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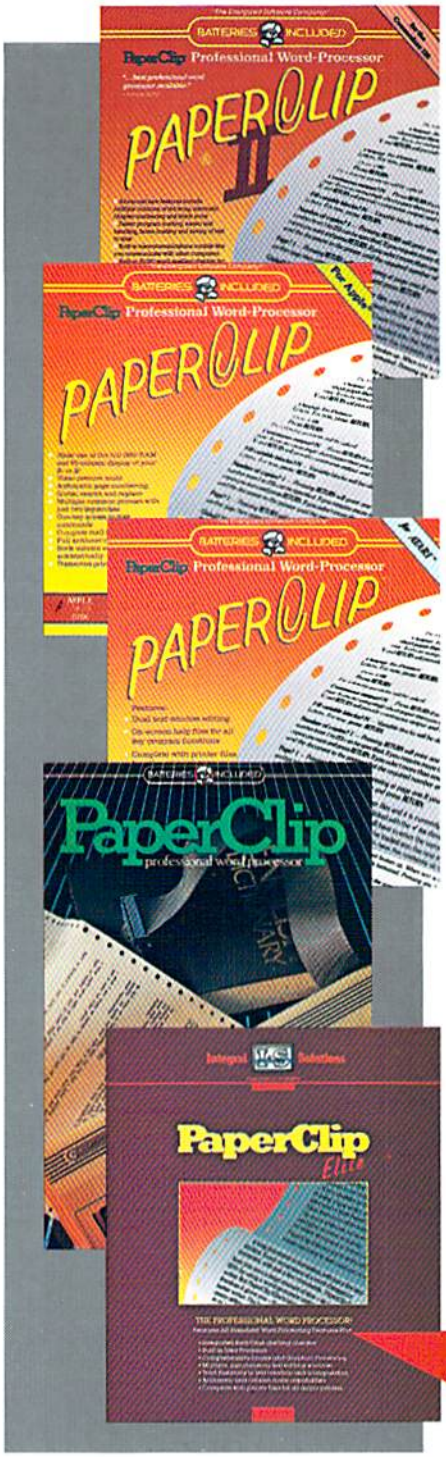
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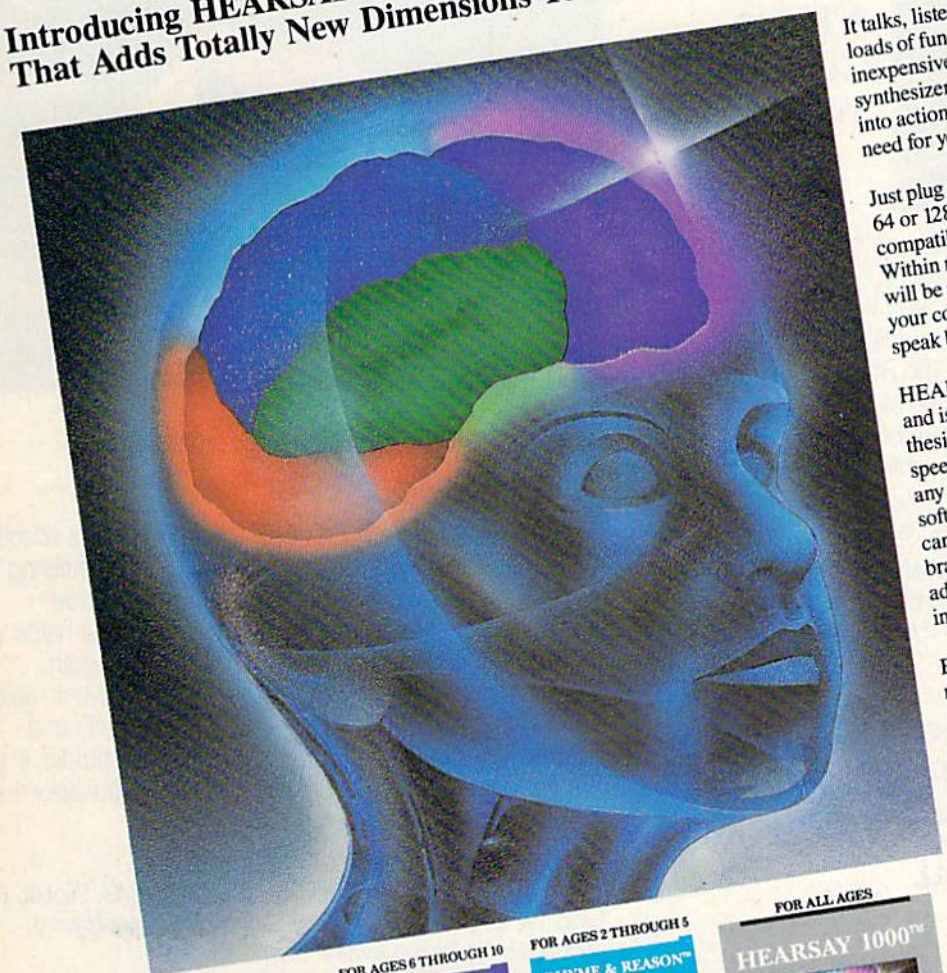
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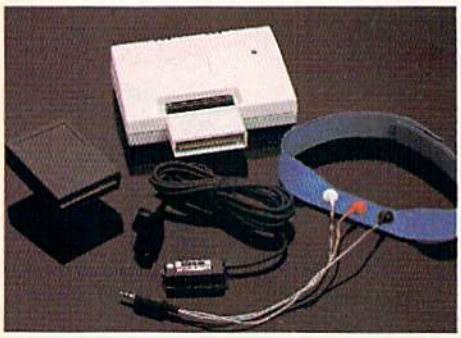
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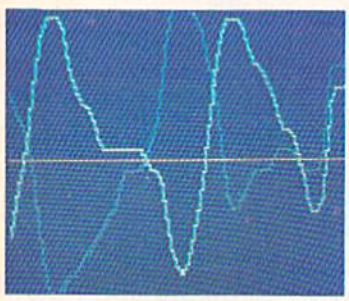
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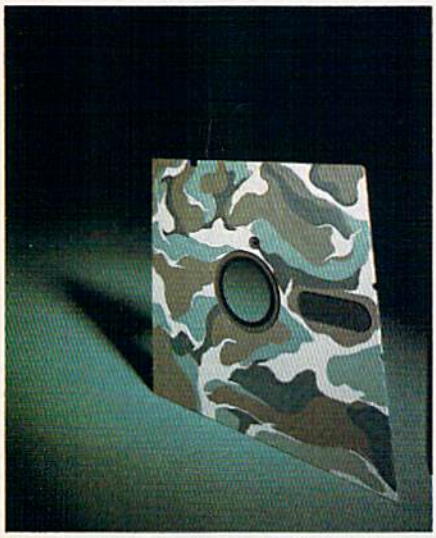
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JANUARY 1987
VOLUME 4, NUMBER 1

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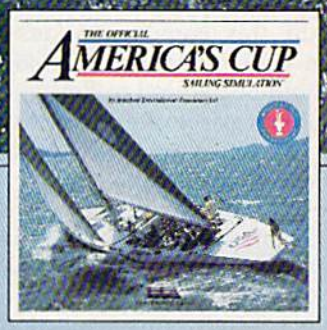
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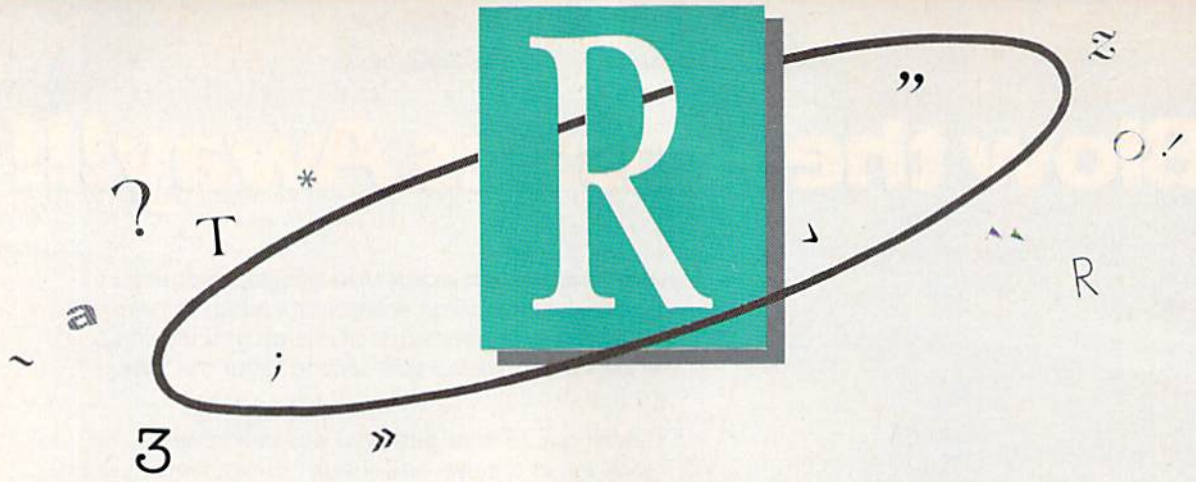


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The Copy Controversy

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 copiers) 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 Commodore 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.

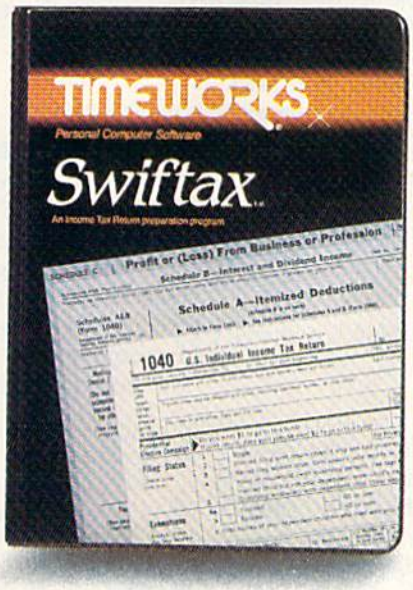
As Mace states in his article, "The vast majority of user groups recognize that illegal copying is a problem, and they are on the front lines of the battle, educating users about the law and about the realities of software publishing. Education is paying off."

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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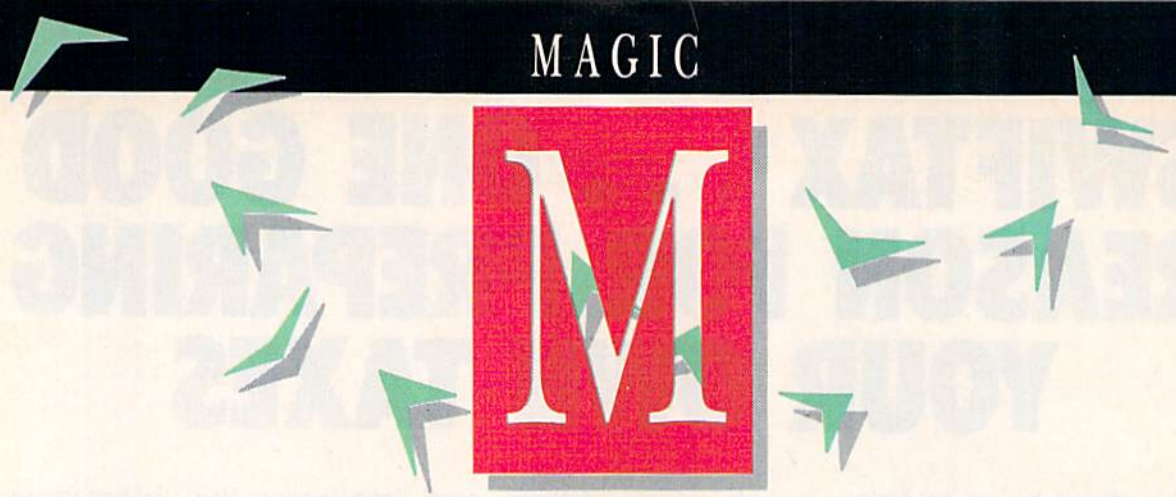
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By JIM BORDEN

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:*

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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 POKE5328Ø,.:POKE53281,.:PRINT"{SHFT CLR}"
  :FORT=1TO23:PRINTTAB(RND(1)*39)"{CTRL 1}.
  ":NEXT
1Ø A$="**********":S=19:PRINT"{HOME}{CRSR
   DN}"TAB(12)"{CTRL 2}MERRY CHRISTMAS!{CRS
   R DN}{CTRL 6}":FORT=1TO11STEP2
2Ø FORL=1TO3:PRINTTAB(S)LEFT$(A$,T):NEXT:S=
   S-1:NEXT:PRINTTAB(19)"*{CRSR DN}{CRSR LF
   }*{CRSR DN}{3 CRSR LFs}*****"
3Ø S=.:DIMF(138):FORT=1Ø24TO2Ø23:IFPEEK(T)=
   42ORPEEK(T)=46THENF(S)=T+54272:S=S+1
4Ø NEXT:S=139:T=15:L=1
5Ø POKEF(S*RND(L)),T*RND(L)+L:GOTO5Ø
```

Richard Penn
Montreal, Quebec, Canada

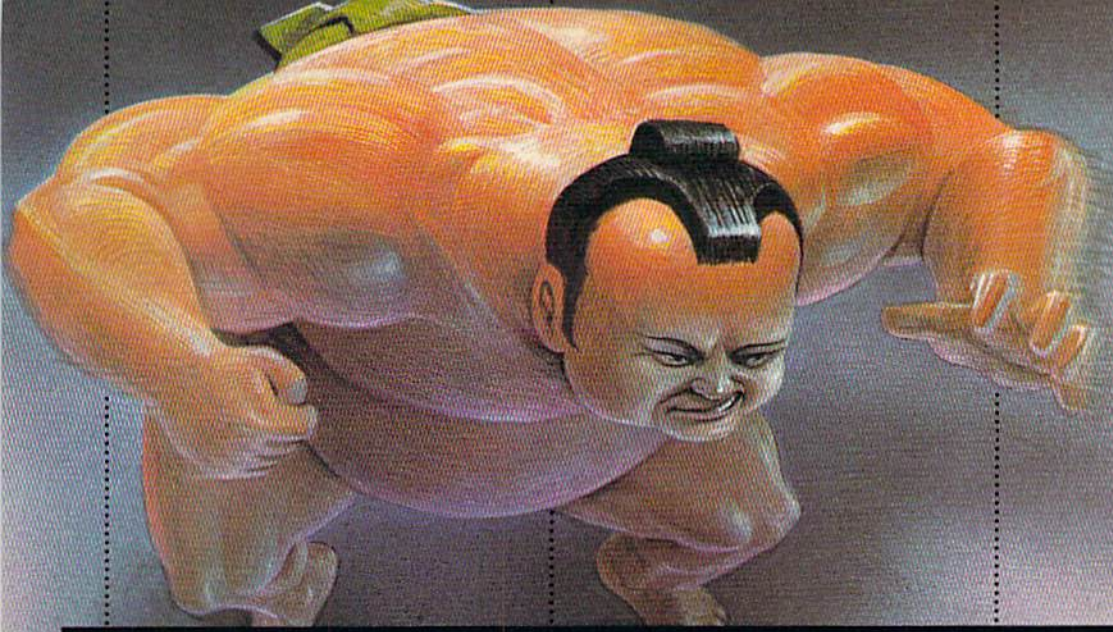
$387 C-64 instant recall—The Screen Saver program listed below is useful for saving lo-res text screens (such as a note to yourself or a disk directory) to the C-64's memory for later recall, even while you're running another program. Type in the listing and make a copy before you run it. Save a screen 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.

```
Ø REM C-64 SCREEN SAVER - CHAD AMES
1Ø FORI=49152 TO 49215:READA:POKEI,A:NEXT:N
   EW
2Ø DATA 169,Ø,162,Ø,189,Ø,4,157
3Ø DATA 8Ø,195,189,255,4,157,79,196
4Ø DATA 189,254,5,157,78,197,189,253
5Ø DATA 6,157,77,198,232,2Ø8,229,96
6Ø DATA 169,Ø,162,Ø,189,8Ø,195,157
7Ø DATA Ø,4,189,79,196,157,255,4
8Ø DATA 189,78,197,157,254,5,189,77
9Ø DATA 198,157,253,6,232,2Ø8,229,96
```

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, hi-res screens and machine language programs can be saved



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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"
   THEND=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$(7):PRIN
   T"{2 CRSR DNs}MY GUESS IS (H)IGH, (L)OW
   OR (R)IGHT ?"
5Ø GETKEY S$:IFS$="H"THENH=M:ELSE IF S$="L"
   THEN L=M:ELSE IF S$="R"THEN EXIT:ELSE GO
   TO5Ø
```

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):TI$="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=1TOAX:IFF%(I)THENFORI2=1TOF%(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$="000000":FORI=
   1TON:A=Y%(I):B=X(I)                :REM*30
60 F%(A)=F%(A)+1:E(A)=B:NEXT:PRINT:PRINT:IT
   =TI                                :REM*202
70 :                                  :REM*46
80 K=1:FORI=1 TO AX                   :REM*170
90 IFF%(I)THENFORI2=1TOF%(I):G%(K)=I:H(K)=E
   (I):K=K+1:NEXT                     :REM*34
100 NEXT:PRINT:PRINT"SORT TIME ="IT/60:PRIN
    T"TOTAL="TI/60                    :REM*16
110 :                                 :REM*86
120 PRINT"HIT ANY KEY FOR LIST"       :REM*10
130 GETA$: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
```

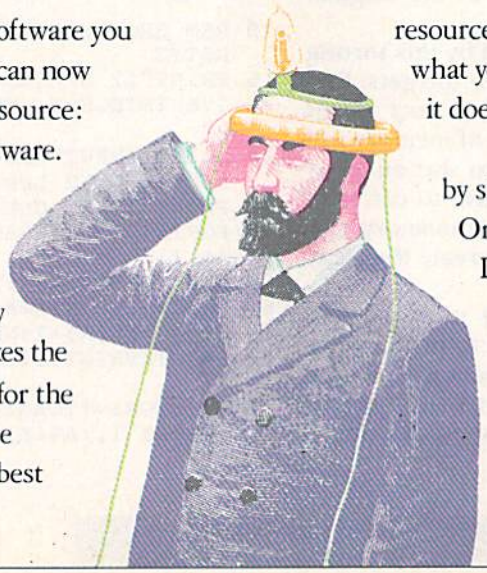
Listing 3.

```
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$="000000"                 :REM*72
60 DIM F%(AX):FORI=1TON:A=Y%(I)       :REM*124
70 F%(A)=F%(A)+1:NEXT:PRINT:PRINT:IT=TI
                                      :REM*112
80 :                                  :REM*56
90 K=1:FORI=1 TO AX                   :REM*180
100 IFF%(I)THENFORI2=1TOF%(I):GOSUB160:K=K+
    1:NEXT                            :REM*8
110 NEXT:PRINT:PRINT"SORT TIME ="IT/60:PRIN
    T"TOTAL="TI/60                    :REM*26
120 :                                 :REM*96
130 PRINT"HIT ANY KEY FOR LIST"       :REM*20
140 GETA$: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:RETUR
    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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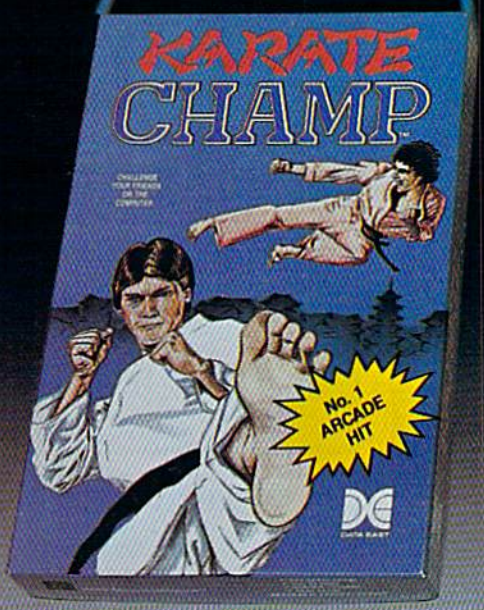
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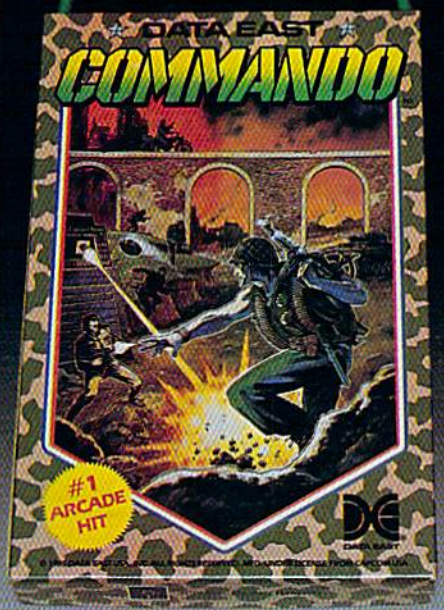


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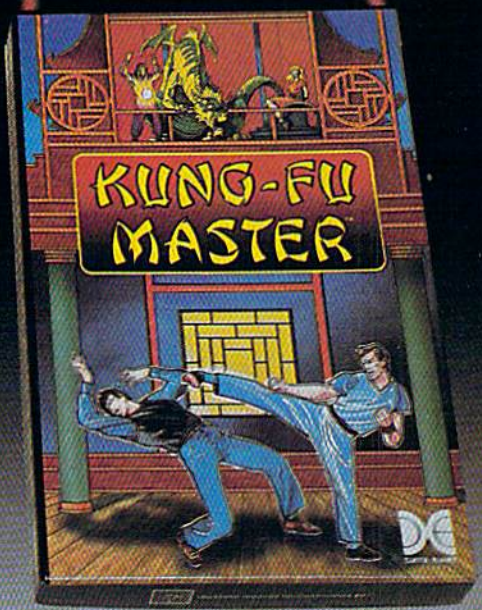
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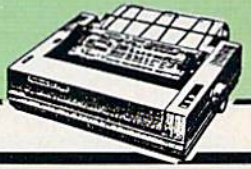
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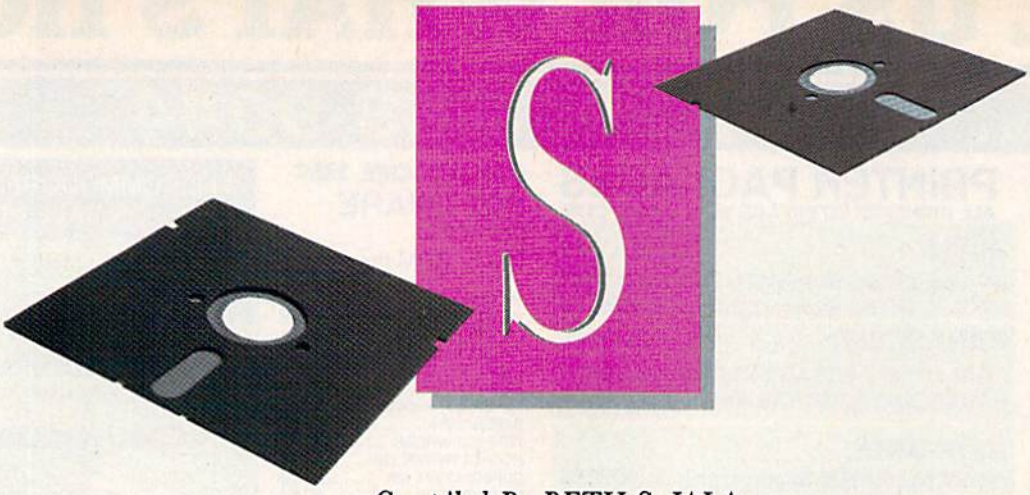




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Compiled By BETH S. JALA

Mind Pursuit

A

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 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 record 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

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!

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.

FROM AMERICA'S Nº1 SOFTWARE HOUSE



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ELITE

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

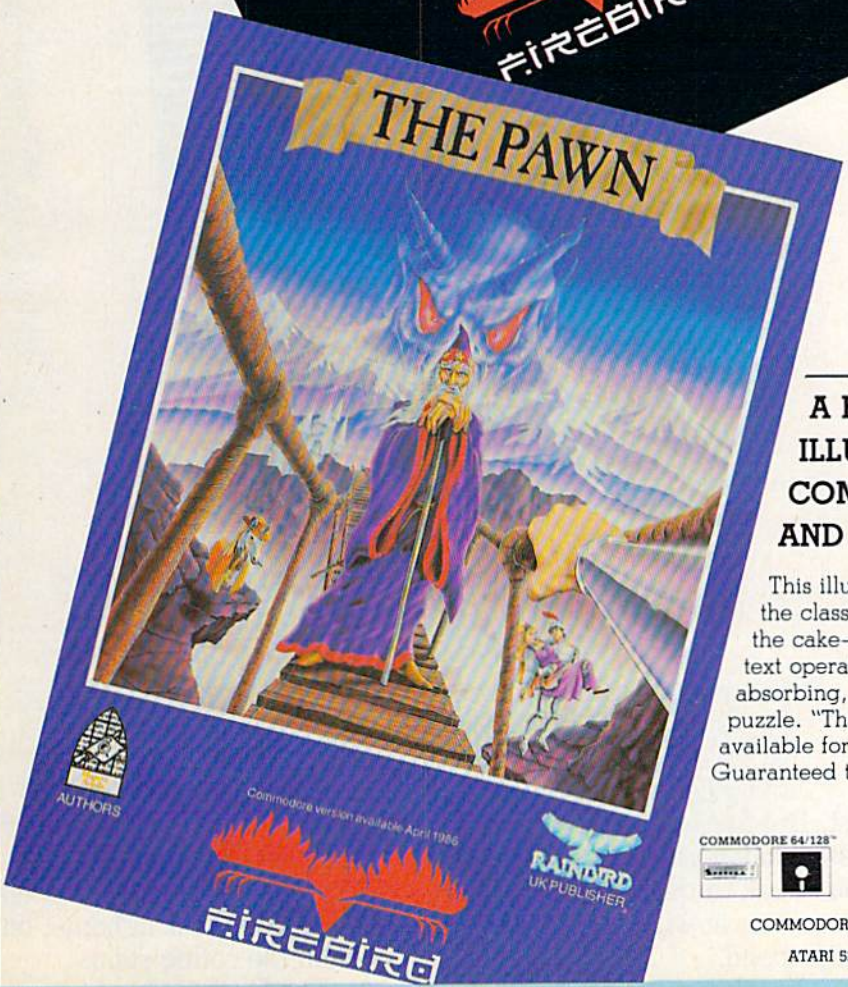
Trade between countless planets, using the proceeds to equip your ship with heat-seeking missiles, beam lasers and other weapons – corporate states can be approached without risk, but unruly anarchies may be swarming with space pirates

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 –

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SCIENTISTS A
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Inside a Commodore 64.

