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VOLUME 2
NUMBER 8

APPLE IIc
A Hands-On Review

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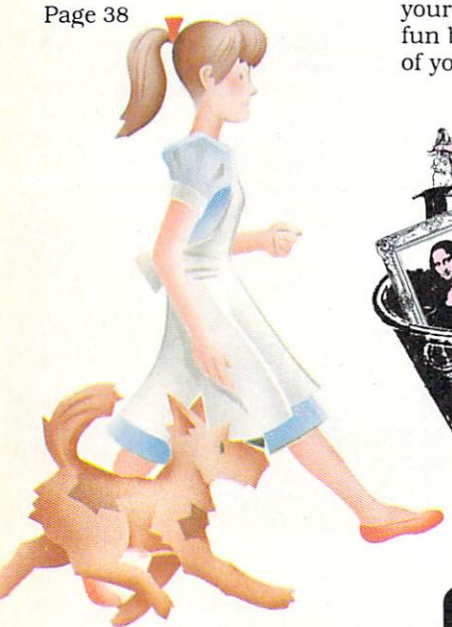

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COMPUTING CLINIC

APPLE AND COMMODORE INCOMPATIBILITY/ADAM'S BASIC/ROM AND RAM/A COMPUTER FOR EUROPE

BY JEFF BAIRSTOW

I recently took a programming class where I used an Apple IIe and stored my programs on disks. I have since purchased a Commodore 64 and was informed by the salesperson that my Apple IIe programs could be "read" by the Commodore 64 and would even run with a few simple changes. This does not work. Why?

RICHARD MARCIANI
Las Vegas, Nevada

Unfortunately, disks are not at all like phonograph records. A disk used to store data or programs from one computer will generally not run on another manufacturer's machine (except for those computers specifically designed to be compatible with, say, the IBM PC). Because the method of storing data and programs differs from computer to computer, Apple IIe disks cannot be read by a Commodore 64. Even if the Commodore 64 could read an Apple disk, it's unlikely that programs written in BASIC for the Apple would run on the Commodore without some modifications. If the programs use graphics, for example, the modifications might be quite extensive. I'm afraid the only suggestion I can make is that you retype your programs on the Commodore and try to run them.

The programs will almost certainly produce error messages that should help you in modifying them for the Commodore. I would recommend you have the BASIC manuals for both computers handy when you're debugging the programs.

Why, when I switch off my computer, do I lose the program in memory, but not the built-in BASIC?

PHILIP PALMER
Bangor, Pennsylvania

A computer usually contains two types of memory: random access memory (RAM) and read only memory (ROM). RAM is like a scratch pad, in that your programs and data can be stored in the memory, and you can alter or erase them any time you wish. ROM is more like a typeset book, in that its programs have been recorded permanently by the manufacturer and cannot be erased by you.

In most personal computers, an operating system and a BASIC interpreter are stored permanently in the ROM. When the computer is switched on, the operating system "takes charge" and allows you to type in BASIC commands or statements. These are stored in RAM and stay there until the user erases them or the computer is switched off.

The RAM can store information only as long as power is applied to its electronic circuits. When the power is switched off, all the memory circuits switch off, so the memory appears "empty" the next time the computer is switched on. That's why user programs are "erased" when the computer is switched off.

Exceptions to this are the "lap" portable computers, such as Radio Shack's TRS-80 Model 100. These computers (using a different technology) have a RAM that is maintained by a small internal battery so programs can be stored in RAM for several weeks.

I understand that the Coleco ADAM SmartBASIC is source-code compatible with Applesoft BASIC. I know that not all Apple programs will work on the ADAM. Can you tell me the differences between the two BASICs?

JAMES POULIN
Rockledge, Florida

If you type an Apple program into your ADAM, you should not receive any syntax error messages because both BASICs use the same "reserved" words. However, the Apple program may not run correctly on the ADAM because the hardware is designed differently.

The Apple text screen is usually 40-characters wide, whereas in BASIC the ADAM screen is only 31 characters across. However, you can usually adjust any PRINT and TAB statements to make sure that you do not run off the screen on the right-hand side. You may also have to adjust any PLOT and HPLOT statements to avoid error messages.

Another source of trouble will be statements using POKEs, PEEKs, or CALLs. These are frequently accesses to ROM or RAM routines and will be different for the two machines. The simplest thing to do is to avoid programs using these statements, unless you are an expert program translator and have a good understanding of machine language.

You may encounter other minor differences between the two computers as you program. That's because ADAM has a different microprocessor than Apple (Z-80 instead of 6502); ADAM's BASIC interpreter was written from scratch. While it is very similar to Apple's interpreter, it is not identical.

I plan to be in Europe writing for six months. Is there a personal computer that is adaptable to European current? Ideally, I'd like to get an IBM PC either here or there and use it with a monitor overseas.

MARIJANE OSBORN
Davis, California

The IBM Portable PC would seem to fit the bill for you. This unit has a built-in monitor (amber screen) that is well suited to word processing. The Portable PC has a power supply that can be switched to U.S. or European voltage standards. Buy the computer here and check it out thoroughly before you leave.

When you travel with your portable, take your sales invoice and warranty card with you in case you need service overseas. Customs officials may ask to see those documents, too. Bear in mind that the IBM Portable PC weighs 30 pounds and will not fit under most aircraft seats. However, it should fit in one of the overhead compartments of a wide-body plane. I would not recommend checking a computer as baggage. FC

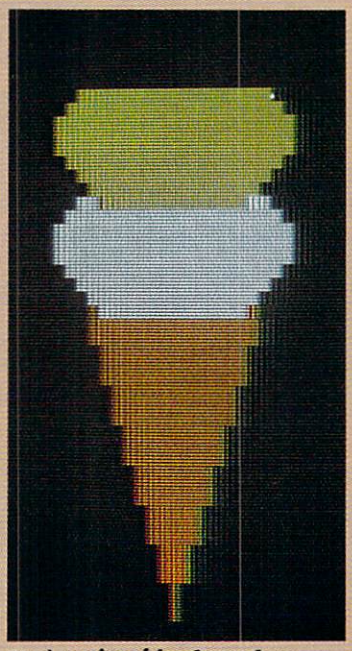
JEFFREY BAIRSTOW, *a technical journalist who lives in West Redding, Connecticut, was a founder and managing editor of* Computer Decisions *magazine. He has also taught math and computer science in England. His family, including two preschoolers, uses a variety of computers.*

ICE CREAM CONE

BY JOEY LATIMER

As you lie in your hammock on a hot summer's day, languidly fanning yourself with a copy of FAMILY COMPUTING, do you ever fantasize about eating a big, delicious, dripping ice cream cone? But does the thought of trudging through the hot streets to the neighborhood store require more energy than you can muster?

Well then, turn to your computer, select one of seven delicious flavors, and watch it dish up a treat that looks good enough to eat! (You may even get a surprise chocolate topping!)



Atari version of *Ice Cream Cone*.

ADAM/*Ice Cream Cone*

```
10 DIM scoop(2,22,2),cn(17,2),flav(8),fl$(8),ice(2)
20 FOR z = 1 TO 7
30 READ flav(z),fl$(z)
40 NEXT z
50 FOR x = 1 TO 2
60 FOR y = 24-12*x TO 33-11*x
70 FOR z = 1 TO 2
80 READ scoop(x,y,z)
90 NEXT z,y,x
100 FOR x = 1 TO 17
110 READ cn(x,1),cn(x,2)
120 NEXT x
130 TEXT
140 FOR x = 1 TO 7
150 PRINT x;" - ";fl$(x)
160 NEXT x
170 PRINT
180 PRINT "PLEASE PRESS THE NUMBER OF YOUR";"CHOICE."
190 FOR x = 1 TO 2
200 PRINT
210 PRINT "WHAT FLAVOR DO YOU WANT FOR";SPC(4);"SCOOP
#";x;"? ";
220 GET a$
230 IF a$ < "1" OR a$ > "7" THEN 220
240 PRINT a$
250 ice(x) = VAL(a$)
260 NEXT x
270 FOR d = 1 TO 200
280 NEXT d
290 GR
300 COLOR= 13
310 FOR ro = 1 TO 17
320 FOR co = cn(ro,1) TO cn(ro,2)
330 PLOT co,ro+22
340 NEXT co,ro
350 FOR z = 1 TO 2
360 COLOR= flav(ice(z))
370 FOR ro = 24-12*z TO 33-11*z
380 FOR co = scoop(z,ro,1) TO scoop(z,ro,2)
390 PLOT co,ro
400 NEXT co,ro,z
410 IF RND(1) > 0.5 OR ice(2) = 2 THEN 470
420 COLOR= 8
430 FOR co = scoop(2,0,1) TO scoop(2,0,2)
440 FOR ro = 0 TO RND(1)*15
450 PLOT co,ro
460 NEXT ro,co
470 FOR d = 1 TO 400
480 NEXT d
490 PRINT "PLEASE PRESS ANY KEY FOR","ANOTHER CONE.";
500 GET a$
510 GOTO 130
1000 DATA 15,VANILLA,8,CHOCOLATE,11,RASPBERRY,1,CHERRY
1010 DATA 14,BLUEBERRY,12,MINT,4,PISTACHIO
2000 DATA 15,23,14,24,13,25,13,25,12,26,12,26,12,26,12
2010 DATA 26,13,25,13,25,14,24,16,22,15,23,14,24,13,25
2020 DATA 13,25,12,26,12,26,12,26,12,26,13,25,13,25,13
2030 DATA 25,14,24,14,24,14,24,14,24,14,24,15,23,15,23
2040 DATA 16,22,16,22,16,22,17,21,17,21,17,21
2050 DATA 18,20,18,20,18,20,19,19,19,19
```

