21701) adds five new

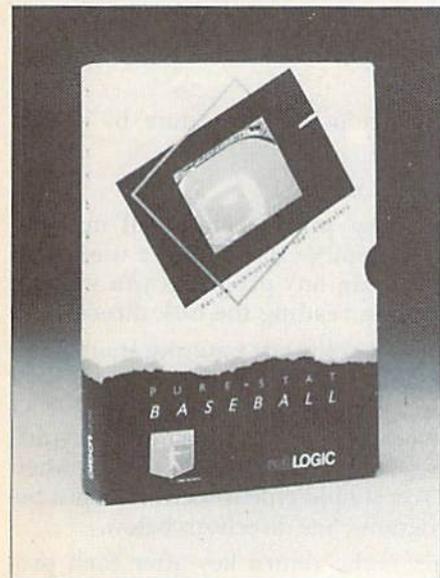
games to its catalog. Speedking is a motorcycle racing game that pits you against 19 determined riders. Las Vegas Video Poker tests your gambling skills against the computer. Master of Magic makes you search for the lost Amulet of Immortality before returning you to your world. Soccer includes crowd atmosphere and an announcer to keep you up to date with the action on the field. Slugger is a baseball game that puts you up against another player or against the computer. Each game is available on disk for the C-64 for \$9.99.

Check Reader Service number 409.

Off-Season Baseball

Pure-Stat Baseball, a one- or two-player sports simulation from SubLogic (713 Edgebrook Drive, Champaign, IL 61820), lets you select the team you'd like to manage, then pick the team you want to play against. Every team from the 1985 season is represented, along with eight classic teams from the past. You can trade team players, draft new players, create your own teams and form your own league. Pure-Stat Baseball keeps track of your team's season statistics and individual player year-to-date stats. It's available on disk for the C-64 for \$49.95.

Check Reader Service number 413.



SubLogic's Pure-Stat Baseball simulation.

I Am the C-128

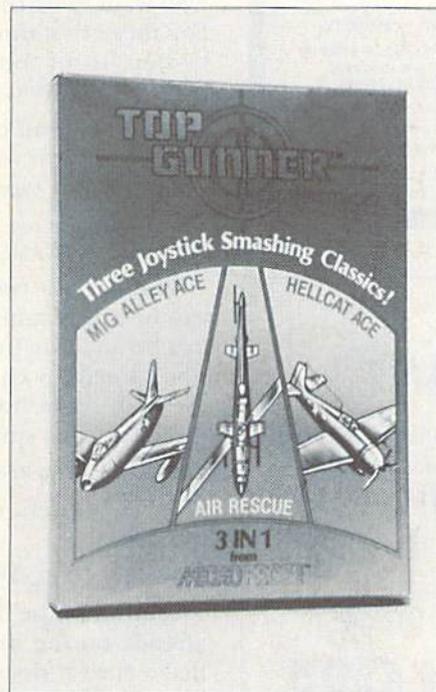
I Am the C-128 is a hands-on tutorial that teaches you the workings of

your 128 and provides you with an introduction to programming. The program explains computer jargon, eliminates cryptic commands and provides insight into everything from keyboard layout to animation programs and debugging. Several practice programs are included so you can experiment with the information. I Am the C-128 is available on disk for \$34.95 from Activision, Inc., 2350 Bayshore Frontage Road, Mountain View, CA 94043.

Check Reader Service number 410.

Danger Zone

MicroProse Software (120 Lakefront Drive, Hunt Valley, MD 21030) has combined three of its previously separate air-combat simulation games for the C-64 into one game package called the Top Gunner Collection. The



The Top Gunner Collection, from MicroProse.

games are Hellcat Ace, which re-creates 14 U.S.-Japanese air battles in the South Pacific during World War II; MiG Alley Ace, an aerial dogfighting game in which two players battle head to head or against the computer-controlled enemy; and Air Rescue, an arcade game that challenges you to move your assault helicopter through a treacherous underground labyrinth while evading the enemy. The Top Gunner Collection is available on disk for \$24.95.

Check Reader Service number 414.