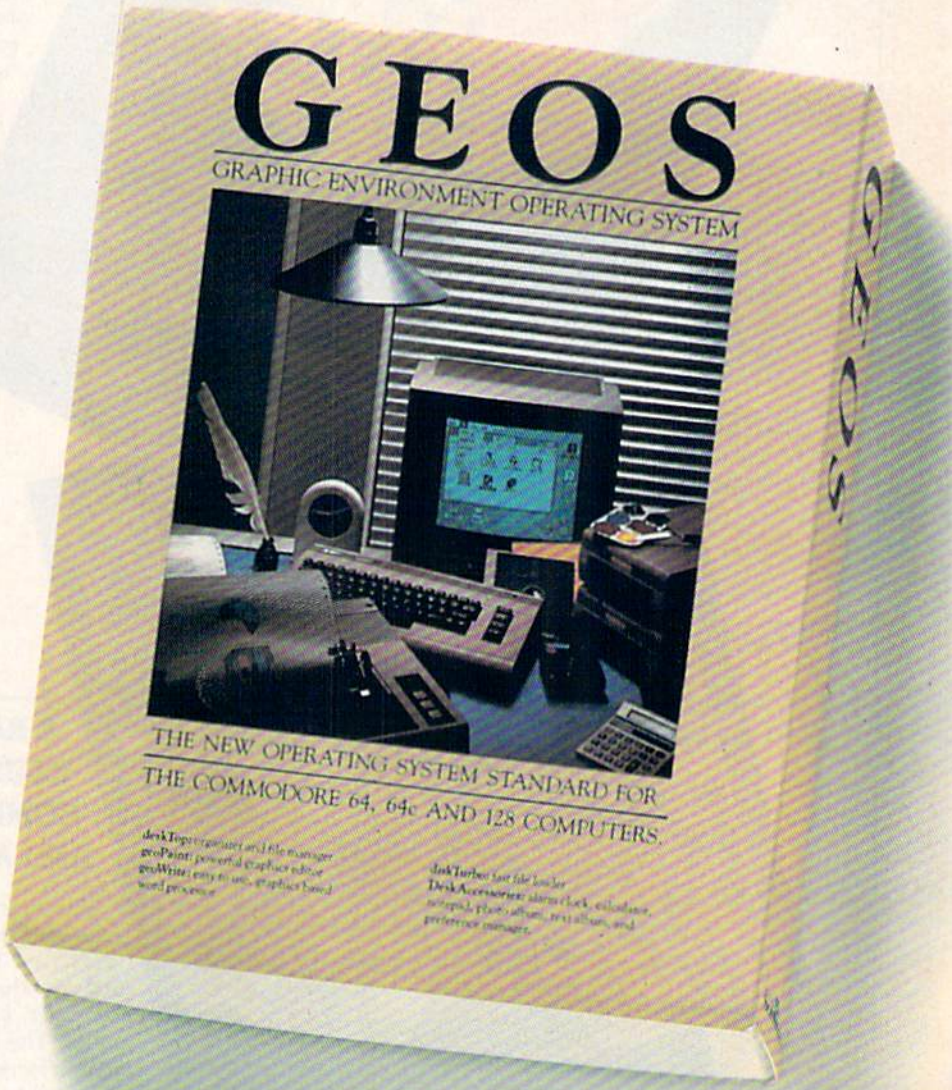
It's called GEOS. And it turns any Commodore into a powerful PC that holds its own against any computer, no matter what kind of fruit it was named after.

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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 storing time.



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

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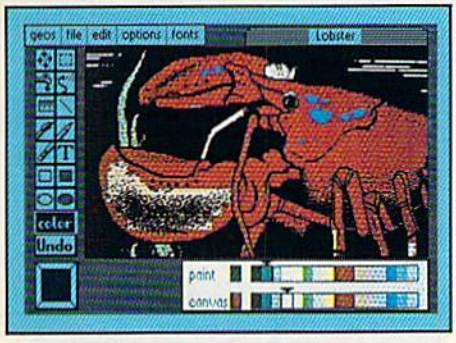
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with all the accessories you need to keep you organized:

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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.

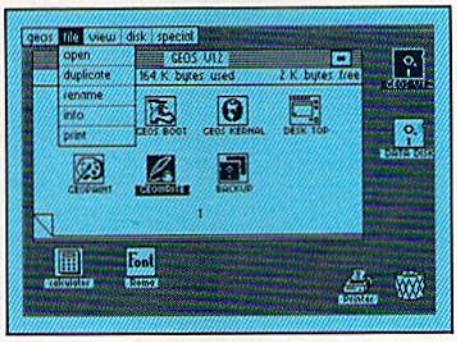
With geoPaint, you become a Michelangelo with a mouse.



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.

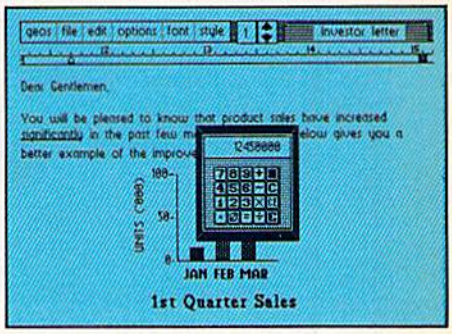
You want to fill in that obtuse rhomboid with an air-brushed geometric pattern in a lighter shade of pink? Point and click.

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.

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.

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

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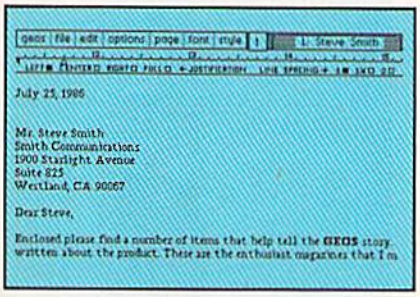
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Whether you're building an argument or just hammering out a memo, any project looks better when you put it together in Writer's Workshop. The supercharger that powers your GEOS-equipped Commodore through even the most wrenching assignments.

Sharpen your skills. The first thing to do in the Workshop is plug into geoWrite 2.0, which contains all the brand new tools you need to hone any rough concept into a well-crafted document.

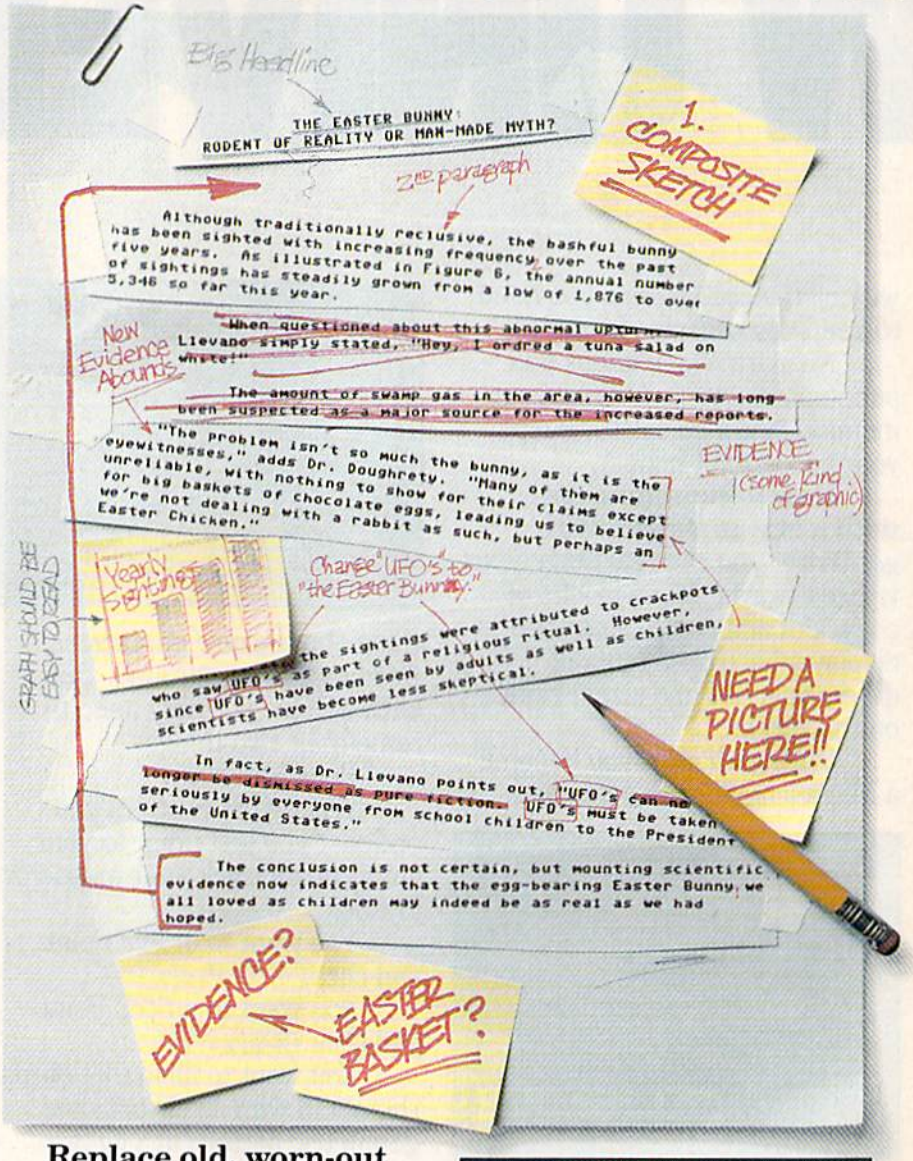
You get headers. Footers. Subscripts and superscripts. You can center your text. Right justify. Full justify. And nail



down formatting problems with variable vertical spacing and adjustable margins.

The Workshop cuts down on your manual labor, too. With one-stroke, "shortcut" keyboard commands. They keep your hands off the mouse so you can keep your mind on your work.

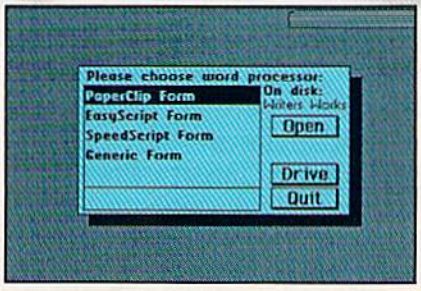
In fact, there's a complete set of heavy-duty accessories that not only strengthen your writing, but reinforce its structure, as well.



Replace old, worn-out parts. You can build anything with Writer's Workshop. And repair old stuff, too. Just decide which parts have to come out and which new ones go in.

Then hit the key and stand back.

Instantly, the "search and replace" drills through your old



Circle 111 on Reader Service card.

GEST CASES
H A WORKSHOP.



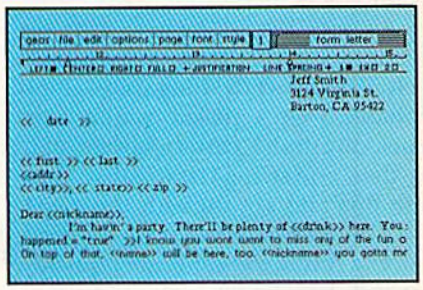
text, replacing worn-out words and phrases with your brand new ones.

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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 LaserWriter for you to print on.

You simply upload your files to QuantumLink.™ Then they're printed and mailed back.

Convenient, or what?



Of course, you don't want to keep good-looking documents like this to yourself. So we built in geoMerge. Which customizes your geoWrite form letters to people on your mailing lists.

So if your plans call for some real masterpieces, do something really constructive about it. Call your software dealer and requisition Writer's Workshop.

Who knows? You just might build a name for your self.

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Writer's Workshop $49.95
(California residents add 6.5% sales tax.)
$2.50 US/$5.50 Foreign for shipping and handling. Allow six weeks for delivery.

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WRITER'S WORKSHOP

GEOS COMPATIBLE



Berkeley Softworks

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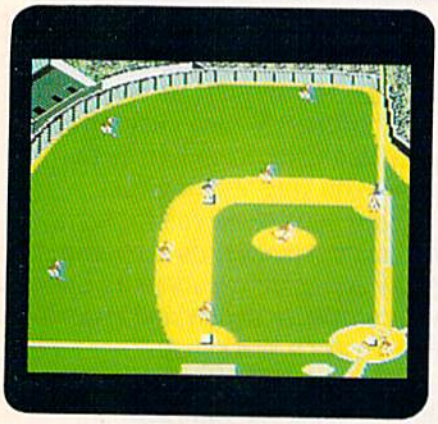
 From p. 18.

ferent defenses or by calling for a bunt from a batter who would normally go for the long ball.

Views of the stadium and animated action will alternate with a score/play selection screen during play. This screen gives you the current score, the stats of the batter, pitcher and current base runner and an action/play selection box.

One of three stadiums—Dodger, Yankee or SubLogic—may be selected. Future releases from the company will include a stadium disk to give you more options in selecting a playing field.

SubLogic has its own answer for speeding up the game of baseball: Each player gets to swing once. If it is probable that a player would have struck out under certain circumstances, then one swing is enough to illustrate this and get on with the game. Hits and walks are similarly reduced, and, as a result, the game goes quickly.



Stadium view of Pure-Stat Baseball.

If you simply want to settle an argument over the better of two teams, then you can match them in an all-computer game and let the stats speak for themselves. It is even possible to switch off the playing field and allow the computer to run through the probabilities about ten times faster.

Because your management of a game generates new statistics, those figures can be saved to a stat/update disk for future use.

I found Pure-Stat Baseball to be one of the best sports simulations I've seen. This assessment applies to the animation, sound effects, ease of use, documentation and, most of all, to the addition of the time machine factor as a way of investigating what might have been. *(SubLogic Corp., 713 Edgebrook Drive, Champaign, IL 61820. C-64/ $49.95 disk.)*

Ervin Bobo
St. Peters, MO

Robot Rascals



Take Your Robot on a High-Tech Scavenger Hunt, But Keep Your Cards Hidden!

What do Gamma Glasses, Digital Donuts and Hologram Hats have in common? Besides the fact that they are alliterations, they're also some of the weird objects that participants must search for while playing Robot Rascals, a new computer/card game for two to four players.

The object of Robot Rascals is to maneuver your robot around the planet Laustenfownd in search of the things that match the cards you hold in your hand. The winner is the first player to find all the objects and return home. But, be forewarned—it's not easy!

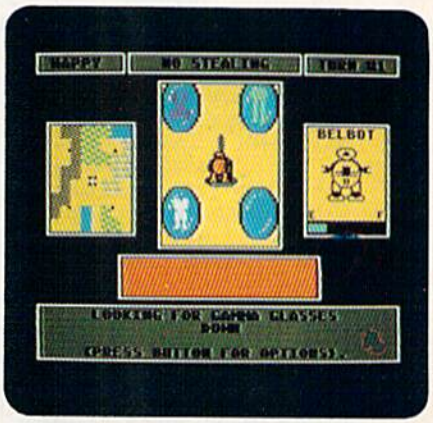
Each player is dealt four item cards. There is little chance, however, that these are the same cards you'll wind up with at the end of the game.

If you choose the standard or advanced levels of play, you're required to select a luck card, which lets you take an item card from the pile or from another player, make two players swap a card, force another player to show one card to everyone else or force everyone to pass a card to the right or left. With cards changing hands so often, there's an excellent chance that the coveted Transistor Taco, which took you ten minutes to find, will become just another piece of excess space debris when someone swipes your card.

To complicate matters further, the player who stole your Taco card may keep it and send his robot to steal the matching item from your robot. In order to prevent this, you can either use some of your robot's energy to put up a protective shield or toss the Taco to the bottom of the nearest lake. Think before you toss, though, because on the thief's next turn, he may find a way to return your card.

Each robot is allotted a specific amount of energy per turn. That energy is expended while moving and teleporting around the planet or scanning for items. When you scan, your robot whirls around and points in the direction you should move to find the object. The faster he spins, the closer you are, and when you're close enough, a scan will cause the item to be sucked up by the robot's tractor beam. You can then scan for something else or quit the turn, using any unspent energy to put up shields or to save for your next turn.

To make things really interesting, at the beginning of every round of turns, the computer announces a Global Event. There are good events such as Free Teleports, Free Scanning, High Energy and Fast Movement, as well as bad events like Home Is Closed and No New Shields. Fortunately, at the beginner level only good events occur, and some types of luck and item cards are removed from the deck before playing.



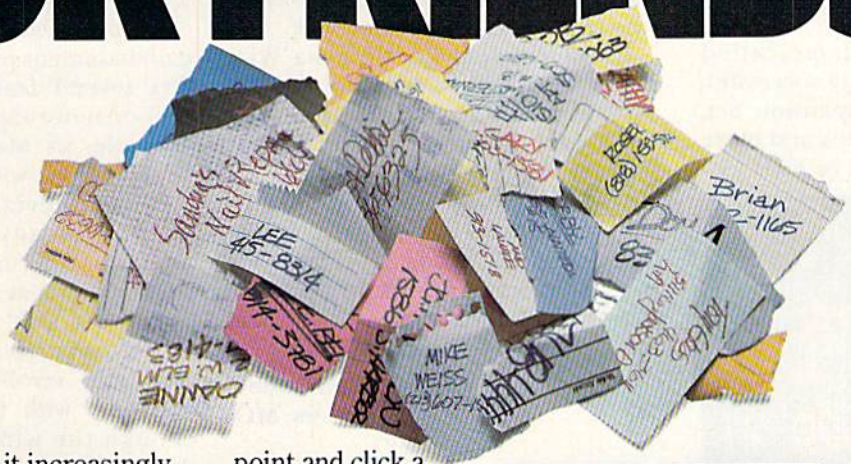
Robot Rascals on the planet Laustenfownd.

In addition to the regular item cards, the advanced game uses two Wild Cards that can be matched up with any item, a Cosmic Cheat card that lets you win with one less item and a Killer Kard that has no matching item and must be discarded or passed off to another player before you can claim victory.

Besides three different levels of play, the amount of energy each player's robot receives at the beginning of each turn can be set individually at the start of the game. In this way, more advanced players can be handicapped to give younger or less experienced players a fair chance at winning.

Robot Rascals is a unique hybrid that combines the entertaining graphics and sound effects of a computer game with the competitive elements

ARE YOU SEARCHING FOR FRIENDS?



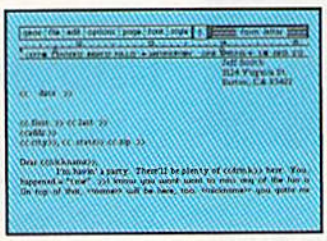
If you're finding it increasingly difficult to find anything at all, maybe it's time you found out about geoDex. The GEOS-compatible directory that generates mailing lists. Prints address labels. And sorts out all sorts of things for your Commodore.

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.

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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.

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GEODEX



Berkeley Softworks

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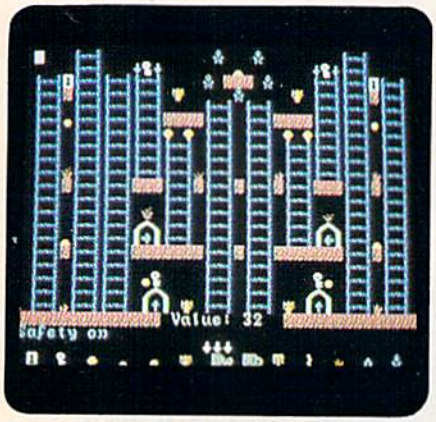
of card and board games, and results in a challenging sport of chance and skill for the whole family. *(Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$39.95 disk.)*

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 occasional 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 B

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, however, 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

C+

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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FONTPACK 1



Berkeley Softworks

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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

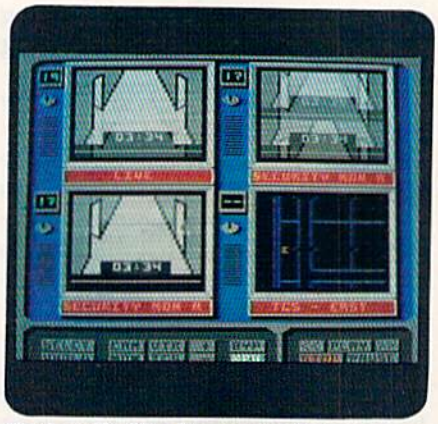
B+

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 scientist 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 Statis 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 cliche 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

ART COLLECTOR, EDITOR, TIMEKEEPER & CARD SHARK FOUND STUFFED IN BOX.

Okay, so maybe we're being a little dramatic. But when you see how much Deskpack 1 adds to your GEOS-equipped Commodore, can you blame us?



First, there's the Graphics Grabber. It runs through clip art galleries like Print Shop,™ Print Master™ and Newsroom™ and copies them into your GEOS photo albums, so that you can use them with geoWrite and geoPaint.



The Icon Editor can replace your GEOS icons with whatever art you've created. Or borrowed.



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And when work gets too boring, our Black Jack dealer pops up to give you a fast shuffle, complete with sound effects.

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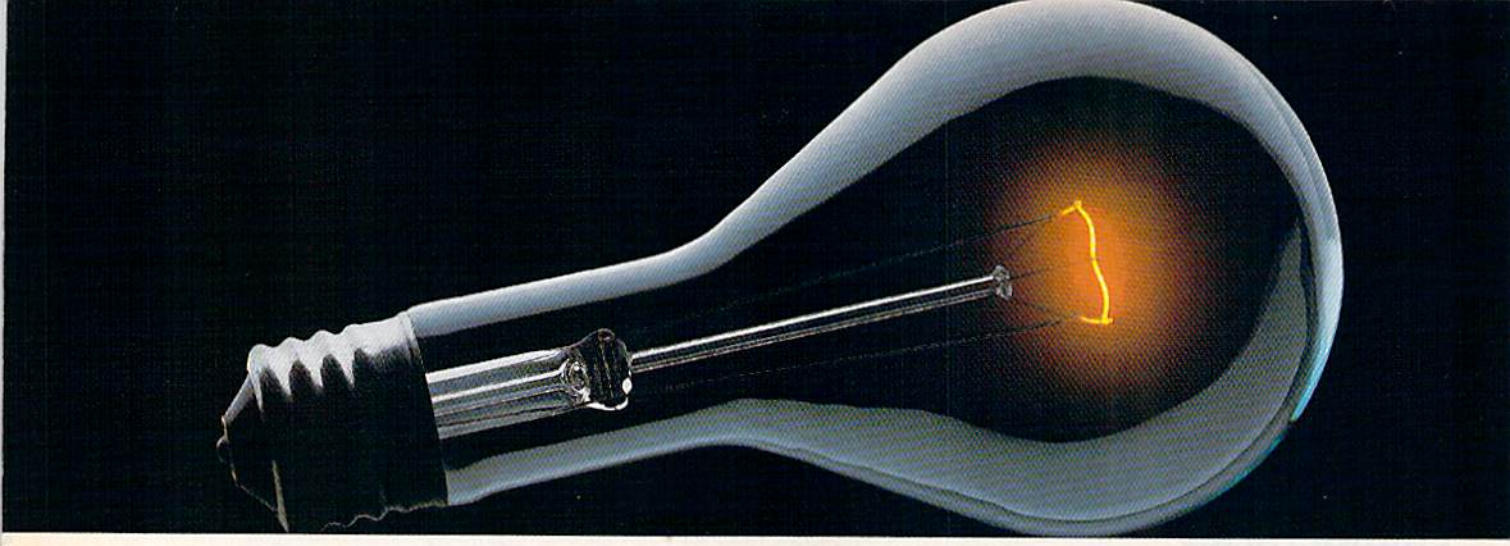
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DESKPACK 1 GEOS COMPATIBLE



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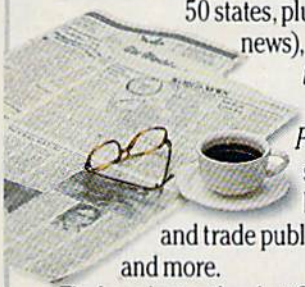
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THE SOFTWARE WAR

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 ▶



PHOTOGRAPHED BY PAUL AVIS

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

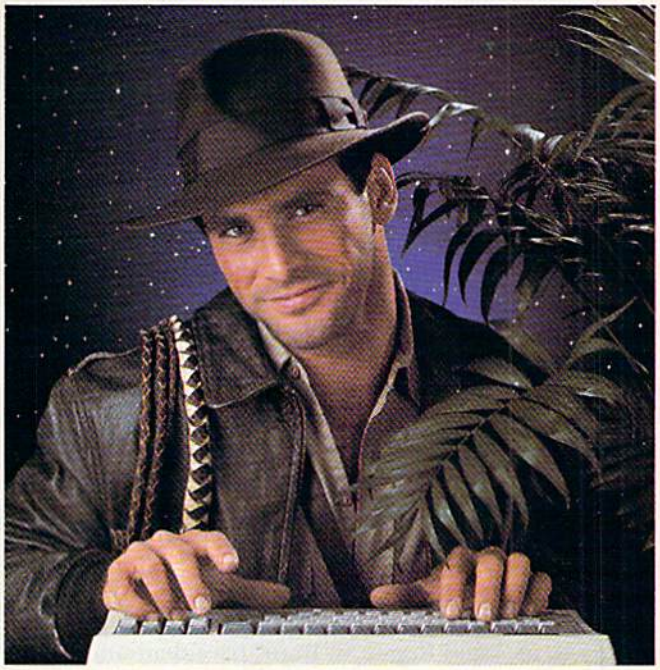
In response, clever users who were also programmers began to write special disk-backup programs to defeat the various protection schemes. A subindustry of "copy-cracking" software has made some of these programmers rich, since many users find these programs essential.

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The Source	X	X	X	no	X	X	$49.95	$10.00	$8.40	$10.80
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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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Tandy 1000/IBM PC Jr. screens shown



"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 *Kaibokan*-type escorts. Moving into attack position."



"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 4! 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."

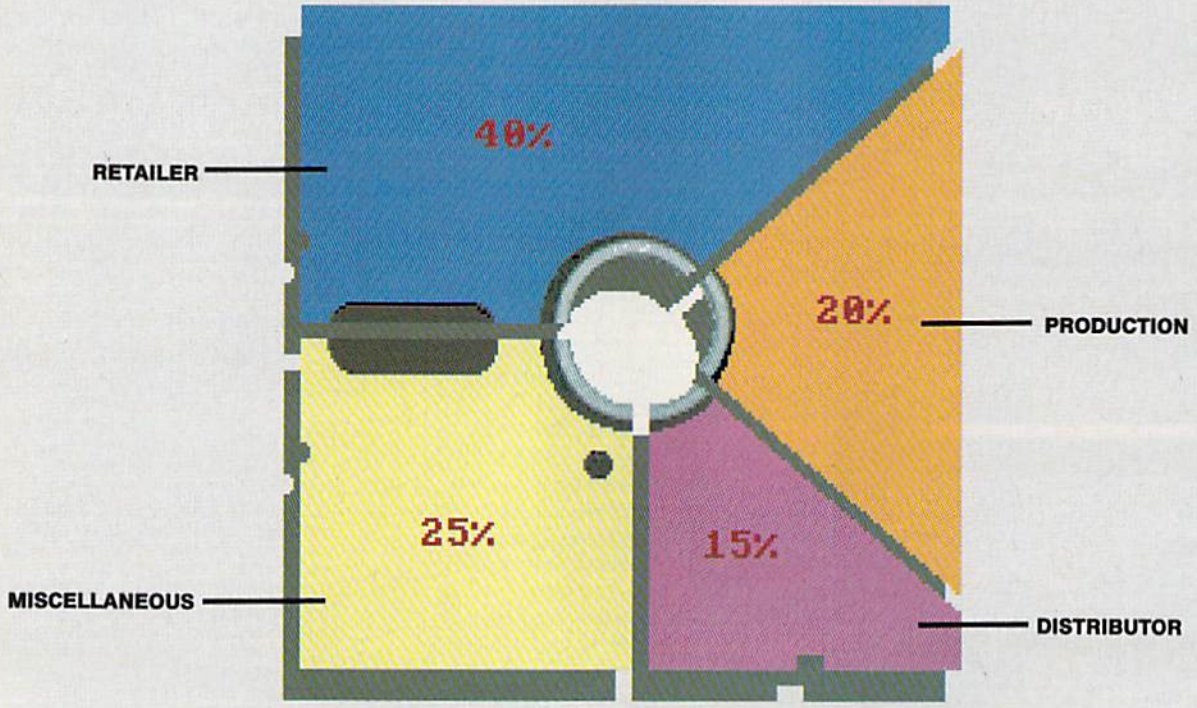
To all these complaints about software price, the publishers offer their data on just what it takes to run a software company.