Apple/*Ice Cream Cone*

```
10 DIM SCOOP(2,22,2),CN(17,2),FLAV(8),FL$(8),ICE(2)
20 FOR I = 1 TO 29
30 READ S
40 POKE 767+I,S
50 NEXT I
60 FOR Z = 1 TO 7
70 READ FLAV(Z),FL$(Z)
80 NEXT Z
90 FOR X = 1 TO 2
100 FOR Y = 24-12*X TO 33-11*X
110 FOR Z = 1 TO 2
120 READ SCOOP(X,Y,Z)
130 NEXT Z,Y,X
140 FOR X = 1 TO 17
150 READ CN(X,1),CN(X,2)
160 NEXT X
170 TEXT
180 HOME
190 FOR X = 1 TO 7
200 PRINT X;" - ";FL$(X)
210 NEXT X
220 PRINT
230 PRINT "PLEASE PRESS THE NUMBER OF YOUR CHOICE."
240 FOR X = 1 TO 2
250 PRINT
260 PRINT "WHAT FLAVOR DO YOU WANT FOR SCOOP #";X;"? "
;
270 GET A$
280 IF A$ < "1" OR A$ > "7" THEN 270
290 PRINT A$
300 ICE(X) = VAL(A$)
310 NEXT X
320 FOR D = 1 TO 200
330 NEXT D
340 GR
350 COLOR= 13
360 FOR RO = 1 TO 17
370 FOR CO = CN(RO,1) TO CN(RO,2)
380 PLOT CO,RO+22
390 NEXT CO,RO
400 FOR Z = 1 TO 2
410 COLOR= FLAV(ICE(Z))
420 FOR RO = 24-12*Z TO 33-11*Z
430 FOR CO = SCOOP(Z,RO,1) TO SCOOP(Z,RO,2)
440 PLOT CO,RO
450 POKE 6,Z
460 POKE 8,240-CO*ICE(Z)
470 CALL 768
480 NEXT CO,RO,Z
490 IF RND(1) > 0.5 OR ICE(2) = 2 THEN 580
500 COLOR= 8
```

```
160 COLOR= 7
170 FOR X = 1 TO 24
180 READ A,B,C
190 FOR Y = A TO B
200 IF X <= 12 THEN PLOT C,Y:GOTO 220
210 PLOT Y,C
220 NEXT Y
230 NEXT X
240 H1 = INT(RND(1)*22)
250 H2 = INT(RND(1)*8)+32*(RND(1) > 0.5)
260 VTAB 22
270 HTAB 18
280 PRINT S;" "
290 S = S-1
300 IF KB = 0 THEN 340
310 R0 = H1+(PDL(1) > 192)-(PDL(1) < 64)
320 C0 = H2+(PDL(0) > 192)-(PDL(0) < 64)
330 GOTO 380
340 J = PEEK(-16384)-128
350 POKE -16368,0
360 R0 = H1+(J = 44 OR J = 46 OR J = 77)-(J = 73 OR J
= 79 OR J = 85)
370 C0 = H2+(J = 46 OR J = 76 OR J = 79)-(J = 74 OR J
= 77 OR J = 85)
380 R0 = R0-(R0 > 39)+(R0 < 0)
390 C0 = C0-(C0 > 39)+(C0 < 0)
400 IF SCRN(C0,R0) = 7 THEN R0 = H1:C0 = H2:GOTO 480
410 COLOR= 0
420 PLOT H2,H1
430 COLOR= 13
440 PLOT C0,R0
450 H1 = R0
460 H2 = C0
470 IF (R0 = 17 OR R0 = 18) AND (C0 = 19 OR CQ = 20) T
HEN 660
480 RA = HR+(R0 > HR)-(R0 < HR)
490 CA = HC+(C0 > HC)-(C0 < HC)
500 CA = CA-(CA > 39)+(CA < 0)
510 RA = RA-(RA > 39)+(RA < 0)
520 IF SCRN(CA.RA) <> 3 AND SCRN(CA,RA) <> 7 THEN 580
530 D = 2*INT(RND(1)*2)-1
540 IF F THEN RA = HR+D:CA = HC:GOTO 560
550 CA = HC+D:RA = HR
560 F = NOT F
570 GOTO 500
580 COLOR= 0
590 PLOT HC,HR
600 COLOR= 11
610 PLOT CA,RA
620 HC = CA
630 HR = RA
640 IF CA = C0 AND RA = R0 THEN 760
650 GOTO 260
660 TEXT
670 HOME
680 IF S > HS THEN HS = S
690 FOR T = 1 TO 150
700 PRINT "YOU DID IT! ";
710 A = PEEK(-16336)
720 NEXT T
730 HOME
740 PRINT "YOUR SCORE IS ";S;"."
750 GOTO 790
760 TEXT
770 HOME
780 PRINT CHR$(7);"SORRY, YOU WERE CAUGHT!"
790 PRINT "THE HIGH SCORE IS ";HS;"."
800 PRINT "PRESS <RETURN> TO PLAY AGAIN.";
810 GET K$
820 IF K$ <> CHR$(13) THEN 810
830 RESTORE
840 GOTO 80
1000 DATA 1000,30,19,0
2000 DATA 6,18,8,20,33,8,12,13,12,15,24,12,26,27
2010 DATA 12,16,22,16,16,22,23,12,13,27,15,24,27
2020 DATA 26,27,27,6,18,31,20,33,31,10,19,6,12,29
2030 DATA 6,12,14,12,16,23,12,25,27,12,16,23,16,18
2040 DATA 21,22,12,14,27,16,23,27,25,27,27,10,19
2050 DATA 33,21,29,33
```

