directory. Directory lists are displayed on the screen with the equivalent of PRINT, so it's easy to disrupt the list by inserting control characters in a filename.

For instance, you might conceal the filename DOG by adding three delete characters after the name. The ASCII table in your *64 User's Guide* tells you that a delete character has a value of 20. This corresponds to lowercase *t* in the screen code table, so you simply type three *t*'s after DOG. Now the program appears as "" when you list the directory. But you can still load the program with the filename DOG* or DOG???. It can also be loaded with the line A$="DOG" + CHR$(20) + CHR$(20) + CHR$(20): LOAD A$,8.

Most characters are easily entered from the keyboard. To enter a reverse video character, press CTRL-9 before typing the character. Disable reverse video by pressing CTRL-0.

Like many protection methods, of course, these simple tricks are only effective against people who know less than you do. It's not very difficult to write a BASIC program that displays a directory without using PRINT statements. If your friends also are familiar with Disk Editor, your attempts at concealment will be utterly transparent. Nevertheless, such methods should be sufficient to deter casual users.

As your knowledge grows, you'll find more practical uses for Disk Editor, such as changing the file type to prevent a program from being scratched. You can also copy blocks from one disk to another, store data directly in unused disk sectors, and restore damaged files to their original condition.

Commodore Disk Editor

Please refer to "COMPUTE!'s Guide to Typing In Programs" before entering this listing.

```
10 REM BLOCK EDIT      :rem 214
20 FORX=0TO26:READA:POKE820+X,
   A:NEXT              :rem 28
30 DATA 162,2,32,198,255,160,0
   ,32,207             :rem 16
40 DATA 255,153,0,4,169,1,153,
   0,216               :rem 170
50 DATA 200,208,242,162,1,32,1
   98,255              :rem 228
60 DATA 96             :rem 239
70 PRINT"{CLR}{CYN}":POKE53281
   ,0:POKE53280,9      :rem 2
80 POKE 53272,23:PRINTCHR$(8)
                       :rem 124
90 OPEN 1,0:OPEN15,8,15
                       :rem 240
100 GOSUB380           :rem 172
110 INPUT"ENTER TRACK, SECTOR"
    ;T,S               :rem 227
120 IFT=99THEN470      :rem 239
130 IFT<1ORS>20ORT>35THEN100
                       :rem 211
140 IFT>17ANDT<25ANDS>18THEN10
    0                  :rem 117
150 IFT>24ANDT<31ANDS>17THEN10
    0                  :rem 112
160 IFT>30ANDS>16THEN100
                       :rem 166
170 OPEN 2,8,2,"#"     :rem 81
180 PRINT#15,"U1:"2;0;T;S
                       :rem 153
190 SYS820:CLOSE2:GOSUB420:GOS
    UB380              :rem 186
200 INPUT"EDIT AND SAVE? {RVS}
    Y{OFF}ES OR {RVS}N{OFF}O";
    A$:IFA$<>"Y"THEN100
                       :rem 105
220 POKE254,PEEK(1024):GOSUB38
    0:PRINT"{WHT}";    :rem 103
230 PRINT"USE THE CURSOR TO TY
    PE OVER THE BLOCK.
    {2 SPACES}IF YOU MAKE A MI
    STAKE, DO ";       :rem 160
240 PRINT"NOT PRESS{5 SPACES}R
    ETURN. PRESS THE F1 FUNCTI
    ON KEY."           :rem 85
250 POKE781,0:POKE782,0:SYS655
    20                 :rem 99
260 POKE204,0:WAIT198,255:WAIT
    207,1:POKE1024,PEEK(254)
                       :rem 100
280 GETA$:IFPEEK(203)=0THEN280
                       :rem 233
290 IFA$=CHR$(13)THENWAIT207,1
    :POKE204,1:GOTO340 :rem 66
300 IFA$=CHR$(133)THEN330
                       :rem 114
310 POKE205,3:WAIT207,1:PRINTA
    $;:GOTO260         :rem 144
330 CLOSE1:CLOSE15:OPEN15,8,15
    ,"I0":CLOSE15:PRINT"{CLR}
    {2 DOWN}OK":GOSUB460:GOTO7
    0                  :rem 162
340 OPEN2,8,2,"#":PRINT"{HOME}
    {14 DOWN}{RVS}SAVING TRACK
    "T"SECTOR"S"       :rem 136
350 FORX=0TO254:PRINT#2,CHR$(P
    EEK(1025+X));:NEXT:PRINT#2
    ,CHR$(PEEK(1024));:rem 163
360 PRINT#15,"U2:"2;0;T;S:CLOS
    E2                 :rem 124
370 A$="":GOSUB420:GOTO100
                       :rem 212
380 PRINT"{HOME}{6 DOWN}"
                       :rem 229
390 PRINTCHR$(5);:FORX=0TO39:P
    RINTCHR$(162);:NEXT:PRINTC
    HR$(159)           :rem 254
400 FORX=1TO100:PRINT"
    {5 SPACES}";:NEXT  :rem 52
410 PRINT"{HOME}{7 DOWN}":RETU
    RN                 :rem 10
420 INPUT#15,A,B$,C,D  :rem 141
430 IF B$="OK"THEN RETURN
                       :rem 182
440 PRINTA;B$;C;D:POKE53281,9
                       :rem 213
450 FORX=1TO2000:NEXT:POKE5328
    1,0:GOTO100        :rem 240
460 FORX=1TO2000:NEXT:RETURN
                       :rem 63
470 PRINT"OK":CLOSE1:PRINT#15,
    "I0":CLOSE15:END :rem 71
```


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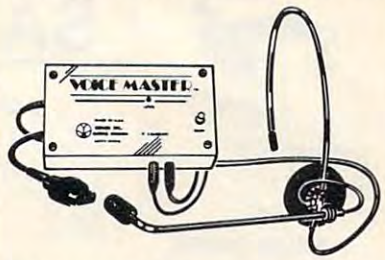

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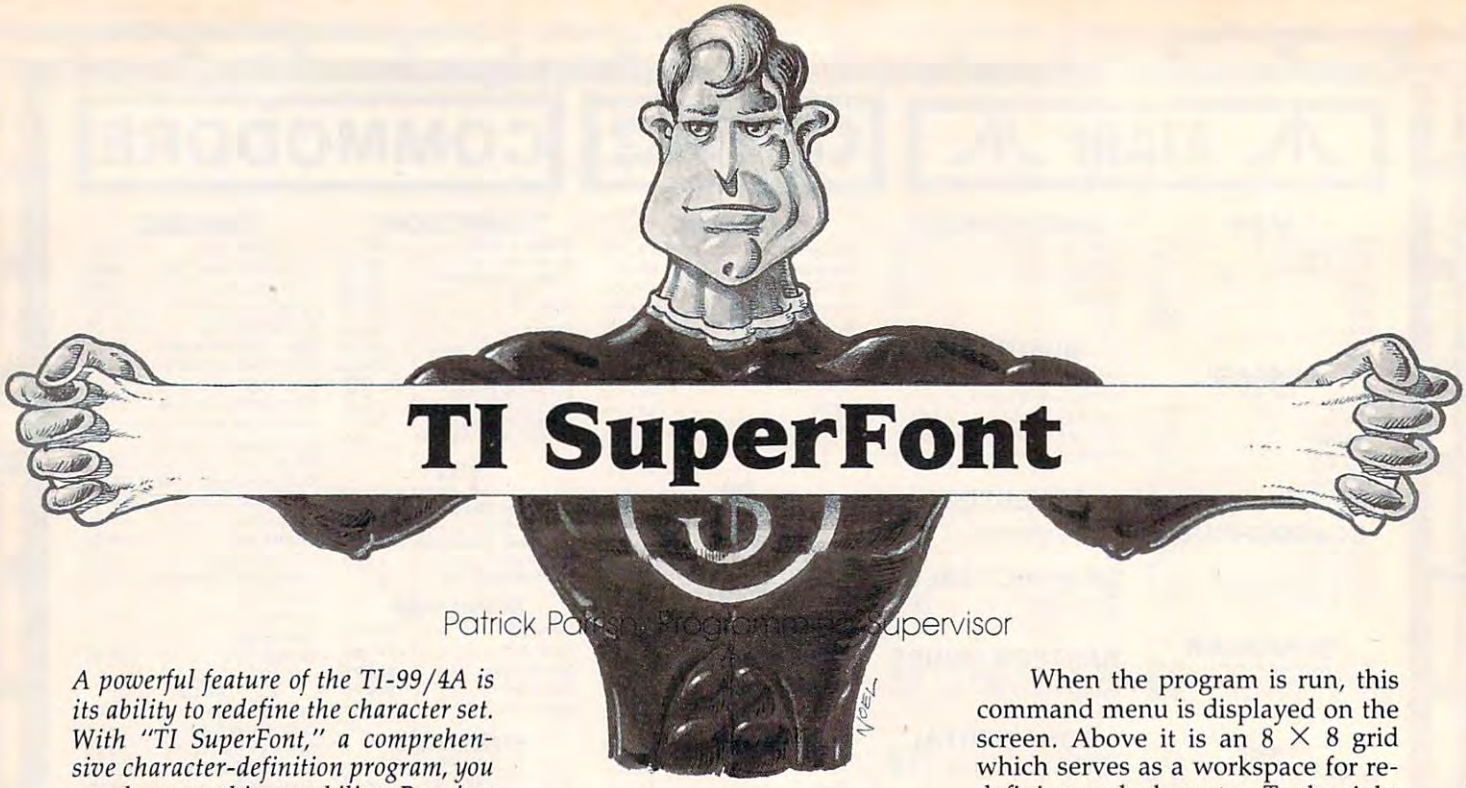

TI SuperFont

Patrick Parish, Programming Supervisor

A powerful feature of the TI-99/4A is its ability to redefine the character set. With "TI SuperFont," a comprehensive character-definition program, you can harness this capability. Requires Extended BASIC and a joystick (printer optional).

The character graphics capabilities of the TI-99/4A are well known. But to redefine a character on the TI by the usual means (see the *TI User's Reference Guide*, pages II-76 to II-79), you must follow a tedious, multistep procedure. First, you plot the character in an 8 × 8 grid. Next, you convert each row of the grid into a two-digit hexadecimal number and then sequentially combine the numbers from each row to generate a *pattern identifier*, or coded representation of the character. Finally, you place this pattern identifier along with a chosen ASCII value for the character in a CALL CHAR statement. Anyone who has repeatedly endured this process can attest to its drudgery.

Fortunately, the process is easily computerized, and several character-definition programs have been written for the TI. Until now, however, these programs have not taken full advantage of the TI's capabilities. With "TI SuperFont" (Program 1), once-tedious character manipulations can now be undertaken with ease.

Sixteen Commands

SuperFont, originally written for the Atari by Charles Brannon, first appeared in the January 1982 issue of COMPUTE! and featured 18 commands for redefining characters. After using this outstanding program on several occasions, I was convinced that TI users deserved a utility as versatile and convenient. That's how TI SuperFont was born.

In converting SuperFont, a few commands with less value to the TI user were eliminated while certain more practical commands were added. As it turned out, the real challenge was to fit the program into a TI without memory expansion. The final version leaves only a hundred or so bytes to spare. However, certain adjustments must be made if you are using a disk drive with the program. Before loading and running SuperFont, type CALL FILES(1). This will free up memory ordinarily reserved for additional disk file manipulation.

TI SuperFont offers the following 16 commands or modes:

E	EDIT	N	INPUT
R	RESTORE CH	H	RESTORE CHSET
F	COPY	W	WRITE DATA
M	MIRROR	V	REVERSE
A	ROTATE	C	CLEAR
I	INSERT	D	DELETE
L	LOAD FONT	S	SAVE FONT
P	PRINT CH	T	PRINT CHSET

When the program is run, this command menu is displayed on the screen. Above it is an 8 × 8 grid which serves as a workspace for redefining each character. To the right of the grid, the current mode and, in some cases, a prompt will be displayed. Below this is printed the entire TI character set (codes 32–143) with each subset (eight characters) denoted by a different background color. (If you find the colors annoying, remove the FOR–NEXT loop in line 300.)

Several commands require that you pick a character from the TI character set. In these instances, a box-shaped sprite (CHR$(143)) appears over the last character referenced from the set (defaults to space). Position the sprite with the joystick over the desired character and press the fire button. Unless indicated otherwise, each command returns you to the *EDIT* mode upon completion.

Now let's examine each command, beginning with *EDIT*. (The ALPHA–LOCK key should be up when making menu selections.)

- *EDIT* is the basic editing command. After you press E, SuperFont requests you to choose a character from the character set. The character selected is copied into the grid and the box-shaped sprite appears. This is actually like a cursor, controlled with the joystick. Press the fire button to set a point (if a point is clear) or reset a point (if a point is already set). You can draw lines by holding down the button while moving the joystick. When you're pleased with

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the appearance of the shape in the grid, press ENTER to redefine the character. (To completely redesign a character from scratch, use the *CLEAR* command, described below.)

- *INPUT* lets you type in a pattern identifier and assign it to a particular character code. After selecting *INPUT*, choose a character from the set with the joystick and then type in the hexadecimal code for the redefined character. The hexadecimal code can be typed in upper- or lowercase (a routine at line 960 automatically converts the code to uppercase). The *INPUT* command is handy when attempting to associate a pattern identifier with a CHR$ code in someone else's program.
- *RESTORE CH* restores the current character to its original configuration. This command is useful if you've mangled a character or changed the wrong one.
- *RESTORE CHSET* restores the entire character set to its initial appearance.
- *COPY* copies a character to a second location in the character set. SuperFont prompts you for the first character (the one to be moved) and the second character (the destination character). This command is handy for arranging your customized characters to fit the various color codes.
- *WRITE DATA* displays the pattern identifier for each selected character along with its ASCII value. Very handy when comparing characters or for providing a few character codes for another program.
- *MIRROR* produces a mirror image of the current character in the grid.
- *REVERSE* puts the current character in the grid in reverse field: All dots become blanks, and all blanks become dots.
- *ROTATE* turns the current character 90 degrees clockwise.
- *CLEAR* completely clears out the current character. For creating new characters from scratch.
- *INSERT* places a row of blanks in the current character. Move the cursor in the grid with the joystick to the row where you wish to insert the blanks and press ENTER. All rows below will scroll down and the bottom row will be lost.
- *DELETE* is the opposite of *INSERT*. Position the cursor on a row in the grid and press ENTER. The row will be eliminated and all other rows will scroll upward. *DELETE* and *INSERT* can be used with *ROTATE* to scroll characters left or right in the grid (of course, one row will be lost in both cases).
- *LOAD FONT* loads a previously SAVEd character set (a font) from tape or disk. SuperFont prompts you for the device and filename. Be sure to type this in the standard format (that is, CS1 or DSK1.FILENAME). Again, capital letters need not be used. The routine that converts from lower- to uppercase takes care of this for you. If you're using tape, the screen will be restored after the tape system messages have been printed (the same occurs with *SAVE FONT*, discussed below). When loading is complete, a command prompt appears.
- *SAVE FONT* saves to tape or disk (in a data file format) only those characters which have been altered since SuperFont was run. Since each character code is saved as a separate record, a large set may take 30 minutes to save. As with *LOAD FONT*, you will be prompted for the device and filename. If you accidentally hit L (for *LOAD FONT*) or S from the main menu, simply press ENTER to abort the command when prompted for the device and filename.

Once saved, character sets can be loaded into any program where they're needed (we'll consider this in greater detail shortly). As with *LOAD FONT*, a command prompt appears when the operation is complete.

- *PRINT CH* prints the current character in an 8 × 8 grid along with its ASCII and pattern identifier codes, then returns you to the main menu. Be sure to modify line 1260 to correspond to the specifications of your printer.
- *PRINT CHSET* is the same as the previous command, except it prints every character which has been modified.

The commands offered by SuperFont are versatile, but you may want to add others. Since the program uses most of the TI's memory, unless you have additional RAM you'll have to substitute your own routine for an existing one. Fortunately, the program is modular in structure. Just follow the branching IF statements from line 360 to 920 for the current commands. If you do alter the program, test it thoroughly to make sure you still have plenty of memory left.

Redesigning a character with "TI SuperFont."

Retrieving A Font Or Screen

After you've saved a newly created character set, how do you go about recovering it for use in another program? Program 2 shows how this is done.

In line 130, the device and filename for the character set file is defined as B$ (the filename used here is FONT). If you store this file on tape rather than disk, line 130 should read B$="CS1". Lines 140–160 load in the new character set and print it on the screen. Line 170 sets up a delay so you can see that the character set has successfully loaded.

With SuperFont, you can perform many chores with ease. You can customize your character set (ever wished for true lowercase?), create graphics characters and animated figures (space creatures!), or just play around. The uses of this utility are endless. I'm sure you'll have as much fun discovering them as I have.

Program 1: TI SuperFont

```
10 DIM A$(111),C$(15),N$(11
   2),D(15),V(8,8):: L=32
20 E=15 :: Q$="DEVICE.FILEN
   AME?" :: GOSUB 1240 :: G
   OTO 260
30 F=0 :: GOSUB 40 :: GOTO
   340
40 CALL HCHAR(5,14,L,16)::
   RETURN
50 CALL HCHAR(3,17,L,7):: C
   ALL HCHAR(7,17,L,16):: R
   ETURN
60 FOR I=5 TO 7 :: CALL HCH
```