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.

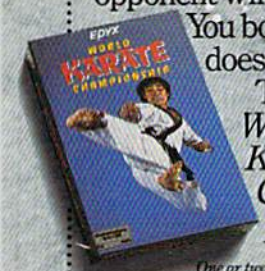
"In addition," said Buoy, "publishers like Mindscape support significant customer service activities and have increased their commitment to research and development of new hardware and new technologies. . . to provide the quality software which our customers expect of us."

"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.*



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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.

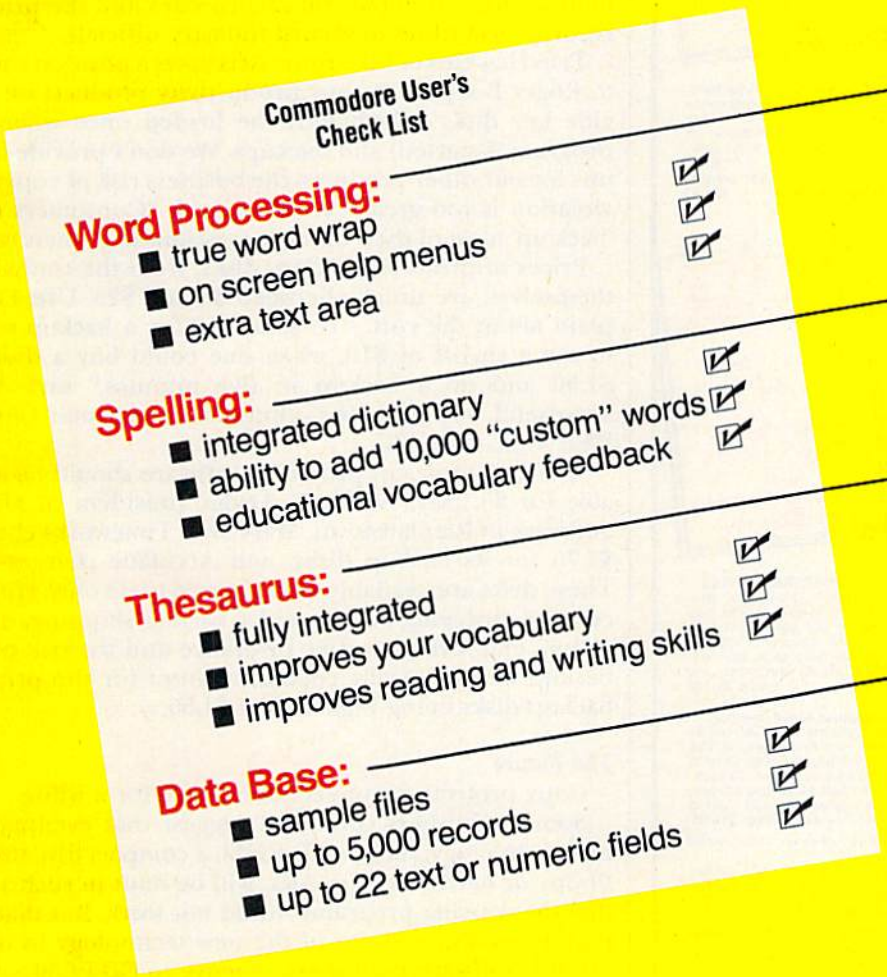
Batteries Included in Toronto is not using copy protection in any new program developed, said Michael Reichmann, president and CEO of the firm. "We are encouraging the user to make the act of pirating obsolete." Sales of one unprotected program, HomePak, have been

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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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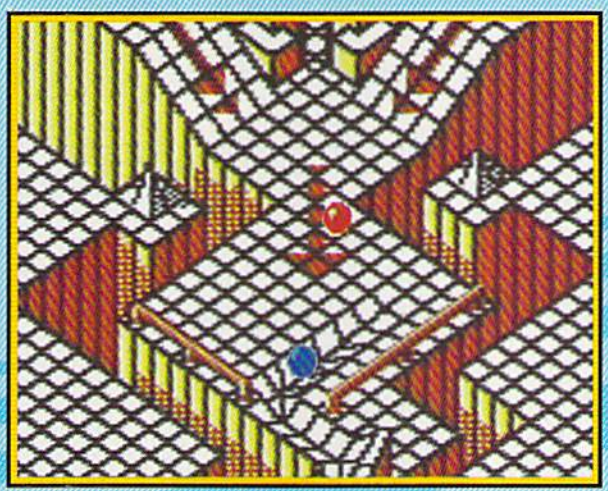
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Go Ahead, Lose Your Marbles . . .

MARBLE MADNESS

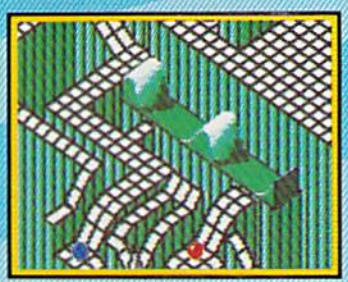
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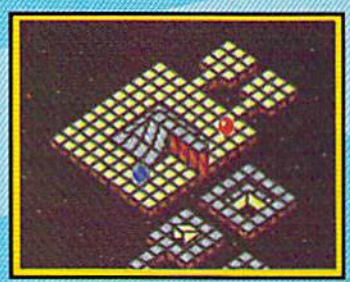
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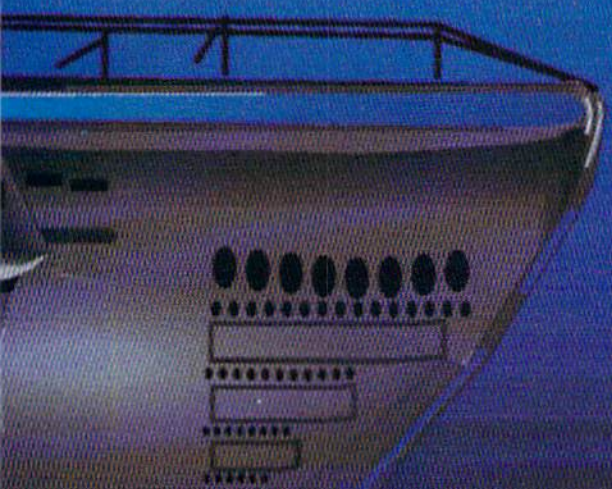
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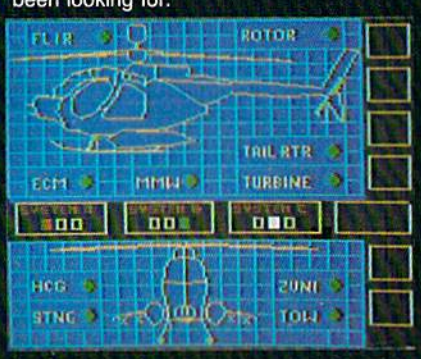
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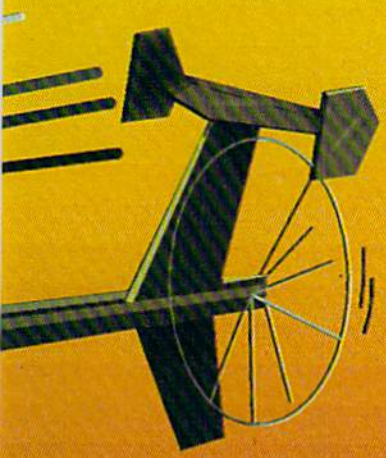
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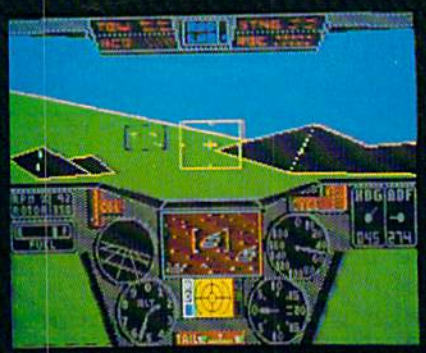
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Colonel Jack Rosenow, USAF (Ret)

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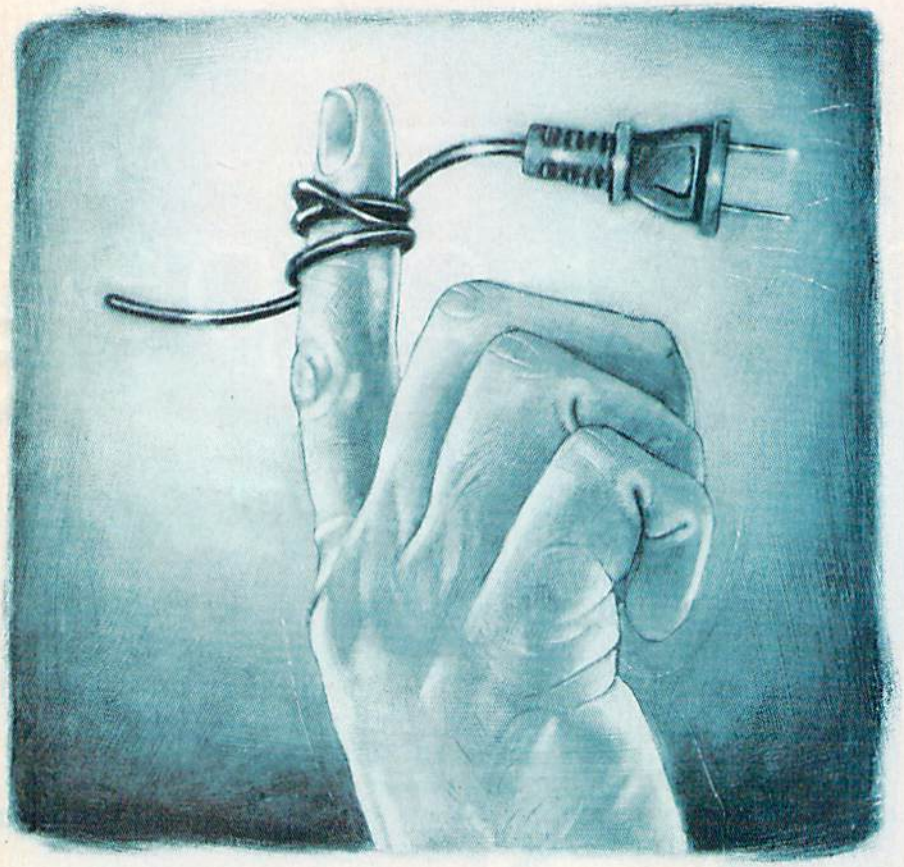
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REMINDER 128

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 relative 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 highlight 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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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. R

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(Z)MID$(E
    DATE$,4,2)"/"MID$(EDATE$,6)"
    /"MID$(EDATE$,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$(255)THEN2000
                             :REM*215
360 PRINT                    :REM*207
370 IFY=0THENPRINT"{CTRL G}SORRY
    , NO MESSAGES TODAY{CTRL 4}"
    :GOTO4000                :REM*207
380 IFY=1THENPRINT"{CTRL G}YOU H
    AVE JUST"Y"MESSAGE{CTRL 4}":
    GOTO4000                 :REM*231
390 PRINT"{CTRL G}YOU HAVE"Y"MES
    SAGES{CTRL 4}"           :REM*29
400 CLOSE 1                  :REM*157
410 IFV=1THENWINDOW2,23,79,24:GO
    TO2960                   :REM*197
420 WINDOW 0,0,79,2          :REM*9
430 GETA$:IFA$=CHR$(29)THENPRINT
    "{CRSR UP}ADD","{CTRL 9}DELE
    TE":GOTO4700             :REM*183
440 IFA$=CHR$(157)THENPRINT"{CRS
    R UP}ADD"TAB(50)"{CTRL 9}EXI
    T{CTRL 0}":GOTO6300      :REM*115
450 IFA$=CHR$(13)THENWINDOW2,23,
    79,24,1:PRINT"{COMD 3}{CTRL
    9}<ESC> TO ESCAPE{63 SPACEs}
    ":GOTO6700               :REM*135
460 GOTO4300                 :REM*207
470 GETA$:IFA$=CHR$(29)THENPRINT
    TAB(10)"{CRSR UP}DELETE","{C
    TRL 9}VIEW":GOTO5100     :REM*11
480 IFA$=CHR$(157)THENPRINT"{CRS
    R UP}{CTRL 9}ADD{CTRL 0}","D
    ELETE":GOTO4300          :REM*201
490 IFA$=CHR$(13)THENWINDOW2,23,
    79,24,1:PRINT"{COMD 3}{CTRL
    9}<ESC> TO ESCAPE{63 SPACEs}
    ":GOTO2310               :REM*41
500 GOTO4700                 :REM*55
510 GETA$:IFA$=CHR$(29)THENPRINT
    TAB(20)"{CRSR UP}VIEW","{CTR
    L 9}SORT":GOTO5500       :REM*65
520 IFA$=CHR$(157)THENPRINTTAB(1
    0)"{CRSR UP}{CTRL 9}DELETE{C
    TRL 0}","VIEW":GOTO4700
                             :REM*112
530 IFA$=CHR$(13)THENV=1:DOPEN#1
    ,"REMFILE":GOTO1700      :REM*160
540 GOTO5100                 :REM*8
550 GETA$:IFA$=CHR$(29)THENPRINT
    TAB(30)"{CRSR UP}SORT","{CTR
    L 9}PRINT":GOTO5900      :REM*248
560 IFA$=CHR$(157)THENPRINTTAB(2
    0)"{CRSR UP}{CTRL 9}VIEW{CTR
    L 0}","SORT":GOTO5100    :REM*52
570 IFA$=CHR$(13)THEN26000
                             :REM*154
580 GOTO5500                 :REM*112
590 GETA$:IFA$=CHR$(29)THENPRINT
    TAB(40)"{CRSR UP}PRINT","{CT
    RL 9}EXIT":GOTO6300      :REM*12
600 IFA$=CHR$(157)THENPRINTTAB(3
    0)"{CRSR UP}{CTRL 9}SORT{CTR
    L 0}","PRINT":GOTO5500
                             :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 GOTO5900                 :REM*216
630 GETA$:IFA$=CHR$(29)THENPRINT
    "{CRSR UP}{CTRL 9}ADD{CTRL 0
    }"TAB(50)"{CRSR UP}EXIT":GOT
    O4300                    :REM*174
640 IFA$=CHR$(157)THENPRINTTAB(4
    0)"{CRSR UP}{CTRL 9}PRINT{CT
    RL 0}","EXIT":GOTO5900
                             :REM*138
650 IFA$=CHR$(13)THEN2270:REM*44
660 GOTO6300                 :REM*168
670 WINDOW 0,0,79,3:PRINT"{CTRL
    4}PLEASE ENTER THE EVENT DAT
    E{3 SPACEs}/{2 SPACEs}/"CHR$
    (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}":GOTO70
    0                        :REM*176
770 IFASC(O$)<49ORASC(O$)>57THEN
```

→

Cover the Spectrum with PRISM SOFTWARE

Sixth Sense 64 $39.95

It answers your phone, makes your calls, acts on both.

Sounds outrageous! It is! The Sixth Sense 64 modem software understands a macro language that operates based on the time of day, data received, internal counters or provided templates. Over 160 functions at your control!

- 700 virtual line screen • 16 macro keys
- 16 condition strings spot prompt/initiate responses
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The spectrum of Prism expands to enhance your Commodore 128. With Sixth Sense 128 comprehensive modem control isn't a mission impossible.

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- 20 active macros • Runs in 80 columns only
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- CompuServe "B" & XMODEM CRC/Checksum file transfer protocol

Dataquick 64 $19.95

Extra! Extra! Calling all potential BBS and Exchange Operators!

Once again Prism Software offers the latest in software for the Commodore 64 user! Now with Dataquick 64 you can operate a BBS with 8 message bases and 10-25 messages per base. Included with Dataquick is the Lightning Exchange which makes multi-file transfers quick and easy.

Dataquick's EXTRAordinary features:

- Supports 1650/1660/1670, Westridge, Master Modem, Volksmodem 12 & Hayes compatible modems.
- Supports 1-4 disk drives. • Supports new Punter protocol.
- Control access to drive 10 & 11. Restricts to high level users.
- Secure - users see only what you let them see. 10 access levels for sysop control. Records hackers and leeches.
- Poll function - Storyboard - E-mail - Macros!
- Complete sysop support-documentation, maintenance programs, samples, setup programs & membership to private support line.

Lightning Exchange's shocking features:

- Multi-file transfer
- Supports same modems as Dataquick 64
- Built-in terminal • Supports 1-4 disk drives

Superkit 1541 $29.95

version 2.0 by Marty Franz & Joe Peter

SINGLE NORMAL COPIER - Copies a disk with no errors in 1 minute. Corrects all disk errors.

DUAL NORMAL COPIER - Copies a disk in 33 seconds with a graphic/music display while working.

SINGLE NIBBLER - Nibble copies a protected disk in 1 minute.

DUAL NIBBLER - Nibbles a disk in 30 seconds and has a graphic/music display while working. It's capable of copying elongated headers, extra sectors and non-standard GCR.

FILE COPIER - Full screen display including buffer, starting track & sector, file being copied and revives deleted/corrupted files.

TRACK & SECTOR EDITOR - Capable of reading to track 40 and examines data under errors. Full editing capabilities in HEX, ASCII or text. An ML monitor is built-in.

GCR EDITOR - Allows examination of a disk in its raw format including the header, density, sync marks and non-standard GCR bytes. You can even examine a full track at a time. It's a great way to learn disk protection methods!

SUPER NIBBLER - The most powerful nibble available. It even detects and duplicates density changes automatically.

DISK SURGEON - This is what a parameter copier should be! It copies and places parameters on the disk. Now, over 400 parameters are included.

SUPER SCAN - Gives a video or printer display of errors and density on a disk in under 35 seconds.

SUPER DOS FAST LOADER - Loads 150 blocks in 10 seconds. It also includes an Auto-Boot maker.

All programs work with 1541/1571 single side drives made. All of the copiers are the fastest on the market and include directory options. The File Copier, Track & Sector Editor, Super Nibbler and Disk Surgeon use 1 or 2 drives and include device number change. All programs re-boot to main menu. SUPERKIT has an easy to use menu-driven operation! Version updates are $10. Parameter updates are $6.

Plus $3.00 Shipping/Handling Charge - $5.00 C.O.D. Charge
All of these programs come on a double-sided disk.

PRISM SOFTWARE

401 Lake Air Drive, Suite D Waco, Texas 76710
Orders/Tech Help (817) 751-0200
Dealers and distributors are welcome.

MASTERCARD & VISA ACCEPTED

SUPERKIT 1541 is for archival use only! We do not condone nor encourage piracy of any kind.

Circle 62 on Reader Service card.

Listing 1 continued.