Atari/*Renegade Robot*

```
10 OPEN #1,4,0,"K:"
20 GRAPHICS 0
30 PRINT CHR$(125);"DO YOU WANT TO USE THE <K>EYBOARD"
40 PRINT "OR THE <J>OYSTICK?"
50 GET #1,KB
60 IF KB<>ASC("J") AND KB<>ASC("K") THEN 50
70 KB=(KB=ASC("J"))
80 GRAPHICS 3
90 READ S,HR,HC,F
100 POKE 752,1
110 COLOR 2
120 PLOT 19,9
130 PLOT 20,9
140 COLOR 3
150 FOR X=1 TO 24
160 READ A,B,C
170 FOR Y=A TO B
180 IF X<=12 THEN PLOT C,Y:GOTO 200
190 PLOT Y,C
200 NEXT Y
210 NEXT X
220 H1=INT(RND(0)*22)
230 H2=INT(RND(0)*7)+33*(RND(0)>0.5)
240 POKE 656,1
250 POKE 657,19
260 PRINT S;" ";
270 S=S-1
280 IF KB=0 THEN 330
290 J=STICK(0)
300 R0=H1+(J=5 OR J=9 OR J=13)-(J=6 OR J=10 OR J=14)
310 C0=H2+(J>=5 AND J<=7)-(J>=9 AND J<=11)
320 GOTO 370
330 J=PEEK(764)
340 POKE 764,255
350 R0=H1+(J=32 OR J=34 OR J=37)-(J=8 OR J=11 OR J=13)
360 C0=H2+(J=0 OR J=8 OR J=34)-(J=1 OR J=11 OR J=37)
370 R0=R0-(R0>19)+(R0<0)
380 C0=C0-(C0>39)+(C0<0)
390 LOCATE C0,R0,SC
400 IF SC=3 THEN R0=H1:C0=H2:GOTO 480
410 COLOR 4
420 PLOT H2,H1
430 COLOR 2
440 PLOT C0,R0
450 H1=R0
460 H2=C0
470 IF R0=9 AND (C0=19 OR C0=20) THEN 670
480 RA=HR+(R0>HR)-(R0<HR)
490 CA=HC+(C0>HC)-(C0<HC)
500 RA=RA-(RA>19)+(RA<0)
510 CA=CA-(CA>39)+(CA<0)
520 LOCATE CA,RA,CH
530 IF CH<>3 AND (RA<>9 OR (CA<>19 AND CA<>20)) THEN 5
90
540 D=2*INT(RND(0)*2)-1
550 IF F THEN RA=HR+D:CA=HC:GOTO 570
560 CA=HC+D:RA=HR
570 F= NOT F
580 GOTO 500
590 COLOR 4
600 PLOT HC,HR
610 COLOR 1
620 PLOT CA,RA
630 HR=RA
640 HC=CA
650 IF CA=C0 AND RA=R0 THEN 750
660 GOTO 240
670 GRAPHICS 0
680 IF S>HS THEN HS=S
690 FOR T=1 TO 75
700 PRINT "YOU DID IT! ";
```

```
GOTO 220
210 POKE SC+Y+22*C,160:POKE CL+Y+22*C,6
220 NEXT Y
230 NEXT X
240 H1=INT(RND(1)*21)
250 H2=INT(RND(1)*2)-20*(RND(1)>.5)
260 PRINT CHR$(19);R$;TAB(8);STR$(S);" ";
270 S=S-1
280 IF KB=0 THEN 360
290 POKE 37154,127
300 J=PEEK(37152) AND 128
310 POKE 37154,255
320 J=J OR (PEEK(37137) AND 127)
330 RO=H1+SGN(J AND 4)-SGN(J AND 8)
340 CO=H2+SGN(J AND 16)-SGN(J AND 128)
350 GOTO 410
360 GET J$
370 IF J$="" THEN J=0:GOTO 390
380 J=ASC(J$)
390 RO=H1-(J=44 OR J=46 OR J=77)+(J=73 OR J=79 OR J=85
)
400 CO=H2-(J=46 OR J=76 OR J=79)+(J=74 OR J=77 OR J=85
)
410 RO=RO+(RO>21)-(RO<0)
420 CO=CO+(CO>21)-(CO<0)
430 IF PEEK(SC+CO+22*RO)=160 THEN RO=H1:CO=H2:GOTO 510
440 POKE SC+H2+22*H1,42
450 POKE CL+H2+22*H1,0
460 POKE SC+CO+22*RO,42
470 POKE CL+CO+22*RO,7
480 H1=RO
490 H2=CO
500 IF RO=9 AND (CO=10 OR CO=11) THEN 700
510 RA=HR-(RO>HR)+(RO<HR)
520 CA=HC-(CO>HC)+(CO<HC)
530 RA=RA+(RA>21)-(RA<0)
540 CA=CA+(CA>21)-(CA<0)
550 CH=PEEK(SC+CA+22*RA)
560 IF CH<>160 AND CH<>102 THEN 620
570 D=2*INT(RND(1)*2)-1
580 IF F THEN RA=HR+D:CA=HC:GOTO 600
590 CA=HC+D:RA=HR
600 F=NOT F
610 GOTO 530
620 POKE SC+HC+22*HR,81
630 POKE CL+HC+22*HR,0
640 POKE SC+CA+22*RA,81
650 POKE CL+CA+22*RA,2
660 HR=RA
670 HC=CA
680 IF CA=CO AND RA=RO THEN 790
690 GOTO 260
700 PRINT CHR$(147);
710 IF S>HS THEN HS=S
720 POKE 36878,7
730 FOR T=180 TO 255
740 PRINT "YOU DID IT! ";
750 POKE 36876,T
760 NEXT T
770 PRINT CHR$(147);"YOUR SCORE IS";S;CHR$(157);"."
780 GOTO 820
790 POKE 36878,10
800 POKE 36876,235
810 PRINT CHR$(147);"YOU WERE CAUGHT!"
820 PRINT "HIGH SCORE IS";HS;CHR$(157);"."
830 PRINT "PRESS <RETURN> TO","PLAY AGAIN.";
840 POKE 36878,0
850 GET K$
860 IF K$<>CHR$(13) THEN 850
870 RESTORE
880 GOTO 90
1000 DATA 7680,38400,1000,16,7,0
2000 DATA 2,10,2,12,20,2,5,6,5,8,14,5,16,17
2010 DATA 5,8,14,8,8,14,13,5,6,16,8,14,16,16
2020 DATA 17,16,2,10,19,12,20,19,4,9,2,11,17
2030 DATA 2,6,6,5,8,13,5,15,15,5,8,13,8,10,11
2040 DATA 14,6,6,17,8,13,17,15,15,17,4,9,20
2050 DATA 11,17,20
```

PROGRAMMING P.S.

Corrections to previous months' programs—and enhancements suggested by our readers

CORRECTIONS . . .

ADAM/*Recipe for Disaster* *(June, page 98)*
The expression `NEXT i` appears in both line 380 and line 390. It should only be in line 380; thus, line 390 should read

```
390 FOR d=1 TO 200:NEXT d:GOTO 210
```

ADAM/*Mystery Manor* *(March, page 109)*
In addition to the modifications indicated, you must also change line 330 to read as follows:

```
330 FOR I=1 TO 10:PRINT G(I);:FLAG=FLAG+(G(I)<>INT(SQR
(GU(I)-9))):NEXT I:PRINT
```

Apple/*Phone Cost Monitor* *(May, pages 64–65)*
Lines 920, 930, and 1080 are incorrect as published. They should read as follows:

```
920 IF S$ = "1" THEN PRINT "YOUR MONEY IS SPENT!"
930 IF S$ = "2" THEN PRINT "TIME'S UP!"
1080 IF PEEK(-16384) < 128 THEN 990
```

Apple/*Mystery Gadget* *(May, page 88)*
In addition to the modifications indicated, you must also change line 510 of the Model 4 version to read as follows:

```
510 GET K$:GOTO 100
```

Atari/*Recipe for Disaster* *(June, pages 96, 98)*
Unless you use some of the Atari's tricks for entering extra-long lines, it won't let you type in a program line that's more than 114 characters long. Line 400 of *Recipe for Disaster* has 132 characters. One way to get around this problem is to break it up into two lines, like so:

```
400 SOUND 0,0,0,0:SOUND 1,0,0,0:SOUND 2,0,0,0:NEXT Y:F
OR D=1 TO 200:NEXT D:NEXT X
405 SOUND 0,90,8,15:FOR D=1 TO 10:NEXT D:SOUND 0,0,0,0
```

TI-99/4A/*Disk Label Maker* *(June, page 78)*
This program requires TI Extended BASIC.

TI-99/4A w/TI Extended BASIC/*Recipe for Disaster* *(June, page 101)*
The semicolon in line 110 should be a colon:

```
110 INPUT "YOUR NAME, PLEASE? ":N$::IF N$="" THEN 110
```

. . . AND ENHANCEMENTS

We encourage you to try translating our programs for other computers—especially the reader-written programs, which appear each month for only one computer. If you're willing, we'll publish your name and address here so that other owners of your brand of computer can write you (with a stamped, self-addressed envelope, of course) for copies of your translation.

A YEAR TO REMEMBER

BY PETER FAVARO

"MAN SNATCHED BY UFO!" was the headline on page two of the local paper. Just before the man disappeared, his wife, Mrs. Harry Winkler, reports, they were sitting quietly at home watching TV. All of a sudden she noticed her oven door opening and closing and the hands on her kitchen clock spinning wildly. Their dog, Bubba, "was turning somersaults and running around in circles in the backyard." Mrs. Winkler went outside to investigate and noticed mysterious red, blue, and green lights flickering across the sky. When she returned inside, Harry was gone. "I never saw anything like it!" Mrs. Winkler is quoted as saying. "Bubba's been so depressed ever since Harry's not been around to take him on his nightly stroll."

PETER FAVARO, PH.D., *is an education and recreation video game design consultant whose fondest recent memory is marrying his wife, Theresa. He is currently writing a book on educational computing for Prentice-Hall and is the author of the June puzzle.*

MEANWHILE, LIGHT-YEARS AWAY...

The Outer People are a peaceful and scholarly race who live on a small planet tucked away in a dark corner of our galaxy. They are obsessed with keeping track of every fact and fad in the Milky Way's history and have developed a technique of traveling through time at high speeds to collect "samplings" from various planets. Although they always make a point of returning their "sampling" right back to the precise year when it was collected so as not to disturb the natural order of things, sometimes they goof. Such was the case with Mr. Harry Winkler. The Outer People simply couldn't remember which year they snatched him from.

Although the Outer People can't communicate directly with Mr. Winkler, fortunately, they have constructed a machine to get them out of sticky situations such as this one. With their "Thought Recorder, Model XIV," the Outer People can view memories locked in Mr. Winkler's brain. By matching his memories of his final moment on earth with their detailed knowledge of the planet's history, they can piece together what year Mr. Winkler should be returned to.