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```
   AR(I,13,L,18):: NEXT I :
   : RETURN
70 Z$=N$(W-L)
80 FOR I=0 TO 15 :: D(I)=AS
   C(SEG$(Z$,I+1,1))-48 ::
   D(I)=D(I)+(D(I)>9)*7
90 NEXT I :: J=0 :: FOR I=0
    TO 7 :: DISPLAY AT(2+I,
   1):C$(D(J));:: DISPLAY A
   T(2+I,5):C$(D(J+1));:: J
   =J+2 :: NEXT I :: RETURN
100 CALL DELSPRITE(#1):: DI
   SPLAY AT(5,15):"WAIT"
110 FOR R=1 TO 8 :: FOR C=1
    TO 8
120 IF M=109 THEN CALL GCHA
   R(R+1,11-C,H):: GOTO 15
   0
130 IF M=97 THEN CALL GCHAR
   (10-C,R+2,H):: GOTO 150
140 CALL GCHAR(R+1,2+C,H)
150 V(R,C)=H-141 :: NEXT C
   :: NEXT R
160 H$="0123456789ABCDEF" :
   : IF M=118 THEN H$="FED
   CBA9876543210"
170 Z$="" :: FOR R=1 TO 8 :
   : LO=V(R,5)*8+V(R,6)*4+
   V(R,7)*2+V(R,8)+1
180 HI=V(R,1)*8+V(R,2)*4+V(
   R,3)*2+V(R,4)+1
190 Z$=Z$&SEG$(H$,HI,1)&SEG
   $(H$,LO,1):: NEXT R
200 IF (M<>100)*(M<>105)THE
   N 240
210 IF M<>100 THEN 230
220 Z$=SEG$(Z$,1,ROW*2-2)&S
   EG$(Z$,ROW*2+1,14)&"00"
    :: GOTO 240
230 Z$=SEG$(Z$,1,ROW*2-2)&"
   00"&SEG$(Z$,ROW*2-1,16-
   ROW*2)
240 CALL CHAR(W,Z$):: N$(W-
   L)=Z$ :: IF (M=100)+(M=
   105)THEN GOSUB 70
250 GOSUB 40 :: RETURN
260 F$="0000000100100011010
   0010101100111100010011O
   1010111100110111101111"
270 FOR I=0 TO 15 :: Z$=SEG
   $(F$,I*4+1,4):: D$=""
280 FOR J=1 TO 4 :: T=VAL(S
   EG$(Z$,J,1))+141 :: D$=
   D$&CHR$(T):: NEXT J ::
   C$(I)=D$ :: NEXT I
290 CALL CHAR(141,"",142,RP
   T$("F",16),143,"FF81818
   1818181FF"):: FOR I=141
    TO 143 :: CALL CHARPAT
   (I,A$(I-L)):: N$(I-L)=A
   $(I-L):: NEXT I
300 CALL DELSPRITE(#1):: CA
   LL CLEAR :: FOR I=2 TO
   14 :: CALL COLOR(I,2,I+
   2):: NEXT I
310 FOR I=L TO 143 :: PRINT
    CHR$(I);:: NEXT I :: D
   ISPLAY AT(1,11):"SUPERF
   ONT" :: GOSUB 1100
320 FOR R=1 TO 8 :: CALL HC
   HAR(R+1,3,141,8):: NEXT
    R
330 BR=20 :: BC=2 :: W=L
340 CALL SOUND(100,800,2)::
    DISPLAY AT(3,15):"MODE
   ?"
350 CALL KEY(0,M,S):: IF S=
   0 THEN 350
360 IF M<>101 THEN 510
370 T=1 :: GOSUB 1200 :: GO
   SUB 980 :: IF (F=1)*(K<
   >112)THEN 30 ELSE IF K=
   112 THEN M=K :: GOSUB 4
   0 :: GOTO 910
380 GOSUB 70 :: Z=1
390 CALL SPRITE(#1,143,10,9
   ,17):: R=1 :: C=2 :: CA
   LL GCHAR(R+1,C+1,T)
400 CALL KEY(0,K,S):: IF (K
   =13)+(K=112)THEN ROW=R
   :: GOSUB 100 :: GOSUB 1
   180 :: IF K<>112 THEN O
   N Z GOTO 340,590
410 IF (K>13)THEN M=K :: GO
   TO 360
420 CALL JOYST(1,X,Y):: IF
   ABS(X)+ABS(Y)=8 THEN 42
   0
430 CALL KEY(1,KK,S):: IF (
   KK<>18)*(ABS(X)+ABS(Y)=
   0)THEN 400
440 OK=0 :: IF ABS(X)+ABS(Y
   )=4 THEN OK=1
450 C=C-(X=4)+(X=-4):: R=R-
   (Y=-4)+(Y=4)
460 C=C-(C=1)*8+(C=10)*8 ::
    R=R-(R=0)*8+(R=9)*8
470 CALL LOCATE(#1,8*R+1,8*
   C+1)
480 IF (KK=18)*(OK=0)THEN C
   ALL GCHAR(R+1,C+1,T)::
   T=283-T
490 IF (OK=1)*(KK<>18)THEN
   CALL GCHAR(R+1,C+1,T)
500 CALL HCHAR(R+1,C+1,T)::
    CALL SOUND(-1,294,3)::
    GOTO 400
510 IF M<>110 THEN 570
520 T=1 :: GOSUB 1200 :: GO
   SUB 980 :: IF F=1 THEN
   30
530 DISPLAY AT(5,12):"CHAR
   HEX CODE?" :: ACCEPT AT
   (6,11)SIZE(16)BEEP:D$ :
   : IF LEN(D$)<>16 THEN 5
   30
540 GOSUB 60 :: GOSUB 960
550 N$(W-L)=Z$ :: GOSUB 80
   :: CALL CHAR(W,Z$)
560 GOSUB 40 :: GOTO 590
570 IF M<>114 THEN 600
580 GOSUB 1200 :: CALL CHAR
   (W,A$(W-L)):: N$(W-L)=A
   $(W-L)
590 Z=1 :: GOSUB 40 :: GOSU
   B 70 :: M=101 :: GOSUB
   1180 :: CALL HCHAR(3,17
   ,69):: CALL SOUND(50,88
   0,3):: GOTO 390
600 IF M<>104 THEN 620
610 GOSUB 1200 :: FOR I=L T
   O 143 :: CALL CHAR(I,A$
   (I-L)):: N$(I-L)=A$(I-L
   ):: NEXT I :: GOTO 590
620 IF M<>102 THEN 670
630 GOSUB 1200
640 DISPLAY AT(5,15):"1ST C
   HAR?" :: GOSUB 980 :: I
   F F=1 THEN 30 ELSE TM=W
650 GOSUB 70 :: DISPLAY AT(
   5,15):"2ND CHAR?" :: GO
   SUB 980 :: IF F=1 THEN
   30 ELSE CALL DELSPRITE(
   #1)
660 CALL CHARPAT(TM,Z$):: C
   ALL CHAR(W,Z$):: N$(W-L
   )=Z$ :: GOTO 590
670 IF M=109 THEN GOSUB 120
   0 :: GOSUB 100 :: GOTO
   590
680 IF M=118 THEN GOSUB 120
   0 :: GOSUB 100 :: GOTO
   590
690 IF M<>97 THEN 730
700 GOSUB 1200
710 GOSUB 100 :: GOSUB 70 :
   : GOSUB 1180 :: T=0 ::
   D$="AGAIN (Y/N)?" :: GO
   SUB 1220 :: GOSUB 40 ::
    IF T=1 THEN 710
720 GOTO 590
730 IF M=99 THEN GOSUB 1200
    :: D$=RPT$("0",16):: C
   ALL CHAR(W,D$):: N$(W-L
   )=D$ :: GOTO 590
740 IF M=105 THEN GOSUB 120
   0 :: Z=2 :: GOTO 390
750 IF M=100 THEN GOSUB 120
   0 :: Z=2 :: GOTO 390
760 IF M<>119 THEN 820
770 T=1 :: GOSUB 1200 :: GO
   SUB 980 :: IF F=1 THEN
   F=0 :: GOTO 810 ELSE GO
   SUB 70
780 DISPLAY AT(7,16):"CHAR=
   ";W :: DISPLAY AT(9,11)
   :N$(W-L)
790 D$="AGAIN(Y/N) ?" :: GO
   SUB 1220
800 CALL HCHAR(9,11,L,18)::
    IF T=1 THEN GOSUB 40 :
   : GOTO 770
810 GOSUB 60 :: GOTO 340
820 IF M<>108 THEN 860
830 GOSUB 1200
840 GOSUB 940 :: OPEN #1:D$
   ,INTERNAL,INPUT ,FIXED
850 INPUT #1:T,N$(T):: IF T
   <>112 THEN CALL CHAR(T+
   L,N$(T)):: GOTO 850 ELS
   E CLOSE #1 :: GOSUB 60
   :: IF ASC(D$)=67 THEN 3
   00 ELSE 340
860 IF M<>115 THEN 910
870 GOSUB 1200 :: GOSUB 940
880 OPEN #1:D$,INTERNAL,OUT
   PUT,FIXED :: FOR I=L TO
    143
890 IF N$(I-L)<>A$(I-L)THEN
    PRINT #1:I-L,N$(I-L)
900 NEXT I :: T=112 :: F$="
   " :: PRINT #1:T,F$ :: C
   LOSE #1 :: GOSUB 60 ::
   IF ASC(D$)=67 THEN 300
   ELSE 340
910 IF M=112 THEN H=1 :: GO
   SUB 1260
920 IF M=116 THEN H=0 :: GO
   SUB 1260
930 GOTO 340
940 DISPLAY AT(5,13):Q$ ::
   ACCEPT AT(6,14):D$ :: I
   F D$="" THEN GOSUB 60 :
   : GOTO 340 ELSE GOSUB 9
   60
950 RETURN
960 Z$="" :: FOR I=1 TO LEN
   (D$):: F$=SEG$(D$,I,1):
   : IF (ASC(F$)>96)*(ASC(
   F$)<123)THEN F$=CHR$(AS
   C(F$)-L)
970 Z$=Z$&F$ :: NEXT I :: D
   $=Z$ :: RETURN
980 CALL SPRITE(#1,143,10,B
   R*8+1,BC*8+1)
990 CALL JOYST(1,X,Y):: IF
   ABS(X)+ABS(Y)=8 THEN 99
   0
1000 BC=BC-(X=4)+(X=-4):: W
   =W-(X=4)+(X=-4)
1010 BR=BR-(Y=-4)+(Y=4):: W
   =W-(Y=-4)*28+(Y=4)*28
1020 IF BC<2 THEN BC=29 ::
   BR=BR-1
1030 IF BC>29 THEN BC=2 ::
   BR=BR+1
1040 IF BR<20 THEN BR=23 ::
    W=W+112
1050 IF BR>23 THEN BR=20 ::
    W=W-112
1060 CALL KEY(1,KK,ST):: CA
   LL KEY(0,K,S)
```


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```
1070 IF S<>0 THEN F=1 :: IF
     M=111 THEN RETURN ELS
     E CALL DELSPRITE(#1)::
     RETURN
1080 IF KK=18 THEN CALL SOU
     ND(10,110,2):: GOSUB 4
     0 :: CALL DELSPRITE(#1
     ):: RETURN
1090 GOTO 980
1100 DISPLAY AT(11,1):"E ED
     IT";TAB(14);"N INPUT"
1110 DISPLAY AT(12,1):"R RE
     STORE CH";TAB(14);"H R
     ESTORE CHSET"
1120 DISPLAY AT(13,1):"F CO
     PY";TAB(14);"W WRITE D
     ATA"
1130 DISPLAY AT(14,1):"M MI
     RROR";TAB(14);"V REVER
     SE"
1140 DISPLAY AT(15,1):"A RO
     TATE";TAB(14);"C CLEAR
     "
1150 DISPLAY AT(16,1):"I IN
     SERT";TAB(14);"D DELET
     E"
1160 DISPLAY AT(17,1):"L LO
     AD FONT";TAB(14);"S SA
     VE FONT"
1170 DISPLAY AT(18,1):"P PR
     INT CH";TAB(14);"T PRI
     NT CHSET" :: RETURN
1180 FOR I=0 TO 5 STEP 2 ::
      CALL HCHAR(7,17+I,W):
     : NEXT I :: RETURN
1190 R=20 :: C=2 :: W=L ::
     CALL SPRITE(#1,143,2,R
     *8+1,C*8+1):: RETURN
1200 GOSUB 50 :: CALL HCHAR
     (3,17,M-L):: IF T=1 TH
     EN DISPLAY AT(5,15):"P
     ICK A CHAR" :: T=0
1210 RETURN
1220 DISPLAY AT(5,15):D$ ::
      ACCEPT AT(5,27)BEEP V
     ALIDATE("yn")SIZE(1):Z
     $ :: IF Z$="y" THEN T=
     1
1230 RETURN
1240 CALL CLEAR :: CALL SCR
     EEN(E):: DISPLAY AT(12
     ,7):"LOADING CHARPATS"
      :: FOR I=127 TO 140 :
     : CALL CHAR(I,""):: NE
     XT I
1250 FOR I=L TO 140 :: CALL
      CHARPAT(I,A$(I-L)):
     N$(I-L)=A$(I-L):: NEXT
     I :: RETURN
1260 DISPLAY AT(3,15):"PRIN
     T" :: OPEN #1:"RS232/2
     .BA=9600.DA=8.PA=N"
1270 TM=W :: IF H=1 THEN 13
     00
1280 FOR T=L TO 143 :: IF N
     $(T-L)<>A$(T-L)THEN W=
     T ELSE 1350
1290 E=E+1 :: E=(E=17)*14+E
     :: CALL SCREEN(E)
1300 IF ((F=1)*(H=1))+(H=0)
     THEN GOSUB 70 :: GOSUB
      1180
1310 FOR R=2 TO 9 :: IF R=5
      THEN PRINT #1:TAB(5);
     "CHR$ # - "&"<"&STR$(W
     )&">";
1320 PRINT #1:TAB(30);:: FO
     R C=3 TO 10 :: CALL GC
     HAR(R,C,X):: IF X=141
     THEN X=45 ELSE X=88
1330 PRINT #1:CHR$(X);:: NE
     XT C :: IF R=5 THEN PR
     INT #1:TAB(47);"HEX CO
     DE - "&"<"&N$(W-L)&">"
1340 NEXT R :: PRINT #1 ::
     PRINT #1 :: IF H=1 THE
     N 1360
1350 NEXT T
1360 CLOSE #1 :: F=0 :: H=0
      :: E=15 :: W=TM :: CA
     LL SCREEN(E):: RETURN
```

Program 2: Character Set Loader

```
100 !GAME
110 !GET REDEFINED CHARS
120 CALL CLEAR
130 B$="DSK1.FONT"
140 OPEN #1:B$,INTERNAL,INP
    UT ,FIXED
150 INPUT #1:F,NEWA$ :: IF
    F<>112 THEN CALL CHAR(F
    +32,NEWA$):: PRINT CHR$
    (F+32);:: GOTO 150
160 CLOSE #1
170 FOR T=1 TO 1000 :: NEXT
     T
```


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Apple ProDOS Variable Lister

Paul F. Stuever

This fast machine language utility takes the pain out of debugging BASIC programs by listing the current value of every program variable. You can also make a hardcopy of the variable list. ProDOS is required.

How many times have you run a program, only to get a message like OVERFLOW ERROR IN 240, or worse yet, BAD SUBSCRIPT ERROR IN 240? When you list the line in question, it may look something like this:

```
240 A$(X +XZ,2 * (B / 4 = C + 1),B / 4)
= STR$ (Z)
```

To locate the error, you'll need to type PRINT X, followed by PRINT XZ and so on, to find the current value of each variable. This is a slow, tedious way to debug a program, especially when you find that some of these variables were defined with other formulas.

"Apple Variable Lister" takes the drudgery out of such debugging tasks by quickly listing the current value of every variable in your program. The program is written in machine language and works on any Apple II series computer with ProDOS.

You can use this utility even if you don't understand machine language: The BASIC loader program listed below creates the machine language and saves it on your disk. Type in the loader, and save a copy before you run it in case you made a typing error. The program has a checksum to catch errors and identify any lines that have mistakes. If no errors are found, it prints OK and saves the utility with the filename VAR.LIST on your disk as a binary file.

Once this is done, you're ready to use the lister. Enter BLOAD VAR.LIST to load it into memory, followed by HIMEM: 31000 to set the top of memory. You will ordinarily want to do this at the beginning of a programming session. To list your variables, simply type CALL 32000 and press RETURN. The same command can run the routine from within a BASIC program. To make a hardcopy of the variable list, enter PR#1 before calling the routine.

A Chronological List

Variable Lister displays your program's arrays first, followed by floating point, string, and integer variables. The variables are displayed in chronological order (the order they are used in the program), not alphabetically. Although Applesoft BASIC allows arrays with up to 88 dimensions and as many elements per dimension as available memory will allow, Variable Lister is more restrictive. For this program, arrays are limited to three dimensions and a maximum of 254 elements per dimension. Attempting to list a larger array—for example, the one created by DIM A$(500)—crashes the utility.

Note that Variable Lister cannot display a variable until it has actually been used in the program. For instance, consider the following line:

```
10 A$="YES":IF A$="NO" THEN
B$="OK"
```

Since the IF condition can never be satisfied, B$ will not appear on the variable list unless the program uses it elsewhere. This is no problem when debugging, since you're interested only in variables that were used up to the time the program crashed. However, to make a complete variable list for permanent documentation, you'll need to run your program until you know that every variable has been used.

Apple Variable Lister

```
100 HOME : PRINT "CREATING VAR.
    LIST": HIMEM: 31000
110 X = 32000:TC = 0: PRINT
120 Z = 0: FOR A = 0 TO 9
130 READ P: POKE X,P:Z = Z + P
140 X = X + 1: IF X > 32601 THE
    N 200
150 NEXT A:TC = TC + Z
160 READ A: IF A = Z THEN 120
170 PRINT "ERROR IN DATA "
180 PRINT "CHECK LINE # ";X - 3
    1010: STOP
190 :
200 IF TC = 85238 THEN PRINT "O
    K": PRINT  CHR$ (4);"BSAVE
    VAR.LIST,A$7D00,L601": END
210 PRINT "ERROR IN DATA "
220 PRINT "MISSING A LINE": STO
    P
1000 DATA 032, 127, 125, 169, 0
     00, 133, 004, 032, 017, 12
     5, 764
1010 DATA 230, 004, 032, 017, 1
     25, 230, 004, 169, 141, 03
     2, 984
1020 DATA 237, 253, 165, 106, 1
     33, 236, 165, 105, 208, 00
     9, 1617
1030 DATA 169, 007, 024, 101, 2
     35, 144, 002, 230, 236, 13
     3, 1281
1040 DATA 235, 165, 236, 197, 1
     08, 144, 009, 240, 001, 09
     6, 1431
1050 DATA 165, 235, 197, 107, 1
     76, 249, 032, 251, 126, 22
     8, 1766
1060 DATA 004, 208, 223, 032, 0
     19, 127, 160, 002, 166, 00
     4, 945
1070 DATA 240, 029, 202, 240, 0
     13, 169, 165, 032, 237, 25
     3, 1580
1080 DATA 032, 072, 249, 032, 2
     28, 126, 208, 198, 169, 16
     4, 1478
1090 DATA 032, 237, 253, 032, 1
     73, 126, 032, 188, 126, 20
     8, 1407
1100 DATA 185, 032, 072, 249, 1
     64, 236, 165, 235, 024, 10
     5, 1467
1110 DATA 002, 144, 001, 200, 0
     32, 249, 234, 032, 046, 23
     7, 1177
1120 DATA 169, 141, 032, 237, 2
     53, 208, 159, 169, 000, 13
     3, 1501
1130 DATA 004, 032, 141, 125, 2
     30, 004, 032, 141, 125, 23
     0, 1064
1140 DATA 004, 169, 141, 032, 2
     37, 253, 165, 107, 133, 23
     5, 1476
1150 DATA 165, 108, 208, 011, 1
     65, 237, 024, 101, 235, 13
     3, 1387
1160 DATA 235, 165, 238, 101, 2
     36, 133, 236, 197, 110, 24
     0, 1891
1170 DATA 003, 144, 007, 096, 1
     65, 235, 197, 109, 176, 24
     9, 1381
1180 DATA 160, 003, 177, 235, 1
     33, 238, 136, 177, 235, 13
     3, 1627
1190 DATA 237, 032, 251, 126, 2
     28, 004, 208, 212, 132, 25
     2, 1682
1200 DATA 132, 251, 132, 250, 1
     60, 004, 177, 235, 170, 20
     0, 1711
1210 DATA 200, 177, 235, 149, 2
     49, 202, 208, 247, 134, 25
     5, 2056
1220 DATA 134, 254, 134, 253, 1
     52, 056, 101, 235, 133, 23
     5, 1687
```


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```
1230 DATA 169, 000, 101, 236, 1
     33, 236, 032, 019, 127, 16
     6, 1219
1240 DATA 004, 208, 005, 032, 0
     44, 126, 208, 011, 202, 20
     8, 1048
1250 DATA  005, 032, 074, 126,
     208, 003, 032, 102, 126, 1
     64, 872
1260 DATA 253, 166, 254, 165, 2
     55, 200, 196, 250, 144, 01
     6, 1899
1270 DATA 160, 000, 232, 228, 2
     51, 144, 009, 162, 000, 02
     4, 1210
1280 DATA 105, 001, 197, 252, 1
     76, 009, 132, 253, 134, 25
     4, 1513
1290 DATA 133, 255, 076, 236, 1
     25, 165, 236, 076, 167, 12
     5, 1594
1300 DATA 032, 127, 126, 165, 2
     35, 164, 236, 032, 249, 23
     4, 1600
1310 DATA 032, 046, 237, 169, 1
     41, 032, 237, 253, 024, 16
     9, 1340
1320 DATA 005, 101, 235, 144, 0
     02, 230, 236, 133, 235, 09
     6, 1417
1330 DATA 169, 164, 032, 237, 2
     53, 032, 127, 126, 160, 00
     0, 1300
1340 DATA 032, 173, 126, 152, 0
     56, 101, 235, 133, 235, 16
     9, 1412
1350 DATA 000, 101, 236, 133, 2
     36, 076, 191, 126, 169, 16
     5, 1433
1360 DATA 032, 237, 253, 032, 1
     27, 126, 160, 000, 032, 22
     8, 1227
1370 DATA 126, 024, 165, 235, 1
     05, 002, 144, 002, 230, 23
     6, 1269
1380 DATA 133, 235, 096, 169, 1
     68, 032, 237, 253, 165, 25
     3, 1741
1390 DATA 032, 034, 127, 165, 2
     51, 240, 024, 169, 172, 03
     2, 1246
1400 DATA 237, 253, 165, 254, 0
     32, 034, 127, 165, 252, 24
     0, 1759
1410 DATA 010, 169, 172, 032, 2
     37, 253, 165, 255, 032, 03
     4, 1359
1420 DATA 127, 169, 169, 032, 2
     37, 253, 076, 072, 249, 17
     7, 1561
1430 DATA 235, 133, 142, 200, 1
     77, 235, 133, 002, 200, 17
     7, 1634
1440 DATA 235, 133, 003, 096, 0
     32, 072, 249, 169, 162, 03
     2, 1183
1450 DATA 237, 253, 166, 142, 2
     40, 018, 160, 000, 177, 00
     2, 1395
1460 DATA 009, 128, 032, 237, 2
     53, 165, 241, 032, 168, 25
     2, 1517
1470 DATA 200, 202, 208, 240, 1
     69, 162, 032, 237, 253, 16
     9, 1872
1480 DATA 141, 076, 237, 253, 1
     77, 235, 133, 158, 200, 17
     7, 1787
1490 DATA 235, 133, 159, 162, 1
     44, 024, 032, 155, 235, 03
     2, 1311
1500 DATA 046, 237, 169, 141, 0
     76, 237, 253, 162, 000, 16
     0, 1481
1510 DATA 001, 177, 235, 016, 0
     01, 232, 009, 128, 133, 00
     1, 933
1520 DATA 136, 177, 235, 016, 0
     01, 232, 009, 128, 133, 00
     0, 1067
1530 DATA 096, 165, 000, 032, 2
     37, 253, 165, 001, 032, 23
     7, 1218
1540 DATA 253, 165, 241, 076, 1
     68, 252, 160, 000, 162, 00
     0, 1477
1550 DATA 201,  100, 144, 012, 1
     60, 176, 162, 176, 200, 05
     6, 1387
1560 DATA 233, 100, 201, 100, 1
     76, 248, 201, 010, 144, 01
     0, 1423
1570 DATA 162, 176, 232, 056, 2
     33, 010, 201, 010, 176, 24
     8, 1504
1580 DATA 009, 176, 072, 138, 0
     72, 152, 240, 003, 032, 23
     7, 1131
1590 DATA 253, 104, 240, 003, 0
     32, 237, 253, 104, 076, 23
     7, 1539
1600 DATA 253, 000, 000, 000, 0
     00, 000, 000, 000, 000, 00
     0, 253
1610 DATA  000, 000, 000, 000,
     000, 000, 000, 000, 000, 0
     00,  0
```

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Atari Cassette Filenames

Norman Lin

Do you have trouble loading Atari cassette files because you keep losing track of the tape counter numbers? Or maybe you're wasting lots of tape by recording only one program per cassette side. Now there's a solution—a clever way to add filename capability to Atari cassettes. The technique works on any Atari 400/800, XL, or XE.

Unlike some other tape storage systems, the Atari doesn't allow filenames for cassette files. You must either jot down the tape counter numbers where the files start, or record only one file on each side of a cassette. But what happens if your cassette recorder's counter goes awry, or if you lose the index numbers? Things would be a lot easier if the computer could locate a program in the middle of a tape and load it for you.

Finally there's a simple way to solve these problems: "Atari Searcher/Loader." It lets you save numerous programs on a single side of a cassette, and then automatically finds and loads the program you want.

Saving Programs

Atari Searcher/Loader is very easy to use. Just follow these steps:

1. Type in the program listing following this article. (Note: Line 90 is too long to be typed as listed; to enter it, you must abbreviate POSITION as POS. When you list the program, POS. automatically appears as POSITION. Don't attempt to edit the line after it is entered. If you make a mistake, retype the entire line.)

2. Save the program once at the beginning of each tape using the LIST"C:" command—*not* the CSAVE command. (Just type LIST"C:", press RETURN, push the Play and Record buttons on the recorder, and hit RETURN again. Of course, you'll have to start with blank tapes to avoid overwriting programs on your existing tapes.) After you've saved Atari Searcher/Loader with LIST"C:", *do not rewind* the tape. Type NEW to clear Searcher/ Loader out of memory.

3. Enter the following short line in immediate mode (that is, without a line number):