```
    75Ø                         :REM*51
78Ø GOTO82Ø                     :REM*33
79Ø GETO$:IFASC(O$)=27ANDT=2THEN
    WINDOW2,23,79,24:GOTO296Ø
                                :REM*67
8ØØ IFASC(O$)=2ØTHENPRINTTAB(28)
    "{CRSR UP} {CRSR LF}":GOTO7Ø
    Ø                           :REM*217
81Ø IFASC(O$)<48ORASC(O$)>5ØTHEN
    79Ø                         :REM*31
82Ø PRINTTAB(29)"{CRSR UP}"O$
                                :REM*153
83Ø IFMANDASC(O$)=52ORMANDASC(O$
    )=54ORMANDASC(O$)=57ORASC(M$
    )=49ANDASC(O$)=49THEND=3Ø
                                :REM*41
84Ø IFMANDASC(O$)=5ØTHEND=28:GOT
    O89Ø                        :REM*67
85Ø GETD$:IFASC(D$)=27ANDT=2THEN
    WINDOW2,23,79,24:GOTO296Ø
                                :REM*17
86Ø IFASC(D$)=2ØTHENPRINTTAB(29)
    "{CRSR UP} {CRSR LF}":D=Ø:GO
    TO73Ø                       :REM*1Ø1
87Ø IFASC(D$)<48ORASC(D$)>51THEN
    85Ø                         :REM*97
88Ø GOTO92Ø                     :REM*141
89Ø GETD$:IFASC(D$)=27ANDT=2THEN
    WINDOW2,23,79,24:GOTO296Ø
                                :REM*57
9ØØ IFASC(D$)=2ØTHENPRINTTAB(29)
    "{CRSR UP} {CRSR LF}":D=Ø:GO
    TO73Ø                       :REM*141
91Ø IFASC(D$)<48ORASC(D$)>5ØTHEN
    89Ø                         :REM*129
92Ø PRINTTAB(31)"{CRSR UP}"D$
                                :REM*223
93Ø IFASC(D$)=51ANDD=3ØTHEN1ØØØ
                                :REM*221
94Ø IFASC(D$)=51THEN1Ø4Ø        :REM*25
95Ø IFASC(D$)=48THEN1Ø8Ø        :REM*61
96Ø GETA$:IFASC(A$)=27ANDT=2THEN
    WINDOW2,23,79,24:GOTO296Ø
                                :REM*97
97Ø IFASC(A$)=2ØTHENPRINTTAB(31)
    "{CRSR UP} {CRSR LF}":GOTO83
    Ø                           :REM*131
98Ø IFASC(A$)<48ORASC(A$)>57THEN
    96Ø                         :REM*61
99Ø GOTO111Ø                    :REM*215
1ØØØ GETA$:IFASC(A$)=27ANDT=2THE
     NWINDOW2,23,79,24:GOTO296Ø
                                :REM*137
1Ø1Ø IFASC(A$)=2ØTHENPRINTTAB(31
     )"{CRSR UP} {CRSR LF}":GOTO
     83Ø                        :REM*171
1Ø2Ø IFASC(A$)<>48THEN1ØØØ
                                :REM*73
1Ø3Ø GOTO111Ø                   :REM*Ø
1Ø4Ø GETA$:IFASC(A$)=27ANDT=2THE
     NWINDOW2,23,79,24:GOTO296Ø
                                :REM*178
1Ø5Ø IFASC(A$)=2ØTHENPRINTTAB(31
     )"{CRSR UP} {CRSR LF}":GOTO
     83Ø                        :REM*212
1Ø6Ø IFASC(A$)<48ORASC(A$)>49THE
     N1Ø4Ø                      :REM*72
1Ø7Ø GOTO111Ø                   :REM*4Ø
1Ø8Ø GETA$:IFASC(A$)=27ANDT=2THE
     NWINDOW2,23,79,24:GOTO296Ø
                                :REM*218
1Ø9Ø IFASC(A$)=2ØTHENPRINTTAB(31
     )"{CRSR UP} {CRSR LF}":GOTO
     83Ø                        :REM*252
11ØØ IFASC(A$)<49ORASC(A$)>57THE
     N1Ø8Ø                      :REM*1Ø6
111Ø PRINTTAB(32)"{CRSR UP}"A$
                                :REM*178
112Ø IFD=28ANDASC(D$)=5ØANDASC(A
     $)=57THEND=29              :REM*182
113Ø GETY$:IFASC(Y$)=27ANDT=2THE
     NWINDOW2,23,79,24:GOTO296Ø
                                :REM*252
114Ø IFASC(Y$)=2ØTHENPRINTTAB(32
     )"{CRSR UP} {CRSR LF}":GOTO
     93Ø                        :REM*182
115Ø IFASC(Y$)<48ORASC(Y$)>57THE
     N113Ø                      :REM*96
116Ø PRINTTAB(34)"{CRSR UP}"Y$
                                :REM*132
117Ø GETE$:IFASC(E$)=27ANDT=2THE
     NWINDOW2,23,79,24:GOTO296Ø
                                :REM*92
118Ø IFASC(E$)=2ØTHENPRINTTAB(34
     )"{CRSR UP} {CRSR LF}":GOTO
     113Ø                       :REM*22Ø
119Ø IFASC(E$)<48ORASC(E$)>57THE
     N117Ø                      :REM*2
12ØØ PRINTTAB(35)"{CRSR UP}"E$
                                :REM*124
121Ø YE=VAL(Y$)*1Ø+VAL(E$)
                                :REM*172
122Ø MO=VAL(M$)*1Ø+VAL(O$)
                                :REM*218
123Ø DA=VAL(D$)*1Ø+VAL(A$)
                                :REM*19Ø
124Ø N=YE-INT(YE/4)*4:IFN<>ØANDD
     =29THENPRINT"{CTRL 4}{CRSR
     DN}FEBRUARY HAS ONLY 28 DAY
     S THIS YEAR.":GOTO129Ø
                                :REM*14Ø
125Ø PRINT"{CTRL 4}{CRSR DN}IS D
     ATE CORRECT?"              :REM*114
126Ø GETX$:IFX$="N"THENPRINT"{CR
     SR UP}{16 SPACEs}":PRINTTAB
     (28)"{3 CRSR UPs}{2 SPACEs}
     {CRSR RT}{2 SPACEs}{CRSR RT
     }{2 SPACEs}":GOTO69Ø:REM*98
127Ø IFX$<>"Y"THEN126Ø          :REM*22Ø
128Ø RETURN                     :REM*63
129Ø PRINT"{CTRL 4}PRESS ANY KEY
      TO CONTINUE{3 CRSR UPs}{5
     CRSR RTs}"                 :REM*1Ø7
131Ø PRINTTAB(31)"{CRSR UP}{2 SP
     ACEs}"                     :REM*193
132Ø PRINTTAB(31)CHR$(15)"{CRSR
     UP}29"                     :REM*127
1325 GETX$:IFX$=""THEN1325
                                :REM*242
133Ø IFT=1THENSCNCLR:PRINT"{CTRL
      4}ENTER TODAY'S DATE{5 SPA
     CEs}/{2 SPACEs}/{2 SPACEs}"
     :PRINT"{CTRL 8}{8Ø COMD Ts}
     {CTRL 2}{2 CRSR UPs}":GOTO6
     9Ø                         :REM*223
134Ø WINDOWØ,Ø,79,3,1:PRINT"{CRS
     R UP}{CTRL 4}ENTER THE EVEN
     T DATE{3 SPACEs}/{2 SPACEs}
     /{2 SPACEs}":PRINT"{CTRL 8}
     {62 COMD Ts}{CTRL 9} ADDING
     ...{2 SPACEs}{2 CRSR UPs}{C
     TRL 2}":GOTO69Ø            :REM*67
135Ø SCNCLR:PRINTTAB(29)"{COMD 3
     }{CTRL 9}CREATING REMINDER
     FILE":PRINT:PRINTTAB(33)"PL
     EASE WAIT..."              :REM*145
136Ø DOPEN#1,"REMFILE",L95
                                :REM*71
137Ø RECORD#1,1ØØ,1             :REM*177
138Ø PRINT#1,CHR$(255):PRINT"{CT
     RL 7}"DS"{CTRL 2}"         :REM*189
139Ø SCNCLR:PRINTTAB(29)"{CTRL G
     }{CTRL 8}{CTRL 9}REMINDER F
     ILE CREATED":PRINT:PRINTTAB
     (27)"PRESS ANY KEY TO CONTI
     NUE"                       :REM*1Ø3
14ØØ GETKEYK$                   :REM*11
141Ø SCNCLR:PRINT"{CTRL 4}{CTRL
     9}ADD{CTRL Ø}","DELETE","VI
     EW","SORT","PRINT","EXIT"
                                :REM*81
142Ø PRINT"{CTRL 8}{66 COMD Ts}{
     CTRL 9} REMINDER 128 {CTRL
     4}{2 CRSR UPs}"            :REM*165
143Ø RETURN                     :REM*213
144Ø EDATE=YE*1ØØØØ+MO*1ØØ+DA
                                :REM*159
145Ø PRINT"{CRSR UP}{16 SPACEs}"
     CHR$(19)"{CTRL 4}{2 CRSR UP
     s}HOW MANY DAYS IN ADVANCE
     WOULD YOU LIKE TO BE WARNED
     ? (1-28)"                  :REM*27
146Ø GETN$:IFASC(N$)=27THENWINDO
     W2,23,79,24:GOTO296Ø:REM*81
147Ø IFASC(N$)<49ORASC(N$)>57THE
     N146Ø                      :REM*197
148Ø PRINTTAB(62)"{CRSR UP}"N$
                                :REM*137
149Ø IFASC(N$)=5ØTHEN154Ø:REM*31
15ØØ GETU$:IFASC(U$)=27THENWINDO
     W2,23,79,24:GOTO296Ø
                                :REM*191
151Ø IFASC(U$)=13ORASC(N$)>5ØTHE
     NNUM=VAL(N$):GOTO158Ø
                                :REM*195
1515 IFASC(U$)=2ØTHENPRINTTAB(62
     )"{CRSR UP} ":GOTO146Ø
                                :REM*98
152Ø IFASC(U$)<48ORASC(U$)>57THE
     N15ØØ                      :REM*2Ø9
153Ø PRINTTAB(63)"{CRSR UP}"U$:N
     UM=VAL(N$)*1Ø+VAL(U$):GOTO1
     58Ø                        :REM*133
154Ø GETU$:IFASC(U$)=27THENWINDO
     W2,23,79,24:GOTO296Ø
                                :REM*232
155Ø IFASC(U$)=13THENNUM=VAL(N$)
     :GOTO158Ø                  :REM*72
1555 IFASC(U$)=2ØTHENPRINTTAB(62
     )"{CRSR UP} ":GOTO146Ø
                                :REM*139
156Ø IFASC(U$)<48ORASC(U$)>56THE
     N154Ø                      :REM*244
157Ø PRINTTAB(63)"{CRSR UP}"U$:N
     UM=VAL(N$)*1Ø+VAL(U$)
                                :REM*1Ø
158Ø N=YE-INT(YE/4)*4           :REM*18
159Ø R=DA-NUM                   :REM*138
16ØØ IFMO=5ORMO=7ORMO=1ØORMO=12T
     HEN165Ø                    :REM*32
161Ø IFMO=3ANDN<>ØTHEN166Ø
                                :REM*78
162Ø IFMO=3ANDN=ØTHEN167Ø:REM*82
163Ø IFMO=1THEN168Ø             :REM*1Ø2
164Ø IFNUM>DATHENBDATE=EDATE-(69
     +DA)+R:GOTO17ØØ:REM 31-DAY
     LAST MONTH                 :REM*2Ø
165Ø IFNUM>DATHENBDATE=EDATE-(7Ø
     +DA)+R:GOTO17ØØ:REM 3Ø-DAY
     LAST MONTH                 :REM*146
166Ø IFNUM>DATHENBDATE=EDATE-(72
     +DA)+R:GOTO17ØØ:REM LAST MO
     NTH FEB NOT LEAP           :REM*122
167Ø IFNUM>DATHENBDATE=EDATE-(71
     +DA)+R:GOTO17ØØ:REM LAST MO
     NTH FEB LEAP               :REM*238
168Ø IFNUM>DATHENBDATE=(EDATE-88
     ØØ)-(69+DA)+R:GOTO17ØØ:REM
     LAST MONTH = LAST YEAR
                                :REM*78
169Ø BDATE=EDATE-NUM            :REM*226
17ØØ WINDOW Ø,Ø,79,1:PRINT"{CTRL
      4}WHAT IS YOUR MESSAGE?{CR
     SR UP}"CHR$(27)"Q":P=23:MSG
     $=""                       :REM*18Ø
171Ø GETM$:IFP<23THENP=23
                                :REM*22Ø
172Ø IFM$=""THEN171Ø            :REM*252
173Ø IFM$=CHR$(2Ø)ANDP>23THENP=P
     -1:MSG$=LEFT$(MSG$,P-23):PR
     INTTAB(P)"{CRSR UP} {CRSR L
     F}":GOTO171Ø               :REM*178
174Ø IFM$=CHR$(2Ø)ANDP=23THENMSG
     $=LEFT$(MSG$,P-23):PRINTTAB
     (P)"{CRSR UP} {CRSR LF}":GO
     TO171Ø                     :REM*11Ø
```

→



"What's wrong with copying software?"

"I use a lot of programs on my personal computer, and I copy them all the time."

"I'm a programmer. Every time you copy one of my programs, you're taking away my income—I depend on *sold* programs for a living."

"Oh, come on. I bought it: I have a right to copy it."

"You *do* have a right to make a back-up, that's true. But when you start copying programs for your friends and co-workers, that's breaking the law."

"What law? Any copying I do is in the privacy of my own home."

"It doesn't make any difference where you do it. Every time you copy a program without permission from the publisher, you're committing a federal offense."

"That's all right, I won't get caught."

"You're missing the point. The issue isn't "What can I get away with?"—it's "who am I hurting?"

Remember, lots of people worked hard to produce every program you use: designers, programmers, distributors, retailers, not to mention all the people who support users. They have a *right* to be compensated for their efforts, and their major compensation is through software sales."

"Well, I don't mean to hurt all those people—or anyone, really."

"Unfortunately, that's what copying does: it hurts people. And, ultimately, it hurts people like you, who want new and innovative software."

Do you copy software? Think about it.

The unauthorized copying of software is a crime.

SPA Software Publishers Association
Suite 1200
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Created by Halcyon Associates, Brooklyn, New York.

COPY II 64/128™

BACKUP PROTECTED SOFTWARE FAST.

From the team who brought you COPY II PLUS (Apple), Copy II PC (IBM) and COPY II MAC (Macintosh) comes a revolutionary new copy program for the Commodore 64 and 128 computers.

- Copies many protected programs—automatically. (We update Copy II 64/128 regularly to handle new protections; you as a registered owner may update at any time for $15 plus $3 s/h.)
- Copies even protected disks in under 2 minutes (single drive).
- Copies even protected disks in under 1 minute (dual drive).
- Maximum of four disk swaps on a single drive.
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Requires a Commodore 64 or 128 computer with one or two 1541 or 1571 drives.

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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,"REMFILE"   :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$(27)THENSCNCLR:PRI
     NT"{CTRL 8}{9 COMD Ts}":WIN
     DOW2,23,79,24:GOTO296Ø
                         :REM*67
199Ø IFX$<>CHR$(145)ANDX$<>CHR$(
     17)THEN197Ø         :REM*13
2ØØØ PRINTCHR$(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$(27)THENSCNCLR:PRI
     NT"{CTRL 8}{9 COMD Ts}":WIN
     DOW2,23,79,24:GOTO296Ø
                         :REM*1Ø7
2Ø3Ø IFX$<>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 SCNCLR: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
```

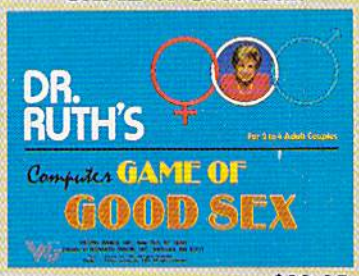

Circle 41 on Reader Service card.

```
21ØØ DOPEN#1,"REMFILE"   :REM*22Ø
211Ø RECORD#1,X,1        :REM*24Ø
212Ø INPUT#1,MSG$        :REM*244
213Ø BDATE=VAL(LEFT$(MSG$,6)):ED
     ATE=VAL(MID$(MSG$,18,6)):ME
     SSAGE$=MID$(MSG$,34):REM*88
214Ø EDATE$=STR$(EDATE)  :REM*242
215Ø IFBDATE=ØTHEN22ØØ   :REM*74
216Ø IFV=2THEN219Ø       :REM*5Ø
217Ø IFBDATE>DATETHEN22ØØ:REM*7Ø
218Ø IFDATE<=EDATETHEN219Ø:ELSE2
     2ØØ                 :REM*158
219Ø PRINT#7,SPC(5)MID$(EDATE$,4
     ,2)"/"MID$(EDATE$,6)"/"MID$
     (EDATE$,2,2),MESSAGE$:Y=Y+1
                         :REM*23Ø
22ØØ IFMSG$<>CHR$(255)THEN2Ø9Ø
                         :REM*19Ø
221Ø PRINT#7             :REM*198
222Ø IFY=ØTHENPRINT#7,SPC(5)"SOR
     RY, NO MESSAGES TODAY":GOTO
     225Ø                :REM*21Ø
223Ø IFY=1THENPRINT#7,SPC(5)"YOU
      HAVE JUST"Y"MESSAGE":GOTO2
     25Ø                 :REM*36
224Ø PRINT#7,SPC(5)"YOU HAVE"Y"M
     ESSAGES"            :REM*62
225Ø CLOSE 1:CLOSE 7:V=Ø:PRINT"{
     CTRL G}"            :REM*13Ø
226Ø PRINTCHR$(27)"{CTRL G}":WIN
     DOW2,23,79,24:GOTO296Ø
                         :REM*22
227Ø PRINT"{CTRL 4}{CRSR UP}LEAV
     E PROGRAM?{2 SPACEs}ARE YOU
      SURE?"CHR$(27)"Q"  :REM*42
228Ø GETX$:IFX$="N"THENWINDOW2,2
     3,79,24:GOTO296Ø    :REM*24Ø
229Ø IFX$<>"Y"THEN228Ø   :REM*38
23ØØ BANK15:SYS65341     :REM*2Ø2
231Ø WINDOW Ø,Ø,79,2:PRINT"{CTRL
     4}ENTER THE NUMBER OF THE
     RECORD YOU WANT TO DELETE (
     1-1ØØ) {CTRL 9}{CTRL Ø}"CHR
     $(27)"Q":PRINTTAB(6Ø)"{CTRL
      8}{CTRL 9} DELETING REMIND
     ERS {CTRL 2}"       :REM*227
232Ø GETR$:IFASC(R$)=27THENWINDO
     W2,23,79,24:GOTO296Ø
                         :REM*217
233Ø IFASC(R$)<49ORASC(R$)>57THE
     N232Ø               :REM*129
234Ø PRINTTAB(58)"{CTRL 4}{2 CRS
     R UPs}"R$           :REM*47
235Ø GETE$:IFASC(E$)=27THENWINDO
     W2,23,79,24:GOTO296Ø
                         :REM*117
236Ø IFASC(E$)=2ØTHENPRINTTAB(58
     )"{CRSR UP} {CRSR LF}":GOTO
     232Ø                :REM*1
237Ø IFE$=CHR$(13)THENRE=VAL(R$)
     :GOTO246Ø           :REM*2Ø7
238Ø IFASC(E$)<48ORASC(E$)>57THE
     N235Ø               :REM*75
239Ø PRINTTAB(59)"{CRSR UP}"E$
                         :REM*2Ø1
24ØØ RE=VAL(R$)*1Ø+VAL(E$):IFRE<
     >1ØTHEN246Ø         :REM*27
241Ø GETM$:IFASC(M$)=27THENWINDO
     W2,23,79,24:GOTO296Ø :REM*1
242Ø IFM$=CHR$(13)THEN246Ø
                         :REM*125
243Ø IFASC(M$)=2ØTHENPRINTTAB(59
     )"{CRSR UP} {CRSR LF}":GOTO
     235Ø                :REM*213
244Ø IFASC(M$)<>48THEN241Ø
                         :REM*255
245Ø PRINTTAB(6Ø)"{CRSR UP}"M$:R
     E=1ØØ               :REM*255
246Ø DOPEN#1,"REMFILE"   :REM*69
247Ø RECORD#1,RE,1       :REM*43
248Ø INPUT#1,MSG$        :REM*93
249Ø BDATE=VAL(LEFT$(MSG$,6)):ED
     ATE=VAL(MID$(MSG$,18,6)):ME
     SSAGE$=MID$(MSG$,34)
                         :REM*193
25ØØ EDATE$=STR$(EDATE)  :REM*91
251Ø PRINT"{CRSR UP}"CHR$(27)"QR
     EC # "RE;"{2 SPACEs}"MID$(E
     DATE$,4,2)"/"MID$(EDATE$,6)
     "/"MID$(EDATE$,2,2)"{2 SPAC
     Es}"MESSAGE$        :REM*159
252Ø 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
253Ø GETX$:IFX$<>CHR$(27)ANDX$<>
     CHR$(13)THEN253Ø    :REM*69
254Ø IFX$=CHR$(27)THENWINDOW2,23
     ,79,24:GOTO296Ø     :REM*231
255Ø RECORD#1,RE,1:PRINT#1,CHR$(
     42)                 :REM*143
256Ø WINDOW Ø,Ø,79,2:PRINT"{CTRL
      4}DELETE ANOTHER?"CHR$(27)
     "Q"                 :REM*52
257Ø GETX$:IFX$<>"Y"ANDX$<>"N"TH
     EN257Ø              :REM*62
258Ø IFX$="N"THENWINDOW2,23,79,2
     4:GOTO296Ø          :REM*62
259Ø GOTO231Ø            :REM*7Ø
26ØØ DIMST$(1ØØ)         :REM*134
261Ø PRINTTAB(67)"{CTRL 8}{CTRL
     9} SORTING ... {CTRL 2}"
                         :REM*92
262Ø DOPEN#1,"REMFILE"   :REM*23Ø
263Ø X=Ø:Y=Ø:Z=Ø         :REM*236
264Ø DO:X=X+1            :REM*86
265Ø RECORD#1,X,1        :REM*14
266Ø INPUT#1,MSG$        :REM*18
267Ø IFMSG$=CHR$(42)THENY=Y+1:GO
     TO264Ø              :REM*62
268Ø Z=Z+1               :REM*2Ø2
269Ø ST$(Z)=MSG$         :REM*4
27ØØ LOOPUNTILMSG$=CHR$(255)
                         :REM*12
271Ø PASS=Z-2            :REM*118
272Ø FORLO=1TOPASS       :REM*18Ø
273Ø F=Ø                 :REM*1Ø4
274Ø FORLI=1TOPASS       :REM*1Ø4
275Ø ADATE=VAL(MID$(ST$(LI),18,6
     ))                  :REM*64
276Ø BDATE=VAL(MID$(ST$(LI+1),18
     ,6))                :REM*194
277Ø HOLD$=ST$(LI)       :REM*46
278Ø IFBDATE<ADATETHENST$(LI)=ST
     $(LI+1):ST$(LI+1)=HOLD$:F=F
     +1                  :REM*Ø
279Ø NEXTLI              :REM*24Ø
28ØØ IFF=ØTHENLO=PASS    :REM*62
281Ø NEXTLO              :REM*1ØØ
282Ø Z=Z-1               :REM*119
283Ø FORW=1TOZ           :REM*131
284Ø RECORD#1,W,1        :REM*77
285Ø PRINT#1,ST$(W)      :REM*231
286Ø NEXTW               :REM*251
287Ø Z=Z+1               :REM*137
288Ø FORW=ZTOX           :REM*217
289Ø RECORD#1,W,1        :REM*127
29ØØ PRINT#1,CHR$(255)   :REM*1Ø9
291Ø NEXTW               :REM*45
292Ø CLOSE1:CLR          :REM*183
293Ø PRINTTAB(66)"{CRSR UP}{CTRL
      8}{CTRL 9} REMINDER 128 {C
     TRL Ø}"             :REM*131
294Ø WINDOW2,23,79,24:PRINT"{CTR
     L G}{COMD 3}{CTRL 9}SORT CO
     MPLETE ...{2 SPACEs}PRESS A
     NY KEY TO CONTINUE":REM*137
295Ø GETKEYX$            :REM*241
296Ø PRINT"{CRSR UP}{COMD 3}{CTR
     L 9}<CRSR> TO SELECT{2 SPAC
     Es}<RETURN> TO EXECUTE{17 S
     PACEs}"             :REM*67
297Ø GOTO 194Ø           :REM*123
298Ø BDATE=BDATE+1ØØØØ:EDATE=EDA
     TE+1ØØØØ:RECORD#1,X,1:PRINT
     #1,STR$(BDATE),STR$(EDATE),
     MESSAGE$:GOTO35Ø    :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

RUN It Right

C-64; printer optional

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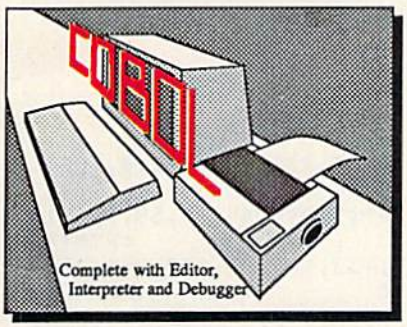


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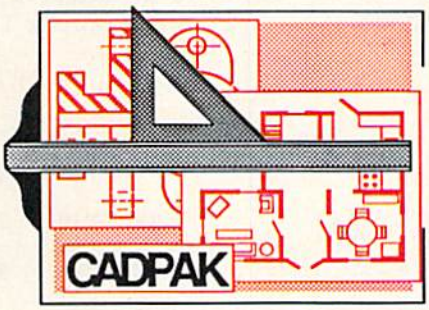
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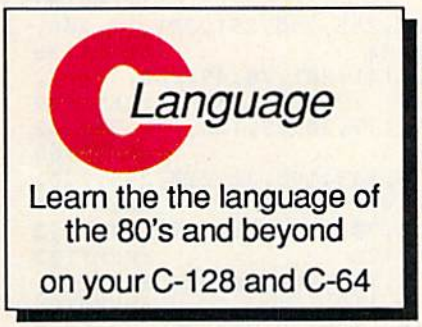
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Circle 8 on Reader Service card.

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=5Ø636:A=51268:FORI=ØT
   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
8Ø POKE A,76:POKE A+1,Ø: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)/1Ø):L=T(I)-1Ø*H:T(I
   )=16*H+L:NEXT                              :REM*34
85 C=56587:POKEC+4,PEEK(C+4)AND127            :REM*95
86 FORI=ØTO3:POKEC-I,T(I+1):NEXT              :REM*88
87 DATA 173,11,221,162,Ø,72,41,16,16Ø,2,2Ø8
   ,12,169,186                                :REM*167
88 DATA 157,182,7,185,9,221,232,72,41,24Ø,7
   4,74,74,74                                 :REM*112
89 DATA 24,1Ø5,176,157,182,7,232,1Ø4,41,15,
   24,1Ø5,176,157                             :REM*221
9Ø DATA 182,7,232,136,16,22Ø,173,8,221,96,3
   2,2Ø4,197,32                               :REM*9Ø
91 DATA 11,2Ø2,165,197,2Ø1,3,24Ø,7,2Ø1,4,24
   Ø,3,76,71                                  :REM*57
92 DATA 2ØØ,72,169,Ø,133,253,133,198,133,15
   7,141,1Ø9,199,169                          :REM*54
93 DATA 54,133,1,32,59,2Ø1,32,117,2Ø1,32,16
   ,2Ø1,162,35                                :REM*185
94 DATA 32,23,199,1Ø4,2Ø1,4,24Ø,17,162,Ø,32
   ,152,198,169                               :REM*3Ø
95 DATA 1,133,185,169,Ø,32,213,255,76,89,19
   8,162,1Ø,32                                :REM*2Ø9
96 DATA 152,198,16Ø,186,132,254,162,Ø,16Ø,1
   89,169,253,32,216                          :REM*122
97 DATA 255,144,4,2Ø1,5,24Ø,45,32,59,2Ø1,16
   9,8,32,18Ø                                 :REM*43
98 DATA 255,169,111,133,185,32,15Ø,255,32,1
   65,255,2Ø1,13,24Ø                          :REM*212
99 DATA 6,32,21Ø,255,76,11Ø,198,32,171,255,
   162,2Ø,32,23                               :REM*1Ø3
1ØØ DATA 199,32,228,255,24Ø,251,2Ø1,13,2Ø8,
    247,32,2Ø4,255,32                         :REM*136
1Ø1 DATA 16,2Ø1,32,141,2Ø1,76,49,2ØØ,32,23,
    199,164,2Ø4,24Ø                           :REM*149
1Ø2 DATA 8,164,211,177,2Ø9,9,128,145,2Ø9,32
    ,225,255,2Ø8,5                            :REM*168
1Ø3 DATA 1Ø4,1Ø4,76,143,198,32,228,255,24Ø,
    229,2Ø1,13,24Ø,41                         :REM*111
1Ø4 DATA 2Ø1,2Ø,24Ø,7Ø,174,1Ø9,199,224,14,2
    4Ø,214,2Ø1,127,176                        :REM*122
1Ø5 DATA 21Ø,2Ø1,32,144,2Ø6,2Ø1,34,24Ø,2Ø2,
    172,1Ø9,199,153,112                       :REM*165
1Ø6 DATA 199,238,1Ø9,199,32,21Ø,255,32,59,2
    Ø1,76,155,198,173                         :REM*178
1Ø7 DATA 1Ø9,199,24Ø,196,24,1Ø5,2,162,11Ø,1
    6Ø,199,32,189,255                         :REM*153
1Ø8 DATA 169,8,133,186,32,59,2Ø1,169,13,32,
    21Ø,255,169,29                             :REM*2
1Ø9 DATA 32,21Ø,255,96,174,1Ø9,199,24Ø,146,
    2Ø6,1Ø9,199,162,7Ø                        :REM*253
11Ø DATA 32,59,2Ø1,32,23,199,76,155,198,189
    ,35,199,24Ø,6                             :REM*218
111 DATA 32,21Ø,255,232,2Ø8,245,96,29,76,79
    ,65,68,58,32                               :REM*81
112 DATA 78,46,Ø,29,83,65,86,69,58,32,78,46
    ,Ø,13                                     :REM*2Ø4
113 DATA 29,8Ø,82,69,83,83,32,82,69,84,85,8
    2,78,Ø                                    :REM*111
114 DATA 13,29,32,32,32,32,32,32,32,32,32,1
    8,78,79                                   :REM*162
115 DATA 84,69,8Ø,65,68,32,87,79,82,75,32,8
    3,67,82                                   :REM*193
116 DATA 69,69,78,146,13,13,Ø,157,32,157,Ø,
    Ø,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
12Ø REM FULL SCREEN DUMP <F5>              :REM*134
121 REM                                    :REM*183
122 PRINT"WAIT...":MEM=5Ø448:A=5Ø7Ø4:FORI=Ø
    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 32,11,2Ø2,169,54,133,1,165,197,2Ø1
    ,5,2Ø8,8,162                           :REM*224
129 DATA 64,16Ø,5,169,17,2Ø8,19,2Ø1,6,2Ø8,1
    8,162,Ø,16Ø                            :REM*9
13Ø DATA 4,169,8,32,66,197,162,64,16Ø,177,1
    69,17,32,66                            :REM*9Ø
131 DATA 197,234,234,234,234,76,71,2ØØ,234,
    134,17Ø,132,171,141                    :REM*225
132 DATA 2Ø1,197,169,4,32,195,255,16Ø,255,1
    73,24,2Ø8,2Ø1,21                       :REM*84
133 DATA 24Ø,2,16Ø,7,169,4,17Ø,32,186,255,1
    69,Ø,32,189                            :REM*149
134 DATA 255,32,192,255,176,43,162,4,32,2Ø1
    ,255,176,36,16Ø                        :REM*14Ø
135 DATA Ø,177,17Ø,17Ø,32,158,197,2ØØ,192,4
    Ø,2Ø8,245,169,13                       :REM*175
136 DATA 32,21Ø,255,16Ø,Ø,165,17Ø,24,1Ø5,4Ø
    ,133,17Ø,144,2                         :REM*22Ø
137 DATA 23Ø,171,2Ø6,2Ø1,197,2Ø8,222,32,2Ø4
    ,255,169,4,32,195                      :REM*67
138 DATA 255,96,192,Ø,2Ø8,15,169,16,32,21Ø,
    255,169,5Ø,32                          :REM*176
139 DATA 21Ø,255,169,48,32,21Ø,255,138,41,1
    27,2Ø1,32,144,9                        :REM*19
14Ø DATA 2Ø1,64,144,9,2Ø1,96,144,3,24,1Ø5,3
    2,1Ø5,32,32                            :REM*192
141 DATA 21Ø,255,96,Ø                      :REM*125
```

Listing 3. *C-64 Append program.*

```
1 REM C-64 SIMPLE APPEND                   :REM*221
1Ø ML=828:Q$=CHR$(34)                      :REM*18
15 FOR I=Ø TO 85:READ BY:POKE ML+I,BY:CK=CK
   +BY:NEXT                                :REM*199
2Ø IF CK <> 1ØØ54 THEN PRINT"DATA ERROR!":S
   TOP                                     :REM*172
25 PRINT"SYNTAX: SYS" ML CHR$(157) CHR$(44)
    Q$ "FILENAME" Q$                       :REM*37
3Ø NEW                                     :REM*168
35 DATA 32,253,174,32,115,Ø,166,122,164,123
   ,134,187,132,188                        :REM*239
4Ø DATA 232,134,183,32,115,Ø,24Ø,2,2Ø8,249,
   165,122,56,229                          :REM*192
45 DATA 183,133,183,169,8,133,186,32,51,165
   ,166,34,164,35                          :REM*167
5Ø DATA 169,Ø,133,185,32,213,255,176,21,134
   ,45,132,46,134                          :REM*192
55 DATA 47,132,48,134,49,132,5Ø,32,51,165,1
   6Ø,1Ø6,32,47                            :REM*33
6Ø DATA 241,96,72,16Ø,Ø,32,47,241,1Ø4,24,1Ø
   5,48,32,21Ø                             :REM*198
65 DATA 255,96                             :REM*185
```


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PLAY BALL, MICROLEAGUERS!