HOW TO PLAY

First, set the Thought Recorder, Model XIV (your computer) to all uppercase letters and turn the volume up. Next, select the memory zone you wish to view (see illustration, below). Type in the first letter of the zone (for example, "A" for Audio). A memory concerning sound will appear on the screen. Type "A" again and a different memory may appear. To ensure that you have viewed every memory concerning sound, press the "A" key several times before moving on to a different zone.

Pay particular attention to the strength signals accompanying each memory. A long flashing line indicates Mr. Winkler's final memories on earth, while a short flashing line refers to a less recent memory lodged deeper in his mind. Only the former are pertinent; they should be jotted down on paper.

Remember that Mr. Winkler was last seen on earth watching television, so his final memories will be partly a direct recollection of what was on the screen in front of him, and partly his own loose associations with the events he was viewing. Once you figure out what Mr. Winkler was watching on TV, and the corresponding year, type "G" to guess. Then input the year (use digits). If you guess an incorrect year, you can get a helpful clue by typing "H" for help. The solution to *Brain Terrain* will appear in next month's issue.

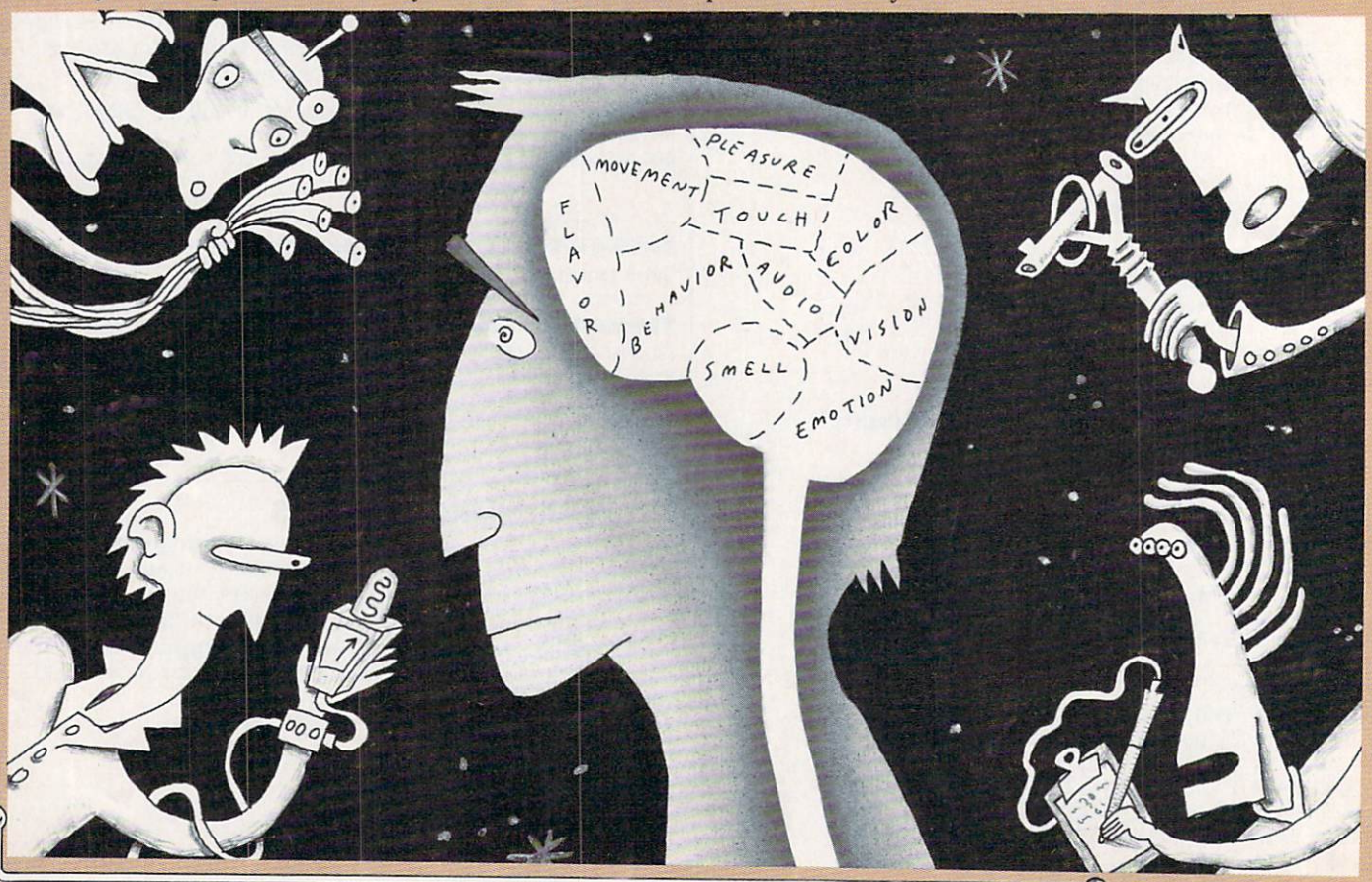
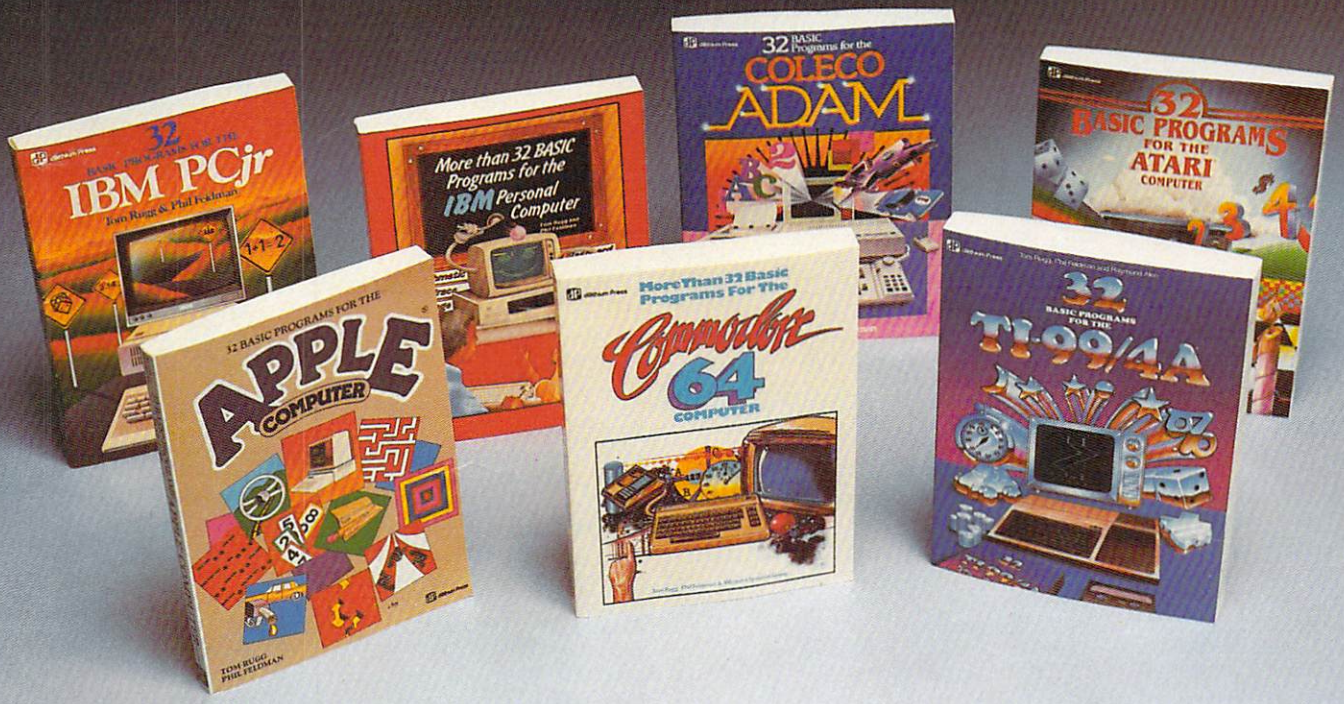


ILLUSTRATION BY JOSH GOSFIELD

We're Showing Your Favorite Programs!