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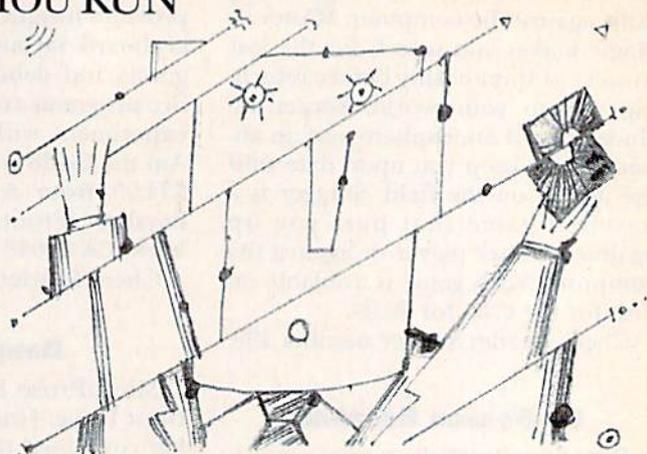
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LEARN TO WALK BEFORE YOU RUN



We receive many letters from new Commodore owners who want to learn the first steps in using their computers. For these first-time users, we present the following step-by-step list of things that all beginners should be aware of as they start typing in programs.

1. Before you can use a fresh disk, you have to format it. First turn on your disk drive, then insert the disk, close the latch and type:

```
OPEN15,8,15 <Press Return>
PRINT#15,"NO:NAME,##" <Press Return>
```

The ## is a two-character identification number that can be any combination of letters and/or digits. "NAME" can be any title for your disk that you choose, but it must not exceed 16 characters. Wait for a few minutes while the disk spins inside the drive, being formatted. When the disk stops spinning, type:

```
CLOSE15 <Press Return>
```

C-128 owners can shorten this procedure by simply typing:

```
HEADER "NAME,##" <Press Return>
```

Caution: The formatting process erases all material already on the disk, so if you're formatting a used disk, make sure it doesn't contain any programs you want to save. See item 7, below, on reading the disk directory.

2. As a beginner, you should start entering short Basic programs. Avoid machine language listings and very lengthy Basic programs until you get the hang of what you're doing. We have a checksum program (Perfect Typist) which actually proofreads your typing and tells you when you make a mistake. You should type in Perfect Typist before you enter any programs. See directions below.

3. Remember to press the return key after each programming line you type in.

4. As you are typing in a program, you are likely to make typographical errors. To check what you have typed in, you'll need to list your program's lines on the screen. You can specify the exact lines that you want to see. Typing LIST 10-50 will list lines 10 through 50. LIST 20 will list only line 20. If you see an error in one of your

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listed lines, you can fix it by using the INST/DEL key and retyping the incorrect section of the line. Always press the return key after you have fixed a line.

5. Be sure to save what you have typed in before turning off your computer. To save any partial or complete Basic program listing to your disk, type:

SAVE "NAME",8 <Press Return>

C-128 owners can press F5, type in the program name, and press the return key.

Note: As you save subsequent versions of the same program, you need to make a slight change in the program name each time. You might simply add version numbers to the end of the program name (PROGRAM.1, PROGRAM.2, etc.).

6. While working on a program, you may develop several versions before you're satisfied that you have it in final form. After you *do* achieve that final version, you might want to go back and erase the old, incomplete versions from your disk. Erasing unwanted programs is called scratching. (Be sure not to erase your final version!) To scratch a program, type:

OPEN15,8,15 <Press Return>

PRINT#15,"S0:prog.name" <Press Return and wait a few seconds>

CLOSE15 <Press Return>

7. After you have saved several programs to your disk, you will need to see their names so that you can load the one you want. To get the complete list (the disk directory) of all the program names on your disk, type:

LOAD "\$",8 <Press Return>

Then type LIST to actually see the directory. C-128 owners simply press F3.

8. When you know what program you want to load into your computer, type:

LOAD "NAME",8 <Press Return>

C-128 owners can just press F2, type in the program name, and press the return key.

9. After you have loaded a program, type RUN to actually use the program.

HOW TO TYPE LISTINGS FROM RUN

To simplify your typing of RUN's C-64 and C-128 program listings, we include checksum numbers. These numbers follow a REM statement at the end of each line (e.g., :REM*123). These checksum numbers necessitate your using RUN's Perfect Typist programs, listed below. Use 64 Perfect Typist for C-64 programs and 128 Perfect Typist for 128 Mode programs on the C-128.

Type in 64 Perfect Typist (Listing 1) or 128 Perfect Typist (Listing 2) and save it to either tape or disk before running. When you want to type in a 64- or a 128-mode program, first load and run the appropriate Perfect Typist listing. Two SYS numbers will be displayed on your screen. Jot these down and keep them handy. They are

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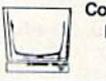
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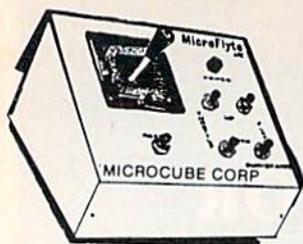
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the SYS numbers that you type in for deactivating and reactivating the checksum program.