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 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.



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

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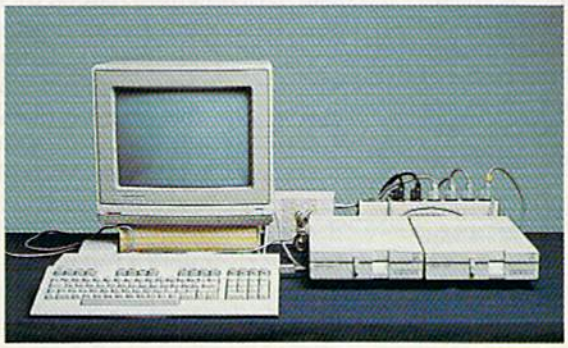
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33-year-old New York businessman who has been playing MLB for nearly two years.

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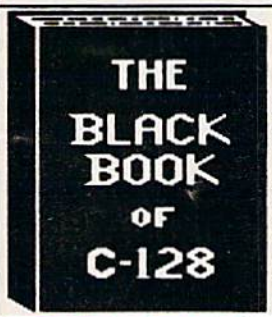
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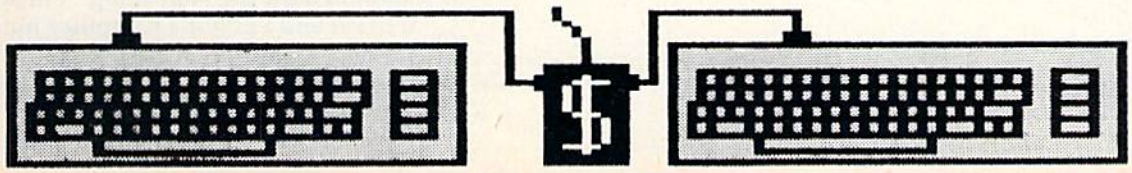
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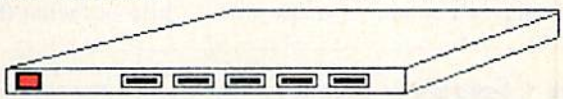
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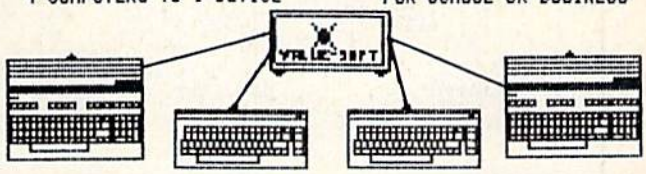
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Lefton plays often enough to have recreated the entire 1984 Mets season. He used the same lineups and pitching rotation Mets manager Davey Johnson used during the actual baseball season. And he even kept track of every player's at-bats to make sure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

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
ROSEBORO	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

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

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*).

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 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.*



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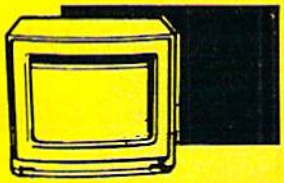
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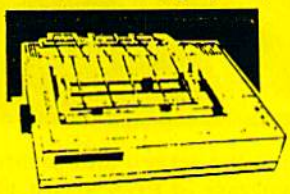
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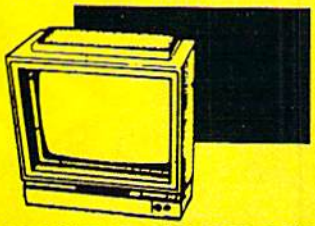
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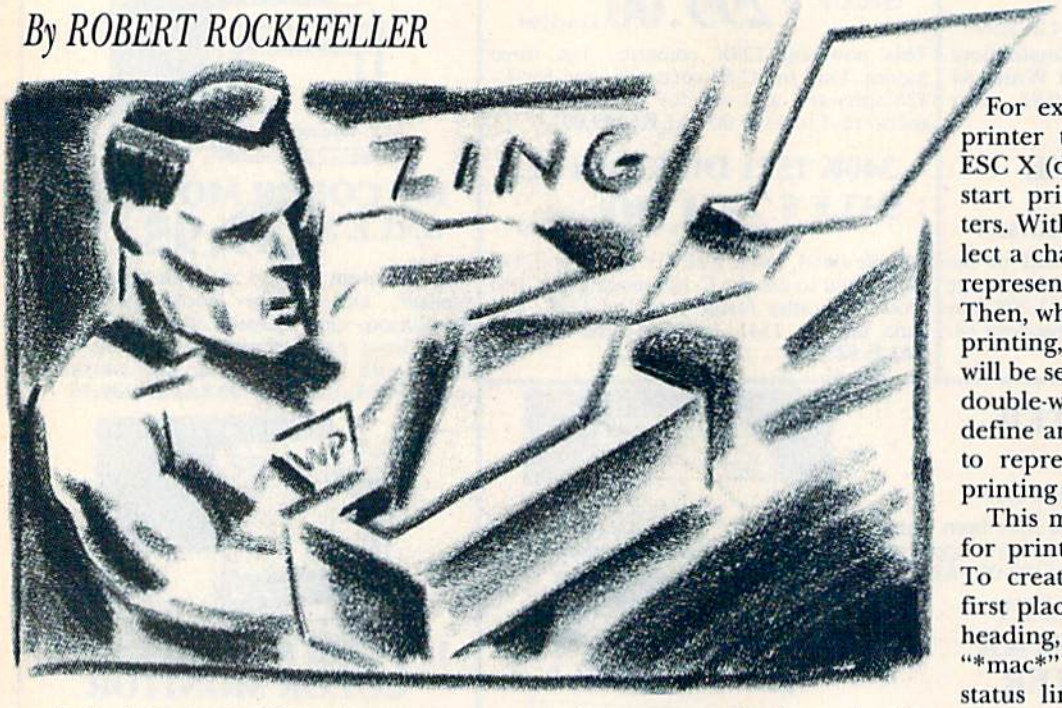
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Take full advantage of your printer's capabilities with RUN Script's macro feature.

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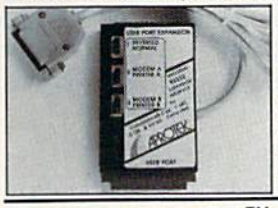
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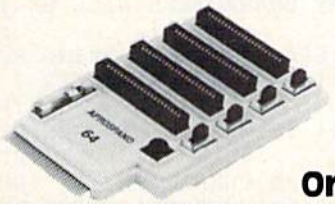
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each macro character, write the decimal values of the character sequence that must be sent to your printer to implement the function each individual macro character represents. Then run the Define Macros program.

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 macro 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

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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. WOUL
    D YOU LIKE TO SELECT ANOTHER (Y/N)?"
                                        :REM*34
120 M2$="HOW MANY CHARACTERS WILL BE IN THE
    "                                   :REM*6
130 M2$=M2$+"{6 SPACEs}MACRO STRING REPRESE
    NTED BY THIS{8 SPACEs}CHARACTER ? "
                                        :REM*88
140 A=780 : X=781 : Y=782 : REM SYS REGISTE
    RS                                  :REM*174
180 REM SELECT MACRO CHARACTER      :REM*248
200 PRINT"{SHFT CLR}{CRSR DN}SELECT A MACRO
     CHARACTER."                        :REM*216
210 GOSUB 1130                          :REM*24
230 IF A$<>"*" THEN 300                  :REM*4
240 PRINT"WHICH MACRO DEFINITION DO YOU WIS
    H TO{3 SPACEs}CANCEL ?"             :REM*82
250 GOSUB 1130                          :REM*64
260 IF A$="*" THEN 240                  :REM*83
270 FLAG%(MACNUM)=0 : REM CANCEL DEF:REM*65
280 GOTO 470                            :REM*91
300 IF FLAG%(MACNUM)<>0 THEN PRINT M1$ : IN
    PUT B$ : IF LEFT$(B$,1)="Y" THEN 200
                                        :REM*91
320 FLAG%(MACNUM)=1                     :REM*61
330 MACRO$(MACNUM)=""                  :REM*197
370 REM DEFINE MACRO STRING            :REM*207
390 PRINTM2$: 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             :REM*96
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 VAL
    UE                                 :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               :REM*189
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$) : POKE X,850AND255 : POK
    E Y,850/256                        :REM*31
990 SYS 65469                          :REM*17
1010 REM USE KERNAL SAVE               :REM*27
1020 POKE 253,0 : POKE 254,4*16       :REM*117
1030 POKE A,253 : POKE X,PTRAND255 : POKE Y
     ,PTR/256                           :REM*2
1040 SYS 65496                        :REM*132
1070 END                               :REM*52
1110 REM INPUT SUBROUTINE              :REM*26
1130 INPUT A$ : 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.

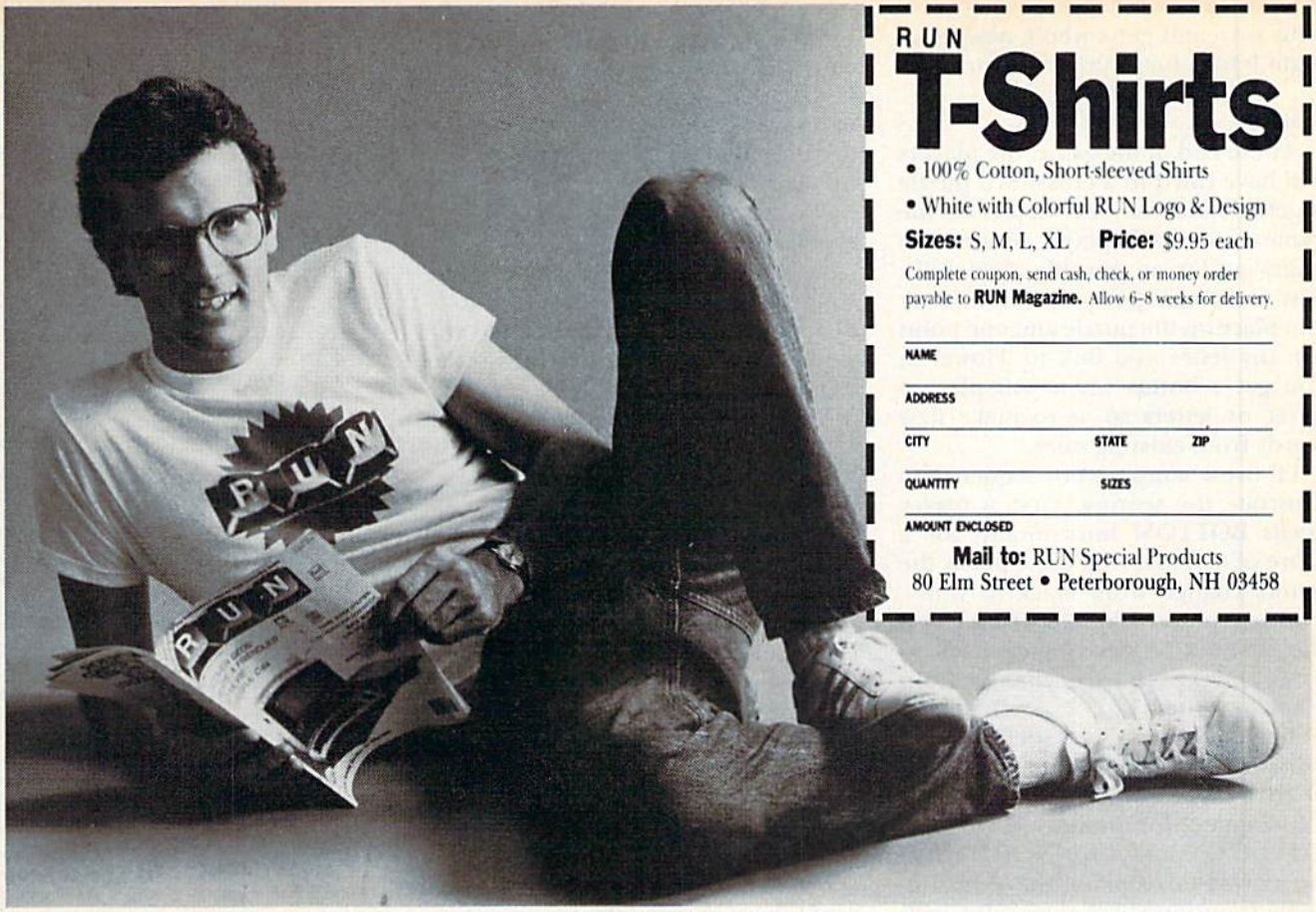
As your letters are scored, their colors change depending on their value, a bell tone sounds and your cumulative score is updated. When the scoring routine is done, the puzzle reverts to its original color scheme, you get enough new letters to replace the ones you used, and the next player's turn begins.

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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C64

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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. Ⓡ

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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$,6)SPC(25)"{CT
    RL 8}C{2 CRSR DNs}{CRSR LF}R
    {2 CRSR DNs}{CRSR LF}O{2 CRS
    R DNs}{CRSR LF}S{2 CRSR DNs}
    {CRSR LF}S{2 CRSR DNs}{CRSR
    LF}W{2 CRSR DNs}{CRSR LF}O{2
     CRSR DNs}{CRSR LF}R{2 CRSR
    DNs}{CRSR LF}D{2 CRSR DNs}{C
    RSR LF}S{HOME}";          :REM*48
110 GOSUB2050:POKE828,I:SYS829:G
    OSUB2050:NEXT             :REM*42
120 FORI=1TO11:GOSUB2050:POKE828
    ,I:SYS829:NEXT:FORI=STOS+6:P
    OKEI,0:NEXT               :REM*234
130 DIMLA%(100):Y=0           :REM*86
140 READI,A:IFI<0THEN160:REM*200
150 FORJ=1TOI:Y=Y+1:LA%(Y)=A:NEX
    T:GOTO140                 :REM*78
160 FORI=1TO75:X=FNR(0):Y=FNR(0)
                             :REM*250
170 LA%(0)=LA%(X):LA%(X)=LA%(Y):
    LA%(Y)=LA%(0):NEXT        :REM*216
180 POKE198,0:PRINT"{SHFT CLR}{4
     CRSR DNs}{CTRL 1}THIS GAME
    CAN BE PLAYED BY{CTRL 2} ONE
     TO EIGHT{CTRL 1} PLAYERS."
                             :REM*132
190 PRINT"{2 CRSR DNs}HOW MANY W
    ILL BE PLAYING THIS GAME?{2
    SPACEs}{CTRL 2}";         :REM*188
200 GETA$:IFA$=""THEN200:REM*108
210 PRINTA$:NP=VAL(A$)        :REM*216
220 IFNP>0ANDNP<9THEN240      :REM*8
230 GOSUB2140:PRINTSPC(10)"{CTRL
     9} NOT 1 TO 8 - TRY AGAIN.{
    2 SPACEs}{CTRL 0} {UP ARROW}
    {2 CRSR UPs}"SPC(39);:GOTO20
    0                         :REM*216
240 DIMPN$(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
32Ø X=ASC(LEFT$(A$,1)+CHR$(Ø)):I
    FX<65ORX>9ØTHENGOSUB214Ø:GOT
    O31Ø                    :REM*137
33Ø IFLEN(A$)>8THENPRINTA$", IS
    MORE THAN EIGHT LETTERS.":GO
    SUB214Ø:GOTO31Ø         :REM*97
34Ø FORJ=1TOLEN(A$):IFMID$(A$,J,
    1)=CHR$(32)THEN36Ø      :REM*151
35Ø IFMID$(A$,J,1)>CHR$(64)ANDMI
    D$(A$,J,1)<CHR$(91)THEN37Ø
                            :REM*187
36Ø A$=LEFT$(A$,J-1)+CHR$(96)+MI
    D$(A$,J+1)              :REM*237
37Ø NEXTJ                   :REM*2Ø7
38Ø IFLEN(A$)<8THENA$=A$+CHR$(96
    ):GOTO38Ø               :REM*187
39Ø PN$(I)=A$:IFNP=1THEN45Ø
                            :REM*239
4ØØ POKE198,Ø:PRINT"{3 SPACEs}"P
    N$(I)"{CTRL 8}CODE? {CTRL 9}
    --{CTRL Ø}{2 CRSR LFs}{COMD
    4}";                    :REM*31
41Ø GETA$:IFA$=""THEN41Ø:REM*191
42Ø PRINT" ";               :REM*49
43Ø GETB$:IFB$=""THEN43Ø:REM*221
44Ø PRINT" ":PN$(I)=PN$(I)+A$+B$
    :NEXTI                  :REM*1
45Ø NT=INT(4Ø/NP+.7):PRINT"{SHFT
     CLR}{CTRL 2}"RIGHT$(DN$,9)"
    ENTER NUMBER OF TURNS 1 TO"N
    T"{CTRL 1}";            :REM*127
46Ø OPEN1,Ø:INPUT#1,A$:CLOSE1:A$
    =A$+CHR$(Ø):X=VAL(A$)
                            :REM*1Ø9
47Ø IFX<1ORX>NTTHENGOSUB214Ø:PRI
    NTLEFT$(DN$,1Ø)SPC(3Ø);:GOTO
    46Ø                     :REM*2Ø5
48Ø NT=X:PRINT:PRINT"{3 CRSR DNs
    }{COMD 4}PRESS ANY KEY TO ST
    ART.":POKE198,Ø         :REM*241
49Ø GETA$:IFA$=""THEN49Ø :REM*17
5ØØ FORI=1TONP:FORJ=1TO8:LL%(I,J
    )=LA%(FNR(Ø)):NEXTJ,I
                            :REM*189
51Ø PRINT"{SHFT CLR}";:I=Ø:GOSUB
    2Ø9Ø:POKE828,15:SYS829
                            :REM*175
52Ø POKE2Ø4Ø,14:POKEV+39,1:POKEV
    ,138:POKEV+1,134:POKEV+21,1:
    A$=""                   :REM*14
53Ø FORI=1TO5:GOSUB216Ø:NEXT:FOR
    I=1TO8:A$=A$+RIGHT$(STR$(I),
    1)+"-{2 CRSR LFs}{CRSR DN}"
                            :REM*23Ø
54Ø NEXT:PRINT"{HOME}{CTRL 7}"SP
    C(36)A$"{HOME}";        :REM*52
55Ø PRINTLEFT$(DN$,9)SPC(33)"{CT
    RL 8}SCORE{2 SPACEs}{CTRL 7}
    "SPC(33)"{CRSR DN}RND{4 SPAC
    Es}"SPC(33)"H/SCORE";
                            :REM*1Ø8
56Ø FORJ=1TONT:FORJ1=1TONP:A=1
                            :REM*136
57Ø FORI=ØTO28ØSTEP4Ø:POKESC+33+
    I,ASC(MID$(PN$(J1),A,1))-64:
    POKECC+33+I,6           :REM*86
58Ø POKESC+38+I,LL%(J1,A):POKECC
    +38+I,6                 :REM*1Ø2
59Ø IFNP=1THEN65Ø           :REM*2Ø4
6ØØ J2=J1+1:IFJ2>NPTHENJ2=1
                            :REM*24
61Ø POKESC+713+I,ASC(MID$(PN$(J2
    ),A,1))-64:POKECC+713+I,Ø
                            :REM*1Ø8
62Ø CK=Ø:IFJ=NTTHENIFJ2=1THENCK=
    14:GOTO64Ø              :REM*136
63Ø POKESC+716+I,LL%(J2,A)
                            :REM*26
64Ø POKECC+716+I,CK         :REM*156
65Ø A=A+1:NEXTI             :REM*16
66Ø PRINTLEFT$(DN$,1Ø)SPC(33)"{C
    TRL 7}"LEFT$(STR$(LL%(J1,Ø))
    +SP$,7);                :REM*17Ø
67Ø PRINTSPC(36)"{CTRL 8}"LEFT$(
    STR$(J)+SP$,4);         :REM*54
68Ø PRINTSPC(33)"{CRSR DN}{CTRL
    8}"LEFT$(STR$(LL%(Ø,Ø))+SP$,
    7);                     :REM*7Ø
69Ø GOSUB132Ø:IFA$<>"P"THEN72Ø
                            :REM*58
7ØØ IFNP>1THENGOSUB84Ø      :REM*1Ø
71Ø GOTO8ØØ                 :REM*186
72Ø GOSUB148Ø:IFA$="P"THEN7ØØ
                            :REM*28
73Ø IFNP>1THENGOSUB84Ø      :REM*4Ø
74Ø PRINTDN$SPC(33)"{CRSR DN}{CT
    RL 1}OKAY{3 SPACEs}"SPC(33)"
    [Y/N]? {HOME}";         :REM*144
75Ø GETA$:IFA$="N"THEN72Ø:REM*62
76Ø IFA$<>"Y"THEN75Ø        :REM*184
77Ø IFLK=-1THEN8ØØ          :REM*123
78Ø GOSUB1Ø3Ø:FORD=STOS+6:POKED,
    Ø:NEXT:FORD=1TO2ØØØ:NEXT:SYS
    829                     :REM*223
79Ø IFLL%(J1,Ø)>LL%(Ø,Ø)THENLL%(
    Ø,Ø)=LL%(J1,Ø)          :REM*241
8ØØ FORI=ØTO7:CK=PEEK(CC+38+I*4Ø
    )AND15                  :REM*33
81Ø IFCK=14THENLL%(J1,I+1)=LA%(F
    NR(Ø))                  :REM*1Ø5
82Ø NEXT                    :REM*65
83Ø LK=-1:NEXTJ1,J:GOTO93Ø
                            :REM*147
84Ø PRINTLEFT$(DN$,13)SPC(33)"{C
    RSR DN}{CTRL 1}ENTER{2 SPACE
    s}"SPC(33)"CODE.{2 SPACEs}";
                            :REM*131
85Ø PRINTSPC(33)"{CTRL 9}--{CTRL
     Ø}{5 SPACEs}{7 CRSR LFs}";
                            :REM*211
86Ø GETA$:IFA$=""THEN86Ø :REM*71
87Ø PRINT" ";               :REM*245
88Ø GETB$:IFB$=""THEN88Ø:REM*1Ø1
89Ø PRINT" ";                :REM*9
9ØØ A$=A$+B$                :REM*237
91Ø IFA$<>RIGHT$(PN$(J2),2)THENG
    OSUB214Ø:PRINTDN$"{2 CRSR DN
    s}";:GOTO85Ø            :REM*149
92Ø PRINTDN$SPC(33)"{7 SPACEs}";
    SPC(33)"{7 SPACEs}";:RETURN
                            :REM*229
93Ø POKEV+21,Ø:POKEV+16,Ø:REM*95
94Ø PRINT"{HOME}";:FORI=1TO24:PR
    INTSPC(33)LEFT$(SP$,7);:NEXT
    :PRINTSPC(33)"{4 SPACEs}";
                            :REM*97
95Ø PRINTLEFT$(DN$,11)SPC(33)"{C
    TRL 2} PRESS "SPC(33)"ANY KE
    Y"SPC(33)"TO{2 SPACEs}SEE";
                            :REM*253
96Ø PRINTSPC(33)"SCORES{HOME}";:
    POKE198,Ø               :REM*235
97Ø GETA$:IFA$=""THEN97Ø :REM*21
98Ø PRINT"{SHFT CLR}{2 CRSR DNs}
    ":FORI=1TONP:PRINTLEFT$(PN$(
    I),8)">"LL%(I,Ø):PRINT:NEXT
                            :REM*133
99Ø PRINT"{3 CRSR DNs}ANOTHER GA
    ME [Y/N]?":POKE198,Ø:REM*2Ø9
1ØØØ GETA$:IFA$="Y"THENRUN
                            :REM*27
1Ø1Ø IFA$<>"N"THEN1ØØØ      :REM*51
1Ø2Ø SYS2Ø48                :REM*163
1Ø3Ø GOSUB129Ø:IFPEEK(SL)=32THEN
    SL=SL-D1                :REM*2Ø
1Ø4Ø IFPEEK(P1-D1/2)<>C1ANDPEEK(
    P1-D1)<>32THENFL=FL+.5
                            :REM*118
1Ø5Ø IFPEEK(P1+D1/2)<>C1ANDPEEK(
    P1+D1)<>32THENFL=FL+.5
                            :REM*192
1Ø6Ø IFFL>ØTHENFL=Ø:GOTO1Ø8Ø
                            :REM*94
1Ø7Ø FL=DX:DX=DY:DY=FL:GOSUB129Ø
                            :REM*17Ø
1Ø8Ø IFPEEK(P1-D1/2)<>C1ANDPEEK(
    P1-D1)<>32THENP1=P1-D1:FL=F
    L+.5:GOTO1Ø8Ø           :REM*254
1Ø9Ø FORI=P1TOSL-D1STEPD1:REM*26
11ØØ IF(PEEK(I+S)AND15)+(PEEK(I+
    S+D1)AND15)=3ØTHENFL=FL+1:G
    OTO112Ø                 :REM*58
111Ø NEXT                   :REM*1ØØ
112Ø FORI=P1TOSLSTEPD1      :REM*8Ø
113Ø IF(PEEK(I+S)AND15)=15THEN11
    6Ø                      :REM*162
114Ø IFPEEK(I-D2/2)<>C2ANDPEEK(I
    -D2)<>32THEND2=-D2:GOTO119Ø
                            :REM*244
115Ø IFPEEK(I+D2/2)<>C2ANDPEEK(I
    +D2)<>32THEN119Ø        :REM*218
116Ø GOSUB126Ø              :REM*66
117Ø NEXT:IFFL>.5ANDLU>1THENFORI
    =SPTOSLSTEPD1:GOSUB125Ø:NEX
    T                       :REM*232
118Ø FL=Ø:RETURN            :REM*36
119Ø P2=I:IFD2>ØTHEN123Ø    :REM*14
12ØØ IFPEEK(I+D2/2)<>C2ANDPEEK(I
    +D2)<>32THENI=I+D2:GOTO12ØØ
                            :REM*166
121Ø IFI<P2THENGOSUB126Ø:I=I-D2:
    GOTO121Ø                :REM*82
122Ø D2=-D2                 :REM*58
123Ø IFPEEK(I)<>32THENGOSUB126Ø:
    IFPEEK(I+D2/2)<>C2THENI=I+D
    2:GOTO123Ø              :REM*13Ø
124Ø I=P2:GOTO116Ø          :REM*36
125Ø IF(PEEK(I+S)AND15)=15OR(PEE
    K(I+S)AND15)=ØTHENRETURN
                            :REM*12Ø
126Ø LL%(J1,Ø)=LL%(J1,Ø)+1:POKEI
    +S,(PEEK(I+S)AND15)+1
                            :REM*232
127Ø PRINTLEFT$(DN$,1Ø)SPC(33)"{
    CTRL 7}"LEFT$(STR$(LL%(J1,Ø
    ))+SP$,7);              :REM*14
128Ø GOSUB218Ø:RETURN       :REM*161
129Ø C1=64:C2=93:D1=8Ø:D2=2:P1=S
    P:FL=Ø                  :REM*195
13ØØ IFDXTHENC1=93:C2=64:D1=2:D2
    =8Ø                     :REM*175
131Ø RETURN                 :REM*93
132Ø POKE198,Ø:PRINTDN$SPC(33)"{
    CTRL 2}{CTRL 9}CURSOR "SPC(
    33)" KEYS. ";           :REM*21
133Ø PRINTSPC(33)"{CTRL 9}DIR H/
    V{CTRL Ø}"SPC(33)"{CTRL 9}P
    =PASS {CTRL Ø}{HOME}";:GOTO
    135Ø                    :REM*135
134Ø GOSUB193Ø:IFFL=1THENGOSUB21
    4Ø:FL=Ø                 :REM*1Ø5
135Ø GETA$:IFA$=""THEN135Ø
                            :REM*65
136Ø DX=16*(A$="{CRSR LF}")-16*(
    A$="{CRSR RT}"):DY=16*(A$="
    {CRSR UP}")-16*(A$="{CRSR D
    N}"):IFDXORDYTHEN134Ø
                            :REM*2Ø5
137Ø IFA$="P"THENFORI=ØTO7:POKEC
    C+38+I*4Ø,14:NEXT:GOTO147Ø
                            :REM*133
138Ø IFA$<>"H"ANDA$<>"V"THENGOSU
    B214Ø:GOTO135Ø          :REM*123
139Ø GOSUB2Ø1Ø:IFPEEK(SL)<>32THE
    NGOSUB214Ø:GOTO135Ø:REM*161
14ØØ DX=-16*(A$="H"):DY=-16*(A$=
    "V"):SP=SL:IFLL%(Ø,Ø)=ØTHEN
    LK=Ø:GOTO147Ø           :REM*227
141Ø IFDXTHEN145Ø           :REM*77
142Ø IFPEEK(SP-4Ø)=64THEN147Ø
                            :REM*71
143Ø IFPEEK(SP-8Ø)<>32THENLK=Ø
```

→



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Circle 108 on Reader Service card.

Listing 1 continued.

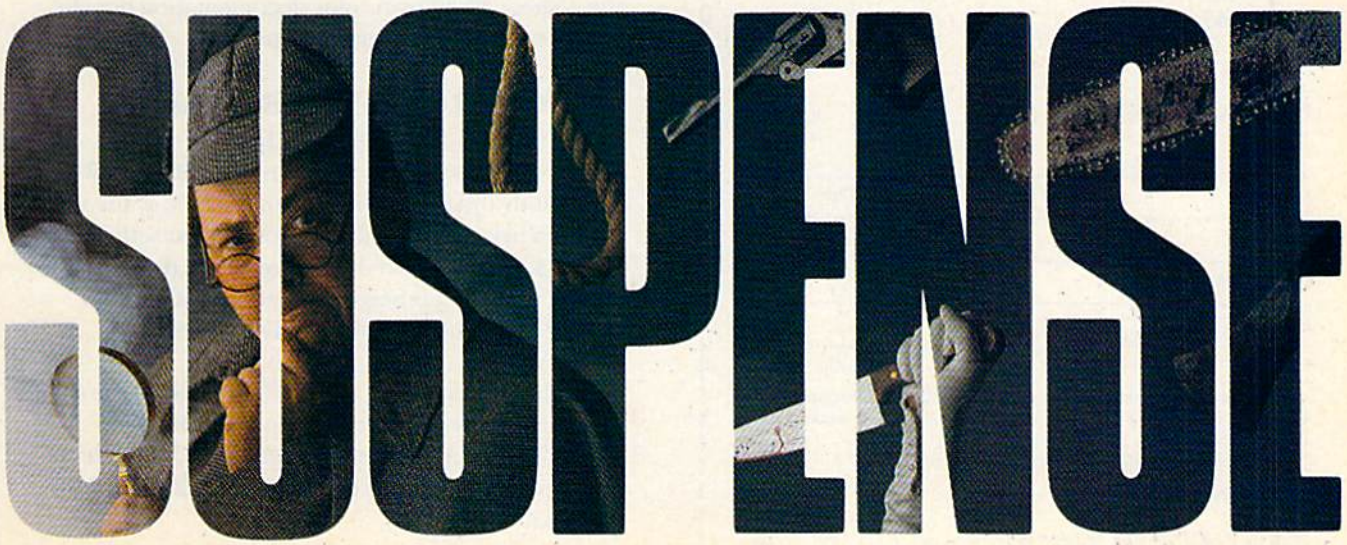
```
                              :REM*159
144Ø GOTO147Ø                 :REM*139
145Ø IFPEEK(SP-1)=93THEN147Ø
                              :REM*7
146Ø IFPEEK(SP-2)<>32THENLK=Ø
                              :REM*175
147Ø FL=Ø:PRINTDN$SPC(33)LEFT$(S
     P$,7)SPC(33)"{2 CRSR DNs}"L
     EFT$(SP$,7);:RETURN:REM*187
148Ø LU=Ø:POKE198,Ø:PRINTDN$SPC(
     33)"{CTRL 7}{CTRL 9}SPELL{2
      SPACEs}"SPC(33)" [1-8] ";:
                              :REM*159
149Ø PRINTSPC(33)"{CTRL 9}D{CTRL
      Ø}ELETE "SPC(33)"{CTRL 9}R
     ETURN {CTRL Ø}{HOME}";
                              :REM*125
15ØØ GETA$:IFA$=""THEN15ØØ
                              :REM*215
151Ø IFA$=CHR$(13)THEN163Ø
                              :REM*249
152Ø IFA$="D"THEN177Ø         :REM*217
153Ø IFVAL(A$)<1ORVAL(A$)>8ORFL=
     1THENGOSUB214Ø:GOTO15ØØ
                              :REM*53
154Ø CK=PEEK(CC+38+4Ø*(VAL(A$)-1
     ))AND15                  :REM*188
155Ø IFCK=14THENGOSUB214Ø:GOTO15
     ØØ                       :REM*92
156Ø POKESL,PEEK(SC+38+4Ø*(VAL(A
     $)-1)):POKESL+S,Ø:LU=LU+1
                              :REM*134
157Ø POKECC+38+4Ø*(VAL(A$)-1),14
     :IFLK=-1THENGOSUB166Ø
                              :REM*12Ø
158Ø GOSUB193Ø                :REM*248
159Ø IFFL=1THEN15ØØ           :REM*18Ø
16ØØ IFPEEK(SL)=32THEN15ØØ
                              :REM*26
161Ø IFLK=-1THENLK=SL-SP+1
                              :REM*46
162Ø GOTO158Ø                 :REM*114
163Ø IFLK=-1THENGOSUB214Ø:GOTO15
     ØØ                       :REM*16
164Ø IFSP=SLANDPEEK(SL)=32THENGO
     SUB214Ø:GOTO15ØØ         :REM*128
165Ø FL=Ø:PRINTDN$SPC(33)LEFT$(S
     P$,7)SPC(33)"{2 CRSR DNs}"L
     EFT$(SP$,7);:RETURN:REM*112
166Ø IFDXTHEN172Ø             :REM*198
167Ø IFPEEK(SL-1)=93THEN169Ø
                              :REM*232
168Ø IFPEEK(SL-2)<>32THENLK=SL-S
     P+1:GOTO176Ø             :REM*166
169Ø IFPEEK(SL+1)=93THEN174Ø
                              :REM*246
17ØØ IFPEEK(SL+2)<>32THENLK=SL-S
     P+1                      :REM*2Ø8
171Ø GOTO176Ø                 :REM*17Ø
172Ø IFPEEK(SL-4Ø)=64THEN174Ø
                              :REM*114
173Ø IFPEEK(SL-8Ø)<>32THENLK=SL-
     SP+1:GOTO176Ø            :REM*25Ø
174Ø IFPEEK(SL+4Ø)=64THEN176Ø
                              :REM*1Ø
175Ø IFPEEK(SL+8Ø)<>32THENLK=SL-
     SP+1                     :REM*186
176Ø RETURN                   :REM*32
177Ø POKE198,Ø:PRINTDN$SPC(33)"{
     COMD 6}{CTRL 9}W{CTRL Ø}ORD
     {3 SPACEs}"SPC(33)"{CTRL 9}
     L{CTRL Ø}ETTER ";:       :REM*52
178Ø PRINTSPC(33)"{CTRL 9}N{CTRL
      Ø}ONE{3 SPACEs}"SPC(33)"{C
     TRL 9}{7 SPACEs}{CTRL Ø}{HO
     ME}";                    :REM*164
179Ø DX=-DX:DY=-DY:LU=LU-1
                              :REM*1Ø2
18ØØ GETA$:IFA$=""THEN18ØØ
                              :REM*197
181Ø IFA$="N"THEN191Ø         :REM*179
182Ø IFA$<>"W"ANDA$<>"L"THENGOSU
     B214Ø:GOTO18ØØ           :REM*19
183Ø IFPEEK(SL)<>32THEN186Ø
                              :REM*117
184Ø IFSL=SPTHEN191Ø          :REM*145
185Ø GOSUB193Ø                :REM*7
186Ø CK=PEEK(SL+S)AND15:IFCK=15T
     HEN184Ø                  :REM*35
187Ø A=PEEK(SL):POKESL,32:IFSL-S
     P+1=LKTHENLK=-1          :REM*213
188Ø FORI=1Ø62TO1342STEP4Ø:CK=PE
     EK(I+S)AND15             :REM*123
189Ø IFPEEK(I)=AANDCK=14THENPOKE
     I+S,6:POKESL+S,14:I=1342
                              :REM*1Ø3
19ØØ NEXT:IFA$="W"THENLK=-1:LU=Ø
     :GOTO184Ø                :REM*211
191Ø FL=Ø:DX=-DX:DY=-DY:IFA$="W"
     THENGOSUB132Ø:IFA$="P"THEN1
     65Ø                      :REM*2Ø1
192Ø GOTO148Ø                 :REM*143
193Ø IFDXTHEN196Ø             :REM*217
194Ø Y=PEEK(V+1)+DY:IFY<5ØORY>24
     5THENFL=1:RETURN         :REM*113
195Ø POKEV+1,Y:GOTO2ØØØ       :REM*223
196Ø X=PEEK(V)+DX-255*(PEEK(V+16
     )=1):IFX<24ORX>266THENFL=1:
     RETURN                   :REM*35
197Ø IFX>255ANDPEEK(V+16)=ØTHENX
     =X-255:POKEV,X:POKEV+16,1:G
```

→

Listing 1 continued.