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Base Version (TRS-80 Color Computer)/ *Brain Terrain*

```
10 CLEAR 900:DIM A$(11,4),N(11):WL=32:GW=0:M=0:Q$="":C
LS
40 E$=CHR$(34):BL$=STRING$(WL,32):ST$=STRING$(WL,42)
50 READ V$:FOR X=1 TO 11:READ N(X):FOR Y=1 TO N(X)
60 READ D$:C=ASC(LEFT$(D$,1))-64
70 FOR Z=2 TO LEN(D$):N=ASC(MID$(D$,Z,1))-C
80 A$(X,Y)=A$(X,Y)+CHR$(N-26*(N<65 AND N+C>64))
90 NEXT Z:NEXT Y:NEXT X
100 CLS:R$="THOUGHT RECORDER, MODEL XIV":GOSUB 1000
110 R$="(PATENT PENDING)":GOSUB 1000
120 PRINT:R$="PRESS A ZONE KEY (A, B, C, E, F, M, P, S
, T, OR V) TO ACCESS MEMORY"
130 IF GW=1 THEN R$=R$+", "+E$+"H"+E$+" FOR HELP,"
140 R$=R$+" OR "+E$+"G"+E$+" TO GUESS.":GOSUB 1000
160 TB=INT((WL-LEN(Q$))/2)
170 IF M=1 THEN NS=RND(TB) ELSE NS=RND(3)
180 N$=LEFT$(ST$,NS)+Q$+RIGHT$(ST$,NS)
190 PRINT@10*WL,BL$;:PRINT@10*WL,"";:GOSUB 2000
200 K$=INKEY$:IF K$="" THEN 170
210 IF K$="G" THEN 260
220 IF K$="H" AND GW=1 THEN 370
230 FL=0:FOR X=1 TO 10:IF MID$(V$,X,1)=K$ THEN FL=X:X=
10
240 NEXT X:IF FL=0 THEN 170
250 M=RND(N(FL)):Q$=A$(FL,M):GOTO 160
260 CLS:FOR X=1 TO 128 STEP 4:SOUND X,1:NEXT X
270 R$="SPACE/TIME MACHINE ACTIVE.":GOSUB 1000
280 PRINT:PRINT:PRINT:PRINT "INPUT YEAR";
290 INPUT Y$:IF Y$<>A$(11,1) THEN GW=1:GOTO 340
300 CLS:FOR X=1 TO 50:SOUND 40+RND(40),1:SOUND 200+RND
(40),1:NEXT X
310 N$="WHOOOOSH!":PRINT@8*WL,"";:GOSUB 2000
320 PRINT:PRINT:R$="SUBJECT RETURNED HOME SAFELY!"
330 GOSUB 1000:END
340 CLS:FOR X=1 TO 30+RND(50):SOUND RND(255),1:NEXT X
350 R$="FAILURE! INCORRECT TIME FRAME."
360 GOSUB 1000:GOTO 390
370 CLS:R$="THE LAST WORDS MR. WINKLER HEARD WERE"
380 GOSUB 1000:PRINT:R$=A$(11,2):GOSUB 1000
390 Q$="":M=0:R$="(PRESS ANY KEY TO CONTINUE.)"
400 PRINT@12*WL,"";:GOSUB 1000
410 K$=INKEY$:IF K$="" THEN 410
420 GOTO 100
1000 IF LEN(R$)<=WL THEN N$=R$:GOSUB 2000:RETURN
1010 J=WL+1:FOR I=WL+1 TO 1 STEP -1
1020 IF MID$(R$,I,1)=" " THEN J=I:I=1
1030 NEXT I:N$=LEFT$(R$,J-1):GOSUB 2000
1040 R$=RIGHT$(R$,LEN(R$)-J):GOTO 1000
2000 PRINT TAB((WL-LEN(N$))/2);N$;
2010 IF LEN(N$)<WL THEN PRINT
2020 RETURN
4000 DATA ACVEFSBMPT
4010 DATA 4,LEFMFUO,UNXMPWWDIB,FLGYZ&ZGRQOTM,QAZEXCV
4020 DATA 2,MSNQRQ,DTMRO$WXVMTIW,2,UIDBCO,KXTCCZC
4030 DATA 3,IJFN,WYLOBALJ,AJSSJUBUJPO
4040 DATA 2,TILUHAY,MJVAGRETERRA,2,EXBJFY,HUQVB
4050 DATA 3,VNKYG6DQJPEJC,MTNETYVAT,MUNOVG
4060 DATA 2,QWCFRKZEX,AVQ!BOE!EPXO
4070 DATA 2,BDQWPEKPI,PICYBYDW
4080 DATA 2,KDHTDD+NSPPDP,RTJAKLDQ
4090 DATA 2,C4<9<,C%111#VPDOO#VWHS#111%
```

Atari/*Brain Terrain*

```
10 DIM A$(209),D$(21),BL$(40),CL$(1),E$(1),N$(40),Q$(2
1),R$(99),ST$(40),V$(10),Y$(4),N(11),AS(11,4),AL(11,4)
20 WL=40:GW=0:M=0:E$=CHR$(34):CL$=CHR$(125):Q$=""
30 BL$=" ":BL$(40)=BL$:BL$(2)=BL$:ST$="*":ST$(40)=ST$:
ST$(2)=ST$
40 OPEN #1,4,0,"K:"
50 POKE 82,0:POKE 752,1:SETCOLOR 2,5,4:PRINT CL$;
60 READ V$:FOR X=1 TO 11:READ T:N(X)=T:FOR Y=1 TO T
70 READ D$:C=ASC(D$)-64
80 AS(X,Y)=LEN(A$)+1:AL(X,Y)=LEN(D$)-2
90 FOR Z=2 TO LEN(D$):N=ASC(D$(Z))-C
100 A$(LEN(A$)+1)=CHR$(N+26*(N<65 AND N+C>64))
110 NEXT Z:NEXT Y:NEXT X
120 N$="THOUGHT RECORDER, MODEL XIV":GOSUB 2000
130 N$="(PATENT PENDING)":GOSUB 2000
140 PRINT :R$="PRESS A ZONE KEY (A, B, C, E, F, M, P,
S, T, OR V) TO ACCESS MEMORY"
150 IF GW=1 THEN R$(68)=", ":R$(70)=E$:R$(71)="H":R$(7
2)=E$:R$(73)=" FOR HELP,"
160 R$(LEN(R$)+1)=" OR ":R$(LEN(R$)+1)=E$
170 R$(LEN(R$)+1)="G":R$(LEN(R$)+1)=E$
180 R$(LEN(R$)+1)=" TO GUESS.":GOSUB 1000
190 TB=INT((WL-LEN(Q$))/2)-1
200 NS=INT(RND(0)*3)+1:IF M=1 THEN NS=INT(RND(0)*TB)+1
210 N$=ST$(1,NS):N$(NS+1)=Q$:N$(LEN(N$)+1)=ST$(1,NS)
220 POSITION 0,10:PRINT BL$;:POSITION 0,10
230 GOSUB 2000:IF PEEK(764)=255 THEN 200
240 GET #1,K:IF K=ASC("G") THEN 300
250 IF K=ASC("H") AND GW=1 THEN 440
260 FL=0:FOR X=1 TO 10:IF ASC(V$(X))=K THEN FL=X:X=10
270 NEXT X:IF FL=0 THEN 200
280 M=INT(RND(0)*N(FL))+1:F=AS(FL,M)
290 Q$=A$(F,F+AL(FL,M)):GOTO 190
300 PRINT CL$;:N$="SPACE/TIME MACHINE ACTIVE."
310 GOSUB 2000:FOR X=0 TO 100
320 SOUND 0,RND(0)*100+X,10,10:SOUND 1,30,10,X
330 NEXT X:SOUND 0,0,0,0:SOUND 1,0,0,0
340 PRINT :PRINT :PRINT :PRINT "INPUT YEAR";
350 INPUT Y$:IF Y$<>A$(186,189) THEN GW=1:GOTO 400
360 PRINT CL$;:POSITION 15,10:PRINT "WHOOOOSH!"
370 PRINT :PRINT :N$="SUBJECT RETURNED HOME SAFELY!":G
OSUB 2000
380 FOR X=0 TO 210 STEP 0.7:SOUND 0,X,8,10-((X>200)*8)
390 SOUND 1,X,10,4:NEXT X:END
400 PRINT CL$;:POSITION 0,10:N$="FAILURE! INCORRECT TI
ME FRAME.":GOSUB 2000
410 Y=7:FOR C=1 TO 3:FOR X=150 TO 80 STEP -1.5
420 Y=-Y:SOUND 0,X+C*20,10,7+Y
430 NEXT X:NEXT C:SOUND 0,0,0,0:GOTO 460
440 PRINT CL$;:N$="THE LAST WORDS MR. WINKLER HEARD WE
RE":GOSUB 2000
450 PRINT :N$=A$(190):GOSUB 2000
460 POSITION 0,20:N$="(PRESS ANY KEY TO CONTINUE.)"
470 GOSUB 2000:GET #1,K:Q$="":M=0:PRINT CL$;:GOTO 120
1000 IF LEN(R$)<=WL THEN N$=R$:GOSUB 2000:RETURN
1010 J=WL+1:FOR I=WL+1 TO 1 STEP -1
1020 IF R$(I,I)=" " THEN J=I:I=1
1030 NEXT I:N$=R$(1,J-1):GOSUB 2000
1040 R$=R$(J+1,LEN(R$)):GOTO 1000
2000 IF LEN(N$)<WL-1 THEN PRINT BL$(1,(WL-LEN(N$))/2);
2010 PRINT N$;:IF LEN(N$)<WL THEN PRINT
2020 RETURN
3000 DATA ACVEFSBMPT
3010 DATA 4,LEFMFUO,UNXMPWWDIB,FLGYZ&ZGRQOTM,QAZEXCV
3020 DATA 2,MSNQRQ,DTMRO$WXVMTIW,2,UIDBCO,KXTCCZC
3030 DATA 3,IJFN,WYLOBALJ,AJSSJUBUJPO
3040 DATA 2,TILUHAY,MJVAGRETERRA,2,EXBJFY,HUQVB
3050 DATA 3,VNKYG6DQJPEJC,MTNETYVAT,MUNOVG
3060 DATA 2,QWCFRKZEX,AVQ!BOE!EPXO
3070 DATA 2,BDQWPEKPI,PICYBYDW
3080 DATA 2,KDHTDD+NSPPDP,RTJAKLDQ
3090 DATA 2,C4<9<,C%111#VPDOO#VWHS#111%
```