After Perfect Typist has been loaded and run, start typing in the program listing from *RUN* as you normally do. The only difference is that now, after you press the return key to log in each line, a 1-, 2- or 3-digit number will appear below the line on the left margin. This is the checksum number, ranging from 0 to 255.

If this number matches the checksum number printed in the listing after the :REM*, then you know you have typed that line correctly. Then you type the next program line right over the previous line's checksum value. If the checksum numbers do not agree, analyze your line on screen for any typographic errors or omissions. Make the needed changes and press the return key again to log in those changes. A new checksum number will appear in place of the old one. Compare this to the magazine's number and then proceed to the next line.

When you've finished typing in your program, disable the Perfect Typist by typing in the appropriate SYS number for either 64 or 128 mode, and press the return key. Now you can save your program as usual, to disk or tape. (Before you attempt to run your new program, turn your computer off and back on to completely clear out the Perfect Typist program.)

You may save an incomplete program any time and continue it later. You will have to reload and run the Perfect Typist program, then load the incompleting program that you were working on, list it, and continue where you left off.

The 128 Perfect Typist will work in either 40 or 80 columns. Also, it lets you use the C-128's automatic line-numbering. If Auto is on, the checksum will be printed below the line you just entered, and the C-128 will place the next line number below the checksum.

All listings in *RUN* have been translated so that the graphics and control characters are designated as understandable key combinations. When you see instructions inside curly brackets, such as {SHIFT L}, you should hold down the shift key and press the L key. What you see on your screen will look quite different from what is designated inside the brackets. Another example is {22 SPACES}, which instructs you to press the space bar 22 times.

Listing 1. 64 Perfect Typist program.

```

1 REM 64 PERFECT TYPIST
2 REM BY: JAMES E BORDEN
10 POKE56, PEEK(56) - 1 : POKE52, PEEK(56) : CLR
20 PG = PEEK(56) : ML = PG * 256 + 60
30 FOR X = ML TO ML + 154 : READD : T = T + D : POKE X, D : NE
  XT
40 IFT <> 16251 THEN PRINT "ERROR IN DATA...":
  END
60 POKE ML + 4, PG : POKE ML + 10, PG : POKE ML + 16, PG
70 POKE ML + 20, PG : POKE ML + 32, PG : POKE ML + 38, P
  G
80 POKE ML + 141, PG
89 PRINT "{SHFT CLR}{CRSR RT}*****"
  *****"
90 SYS ML : PRINT "{CRSR RT}** 64 PERFECT TYP
  IST IS NOW ACTIVE{2 SPACES}**"
    
```

```

100 PRINT "(CRSR RT)** SYS"ML"=ON(5 SPACES)
SYS"ML+30"=OFF **"
101 PRINT"{CRSR RT}"*****
*****":NEW
110 DATA 173,005,003,201,003,208,001,096
120 DATA 141,105,003,173,004,003,141,104
130 DATA 003,162,103,160,003,142,004,003
140 DATA 140,005,003,096,234,234,173,104
150 DATA 003,141,004,003,173,105,003,141
160 DATA 005,003,096,032,124,165,132,011
170 DATA 162,000,142,240,003,142,241,003
180 DATA 189,000,002,240,051,201,032,208
190 DATA 004,164,212,240,040,201,034,208
200 DATA 008,072,165,212,073,001,133,212
210 DATA 104,072,238,241,003,173,241,003
220 DATA 041,007,168,104,024,072,024,104
230 DATA 016,001,056,042,136,016,246,109
240 DATA 240,003,141,240,003,232,208,200
250 DATA 173,240,003,024,101,020,024,101
260 DATA 021,141,240,003,169,042,032,210
270 DATA 255,169,000,174,240,003,032,205
280 DATA 189,162,003,189,211,003,032,210
290 DATA 255,202,016,247,164,011,096,145
300 DATA 013,032,032