```
    OTO2000              :REM*127
1980 IFX<256ANDPEEK(V+16)=1THENP
    OKEV,X:POKEV+16,0    :REM*21
1990 POKEV,X             :REM*171
2000 GOSUB2160           :REM*133
2010 X=INT((PEEK(V)-255*(PEEK(V+
    16)=1)-24)/8)+1      :REM*123
2020 Y=INT((PEEK(V+1)-50)/8)+1
                         :REM*171
2030 SL=1024+X+Y*40      :REM*177
2040 RETURN              :REM*57
2050 POKES+5,9           :REM*250
2060 POKES+1,FNR(0)+35   :REM*196
2070 POKES+4,33:FORD=1TO100:NEXT
                         :REM*92
2080 POKES+4,32:RETURN   :REM*214
2090 PRINTSPC(I)"{COMD A}{SHFT *
    }{COMD R}{SHFT *}{COMD R}{S
    HFT *}{COMD R}{SHFT *}{COMD
     R}{SHFT *}{COMD R}{SHFT *}
    {COMD R}{SHFT *}{COMD R}{SH
    FT *}{COMD R}{SHFT *}{COMD
    R}{SHFT *}{COMD R}{SHFT *}{
    COMD R}{SHFT *}{COMD R}{SHF
    T *}{COMD R}{SHFT *}{COMD R
    }{SHFT *}{COMD R}{SHFT *}{C
    OMD S}"              :REM*56
2100 FORJ=0TO10:PRINTSPC(I)"{SHF
    T -} {SHFT B} {SHFT B} {SHF
    T B} {SHFT B} {SHFT B} {SHF
    T B} {SHFT B} {SHFT B} {SHF
    T B} {SHFT B} {SHFT B} {SHF
    T B} {SHFT B} {SHFT B} {SHF
    T B} {SHFT B} {SHFT B} {SHF
    T B} {SHFT -}"       :REM*166
2110 PRINTSPC(I)"{COMD Q}{SHFT C
    }{SHFT +}{SHFT C}{SHFT +}{S
    HFT C}{SHFT +}{SHFT C}{SHFT
     +}{SHFT C}{SHFT +}{SHFT C}
    {SHFT +}{SHFT C}{SHFT +}{SH
    FT C}{SHFT +}{SHFT C}{SHFT
    +}{SHFT C}{SHFT +}{SHFT C}{
    SHFT +}{SHFT C}{SHFT +}{SHF
    T C}{SHFT +}{SHFT C}{SHFT +
    }{SHFT C}{SHFT +}{SHFT C}{C
    OMD W}":NEXT         :REM*134
2120 PRINTSPC(I)"{SHFT -} {SHFT
    B} {SHFT B} {SHFT B} {SHFT
    B} {SHFT B} {SHFT B} {SHFT
    B} {SHFT B} {SHFT B} {SHFT
    B} {SHFT B} {SHFT B} {SHFT
    B} {SHFT B} {SHFT B} {SHFT
    -}"                  :REM*202
2130 PRINTSPC(I)"{COMD Z}{SHFT *
    }{COMD E}{SHFT *}{COMD E}{S
    HFT *}{COMD E}{SHFT *}{COMD
     E}{SHFT *}{COMD E}{SHFT *}
    {COMD E}{SHFT *}{COMD E}{SH
    FT *}{COMD E}{SHFT *}{COMD
    E}{SHFT *}{COMD E}{SHFT *}{
    COMD E}{SHFT *}{COMD E}{SHF
    T *}{COMD E}{SHFT *}{COMD E
    }{SHFT *}{COMD E}{SHFT *}{C
    OMD X}{HOME}";:RETURN
                         :REM*18
2140 POKES,10:POKES+1,10:POKES+5
    ,45:POKES+6,165:POKES+4,33
                         :REM*32
2150 FORD=1TO200:NEXT:FORD=STOS+
    6:POKED,0:NEXT:RETURN
                         :REM*236
2160 POKES,0:POKES+1,60:POKES+5,
    0:POKES+6,96:POKES+4,17
                         :REM*110
2170 FORD=1TO10:NEXT:FORD=STOS+6
    :POKED,0:NEXT:RETURN :REM*0
2180 POKES+5,10:POKES+6,8:POKES+
    1,70:POKES+4,17:FORD=1TO50:
    NEXT:POKES+4,16      :REM*32
2190 FORD=1TO250:NEXT:RETURN
                         :REM*92
2200 DATA 7,160,0,162,0,173,60,3
    ,153                 :REM*102
2210 DATA 41,216,153,25,217,153,
    9,218                :REM*206
2220 DATA 153,249,218,200,200,23
    2,224                :REM*220
2230 DATA 16,208,237,192,192,208
    ,1,96                :REM*46
2240 DATA 152,24,105,48,168,208,
    220                  :REM*40
2250 DATA 9,1,2,2,2,3,5,4,12,5,2
    ,6,3,7,2,8,9,9,1,10,1,11,4,
    12,2,13,6,14,8,15    :REM*174
2260 DATA 2,16,1,17,6,18,5,19,6,
    20,4,21,2,22,2,23,1,24,2,25
    ,1,26,-1,-1          :REM*172
2270 DATA 127,255,192,127,255,19
    2,096                :REM*176
2280 DATA 0,192,96,0,192,96,0,19
    2,96                 :REM*34
2290 DATA 0,192,96,0,192,96,0,19
    2                    :REM*78
2300 DATA 96,0,192,96,0,192,96,0
                         :REM*246
2310 DATA 192,96,0,192,96,0,192,
    96,0                 :REM*187
2320 DATA 192,127,255,192,127,25
    5,192                :REM*107
2330 DATA 0,0,0,0,0,0,0,0
                         :REM*213
2340 DATA 0,0,0,0,0,0,0,0
                         :REM*223
```


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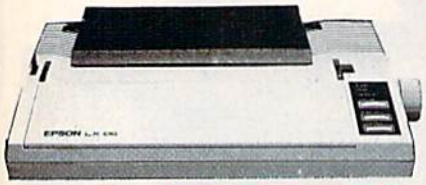
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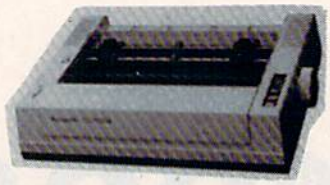
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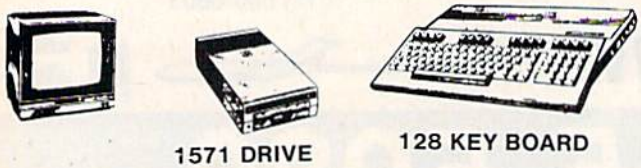
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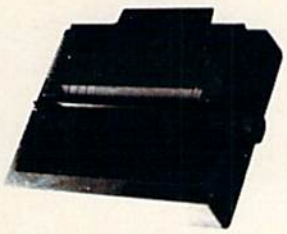


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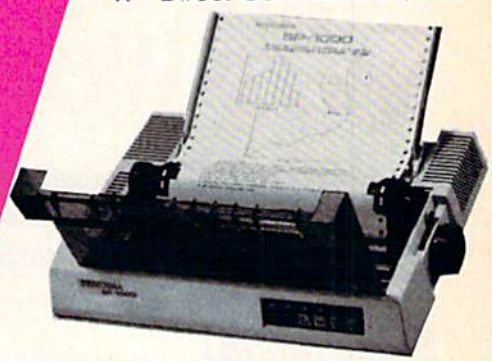


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SOLVING THE SPLIT-WORD PROBLEM

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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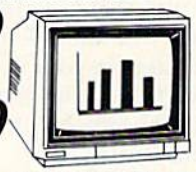
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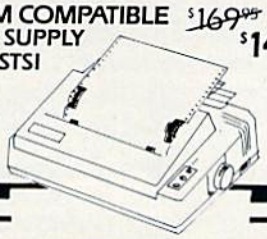
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There is a way, however, to prevent the "old text" from being visible, even if part of it does remain on the screen.

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 originally. 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.

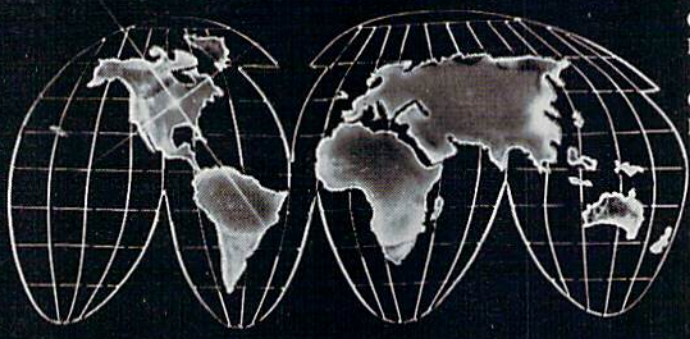
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Listing 1. *Basic loader.*

```
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.