TI-99/4A/*Brain Terrain*

```
10 DIM A$(11,4),N(11)
20 READ WL,GW,M,FA,V$
30 E$=CHR$(34)
40 FOR X=1 TO WL
50 ST$=ST$&"*"
60 NEXT X
70 FOR X=1 TO 11
80 READ N(X)
90 FOR Y=1 TO N(X)
100 READ D$
110 C=ASC(SEG$(D$,1,1))-64
120 FOR Z=2 TO LEN(D$)
130 A=ASC(SEG$(D$,Z,1))-C
140 A$(X,Y)=A$(X,Y)&CHR$(A+26*((A<65)*(A+C>64)))
150 NEXT Z
```

```
350 SLOW
360 LET R$="THOUGHT RECORDER, MODEL XIV (PATENT PENDIN
G)"
370 GOSUB 1000
380 PRINT
390 LET R$="PRESS A ZONE KEY (A, B, C, E, F, M, P, S,
T, OR V) TO ACCESS MEMORY"
400 IF GW=1 THEN LET R$=R$+", "+E$+"H"+E$+" FOR HELP,"
410 LET R$=R$+" OR "+E$+"G"+E$+" TO GUESS."
420 GOSUB 1000
430 LET TB=INT ((WL-LEN Q$)/2)
440 LET NS=INT (RND*3+1)
450 IF M=1 THEN LET NS=INT (RND*TB+1)
460 LET N$=S$( TO NS)+Q$+S$( TO NS)
470 PRINT AT 18,0;B$;
480 PRINT AT 18,0;
490 GOSUB 2000
500 LET K$=INKEY$
510 IF K$="" THEN GOTO 440
520 IF K$="G" THEN GOTO 620
530 IF K$="H" AND GW=1 THEN GOTO 760
540 LET FL=0
550 FOR X=1 TO 10
560 IF V$(X)=K$ THEN LET FL=X
570 NEXT X
580 IF FL=0 THEN GOTO 440
590 LET M=INT (RND*VAL L$(FL)+1)
600 LET Q$=A$(FL,M) (2 TO CODE A$(FL,M,1))
610 GOTO 430
620 CLS
630 LET N$="SPACE/TIME MACHINE ACTIVE."
640 GOSUB 2000
650 PRINT AT 4,0;"INPUT YEAR."
660 INPUT Y$
670 IF Y$<>A$(11,1) (2 TO 5) THEN GOTO 720
680 CLS
690 PRINT AT 10,11;"WHOOOOSH."
700 PRINT AT 13,1;"SUBJECT RETURNED HOME SAFELY."
710 STOP
720 LET GW=1
730 CLS
740 PRINT AT 6,1;"FAILURE. INCORRECT TIME FRAME."
750 GOTO 800
760 CLS
770 LET R$="THE LAST WORDS MR. WINKLER HEARD WERE"
780 GOSUB 1000
790 PRINT AT 3,6;A$(11,2) (2 TO 21)
800 LET Q$=""
810 LET M=0
820 PRINT AT 20,2;"(PRESS ANY KEY TO CONTINUE.)"
830 LET K$=INKEY$
840 IF K$="" THEN GOTO 830
850 CLS
860 GOTO 360
1000 IF LEN R$>WL THEN GOTO 1040
1010 LET N$=R$
1020 GOSUB 2000
1030 RETURN
1040 LET J=WL+1
1050 FOR I=WL+1 TO 1 STEP -1
1060 IF R$(I)<>CHR$ 0 THEN GOTO 1090
1070 LET J=I
1080 LET I=1
1090 NEXT I
1100 LET N$=R$( TO J-1)
1110 GOSUB 2000
1120 LET R$=R$(J+1 TO LEN R$)
1130 GOTO 1000
2000 PRINT TAB (WL-LEN N$)/2;N$;
2010 IF LEN N$<WL THEN PRINT
2020 RETURN
```

MODIFICATIONS FOR OTHER COMPUTERS

ADAM/*Brain Terrain*

Use the base version, with the following alterations: Change `CLS` to `HOME` in lines 100 and 370. Add line 150:

```
150 FOR y=1 TO 10
```

Omit line 420. Finally, change lines 10, 40, 80, 170, 190, 200, 240–260, 300, 310, 340, 400, 410, and 2000 to read as follows:

```
10 DIM a$(11,4),n(11):wl=31:gw=0:m=0:q$="":HOME
40 e$=CHR$(34):FOR x=1 TO wl:bl$=bl$+CHR$(32):st$=st$+
CHR$(42):NEXT x
80 a$(x,y)=a$(x,y)+CHR$(n+26*(n<65 AND n+c>64))
170 ns=INT(RND(1)*3)+1:IF m=1 THEN ns=INT(RND(1)*tb)+1
190 VTAB 10:HTAB 1:PRINT bl$;:VTAB 10:HTAB 1:GOSUB 200
0
200 NEXT y:GET k$
240 NEXT x:IF fl=0 THEN 150
250 m=INT(RND(1)*n(fl))+1:q$=a$(fl,m):GOTO 150
260 HOME
300 HOME
310 VTAB 10:HTAB 11:FLASH:PRINT "WHOOOOSH!":NORMAL
340 HOME
400 VTAB 20:GOSUB 1000
410 GET k$:GOTO 100
2000 PRINT TAB((wl-LEN(n$))/2+1);n$;
```

Apple/*Brain Terrain*

Use the base version, with the following alterations: Add lines 20 and 150:

```
20 FOR S=1 TO 29:READ A:POKE 767+S,A:NEXT S
150 POKE -16368,0
```

Change `CLS` to `HOME` in lines 100 and 370. Omit line 420. Finally, change lines 10, 40, 80, 170, 190–210, 250, 260, 300, 310, 340, 400, 410, 2000, and 3000–3020 to read as follows:

```
10 DIM A$(11,4),N(11):WL=40:GW=0:M=0:Q$="":HOME
40 E$=CHR$(34):FOR X=1 TO WL:BL$=BL$+CHR$(32):ST$=ST$+
CHR$(42):NEXT X
80 A$(X,Y)=A$(X,Y)+CHR$(N+26*(N<65 AND N+C>64))
170 NS=INT(RND(1)*3)+1:IF M=1 THEN NS=INT(RND(1)*TB)+1
190 VTAB 10:HTAB 1:PRINT BL$;:VTAB 10:HTAB 1:GOSUB 200
0
200 K=PEEK(-16384):IF K<=127 THEN 170
210 POKE -16368,0:K$=CHR$(K-128):IF K$="G" THEN 260
250 M=INT(RND(1)*N(FL))+1:Q$=A$(FL,M):GOTO 150
260 HOME:FOR X=180 TO 10 STEP -5:POKE 6,10:POKE 8,X:CA
LL 768:NEXT X
300 HOME:FOR X=1 TO 40:FOR Y=1 TO 3:Q=PEEK(-16336):NEX
T Y:POKE 6,9:POKE 8,RND(1)*60+190:CALL 768:NEXT X
310 VTAB 10:HTAB 15:FLASH:PRINT "WHOOOOSH!":NORMAL
340 HOME:FOR X=1 TO 40:POKE 6,RND(1)*20+1:POKE 8,RND(1
)*250+5:CALL 768:NEXT X
400 VTAB 20:GOSUB 1000
410 GET K$:GOTO 100
2000 PRINT TAB((WL-LEN(N$))/2+1);N$;
3000 DATA 165,8,74,133,10,164,8,173,48,192
3010 DATA 136,234,234,208,251,165,7,56,229
3020 DATA 10,133,7,176,237,198,6,208,233,96
```

Commodore 64/*Brain Terrain*

Use the base version, with the following alterations: Add lines 20 and 30:

```
20 VL=54272:VH=VL+1:FOR X=VL TO VL+24:POKE X,0:NEXT X
30 POKE VL+24,15:POKE VL+5,32:POKE VL+6,32:POKE VL+4,1
7
```

Change `CLS` to `PRINT CL$` in lines 100 and 370. Finally, change lines 10, 40, 170, 190, 200, 250, 260, 300, 310, 340, 400, and 410 to read as follows:

```
10 DIM A$(11,4),N(11):WL=40:GW=0:M=0:Q$="":CL$=CHR$(14
7):PRINT CL$;CHR$(5)
40 E$=CHR$(34):FOR X=1 TO WL:BL$=BL$+CHR$(32):ST$=ST$+
CHR$(42):NEXT X
170 NS=INT(RND(0)*3)+1:IF M=1 THEN NS=INT(RND(0)*TB)+1
190 POKE 214,10:PRINT:PRINT BL$;:POKE 214,10:PRINT:GOS
UB 2000
200 GET K$:IF K$="" THEN 170
250 M=INT(RND(0)*N(FL))+1:Q$=A$(FL,M):GOTO 160
```

LEARNING THE EASY WAY

BY ALAN DROGIN

Alan, on the roof of the FAMILY COMPUTING building in Greenwich Village, New York City.