```
OPEN#1,8,0,"C:":? #1;
"filename":CLOSE #1
```

where *filename* is the name you wish to assign to your program. Then press the Play and Record buttons and hit RETURN twice. After a few seconds, the filename is written onto tape and the computer's READY prompt reappears.

4. Now you can start saving your regular program as usual, except that you must use the LIST"C:" command as described above instead of CSAVE. If you want to load a program from another tape to save onto the Searcher/Loader tape with a filename, swap cassettes without rewinding the Searcher/Loader tape.

Repeat steps 3 and 4 for each program you save on that side of the tape.

The filename can be anything you like. Disk filenames are limited to eight characters plus a three-character extender (such as PROGRAM1.BAS), but Atari Searcher/ Loader permits much longer filenames. However, you should not include spaces or graphics characters as part of a name. Stick to letters, numbers, and common symbols. Do not use the same filename more than once on the same side of a cassette. It is a good idea to write the filenames on the cassette label in case you forget them.

Automatic Loading

Loading your programs with Atari Searcher/Loader is even easier than saving them. Suppose you've saved five programs on one tape using the above procedure. Their filenames are PROG1, PROG2, PROG3, PROG4, and PROG5. Now you want to load PROG4. Just follow these steps:

1. Rewind the tape to the beginning and load Atari Searcher/ Loader by typing this command and pressing RETURN:

```
ENTER"C:"
```

2. When the READY prompt reappears, type RUN. Searcher/ Loader asks, FILENAME?. Type in the filename (in this example, PROG4) and press RETURN.

Searcher/Loader hunts through the tape until it finds PROG4, then automatically loads it and stops.

How It Works

After Searcher/Loader asks you for the filename, it stores the name in the string variable A$ and enters the FOR-NEXT loop at lines 40–80. This loop searches for and loads one block of data at a time (made possible by the LIST"C:" format in which the programs are saved). Each block of data is stored in B$. If you'd like to see these blocks of data printed on the screen during the search process, insert line 65 PRINT B$.

Line 70 checks to see if B$ equals A$—in other words, if the block of data loaded is the same as the filename you specified (which is actually a block of data in itself). If B$ does not equal A$, the search goes on. If an error occurs or the tape ends, Searcher/Loader displays the error message at line 100.

If a block of data loaded corresponds to the specified filename (if B$=A$), the program jumps out of

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the FOR-NEXT loop and goes to line 90. Line 90 clears the screen, erases Searcher/Loader from memory, and then loads the program that follows. When the program is loaded, the operation stops.

Although slow, Searcher/Loader does eliminate part of the hassle of cassette files.

Atari Searcher/Loader

Please refer to "COMPUTE!'s Guide to Typing In Programs" before entering this listing.

```
BI 10 REM TO SAVE A PROGRAM
      WITH A FILENAME, TYPE
      OPEN #1,8,0,"C:":?#1;"
      [FILENAME]":CLOSE #1
AD 20 DIM A$(100),B$(256)
JB 30 ? "FILENAME";:INPUT A$
BE 40 FOR I=1 TO 1.0E+97
JE 50 OPEN #1,4,0,"C:"
NO 60 TRAP 100:INPUT #1,B$
JG 70 IF B$=A$ THEN 90
JA 80 CLOSE #1:POKE 764,33:N
      EXT I
OO 90 ? "{CLEAR}":POSITION 2
      ,4:? "NEW":? :? :? "EN
      TER";CHR$(34);"C:";CHR
      $(34):? :? :? "POKE842
      ,12":POSITION 2,0:POKE
       842,13:POKE 764,33:EN
      D
PE 100 ? "BAD BLOCK. LOAD FA
       ILED. TRY AGAIN."   ©
```


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ABC.E.G...	$25 e	$18	Memory Bldr:Concentration
....E.G...	$40 r	$28	M.U.L.E. (Electronic Arts)
ABC.E.G...	CALL e	CALL	Muppet Learning Keys
ABC.E.G.IJ	$40 r	$28	Murder on the Zinderneuf
ABC.E.G.IJ	$40 r	$28	Music Construction Set
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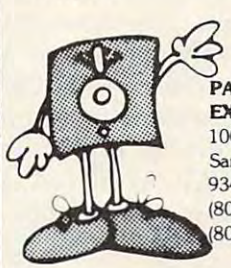

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COMPUTE!'s Guide To Typing In Programs

Before typing in any program, you should familiarize yourself with your computer. Learn how to use the keyboard to type in and correct BASIC programs. Read your manuals to understand how to save and load BASIC programs to and from your disk drive or cassette unit. Computers are precise—take special care to type the program *exactly* as listed, including any necessary punctuation and symbols. To help you with this task, we have implemented a special listing convention as well as a program to help check your typing—the "Automatic Proofreader." Please read the following notes before typing in any programs from COMPUTE!. They can save you a lot of time and trouble.

Since programs can contain some hard-to-read (and hard-to-type) special characters, we have developed a listing system that spells out in abbreviated form the function of these control characters. You will find these special characters within curly braces. For example, {CLEAR} or {CLR} instructs you to insert the symbol which clears the screen on the Atari or Commodore machines. A symbol by itself within curly braces is usually a control key or graphics key. If you see {A}, hold down the CONTROL key and press A. Commodore machines have a special control key labeled with the Commodore logo. Graphics characters entered with the Commodore logo key are enclosed in a new kind of special bracket. A graphics character can be listed as [<A>]. In this case, hold down the Commodore logo key as you type A. Our Commodore listings are in uppercase, so shifted symbols are underlined. A graphics heart symbol (SHIFT-S) would be listed as S. One exception is {SHIFT-SPACE}. Hold down SHIFT and press the space bar.

If a number precedes a symbol, such as {5 RIGHT}, {6 S}, or [<8 Q>], you would enter five cursor rights, six shifted S's, or eight Commodore-Q's. On the Atari, inverse characters (printed in white on black) should be entered with the Atari logo key. Since spacing is sometimes important, any more than two spaces will be listed, for example, as: {6 SPACES}. A space is never left at the end of a line, but will be moved to the next printed line as {SPACE}. There are no special control characters found in our IBM PC/PCjr, TI-99/4A, and Apple program listings. For your convenience, we have prepared this quick-reference key for the Commodore and Atari special characters:

Atari 400/800/XL

When you see	Type	See
{CLEAR}	ESC SHIFT <	Clear Screen
{UP}	ESC CTRL -	Cursor Up
{DOWN}	ESC CTRL =	Cursor Down
{LEFT}	ESC CTRL +	Cursor Left
{RIGHT}	ESC CTRL *	Cursor Right
{BACK S}	ESC DELETE	Backspace
{DELETE}	ESC CTRL DELETE	Delete character
{INSERT}	ESC CTRL INSERT	Insert character
{DEL LINE}	ESC SHIFT DELETE	Delete line
{INS LINE}	ESC SHIFT INSERT	Insert line
{TAB}	ESC TAB	TAB key
{CLR TAB}	ESC CTRL TAB	Clear tab
{SET TAB}	ESC SHIFT TAB	Set tab stop
{BELL}	ESC CTRL 2	Ring buzzer
{ESC}	ESC ESC	ESCape key

Commodore PET/CBM/VIC/64

When You Read:	Press:	See:
{CLR}	SHIFT CLR/HOME	
{HOME}	CLR/HOME	
{UP}	SHIFT CRSR ↕	
{DOWN}	CRSR ↕	
{LEFT}	SHIFT CRSR ↔	
{RIGHT}	CRSR ↔	
{RVS}	CTRL 9	
{OFF}	CTRL 0	
{BLK}	CTRL 1	
{WHT}	CTRL 2	
{RED}	CTRL 3	
{CYN}	CTRL 4	
{PUR}	CTRL 5	

When You Read:	Press:	See:
{GRN}	CTRL 6	
{BLU}	CTRL 7	
{YEL}	CTRL 8	
{F1}	f1	
{F2}	f2	
{F3}	f3	
{F4}	f4	
{F5}	f5	
{F6}	f6	
{F7}	f7	
{F8}	f8	
←	←	
↑	SHIFT ↕	

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Also, we have developed a simple, yet effective program that can help check your typing. Type in the appropriate Proofreader program for your machine, then save it for future use. On the VIC, 64, or Atari, run the Proofreader to activate it, then enter NEW to erase the BASIC loader (the Proofreader will still be active, hidden in memory, as a machine language program). Pressing RUN/STOP–RESTORE or SYSTEM RESET deactivates the Proofreader. You can use SYS 886 to reactivate the VIC/64 Proofreader, or PRINT USR(1536) to reenable the Atari Proofreader. The IBM Proofreader is a BASIC program that lets you enter, edit, list, save, and load programs that you type. It simulates the IBM's BASIC line editor.

Using The Automatic Proofreader

Once the Proofreader is active, try typing in a line. As soon as you press RETURN, either a number (on the Commodore) or a pair of letters

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(Atari or IBM) appears. The number or pair of letters is called a *checksum*. Try making a change in the line, and notice how the checksum changes.

All you need to do is compare the value provided by the Proofreader with the checksum printed in the program listing in the magazine. In Commodore listings, the checksum is a number from 0 to 255. It is set off from the rest of the line with *rem*. This prevents a syntax error if the checksum is typed in, but the REM statements and checksums need *not* be typed in. It is just there for your information.

In Atari and IBM listings, the checksum is given to the left of each line number. Just type in the program, a line at a time (without the printed checksum) and compare the checksum generated by the Proofreader to the checksum in the listing. If they match, go on to the next line. If not, check your typing: You've made a mistake. On the Commodore and Atari Proofreader, spaces are not counted as part of the checksum, and no check is made to see that you've typed in the characters in the right order. If characters are transposed, the checksum will still match the listing. Because of the checksum method used, do not use abbreviations, such as ? for PRINT. However, the Proofreader does catch the majority of typing errors most people make. The IBM Proofreader is even pickier; it *will* detect errors in spacing and transposition. Also, be sure you leave Caps Lock on, except when you need to enter lowercase characters.

Special Proofreader Notes For Commodore Cassette Users

The Proofreader resides in the cassette buffer, which is used during tape LOADs and SAVEs. Be sure to press RUN/STOP–RESTORE before you save or load a program, to get the Proofreader out of the way. If you want to use the Proofreader with tape, run the Proofreader, then enter these two lines *exactly* as shown, pressing RETURN after each one:

```
A$="PROOFREADER.T":B$="{10 SPACES}"
    :FORX=1TO4:A$=A$+B$:NEXT

FORX=886TO1018:A$=A$+CHR$(PEEK(X))
    :NEXT:OPEN 1,1,1,A$:CLOSE1
```

Then press RECORD and PLAY on a blank tape, and a special version of the Proofreader will be saved to tape. Anytime you need to reload the Proofreader after it has been erased, just rewind the tape, type OPEN1:CLOSE1, then press PLAY. When READY comes back, enter SYS 886.

IBM Proofreader Commands

Since the IBM Proofreader replaces the computer's normal BASIC line editor, it has to include many of the direct-mode IBM BASIC commands. The syntax is identical to IBM BASIC. Commands simulated are LIST, LLIST, NEW, FILES, SAVE, and LOAD. When listing your program, press any key (except Ctrl-Break) to stop the listing. If you enter NEW, the Proofreader will prompt you to press Y to be especially sure you mean yes.

Two new commands are BASIC and CHECK. BASIC exits the Proofreader back to IBM BASIC, leaving the Proofreader in memory. CHECK works just like LIST, but shows the checksums along with the listing. After you have typed in a program, save it to disk. Then exit the Proofreader with the BASIC command, and load the program into the normal BASIC environment (this will replace the Proofreader in memory). You can now run the program, but you may want to resave it to disk. This will shorten it on disk and make it load faster, but it can no longer be edited with the Proofreader. If you want to convert a program to Proofreader format, save it to disk with SAVE "filename",A.

VIC/64 Proofreader

```
100 PRINT"{CLR}PLEASE WAIT...":FORI=886TO10
    18:READA:CK=CK+A:POKEI,A:NEXT
110 IF CK<>17539 THEN PRINT"{DOWN}YOU MADE
    {SPACE}AN ERROR":PRINT"IN DATA STATEMEN
    TS.":END
120 SYS886:PRINT"{CLR}{2 DOWN}PROOFREADER A
    CTIVATED.":NEW
886 DATA 173,036,003,201,150,208
892 DATA 001,096,141,151,003,173
898 DATA 037,003,141,152,003,169
904 DATA 150,141,036,003,169,003
910 DATA 141,037,003,169,000,133
916 DATA 254,096,032,087,241,133
922 DATA 251,134,252,132,253,008
928 DATA 201,013,240,017,201,032
934 DATA 240,005,024,101,254,133
940 DATA 254,165,251,166,252,164
946 DATA 253,040,096,169,013,032
952 DATA 210,255,165,214,141,251
958 DATA 003,206,251,003,169,000
964 DATA 133,216,169,019,032,210
970 DATA 255,169,018,032,210,255
976 DATA 169,058,032,210,255,166
982 DATA 254,169,000,133,254,172
988 DATA 151,003,192,087,208,006
994 DATA 032,205,189,076,235,003
1000 DATA 032,205,221,169,032,032
1006 DATA 210,255,032,210,255,173
1012 DATA 251,003,133,214,076,173
1018 DATA 003
```

Atari Proofreader

```
100 GRAPHICS 0
110 FOR I=1536 TO 1700:READ A:POKE I
    ,A:CK=CK+A:NEXT I
120 IF CK<>19072 THEN ? "Error in DA
    TA Statements.  Check Typing.":E
    ND
130 A=USR(1536)
140 ? :? "Automatic Proofreader Now
    Activated."
```


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```
150 END
1536 DATA 104,160,0,185,26,3
1542 DATA 201,69,240,7,200,200
1548 DATA 192,34,208,243,96,200
1554 DATA 169,74,153,26,3,200
1560 DATA 169,6,153,26,3,162
1566 DATA 0,189,0,228,157,74
1572 DATA 6,232,224,16,208,245
1578 DATA 169,93,141,78,6,169
1584 DATA 6,141,79,6,24,173
1590 DATA 4,228,105,1,141,95
1596 DATA 6,173,5,228,105,0
1602 DATA 141,96,6,169,0,133
1608 DATA 203,96,247,238,125,241
1614 DATA 93,6,244,241,115,241
1620 DATA 124,241,76,205,238,0
1626 DATA 0,0,0,0,32,62
1632 DATA 246,8,201,155,240,13
1638 DATA 201,32,240,7,72,24
1644 DATA 101,203,133,203,104,40
1650 DATA 96,72,152,72,138,72
1656 DATA 160,0,169,128,145,88
1662 DATA 200,192,40,208,249,165
1668 DATA 203,74,74,74,74,24
1674 DATA 105,161,160,3,145,88
1680 DATA 165,203,41,15,24,105
1686 DATA 161,200,145,88,169,0
1692 DATA 133,203,104,170,104,168
1698 DATA 104,40,96
```

IBM Proofreader

```
10 'Automatic Proofreader Version 2.00 (Lines 270,510,515,517,620,630 changed from V1.0)
100 DIM L$(500),LNUM(500):COLOR 0,7,7:KEY OFF:CLS:MAX=0:LNUM(0)=65536!
110 ON ERROR GOTO 120:KEY 15,CHR$(4)+CHR$(7@):ON KEY(15) GOSUB 640:KEY (15) ON :GOTO 130
120 RESUME 130
130 DEF SEG=&H40:W=PEEK(&H4A)
140 ON ERROR GOTO 650:PRINT:PRINT"Proofreader Ready."
150 LINE INPUT L$:Y=CSRLIN-INT(LEN(L$)/W)-1:LOCATE Y,1
160 DEF SEG=0:POKE 1050,30:POKE 1052,34:POKE 1054,0:POKE 1055,79:POKE 1056,13:POKE 1057,28:LINE INPUT L$:DEF SEG:IF L$="" THEN 150
170 IF LEFT$(L$,1)=" " THEN L$=MID$(L$,2):GOTO 170
180 IF VAL(LEFT$(L$,2))=0 AND MID$(L$,3,1)=" " THEN L$=MID$(L$,4)
190 LNUM=VAL(L$):TEXT$=MID$(L$,LEN(STR$(LNUM))+1)
200 IF ASC(L$)>57 THEN 260 'no line number, therefore command
210 IF TEXT$="" THEN GOSUB 540:IF LNUM=LNUM(P) THEN GOSUB 560:GOTO 150 ELSE 150
220 CKSUM=0:FOR I=1 TO LEN(L$):CKSUM=(CKSUM+ASC(MID$(L$,I))*I) AND 255:NEXT:LOCATE Y,1:PRINT CHR$(65+CKSUM/16)+CHR$(65+(CKSUM AND 15))+" "+L$
230 GOSUB 540:IF LNUM(P)=LNUM THEN L$(P)=TEXT$:GOTO 150 'replace line
240 GOSUB 580:GOTO 150 'insert the line
260 TEXT$="":FOR I=1 TO LEN(L$):A=ASC(MID$(L$,I)):TEXT$=TEXT$+CHR$(A+32*(A>96 AND A<123)):NEXT
270 DELIMITER=INSTR(TEXT$," "):COMMAND$=TEXT$:ARG$="":IF DELIMITER THEN COMMAND$=LEFT$(TEXT$,DELIMITER-1):ARG$=MID$(TEXT$,DELIMITER+1) ELSE DELIMITER=INSTR(TEXT$,CHR$(34)):IF DELIMITER THEN COMMAND$=LEFT$(TEXT$,DELIMITER-1):ARG$=MID$(TEXT$,DELIMITER)
280 IF COMMAND$<>"LIST" THEN 410
290 OPEN "scrn:" FOR OUTPUT AS #1
300 IF ARG$="" THEN FIRST=0:P=MAX-1:GOTO 340
310 DELIMITER=INSTR(ARG$,"-"):IF DELIMITER=0 THEN LNUM=VAL(ARG$):GOSUB 540:FIRST=P:GOTO 340
320 FIRST=VAL(LEFT$(ARG$,DELIMITER)):LAST=VAL(MID$(ARG$,DELIMITER+1))
330 LNUM=FIRST:GOSUB 540:FIRST=P:LNUM=LAST:GOSUB 540:IF P=0 THEN P=MAX-1
340 FOR X=FIRST TO P:N$=MID$(STR$(LNUM(X)),2)+" "
350 IF CKFLAG=0 THEN A$="":GOTO 370
360 CKSUM=0:A$=N$+L$(X):FOR I=1 TO LEN(A$):CKSUM=(CKSUM+ASC(MID$(A$,I))*I) AND 255:NEXT:A$=CHR$(65+CKSUM/16)+CHR$(65+(CKSUM AND 15))+" "
370 PRINT #1,A$+N$+L$(X)
380 IF INKEY$<>"" THEN X=P
390 NEXT :CLOSE #1:CKFLAG=0
400 GOTO 130
410 IF COMMAND$="LLIST" THEN OPEN "lpt1:" FOR OUTPUT AS #1:GOTO 300
420 IF COMMAND$="CHECK" THEN CKFLAG=1:GOTO 290
430 IF COMMAND$<>"SAVE" THEN 450
440 GOSUB 600:OPEN ARG$ FOR OUTPUT AS #1:ARG$="":GOTO 300
450 IF COMMAND$<>"LOAD" THEN 490
460 GOSUB 600:OPEN ARG$ FOR INPUT AS #1:MAX=0:P=0
470 WHILE NOT EOF(1):LINE INPUT #1,L$:LNUM(P)=VAL(L$):L$(P)=MID$(L$,LEN(STR$(VAL(L$)))+1):P=P+1:WEND
480 MAX=P:CLOSE #1:GOTO 130
490 IF COMMAND$="NEW" THEN INPUT "Erase program - Are you sure";L$:IF LEFT$(L$,1)="y" OR LEFT$(L$,1)="Y" THEN MAX=0:GOTO 130:ELSE 130
500 IF COMMAND$="BASIC" THEN COLOR 7,0,0:ON ERROR GOTO 0:CLS:END
510 IF COMMAND$<>"FILES" THEN 520
515 IF ARG$="" THEN ARG$="A:" ELSE SEL=1:GOSUB 600
517 FILES ARG$:GOTO 130
520 PRINT"Syntax error":GOTO 130
540 P=0:WHILE LNUM>LNUM(P) AND P<MAX:P=P+1:WEND:RETURN
560 MAX=MAX-1:FOR X=P TO MAX:LNUM(X)=LNUM(X+1):L$(X)=L$(X+1):NEXT:RETURN
580 MAX=MAX+1:FOR X=MAX TO P+1 STEP -1:LNUM(X)=LNUM(X-1):L$(X)=L$(X-1):NEXT:L$(P)=TEXT$:LNUM(P)=LNUM:RETURN
600 IF LEFT$(ARG$,1)<>CHR$(34) THEN 520 ELSE ARG$=MID$(ARG$,2)
610 IF RIGHT$(ARG$,1)=CHR$(34) THEN ARG$=LEFT$(ARG$,LEN(ARG$)-1)
620 IF SEL=0 AND INSTR(ARG$,".")=0 THEN ARG$=ARG$+".BAS"
630 SEL=0:RETURN
640 CLOSE #1:CKFLAG=0:PRINT"Stopped.":RETURN 150
650 PRINT "Error #";ERR:RESUME 150
```


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Apple MLX
Machine Language Entry Program

Tim Victor, Editorial Programmer

To make it easier to enter machine language programs into your computer without typos, COMPUTE! *is introducing its MLX entry program for the Apple II series. It's our best MLX yet. It runs on the II, II+, IIe, and IIc, and with either DOS 3.3 or ProDOS.*

A machine language (ML) program is usually listed as a long series of numbers. It's hard to keep your place and even harder to avoid making mistakes as you type in the listing, since an incorrect line looks almost identical to a correct one. To make error-free entry easier, COMPUTE! generally lists ML programs for Commodore and Atari computers in a format designed to be typed in with a utility called "MLX." The MLX program uses a checksum system to catch typing errors almost as soon as they happen.