```

Listing 2. 128 Perfect Typist program.

```

1 REM 40/80 COL C128 PERFECT TYPIST
2 REM BY: JAMES E BORDEN
10 FORX=5120TO5379:READD:T=T+D:POKEX,D
20 NEXT:IFT<>28312 THENPRINT"{2 CRSR DNS}ER
ROR IN DATA...":END
25 A$="":IFPEEK(215) THENA$="{20 SPACES}"
30 PRINT"{SHFT CLR}"A$ *****
*****":NEW
40 PRINTA$ ** 128 PERFECT TYPIST IS NOW AC
TIVE **"
50 PRINTA$ **{2 SPACES}SYS 5120=ON(7 SPAC
S)SYS 5150=OFF{2 SPACES}**"
60 PRINTA$ *****
*****":SYS5120:NEW
70 DATA 173,5,3,201,20,208,1,96,141,45,20,1
73,4,3,141,44,20,162,43,160,20
80 DATA 142,4,3,140,5,3,96,234,234,173,44,2
0,141,4,3,173,45,20,141,5,3,96
90 DATA 32,13,67,140,255,19,162,0,142,252,1
9,142,253,19,142,254,19,189,0,2
100 DATA 201,32,240,8,201,48,144,7,201,58,1
76,3,232,208,238,189,0,2,240,54
110 DATA 201,32,208,5,172,254,19,240,42,201
,34,208,10,72,173,254,19,73,1
120 DATA 141,254,19,104,72,238,253,19,173,2
53,19,41,7,168,104,24,72,24,104
130 DATA 16,1,56,42,136,16,246,109,252,19,1
41,252,19,232,208,197,173,252
140 DATA 19,24,101,22,24,101,23,141,252,19,
169,42,32,241,20,32,188,20,160
150 DATA 2,185,185,20,32,241,20,136,16,247,
165,116,208,9,165,117,208,5,169
160 DATA 145,32,241,20,172,255,19,96,13,32,
32,162,0,173,252,19,232,56,233
170 DATA 100,176,250,105,100,202,240,3,32,2
32,20,201,10,176,5,205,252,19
180 DATA 240,15,162,0,232,56,233,10,16,250,
24,105,10,202,32,232,20,170,72
190 DATA 138,9,48,32,241,20,104,96,170,173,
0,255,72,169,0,141,0,255,138,32
200 DATA 210,255,104,141,0,255,96

```



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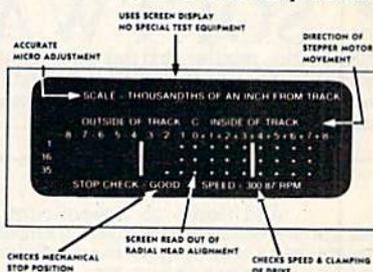
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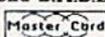
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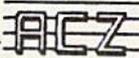
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Item: For those who wish to write to Ken Amberg, author of "Sign Maker" (September 1986, p. 76), his new address is 8813 Tammy Drive, Westchester, OH 45069.

Item: Since publication of Magic trick \$364 (November 1986, p. 111), Romco's address and telephone number have changed. The company can be reached at PO Box 248, Derby, KS 67037; 316-788-6985 or 800-346-3025.

Item: Magic trick \$35F (November 1986, p. 110) implied that Okidata's new edition of the manual for the Okimate 10 color printer could be obtained free of charge. This is not so. The cost is \$5.

Item: "Dashing Off the Dots" (November 1986) needs a slight correction in Listing 1 on p. 119. In line 5020, insert a quotation mark after the word DATA. Also, we offer apologies to Electronic Put-Ons, of Vancouver, Washington, for our inadvertent use of "Morse Code Tutor" as the name of the program. We were unaware that "Morse Code Tutor" is a copyrighted name of one of that company's programs. See this issue's Mail RUN.

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February

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GEOS ENHANCERS—Berkeley Softworks has released the first of several utilities that promise to increase the capabilities of the GEOS operating system. We'll review Font Pack, which lets you add various type styles and sizes, and Desk Pack, featuring four new applications, including an appointment calendar.