I remember playing *Hangman* in fifth grade with my childhood friend, Joe. The only thing that I can remember about Joe is that he had five sisters and always wore an unbuttoned lumberjack shirt over a T-shirt. We would sneak in a game or two when we got really bored and the teacher wasn't looking, usually during multiplication table drills. Joe was an artist, so he would always draw the minutest details on the hanged man like fingers, toes, and even eyelashes. By then I'd had enough turns to guess almost every letter in the alphabet, so I usually won.

Many years later, while studying to become a teacher, I student-taught a class of fifth graders at Phillips Elementary School in Watertown, Massachusetts. Times had changed. All of a sudden, drills were turned into games and school was supposed to be fun. Teachers had to match the fast-paced entertainment of television. So I constructed lesson plans based on the old games Joe and I used to sneak in during class. *Hangman* became a classroom activity played out in the open to teach spelling.

HOW TO PLAY

Before playing *Hangman*, Player No. 1 should select a word or phrase (25 letters maximum including spaces between words) and type it into the computer when Player No. 2 isn't looking. (It's OK to use punctuation, such as commas or apostrophes.) A series of asterisks representing the word or phrase will appear on the screen. Player No. 2 should then guess a letter and type it in.

If the letter does not appear anywhere in the word or phrase, a part of the hanged man's body will appear on the screen. If the letter is correct, the computer will replace an asterisk with that letter wherever it appears in the word or phrase, and Player No. 2 will then get a chance to guess (without penalty) the entire word or phrase. All punctuation and spaces must be correct. If Player No. 2 chooses not to guess, he or she simply presses the RETURN key.

Player No. 2 wins by guessing the word or phrase before the drawing of the hanged man is completed on the screen. Thirteen wrong guesses are permitted.

(NOTE: Hangman *was written for the ADAM, but can be played on Apple computers as well. Apple owners should enter the program using all capital letters for statements and variable names. Characters enclosed in quotes may be entered in lowercase if your Apple allows.)*

ALAN DROGIN, *26, is a freelance programmer, writer, and music director for dance groups. He lives in a New York apartment with one computer and five guitars. The word that never fails to stump his friends when playing Hangman is "rhythm."*

ADAM & Apple/*Hangman*

```
10 DIM p(25):TEXT:HOME:try = 0:FOR x = 1 TO 31:bl$ = b
l$+" ":NEXT x
20 PRINT "WHILE PLAYER #2 ISN'T LOOKING,"
30 PRINT "TYPE IN A WORD OR PHRASE"
40 PRINT "(NO MORE THAN 25 LETTERS LONG)"
50 PRINT "AND PRESS <RETURN>."
60 PRINT:PRINT "WORD OR PHRASE: ";:PRINT:GOSUB 1000:p$
 = y$
70 IF p$ <> "" AND LEN(p$) <= 25 THEN 90
80 PRINT:PRINT CHR$(7);"PLEASE REENTER.":GOTO 60
90 nl = 0:FOR x = 1 TO LEN(p$)
100 j = ASC(MID$(p$,x,1))
110 IF (j >= 65 AND j <= 90) OR (j >= 97 AND j <= 122)
THEN p(x) = -j:nl = nl+1:GOTO 130
120 p(x) = j
130 NEXT x
140 IF nl = 0 THEN 80
150 HGR:HCOLOR= 3
160 HPLOT 134,20 TO 134,10 TO 90,10 TO 90,140
170 HPLOT 70,140 TO 110,140 TO 110,155 TO 70,155 TO 70
,140
180 HOME:GOSUB 2000
190 VTAB 22:HTAB 1:PRINT "GUESS A LETTER: ";
200 GET guess$:IF (guess$ < "A" OR guess$ > "Z") AND
(guess$ < "a" OR guess$ > "z") THEN 200
210 PRINT guess$:j = ASC(guess$):f = 0:FOR x = 1 TO
LEN(p$)
220 k = ASC(MID$(p$,x,1)):IF (ABS(j-k) = 0 OR ABS(j-k)
 = 32) AND p(x) < 0 THEN f = 1:nl = nl-1:p(x) = -p(x)
230 NEXT x:IF nl = 0 THEN HOME:GOSUB 2000:FOR de = 1 T
O 200:NEXT de:GOTO 380
240 IF f = 1 THEN 330
250 try = try+1:if try > 1 THEN 300
260 FOR i = 1/15 TO 8*ATN(1) STEP 1/15
270 xf = SIN(i)*10+134:yf = COS(i)*10+30
280 HPLOT xf,yf:NEXT i
290 GOTO 180
300 READ a,b,c,d:HPLOT a,b TO c,d:IF try < 14 THEN 180
310 FOR d = 1 TO 10:PRINT CHR$(7);:NEXT d
320 TEXT:HOME:PRINT "YOU LOSE! THE ANSWER IS ...":PRIN
T:PRINT p$:GOTO 390
330 GOSUB 2000
340 PRINT:PRINT "GUESS THE WORD OR PHRASE,":PRINT "THE
N PRESS <RETURN>."
350 PRINT ">";:GOSUB 1000:IF LEN(y$) <> LEN(p$) THEN 1
80
360 f = 0:FOR x = 1 TO LEN(y$):j = ASC(MID$(y$,x,1)):k
 = ASC(MID$(p$,x,1)):IF j <> k AND ABS(j-k) <> 32 THEN
 f = 1
370 NEXT x:IF f = 1 THEN 180
380 TEXT:HOME:FOR x = 1 TO 100:PRINT "YOU WIN! ";:NEXT
 x
390 PRINT:PRINT:PRINT "SWITCH PLACES AND PRESS":PRINT
"ANY KEY TO PLAY AGAIN."
400 GET k$:RUN
1000 y$ = ""
1010 GET l$:IF l$ = CHR$(13) THEN RETURN
1020 IF l$ <> CHR$(8) THEN PRINT l$;:y$ = y$+l$:GOTO 1
010
1030 IF LEN(y$) = 0 THEN 1010
1040 IF LEN(y$) = 1 THEN y$ = "":GOTO 1060
1050 y$ = LEFT$(y$,LEN(y$)-1)
1060 PRINT CHR$(8);" ";CHR$(8);:GOTO 1010
2000 VTAB 21:HTAB (31-LEN(p$))/2
2010 FOR x = 1 TO LEN(p$)
2020 IF p(x) < 0 THEN PRINT "*";:GOTO 2040
2030 PRINT CHR$(p(x));
2040 NEXT x:RETURN
3000 DATA 134,40,134,80,126,48,142,48
3010 DATA 126,48,118,80,142,48,150,80
3020 DATA 126,80,142,80,126,80,120,130
3030 DATA 142,80,148,130,120,130,116,134
3040 DATA 148,130,152,134,134,28,135,32
3050 DATA 131,27,133,27,135,27,137,27
3060 DATA 131,34,137,34
```