This month, COMPUTE! introduces MLX for the Apple II series. Apple MLX checks your typing on a line-by-line basis. It won't let you enter invalid characters or let you continue if there's a mistake in a line. It won't even let you enter a line or digit out of sequence. Best of all, you don't have to know anything about machine language to enter ML programs with MLX. Apple MLX makes typing ML programs almost foolproof.

Using Apple MLX

Type in and save some copies of Apple MLX on disk (you'll want to use MLX to enter future ML programs in COMPUTE!). It doesn't matter whether you type it in on a disk formatted for DOS 3.3 or ProDOS. Programs entered with Apple MLX, however, must be saved to a disk formatted with the same operating system as Apple MLX itself.

If you have an Apple IIe or IIc, make sure that the key marked CAPS LOCK is in the down position. Type RUN. You'll be asked for the starting and ending addresses of the ML program. These values vary for each program, so they're given at the beginning of the ML program listing and in the program's accompanying article. Find them and type them in.

The next thing you'll see is a menu asking you to select a function. The first is (E)NTER DATA. If you're just starting to type in a program, pick this. Press the E key, and the program asks for the address where you want to begin entering data. Type the first number in the first line of the program listing if you're just starting, or the line number where you left off if you've already typed in part of a program. Hit the RETURN key and begin entering the data.

Once you're in Enter mode, Apple MLX prints the address for each program line for you. You then type in all nine numbers on that line, beginning with the first two-digit number after the colon (:). Each line represents eight bytes and a checksum. When you enter a line and hit RETURN, Apple MLX recalculates the checksum from the eight bytes and the address. If you enter more or less than nine numbers, or the checksum doesn't exactly match, Apple MLX erases the line you just entered and prompts you again for the same line.

Invalid Characters Banned

Apple MLX is fairly flexible about how you type in the numbers. You can put extra spaces between numbers or leave the spaces out entirely, compressing a line into 18 keypresses. Be careful not to put a space between two digits in the middle of a number. Apple MLX will read two single-digit numbers instead of one two-digit number (F 6 means F and 6, not F6).

You can't enter an invalid character with Apple MLX. Only the numerals 0–9 and the letters A–F can be typed in. If you press any other key (with some exceptions noted below), nothing happens. This safeguards against entering extraneous characters. Even better, Apple MLX checks for transposed characters. If you're supposed to type in A0 and instead enter 0A, Apple MLX will catch your mistake.

Apple MLX also checks to make sure you're typing in the right line. The address (the number to the left of the colon) is part of the checksum recalculation. If you accidentally skip a line and try to enter incorrect values, Apple MLX won't let you continue. Just make sure you enter the correct starting address; if you don't, you won't be able to enter any of the following lines. Apple MLX will stop you.

Editing Features

Apple MLX also includes some editing features. The left- and right-arrow keys allow you to back up and go forward on the line that you are entering, so you can retype data. Pressing the CONTROL (CTRL) and D keys at the same time (*delete*) removes the character under the cursor, shortening the line by one character. Pressing CTRL-I (*insert*) puts a space under the cursor and shifts the rest of the line to the right, making the line one character longer. If the cursor is at the right end of the line, neither CTRL-D nor CTRL-I has any effect.

When you've entered the entire listing (up to the ending address that you specified earlier), Apple MLX

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automatically leaves Enter mode and redisplays the functions menu. If you want to leave Enter mode before then, press the RETURN key when Apple MLX prompts you with a new line address. (For instance, you may want to leave Enter mode to enter a program listing in more than one sitting; see below.)

Display Data

The second menu choice, (D)ISPLAY DATA, examines memory and shows the contents in the same format as the program listing. You can use it to check your work or to see how far you've gotten. When you press D, Apple MLX asks you for a starting address. Type in the address of the first line you want to see and hit RETURN. Apple MLX displays program lines until you press any key or until it reaches the end of the program.

Save And Load

Two more menu selections let you save programs on disk and load them back into the computer. These are (S)AVE FILE and (L)OAD FILE. When you press S or L, Apple MLX asks you for the filename. The first time you save an ML program, the name you assign will be the program's filename on the disk. If you press L and specify a filename that doesn't exist on the disk, you'll see a disk error message.

If you're not sure why a disk error has occurred, check the drive. Make sure there's a formatted disk in the drive and that it was formatted by the same operating system you're using for Apple MLX (ProDOS or DOS 3.3). If you're trying to save a file and see an error message, the disk might be full. Either save the file on another disk or quit Apple MLX (by pressing the Q key), delete an old file or two, then run Apple MLX again. Your typing should still be safe in memory.

Apple MLX: Machine Language Entry Program

```
100 N = 9: HOME : NORMAL : PRIN
    T "APPLE MLX": POKE 34,2: O
    NERR  GOTO 610
110 VTAB 1: HTAB 20: PRINT "STA
    RT ADDRESS";: GOSUB 530: IF
     A = 0 THEN  PRINT  CHR$ (7
    ): GOTO 110
120 S = A
130 VTAB 2: HTAB 20: PRINT "END
     ADDRESS  ";: GOSUB 530: IF
     S >  = A OR A = 0 THEN  PR
    INT  CHR$ (7): GOTO 130
140 E = A
150 PRINT : PRINT "CHOOSE:(E)NT
    ER DATA";: HTAB 22: PRINT "
    (D)ISPLAY DATA": HTAB 8: PR
    INT "(L)OAD FILE  (S)AVE FI
    LE  (Q)UIT": PRINT
160 GET A$: FOR I = 1 TO 5: IF
    A$ < > MID$ ("EDLSQ",I,1) T
    HEN  NEXT : GOTO 160
170 ON I GOTO 270,220,180,200:
    POKE 34,0: END
180 INPUT "FILENAME: ";A$: IF A
    $ <  > "" THEN  PRINT  CHR$
     (4);"BLOAD";A$;",A";S
190 GOTO 150
200 INPUT "FILENAME: ";A$: IF A
    $ <  > "" THEN  PRINT  CHR$
     (4);"BSAVE";A$;",A";S;",L"
    ;E - S
210 GOTO 150
220 GOSUB 590: IF B = 0 THEN 15
    0
230 FOR B = B TO E STEP 8:L = 4
    :A = B: GOSUB 580: PRINT A$
    ;": ";:L = 2
240 FOR F = 0 TO 7:V(F + 1) = P
    EEK (B + F): NEXT : GOSUB 5
    60:V(9) = C
250 FOR F = 1 TO N:A = V(F): GO
    SUB 580: PRINT A$" ";: NEXT
     : PRINT : IF  PEEK (49152)
     < 128 THEN  NEXT
260 POKE 49168,0: GOTO 150
270 GOSUB 590: IF B = 0 THEN 15
    0
280 FOR B = B TO E STEP 8
290 HTAB 1:A = B:L = 4: GOSUB 5
    80: PRINT A$;": ";: CALL 64
    668:A$ = "":P = 0: GOSUB 33
    0: IF L = 0 THEN 150
300 GOSUB 470: IF F < > N THEN
    PRINT CHR$ (7);: GOTO 290
310 IF N = 9 THEN GOSUB 560: IF
     C < > V(9) THEN PRINT CHR$
     (7);: GOTO 290
320 FOR F = 1 TO 8: POKE B + F
    - 1,V(F): NEXT : PRINT : NE
    XT : GOTO 150
330 IF LEN (A$) = 33 THEN A$ =
    O$:P = O: PRINT CHR$ (7);
340 L = LEN (A$):O$ = A$:O = P:
    L$ = "": IF P > 0 THEN L$ =
     LEFT$ (A$,P)
350 R$ = "": IF P < L - 1 THEN
    R$ =  RIGHT$ (A$,L - P - 1)
360 HTAB 7: PRINT L$;: FLASH :
    IF P < L THEN PRINT MID$ (A
    $,P + 1,1);: NORMAL : PRINT
     R$;
370 PRINT " ";: NORMAL
380 K = PEEK (49152): IF K < 12
    8 THEN 380
390 POKE 49168,0:K = K - 128
400 IF K = 13 THEN HTAB 7: PRIN
    T A$;" ";: RETURN
410 IF K = 32 OR K > 47 AND K <
     58 OR K > 64 AND K < 71 TH
    EN A$ = L$ + CHR$ (K) + R$:
    P = P + 1
420 IF K = 4 THEN A$ = L$ + R$
430 IF K = 9 THEN A$ = L$ + " "
     +  MID$ (A$,P + 1,1) + R$
440 IF K = 8 THEN P = P - (P >
    0)
450 IF K = 21 THEN P = P + (P <
     L)
460 GOTO 330
470 F = 1:D = 0: FOR P = 1 TO L
    EN (A$):C$ = MID$ (A$,P,1):
     IF F > N AND C$ < > " " TH
    EN  RETURN
480 IF C$ < > " " THEN  GOSUB 5
    20:V(F) = J + 16 * (D = 1)
    * V(F):D = D + 1
490 IF D > 0 AND C$ = " " OR D
    = 2 THEN D = 0:F = F + 1
500 NEXT : IF D = 0 THEN F = F
    - 1
510 RETURN
520 J = ASC (C$):J = J - 48 - 7
     * (J > 64): RETURN
530 A = 0: INPUT A$:A$ = LEFT$
    (A$,4): IF LEN (A$) = 0 THE
    N RETURN
540 FOR P = 1 TO LEN (A$):C$ =
    MID$ (A$,P,1): IF C$ < "0"
    OR C$ > "9" AND C$ < "A" OR
     C$ > "Z" THEN A = 0: RETUR
    N
550 GOSUB 520:A = A * 16 + J: N
    EXT : RETURN
560 C = INT (B / 256):C = B - 2
    54 * C - 255 * (C > 127):C
    = C - 255 * (C > 255)
570 FOR F = 1 TO 8:C = C * 2 -
    255 * (C > 127) + V(F):C =
    C - 255 * (C > 255): NEXT :
     RETURN
580 I = FRE (0):A$ = "": FOR I
    = 1 TO L:T =  INT (A / 16):
    A$ =  MID$ ("0123456789ABCD
    EF",A - 16 * T + 1,1) + A$:
    A = T: NEXT : RETURN
590 PRINT "FROM ADDRESS ";: GOS
    UB 530: IF S > A OR E < A O
    R A = 0 THEN B = 0: RETURN
600 B = S + 8 * INT ((A - S) /
    8): RETURN
610 PRINT "DISK ERROR": GOTO 15
    0
```


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SpeedScript 3.0

All Machine Language Word Processor For Apple

Charles Brannon, Program Editor
Apple Adaptation By Kevin Martin, Editorial Programmer

COMPUTE! *concludes its* SpeedScript 3.0 *series this month with a version for Apple II-series computers with DOS 3.3 and at least 48K RAM. Originally written for the Commodore 64 and VIC-20,* SpeedScript *has also been adapted for Atari computers* (COMPUTE!, *May 1985) and has become extremely popular. It compares favorably with commercial programs and has some features never seen before in an Apple word processor.*

SpeedScript 3.0, though compact in size (5.5K), has most of the functions you expect in a full-featured word processor. *SpeedScript* is also very easy to learn and use. You type in everything first; preview and make corrections on the screen; insert and delete words, sentences, and paragraphs; then print out an error-free draft, letting *SpeedScript* take care of things like margins, centering, headers, and footers.

The Apple version of *SpeedScript 3.0,* and all other Apple programs in this issue, may be ordered on disk directly from COMPUTE! Publications. Call **TOLL FREE 1-800-334-0868** (in NC 1-919-275-9809) to charge your order 8:30 a.m.–7:00 p.m. Eastern Time, Monday through Friday. Or send check or money order ($12.95 plus $2.00 shipping and handling) to:

COMPUTE! Publications, Inc.
P.O. Box 5058
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Special Typing Instructions

Apple *SpeedScript* is the longest Apple machine language program we've ever published, but COMPUTE!'s new "Apple MLX" entry system helps you type it right the first time. MLX can detect most typing errors as they happen. (See the Apple MLX article elsewhere in this issue.) MLX also lets you type *SpeedScript* in more than one sitting. Although the program listing is lengthy, we guarantee the effort will be worthwhile. If you prefer, you can order Apple *SpeedScript 3.0* (and all other Apple programs in this issue) on disk directly from COMPUTE! Publications at a nominal cost (see box).

To begin entering the data for *SpeedScript,* boot up your Apple with a DOS 3.3 startup disk in the drive. As the MLX article states, programs entered with MLX must be saved to a disk with the same operating system format as the disk from which MLX was loaded. Since this version of *SpeedScript* works only with DOS 3.3, you must load Apple MLX from a DOS 3.3 disk. If you have a IIe or IIc that came with the ProDOS operating system, you must obtain a copy of DOS 3.3 before entering *SpeedScript.*

Because the machine language data for *SpeedScript* resides in the same area of memory where BASIC programs are normally loaded, it's necessary in this case to reconfigure memory before loading MLX to enter *SpeedScript.* Otherwise, the *SpeedScript* data you enter with MLX will overwrite the MLX program itself as you type. To reconfigure memory, type the following line in direct mode (no line number) and hit RETURN:

```
POKE 104,32: POKE 8192,0: NEW
```

You must *always* enter this line before loading MLX to enter *SpeedScript* data. It is, however, *not* necessary to enter this line before loading the completed *SpeedScript* program.

Now load and run Apple MLX. Answer the first two questions that MLX asks like this:

```
STARTING ADDRESS? 0800
ENDING ADDRESS? 1E45
```

An options menu appears next. Press E to Enter the program. Now type the address at which you'd like to start typing. If you're just beginning to type the listing, you'd enter 0800. The screen then shows the first prompt, the number 0800 followed by a colon (:). Type in each two-digit number shown in the *SpeedScript* listing (some of the digits are letters, because the numbers are in hexadecimal). You don't need to type the spaces shown in the listing, but you can for the sake of readability. MLX does not let you type illegal characters.

The last number you enter in each line is a *checksum.* If you type the line correctly, the checksum calculated by MLX should match the checksum number you typed in. If it doesn't match, MLX makes you retype the line. MLX is not foolproof, though. It's quite rare, but it's possible that an error in one number could be offset by an error in another. MLX will help catch your errors, but you still must be careful.

Typing In Multiple Sittings

If you want to stop typing the listing at some point and pick up later, press RETURN at the address prompt without typing anything.

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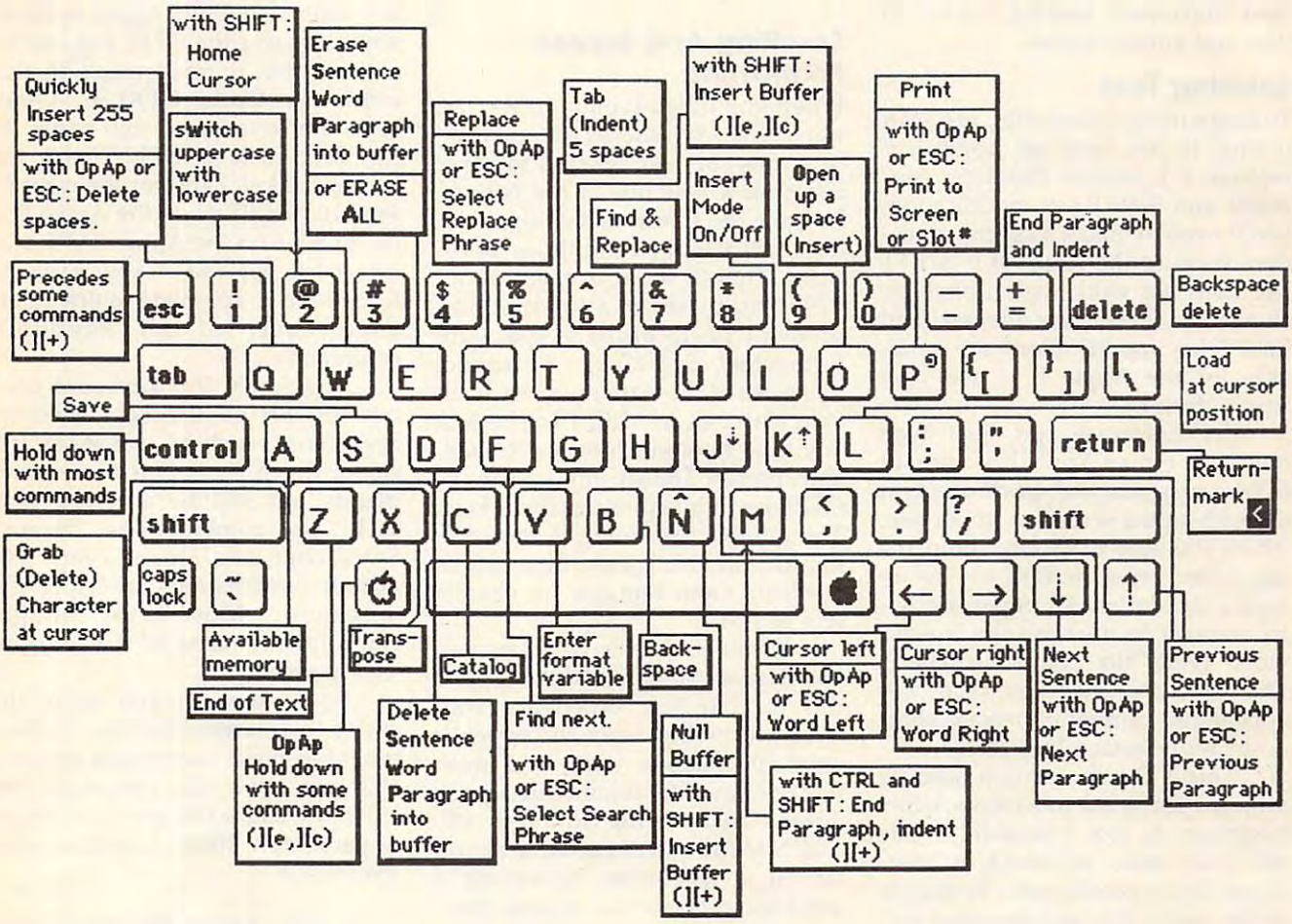

Write down the address number you stopped at. The options menu reappears, and you can save your typing at this point. To continue entering data the next time, boot your system, enter the direct-mode line given above to configure memory, and load MLX. Answer the STARTING ADDRESS? and ENDING ADDRESS? questions with the same values you used the first time, 0800 and 1E45. Then select Load from the options menu, then press E to enter data. Give MLX the address number you previously stopped at. Now continue typing as before.

When you finish all typing, MLX returns you to the options menu, where you can save the finished program.

MLX has now created a binary file on disk. To run it, reboot the machine to clear out memory, then from BASIC type BRUN *filename*, where *filename* is the name you specified when saving *SpeedScript* on disk with MLX. *SpeedScript* automatically loads and runs. If you prefer, you can write a short program:

```
10 PRINT CHR$(4);"BRUN filename"
```

and save it as the HELLO file on the disk (INIT HELLO to format and set up a blank disk). This makes *SpeedScript* load and run automatically when you boot up.

Do You Have Lowercase?

When you BRUN *SpeedScript*, you'll first be asked, LOWERCASE? [Y/N]. If you are running *SpeedScript* on an Apple IIe or IIc, or have a lowercase character generator in your Apple II+, press Y for Yes. Otherwise, press N. This adjusts *SpeedScript* for your machine.

After you've answered the prompt, you'll see a blank 40-column screen with a blinking underline cursor. The first line on the screen is in inverse video, white with black letters. *SpeedScript* presents all messages on this *command line*. The remaining 23 lines of the screen are used to enter, edit, and

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display your document. You cannot enter text in 80 columns, although you can print the document to the screen in 80 columns, if you have the appropriate hardware.

The cursor shows where the next character you type will appear on the screen. *SpeedScript* lets you move the cursor anywhere within your document, making it easy to find and correct errors.

Entering Text

To begin using *SpeedScript*, just start typing. If you have an Apple II+ without a lowercase character generator and SHIFT key modification, you'll need to follow a special procedure because the Apple II+ SHIFT key does not work with alphabetic characters. (Lowercase adapters and SHIFT key modifications are available for the Apple II+; see your Apple dealer.)

For lowercase text, just type normally. On an Apple II+ without a lowercase adapter, lowercase text appears on the screen as uppercase. When you need to specify an uppercase letter, press the **ESC** key before typing that letter. An uppercase letter appears on the screen in inverse video (with the colors switched). The next character you type will appear as a normal uppercase character, representing lowercase.

This is the convention used by most Apple word processors when lowercase is not available. While this may seem awkward, it overcomes the uppercase-only limitation of the Apple II+ and becomes second nature after a while. For example, to enter:

Who won the World Series?

you'd type:

ESC WHO WON THE ESC WORLD ESC SERIES?

which appears onscreen as:

WHO WON THE WORLD SERIES?

With an Apple II+ with the SHIFT key modification or an Apple IIe/IIc, you type as you would on a typewriter, holding down the SHIFT key while typing the uppercase letter. Be sure to disengage the CAPS LOCK key if you want to type lowercase.