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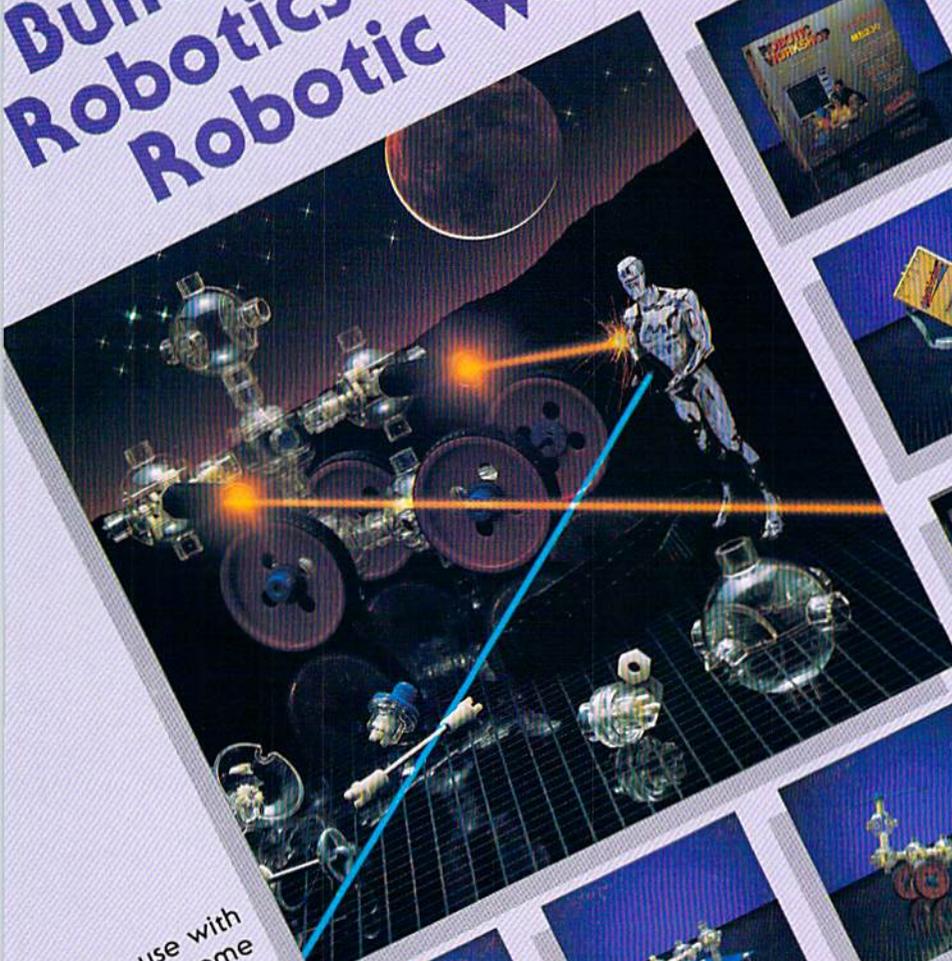
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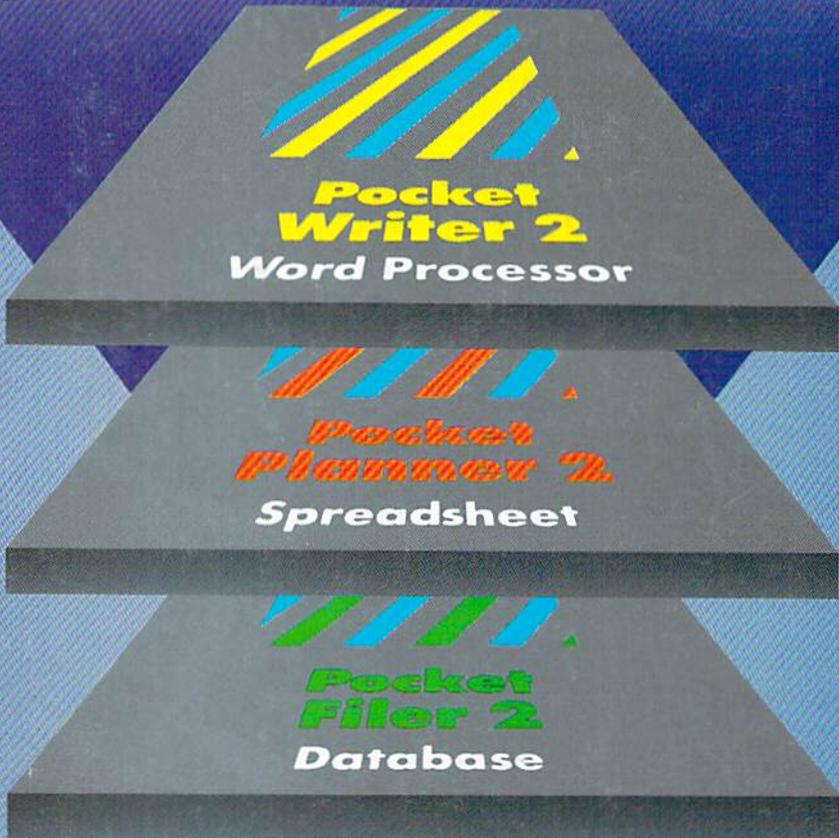
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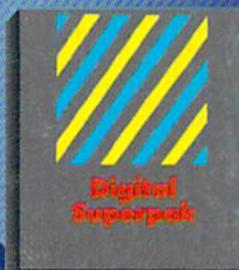
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