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

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 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 POKE5328Ø,Ø:POKE53281,Ø:PRINT"{COMD 8}{SH
  FT CLR}"                              :REM*11
1Ø DIMND(12),MO$(12):OPEN4,4            :REM*44
15 T$="{4 SPACEs}-------------------------
   ------------------------------------{3
    SPACEs}"                            :REM*51
2Ø C$="{SHFT H}{8 SPACEs}":T$="{5 SPACEs}"+
   T$                                   :REM*7Ø
25 FORLO=1TO12:READND(LO),MO$(LO):NEXTLO
                                        :REM*111
3Ø FORLL=1TO7:READDY$:AA$=AA$+"{6 SPACEs}"+
   DY$:NEXT                             :REM*1Ø6
35 D=1:MO=1:YR=2ØØØ                     :REM*153
4Ø GOSUB2ØØ                             :REM*25Ø
45 INPUT"MONTH & YEAR (MM,YYYY)";MO,YR
                                        :REM*129
5Ø GOSUB12Ø                             :REM*28
55 XX=(ND(MO)+J)/7:NU=INT(XX):IFXX>NUTHENNU
   =NU+1                                :REM*187
6Ø IF (YR/4)-INT(YR/4)=Ø THEN ND(2)=29
                                        :REM*82
65 SR=(J*1Ø)+4                          :REM*11
7Ø GOSUB3ØØ                             :REM*32
75 CLR:INPUT"AGAIN (Y/N)";XZ$:IFXZ$="Y"THEN
   RUN                                  :REM*2Ø9
8Ø CLOSE4                               :REM*116
85 END                                  :REM*87
9Ø GOSUB3ØØ                             :REM*52
95 END                                  :REM*97
99 REM DAY#                             :REM*2Ø3
1ØØ DATA 31,JANUARY,28,FEBRUARY,31,MARCH,3Ø
   ,APRIL,31,MAY,3Ø,JUNE,31,JULY,31:REM*64
1Ø5 DATA AUGUST,3Ø,SEPTEMBER,31,OCTOBER,3Ø,
   NOVEMBER,31,DECEMBER                 :REM*27
11Ø DATA SUN,MON,TUE,WED,THU,FRI,SAT:REM*38
12Ø Q=YR+(MO<3):J=INT(275*MO/9)-INT((7*Q+7)
   /4)+367*YR+D-INT((INT(Q/1ØØ)+1)*3/4)
                                        :REM*118
125 J=J-4-7*INT((J-4)/7):RETURN         :REM*215
13Ø RETURN                              :REM*188
135 DATA SUN,MON,TUE,WED,THU,FRI,SAT:REM*63
2ØØ PRINT"{SHFT CLR}":PRINTSPC(1Ø)"* CALEND
   AR GENERATOR *":PRINT                :REM*2Ø
21Ø PRINT"{3 SPACEs}INPUT ANY MONTH IN TWO
   (2) DIGIT FORM AND ANY YEAR IN FOUR (4)
   ";                                   :REM*26
215 PRINT" DIGIT FORM. A{2 SPACEs}CALENDAR
   FOR THAT MONTH AND YEAR WILL{3 SPACEs}B
   E DUMPED";                           :REM*115
22Ø PRINT" TO THE PRINTER."             :REM*7Ø
225 PRINT:PRINT:PRINT"{4 SPACEs}{CTRL 8}TUR
   N ON PRINTER NOW!{COMD 8} "          :REM*161
23Ø PRINT:PRINT:PRINT"{4 SPACEs}HIT ANY KEY
    TO CONTINUE"                        :REM*9Ø
235 GETG$:IFG$=""THEN235                :REM*5
24Ø RETURN                              :REM*42
3ØØ CE=(64-LEN(MO$(MO))*2-12)/2+9:PRINT#4:P
   RINT#4,SPC(CE)CHR$(14);MO$(MO)+" ";YR
                                        :REM*15
3Ø5 PRINT#4,CHR$(15):PRINT#4            :REM*1Ø
31Ø IN=4:GU=Ø:N9$="Ø1":N9=1             :REM*17
315 PRINT#4,SPC(7)AA$                   :REM*14Ø
32Ø PRINT#4,T$                          :REM*155
325 FORLO=1TONU                         :REM*142
33Ø PRINT#4,"{9 SPACEs}";               :REM*171
335 FORL3=1TO7                          :REM*24
34Ø IN=IN+9:IFIN>=SRTHENGU=1            :REM*127
345 IFN9>ND(MO)THENGU=Ø                 :REM*6
35Ø IFGU=ØTHEN36Ø                       :REM*179
355 PRINT#4,LEFT$(C$,7);RIGHT$(N9$,2);:N9=N
   9+1:N9$="Ø"+MID$(STR$(N9),2):GOTO365
                                        :REM*18
36Ø PRINT#4,C$;                         :REM*63
365 NEXTL3:PRINT#4,"{SHFT H}"           :REM*6Ø
37Ø FORL2=2TO8                          :REM*1Ø7
375 PRINT#4,"{9 SPACEs}";C$;C$;C$;C$;C$;C$;
   C$;"{SHFT H}":NEXTL2                 :REM*2Ø4
38Ø PRINT#4,T$                          :REM*215
385 NEXTLO:PRINT#4,CHR$(12)             :REM*154
39Ø RETURN                              :REM*193
```

■

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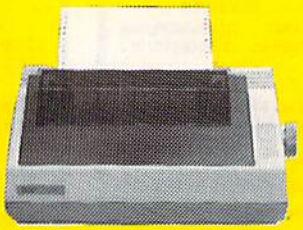
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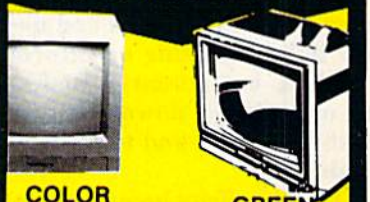
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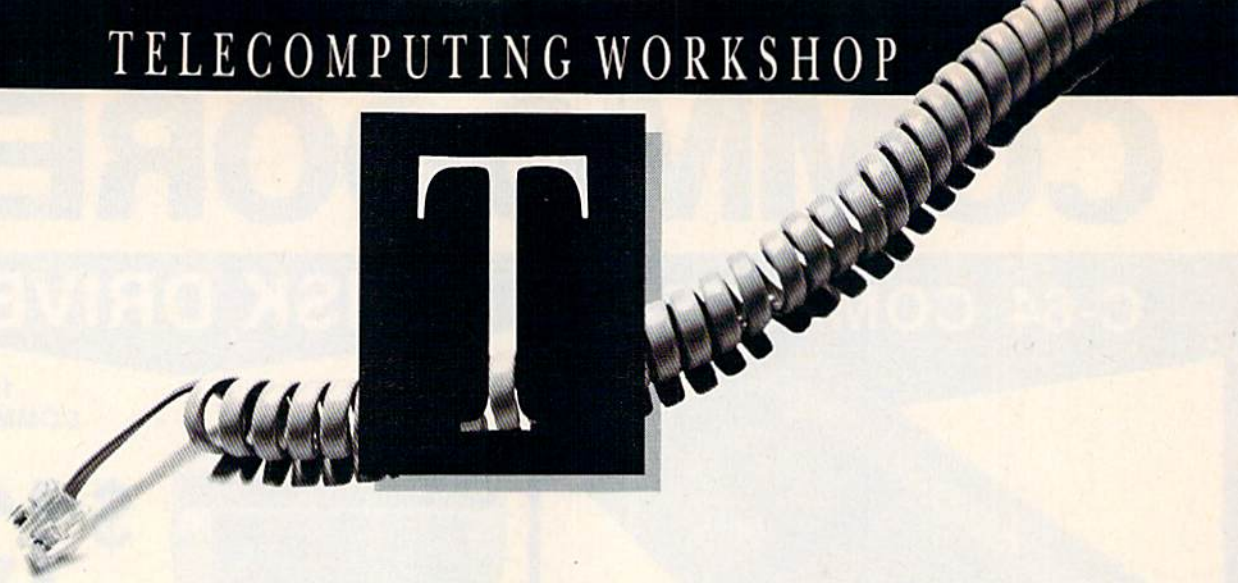
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By DAVID BRADLEY

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
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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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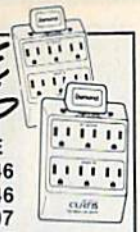
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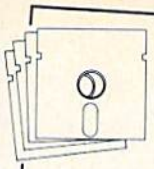
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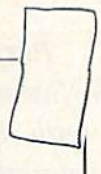
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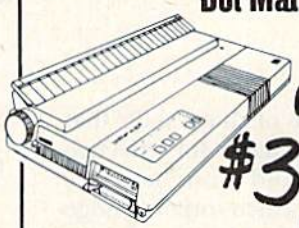
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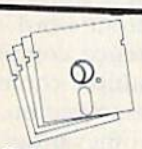


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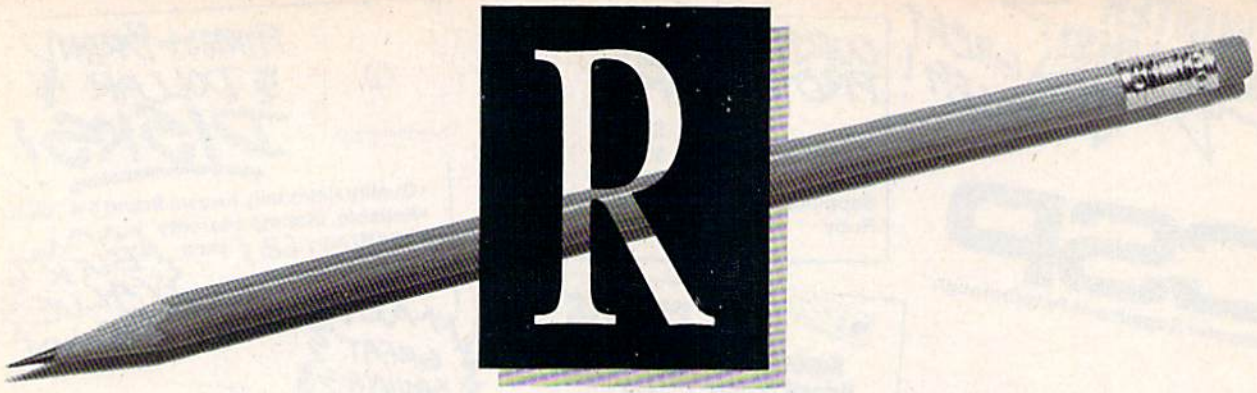
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By MARGARET MORABITO

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

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 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)
Weekly Reader Family Software
245 Long Hill Road
Middletown, CT 06457
$29.95.

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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 redisplays 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

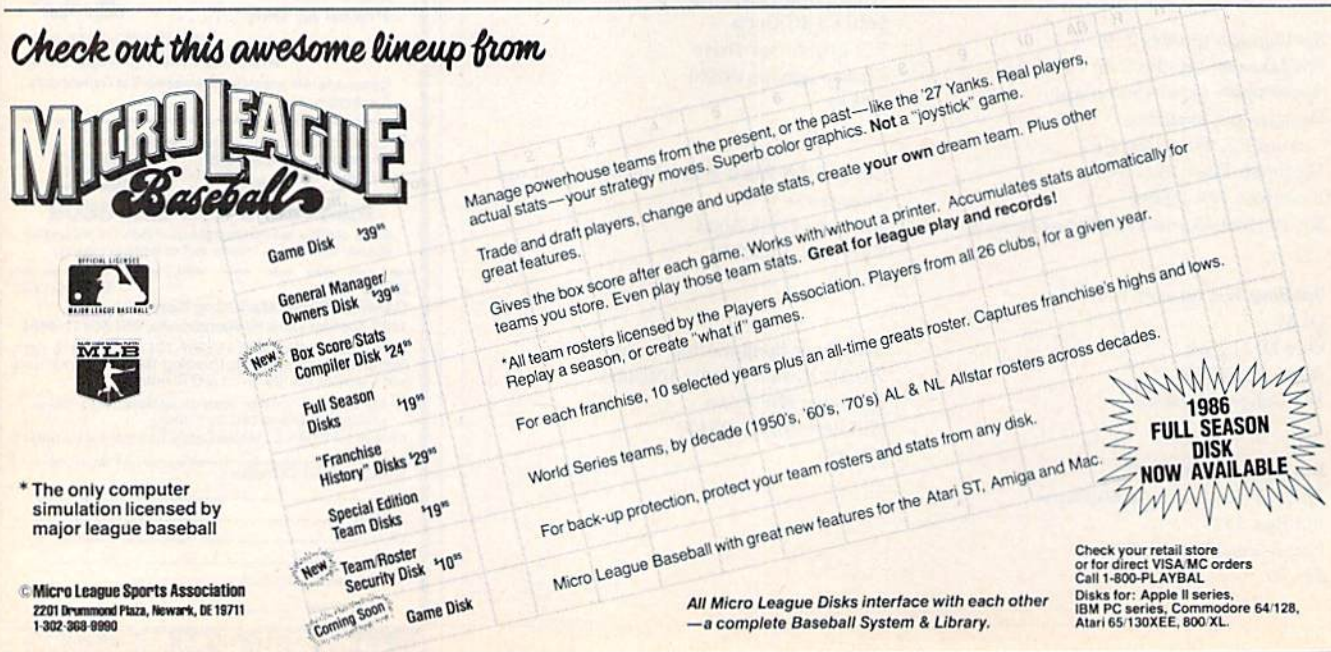
August—Telecommunications in schools

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



Circle 106 on Reader Service card.

I'd recommend that schools invest in a comprehensive package.

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.

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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. R

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

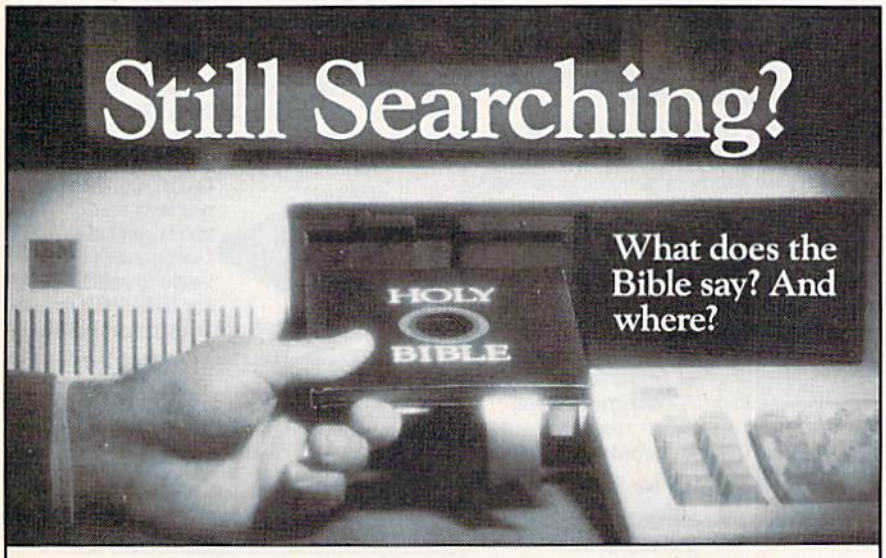
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The Resource Center
c/o RUN *magazine*
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Peterborough, NH 03458

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}9Ø1 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 1ØØØØ :REM*2Ø9
6 REM{2 SPACEs}BE SURE TO END DATA STATEMEN
  TS WITH *                         :REM*54
7 REM PUBLIC DOMAIN PROGRAM         :REM*233
1Ø POKE5328Ø,2:POKE53281,1:POKE53272,23
                                    :REM*128
1ØØ PRINT"{SHFT CLR}"               :REM*9Ø
2ØØ 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=1TO2ØØØ:NEXT:PRINT"{SHFT CLR}"
                                    :REM*169
261 PRINT"{SHFT CLR}"               :REM*252
262 RESTORE                         :REM*57
265 REM: MENU ROUTINE               :REM*1Ø8
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
27Ø GETCHOICE$:IFCHOICE$=""THEN GOTO 27Ø
                                    :REM*1
275 IF CHOICE$="1"THEN GO TO 2ØØØ   :REM*158
276 IFCHOICE$="2" THEN GOTO25ØØ     :REM*29
277 IFCHOICE$<>"1"ANDCHOICE$<>"2"THENGOTO27
    Ø                               :REM*66
279 PRINT"{SHFT CLR}"               :REM*14
28Ø 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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Listing 1 continued.

```
281 FOR X=1TO25ØØ:NEXT                          :REM*2ØØ
29Ø SUM=Ø                                       :REM*81
3ØØ READ A$                                     :REM*151
31Ø COUNT=Ø                                     :REM*127
35Ø IF A$="*"THEN GOTO 1ØØ5Ø                    :REM*95
395 PRINT"{SHFT CLR}":FORZ=1TO5ØØ:NEXT
                                                :REM*128
396 FORI=1 TO 1Ø                                :REM*33
397 PRINT"{15 CRSR RTs}{1Ø CRSR DNs}";A$
                                                :REM*142
398 PRINT"{SHFT CLR}"                           :REM*133
4ØØ NEXT                                        :REM*155
5ØØ PRINT"{SHFT CLR}":FORI=1TO 3ØØ:NEXT
                                                :REM*185
61Ø 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$:REM*44
65Ø COUNT=COUNT+1                               :REM*54
7ØØ IF B$=A$ THEN SUM=SUM+5:GOSUB5ØØØ:GOTO3
    ØØ                                          :REM*3Ø
7Ø5 IF B$<>A$THENGOSUB 6ØØØ                     :REM*57
71Ø SUM=SUM-1                                   :REM*21Ø
75Ø IF COUNT=3 THEN 95Ø                         :REM*11Ø
8ØØ GOTO 395                                    :REM*29
925 PRINT"{SHFT CLR}"                           :REM*15Ø
93Ø GOTO261                                     :REM*231
94Ø PRINT"{SHFT CLR}"                           :REM*165
95Ø 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 GOTO94Ø                       :REM*113
96Ø PRINT"{5 CRSR RTs}{7 CRSR DNs}{SHFT P}R
    ESS ANY KEY TO CONTINUE"                    :REM*65
98Ø GET Q$:IFQ$=""THEN GOTO98Ø                  :REM*1Ø1
99Ø PRINT"{SHFT CLR}"                           :REM*215
1ØØØ GOTO3ØØ                                    :REM*181
12ØØ 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*15Ø
2ØØØ REM: STUDY WORD ROUTINE                    :REM*77
2Ø5Ø PRINT"{SHFT CLR}"                           :REM*Ø
21ØØ READA$                                     :REM*166
22ØØ PRINT"{15 CRSR RTs}{8 CRSR DNs}";A$
                                                :REM*4Ø
225Ø IF A$="*"THEN GOTO261                      :REM*244
23ØØ PRINT:PRINT:PRINT:PRINT"{5 CRSR RTs}{S
    HFT P}{SHFT R}{SHFT E}{2 SHFT Ss}{SHFT
     SPACE}{SHFT A}{SHFT N}{SHFT Y}{SHFT S
    PACE}{SHFT K}{SHFT E}{SHFT Y}{SHFT SPA
    CE}{SHFT T}{SHFT O}{SHFT SPACE}{SHFT S
    }{2 SHFT Es}{SHFT SPACE}{SHFT N}{SHFT
    E}{SHFT X}{SHFT T}{SHFT SPACE}{SHFT W}
    {SHFT O}{SHFT R}{SHFT D}"                   :REM*174
231Ø GETL$:IFL$=""THEN GOTO231Ø                 :REM*17
2312 PRINT"{SHFT CLR}"                           :REM*7
24ØØ GO TO 21ØØ                                 :REM*45
25ØØ PRINT"{SHFT CLR}":PRINT"{11 CRSR RTs}{
    6 CRSR DNs}{SHFT P}{SHFT O}{SHFT I}{SH
    FT N}{SHFT T} {SHFT A}{SHFT W}{SHFT A}
    {SHFT R}{SHFT D}{SHFT S}"                   :REM*229
251Ø PRINT:PRINT:PRINT"{7 CRSR RTs}{SHFT C}
    {SHFT O}{2 SHFT Rs}{SHFT E}{SHFT C}{SH
    FT T}{SHFT SPACE}{SHFT F}{SHFT I}{SHFT
     R}{SHFT S}{SHFT T}{SHFT SPACE}{SHFT T
    }{SHFT I}{SHFT M}{SHFT E} = +5{SHFT SP
    ACE}{SHFT P}{SHFT O}{SHFT I}{SHFT N}{S
    HFT T}{SHFT S}"                             :REM*29
252Ø PRINT:PRINT"{1Ø CRSR RTs}{SHFT W}{SHFT
     R}{SHFT O}{SHFT N}{SHFT G}{SHFT SPACE
    }{SHFT E}{SHFT A}{SHFT C}{SHFT H}{SHFT
     SPACE}{SHFT T}{SHFT I}{SHFT M}{SHFT E
    }{SHFT SPACE}= -1 {SHFT P}{SHFT O}{SHF
    T I}{SHFT N}{SHFT T}"                       :REM*41
253Ø PRINT:::PRINT"{8 CRSR RTs}{5 CRSR DNs}
    {SHFT P}{SHFT R}{SHFT E}{2 SHFT Ss}{SH
    FT SPACE}{SHFT A}{SHFT N}{SHFT Y} {SHF
    T K}{SHFT E}{SHFT Y}{SHFT SPACE}{SHFT
    T}{SHFT O}{SHFT SPACE}{SHFT B}{SHFT E}
    {SHFT G}{SHFT I}{SHFT N}"                   :REM*89
254Ø GET A$:IFA$=""THEN254Ø                     :REM*13
261Ø PRINT"{SHFT CLR}":GOTO279                   :REM*8
5ØØØ REM{2 SPACEs}BELL SOUND                    :REM*221
5Ø1Ø POKE54296,15:POKE54277,Ø:POKE54278,247
                                                :REM*77
5Ø2Ø POKE54276,17:POKE54273,4Ø:POKE54272,Ø
                                                :REM*57
5Ø3Ø FOR T=1TO5ØØ:NEXT:POKE54276,6              :REM*63
5Ø4Ø PRINT"{SHFT CLR}":FORX=1TO6:PRINTTAB(1
    7)"{1Ø CRSR DNs}{SHFT R}{SHFT I}{SHFT
    G}{SHFT H}{SHFT T}!":FORY=1TO8Ø:NEXT:P
    RINT"{SHFT CLR}"                            :REM*147
5Ø5Ø FORZ=1TO8Ø:NEXT:NEXT:RETURN                :REM*2Ø9
6ØØØ REM BUZZER                                  :REM*3
6Ø1Ø POKE54296,15:POKE54277,45:POKE54268,16
    5                                           :REM*95
6Ø2Ø POKE54276,33:POKE54273,6:POKE54272,5
                                                :REM*171
6Ø3Ø FORT=1TO5ØØ:NEXT:POKE54276,32:POKE5427
    3,Ø:POKE54272,Ø                             :REM*225
6Ø4Ø PRINT"{SHFT CLR}":FORX=1TO6:PRINTTAB(1
    7)"{1Ø CRSR DNs}{SHFT W}{SHFT R}{SHFT
    O}{SHFT N}{SHFT G}!":FORY=1TO8Ø:NEXT:P
    RINT"{SHFT CLR}"                            :REM*39
6Ø5Ø FORZ=1TO8Ø:NEXT:NEXT:RETURN                :REM*189
1ØØØØ DATA ACCIDENTALLY,ATTENDANCE,BENEFIT,
     CHARACTERISTIC,DENY,DOUBLE,ELABORATE
                                                :REM*1
1ØØØ1 DATA MISSPELL,*                           :REM*19Ø
1ØØ2Ø REM*******MESSAGE ROUTINE*****
                                                :REM*1Ø3
1ØØ5Ø IF SUM<75 THEN MSG$="{SHFT Y}OU NEED
    TO STUDY YOUR WORDS"                        :REM*1Ø1
1ØØ51 IF SUM>75 AND SUM<84 THEN MSG$="{SHFT
     P}RETTY GOOD JOB"                          :REM*222
1ØØ52 IF SUM>84 AND SUM<94 THEN MSG$="{SHFT
     R}EAL GOOD"                                :REM*191
1ØØ53 IF SUM>94 AND SUM<1ØØ THEN MSG$="{SHF
    T A}LMOST PERFECT"                          :REM*234
1ØØ54 IF SUM>99 THENMSG$="{SHFT P}ERFECT SC
    ORE!! {SHFT H}OORAY!!!                      :REM*239
1ØØ55 PRINT"{6 CRSR RTs}{6 CRSR DNs}";MSG$
                                                :REM*182
1ØØ58 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
1ØØ6Ø PRINT:PRINT:PRINT"{5 CRSR RTs}{4 CRSR
     DNs}{SHFT T}AKE TEST AGAIN? Y/N"
                                                :REM*2Ø1
1Ø35Ø GETZ$:IFZ$=""THEN 1Ø35Ø                   :REM*136
1Ø4ØØ IF Z$="Y" THEN 261                        :REM*148
1Ø5ØØ PRINT"{SHFT CLR}":PRINT"{15 CRSR RTs}
    {SHFT S}EE YOU LATER."                      :REM*155
1Ø6ØØ END                                       :REM*147 ■
```

Magic

From p. 12.

```
6Ø LOOP
7Ø SCNCLR:TEMPO15:PLAY"V1O6T9U15XØO5QCGO6IC
   CCO5IGGGQEGECCEO6ICCCO5IGGGEEEQGEC"
8Ø PRINT"I GUESS IT IN ONLY"T"TRIES!":PRINT
   "WANT TO TRY AGAIN?":PRINT"(Y)ES OR (N)O
   "
9Ø GETKEYS$:IFS$="Y"GOTO1Ø: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.

```
1Ø REM CAPS-LOCK-Q FIX - JERRY KIRK
2Ø FAST:BANK15:FORJ=ØTO88:POKE6333+J,PEEK(6
   4484+J):NEXT:POKE84Ø,189:POKE841,24:POKE
   6395,2Ø9: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.

```
49Ø REM C-64 THINKING - JOSEPH CHARNETSKI
5ØØ S=54272:POKE S+6,24Ø:POKE S+5,34
51Ø POKE S+24,15:POKE S+4,21
52Ø FOR I=1TO3Ø
53Ø POKES+1,RND(1)*18Ø:POKE S,RND(1)*2Ø
54Ø FOR J=1TO6Ø:NEXT:NEXT
55Ø POKE S+4,Ø: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

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

```
Ø REM LOWER CASE CHAR - CARLOS CASTELLANOS
1 :
2 REM ----DELETE ALL BUT LINE 1Ø TEXT----
3 :
1Ø CHAR 1,Ø,Ø,CHR$(14)+"{SHFT 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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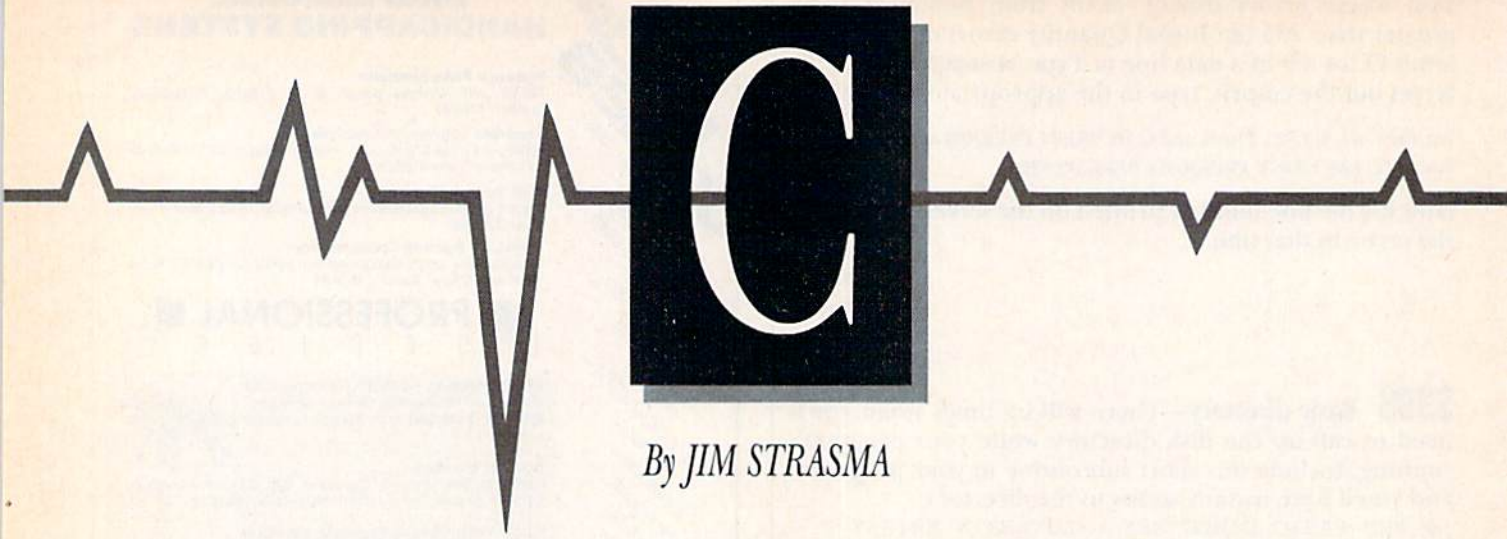
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By JIM STRASMA

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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 Epsons 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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Leather Goddesses $23
Moonmist (D) $23
Planetfall (D) $23
Sorcerer (D) $25
Suspect (D) $25
Trinity 128 $25
Wishbringer (D) $23
Zork 1 (D) $23
Zork 2 or 3 (D) $25
KONAMI
Yie Ar Kung Fu (D) $19
MASTERTRONIC
Action Biker (D) $7
Electra Glide (D) $7
Infinity Machine (R) $12
5-A-Side Soccer (D) $7
Kikstart 128 $12
Knight Games (D) $7
Last V-8 (D) $7
Last V-8 128 $12
Magnum Joystick $12
Master of Magic (D) $7
Ninja (D) $7
Pro Golf (D) $7
Speed King (D) $7
The Slugger (D) $7
Vegas Poker & Jackpot (D) $7
MICROLEAGUE
Baseball (D) $25
Box Score Stats (D) $16
General Manager (D) $25
1985 Team Data Disk $14
1986 Team Data Disk $14
WWF Wrestling (D) $25
MICROPROSE
Acrojet (D) $16
Conflict in Viet Nam (D) $25
Crusade in Europe (D) $25
Decision in Desert (D) $25
F-15 Strike Eagle (D) $23
Gunship (D) $23
Kennedy Approach (D) $16
Silent Service (D) $23
Top Gunner (D) $16
MINDSCAPE
Bop & Wrestle (D) $19
Fairlight (D) $19
High Roller (D) $19
Indoor Sports (D) $19
Infiltrator (D) $19
Perfect Score SAT (D) $44
The American Challenge Sailing Simulation (D) $19
MISC
CSM 1541 Align Kit (D) $29
Central Point-Copy 2 (D) $23
Font Master 2 (D) $33
Font Master 2 128 $39
Gato (D) $19
Snapshot 64 (R) $39
Superbase 64 (D) $47
Superbase 128 (D) $59
Superscript 64 (D) $33
Superscript 128 $47
ORIGIN
Autoduel (D) $32
Moebius (D) $26
Ogre (D) $26
Ultima 3 (D) $32
Ultima 4 (D) $39
PENGUIN/POLARWARE
Crimson Crown (D) $12
Oo-Topos (D) $12
Transylvania (D) $12
RELEVANT
Billboard Maker (D) $25
Icon Factory (D) $25
SCARBOROUGH
Build A Book (D) $16
Mastertype (D) $25
SIMON & SCHUSTER
Chem. Lab (D) $25
Great Int'l. Paper Airplane Const. (D) $19
Star Trek: Promethean Prophecy (D) $19
Typing Tutor 3 (D) $25
SPINNAKER
ACE $14
Homework Helper: Math Word Problems $23
Writing $23
Kung Fu 1 or 2 (D) $19 ea.
SPRINGBOARD
Certificate Maker (D) $33
C.M. Library Vol. 1 Call
Newsroom (D) $33
N.R. Clip Art Vol. 1 (D) $19
N.R. Clip Art Vol. 2 (D) $25
N.R. Clip Art Vol. 3 (D) $19
Print Shop Graphics Expander (D) $23
SSI
Battle Group (D) $37
Battle of Antietam (D) $33
Colonial Conquest (D) $25
Gemstone Healer (D) $19
Gettysburg (D) $37
Kampfgruppe (D) $37
Mech Brigade (D) $37
NAM (D) $25
Phantasie (D) $25
Phantasie 2 (D) $25
Rings of Zilfin (D) $25
Roadwar 2000 (D) $25
Shard of Spring (D) $25
War Game Construction Set (D) $19
Warship (D) $39
Wizard's Crown (D) $25
SOFTSYNC
Personal Accountant (D) $23
SUBLOGIC
Baseball (D) $32
Flight Simulator 2 (D) $32
F.S. Scenery Disks Call
Football (D) $26
Jet (D) $26
TELARIUM
Amazon (D) $9.88
Fahrenheit 451 (D) $9.88
Dragon World (D) $9.88
Rendezvous (D) $9.88
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Accts. Receivable (D) $39
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Inventory Mgmt (D) $39
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Partner 128 (R) $43
Swiftcalc/Sideways (D) $25
Swiftcalc/Sideways 128 $43
Sylvia Porter's Personal Fin. Planner (D) 64 $33
Sylvia Porter's Personal Fin. Planner 128 $43
Word Writer w/Speller (D) $33
Word Writer w/85000 Word Speller 128 $43
UNISON WORLD
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Art Gallery 2 (D) $16
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Stickybear Series:
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Numbers (D) $16
Opposites (D) $16
Reading (D) $16
Shapes (D) $16
Spellgrabber (D) $16
Typing (D) $16
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Swiss Family Robinson (D) $6.88
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Wizard of Oz (D) $6.88
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Bonus DS, DD $6.99 Bx
Compuserve Starter Kit (a $25 usage Credit) $19
Disk Case (Holds 75) $9
Disk Drive Cleaner $9
Epyx 500XJ Joystick $14
Wico Bat Handle $17
Wico Black Max $9
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Circle 254 on Reader Service card.

Commodore Clinic

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 Spinnaker Software. If it runs, your cartridge port is good, and should also work with a RAM cartridge.

SOFTWARE

Q: I'm in the U.S. Navy and only get back to the U.S. two or three months each year. Who can I write to for information on printers, programs and any other information I may require?

Ronald F. Fortune
U.S.S. Enterprise
FPO, San Francisco, CA



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Circle 4 on Reader Service card.

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 Bible" 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.



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", Iid. 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 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).

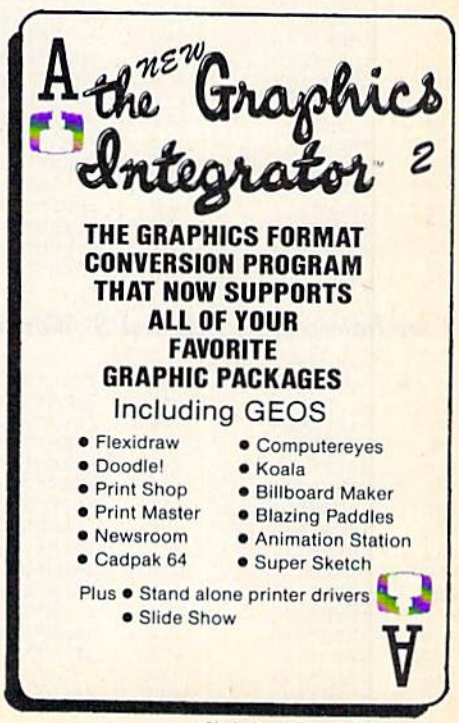
Q: Thanks heaps for answering my question in September's Commodore Clinic. I purchased the 6502 reference card you suggested. It's a great source of information, but I still can't figure out how to clear the screen in machine language. Could you give a routine that does this?

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 BSOut 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.■



Circle 24 on Reader Service card.

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

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

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

→

Listing continued.