When the cursor reaches the right edge of the screen, it automatically jumps to the beginning of the next line, just as in BASIC. But unlike BASIC, *SpeedScript* never splits words at the right edge of the screen. If a word you're typing won't fit at the end of one line, it's instantly moved to the next line. This feature, called *word-wrap* or *parsing*, also helps make your text more readable.

Scrolling And Screen Formatting

When you finish typing on the last screen line, *SpeedScript* automatically scrolls the text upward to make room for a new line at the bottom. Imagine the screen as a 23-line window on a long, continuous document. There's room in memory for 27904 characters on a 48K machine, or about 10–15 pages of text. (Unfortunately, *SpeedScript 3.0* cannot make use of the extra memory available with 64K or 128K.) To check at any time how much space is available, press **CTRL-A** (hold down the CTRL key while pressing the A key). The number appearing in the command line indicates how much *available* room remains for characters of text.

If you're used to a typewriter, you'll have to unlearn some habits if this is your first experience with word processing. Since the screen is only 40 columns wide, and most printers have 80-column carriages, it doesn't make sense to press RETURN at the end of each line as you do on a typewriter. *SpeedScript*'s word-wrap takes care of this automatically. Press RETURN only when you want to force a carriage return to end a paragraph or limit the length of a line. A *return-mark* appears on the screen as an inverse less-than sign (<).

Using The Keyboard

Most features are accessed with control-key commands—you hold down CTRL while pressing another key. In this article, control-key commands are abbreviated **CTRL-*x*** (where *x* is the key you press in combination with CTRL). An example is the CTRL-A mentioned above to check on available memory. CTRL-E means hold down CTRL and press E.

Some commands have special options. On the Apple II+, you'll sometimes need to press ESC before the CTRL key, as in ESC-CTRL-E. You first press ESC, then release it and press CTRL and E together. If your Apple II+ has the SHIFT key modification, you can press SHIFT instead of ESC, but you must press it simultaneously with CTRL and the command key.

On the Apple IIe and IIc, you hold down the Open Apple key (the key with a hollow Apple symbol) while pressing the CTRL key combination. This is represented in this article as **OpAp-CTRL-E**. Other keys are referenced by name or function, such as DELETE for the backspace key, *carat* for the carat (^) symbol (SHIFT-N on the Apple II+ or SHIFT-6 on the Apple IIe/IIc), or *cursor-left* for the ← key. See the figure for a complete quick-reference chart of all keyboard commands.

The Apple II+ keyboard does not support all the keys used by *SpeedScript*, such as cursor-up and cursor-down (↑ ↓), but these commands can still be accessed with CTRL-key combinations. Because *SpeedScript* uses almost every key, not all combinations are especially mnemonic. Most keys, though, stand for the name of the function they perform.

Some keys let you move the cursor to different places in the document to make corrections or scroll text into view. You can move the cursor by character, word, sentence, or paragraph. Here's how to control the cursor:

- The **cursor-left/right** keys (←/→) move the cursor a single space in either direction. By preceding this key with ESC on the Apple II+, or by holding down the Open Apple key while pressing the key on the Apple IIe/IIc, you can move the cursor to the beginning of the next (→) or previous (←) word.
- The **cursor-up/down** keys (↑/↓ on the IIe/IIc, **CTRL-J/CTRL-K** on the II+) move the cursor to the beginning of either the previous or next sentence. On the IIe/IIc, hold down the Open Apple key as you press the arrow to move to the beginning of the next (↓) or previous (↑) paragraph. On the Apple II+, press CTRL-K to move the cursor to the beginning of the next sentence, and press CTRL-J to move the cursor to the beginning of the previous sentence. Press ESC-CTRL-K to move

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the cursor to the beginning of the next paragraph, or ESC-CTRL-J to move the cursor to the beginning of the previous paragraph. (A paragraph is defined as any sequence of characters ending in a return-mark.)

• Pressing **CTRL-@** (CTRL-SHIFT-2 on the IIe/IIc, CTRL-SHIFT-P on the II+), puts the cursor *at* the top of the screen. If the cursor is already at the top of the screen, CTRL-@ moves the cursor to the top of the document. So to quickly move to the beginning of the document, press CTRL-@ twice.

• **CTRL-Z** moves the cursor to the end of the document, scrolling if necessary. It's easy to remember since Z is at the *end* of the alphabet.

Making Corrections

Sometimes you'll have to insert some characters to make a correction. Use **CTRL-O** to *open up* a single space. Merely position the cursor at the point where you want to insert a space, and press CTRL-O.

It can be tedious to use CTRL-O to open up enough space for a whole sentence or paragraph. For convenience, *SpeedScript* has an insert mode that automatically inserts space for each character you type. In this mode, you can't type over characters; everything is inserted at the cursor position. To enter insert mode, press **CTRL-I.** To cancel insert mode, press CTRL-I again. To let you know you're in insert mode, the cursor changes from a blinking underline to a blinking inverse underline (which looks like a solid square). The cursor changes back to a blinking underline when you exit insert mode. Because of keyboard redundancy, the TAB key on the Apple IIe/IIc works just like CTRL-I.

Insert mode is the easiest way to insert text, but it can become too slow when inserting near the top of a very long document because it must move all the text following the cursor position. So *SpeedScript* has even more ways to insert blocks of text.

One way is to use **CTRL-T** (*tab*). It is programmed in *SpeedScript* to act as a five-space margin indent. To end a paragraph and start another, press RETURN twice and press CTRL-T. A shortcut for this is **CTRL-]** on the Apple IIe/IIc and **CTRL-SHIFT-M** on the Apple II+; these keystrokes automatically insert two return-marks and indent the margin. CTRL-T always inserts; you don't need to be in insert mode. You can also use CTRL-T to open up more space than CTRL-O. (You cannot set or clear tab stops in *SpeedScript* as you can with some word processors.) No matter how much space you want to insert, each insertion takes the same amount of time. So CTRL-T can insert five spaces five times faster than pressing CTRL-O five times.

There's an even better way, though. Press **CTRL-Q** to *quickly* insert 255 spaces (it does not insert a line; use RETURN for that). You can press it several times to open up as much space as you need. And CTRL-Q is quick indeed. It inserts 255 spaces as fast as CTRL-O opens up one space. Now just type the text you wanted to insert over the blank space. (You don't want to be in CTRL-I insert mode when you use this trick; that would defeat its purpose.)

Since DELETE (backspace) is also slow when working with large documents (it, too, must move all text following the cursor), you may prefer to use the cursor-left key to backspace when using this method.

After you're done inserting, there may be some inserted spaces left over that you didn't use. Just press **ESC-CTRL-Q** on the II+ or **OpAp-CTRL-Q** on the IIe/IIc. This instantly deletes all extra spaces between the cursor and the start of following text. It's also useful whenever you need to delete a block of spaces for some reason.

Erasing Text

To erase the character on which the cursor is sitting, press **CTRL-G** (to *grab* the character). The character highlighted by the cursor is removed, and all following text is moved toward the cursor to fill the empty space.

Press **CTRL-B** (*backspace*) on the II+ or the **DELETE** key on the IIe/IIc to delete the character to the left of the cursor. All the following text is moved with the cursor to fill the empty space.

These keys are fine for minor deletions, but it could take all day to delete a whole paragraph this way. So *SpeedScript* has two commands that can delete an entire word, sentence, or paragraph at a time. **CTRL-E** erases text *after* (to the right of) the cursor position (and can also erase all text), and **CTRL-D** deletes text *behind* (to the left of) the cursor.

To use the CTRL-E erase mode, first place the cursor at the beginning of the word, sentence, or paragraph you want to erase. Then press CTRL-E. The command line shows the message "ERASE (S,W,P,A): RETURN TO EXIT." Press S to erase a sentence, W for a word, or P for a paragraph. Each time you press one of these letters, the text is quickly erased. You can keep pressing S, W, or P until you've erased all the text you wish. Then press RETURN to exit the erase mode.

You also use CTRL-E to erase all text from memory when you want to start a new document. To erase all text, press CTRL-E, then press the A (*all*) key. A prompt appears: ERASE ALL TEXT: ARE YOU SURE (Y/N). Press Y to perform the irreversible deed. You cannot recover any text erased this way. Press N or any other key to cancel this function.

The CTRL-D delete mode works similar to CTRL-E, but deletes only one word, sentence, or paragraph at a time. First, place the cursor after the word, sentence, or paragraph you want to delete. Then press CTRL-D. Next, press S, W, or P for sentence, word, or paragraph. The text is immediately deleted and you return to editing. You don't need to press RETURN to exit the CTRL-D delete mode unless you pressed this key by mistake. *(In general, you can escape from any function in SpeedScript by simply pressing RETURN.)* CTRL-D is most convenient when the cursor is already past what you've been typing.

The Text Buffer

When you erase or delete with CTRL-E and CTRL-D, the text isn't lost forever (unless you've performed an Erase All). *SpeedScript* remembers what you've removed by storing deletions in a separate area of memory called a *buffer*. The buffer is a failsafe device. If you erase too much, or change your mind, just press **CTRL-*carat*** (CTRL-SHIFT-6 on the IIe/IIc, CTRL-SHIFT-N on the II+) to restore the deletion. However, be aware that *SpeedScript* remembers only the last erase or

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delete you performed. It's not to hard to remember this command, since the carat is used in paper-and-pencil editing to signify an insertion. Be sure you don't press CTRL-N without SHIFT, since CTRL-N is the command to clear out (*null*) the buffer.

Another, more powerful, use of this buffer is to move or copy sections of text. To move some text from one location in your document to another, first erase or delete it with CTRL-E or CTRL-D. Then move the cursor to where you want the text to appear and press CTRL-*carat*. CTRL-*carat* instantly inserts the contents of the buffer at the cursor position. If you want to copy some text from one part of your document to another, just erase or delete it with CTRL-E or CTRL-D, restore it at the original position with CTRL-*carat*, then move the cursor elsewhere and press CTRL-*carat* to restore it again. You can retrieve the buffer with CTRL-*carat* as many times as you like. If there is no room left in memory for inserting the buffer, you'll see the message NO ROOM.

Important: The CTRL-E erase mode lets you erase up to the maximum size of the buffer (2K), and CTRL-E also removes the previous contents of the buffer. The buffer is also erased with the ERASE ALL option of CTRL-E. Keep this in mind if there's something in the buffer you'd rather keep. If you don't want the buffer to be erased, hold down the Open Apple key (or precede with ESC on the II+) when you press CTRL-E. This preserves the buffer contents and adds newly erased text to the buffer.

If you ever need to erase the contents of the buffer, press **CTRL-N** (*null buffer*).

Search And Replace

SpeedScript has a Find command that searches through your document to find a selected word or phrase. A Replace option lets you automatically change one word to another throughout the document.

ESC-CTRL-F or **OpAp-CTRL-F** (*find*) lets you define a search phrase, **ESC-CTRL-R** or **OpAp-CTRL-R** (*replace*) lets you define a replace phrase, and **CTRL-Y** is for automatically searching and replacing.

Searching is a two-step process. First you need to tell *SpeedScript* what to search for, then you trigger the actual search. Hold down Open Apple and press CTRL-F (on the Apple II+, press ESC, then CTRL-F). The command line prompts FIND:. Type in what you'd like to search for, the *search phrase*. If you press RETURN alone without typing anything, the Find command is canceled.

When you are ready to search, press **CTRL-F.** *SpeedScript* looks for the next occurrence of the search phrase *starting from the current cursor position.* If you want to hunt through the entire document, press CTRL-@ twice to move the cursor to the very top before beginning the search. Each time you press CTRL-F, *SpeedScript* looks for the next occurrence of the search phrase and places the cursor at the start of the phrase. If the search fails, you'll see the message NOT FOUND.

CTRL-R works together with CTRL-F. After you've specified the search phrase with OpAp-CTRL-F or ESC-CTRL-F, press OpAp-CTRL-R or ESC-CTRL-R to select the replace phrase. (You can press RETURN alone at the REPLACE WITH: prompt to select a *null* replace phrase. When you hunt and replace, this deletes the located phrase.) To manually search and replace, start by pressing CTRL-F. After *SpeedScript* finds the search phrase, press CTRL-R if you want to replace the phrase. If you don't want to replace the phrase, don't press CTRL-R. You are not in a special search and replace mode. You're free to continue writing at any time.

CTRL-Y links CTRL-F and CTRL-R together (think of the two branches of the Y linking together Find and Replace). It first asks FIND:, then REPLACE:, then automatically searches and replaces throughout the document starting at the cursor position.

There are a few things to watch out for when using search and replace. First, realize that if you search for "the," *SpeedScript* finds the embedded "the" in words like "therefore" and "heathen." If you changed all occurrences of "the" to "cow," these words would become "cowrefore" and "heacown." If you want to find a single word, include a space as the first character of the word, since almost all words are preceded by a space. Naturally, if you are replacing, you need to include the space in the replace phrase, too.

Also, *SpeedScript* distinguishes between upper- and lowercase. The word "Meldids" does not match with "meldids." *SpeedScript* will not find a capitalized word unless you capitalize it in the search phrase. To cover all bases, you will sometimes need to make two passes at replacing a word. Keep these things in mind when using CTRL-Y, since you don't have a chance to stop a linked find and replace.

Storing Your Document

To store your text, press **CTRL-S**. You'll see the prompt SAVE:. Type in the filename and press RETURN. If you need to access a second disk drive, precede the filename with **2:**. This becomes the default drive for future disk access. To return to drive 1, precede the filename with **1:**. If the filename you specify coincides with one already on the disk, the existing file will be overwritten by the new one.

CTRL-S always saves the entire document. The cursor position within the document is not important.

When the SAVE is complete, *SpeedScript* reports NO ERRORS if all is well, or gives a message like DISK FULL if not. Check your DOS or BASIC manual for a list of error messages and their causes.

Press CTRL-C to display the disk catalog. The catalog pauses when the screen is full, waiting for you to press a key to continue. When the catalog is finished, press RETURN to return to editing.

Loading A Document

To recall a previously saved document, press **CTRL-L**. Answer the LOAD: prompt with the filename. Again, you can precede the filename with **1:** or **2:** to switch drives. *SpeedScript* loads the file and should display NO ERRORS. Otherwise, *SpeedScript* reports the error.

The position of the cursor is important before loading a file. Documents start loading at the cursor position, so be sure to press CTRL-@ twice or CTRL-E and A (Erase All) to move the cursor to the start of text, unless you want to merge two documents. When you press CTRL-L to

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load, a flashing asterisk appears to warn you if the cursor is not at the top of the document.

To merge two or more files, simply load the first file, press CTRL-Z to move the cursor to the end of the document, and then load the file you want to merge. Do not place the cursor somewhere in the middle of your document before loading. A Load does not insert the text from disk, but overwrites all text after the cursor position. The last character loaded becomes the new end-of-text pointer, and you cannot access any text that appears ahead of this pointer.

Since *SpeedScript* stores documents as binary files, you cannot read a text file in BASIC, load a BASIC program into *SpeedScript*, or upload a text file with a modem. However, Program 2 is a file conversion program which allows these functions. It converts *SpeedScript* binary files into ASCII text files. It can also convert an ASCII text file into a *SpeedScript* binary file. This lets you convert word processing files from other word processors, or change a *SpeedScript* document into a text file suitable for uploading. You can even edit BASIC programs with *SpeedScript*. Add the following line to your BASIC program and run it. It creates a text file on disk of your BASIC listing.

```
0 PRINT CHR$(4);"OPEN filename"
  :PRINT CHR$(4)"WRITE
  filename":LIST
```

Run Program 2 to convert the BASIC text file to a *SpeedScript* file. You can then load this file into *SpeedScript* for editing. Save this file back to disk, run Program 2 to convert it back to a text file, then in BASIC use EXEC *filename* to read the text file back into BASIC. Although this seems rather tedious, you may find it quite worthwhile when working with long programs. A similar technique can be used to edit files written by other applications.

Note: Delete any *SpeedScript* print formatting commands (described below) before converting a text file to an ASCII file. Otherwise, they will not be converted correctly.

Additional Features

SpeedScript has a few commands that don't do much, but are nice to have. **CTRL-X** exchanges the character under the cursor with the character to the right of the cursor. Thus you can fix transposition errors with a single keystroke. **CTRL-W** (think *sWitch)* changes the character under the cursor from uppercase to lowercase or vice versa.

Apple *SpeedScript* traps the RESET key. RESET or CTRL-RESET always returns you to editing mode. There is no way to exit *SpeedScript* once you've run it, short of rebooting.

PRINT!

If you already think *SpeedScript* has plenty of commands, wait until you see what the printing package offers. *SpeedScript* supports an array of powerful formatting features. It automatically fits your text between left and right margins you can specify. You can center a line or block it against the right margin. *SpeedScript* skips over the perforation on continuous-form paper, or can wait for you to insert single-sheet paper. A line of text can be printed at the top of each page (a *header*) and/or at the bottom of each page (a *footer*), and can include automatic page numbering, starting with whatever number you like.

SpeedScript can print on different lengths and widths of paper, and single-, double-, triple-, or any-spacing is easy. You can print a document as big as can fit on a disk by linking several files together during printing. You can print to the screen or to a file instead of to a printer. Other features let you send special codes to the printer to control features like underlining, boldfacing, italics, and double-width type (depending on the printer).

But with all this power comes the need to learn additional commands. Fortunately, *SpeedScript* sets most of these variables to a *default* state. If you don't change these settings, *SpeedScript* assumes a left margin of five, a right margin position of 75, no header or footer, single-spacing, and continuous paper page feeding. You can change these default settings if you want (see below).

Before printing, be sure the paper in your printer is adjusted to top-of-form (move the paper perforation just above the printing element). One additional note: Some printers incorporate an automatic skip-over-perforation feature. The printer skips to the next page when it reaches the bottom of a page. Since *SpeedScript* already controls paper feeding, you need to turn off this automatic skip-over-perf feature before running *SpeedScript*, or paging won't work properly.

To begin printing, press **CTRL-P.** If your printer is attached, powered on, and selected (online), *SpeedScript* begins printing immediately. To cancel printing, press CTRL and the RESET key.

If you need to print to an RS-232 printer or to a printer in a slot other than slot #1, press **ESC-CTRL-P** (Apple II+) or **OpAp-CTRL-P** (Apple IIe/IIc). This brings up the prompt PRINT TO: SCREEN, PRINTER? Press S to print to the screen. If you don't have lowercase, the screen display won't make much sense, although you can still see where pages break. If you have an Apple IIc, an Apple IIe with the 80-column card, or an Apple II+ with a compatible 80-column card, *SpeedScript* automatically prints to the screen in 80 columns, simulating the printer.

If you select P, you'll be asked for the slot number. Output is sent to the slot number you select. It's similar to PR# in BASIC. If you print to slot 6 (the disk drive), you'll cause the system to reboot, so be careful.

Formatting Commands

The print formatting commands are single letters embedded in text, such as L for left margin. To enter a formatting variable, press **CTRL-V**. You'll see the prompt ENTER FORMAT VARIABLE:. Now press any key. The print formatting commands must be distinguished from normal text, so they appear on-screen in flashing inverse video with the text and background colors switched. All lettered printer commands should be entered without the SHIFT key. During printing, *SpeedScript* treats these characters as printing commands.

There are two kinds of printing commands, which we'll call Stage 1 and Stage 2. Stage 1 commands usually control variables such as left margin and right margin. Most are followed by a number, with no space between the command and the number. Stage 1 commands are

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executed before a line is printed.

Stage 2 commands, like centering and underlining, are executed while the line is being printed. Usually Stage 1 commands must be on a line of their own, although you can group several Stage 1 commands together on a line. Stage 2 commands are by nature embedded within a line of text. Again, remember to press CTRL-V to enter the boldface characters shown below.

Stage 1 Commands

L Left margin. Follow with a number from 0 to 255. Use 0 for no margin. Defaults to 5.

R Right margin position, a number from 1 to 255. Defaults to 75. Be sure the right margin value is greater than the left margin value, or *SpeedScript* will go bonkers.

T Top margin. The position at which the first line of text is printed, relative to the top of the page. Defaults to 5. The header (if any) is always printed on the first line of the page, before the first line of text.

B Bottom margin. The line at which printing stops before continuing to the next page. Standard 8½ × 11-inch paper has 66 lines. Bottom margin defaults to the fifty-eighth line. Don't make the bottom margin greater than the page length.

P Page length. Defaults to 66. If your printer does not print six lines per inch, multiply lines-per-inch by 11 to get the page length. European paper is usually longer than American paper—11⅝ or 12 inches. Try a page length of 69 or 72.

S Spacing. Defaults to single-spacing. Follow with a number from 1 to 255. Use 1 for single-spacing, 2 for double-spacing, 3 for triple-spacing.

@ Start numbering *at* page number given. Page numbering normally starts with 1.

? Disables printing until selected page number is reached. For example, a value of 3 would start printing the third page of your document. Normally, *SpeedScript* prints starting with the first page.

X Sets the page width, in columns (think *a cross*). Defaults to 80. You need to change this for the sake of the centering command if you are printing in double-width or condensed type, or are using a 40-column or wide-carriage printer.

N Forced paging. Normally, *SpeedScript* prints the footer and moves on to the next page only when it has finished a page, but you can force it to continue to the next page by issuing this command. It requires no numbers.

M Margin release. Disables the left margin for the next printed line. Remember that this executes before the line is printed. It's used for outdenting.

W Page wait. This command should be placed at the beginning of your document before any text. With page wait turned on, *SpeedScript* prompts you to INSERT NEXT SHEET, PRESS RETURN when each page is finished printing. Insert the next sheet, line it up with the printhead, then press RETURN to continue. Page wait is ignored during disk or screen output.