GAMES

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	PS	GQ	EU	V
B-1 NUCLEAR BOMBER Avalon Hill Game Co. 4517 Harford Road Baltimore, MD 21214 (301) 254-9200 $16 (cassette) $21 (disk) © 1982	Pilot your bomber into Russia to destroy designated targets in exciting strategy game. Lacks interesting graphics, but its short play-length is a plus for younger gamers. For ages 12+. Not an arcade game. —DELSON	Reviewed on Atari Home Computers, 32K (cass.); available on 32K (d.). Also for C 64 (d. & cass.); IBM PC, 64K (d.); TI-99/4A, 16K (cass.); TRS-80 I/III/4, 16K (cass.), 32K (d.); TS 1000, 16K (cass.).	Defective material replaced free.	★★★	★★★	★★	★	A	★★★
BRUCE LEE Datasoft 19808 Nordhoff Place Chatsworth, CA 91311 (818) 701-5161 $34.95 © 1984	Leap through the air delivering karate chops to eliminate adversaries. Beat the Wizard and take his gold in exciting arcade adventure for ages 10+. —DELSON	Reviewed on Atari Home Computers, 32K (d.); available on 16K (cass.). Planned for Apple II series; C 64; IBM PC/PC*jr*. Joystick required.	3-month warranty; $7.50 fee if user-damaged or for backup copy.	★★★	★★	★★★	★★★	D	★★★
ENCHANTER Infocom, Inc. 55 Wheeler St. Cambridge, MA 02138 (617) 492-1031 $49.95 © 1983	Seek out evil Warlock. Acquire spells, powers, and learn secrets in all-text fantasy-adventure game filled with wizards, magical creatures, and stimulating puzzles.† —DELSON	Reviewed on Apple II series, 32K (d.). Also for Atari Home Computers, 32K (d.); C 64 (d.); IBM PC/PC*jr*, 48K (d.); TI-99/4A, 32K (d.); TRS-80 I/III/4, 32K (d.).	90-day warranty; $5 fee thereafter or if user-damaged. TRS and IBM users make backups.	★★★	★★★	★★★	N/A	D	★★★
FORT APOCALYPSE Synapse Software 5221 Central Ave. Richmond, CA 94804 (415) 527-7751 $34.95 © 1983	Steer through underground maze and free prisoners, while heading for Fort Apocalypse itself, in exciting helicopter shoot-'em-up, with long play life and lively action for ages 10+. —DELSON	Reviewed on Atari Home Computers, 32K (disk); available on 32K (cassette). Also for Commodore 64 (disk or cassette). Joystick required.	Defective disks replaced free w/in 90 days, $5 fee thereafter or if user-damaged.	★★★	★★	★★★	★★	A	★★★
INTERNATIONAL SOCCER Commodore Business Machines, Inc. 1200 Wilson Drive West Chester, PA 19380 (215) 431-9100 $34.95 © 1984	Compelling simulation recreates thrill, timing, and "feel" of soccer. Play computer's 9 skill levels or take on human opponent in beautifully animated game for ages 10+. —DELSON	Reviewed on Commodore 64 (cartridge). Joystick required.	Defective cartridges replaced free w/in 90 days; $17.50 thereafter.	★★★★	★★	★★★★	★★★★	A	★★★★
LORDLINGS OF YORE Softlore Corp. 8714 Wellesley Manor San Antonio, TX 78248-2116 (512) 691-2800 $39.95 © 1983	Hire troops, purchase spells, rule peasants, and collect taxes as you strive to become Lord over up to 3 other opponents in role-playing strategy-adventure game for ages 10+. † —DELSON	Reviewed on Apple II series, 48K (disk). Also for Apple III. Version planned for IBM PC/PC*jr*, TRS-80 CoCo.	Defective or user-damaged disks replaced free w/in 90 days; $10 fee thereafter.	★★★	★★★	★★★	★★	E	★★★
MIG ALLEY ACE MicroProse Software 10616 Beaver Dam Road Hunt Valley, MD 21030 (301) 667-1151 $34.95 © 1983	Fly solo, head-to-head, or cooperative missions as a North Korean or U.S. fighter pilot in fast-paced simulation with 4 skill levels and 5 game scenarios. For ages 8+.† —DELSON	Reviewed on Atari Home Computers, 48K (disk); available on 16K (cassette). Joystick required.	30-day warranty; $10 fee thereafter, if user-damaged, or for backup copy.	★★★★	★★★	★★★★	★★★	A	★★★★
OIL'S WELL Sierra On-Line Sierra On-Line Bldg. Coarsegold, CA 93614 (209) 683-6858 $29.95 (disk) $34.95 (cartridge) © 1983	Direct "drill bit" through underground field to tap black gold and eliminate meanies. Addictive game may wear thin once you've mastered play system. Good for ages 8+. —DELSON	Reviewed on Apple II series, 48K (d.). Also for ADAM (cart.); Atari Home Computers, 40K (d. & cart.); C 64 (d. & cart.). Version planned for IBM PC/PC*jr*. Joystick.	90-day warranty; $5 fee thereafter or if user-damaged.	★★★	★★	★★	★★★	A	★★
THE PHARAOH'S CURSE Synapse Software 5221 Central Ave. Richmond, CA 94804 (415) 527-7751 $34.95 © 1983	Colorful, simple, skill/arcade treasure hunt takes place in underground caverns of the Pharoah's tomb. Best suited for fans seeking nonstop action, ages 10+. —DELSON	Reviewed on Atari Home Computers, 32K (disk or cassette). Also for Commodore 64 (disk or cassette). Joystick required.	90-day warranty; $5 fee thereafter or if user-damaged.	★★	★★	★★	★★★	A	★★
ULTIMA II Sierra On-Line Sierra On-Line Bldg. Coarsegold, CA 93614 (209) 683-6858 $59.95 © 1983	Roam continents and planets, take on monsters, and acquire treasures and experience points, traveling from age to age in role-playing adventure for ages 12+, 8+ with adult help.† —DELSON	Reviewed on Apple II series, 48K (disk). Also for Atari Home Computers, 48K (disk); Commodore 64 (disk); IBM PC/PC*jr*, 64K (disk).	Defective disks replaced free w/in 90 days. $5 fee thereafter or if user-damaged.	★★★★	★★★★	★★★	★★★	A	★★★

RATINGS KEY **O** Overall performance: **D** Documentation: **PS** Play system: **EH** Error-handling: **GQ** Graphics quality: **EU** Ease of use: **V** Value for money: ★ Poor; ★★ Average; ★★★ Good; ★★★★ Excellent: N/A Not applicable: E Easy; A Average; D Difficult; † Longer review follows chart

WHAT'S IN STORE
SOFTWARE REVIEWS

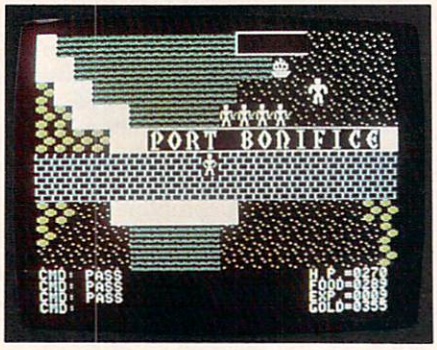
By using the gold in your treasury, you may hire troops, purchase a number of exotic spells for your necromancer, bribe neighboring rulers, and win the loyalty of your citizens. As the game progresses, you may attack your neighbors to increase your holdings (and add to your tax coffers), form defensive and offensive alliances, protect your shire against attack, and occasionally wreak havoc in distant parts of the country by having your necromancer cast dangerous spells.

Strategy skills will certainly come in handy for newcomers to *Lordlings*. Playing out a few practice rounds, though, will help you get acquainted with the system before the actual game. A handicap option helps balance competition between players of different skills.

Playtesters who enjoy strategy games and scenarios that require a lot of thought were thoroughly absorbed by this game. They liked the options which let you bribe and appease your way to success (as opposed to merely charging and shooting). Suitable for ages 10 and up, *Lordlings of Yore* usually runs two-to-eight hours in length and is ideal for group play in family or after-school sessions.

Ultima II

HARDWARE REQUIREMENTS: Apple II series, 48K (disk). Also for Atari, Commodore 64, and IBM PC/PC*jr*.
MANUFACTURER: Sierra On-Line
PRICE: $59.95



If sprawling, role-playing adventures are your style, this enormous program (3 disk sides) might be just your cup of mead. Spanning five ages of time, all the earth's continents (shaped and reshaped as time passes), plus the nearby planets of our galaxy, this is a program on which you'd better be prepared to spend six months. It's as challenging a game as I've seen, requiring patience, cunning, daring, and an unquenchable thirst for adventure.

You start by creating a character and endowing it with various degrees of agility, strength, charisma, and other attributes. Then you move across a scrolling mapboard and search for a town so you can buy weapons, food, spells, and information to begin your quest. Roaming the countryside, you'll encounter monsters, acquire their treasures, and gain experience points for killing them, thereby building up your character, personal wealth, and chances of survival. You use time portals to transport from age to age, continent to continent, and planet to planet.

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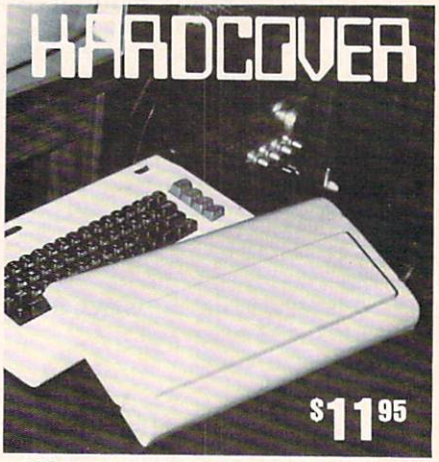

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