```
87Ø    :REM*151
88Ø     :REM*83
89Ø     :REM*29
9ØØ    :REM*127
91Ø     :REM*85
92Ø    :REM*2Ø7
93Ø    :REM*223
94Ø     :REM*85
95Ø    :REM*133
96Ø    :REM*175
97Ø      :REM*7
98Ø    :REM*151
99Ø    :REM*115
1ØØØ   :REM*2Ø9
1ØØ3   :REM*148
1ØØ5   :REM*138
1ØØ6   :REM*123
1ØØ7   :REM*148
1Ø2Ø   :REM*215
1Ø3Ø     :REM*Ø
1Ø4Ø   :REM*176
1Ø5Ø    :REM*32
1Ø6Ø    :REM*64
1Ø7Ø   :REM*146
1Ø8Ø    :REM*64
1Ø9Ø    :REM*16
11ØØ   :REM*17Ø
11Ø5   :REM*251
111Ø    :REM*74
112Ø   :REM*23Ø
113Ø   :REM*16Ø
115Ø   :REM*212
116Ø   :REM*19Ø
117Ø     :REM*Ø
118Ø    :REM*72
119Ø    :REM*68
12ØØ   :REM*1Ø6
121Ø    :REM*6Ø
122Ø   :REM*18Ø
123Ø   :REM*192
125Ø   :REM*21Ø
127Ø    :REM*48
128Ø    :REM*63
129Ø   :REM*121
1298      :REM*3
13ØØ   :REM*139
131Ø   :REM*249
132Ø   :REM*1Ø9
133Ø   :REM*253
134Ø   :REM*131
1345    :REM*96
1348     :REM*53
135Ø     :REM*97
136Ø   :REM*111
137Ø   :REM*125
138Ø    :REM*95
139Ø    :REM*65
14ØØ   :REM*183
14Ø5   :REM*2Ø8
141Ø   :REM*153
142Ø   :REM*161
143Ø   :REM*229
144Ø   :REM*179
145Ø   :REM*171
146Ø   :REM*237
147Ø   :REM*173
148Ø   :REM*125
149Ø    :REM*29
15ØØ   :REM*215
151Ø   :REM*215
152Ø   :REM*1Ø1
153Ø    :REM*31
154Ø   :REM*118
155Ø     :REM*1Ø
156Ø   :REM*142
157Ø   :REM*128
158Ø   :REM*1Ø8
16ØØ     :REM*6
2ØØØ    :REM*89
2Ø1Ø   :REM*165
2Ø2Ø   :REM*2Ø7
2Ø3Ø   :REM*117
2Ø4Ø   :REM*255
2Ø5Ø   :REM*134
2Ø6Ø   :REM*218
```

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

```
1Ø      :REM*58
2Ø      :REM*14
3Ø      :REM*48
4Ø     :REM*224
5Ø     :REM*178
6Ø     :REM*12Ø
7Ø     :REM*24Ø
8Ø     :REM*116
1ØØ    :REM*122
11Ø     :REM*62
12Ø     :REM*52
13Ø    :REM*15Ø
14Ø     :REM*84
15Ø    :REM*2Ø6
155    :REM*135
16Ø     :REM*3Ø
162    :REM*248
163    :REM*225
165     :REM*59
17Ø     :REM*26
175    :REM*2Ø5
18Ø    :REM*156
185    :REM*117
19Ø     :REM*84
2ØØ    :REM*2Ø8
21Ø    :REM*124
22Ø    :REM*2ØØ
23Ø    :REM*164
24Ø    :REM*164
245     :REM*39
25Ø    :REM*18Ø
26Ø     :REM*93
27Ø    :REM*111
28Ø    :REM*173
285     :REM*56
29Ø    :REM*175
295    :REM*226
296     :REM*91
3ØØ     :REM*63
3Ø5    :REM*1Ø8
31Ø     :REM*79
32Ø    :REM*2Ø1
325     :REM*4Ø
33Ø    :REM*133
335     :REM*66
34Ø     :REM*17
345     :REM*32
35Ø      :REM*5
355    :REM*248
356    :REM*163
36Ø     :REM*97
37Ø     :REM*61
375    :REM*246
376    :REM*123
38Ø     :REM*27
4ØØ     :REM*47
41Ø    :REM*225
415    :REM*172
42Ø    :REM*143
43Ø    :REM*127
435    :REM*192
44Ø    :REM*137
445    :REM*12Ø
45Ø    :REM*191
455    :REM*2Ø4
46Ø    :REM*161
465    :REM*174
47Ø    :REM*2Ø3
475    :REM*232
48Ø    :REM*111
485     :REM*56
49Ø    :REM*223
495    :REM*252
5ØØ     :REM*59
51Ø    :REM*175
52Ø     :REM*44
525    :REM*2Ø7
53Ø    :REM*1Ø8
54Ø    :REM*142
541     :REM*33
```

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

```
1ØØ    :REM*134
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15Ø    :REM*19Ø
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42Ø    :REM*121
43Ø     :REM*77
44Ø    :REM*117
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77Ø     :REM*75
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82Ø    :REM*197
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84Ø     :REM*79
85Ø     :REM*31
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Landlord's Helper, by Wayne Arnett; March, p. 30.

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17Ø     :REM*98
18Ø    :REM*18Ø
19Ø    :REM*254
2ØØ    :REM*2ØØ
21Ø     :REM*1Ø
22Ø    :REM*2ØØ
23Ø     :REM*98
24Ø     :REM*84
25Ø     :REM*5Ø
26Ø    :REM*151
265    :REM*242
27Ø     :REM*27
275    :REM*252
28Ø    :REM*141
285      :REM*6
29Ø    :REM*133
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31Ø    :REM*173
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32Ø    :REM*213
33Ø    :REM*233
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36Ø    :REM*1Ø5
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37Ø    :REM*217
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43Ø    :REM*233
44Ø    :REM*125
45Ø    :REM*253
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46Ø    :REM*233
465    :REM*186
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48Ø    :REM*2Ø1
49Ø      :REM*7
5ØØ     :REM*83
51Ø     :REM*47
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53Ø     :REM*74
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55Ø    :REM*214
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85Ø    :REM*181
855     :REM*66
86Ø     :REM*93
87Ø     :REM*95
88Ø     :REM*81
89Ø    :REM*177
9ØØ     :REM*23
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→

Listing continued.

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93Ø    :REM*231
94Ø     :REM*97
95Ø     :REM*43
96Ø    :REM*239
97Ø    :REM*145
98Ø     :REM*79
99Ø    :REM*173
995    :REM*2Ø6
1ØØØ   :REM*135
1ØØ5   :REM*216
1Ø1Ø    :REM*55
1Ø2Ø   :REM*1Ø7
1Ø3Ø   :REM*242
1Ø4Ø   :REM*228
1Ø5Ø   :REM*232
1Ø6Ø    :REM*32
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1Ø8Ø    :REM*42
1Ø9Ø   :REM*178
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112Ø   :REM*156
113Ø   :REM*122
114Ø   :REM*2Ø8
115Ø    :REM*22
116Ø   :REM*154
117Ø   :REM*166
118Ø   :REM*22Ø
119Ø   :REM*164
12ØØ    :REM*2Ø
12Ø5   :REM*161
121Ø     :REM*6
1215   :REM*171
122Ø   :REM*222
123Ø    :REM*56
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127Ø   :REM*196
128Ø   :REM*217
129Ø   :REM*1Ø7
13ØØ   :REM*171
131Ø   :REM*191
132Ø    :REM*51
133Ø   :REM*221
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135Ø    :REM*11
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137Ø   :REM*187
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139Ø   :REM*253
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146Ø   :REM*2Ø3
147Ø    :REM*93
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259Ø   :REM*12Ø
26ØØ   :REM*1Ø8
261Ø   :REM*252
262Ø     :REM*6
263Ø   :REM*198
264Ø    :REM*92
```

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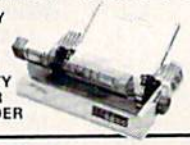
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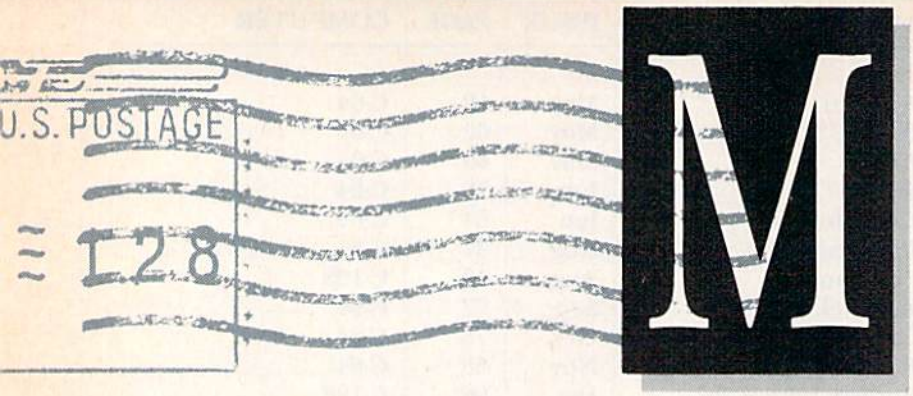
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THE MAIL RUN



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 callsigns, 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 callsign.

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 we 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



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 CP/M. 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, mouses, 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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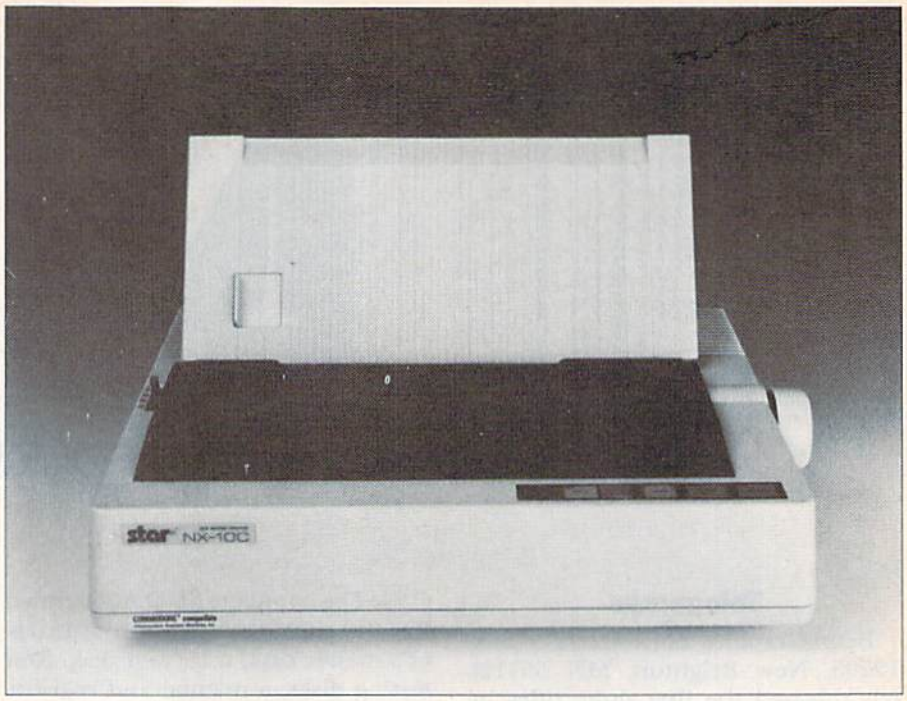
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Star Micronics' NX-10C printer.

Near-Letter Quality Printer

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 Sub-Logic (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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Programmer's Notebook uses indexed files to maintain records of magazine articles, short routines, interesting tips & tricks. It eliminates the need to maintain a notebook near the computer while programming. It's different from the typical indexing program because it stores not just the location of the material, but the material itself plus a user comment line for special notes about the record. Very fast search & Display (about 3 sec. for 740 records). Program is menu driven & has full printer capability. Keep track of those important subroutines! For the C128 & 1571. Disk - $19.95

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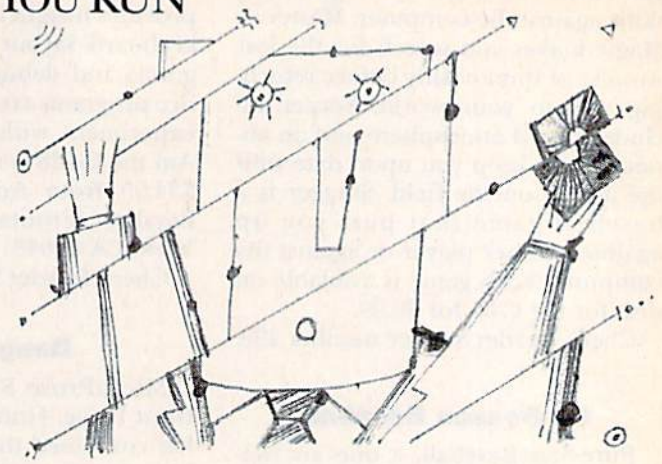
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LEARN TO WALK BEFORE YOU RUN



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,"N0: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

Circle 145 on Reader Service card.

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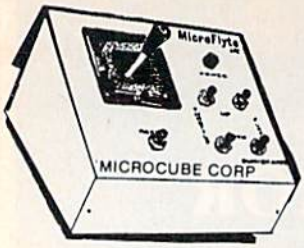
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the SYS numbers that you type in for deactivating and reactivating the checksum program.

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 incompleted 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
1Ø POKE56,PEEK(56)-1:POKE52,PEEK(56):CLR
2Ø PG=PEEK(56):ML=PG*256+6Ø
3Ø FORX=ML TO ML+154:READD:T=T+D:POKEX,D:NE
   XT
4Ø IFT<>16251 THEN PRINT"ERROR IN DATA...":
   END
6Ø POKEML+4,PG:POKE ML+1Ø,PG:POKE ML+16,PG
7Ø POKE ML+2Ø,PG:POKE ML+32,PG:POKE ML+38,P
   G
8Ø POKE ML+141,PG
89 PRINT"{SHFT CLR}{CRSR RT}**************
   **********************"
9Ø SYS ML:PRINT "{CRSR RT}** 64 PERFECT TYP
   IST IS NOW ACTIVE{2 SPACEs}**"
```

```
10Ø PRINT "{CRSR RT}** SYS"ML"=ON{5 SPACEs}
    SYS"ML+3Ø"=OFF **"
101 PRINT"{CRSR RT}**********************
    *************":NEW
11Ø DATA 173,Ø05,Ø03,2Ø1,Ø03,2Ø8,Ø01,Ø96
12Ø DATA 141,1Ø5,Ø03,173,Ø04,Ø03,141,1Ø4
13Ø DATA Ø03,162,1Ø3,16Ø,Ø03,142,Ø04,Ø03
14Ø DATA 14Ø,Ø05,Ø03,Ø96,234,234,173,1Ø4
15Ø DATA Ø03,141,Ø04,Ø03,173,1Ø5,Ø03,141
16Ø DATA Ø05,Ø03,Ø96,Ø32,124,165,132,Ø11
17Ø DATA 162,ØØØ,142,24Ø,Ø03,142,241,Ø03
18Ø DATA 189,ØØØ,Ø02,24Ø,Ø51,2Ø1,Ø32,2Ø8
19Ø DATA Ø04,164,212,24Ø,Ø4Ø,2Ø1,Ø34,2Ø8
2ØØ DATA Ø08,Ø72,165,212,Ø73,ØØ1,133,212
21Ø DATA 1Ø4,Ø72,238,241,Ø03,173,241,Ø03
22Ø DATA Ø41,Ø07,168,1Ø4,Ø24,Ø72,Ø24,1Ø4
23Ø DATA Ø16,ØØ1,Ø56,Ø42,136,Ø16,246,1Ø9
24Ø DATA 24Ø,Ø03,141,24Ø,Ø03,232,2Ø8,2ØØ
25Ø DATA 173,24Ø,Ø03,Ø24,1Ø1,Ø2Ø,Ø24,1Ø1
26Ø DATA Ø21,141,24Ø,Ø03,169,Ø42,Ø32,21Ø
27Ø DATA 255,169,ØØØ,174,24Ø,Ø03,Ø32,2Ø5
28Ø DATA 189,162,Ø03,189,211,Ø03,Ø32,21Ø
29Ø DATA 255,2Ø2,Ø16,247,164,Ø11,Ø96,145
3ØØ DATA Ø13,Ø32,Ø32
```

Listing 2. *128 Perfect Typist program.*

```
1 REM 4Ø/8Ø COL C128 PERFECT TYPIST
2 REM BY: JAMES E BORDEN
1Ø FORX=512ØTO5379:READD:T=T+D:POKEX,D
2Ø NEXT:IFT<>28312 THENPRINT"{2 CRSR DNs}ER
   ROR IN DATA...":END
25 A$="":IFPEEK(215) THENA$="{2Ø SPACEs}"
3Ø PRINT"{SHFT CLR}"A$" ******************
   ******************"
4Ø PRINTA$" ** 128 PERFECT TYPIST IS NOW AC
   TIVE **"
5Ø PRINTA$" **{2 SPACEs}SYS 512Ø=ON{7 SPACE
   s}SYS 515Ø=OFF{2 SPACEs}**"
6Ø PRINTA$" ******************************
   *******":SYS512Ø:NEW
7Ø DATA 173,5,3,2Ø1,2Ø,2Ø8,1,96,141,45,2Ø,1
   73,4,3,141,44,2Ø,162,43,16Ø,2Ø
8Ø DATA 142,4,3,14Ø,5,3,96,234,234,173,44,2
   Ø,141,4,3,173,45,2Ø,141,5,3,96
9Ø DATA 32,13,67,14Ø,255,19,162,Ø,142,252,1
   9,142,253,19,142,254,19,189,Ø,2
1ØØ DATA 2Ø1,32,24Ø,8,2Ø1,48,144,7,2Ø1,58,1
   76,3,232,2Ø8,238,189,Ø,2,24Ø,54
11Ø DATA 2Ø1,32,2Ø8,5,172,254,19,24Ø,42,2Ø1
   ,34,2Ø8,1Ø,72,173,254,19,73,1
12Ø DATA 141,254,19,1Ø4,72,238,253,19,173,2
   53,19,41,7,168,1Ø4,24,72,24,1Ø4
13Ø DATA 16,1,56,42,136,16,246,1Ø9,252,19,1
   41,252,19,232,2Ø8,197,173,252
14Ø DATA 19,24,1Ø1,22,24,1Ø1,23,141,252,19,
   169,42,32,241,2Ø,32,188,2Ø,16Ø
15Ø DATA 2,185,185,2Ø,32,241,2Ø,136,16,247,
   165,116,2Ø8,9,165,117,2Ø8,5,169
16Ø DATA 145,32,241,2Ø,172,255,19,96,13,32,
   32,162,Ø,173,252,19,232,56,233
17Ø DATA 1ØØ,176,25Ø,1Ø5,1ØØ,2Ø2,24Ø,3,32,2
   32,2Ø,2Ø1,1Ø,176,5,2Ø5,252,19
18Ø DATA 24Ø,15,162,Ø,232,56,233,1Ø,16,25Ø,
   24,1Ø5,1Ø,2Ø2,32,232,2Ø,17Ø,72
19Ø DATA 138,9,48,32,241,2Ø,1Ø4,96,17Ø,173,
   Ø,255,72,169,Ø,141,Ø,255,138,32
2ØØ DATA 21Ø,255,1Ø4,141,Ø,255,96
```




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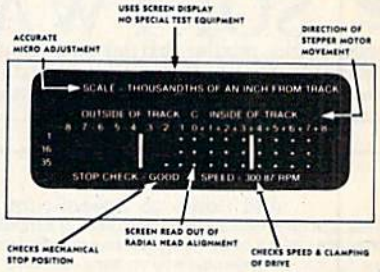
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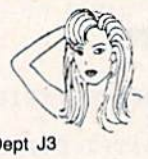
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RUN AMOK

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

COMING ATTRACTIONS

C-64 TAKEOFF—In our February issue, *RUN* technical editor Tim Walsh will put readers in the pilot's seat with a bird's-eye view of popular flight-simulation programs. You may be surprised that these entertaining programs aren't just for aviators.

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.

WINNERS ANNOUNCED—The deadline has passed, the drawing is over and the winners are.... Next month you'll find out who are the lucky winners to share more than $25,000 in software and hardware prizes in *RUN*'s Second Annual Great RUNaway contest.

A BATTERY-OPERATED 64?—For the computerist on the move, we'll publish a program that links a Radio Shack Model 100 to your C-64. You can take the Model 100 into the field, then bring its files home to your Commodore.

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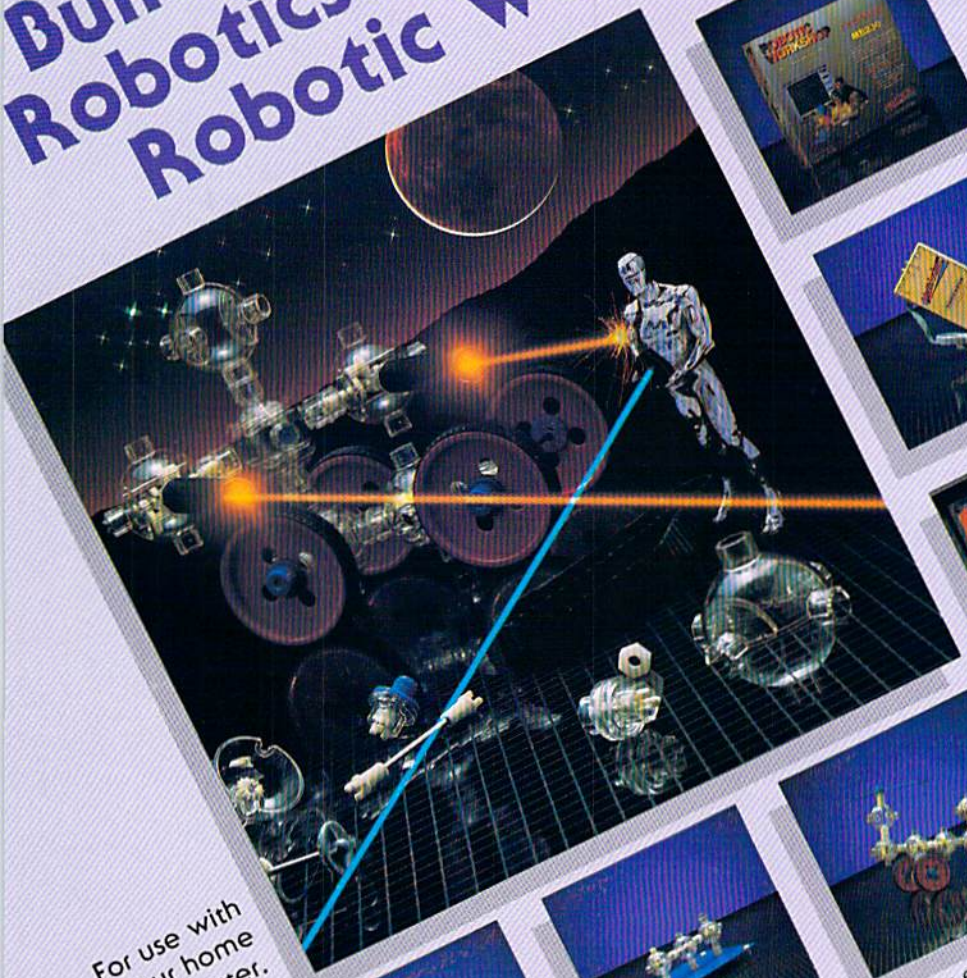
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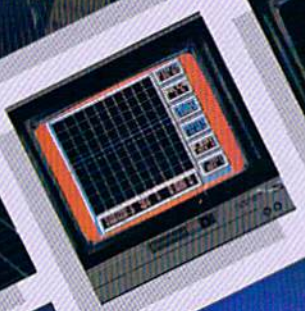
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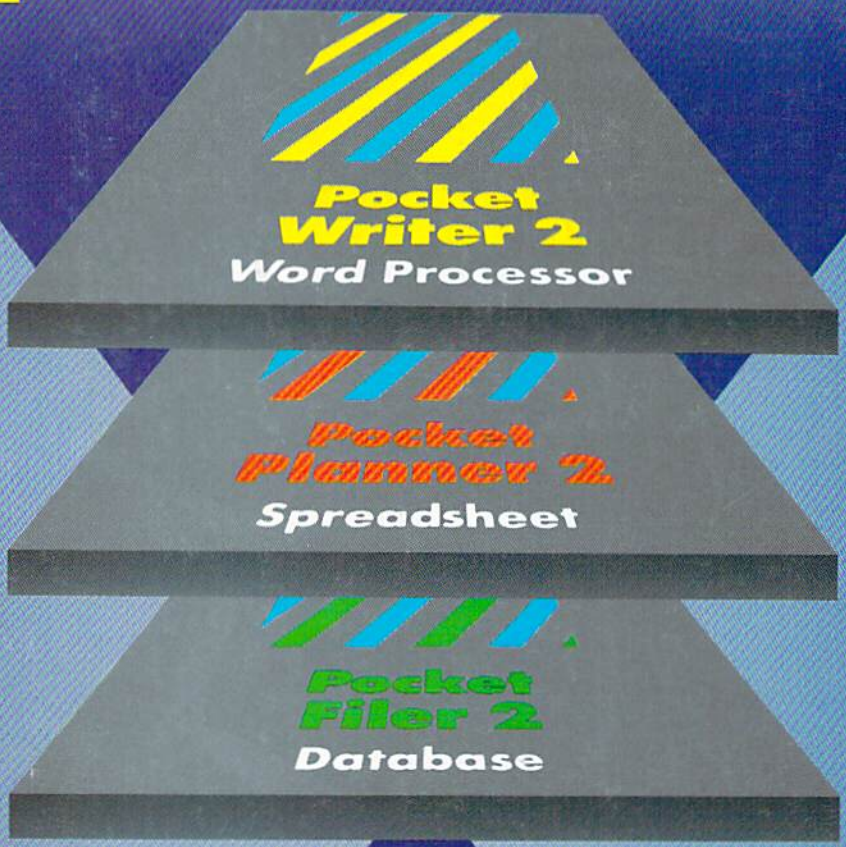
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