J Select automatic linefeeds after carriage return. Like **W**, this command must be placed before any text. Don't use this command to achieve double-spacing, but only if all text prints on the same line with some printers.

I Information. This works like REM in BASIC. You follow the command with a line of text, up to 255 characters, ending in a return-mark. This line will be ignored during printing, and is handy for making notes to yourself such as the filename of the document.

H Header define and enable. The header must be a single line of text (up to 254 characters) ending in a return-mark. The header prints on the first line of each page. You can include Stage 2 commands such as centering and page numbering in a header. You can use a header by itself without a footer. The header and footer should be defined at the top of your document, before any text. If you want to prevent the header from printing on the first page, put a return-mark by itself at the top of your document before the header definition.

F Footer define and enable. The footer must be a single line of text (up to 254 characters) ending in a return-mark. The footer prints two lines prior to the last line of each page. As with the header, you can include Stage 2 printing commands, and you don't need to set the header to use a footer.

G Go to (link) next file. Put this command as the last line in your document. Follow the command with the filename (with no spaces between the **G** and the filename), including the drive number prefix **1:** or **2:**, if appropriate. After the text in memory is printed, the link command loads the next file into memory. You can continue linking successive files, but don't include a link in the last file. Before you start printing a linked file, make sure the first of the linked files is in memory. When printing is finished, the last file linked to will be in memory.

Stage 2 Commands

These commands either precede a line of text or are embedded within one.

C Centering. Put this at the beginning of a line you want to center. This centers only one line ending in a return-mark. Repeat this command at the beginning of every line you want centered. Centering uses the page-width setting (see above) to properly center the line. To center a double-width line, either set the page width to 40 or pad out the rest of the line with an equal number of spaces. If you use double width, remember that the spaces preceding the centered text will be double-wide spaces.

When *SpeedScript* encounters this command, it prints the current page number. You usually embed this within a header or footer.

U A simple form of underlining. It works only on printers that recognize CHR$(8) as a backspace and CHR$(95) as an underline character. Underlining works on spaces, too. Use the first **U** to start underlining, and another one to turn off underlining.

Fonts And Styles

Most dot-matrix printers are capable of more than just printing text at ten characters per inch. Some printers have several character sets, with italics and foreign language characters. Most can print in double width (40 characters per line), condensed (132 characters per line), and in either pica or elite. Other features may include programmable characters, programmable tab stops, and graphics modes. Many word processors customize themselves to a particular printer, but for flexibility

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SpeedScript was purposely designed not to be printer-specific. Instead, *SpeedScript* lets you define your own Stage 2 printing commands.

You define a programmable *printkey* by choosing any character that is not already used for other printer commands. The numbers 0-9, most symbols, and some alphabetic characters are available for printkeys. You enter these commands like printer commands with CTRL-V. The printkeys are like variables in BASIC.

To define a printkey, press CTRL-V, then type the key you want to assign as the printkey, then an equals sign (=), and finally the ASCII value to be substituted for the printkey during printing. Now whenever *SpeedScript* encounters the printkey embedded in text, it prints the character with the ASCII value you previously defined. (If you have trouble passing some printkeys to the printer, try adding 128 to the ASCII value you wish to send. Otherwise, some printer interfaces intercept the printkey.)

For example, to define the + key as the letter z, you first look up the ASCII value of the letter z (in either your printer manual or in the BASIC manual). The ASCII value of the letter z is 122, so the definition is:

```
+=122<
```

Now, anywhere you want to print the letter z, substitute the printkey:

```
Gad+ooks! The +oo is +any!<
```

This would appear on paper as:

Gadzooks! The zoo is zany!

More practically, here's how you could program italics on an Epson MX-80 compatible printer. You switch on italics by sending an ESC (a character with an ASCII value of 27), then the character 4. You turn off italics by sending ESC 5. So define * as the escape code. Anywhere you want to print a word in italics, bracket it with *4 and *5.

You can similarly define whatever codes your printer uses for features like double width or emphasized mode. For your convenience, four of the printkeys are predefined, though you can change them. The keys 1-4 are defined as 27, 14, 15, and 18, common values for most printers. On most printers, CHR$(27) is the ESCape key, CHR$(14) starts double-width printing, CHR$(15) either stops double width or starts condensed characters, and CHR$(18) usually cancels condensed characters.

Keep one thing in mind about printkeys. *SpeedScript* always assumes it is printing to a rather dumb, featureless printer, the least common denominator. *SpeedScript* doesn't understand the intent of a printkey; it justs sends out its value. So if you make one word within a line double width, it may make the line overflow the specified right margin. There's no way for *SpeedScript* to include built-in font and typestyle codes without being customized for a particular printer, since no set of codes is universal to all printers.

Hints And Tips

It may take you awhile to fully master *SpeedScript*, but as you do you'll discover many ways to use the editing and formatting commands. For example, there is a simple way to simulate tab stops, say for a columnar table. Just type a period at every tab stop position. Erase the line with CTRL-E, then restore it with CTRL-*carat* multiple times. When you are filling in the table, just use word-left/word-right to jump quickly between the periods. Or you can use the programmable printkeys to embed your printer's own commands for setting and jumping to tab stops.

You don't have to change or define printer commands every time you write. Just save these definitions, and load this file for each session. You can create many custom definition files and have them ready to use on disk. You can create customized "fill-in-the-blank" letters. Just type the letter, and everywhere you'll need to insert something, substitute a unique character, such as an * or a CTRL character. When you're ready to customize the letter, use Find to locate each symbol and insert the specific information. Instead of typing an oft-used word or phrase, substitute a unique character, then use CTRL-Y to automatically change these characters into the actual word or phrase. You can even use *SpeedScript* as a simple filing program. Just type in all your data, flagging each field with a unique character. You can use Find to quickly locate any field.

If you experience any problems with *SpeedScript* that you are sure are not due to your error, please *write* (don't call) with a detailed explanation of the problem and how it occurred. Describe your hardware configuration. It also helps to send us a disk copy of your typing so we can determine with our equipment whether you have a hardware problem.

Due to the volume of mail, we cannot always reply to individual questions, but we welcome your suggestions. Who knows—your feedback may help make *SpeedScript 4.0* a reality.

The Apple version of *SpeedScript 3.0*, and all other Apple programs in this issue, may be ordered on disk directly from COMPUTE! Publications. Call **TOLL FREE 1-800-334-0868** (in NC 1-919-275-9809) to charge your order 8:30 a.m.–7:00 p.m. Eastern Time, Monday through Friday. Or send check or money order ($12.95 plus $2.00 shipping and handling) to:

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Program 1: *SpeedScript 3.0* For Apple

Please refer to the "Apple MLX" article before entering this listing.

```
START ADDRESS: 0800
END ADDRESS:   1E45

0800: 20 58 FC A9 26 A0 1E 85 E5
0808: ED 84 EE A0 00 20 DE 09 5F
0810: 20 E9 09 C9 D9 F0 0C C9 DC
0818: CE D0 F5 A9 00 8D 00 03 56
0820: 4C 28 08 A9 80 8D 00 03 39
0828: 20 29 0A 20 9B 09 4C 18 87
0830: 0B A5 06 8D 51 08 A5 08 C6
0838: 8D 52 08 A5 19 8D 54 08 AE
0840: A5 1B 8D 55 08 A6 F9 F0 B0
0848: 20 A9 00 8D 53 1E A0 00 FF
0850: B9 FF FF 99 FF FF C8 CC 35
0858: 53 1E D0 F4 EE 52 08 EE C2
0860: 55 08 E0 00 F0 07 CA D0 43
0868: E0 A5 1D D0 DE 60 A5 F9 C0
0870: AA 05 1D D0 01 60 18 8A 0C
0878: 65 08 8D 99 08 A5 06 8D F8
0880: 98 08 18 8A 65 1B 8D 9C D9
0888: 08 A5 19 8D 9B 08 E8 A4 75
```


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```
0890: 1D D0 04 F0 0D A0 FF B9 97
0898: FF FF 99 FF FF 88 C0 FF 7F
08A0: D0 F5 CE 99 08 CE 9C 08 C6
08A8: CA D0 EA 60 A2 00 BD 6D B3
08B0: 09 8D 0F 09 8D 40 09 BD 58
08B8: 84 09 8D 0E 09 8D 3F 09 E5
08C0: AD 4F 1E 8D DC 08 8D ED 28
08C8: 08 8D 03 09 AD 50 1E 8D A9
08D0: DD 08 8D EE 08 8D 04 09 F9
08D8: E8 A0 00 B9 FF FF C8 C9 7C
08E0: 82 F0 1C C9 3C F0 18 C0 25
08E8: 28 D0 F0 88 B9 FF FF C9 7F
08F0: 80 F0 0B 29 3F C9 20 F0 C3
08F8: 05 88 D0 F0 A0 27 C8 84 8E
0900: ED 88 B9 FF FF 10 06 C9 78
0908: 83 B0 02 A5 FF 99 FF FF 09
0910: 88 10 EF A4 ED 18 98 6D 21
0918: DC 08 8D DC 08 8D ED 08 74
0920: 8D 03 09 AD DD 08 69 00 97
0928: 8D DD 08 8D EE 08 8D 04 09
0930: 09 E0 01 D0 03 8C 4E 1E 31
0938: C0 28 F0 0A A9 A0 99 FF 76
0940: FF C8 C0 28 D0 F8 BD 6D 72
0948: 09 8D 0F 09 8D 40 09 BD F1
0950: 84 09 8D 0E 09 8D 3F 09 7F
0958: E8 E0 18 F0 03 4C D9 08 2E
0960: AD DC 08 8D 59 1E AD DD D6
0968: 08 8D 5A 1E 60 04 05 05 31
0970: 06 06 07 07 04 04 05 05 97
0978: 06 06 07 07 04 04 05 05 9F
0980: 06 06 07 07 80 00 80 00 6D
0988: 80 00 80 28 A8 28 A8 28 CC
0990: A8 28 A8 50 D0 50 D0 50 D4
0998: D0 50 D0 AD 46 1E 85 EB BD
09A0: 8D 4F 1E 8D 55 1E 85 FB 14
09A8: AD 47 1E 85 EC 8D 50 1E DB
09B0: 8D 56 1E 85 FC 38 AD 49 A8
09B8: 1E ED 47 1E AA A9 A0 A0 FD
09C0: FF C6 EC 91 EB C8 E6 EC 78
09C8: 91 EB C8 D0 FB E6 EC CA E4
09D0: D0 F6 91 EB 60 85 ED 84 73
09D8: EE 20 80 FE A0 00 B1 ED C0
09E0: F0 06 20 ED FD C8 D0 F6 7B
09E8: 60 20 F5 09 F0 FB C9 C0 4E
09F0: 90 02 29 DF 60 2C 00 C0 63
09F8: 10 2C AD 00 C0 C9 C0 90 13
0A00: 21 2C 00 03 30 1C 85 E3 C0
0A08: AD 61 C0 0D 44 1E 4D 63 CC
0A10: C0 10 08 A5 E3 09 20 8D F4
0A18: 10 C0 60 A9 00 8D 44 1E E7
0A20: A5 E3 8D 10 C0 60 A9 00 8D
0A28: 60 20 58 FC A9 00 8D 52 0A
0A30: 1E 8D 46 1E 8D 48 1E 8D B8
0A38: 4A 1E 8D 4C 1E 8D F0 1E 96
0A40: 8D 19 1F 20 95 FE A9 60 A3
0A48: 8D D5 A6 A9 01 20 5D A2 ED
0A50: A9 22 18 69 01 8D 47 1E 46
0A59: A9 90 8D 49 1E A9 91 8D F3
0A60: 4B 1E A9 99 8D 4D 1E A9 F7
0A68: FF 8D EE 1E 20 78 0E A9 48
0A70: A0 8D F2 03 A9 0A 8D F3 4B
0A78: 03 49 A5 8D F4 03 A9 DF D4
0A80: 85 FF 20 90 0A A9 D1 A0 9F
0A88: 1C 20 D5 09 EE 51 1E 60 57
0A90: 20 A6 0A A9 C1 A0 1C 20 23
0A98: D5 09 A9 00 8D 51 1E 60 5D
0AA0: 20 82 0A 4C 18 0B A2 27 C4
0AA8: A9 20 9D 00 04 CA 10 FA B3
0AB0: A9 00 85 24 85 25 4C 24 0A
0AB8: FC 2C 00 03 30 0D C9 C0 90
0AC0: 90 09 C9 E0 90 03 29 DF 69
0AC8: 60 29 1F 60 A0 00 B1 FB A5
0AD0: 85 1F A0 00 A5 1F C9 3C FC
0AD8: F0 0B 29 3F C9 20 D0 0A BB
0AE0: A9 80 4C EC 0A A9 82 4C 8A
0AE8: EC 0A A9 81 91 FB 20 AC AC
0AF0: 08 A0 00 A5 1F 91 FB A2 65
0AF8: 12 20 F5 09 D0 19 C8 D0 BA
0B00: F8 CA D0 F5 20 AC 08 A2 25
0B08: 12 20 F5 09 D0 09 C8 D0 8B
0B10: F8 CA D0 F5 4C D2 0A 60 F0
0B18: AD 45 1E 30 12 D0 0B A9 B0
0B20: 00 8D 44 1E CE 45 1E 4C 18
0B28: 2F 0B A9 00 8D 45 1E 20 AB
0B30: CC 0A AA AD 51 1E F0 07 4B
0B38: 8A 48 20 90 0A 68 AA 8A 84
0B40: C9 FF D0 06 20 5A 0F 4C 8A
0B48: 18 0B 8A C9 8D D0 02 A2 71
0B50: 3C 8A 29 7F C9 20 90 48 7C
0B58: 8A 20 B9 0A 48 A0 00 B1 0A
0B60: FB C9 3C F0 05 AD 52 1E 1F
0B68: F0 03 20 BE 10 68 A0 00 0B
0B70: 91 FB 20 AC 08 38 A5 FB 85
0B78: ED 55 1E 85 ED A5 FC ED E4
0B80: 56 1E 05 ED 90 0E A5 FB CC
0B88: 69 00 8D 55 1E A5 FC 69 45
0B90: 00 8D 56 1E E6 FB D0 02 81
0B98: E6 FC 20 1F 0C 4C 18 0B 24
0BA0: 8A 48 20 AC 08 68 AE C7 E3
0BA8: 0B DD C7 0B F0 06 CA D0 6B
0BB0: F8 4C 18 0B CA 8A 0A AA 49
0BB8: A9 0B 48 A9 17 48 BD E6 46
0BC0: 0B 48 BD E5 0B 48 60 1D DB
0BC8: 95 88 8B 8A 82 8F 84 80 C1
0BD0: 89 85 8C 93 83 9E 98 9A 3A
0BD8: 90 96 87 97 8E 86 81 94 6D
0BE0: 91 92 9D 99 9B D4 0C E8 E2
0BE8: 0C 94 0D 08 0E 59 0F BD FD
0BF0: 10 83 0F C8 0F 23 11 E4 6A
0BF8: 11 E3 13 EE 12 CB 14 58 22
0C00: 15 EC 15 78 0D 82 16 BC 63
0C08: 13 74 0F FC 15 65 0E B5 88
0C10: 1A 98 1C 7A 10 64 10 5C 15
0C18: 1B A2 10 94 1A B2 1C 20 A5
0C20: 7D 0C 38 A5 FB ED 4F 1E AF
0C28: A5 FC ED 50 1E B0 20 38 41
0C30: AD 4F 1E ED 46 1E 85 ED 39
0C38: AD 50 1E ED 47 1E 05 ED 88
0C40: F0 0D A5 FB 8D 4F 1E A5 14
0C48: FC 8D 50 1E 20 AC 08 38 2A
0C50: AD 59 1E E5 FB 85 EB AD 33
0C58: 5A 1E E5 FC 85 EC 05 EB 87
0C60: F0 02 B0 18 18 AD 4F 1E 3D
0C68: 6D 4E 1E 8D 4F 1E AD 50 06
0C70: 1E 69 00 8D 50 1E 20 AC B2
0C78: 08 4C 4F 0C 60 38 AD 55 E6
0C80: 1E ED 48 1E 85 ED AD 56 A3
0C88: 1E ED 49 1E 05 ED 90 0C 43
0C90: AD 48 1E 8D 55 1E AD 49 F5
0C98: 1E 8D 56 1E 38 A5 FB ED 0E
0CA0: 46 1E 85 ED A5 FC ED 47 37
0CA8: 1E 05 ED B0 0B AD 46 1E 93
0CB0: 85 FB AD 47 1E 85 FC 60 16
0CB8: 38 A5 FB ED 55 1E 85 ED D0
0CC0: A5 FC ED 56 1E 05 ED B0 9F
0CC8: 01 60 AD 55 1E 85 FB AD 31
0CD0: 56 1E 85 FC 60 AD 61 C0 59
0CD8: 0D 44 1E 4D 63 C0 10 55 B4
0CE0: E6 FB D0 02 E6 FC 4C 1F 88
0CE8: 0C AD 61 C0 0D 44 1E 4D AD
0CF0: 63 C0 10 0B A5 FB D0 02 5E
0CF8: C6 FC C6 FB 4C 1F 0C A5 E8
0D00: FB 85 EB A5 FC 85 EC C6 EF
0D08: EC A0 FF B1 EB C9 A0 F0 94
0D10: 04 C9 3C D0 03 88 D0 F3 03
0D18: B1 EB C9 A0 F0 08 C9 3C C0
0D20: F0 04 88 D0 F3 60 38 98 FB
0D28: 65 EB 85 FB A5 EC 69 00 14
0D30: 85 FC 4C 1F 0C A0 00 B1 5C
0D38: FB C9 A0 F0 08 C9 3C F0 B6
0D40: 04 C8 D0 F3 60 C8 D0 0B BA
0D48: E6 FC A5 FC CD 56 1E 90 2E
0D50: 02 D0 19 B1 FB C9 A0 F0 17
0D58: EC C9 3C F0 E8 18 98 65 30
0D60: FB 85 FB A5 FC 69 00 85 C6
0D68: FC 4C 1F 0C AD 55 1E 85 3D
0D70: FB AD 56 1E 85 FC 4C 1F 78
0D78: 0C A9 00 8D 4F 1E AD 56 80
0D80: 1E 38 E9 04 CD 47 1E B0 AD
0D88: 03 AD 47 1E 8D 50 1E 20 64
0D90: AC 08 4C 6C 0D AD 61 C0 F5
0D98: 0D 44 1E 4D 63 C0 30 03 64
0DA0: 4C 8A 11 A5 FB 85 EB A5 73
0DA8: FC 85 EC C6 EC A0 FF B1 48
0DB0: EB C9 AE F0 0C C9 A1 F0 D3
0DB8: 08 C9 BF F0 04 C9 3C D0 E0
0DC0: 04 88 D0 EB 60 B1 EB C9 43
0DC8: AE F0 1B C9 A1 F0 17 C9 3F
0DD0: BF F0 13 C9 3C F0 0F 88 52
0DD8: D0 EB C6 EC A5 EC CD 46 C0
0DE0: 1E B0 E2 4C FC 0D 84 ED 6A
0DE8: C6 ED C8 F0 0A B1 EB C9 C2
0DF0: A0 F0 F7 88 4C 26 0D A4 D8
0DF8: ED 4C C5 0D AD 46 1E 85 EE
0E00: FB AD 47 1E 85 FC 4C 1F 28
0E08: 0C AD 61 C0 0D 44 1E 4D D0
0E10: 63 C0 30 03 4C 69 11 A0 0F
0E18: 00 B1 FB C9 AE F0 1D C9 F9
0E20: A1 F0 19 C9 BF F0 15 C9 BE
0E28: 3C F0 11 C8 D0 EB E6 FC 4E
0E30: A5 FC CD 56 1E F0 E2 90 88
0E38: E0 4C 6C 0D C8 D0 0E E6 C2
0E40: FC A5 FC CD 56 1E 90 05 12
0E48: F0 03 4C 6C 0D B1 FB C9 DE
0E50: A0 F0 E9 C9 AE F0 E5 C9 A1
0E58: A1 F0 E1 C9 BF F0 DD C9 A1
0E60: 3C F0 D9 4C 5D 0D 20 A6 DC
0E68: 0A A9 38 A0 1E 20 D5 09 2B
0E70: 20 38 11 F0 03 4C 90 0A 50
0E78: AD 4A 1E 8D CA 1E AD 4B 10
0E80: 1E 8D CB 1E 20 A6 0A A9 C3
0E88: F0 A0 1C 20 D5 09 A9 01 F1
0E90: 8D 51 1E 60 38 A5 FB ED CF
0E98: 46 1E 85 ED A5 FC ED 47 33
0EA0: 1E 05 ED D0 03 68 68 60 C2
0EA8: A5 FB 85 06 A5 FC 85 08 DB
0EB0: 60 38 A5 FB 85 19 49 FF A2
0EB8: 65 06 8D CE 1E A5 FC 85 AE
0EC0: 1B 49 FF 65 08 8D CF 1E 47
0EC8: A5 06 8D D0 1E A5 08 8D 1D
0ED0: D1 1E A5 19 8D D2 1E 85 1D
0ED8: 06 A5 1B 8D D3 1E 85 08 C7
0EE0: 38 AD CF 1E 6D CB 1E CD 05
0EE8: 4D 1E 90 10 20 A6 0A A9 9F
0EF0: FE A0 1C 20 D5 09 A9 01 61
0EF8: 8D 51 1E 60 AD CA 1E 85 54
0F00: 19 AD CB 1E 85 1B AD CE 34
0F08: 1E 85 1D 18 6D CA 1E 8D 1C
0F10: CA 1E AD CF 1E 85 F9 6D 36
0F18: CB 1E 8D CB 1E 20 31 08 ED
0F20: AD D0 1E 85 06 AD D1 1E 0E
0F28: 85 08 AD D2 1E 85 19 AD D4
0F30: D3 1E 85 1B 38 AD 55 1E 63
0F38: E5 19 85 1D AD 56 1E E5 FA
0F40: 1B 85 F9 20 31 08 38 AD 56
0F48: 55 1E ED CE 1E 8D 55 1E 33
0F50: AD 56 1E ED CF 1E 8D 56 E5
0F58: 1E 60 20 94 0E 20 F4 0C D1
0F60: 20 B1 0E 38 AD CA 1E E9 FE
0F68: 01 8D CA 1E AD CB 1E E9 68
0F70: 00 8D CB 1E 60 20 E0 0C 9E
0F78: 20 94 0E 20 F4 0C 20 B1 59
0F80: 0E 4C 63 0F 20 78 0E 20 35
0F88: A6 0A A9 0A A0 1D 20 D5 E1
0F90: 09 20 CC 0A C9 C0 90 02 E9
0F98: 29 DF 48 20 90 0A 68 29 F4
0FA0: 7F C9 57 D0 09 20 94 0E E8
0FA8: 20 FF 0C 4C B1 0E C9 53 C9
0FB0: D0 09 20 94 0E 20 A3 0D 0C
0FB8: 4C B1 0E C9 50 D0 09 20 BF
0FC0: 94 0E 20 8A 11 4C B1 0E 84
0FC8: 60 38 A5 FB ED 4F 1E 85 08
0FD0: ED A5 FC ED 50 1E 05 ED C0
0FD8: F0 0B AD 4F 1E 85 FB AD 89
0FE0: 50 1E 85 FC 60 AD 46 1E 93
0FE8: 85 FB AD 47 1E 85 FC 4C 40
0FF0: 1F 0C A5 FB 85 EB 85 19 16
0FF8: A5 FC 85 EC 85 1B A0 00 82
1000: B1 EB C9 A0 D0 1E C8 D0 98
1008: F7 A5 EC CD 56 1E 90 0F 63
1010: AD 55 1E 85 EB AD 56 1E 59
1018: 85 EC A0 00 4C 24 10 E6 44
1020: EC 4C 00 10 18 98 65 EB A4
1028: 85 06 A9 00 65 EC 85 08 B3
1030: 38 AD 55 1E E5 19 85 1D 20
1038: AD 56 1E E5 1B 85 F9 38 02
1040: A5 06 E5 19 8D CE 1E A5 8C
1048: 08 E5 1B 8D CF 1E 20 31 8A
1050: 08 38 AD 55 1E ED CE 1E F1
1058: 8D 55 1E AD 56 1E ED CF 0A
1060: 1E 8D 56 1E 60 AD 61 C0 DC
1068: 0D 44 1E 4D 63 C0 30 03 3A
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1070: 4C F2 0F A9 FF 8D E8 1E 16
1078: 4C 8D 10 A9 05 8D E8 1E 0D
1080: 20 8D 10 B1 FB C9 A0 D0 4A
1088: 01 C8 4C 5D 0D A9 00 8D 57
1090: E9 1E 20 D4 10 A9 A0 AE 95
1098: E8 1E A0 00 91 FB C8 CA A1
10A0: D0 FA 60 20 BE 10 20 BE 2B
10A8: 10 A9 3C A0 00 91 FB C8 D3
10B0: 91 FB 20 AC 08 20 E0 0C F5
10B8: 20 E0 0C 4C 7B 10 A9 01 D7
10C0: 8D E8 1E A9 00 8D E9 1E 68
10C8: 20 D4 10 A9 A0 A0 00 91 E3
10D0: FB 4C 1F 0C 18 AD 55 1E E6
10D8: 6D E8 1E AD 56 1E 6D E9 78
10E0: 1E CD 49 1E 90 05 68 68 60
10E8: 4C 23 11 18 A5 FB 85 06 C9
10F0: 6D E8 1E 85 19 A5 FC 85 FC
10F8: 08 6D E9 1E 85 1B 38 AD 4E
1100: 55 1E E5 06 85 1D AD 56 C3
1108: 1E E5 08 85 F9 20 6E 08 41
1110: 18 AD 55 1E 6D E8 1E 8D 0F
1118: 55 1E AD 56 1E 6D E9 1E 20
1120: 8D 56 1E 60 AD 52 1E 49 A4
1128: 0E 8D 52 1E F0 05 A9 1F EE
1130: 85 FF 60 A9 DF 85 FF 60 31
1138: A9 19 A0 1D 20 D5 09 20 E5
1140: CC 0A C9 C0 90 02 29 DF 4F
1148: C9 D9 60 20 A6 0A A9 30 B4
1150: A0 1D 20 D5 09 20 38 11 B5
1158: F0 03 4C 90 0A A2 FA 9A B1
1160: 20 9B 09 20 82 0A 4C 18 89
1168: 0B A0 00 B1 FB C9 3C F0 C3
1170: 11 C8 D0 F7 E6 FC A5 FC 5A
1178: CD 56 1E 90 EE F0 EC 4C 45
1180: 6C 0D C8 D0 02 E6 FC 4C 34
1188: 5D 0D A5 FB 85 EB A5 FC 35
1190: 85 EC C6 EC A0 FF B1 EB AC
1198: C9 3C F0 11 88 C0 FF D0 F5
11A0: F5 C6 EC A5 EC CD 47 1E B2
11A8: B0 EC 4C FC 0D 38 98 65 97
11B0: EB 85 EB A9 00 65 EC 85 37
11B8: EC 38 A5 EB E5 FB 85 ED EA
11C0: A5 EC E5 FC 05 ED D0 12 11
11C8: 84 ED 18 A5 EB E5 ED 85 5E
11D0: EB A5 EC E9 00 85 EC 4C CA
11D8: 9C 11 A5 EB 85 FB A5 EC 55
11E0: 85 FC 4C 1F 0C AD 61 C0 1B
11E8: 0D 44 1E 4D 63 C0 10 03 7C
11F0: 20 78 0E 20 A6 0A A9 3F F4
11F8: A0 1D 20 D5 09 20 CC 0A 80
1200: C9 C0 90 02 29 DF C9 D7 9F
1208: D0 09 20 3A 12 20 35 0D 07
1210: 4C 49 12 C9 D3 D0 09 20 9F
1218: 3A 12 20 17 0E 4C 49 12 99
1220: C9 D0 D0 09 20 3A 12 20 36
1228: 69 11 4C 49 12 C9 C1 D0 6F
1230: 03 4C 4B 11 20 1F 0C 4C 45
1238: 90 0A A5 FB 85 19 8D C4 0C
1240: 1E A5 FC 85 1B 8D C5 1E 8D
1248: 60 38 A5 FB 85 06 ED C4 04
1250: 1E 8D CE 1E A5 FC 85 08 D6
1258: ED C5 1E 8D CF 1E 20 C8 81
1260: 0E AD C4 1E 85 FB AD C5 AE
1268: 1E 85 FC 20 AC 08 4C FD BA
1270: 11 A9 27 E5 24 8D 57 1E EE
1278: 20 84 FE A0 00 A9 1F 20 BC
1280: ED FD 8C 58 1E 20 F5 09 98
1288: F0 FB AC 58 1E 85 ED A9 CB
1290: 88 20 ED FD A9 20 20 ED 9A
1298: FD A9 88 20 ED FD A5 ED D9
12A0: C9 9B F0 37 C9 8D F0 39 C1
12A8: C9 FF F0 04 C9 88 D0 0F 31
12B0: 88 10 04 C8 4C 7D 12 A9 50
12B8: 88 20 ED FD 4C 7D 12 A5 E8
12C0: ED 29 7F C9 20 90 B6 CC 30
12C8: 57 1E F0 B1 A5 ED 20 B9 38
12D0: 0A 99 83 1E 20 ED FD C8 30
12D8: 4C 7D 12 20 B3 1C 4C 7D EA
12E0: 12 20 ED FD A9 00 99 83 B7
12E8: 1E 98 20 80 FE A8 60 20 C9
12F0: A6 0A A9 76 A0 1D 20 D5 17
12F8: 09 20 4C 13 AD 46 1E 8D B4
1300: 72 AA AD 47 1E 8D 73 AA EC
1308: AD 55 1E 38 ED 46 1E 8D F3
1310: 6C AA AD 56 1E ED 47 1E 87
1318: 8D 6D AA A9 30 8D 5F AA 71
1320: A9 09 8D 65 AA 20 60 14 10
1328: 20 80 A1 20 96 14 AD C5 DA
1330: B5 D0 03 4C 53 14 20 A6 5C
1338: 0A AE C5 B5 20 02 A7 A9 25
1340: 87 20 F0 FD 60 A9 01 8D 69
1348: 51 1E 60 00 20 71 12 D0 66
1350: 06 20 90 0A 68 68 60 20 F9
1358: 95 A0 A9 00 8D 51 AA 8D 3B
1360: 52 AA 8D 74 AA 8D 66 AA 56
1368: 8D 6C AA 8D 6D AA 8D 63 33
1370: AA 8D 70 AA 8D 71 AA 8D 1D
1378: D3 9C A2 00 A0 01 B9 83 04
1380: 1E C9 BA D0 1F AD 83 1E 61
1388: 38 E9 B0 F0 0D 30 0B C9 73
1390: 03 B0 07 8D 68 AA C8 4C E9
1398: A6 13 68 68 20 A6 0A A2 BC
13A0: 02 4C 3C 13 A0 00 B9 83 8F
13A8: 1E 20 2F 16 C9 E0 90 02 22
13B0: 29 DF 9D 75 AA E8 C8 CC C5
13B8: 58 1E D0 EA 60 20 A6 0A 36
13C0: A9 5F A0 1D 20 D5 09 20 04
13C8: CC 0A C9 C0 90 02 29 DF DB
13D0: 29 3F 09 40 48 AD 52 1E 3C
13D8: F0 03 20 BE 10 20 90 0A 54
13E0: 68 4C 6E 0B 20 A6 0A A5 22
13E8: FB CD 46 1E D0 07 A5 FC 16
13F0: CD 47 1E F0 05 A9 6A 8D D3
13F8: 27 04 A9 86 A0 1D 20 D5 E0
1400: 09 20 4C 13 AD 27 04 C9 4B
1408: 6A F0 03 20 9B 09 A5 FB 4C
1410: 8D 72 AA A5 FC 8D 73 AA FA
1418: A9 32 8D 5F AA A9 01 8D D4
1420: 65 AA 20 60 14 20 80 A1 73
1428: AE 60 AA AC 61 AA AD C5 B6
1430: B5 F0 06 20 96 14 4C 36 06
1438: 13 8E 55 1E 8C 56 1E A5 B9
1440: FB 18 6D 55 1E 8D 55 1E 5F
1448: A5 FC 6D 56 1E 8D 56 1E 87
1450: 20 96 14 20 A6 0A A9 7C DF
1458: A0 1D 20 D5 09 4C 45 13 90
1460: 2C 00 03 30 2B EE 56 1E E1
1468: A9 00 85 08 AD 47 1E 85 E2
1470: 09 A0 00 B1 08 C9 20 90 98
1478: 18 C9 C0 90 04 09 20 91 56
1480: 08 C8 D0 EF E6 09 A5 09 A7
1488: CD 56 1E D0 E6 CE 56 1E 3B
1490: 60 09 C0 4C 7F 14 2C 00 AC
1498: 03 30 2B EE 56 1E A9 00 21
14A0: 85 08 AD 47 1E 85 09 A0 71
14A8: 00 B1 08 C9 C0 90 08 C9 FC
14B0: E0 90 14 29 DF 91 08 C8 A0
14B8: D0 EF E6 09 A5 09 CD 56 F5
14C0: 1E D0 E6 CE 56 1E 60 29 0B
14C8: 1F 4C B5 14 20 58 FC 20 08
14D0: 84 FE A9 00 8D D3 9C 20 45
14D8: 6E A5 A9 8D 20 ED FD A9 0E
14E0: 8C A0 1D 20 D5 09 20 F5 26
14E8: 09 C9 8D D0 F9 4C 90 0A F2
14F0: A2 00 8E C6 1E 8E C7 1E 81
14F8: 8E C8 1E 8E C9 1E 38 B1 30
1500: EB E9 B0 90 2A C9 0A B0 F6
1508: 26 0E C6 1E 2E C7 1E 0E 5E
1510: C6 1E 2E C7 1E 0E C6 1E 3C
1518: 2E C7 1E 0E C6 1E 2E C7 C2
1520: 1E 0D C6 1E 8D C6 1E C8 E3
1528: D0 D4 E6 EC 4C FE 14 F8 1B
1530: AD C6 1E 0D C7 1E F0 1C 2C
1538: 38 AD C6 1E E9 01 8D C6 D9
1540: 1E AD C7 1E E9 00 8D C7 F1
1548: 1E EE C8 1E D0 03 EE C9 72
1550: 1E 4C 30 15 AD C8 1E D8 99
1558: 60 38 AD CA 1E ED 4A 1E 7E
1560: 8D CC 1E AD CB 1E ED 4B 21
1568: 1E 8D CD 1E 0D CC 1E D0 49
1570: 10 20 A6 0A A9 A1 A0 1D 52
1578: 20 D5 09 A9 01 8D 51 1E E2
1580: 60 18 A5 FB 85 06 6D CC 41
1588: 1E 85 19 A5 FC 85 08 6D 1C
1590: CD 1E 85 1B 38 AD 55 1E CC
1598: E5 06 85 1D AD 56 1E E5 A2
15A0: 08 85 F9 18 65 1B CD 49 6D
15A8: 1E 90 10 20 A6 0A A9 99 54
15B0: A0 1D 20 D5 09 A9 01 8D 52
15B8: 51 1E 60 20 6E 08 18 AD 92
15C0: CC 1E 85 1D 6D 55 1E 8D E5
15C8: 55 1E AD CD 1E 85 F9 6D 20
15D0: 56 1E 8D 56 1E A5 FB 85 C9
15D8: 19 A5 FC 85 1B AD 4A 1E 33
15E0: 85 06 AD 4B 1E 85 08 20 F0
15E8: 31 08 4C 1F 0C A0 00 B1 BD
15F0: FB AA C8 B1 FB 88 91 FB 19
15F8: C8 8A 91 FB 60 A0 00 8C 2E
1600: 44 1E B1 FB 2C 00 03 30 63
1608: 12 C9 20 90 09 C9 C0 90 3E
1610: 19 29 1F 4C 2A 16 09 C0 38
1618: 4C 2A 16 C9 C0 90 0B C9 7C
1620: E0 90 05 29 DF 4C 2A 16 AE
1628: 09 20 91 FB 4C E0 0C 2C FC
1630: 00 03 30 0A C9 20 90 07 BA
1638: C9 C0 90 02 09 20 60 09 3E
1640: C0 60 05 4B 42 05 3A 01 D5
1648: 01 01 00 01 00 50 1B 0E CA
1650: 0F 12 8D EF 1E 8A 48 98 7D
1658: 48 38 AD DD 1E ED DF 1E D0
1660: AD DE 1E ED E0 1E 90 06 64
1668: AD EF 1E 20 ED FD 68 A8 0E
1670: 68 AA AD EF 1E 60 20 A6 89
1678: 0A A9 DC A0 1D 4C D5 09 88
1680: 4C EF 17 AD 61 C0 0D 44 F8
1688: 1E 4D 63 C0 10 03 4C D5 8A
1690: 16 20 A6 0A 20 AC 08 A9 B2
1698: B4 A0 1D 20 D5 09 20 E9 E9
16A0: 09 A2 03 8E EA 1E C9 D3 7A
16A8: F0 30 A2 08 8E EA 1E C9 54
16B0: D0 D0 CD 20 A6 0A A9 CF B5
16B8: A0 1D 20 D5 09 20 E9 09 83
16C0: C9 B1 90 0D C9 B8 B0 09 BC
16C8: 38 E9 B0 8D EA 1E 4C DA BD
16D0: 16 20 90 0A 60 A9 01 8D FB
16D8: EA 1E AD EA 1E A8 20 76 B0
16E0: 16 AD EA 1E C9 03 D0 0D CB
16E8: AD 05 C3 18 6D 07 C3 C9 FF
16F0: 50 D0 05 A9 03 20 95 FE 77
16F8: 20 84 FE A2 00 8E D5 1E 64
1700: 8E D4 1E 8E EB 1E 8E EC 39
1708: 1E BD 42 16 9D D6 1E E8 CB
1710: E0 0C D0 F5 A9 FF 8D E4 78
1718: 1E 8D E2 1E A2 04 BD 4D E4
1720: 16 9D 72 1F CA D0 F7 AD 38
1728: 46 1E 85 EB AD 47 1E 85 BC
1730: EC A0 00 8C E3 1E CC E2 D9
1738: 1E F0 06 AD D6 1E 8D E3 7B
1740: 1E B1 EB 30 07 C9 40 90 DA
1748: 03 4C CA 18 C9 3C F0 2C 33
1750: 99 C2 1F C8 EE E3 1E AD 5D
1758: E3 1E CD D7 1E 90 E2 8C BC
1760: 54 1E B1 EB C9 A0 F0 14 FB
1768: CE E3 1E 88 D0 F4 AC 54 4B
1770: 1E 4C 7F 17 C8 B1 EB C9 D0
1778: A0 F0 01 88 8C 54 1E 98 66
1780: 38 65 EB 85 EB A5 EC 69 33
1788: 00 85 EC A0 00 AD E4 1E 5E
1790: C9 FF D0 03 20 75 18 AD A2
1798: E2 1E F0 03 20 A5 18 38 0E
17A0: 2E E2 1E AD 54 1E 8D 53 C6
17A8: 1E A9 C2 85 D6 A9 1F 85 22
17B0: D7 20 05 1C 20 B6 18 AD EE
17B8: E4 1E CD DA 1E 90 03 20 A1
17C0: 00 18 38 A5 EB ED 55 1E 36
17C8: 85 ED A5 EC ED 56 1E 05 C2
17D0: ED F0 2A 90 28 AD D5 1E 42
17D8: F0 0B A9 00 8D D4 1E 8D 01
17E0: D9 1E 20 00 18 AD EA 1E F2
17E8: C9 03 D0 03 20 E9 09 A9 6B
17F0: 00 20 95 FE A2 FA 9A 20 20
17F8: 90 0A 4C 18 0B 4C 31 17 FF
1800: 38 AD D8 1E ED E4 1E A8 9C
1808: 88 88 F0 0A 30 08 A9 8D DF
1810: 20 52 16 88 D0 F8 AD D5 CB
1818: 1E F0 11 8D 53 1E A9 C2 B7
1820: 85 D6 A9 21 85 D7 20 A5 81
1828: 18 20 05 1C A9 8D 20 52 E4
1830: 16 20 52 16 20 52 16 EE 84
1838: DD 1E D0 03 EE DE 1E AD 06
1840: DC 1E D0 31 AD EA 1E C9 B2
1848: 03 F0 2A 38 AD DD 1E ED 0E
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1850: DF 1E AD DE 1E ED E0 1E 24
1858: 90 1B A9 00 20 95 FE 20 42
1860: A6 0A A9 E8 A0 1D 20 D5 B9
1868: 09 20 E9 09 20 76 16 AD A7
1870: EA 1E 20 95 FE AD D4 1E 71
1878: F0 11 8D 53 1E A9 C2 85 EE
1880: D6 A9 20 85 D7 20 A5 18 85
1888: 20 05 1C A9 8D 20 52 16 CF
1890: AC D9 1E 8C E4 1E 88 88 53
1898: F0 0A 30 08 A9 8D 20 52 60
18A0: 16 88 D0 F8 60 A9 A0 AC 3F
18A8: D6 1E 8C E3 1E F0 06 20 7C
18B0: 52 16 88 D0 FA 60 AC DB 3C
18B8: 1E 18 98 6D E4 1E 8D E4 87
18C0: 1E A9 8D 20 52 16 88 D0 EA
18C8: FA 60 8D E6 1E AE 10 19 93
18D0: DD 10 19 F0 09 CA D0 F8 34
18D8: CE E3 1E 4C 09 1A CA 8A C2
18E0: 0A AA 8C E5 1E A9 18 48 C0
18E8: A9 F3 48 BD 22 19 48 BD 93
18F0: 21 19 48 60 38 AD E5 1E 69
18F8: 65 EB 85 EB A5 EC 69 00 F9
1900: 85 EC 4C 31 17 B1 EB C9 ED
1908: 3C F0 01 88 8C E5 1E 60 D5
1910: 10 57 4C 52 54 42 53 4E 6F
1918: 48 46 40 50 7F 58 4D 49 4E
1920: 47 7D 19 86 19 90 19 9A B8
1928: 19 A4 19 AE 19 B8 19 C7 C3
1930: 19 E9 19 63 19 73 19 53 DE
1938: 19 49 19 40 19 02 1A 29 9E
1940: 1A C8 A9 00 8D E2 1E 4C 67
1948: 05 19 C8 20 F0 14 8D E1 33
1950: 1E 4C 05 19 C8 20 F0 14 93
1958: 8D DF 1E AD C9 1E 8D E0 AA
1960: 1E 4C 05 19 C8 20 F0 14 A3
1968: 8D DD 1E AD C9 1E 8D DE 38
1970: 1E 4C 05 19 C8 20 F0 14 B3
1978: 8D D8 1E 4C 05 19 A9 00 10
1980: 8D DC 1E C8 4C 05 19 C8 72
1988: 20 F0 14 8D D6 1E 4C 05 2F
1990: 19 C8 20 F0 14 8D D7 1E 39
1998: 4C 05 19 C8 20 F0 14 8D 5C
19A0: D9 1E 4C 05 19 C8 20 F0 3E
19A8: 14 8D DA 1E 4C 05 19 C8 F6
19B0: 20 F0 14 8D DB 1E 4C 05 7F
19B8: 19 AC E5 1E C8 98 48 20 9A
19C0: 00 18 68 A8 8C E5 1E 60 29
19C8: 20 E2 19 88 8C D4 1E A0 04
19D0: 01 B1 EB 99 C1 20 C8 CC F3
19D8: D4 1E 90 F5 F0 F3 C8 4C A3
19E0: 05 19 C8 B1 EB C9 3C D0 DF
19E8: F9 60 20 E2 19 88 8C D5 3C
19F0: 1E A0 01 B1 EB 99 C1 21 FF
19F8: C8 CC D5 1E 90 F5 F0 F3 91
1A00: 4C 05 19 20 E2 19 4C 05 D9
1A08: 19 C8 B1 EB C9 BD F0 07 1E
1A10: 88 AD E6 1E 4C 4C 17 C8 3D
1A18: 20 F0 14 48 AD E6 1E AA 8F
1A20: 68 9D 42 1F 20 05 19 4C BD
1A28: F4 18 A2 00 C8 B1 EB C9 DF
1A30: 3C F0 0A 20 2F 16 9D 83 92
1A38: 1E E8 4C 2C 1A 8E 58 1E DB
1A40: 20 9B 09 20 57 13 A5 FB DC
1A48: 8D 72 AA A5 FC 8D 73 AA 3F
1A50: A9 32 8D 5F AA A9 01 8D 19
1A58: 65 AA 20 60 14 20 80 A1 B7
1A60: AE 60 AA AC 61 AA AD C5 FA
1A68: B5 F0 0B 20 96 14 A9 00 6F
1A70: 20 95 FE 4C 36 13 8E 55 2F
1A78: 1E 8C 56 1E A5 FB 18 6D 46
1A80: 55 1E 8D 55 1E A5 FC 6D DC
1A88: 56 1E 8D 56 1E 20 96 14 39
1A90: 68 68 4C 27 17 20 C1 1A E5
1A98: AD F0 1E F0 16 20 68 1B CF
1AA0: 20 E7 1A AD EE 1E C9 FF 80
1AA8: F0 09 20 8B 1B 20 AC 08 0F
1AB0: 4C A0 1A 4C 90 0A AD 61 A4
1AB8: C0 0D 44 1E 4D 63 C0 30 A4
1AC0: 26 20 A6 0A A9 08 A0 1E 52
1AC8: 20 D5 09 20 71 12 8D F0 85
1AD0: 1E D0 03 4C 90 0A A0 00 5B
1AD8: B9 83 1E 99 F1 1E C8 CC 8E
1AE0: 58 1E D0 F4 4C 90 0A A5 90
1AE8: FB 85 EB A5 FC 85 EC A9 D5
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1B78: F0 0E A0 00 B9 83 1E 99 70
1B80: 1A 1F CB CC 58 1E D0 F4 43
1B88: 4C 90 0A 38 A5 FB 85 19 0F
1B90: ED ED 1E 85 ED A5 FC 85 DA
1B98: 1B ED EE 1E 05 ED D0 62 7B
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1BA8: 1E 65 FB 85 06 A9 00 65 5B
1BB0: FC 85 08 38 AD 55 1E E5 30
1BB8: 19 85 1D AD 56 1E E5 1B 6D
1BC0: 85 F9 20 31 08 38 AD 55 21
1BC8: 1E ED F0 1E 8D 55 1E AD 35
1BD0: 56 1E E9 00 8D 56 1E AD A6
1BD8: 19 1F F0 26 8D E8 1E A9 D9
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1BE8: 00 B9 1A 1F 91 FB C8 CC 9D
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1BF8: 19 1F 85 FB A5 FC 69 00 E7
1C00: 85 FC 4C 1F 0C A0 00 CC 65
1C08: 53 1E F0 21 B1 D6 30 04 EE
1C10: C9 40 B0 1A 20 2F 16 20 FE
1C18: 52 16 AD EC 1E F0 0A A9 F5
1C20: 88 20 52 16 A9 DF 20 52 AF
1C28: 16 C8 4C 07 1C 60 8C E5 F8
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1C38: 43 D0 1B 38 AD E1 1E ED 4C
1C40: 53 1E 4A 38 ED D6 1E A8 26
1C48: A9 A0 20 52 16 88 D0 FA 16
1C50: AC E5 1E 4C 29 1C C9 45 73
1C58: D0 11 38 AD D7 1E ED 53 85
1C60: 1E 38 ED D6 1E A8 A9 A0 68
1C68: 4C 4A 1C C9 55 D0 08 AD 25
1C70: EC 1E 49 01 8D EC 1E C9 06
1C78: 63 D0 12 8C E5 1E AE DD 84
1C80: 1E AD DE 1E 20 24 ED AC 0B
1C88: E5 1E 4C 29 1C AE E6 1E DE
1C90: BD 42 1F 20 52 16 4C 29 CA
1C98: 1C 20 A6 0A 38 AD 48 1E 83
1CA0: ED 55 1E AA AD 49 1E ED 50
1CA8: 56 1E 20 24 ED A9 01 8D 7F
1CB0: 51 1E 60 AD 44 1E 49 80 AD
1CB8: 8D 44 1E A9 01 8D 45 1E 0E
1CC0: 60 D3 D0 C5 C5 C4 D3 C3 41
1CC8: D2 C9 D0 D4 A0 B3 AE B0 26
1CD0: 00 88 88 88 88 A0 C2 D9 EA
1CD8: A0 C3 AE A0 C2 D2 C1 CE E5
1CE0: CE CF CE A0 A6 A0 CB AE 56
1CE8: A0 CD C1 D2 D4 C9 CE 00 B5
1CF0: C2 D5 C6 C6 C5 D2 A0 CE CE
1CF8: D5 CC CC C5 C4 00 C2 D5 C6
1D00: C6 C6 C5 D2 A0 C6 D5 CC CD
1D08: CC 00 C4 C5 CC C5 D4 C5 8A
1D10: A0 A8 D3 AC D7 AC D0 A9 C6
1D18: 00 BA A0 C1 D2 C5 A0 D9 F9
1D20: CF D5 A0 D3 D5 D2 C5 BF 4E
1D28: A0 A8 D9 AF CE A9 BA 00 A5
1D30: C5 D2 C1 D3 C5 A0 C1 CC 78
1D38: CC A0 D4 C5 D8 D4 00 C5 D7
1D40: D2 C1 D3 C5 A0 A8 D3 AC 27
1D48: D7 AC D0 AC C1 A9 BA A0 49
1D50: D2 C5 D4 D5 D2 CE A0 D4 45
1D58: CF A0 C5 D8 C9 D4 00 C5 50
1D60: CE D4 C5 D2 A0 C6 CF D2 AF
1D68: CD C1 D4 A0 D6 C1 D2 C9 CB
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1DA8: A0 C9 CE A0 C2 D5 C6 C6 4B
1DB0: C5 D2 AE 00 D0 D2 C9 CE 8C
1DB8: D4 A0 D4 CF BA A0 D3 C3 E0
1DC0: D2 C5 C5 CE AC A0 D0 D2 D7
1DC8: C9 CE D4 C5 D2 BF 00 D3 FB
1DD0: CC CF D4 A0 CE D5 CD C2 36
1DD8: C5 D2 BF 00 D0 D2 C9 CE D6
1DE0: D4 C9 CE C7 AE AE AE 00 DB
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1E20: D7 C9 D4 C8 BA 00 CC CF 21
1E28: D7 C5 D2 C3 C1 D3 C5 A0 E1
1E30: DB D9 AF CE DD BF 60 00 62
1E38: CE D5 CC CC A0 C2 D5 C6 3A
1E40: C6 C5 D2 00 00 FF 00 00 AB
```

Program 2: *SpeedScript 3.0* File Converter

```
5 HIMEM: 8191
10 HOME
20 D$ = CHR$ (4)
30 PRINT D$;"MAXFILES1"
40 PRINT "DO YOU WANT TO:"
50 PRINT " (1) MAKE A SPEEDSCRI
   PT FILE INTO A TEXT      FILE
   "
60 PRINT " (2) MAKE A TEXT FILE
    INTO A SPEEDSCRIPT      FILE
   "
70 GET A$:A = VAL (A$)
80 IF A < > 1 AND A < > 2 THEN
   70
90 ON A GOTO 100,200
100 PRINT "ENTER SPEEDSCRIPT FI
    LE NAME": INPUT ":";A$
110 PRINT "ENTER TEXT FILE NAME
     TO CREATE": INPUT ":";B$
120 PRINT D$;"BLOAD ";A$;",A$20
    00"
125 L = PEEK (43616) + PEEK (43
    617) * 256 + 8192
130 PRINT D$;"OPEN ";B$
131 PRINT D$;"DELETE ";B$
132 PRINT D$;"OPEN ";B$
140 PRINT D$;"WRITE ";B$
150 FOR I = 8192 TO L - 1
155 B = PEEK (I)
160 IF B = 60 THEN B = 141
170 PRINT CHR$ (B);
180 NEXT
190 PRINT
195 PRINT D$;"CLOSE ";B$
196 END
200 PRINT "ENTER TEXT FILE NAME
    ": INPUT ":";B$
210 INPUT "ENTER SPEEDSCRIPT FI
    LE NAME TO CREATE   :";A$
220 PRINT D$;"OPEN ";B$
230 PRINT D$;"READ ";B$
235 L = 0
240 ONERR GOTO 270
250 GET C$:A = ASC (C$ + CHR$ (
    0)) + 128: IF A = 141 THEN
    A = 60
260 POKE 8192 + L,A:L = L + 1:
    GOTO 250
270 POKE 216,0
280 PRINT
290 PRINT D$;"CLOSE ";B$
295 PRINT D$;"BSAVE ";A$;",A819
    2,L";L - 1
296 END
```

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CAPUTE!

Modifications or Corrections To Previous Articles

Apple Games In ProDOS

Most of the Apple game programs recently published in COMPUTE! fail to operate properly with Apple's new ProDOS operating system, although they all work with DOS 3.3. The programs suffer from the same bug: Their graphics were developed using the DOS 3.3 version of the "Apple SuperFont" utility (published in the April 1985 issue). To use the following programs with ProDOS, these changes are required:

For "Mindbusters" (April 1985, p. 54):

```
120 POKE 6,0:POKE 7,141:P
    RINT CHR$(4);"PR# A$3
    00"
450 PRINT CHR$(4);"PR#0"
```

For "Space Caverns" (March 1985, p. 54):

```
910 HOME:HGR:POKE 6,0:POK
    E 7,141:PRINT CHR$(4)
    ;"PR# A$300"
```

For "Bowling Champ" (February 1985, p. 126):

```
130 HOME : POKE 230,32: CALL
    62450: HGR: POKE 6,0: POK
    E 7,141: PRINT CHR$(4);"P
    R# A$300"
830 X = 0: FOR I = 768 TO 853
    : READ A:X = X + A: POKE
    I,A: NEXT : IF X < > 7950
     THEN PRINT "ERROR IN DAT
    A STATEMENTS FOR ML AT 76
    8.": STOP
840 DATA  216,133,69,134,70,1
    32,71,166,7
```

For "Paratrooper" (January 1985, p. 72):

```
200 FOR I = 768 TO I + 85: RE
    AD A:X = X + A: POKE I,A:
     NEXT : IF X < > 23417 TH
    EN PRINT "ERROR IN DATA S
    TATEMENTS.": STOP
220 PRINT  CHR$ (4)"PR# A$300
    "
1130 DATA  216,133,69,134,70,
     132,71,166,7
```

For "Things in the Dark" (December 1984, p. 79):

```
770 HOME : HGR : POKE 6,0: PO
    KE 7,141: PRINT CHR$ (4)"
    PR# A$300"
990 X = 0: FOR I = 768 TO 853
    : READ A:X = X + A: POKE
    I,A: NEXT : IF X < > 7950
     THEN PRINT "ERROR IN 1ST
     SET OF DATA STATEMENTS."
    : STOP
1000 DATA  216,133,69,134,70,
     132,71,166,7
```

For "Spiders" (November 1984, p. 96):

```
160 CALL 36884
```

In addition, ProDOS filename conventions require that you BSAVE the machine language portion of Spiders (Program 6) with the title SPIDER.2 instead of SPIDER 2 as indicated on p. 90. You'll also have to change SPIDER 2 to SPIDER.2 in line 130 of Program 5.

Atari Disk Rx

The author of this utility program from the March issue (p. 107) has provided the following corrections: Renumber line 4015 to become line 4006, replace the old line 4015 with 4015 REM, change the GOTO HALT in line 5075 with GOSUB HALT, and change the REC=1 in line 6040 to REC=0.

It is also possible for the program to crash with the message ERROR 5 IN LINE 325 while you are attempting to recover large files. The error occurs because the program does not check for buffer overflow. To prevent this, reader Jim Owens suggests adding and changing the following lines:

```
323 IF FILL=1 AND (BCNT+T
    YPE)>RAM THEN ?:? "BU
    FFER FULL. LAST BUFFE
    R SECT=";SECT-1:POP:G
    OTO 330
326 NEXT SECT
330 IF DIR=1 THEN RETURN
```

Apple SuperFont

There are two typos in the checksum program (Program 6, p. 137) for this custom character utility for the Apple II series in the April issue. Lines 140 and 150 should read as follows:

```
140 FOR J = 0 TO 63:S = S
     + PEEK (4096 + I * 6
    4 + J): NEXT
150 READ A:S = S - 256 *
    INT (S / 256)
```

Plus/Term For VIC & 64

In addition to the items in last month's "CAPUTE!" column, there is another correction to the machine language portion for the VIC-20. Whenever you load a file into the buffer, the lower boundary of the buffer is reset incorrectly so that 256 bytes of garbage are added to the start of the text. To remedy this, reset the VIC by turning it off and back on. Load the machine language data by typing LOAD "PLUS/TERM.ML",8,1 (for tape, replace the ,8,1 with ,1,1). Then enter the following line in direct mode (without a line number):

```
POKE 43,0: POKE 44,24: POKE 7075,64
```

Immediately save the revised version by typing SAVE "PLUS/TERM.ML2",8 (or ,1 for tape). Now change line 100 of the BASIC portion to reflect the new name for the machine language portion.

If your printer is not properly handling upper- and lowercase characters, try changing line 1900 to

```
1900 OPEN 5,ZE,7.
```

The article states that changing the baud rate after other parameters have been set causes all other parameters to revert to their default values. Actually, even though the various submenus will show all parameters reverted to their default states, the actual parameter values will not have changed. Thus, the menus will not reflect the actual settings of the parameters. For this reason, you should always change the baud rate before changing any other parameter. ©

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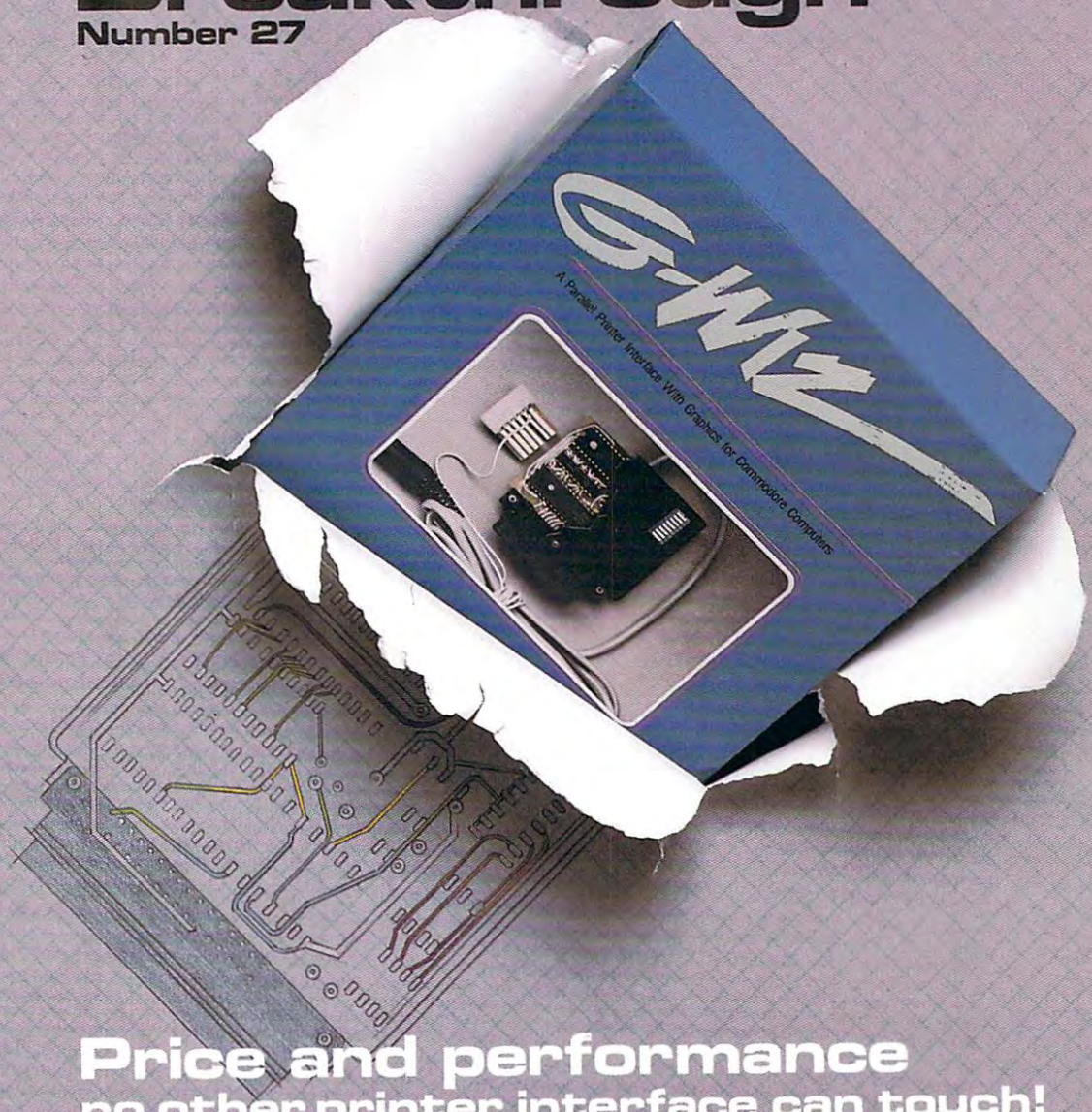

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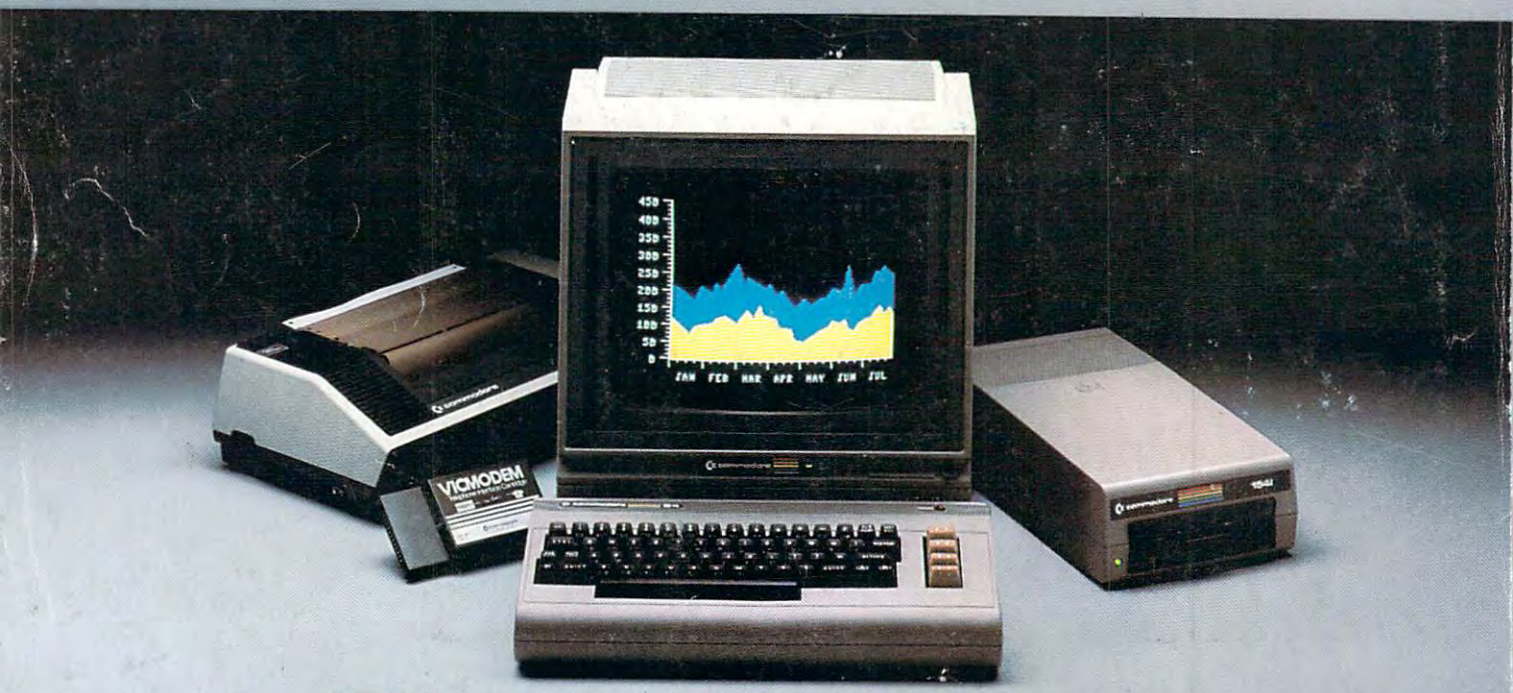

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It has the initials I, B, and M. And you pay for those initials.

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COMMODORE 64

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